Interstage Application Server

V7.0

Single Sign-on Operator's Guide

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The contents of this manual may be revised without prior notice.

Preface

Purpose of this Document

This manual describes the environment setup and operation procedures required for Interstage Single Sign-on operation.

Note

Throughout this manual Interstage Application Server is referred to as Interstage.

Who Should Read this Document?

It is assumed that readers of this manual have a basic knowledge of the following:

- The Internet
- SSL
- Apache
- Web Server
- LDAP and X.500
- Basic knowledge of Java application development using JAAS for Java application development
- Basic knowledge of the OS used

Organization of this Document

This document is organized as follows:

- *Chapter 1 Overview*

  This chapter provides an outline and explanation of the concepts (e.g., system configuration) and functions of Interstage Single Sign-on.

- *Chapter 2 Environment Setup (SSO Administrators)*

  This chapter explains how to set up the authentication infrastructure environment for Interstage Single Sign-on.

- *Chapter 3 Environment Setup (Business Server Administrators)*

  This chapter explains how to set up the business system environment that is needed for Interstage Single Sign-on.

- *Chapter 4 Operation and Maintenance*

  This chapter provides details on the operation and maintenance of Interstage Single Sign-on.

- *Chapter 5 Single Sign-on Customization*

  This chapter explains how to customize Interstage Single Sign-on.

- *Chapter 6 Troubleshooting*

  This chapter explains how to troubleshoot problems in Interstage Single Sign-on.

- *Chapter 7 Developing Applications*

  This chapter provides an explanation of the application interface provided by Interstage Single Sign-on. In addition, it also provides information on how to develop applications for Interstage Single Sign-on.

- *Appendix A Samples of User Program Descriptions*

  This appendix provides samples of the user programs that are required to operate the SSO repository for Interstage Single Sign-on.

- *Appendix B Entry Attributes To Be Registered in SSO Repository*

  This appendix provides user information, role configurations, and protection resources that are registered in the SSO repository, which are required for authentication and authorization for Interstage Single Sign-on.

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Chapter 1

Overview

This chapter provides an outline and description of the functions in the Interstage Single Sign-on application.

What Is Single Sign-on

A business information system uses multiple Web Servers and Web Services together. Users usually need to enter the each their ID and password for Web server and Web service.

The Single Sign-on function enables the user to obtain authorization to access multiple Web Servers and Web Services by a single sign-on (Authentication) operation.

The Single Sign-on function provides an authentication and authorization infrastructure for multiple Web servers and Web services comprising an enterprise system.

Authentication

Authentication is the process used to verify the validity and identification of the person who uses the system.

Authorization

Authorization is the process used to make sure that the user who requests access to a resource is allowed to access that resource. It is to confirm that a user who requests access to a resource, for example, a HTML document, image data, voice data on a Web server, and a CGI application operating on a Web server is allowed to access the resource.

Problems in Conventional Systems

It is often stated that a company cannot fully adapt to changes in the market and grow unless their business information system is constructed on application servers based on Internet technology. This means that not all-in-one information systems are used, but the system that can be flexibility to adapt to changes is used by the construction on the Web servers and services adapted to needs and purposes of individual, and operation it integrally.

However, business information systems that use multiple Web servers and Web services often occurs troubles.

User authentication is essential to business information systems, so conventional systems must supply Web servers and Web services with authentication functionality.

Common problems such as listed on the following page faced to system administrators and users.

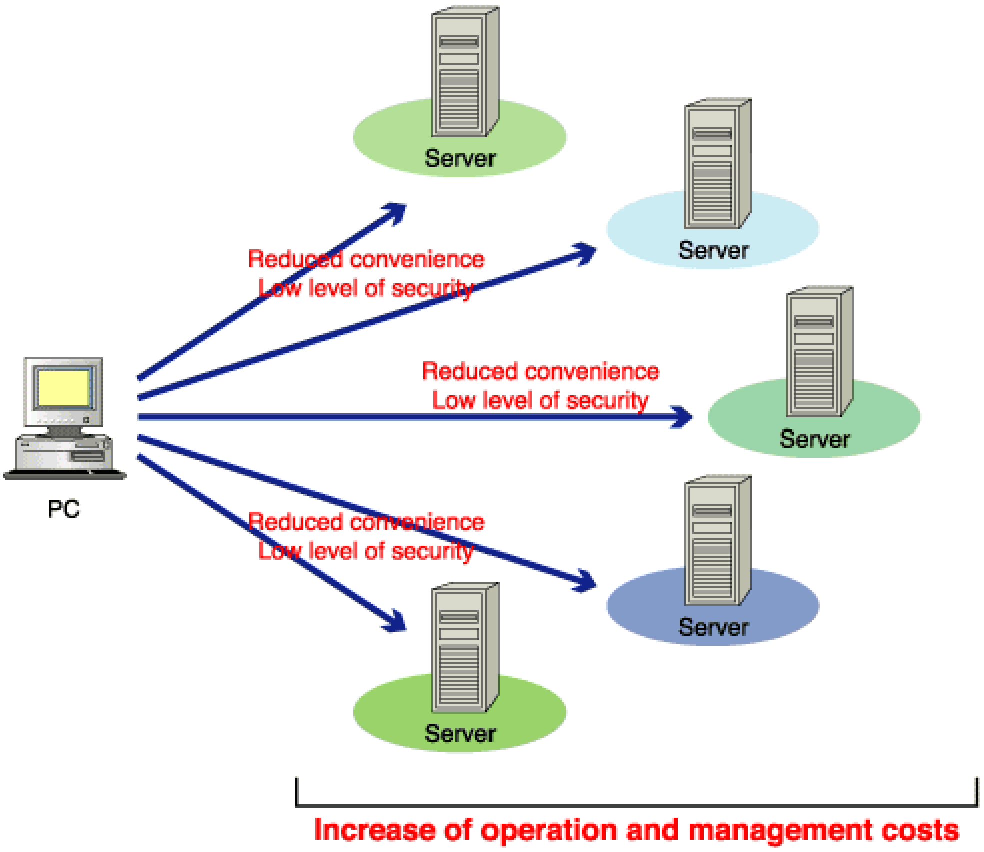


Figure 1-1 Problems in Conventional Systems

Reduced User Convenience

Since each system has an authentication function, a user must be authenticated every time they use the system. User information (user ID and password) is also managed for each system and therefore user must enter the user ID and password for authentication of each system. The user must also memorize and manage the user ID and password for each system. These restrictions make users to be inconvenience to use and access system.

Increase of Operation Cost

Every time a user is added, changed, or deleted because of a personnel change (or for other reasons), the administrator for each individual system must perform maintenance on the associated user and access control details. This means that the cost and time required for management of this activity is quite significant.

Increase of Development Cost

Since a security function must be developed for each system, the time and costs required for this development increases.

Low Level of Security

The total security level of an information system that contains multiple subsystems is equivalent to the lowest security level of its subsystems. This means that even if a subsystem is equipped with an advanced security function based on the latest security architecture, the advanced security function only has an effect on the total system security when all other subsystems have been used within the advanced system.

Effects of Single Sign-on

Interstage Single Sign-on can solve the problems associated with conventional information systems.

Improving User Convenience

Each user can access various Web systems and services securely by using a single pair user ID and password.

Reduction of Operation Cost

The system management and maintenance that is required when users are added, changed, or deleted because of personnel changes can be integrated. This means that the associated costs for system management and maintenance can be reduced.

Reduction of Development Cost

The need for security function development for each system is also eliminated and this means that the associated development costs can be reduced.

Realization of High Security Level

The level of security can be increased using an integrated method and as a result the total system can utilize the latest security architecture that is available.

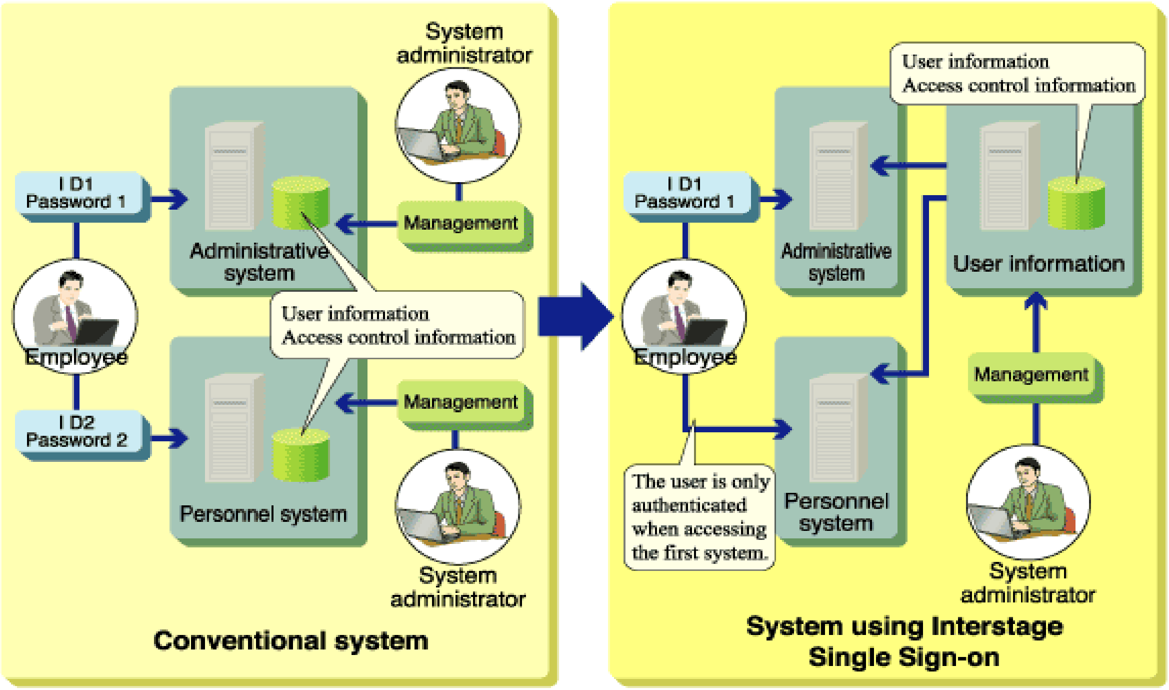


Figure 1-2 Comparison of a Conventional System and an Interstage Single Sign-on system

Implementation Method

Interstage Single Sign-on uses an implementation method called the "agent style" to implement the Single Sign-on.

The agent style locates an agent on each business server, where the necessity for user authentication is determined. When authentication is necessary, the authentication server is requested to perform authentication. The agent style also allows the original network configuration to be used after Interstage Single Sign-on is installed.

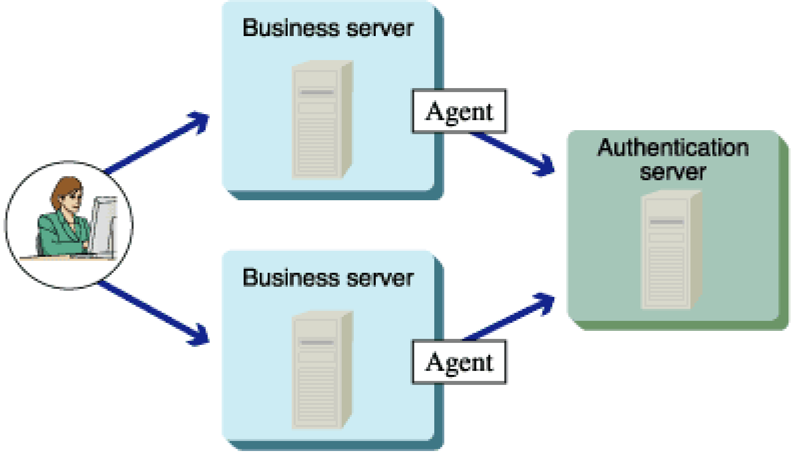


Figure 1-3 Implementation Method

Basic System Configuration

The Interstage Single Sign-on system basically consists of an authentication infrastructure, a business system, and clients. The authentication infrastructure has an authentication server, a repository server, and an SSO repository. The business system has a business server.

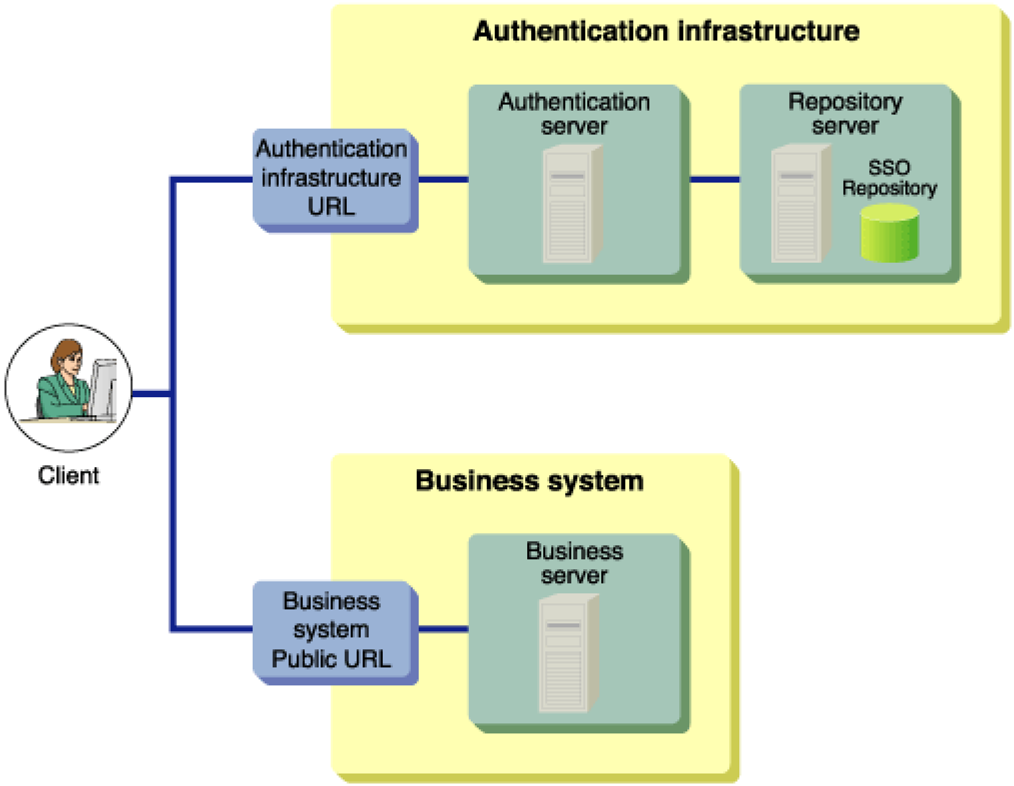

Authentication infrastructure
Authentication server
Repository server
SSO Repository
Authentication infrastructure URL
Client
Business system
Business server
Business system Public URL

Figure 1-4 Basic System Configuration

Users access the system from a Web browser on a client.

The user can use the system in the following two ways:

- Specifying the Authentication infrastructure URL through a Web browser

  Before accessing a business system, the user is authenticated by accessing the Authentication infrastructure URL through the Web browser. When authentication is successful, subsequent accesses to the business system are enabled.

- Specifying the Business system public URL through the Web browser

  The user accesses the business system through the Web browser without being aware of the authentication infrastructure.

If the user accesses the business system without being authenticated, the Web browser is automatically directed to the Authentication infrastructure URL and requested to perform user authentication. When authentication is successful, the Web browser is automatically directed back to the URL specified first.

Note

- The authentication and business servers cannot be constructed on the same machine.

Authentication Infrastructure

The authentication infrastructure retains the user information required for authentication, and requests each user to present a pair of user ID and password to certificate and authenticate.

The authentication infrastructure consists of an authentication server, repository server, and SSO repository.

Note

All access to the Authentication infrastructure uses SSL communication. For details, refer to “Authentication infrastructure URL”.

Authentication Server

The authentication server requests each user to present a pair of user ID and password or a certificate, and authenticate the user.

The authentication server compares the user ID and Password (or certificate presented by the user) with the user information previously set in the repository server to determine whether the user can use the Single Sign-on system.

Note

The authentication server is provided by the following products:

- Interstage Application Server Enterprise Edition
- Interstage Application Server Standard Edition
- Interstage Application Server Plus

Repository Server

The repository server manages the information necessary for user authentication, such as user IDs and passwords, and the information to authorize users to access the public URL path to the business system.

According to the request from the authentication server, the repository server fetches the user information necessary for authentication from the SSO repository. The fetched information is then transferred to the authentication server.

Two types of repository server are available: Repository server (update system) and repository server (reference system).

The repository server (reference system) is installed when system availability needs to be increased. If the repository server (reference system) to which the authentication server requests authentication has failed, repository server (reference system) to the authentication request destination is switched automatically to respond to the authentication request from the relevant client.

Note

The repository server is provided by the following products:

- Interstage Application Server Enterprise Edition
- Interstage Application Server Standard Edition
- Interstage Application Server Plus

SSO Repository

The SSO repository is a single directory used to control the information about all users of the operating system, and the resources associated with each business server.

For the SSO repository, Interstage Smart Repository is used.

Basic Configurations of Authentication Infrastructure

The following describes the basic configurations of the authentication infrastructure.

Four configuration patterns are supported to meet different system-scale requirements, e.g., load balancing and increase of system availability.

1. When Setting Up the Authentication Server on One Machine and the Repository Server on Another Machine (Middle-scale System)

This system configuration is suitable when the number of users in the business system and the number of simultaneous accesses to the business system are low in volume.

If the number of users within a business system increase and simultaneous access also increases, authentication servers can be added to change the system configuration in order to match the setup described in item 2 below.

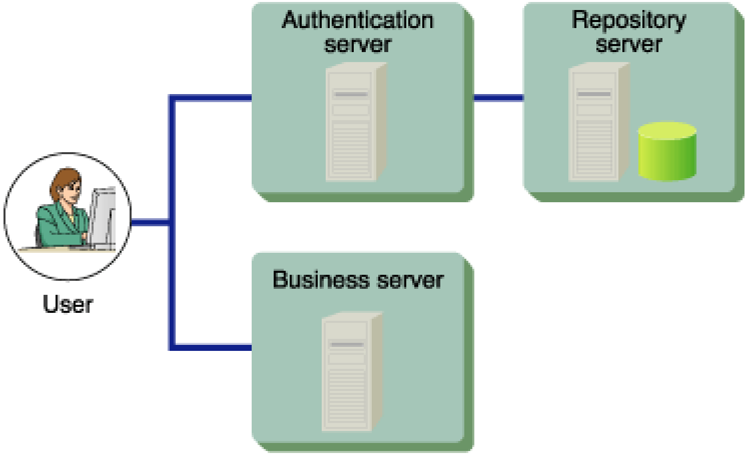


Figure 1-5 Setting Up the Authentication on One Machine and the Repository Server on Another Machine (Middle Scale System)

2. When Setting Up the Authentication Server on Multiple Machines and the Repository Server on a Machine (Middle-scale System: Balancing the Authentication Server Load)

This configuration is suitable when the number of users of the business system and the volume of simultaneous access to that business system is large.

This system configuration places a load balancer before multiple authentication servers to balance the load of the authentication servers. Three or more authentication servers can be implemented.

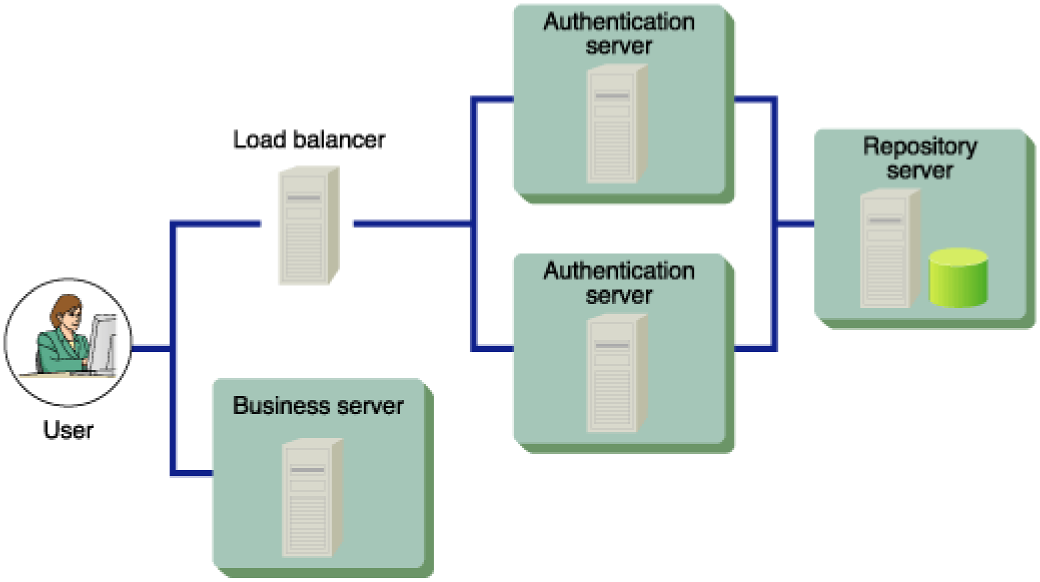


Figure 1-6 Setting Up the Authentication Server on Multiple Machines and the Repository Server on a Machine (Middle Scale System- Balancing the Authentication Server Load)

3. When Setting Up the Authentication Server and the Repository Server on Multiple Machines Individually (Large-scale System)

This system configuration has multiple repository servers that are used separately as update and reference systems. Multiple repository servers have been used in this setup in order to share and balance the processing load as needed.

This system configuration positions a load balancer between the client and multiple authentication servers, to balance the load of the authentication servers. This configuration also uses multiple repository servers to balance the load on repository servers during authentication processing.

Multiple repository servers (reference systems) can be allocated for an authentication server. With multiple repository servers, even if a repository server (reference system) stops (fails), the system can continue operation by switching the repository server to another (reference system). A repository server (update system) can be also operated as a repository server (reference system). If a repository server (update system) stops (fails), the system is automatically stopped.

The information stored in the SSO repositories of update and reference systems must always be maintained to be the same status by the repository replication function.

Two or more repository servers (reference systems) can be installed.

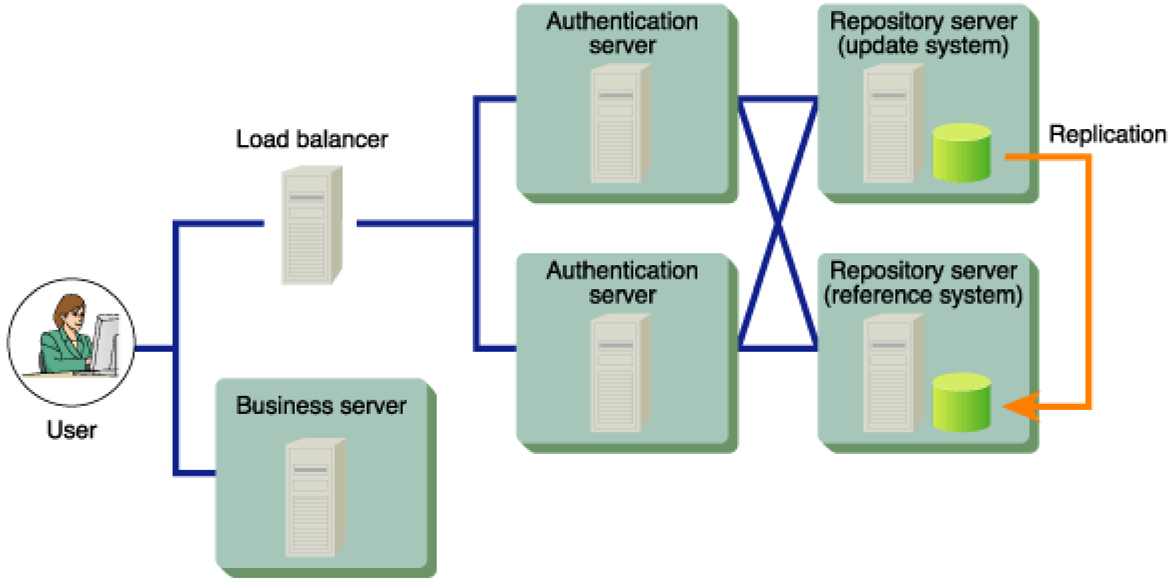


Figure 1-7 Setting Up the Repository Server and Authentication Server on Multiple Machines Individually (Large Scale System)

4. When Setting Up the Repository Server and the Authentication Server on a Single Machine (Small-scale System)

This system configuration sets up the authentication infrastructure (repository and authentication servers) on one machine. This configuration is suitable for a small-scale system in which the number of business system users and the number of simultaneous accesses to the business system are small.

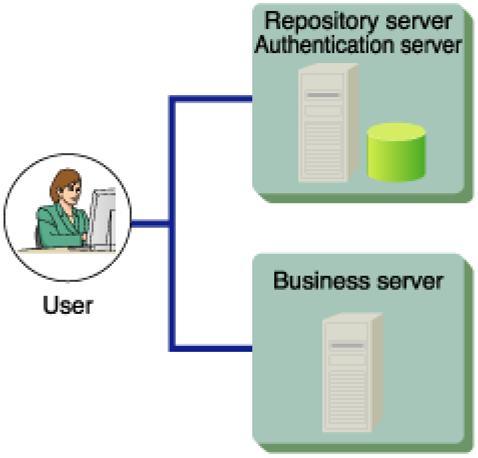


Figure 1-8 Setting Up the Repository Server and Authentication Server on a Single Machine (Small Scale System)

Business System

The business system provides users with Web-based services.

The business system basically consists of a business server and Web Systems and services operated on the business server.

Business Server

In request for business system access from a user, the business server requests the authentication infrastructure in order to authenticate the user. At this point, the business server also authorizes the authenticated user to use the access-target services.

The business server that is available to add to the business system of Interstage Single Sign-on must be operated on the following Web servers.

Windows

- Interstage HTTP Server
- InfoProvider Pro
- Microsoft(R) Internet Information Services

Solaris OE

- Interstage HTTP Server
- InfoProvider Pro
- Sun ONE Web Server Enterprise Edition

Linux

- Interstage HTTP Server

Basic Configurations of Business System

The following two configuration patterns are available for the business system.

1. When Setting Up a Business Server on a Machine

A business server is set up on a machine.

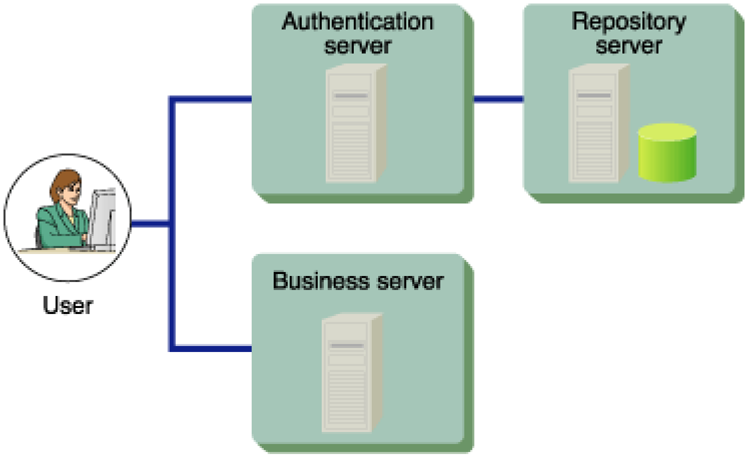


Figure 1-9 Setting Up a Business Server on a Machine

2. When Setting Up Business Servers on Multiple Machines

This system configuration positions a load balancer between the client and multiple business servers, to balance the load of the business servers. Three or more business servers can be implemented.

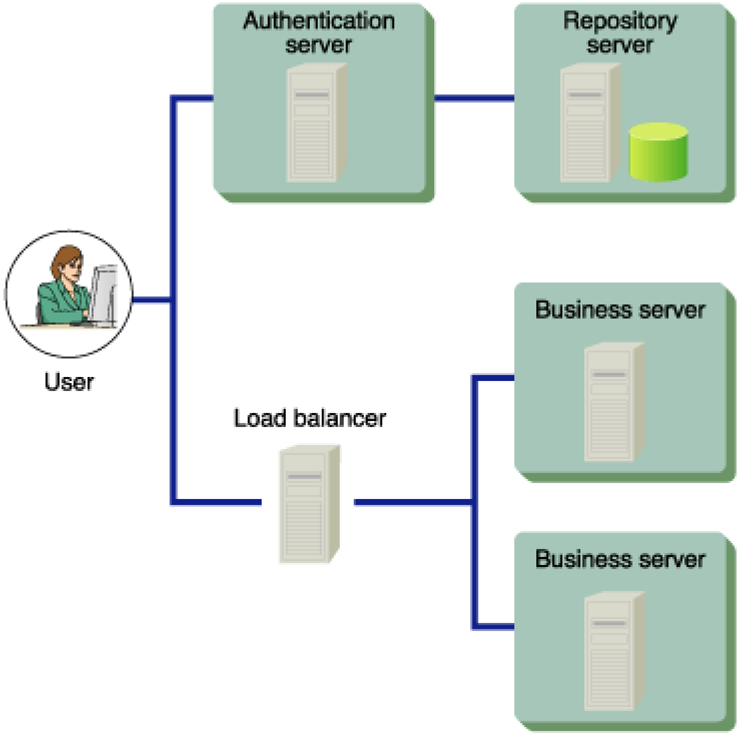


Figure 1-10 Setting Up Business Servers on Multiple Machines

Client

With Interstage Single Sign-on, a user uses the business system from a Web browser on a client.

Supported Web Browsers

The following table lists the Web browsers that can be used on the client.

Table 1-1 Supported Web Browsers

Web browser	Version and level
Netscape Communicator	4.6, 4.7, 4.72, 4.73, 4.75, 4.78
Microsoft(R) Internet Explorer	5.01, 5.5, 6.0

Web Browser Setup

- Set up the browser to accept cookies.
- Validate Java scripts.
- When using proxy servers, set up the browser so that both authentication and business servers are connected through proxy servers.
- Set up the browser to use SSL2.0 and SSL3.0.

Application of Security Patch

The client system may be attacked and cookies may be stolen when a problem occurs in the Web browser being used. If such a trouble is detected, the developer of the Web browser releases a security patch. The system administrator must instruct all users of the operating system to always apply the latest security patches to their browsers.

About Proxy Servers

When a load balancer, such as Interstage Traffic Director, is used for load balancing, the proxy server through which a client is connected may be varied per access according to load balancer settings. Since the authentication and business servers recognize the proxy server address as the client address, if the proxy server is varied, the client address will be different between the access to the authentication server and the access to the business server.

If it occurs, the Single Sign-on operation cannot be validated. To avoid this problem, ensure the load balancer is set up so that access to the same client always uses the same proxy server.

For example, when "Balancing for each node" is specified for Interstage Traffic Director, every request from the same client is connected to the same server.

Administrators

To operate Interstage Single Sign-on, the SSO (Single Sign-on) administrator must not only manage the authentication infrastructure but also coordinate with the administrator of the business server linked to Single Sign-on.

SSO Administrator

The SSO administrator manages the authentication infrastructure.

Based on the information obtained from the business server administrator, the SSO administrator registers users in the SSO repository, deletes users from the SSO repository or changes registered user information.

Business Server Administrator

The business server administrator manages the business system.

The business server administrator decides the resources to be protected by the business server and protection policies, including the criteria for the users who can access protected resources and delivers the information to register the business system in the authentication infrastructure to the SSO administrator. For details, refer to "Designing a Business System".

Authentication

Authentication is the operation used to check the validity of any person who attempts to use the system.

This section explains the authentication function provided with Interstage Single Sign-on.

Interstage Single Sign-on supports the following authentication methods for user authentication:

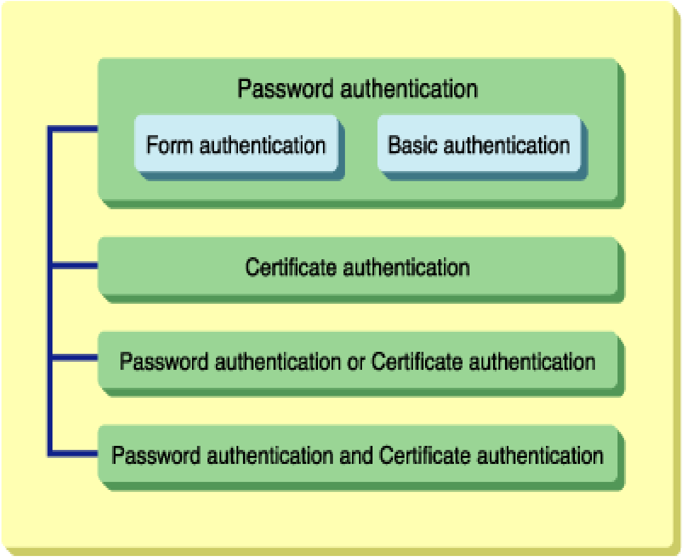

Password authentication
Form authentication
Basic authentication
Certificate authentication
Password authentication or Certificate authentication
Password authentication and Certificate authentication

Figure 1-11 Authentication

For details about Password authentication, Form authentication, Basic authentication, and Certificate authentication, refer to “Password and Certificate Authentication“.

For details about “Password authentication or Certificate authentication” and “Password authentication and Certificate authentication“, refer to “Combinations of Authentication Methods”.

Password and Certificate Authentication

Interstage Single Sign-on supports the following two authentication methods for user authentication. Both methods can be used in combination.

- Password authentication
- Certificate authentication

With Interstage Single Sign-on, the two authentication methods can be specified separately or in combination for the resources as access control targets for each user.

The authentication method for a user is set according to ssoAuthType, a user information entry managed by the SSO repository of the repository server.

Also, a re-authentication interval can be specified for authentication. When a re-authentication interval is specified, an authenticated user is requested to be authenticated again after a specified time elapses from the first authentication. This function prevents unauthorized use of the Web system by a third person even if a user leaves the client computer for long after authentication.

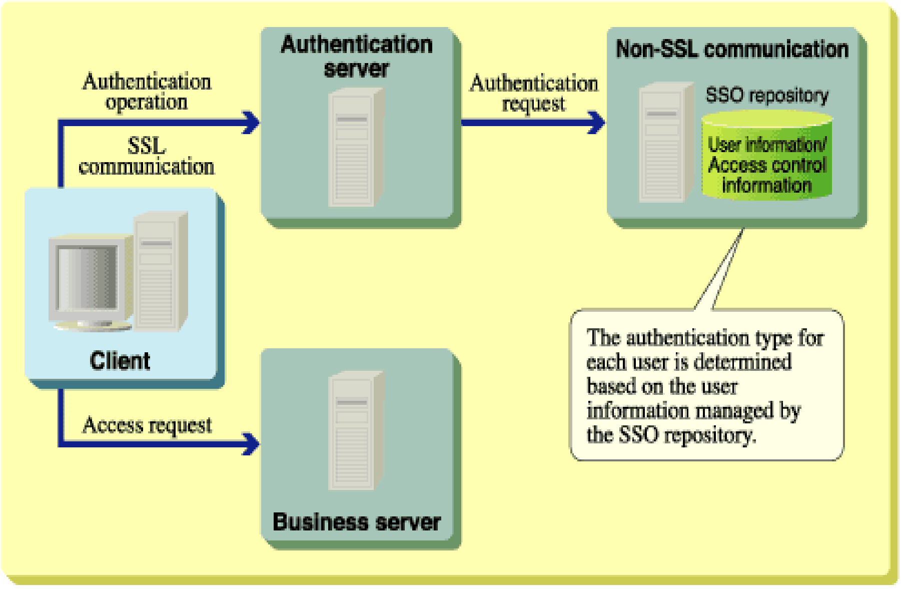

Authentication server
Authentication operation
SSL communication
Authentication request
Non-SSL communication
SSO repository
User information/ Access control information
Client
Access request
Business server
The authentication type for each user is determined based on the user information managed by the SSO repository.

Figure 1-12 Password and Certificate Authentication

Password Authentication

Password authentication is the process used to authenticate a user via a paired user ID and password. This means that if a computer used by the user is undefined, the user can be easily authenticated.

With Interstage Single Sign-on, it is possible to select either of the following user ID/password input screen for password authentication:

Table 1-2 Password Authentication

User ID/password input screen	Explanation	Written name in subsequent explanations
Form authentication page	Web page in which the authentication form is embedded	Form authentication
Basic authentication dialog	Standard authentication window of the Web browser	Basic authentication

When the user accesses the business system, the form authentication page appears for form authentication, and the basic authentication dialog appears for basic authentication. The user is prompted to enter the user ID and password.

Valid user ID and password pairs must be registered in the SSO repository beforehand. Only users who present a user ID and password pair that matches a valid registered pair are authenticated successfully.

If the form authentication is used, users can access the Authentication infrastructure URL directly through a Web browser for authentication, and users can also access the business system.

If users access to Authentication infrastructure directly, use the same method to access the following URL:

```
Authentication infrastructure URL/ssoatcag (*1)(*2)
```

In the following explanation, the URL above is replaced with “URL of Form authentication“

*1 Specify the port number even if 443 is specified.

*2 If the Authentication infrastructure URL is confirmed after setting the business server, on the Interstage Management Console, select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Settings] > [Detailed Settings [Show]], and then check the setting for [Repository Server URL] under [Authentication Infrastructure Information Settings].

Example

If Authentication infrastructure URL is used as "https://authserver.fujitsu.com", the URL of Form authentication page is the following:

```
https://authserver.fujitsu.com:443/ssoatcag
```

Note

If the incorrect URL is specified, the following error occurs and the authentication may fail.

- The following message outputs on the Web browser, even if authentication is performed. Or re-authentication is required.
  - “403 Forbidden/Authentication is processing”
- If client authentication is processed through SSL communication, the request window of the client certificate is displayed several times.
- The following message is displayed on the Web browser, and output message: sso02012 to the system log.
  - “403 Not Found”
  - “The page cannot be displayed”

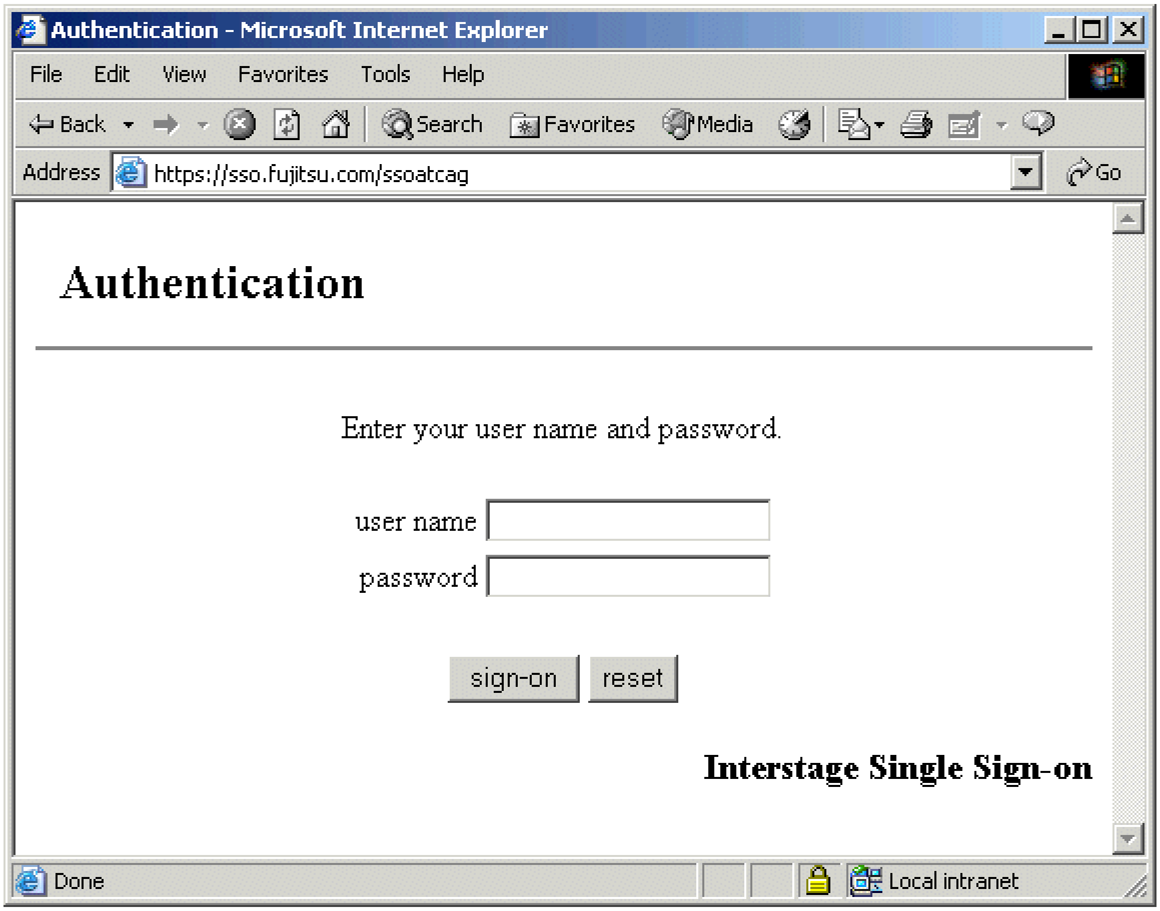
The form authentication page can be customized. For customization method details, see “Customizing a Message"

Authentication by Password authentication is simple, but there is a risk that a user's password could be stolen or spoofed.

The following examples show the form authentication page and dialogs that are displayed by each Web browser for basic authentication.

Example

An example of the form authentication page is shown below.


Authentication - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Search
Favorites
Media
Address
Go
Done
Local intranet

https://sso.fujitsu.com/ssoatcag

Authentication

Enter your user name and password.

user name

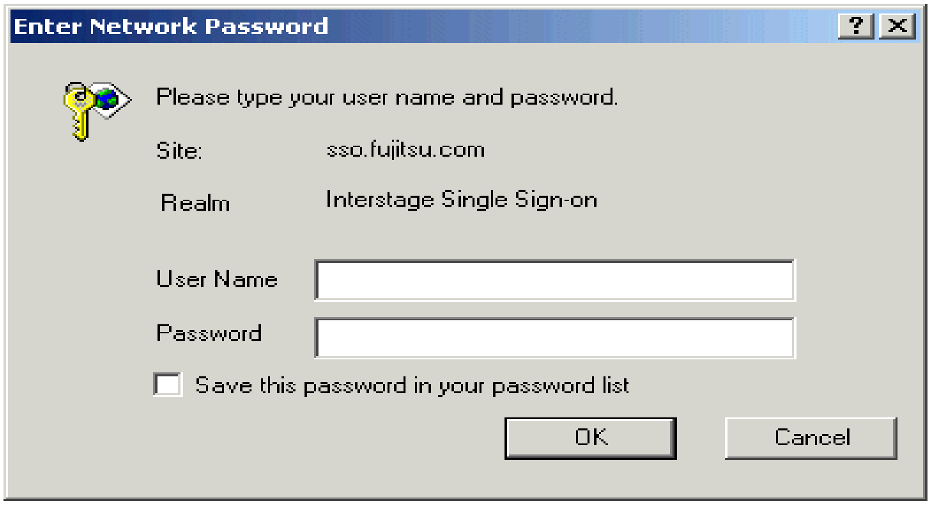
password

Interstage Single Sign-on

Figure 1-13 Form Authentication Page in Microsoft(R) Internet Explorer 6.0

Example

Basic authentication dialog for Microsoft(R) Internet Explorer 6.0



Enter Network Password

Please type your user name and password.

Site: sso.fujitsu.com

Realm Interstage Single Sign-on

User Name

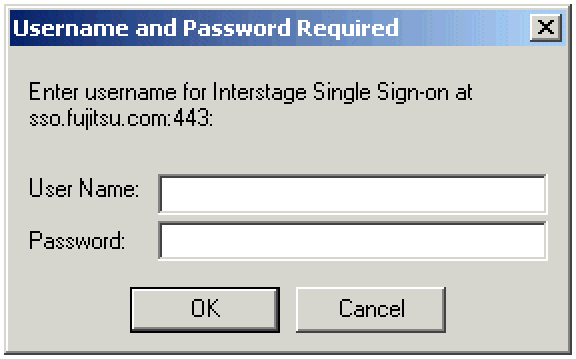
Password

□ Save this password in your password list

Figure 1-14 Authentication Window for Microsoft ® Internet Explorer 6.0

Example

Basic authentication dialog for Netscape Communicator 4.75



Username and Password Required

Enter username for Interstage Single Sign-on at sso.fujitsu.com:443:

User Name:

Password:

Figure 1-15 Basic Authentication Window for Netscape Communicator 4.75

Certificate Authentication

This authentication method is used to authenticate a user with a certificate. This method is convenient when the computer to be used is specified.

When the user accesses a business system or the Authentication infrastructure URL, the Web browser prompts the user to present the certificate. Authentication is performed by registering the certificate in advance in the Web browser used by the user. In this authentication method, the user is assumed to be authenticated when he or she can be identified from the presented certificate.

Certificate Information

For certificate authentication by Interstage Single Sign-on, the owner name (Subject), owner alias (Subject Alternative Name) and extension information contained in the presented certificate is referenced. Therefore, one of the following items of information must be stored in the certificate.

Certificate information referenced by Interstage Single Sign-on

- Mail address (mail)
- Employee number (employeeNumber)
- User ID (uid)
- Serial number (serialNumber)
- DN qualifier (dnQualifier)
- Name (cn)

If same attribute is specified for the owner name (Subject), owner alias (Subject Alternative Name) and extension information contained in the presented certificate, the following is referenced.

- For Mail address, the value that is set in the owner alias (Subject Alternative Name) and extension information is valid.
- For except mail address, the value that set in the owner name (Subject) is valid.

To set the certificate information, such as owner name and owner alias, on the Interstage Management Console, select, [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Authentication server] > [Settings] > [Detailed Settings [Show]]. Then, make settings for [Attributes used for Authentication] under [Certificate Authentication Settings].

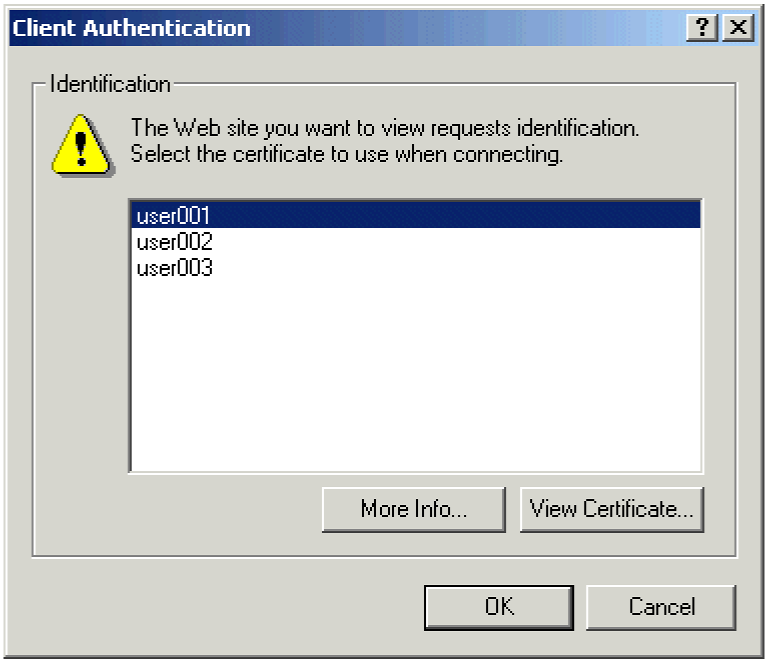
The following examples show the certificate selection windows that are displayed for certificate authentication in Web browsers. If multiple certificates have been registered in a Web browser, select the certificate on this window to be presented to the Web server.

If only one certificate has been registered in a Web browser, the certificate can be used automatically without the certificate selection window displayed. For further details about how to display the certificate selection window, refer to "Certificate selection windows".

For details about how to register certificates in a Web browser, refer to the Security System Guide.

Example

Certificate selection window of Microsoft(R) Internet Explorer 6.0



Client Authentication

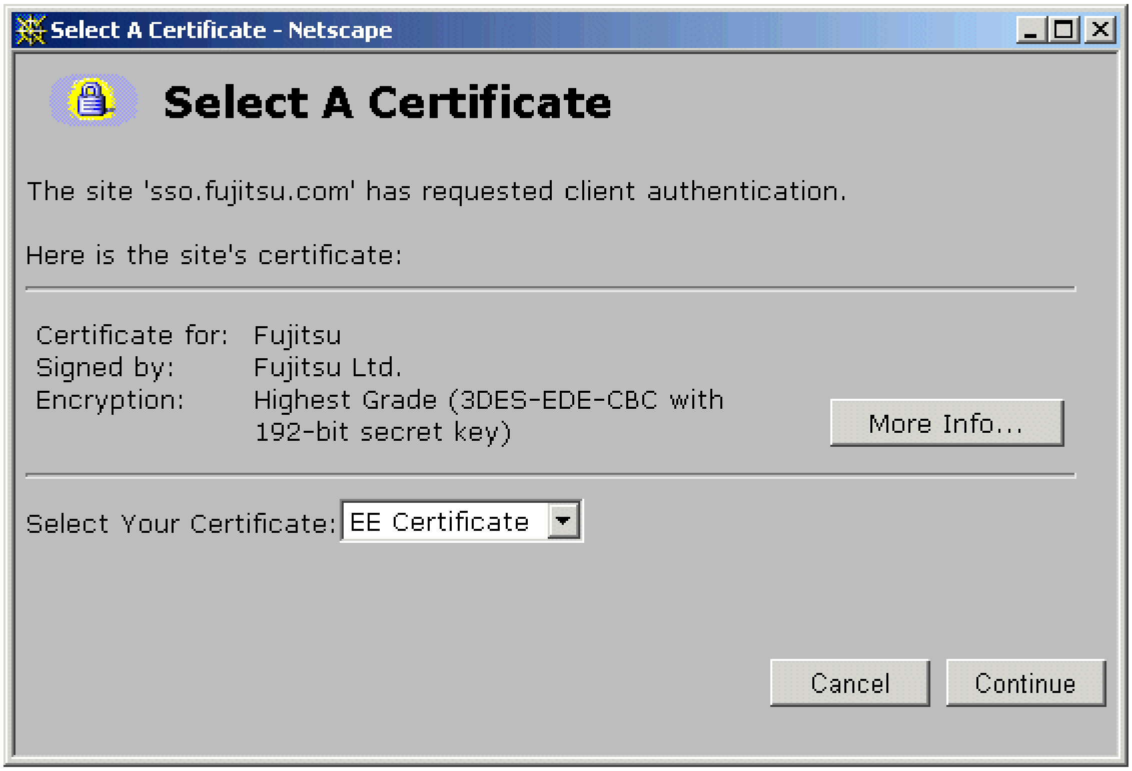
Identification

The Web site you want to view requests identification.
Select the certificate to use when connecting.

Figure 1-16 Certificate Selection Window for Microsoft ® Internet Explorer 6.0

Example

Certificate selection window for Netscape Communicator 4.75.



Select A Certificate - Netscape

Select A Certificate

The site 'sso.fujitsu.com' has requested client authentication.

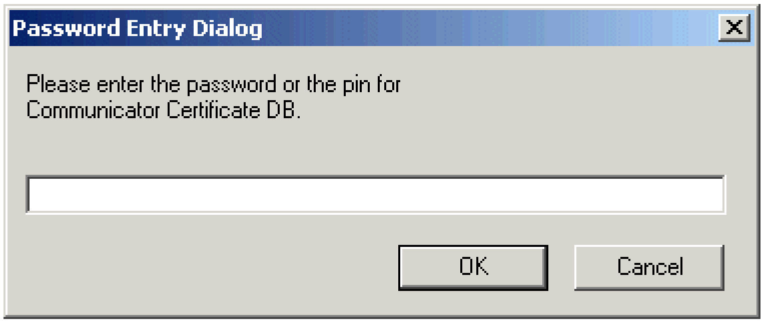
Here is the site's certificate:

Certificate for: Fujitsu
Signed by: Fujitsu Ltd.
Encryption: Highest Grade (3DES-EDE-CBC with 192-bit secret key)

Select Your Certificate: EE Certificate

Figure 1-17 Certificate Selection Window for Netscape Communicator 4.75

On Netscape Communicator, the following window is opened after the certificate selection window is displayed.



Password Entry Dialog

Please enter the password or the pin for
Communicator Certificate DB.

Figure 1-18 Password Entry Dialog Window

The "password" or "PIN" is the information to confirm the user who uses the selected certificate. When a valid password or PIN is entered, the selected certificate is presented to the Web server.

Certificates Supported by Interstage Single Sign-on

Interstage Single Sign-on supports certificates issued by the VeriSign Inc.and Japan Certification Services, Inc .

Checking the Effectiveness of Certificate

The certificate used for certificate authentication can be checked effectiveness by the authentication server. The effectiveness is checked based on the certificate revocation list (CRL) registered in the authentication server. The CRL lists revoked certificates. If a certificate listed in the CRL is presented, then authentication fails.

Note

If password authentication is being executed with basic authentication, a user cannot directly access the Authentication infrastructure URL using, for example, a Web browser.

Combinations of Authentication Methods

Interstage Single Sign-on supports the following four authentication methods as combinations of password authentication and certificate authentication. Authentication methods can be selected for each user.

Authentication Method	Description
password authentication	This authentication method uses a user ID and password pair. Either form authentication or basic authentication can be used.
certificate authentication	This authentication method uses the certificate obtained at SSL client authentication. Either the file-format certificate registered in the Web browser can be used.
password authentication or certificate authentication	Success of authentication is assumed only when either password authentication or certificate authentication is successful.
password authentication and certificate authentication	Success of authentication is assumed only when both password authentication and certificate authentication are successful.

Password Authentication or Certificate Authentication

Success of authentication is assumed when either password authentication or certificate authentication is successful.

This authentication method is appropriate for a user who frequently performs access from the computers other than the one in which the user's certificate has been registered. For example, when a user who always receives certificate authentication needs to access a resource from a different computer during a business trip or cannot use the certificate for some reason, the user can obtain access by using password authentication. The authentication operation is flexible.

This authentication method first requests the user to receive certificate authentication. When certificate authentication is successful, success of authentication is assumed. If the user fails in certificate authentication or presents no certificate, the user is requested to receive password authentication. When password authentication is successful, success of authentication is assumed. If the user fails password authentication, failure in authentication is assumed.

When the user has registered only one certificate or has not registered any certificate, the user can also use the registered certificate without displaying the certificate selection window or display the password authentication window without displaying the certificate selection window. For further details about how to display the certificate selection window, refer to "Certificate Selection Windows".

Password Authentication and Certificate Authentication

This authentication method only assumes authentication has been successful when both password authentication and certificate authentication have been successfully completed.

This method of authentication firstly requests the user to receive certificate authentication. When certificate authentication is successful, the user is then requested to complete password authentication. When password authentication has been completed, the authentication process has been successful. If password authentication fails, the authentication process may fail.

When the user has registered only one certificate, the user can also use the registered certificate without displaying the certificate selection window. For details about how to display the certificate selection window, refer to "Certificate Selection Windows".

Remark

When the Web browser is Netscape Communicator, the certificate selection window may be displayed twice. If it occurs, operate same action for both windows.

User Information

User information is managed in the SSO repository, and includes the user ID, password and authentication method for each user managed by Interstage Single Sign-on. The following user information can be set for each user according to system operation requirements.

The following table lists the main setting items for user information.

Table 1-3 User Information

Item	Description
Authentication method	One of the following authentication method: Password authentication Certificate authentication Password authentication or certificate authentication Password authentication and certificate authentication
User ID	User ID of the user. Only one user ID must be set for a user.
Password	Password of the user. Only one password must be set for a user.
Information to identify the user at certificate authentication	Certificate information that can identify the user with the certificate used by the user during certification authentication. This information does not need to be set when certificate authentication is not applied.

Item	Description
Role name/role set name	Name of the role or role set assigned to the user. Multiple roles or role sets can be set. The role and role set names set in user information must be those defined by role configuration.
Re-authentication interval	Interval of the time from authentication to subsequent re-authentication required.
Validity period start time	Date and time when the user starts using Single Sign-on.
Validity period end time	Date and time when the user ends the use of Single Sign-on.

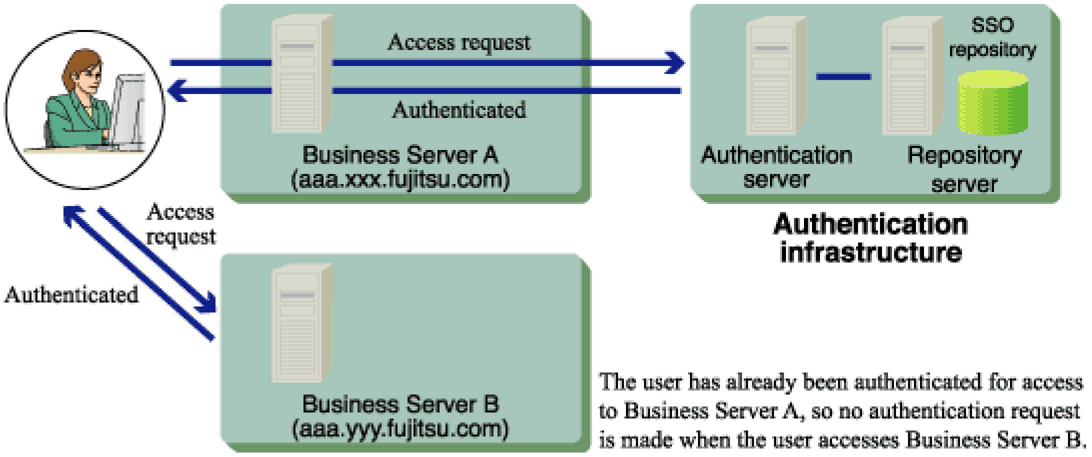
For details of roles and role sets, refer to "Relationships between Roles, Users, and Resources".

Authentication Information

After a user is authenticated, the user's mail address, employee number, and other information that is registered in the SSO repository are transferred as authentication information in a cookie format to the business, authentication and repository servers.

Authentication in a Multi-domain Environment

Authentication and authorization Interstage Single Sign-on are also available for an environment where the business system and authentication infrastructure belong to different domains.



The user has already been authenticated for access to Business Server A, so no authentication request is made when the user accesses Business Server B.

Figure 1-19 Authentication in a Multi-domain Environment

Certificate Selection Windows

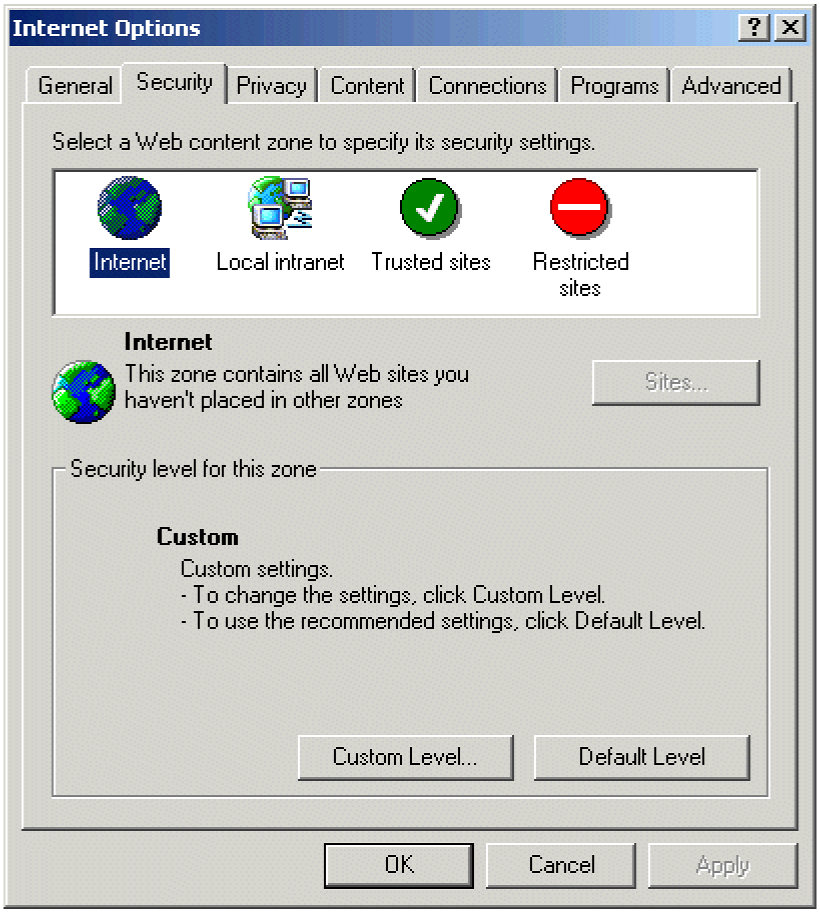
If no certificate (or only one certificate) has been registered in the client computer, the displaying of the certificate selection window can be suppressed during the certificate authentication operation.

The following explains how to suppress display of the certificate selection window on Microsoft® Internet Explorer and Netscape Communicator. As the display procedure for the certificate selection window varies depending on the version of Web browser, refer to the manual for the corresponding Web browser.

Example

Microsoft® Internet Explorer 6.0

Select [Tools] > [Internet Options] > [Security], and from the tab, select [Custom level].



Select a Web content zone to specify its security settings.

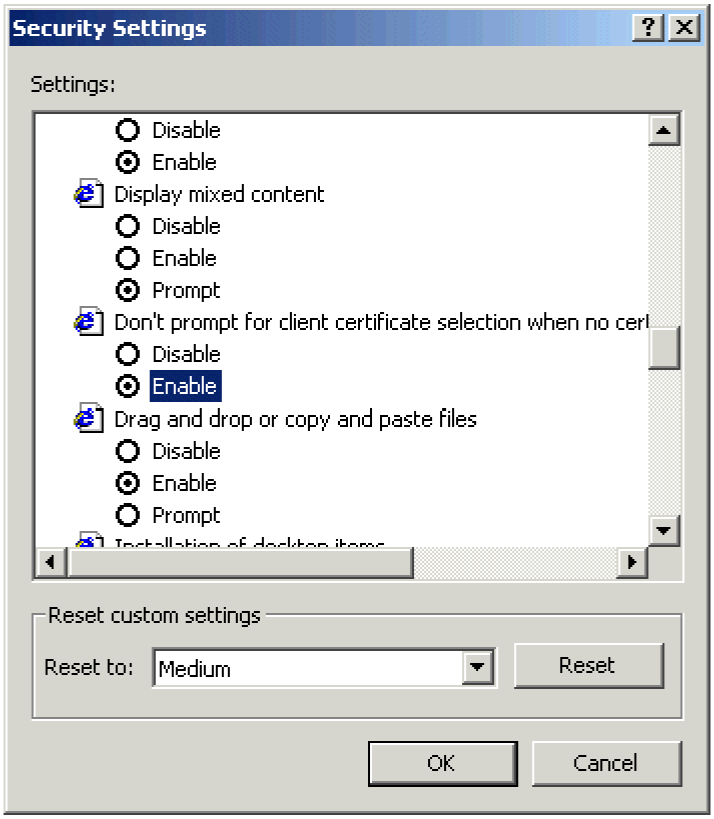
Internet
This zone contains all Web sites you haven't placed in other zones

Security level for this zone

Custom
Custom settings.
- To change the settings, click Custom Level.
- To use the recommended settings, click Default Level.

Figure 1-20 Internet Options

Select "Enable" for [Don't prompt for client certificate selection when no certificates or only one certificate exists].



Settings:

○ Disable
● Enable
Display mixed content
○ Disable
○ Enable
● Prompt
Don't prompt for client certificate selection when no cert
○ Disable
● Enable
Drag and drop or copy and paste files
○ Disable
● Enable
○ Prompt
Installation of desktop items

Reset custom settings

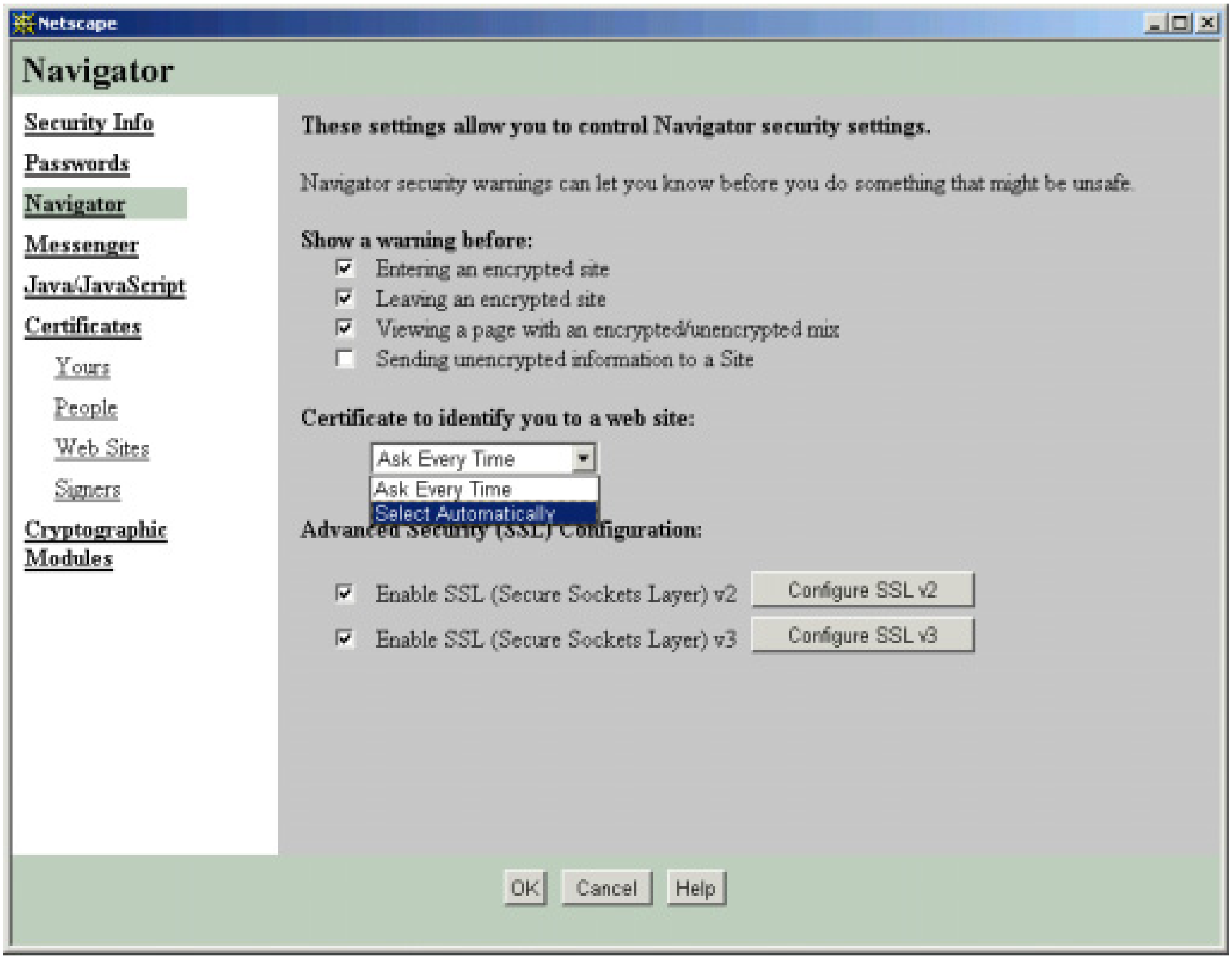
Reset to: Medium

Figure 1-21 Security Settings

Example

Netscape Communicator 4.78

Select [Communicator] > [Tools] > [Security Info], and from the window displayed, select [Navigator]. Then select "Select Automatically" for [Certificate to identify you to a web site].



These settings allow you to control Navigator security settings.

Navigator security warnings can let you know before you do something that might be unsafe.

Show a warning before:

☑ Entering an encrypted site
☑ Leaving an encrypted site
☑ Viewing a page with an encrypted/unencrypted mix
☐ Sending unencrypted information to a Site

Certificate to identify you to a web site:

Ask Every Time
Ask Every Time
Select Automatically

Advanced Security (SSL) Configuration:

☑ Enable SSL (Secure Sockets Layer) v2
☑ Enable SSL (Secure Sockets Layer) v3

Figure 1-22 Netscape Navigator Screen

Restrictions on Authentication

Interstage Single Sign-on provides some functions to prevent illegal access. The functions include the function for requesting re-authentication after a specified time elapses, the function setting a user validity period and the lockout function for disabling password input after several times consecutive invalid password input.

Re-authentication and Re-authentication Interval

A re-authentication interval can be set, so that an authenticated user is requested to be authenticated again after a specified time elapses from the first authentication. This function reduces the risk of unauthorized use of the user's client computer by a third person even when the user leaves the client computer without closing the browser after the user has been authenticated.

When the authenticated user connects to the business system from a client computer that has a different IP address, the user is requested to be authenticated regardless of the setting of the re-authentication interval.

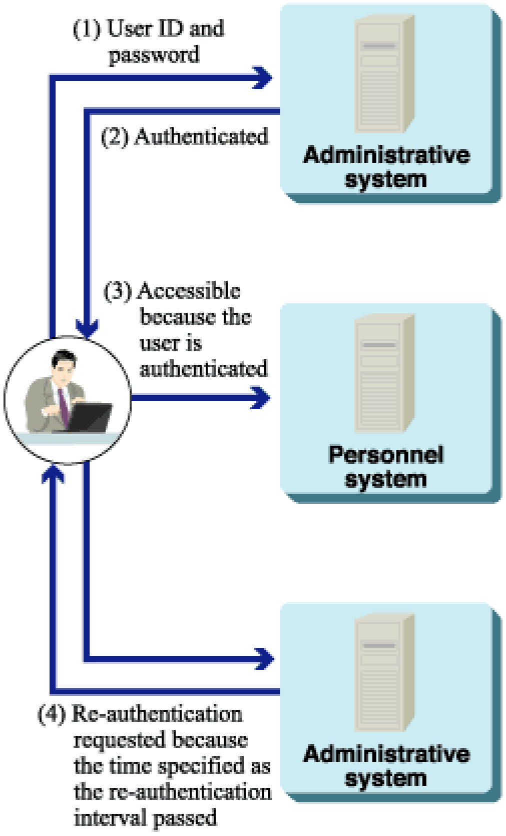

(1) User ID and password
(2) Authenticated
Administrative system
(3) Accessible because the user is authenticated
Personnel system
(4) Re-authentication requested because the time specified as the re-authentication interval passed
Administrative system

Figure 1-23 Interstage Single Sign-on Authentication

Re-authentication intervals can be set using the following methods.

- To set a re-authentication interval for each user, set the time of re-authentication interval for "ssoCredentialTTL" in the user information stored in the SSO repository.
- To set a standard re-authentication interval, from the Interstage Management Console, select [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Authentication server] > [Settings] > [Detailed Settings [Show]]. Then, set the time of standard re-authentication interval for [Re-authentication Interval] under [Operation after Authentication].

If all 2 items above have been set, the priority (for the re-authentication) is described in the table below.

Table 1-4 The priority for the re-authentication settings

High ^ | Low	Re-authentication interval set for each user Standard re-authentication interval

For details of the user information stored in the SSO repository, refer to "User Information Entry".

For details of the configurations on the Interstage Management Console, refer to Operator’s Guide.

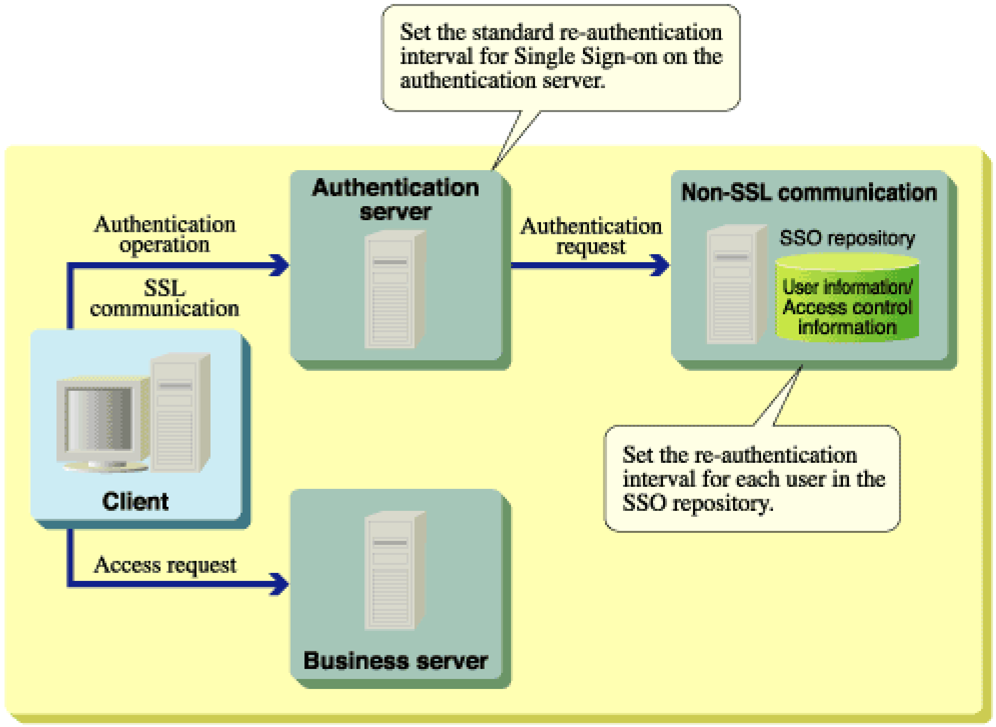

Set the standard re-authentication interval for Single Sign-on on the authentication server.
Authentication server
Authentication operation
SSL communication
Authentication request
Non-SSL communication
SSO repository
User information/ Access control information
Client
Set the re-authentication interval for each user in the SSO repository.
Access request
Business server

Figure 1-24 Using Re-authentication Intervals

Remarks

- When "certificate authentication" is used as the authentication method for the user, or when the user has been authenticated by certificate authentication with "password authentication or certificate authentication" used as the authentication method, the client (Web browser) automatically presents the certificate to the Web server at re-authentication.

  Therefore, the window requesting re-authentication is not shown to the user. Note that, when users are setting up the Authentication Server on multiple machines and the Repository Server on a machine, or setting up the Authentication Server and the Repository Server on multiple machines individually, the window requesting re-authentication may display even when the authentication method is "certificate authentication" or "password authentication or certificate authentication."
- When the remaining time for the validity period registered as user information in the SSO repository is shorter than the set re-authentication interval, the validity period registered as user information in the SSO repository has priority over the re-authentication interval. For details about the validity period when set as user information, refer to "User Validity Period" of “Restrictions on Authentication“.
- To reduce the risk of unauthorized use by third persons, it is strongly recommended that "0" should not be set as the re-authentication interval for each user or the standard re-authentication interval.

User Validity Period

Validity periods can be set for users in Interstage Single Sign-on.

For example, if the information on new employees is stored in the SSO repository in advance, settings can be made to validate authentication on the beginning date of employment and specify the projected end date of employment as the validity period end date.

Thus, authentication can be invalidated temporarily, and user validity periods can be set without deletion of user information from the SSO repository.

Set the user validity period by specifying values in "ssoNotBefore" and "ssoNotAfter" for the user information in the SSO repository.

For details about the user information in the SSO repository, refer to "User Information Entry".

Lockout

In order to protect users against unauthorized access, the lockout function restricts authentication and disables access to the resources managed by Interstage Single Sign-on.

If a user inputs invalid passwords (user ID and password) for a specified number of consecutive times, the user is locked and the use of the Single Sign-on system is restricted to disable the user from attempting the input of any more passwords.

The locked user fails authentication until the userID is unlocked.

To unlock user is performed using the Interstage Management Console by the SSO administrator. The locked user can also be unlocked automatically after a specified time. Automatic unlocking after a specified time is performed at the user's first authentication operation after the specified time elapses.

The count for successive authentication failures is reset when the user succeeds in password authentication.

Remark

If a user fails in authentication using a certificate, the user is requested to input the user ID and password. If the authentication method specified for that user is "certificate authentication" or "Password authentication and certificate authentication," the user will fail in authentication even when the user inputs valid user ID and password. If it occurs, select [Cancel] on the User ID/Password Request window.

When the user inputs a user ID and a password to the user ID/password request window, the user is regarded as a lockout target and the count for successive authentication failures is increased by one, even if the input user ID and password are valid.

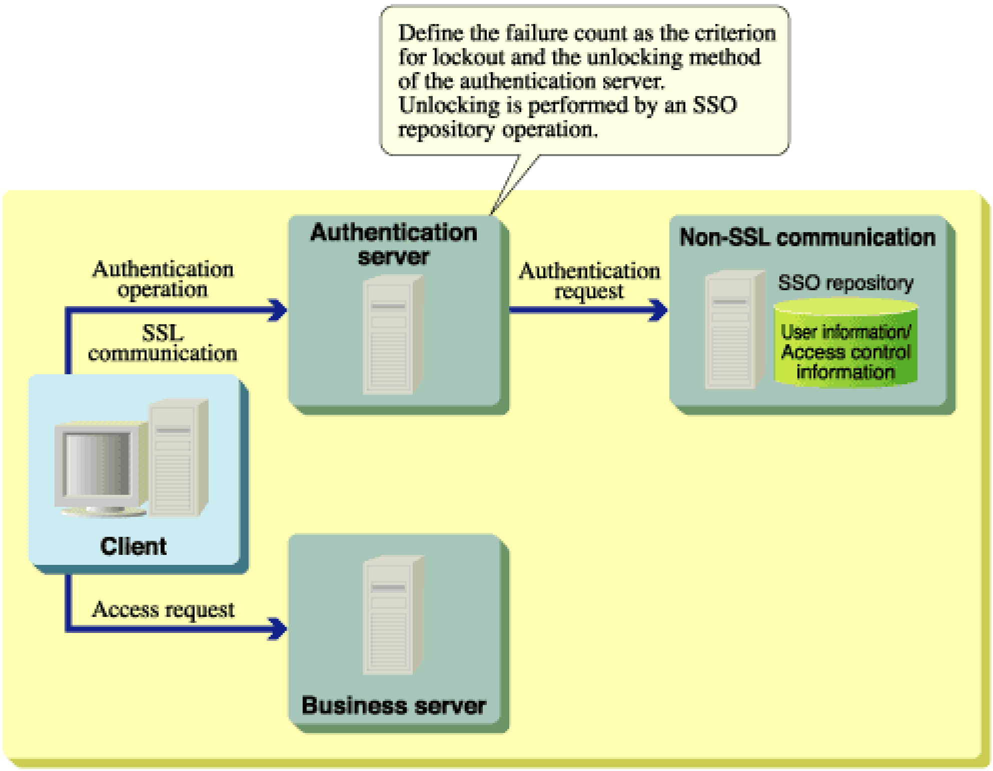
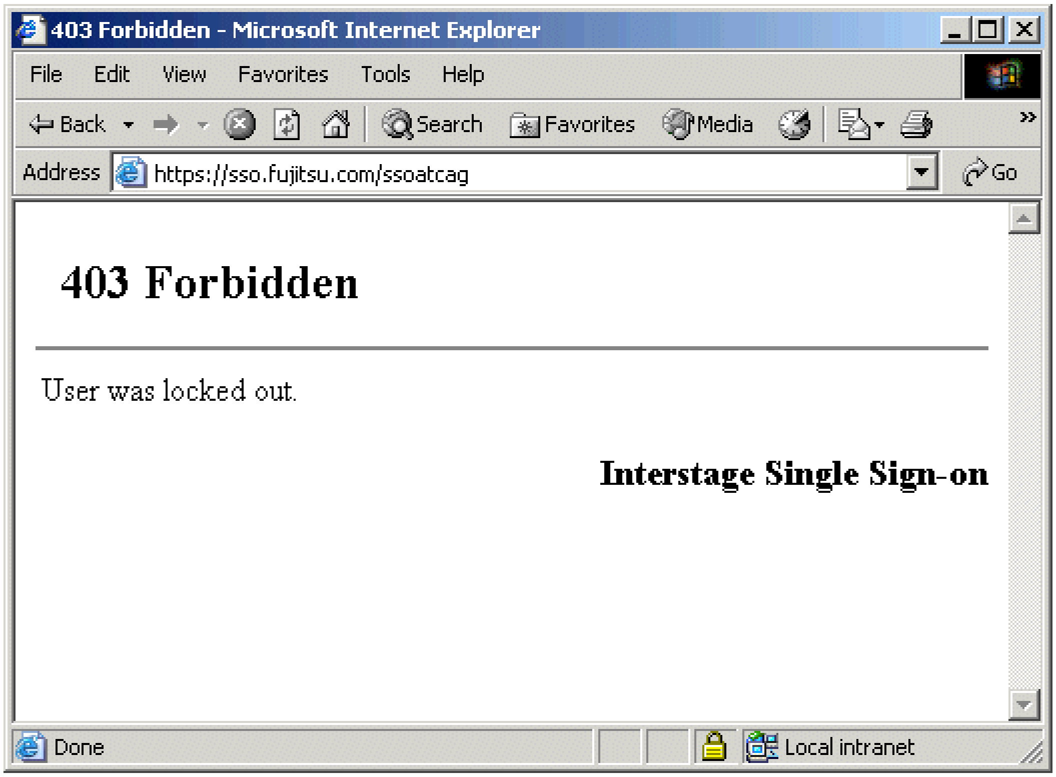

Define the failure count as the criterion for lockout and the unlocking method of the authentication server.
Unlocking is performed by an SSO repository operation.
Authentication server
Authentication operation
SSL communication
Authentication request
Non-SSL communication
SSO repository
User information/ Access control information
Client
Access request
Business server

Figure 1-25 Lockout in Single Sign-on Authentication

If a user has failed password authentication for a specified consecutive number of times and is locked by the lockout function, a message is sent to the user's client computer.

The message shown in Figure 1-26 notifies the user when authentication has failed. The display of this message is configured in the environment setup on the authentication server. To activate this setting, on the Interstage Management Console select [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Authentication server] > [Authentication server: Settings]. Then select [Yes] for [Notify Cause of Authentication Failure to user?].

If [No] is selected, the message "User name or password is invalid." is displayed on the browser. For further details, refer to "Messages that can be Customized".


403 Forbidden - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address https://sso.fujitsu.com/ssoatcag
Go
Done
Local intranet

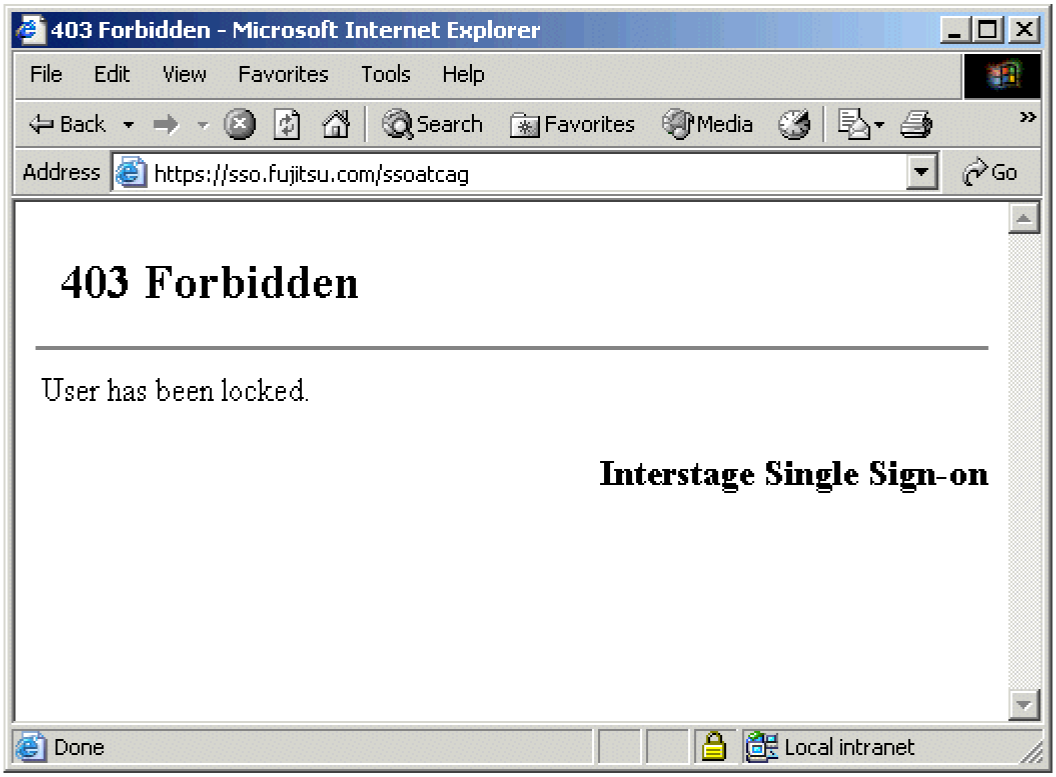
403 Forbidden

User was locked out.

Interstage Single Sign-on

Figure 1-26 Screen Displayed when User is Locked Out

When a locked user performs authentication, the following window is displayed on the Web browser.


403 Forbidden - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Search
Favorites
Media
Address
https://sso.fujitsu.com/ssoatcag
Go
Done
Local intranet

403 Forbidden

User has been locked.

Interstage Single Sign-on

Figure 1-27 Screen Displayed when User has been Locked

Note

Locked users cannot use Interstage Single Sign-on (even for certificate authentication) until they are unlocked.

Authorization

Authorization is the process that is used to make sure that the user who requests access to a resource is allowed to access the resource. A user who requests access to a resource, for example, a HTML document, image data, or voice data disclosed on a Web server or a CGI application operating on a Web server; is checked to allow access to the resource.

Interstage Single Sign-on authorizes users' access based on the concept of "role," which is an attribute indicating a department or business. Whether a user is allowed to access a resource is determined according to the relationship between the role of the user and the role set for the access target resource. The relationships between resources and roles are managed as access control information.

Relationships between Roles, Users, and Resources

Roles are defined based on actual departments and businesses, e.g., "general employee" and "domestic sales," and assigned to user information. On the other hand, the roles required to access resources, including the HTML and CGI resources disclosed by the Web services on business servers, are set for the respective resources. When a user accesses a resource, the user must succeed in authentication and have the role that is set for the target resource.

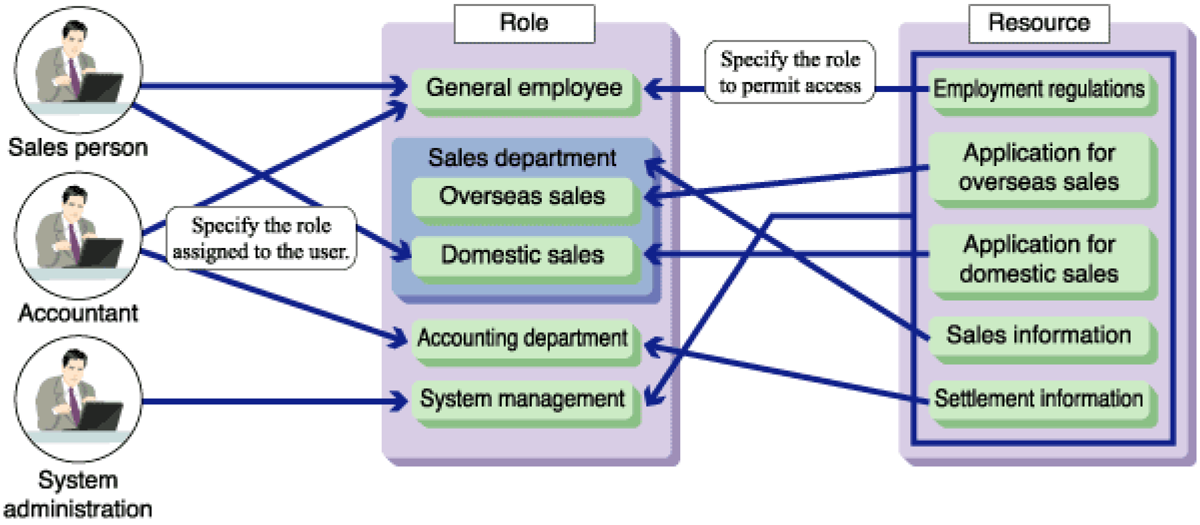


Figure 1-28 Relationships Between, Roles, Users and Resources

In the above example:

- The roles "general employee" and "accounting department" are assigned to the accountant.
- The role "general employee" is permitted to access only the resource "employment regulations."
- The role "accounting department" is permitted to access only the resource "settlement information."

- Therefore, the accountant can access only the resources "employment regulations" and "settlement information."

Multiple roles can be grouped as a role set. In the above example:

- The role set "sales department" contains two roles, such as "overseas sales" and "domestic sales."
- Because the resource "sales information" permits both "overseas sales" and "domestic sales" to access the resource, the role set "sales department" can be set for the resource.
- Because the resource "application for domestic sales" is intended to permit only the role "domestic sales" to access the resource, only the role "domestic sales" should be assigned to the resource.

As described above, the concept of role can be used to implement authorization in a flexible manner.

Information Required for Authorization Using Roles

The following information required for the authorization using roles must be registered in the SSO repository.

1. Role configuration
2. User information
3. Protection resource

The following shows examples of configurations in the SSO repository. Access control information is a set of role configuration and protection resource information.

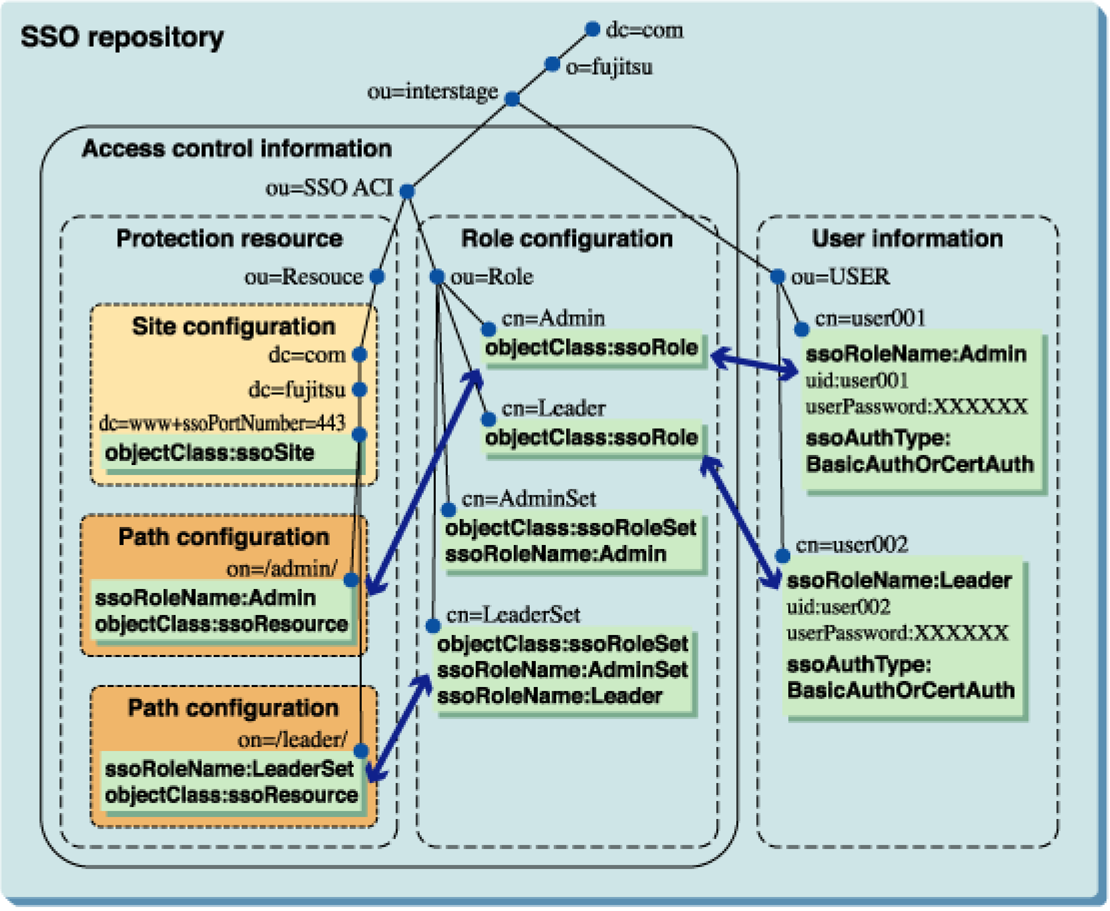


Figure 1-29 Information Required for Authorization Using Roles

Role Configuration

The role or role set name to be used is registered as a role configuration.

Roles are used to authorize the users who access the business system. Roles must be designed on the basis of the departments and businesses of the users who use the business system. To define a post, e.g., "general employee" or "manager," or a department, e.g., "accounting department" or "administration department," as a role, use the role name that corresponds to the post or department as shown in the table below to define it in the SSO repository.

When multiple roles are grouped and defined as a role set according to the hierarchy of organization and assigned to resource information, the system has the flexibility to accommodate the future changes in organization.

Note

Interstage Single Sign-on provides authorization with a role. Please be sure to perform a role configuration to the SSO repository. Unless role configuration is performed, a repository server does not start.

Examples of Roles

Table 1-5 Role

Post/department	Role name
General employee	employee
Executive officer	executives
Accounting department	finance department
Administration department	administration department

Example of Role Set

Table 1-6 Role Set

Post/department	Role set name	Contained role
All employees	all	employee、executives

User Information

For details of user information, refer to "User information".

Protection Resource

If authentication and authorization are required for users to access resources such as HTML documents and CGI applications disclosed in the business system, define those resources as protection resources.

Protection resource information consists of site and path configurations.

Site Configuration

The site configuration defines the site name of the business system. The format of site name is "fully qualified domain name (FQDN) + port number." FQDN is the host name that includes domain name.

When the Business system public URL is "https://www.fujitsu.com:443/index.html", the site name is "www.fujitsu.com:443".

Path Configuration

The path configuration specifies the name of the directory or file that is disclosed on the site defined by the site configuration and requires authentication and authorization for access. When a directory name is specified (when the path name ends with "/"), all resources under the specified directory are the targets of authentication and authorization.

In addition, the names of the roles and role sets that are permitted to access the specified directories or files are specified. Multiple roles and role sets can be specified.

The specification of path configurations used for authentication and authorization is described below:

- When a directory or folder that is not defined by path configuration is accessed, the relevant resource is disclosed unconditionally.
- When only a directory or folder is specified and roles or role sets are not defined for the resource, the resource is disclosed to only authenticated users.
- When a directory or folder is specified and roles or role sets are defined for the resource, the resource is disclosed to only the users who are authenticated and permitted to access the resource.

Note

If a role or role set name set in the path configuration is not defined by role configuration, access control information cannot be updated on the business server. The role and role set names set in the path configuration must be the same as that defined by the role configuration.

Centralized Management of User and Access Control Information

The user and access control information concerning the users of multiple systems can be centrally managed using the SSO repository to reduce the system administrators' load.

Example

The following diagram illustrates the centralized management using one SSO repository of the user and access control information concerning business servers A, B, and C.

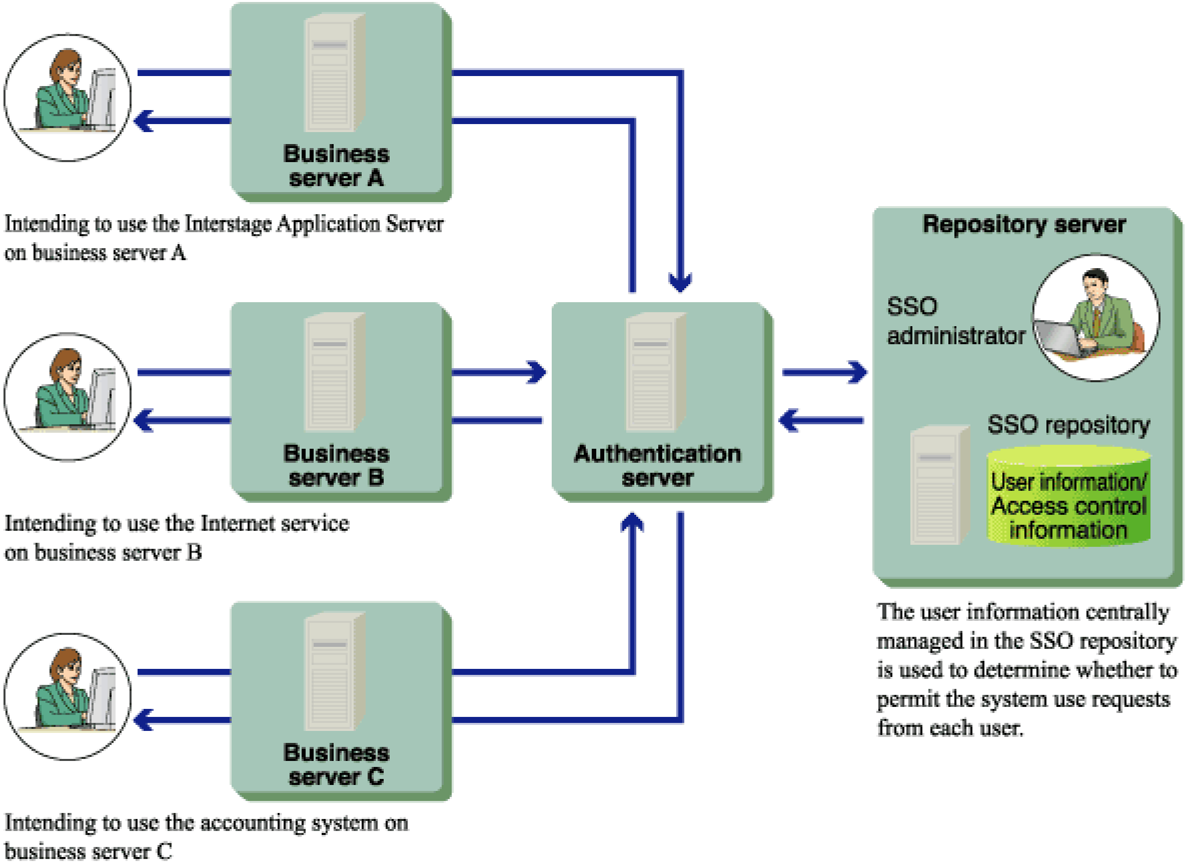

Business server A
Intending to use the Interstage Application Server on business server A
Business server B
Intending to use the Internet service on business server B
Business server C
Intending to use the accounting system on business server C
Authentication server
Repository server
SSO administrator
SSO repository
User information/ Access control information
The user information centrally managed in the SSO repository is used to determine whether to permit the system use requests from each user.

Figure 1-30 Centralized Management of User and Access Control Information

Updating Access Control Information

The business server retains the access control information fetched from the SSO repository to reduce the load on the repository server and increase the processing speed of the business server itself.

If the access control information (role configurations, protection resources) registered in the SSO repository has been changed, access control information retained in the business server must be updated.

The following describes the methods of updating the access control information in the business server.

- Updating Access Control Information from the Interstage Management Console

  On the Interstage Management Console, select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Update access control iInformation], and click [Update] to update the access control information. This operation can be performed even while the business server is active.

- Updating Access Control Information Automatically at Business Server Startup

  Access control information can be updated automatically at the startup of business server according to an environment setting. On the Interstage Management Console, select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Settings] > [Detailed Settings [Show]] to check or change the environment setting.

  Then, check or change the setting for [When updating Access Control Information?] under [Access Control Information]. When "Execute when Business server is started" is selected, the access control information is updated at the startup of business server.

When the access control is updated information, the business server accesses the repository server that was specified by [Repository server URL] at the creation of the business system setup file. For details about the business system setup file, refer to “Downloading Business System Setup File” of ”Preparations for Setting up a Business System”.

To check or change the URL of the repository server after setting up the business server, select, on the Interstage Management Console, [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Settings] > [Detailed Settings [Show]]. Then, check the setting for [Repository Server URL] under [Authentication Infrastructure Information Settings].

Notes

- Changes to access control information (role configurations, protection resources) of the SSO repository are not reflected in business server authentication. To enable reflection of such changes, access control information must be updated in the business server.
  Note that, if "access control information is not updated at the start of the business server," is set, changing of the SSO repository is not reflected even if the business server is restarted.

- If the access control information is updated while the business server is active, make sure that you access a protection resource after the update. This is important to ensure that authentication and authorization can be performed normally. If authentication or authorization is not performed normally, updating may have failed.

  If updating of access control information has failed, the business server responds to every access from user with message "500 Internal Server Error".

  Check those messages output to the system log which begin with "sso", take corrective action, and stop and restart the business server. For details of message contents, refer to "Messages with Message Numbers Beginning sso" in the Messages.

- If an error message is output after the access control information has been updated on the Interstage Management Console, the business server remains in the status to perform authorization according to the old access control information. In that case, stop the business server or take another measure as required until the business server has recovered from the error and the information is updated normally.

High-Performance and High-Reliability System

Interstage Single Sign-on supports high-performance and high-reliability systems such as client certificate verification, high-speed SSL communication, load balancing, and increased availability.

Load Balancing

When the authentication requests from users converge on the authentication server, the load on the server is also increased. The load can be balanced by adding an authentication server.

Also, the authentication processing on the repository server can be distributed to two repository servers, repository server (update system) and repository server (reference system) in order to balance the load of authentication processing on the repository server.

To distribute authentication processing to the repository server (update system) and repository server (reference system), select, on the Interstage Management Console, [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Authentication server] > [Settings] > [Detailed Settings [Show]].

Then, specify the repository server (update system) and repository server (reference system) for [Communication Settings with Repository server] and [Communication Settings with repository Server (reference system)].

For details about the configurations on the Interstage Management Console, refer to the Operator’s Guide.

It is recommended to install one repository server (update system) and multiple repository servers (reference systems) to balance the load of authentication processing on the repository servers.

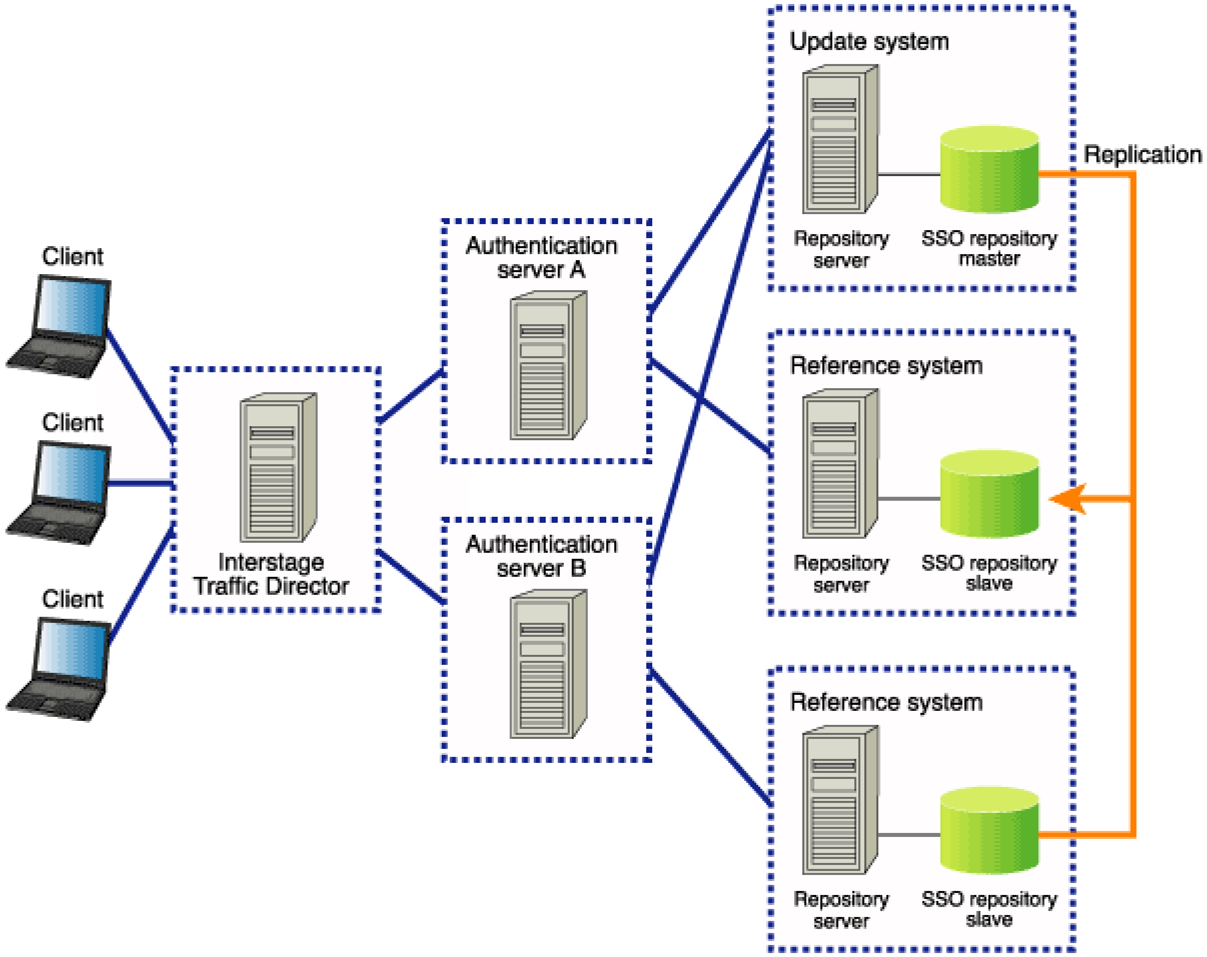


Figure 1-31 Load Balancing among Authentication and Repository Servers

The figure above shows the load balancing among authentication and repository servers.

The authentication requests from clients are distributed to each authentication server by a load balancer, e.g., Interstage Traffic Director, to each authentication server.

When one repository server (update system) and multiple repository servers (reference systems) are allocated to each authentication server, the authentication server connects to a repository server (reference system) for the processing of ordinary authentication request. It connects automatically to the repository server (update system) only when the information in the SSO repository is required to change(e.g., when the user is locked by the lockout function). When different repository servers (reference systems) are allocated separately to the authentication servers, the load on repository servers can be balanced.

When the information in the SSO repository of the repository server (update system) is updated, the updated content can be reflected in the SSO repository of the repository servers (reference systems) automatically by using the Smart Repository replication function.

When a different repository server (reference system) is assigned to each authentication server as the one to be connected preferentially, the load on repository servers can be balanced.

For an example of setting a system configuration in which multiple authentication servers are arranged to distribute the authentication server load, see “When Setting Up the Authentication Server on Multiple Machines and the Repository Server on a Machine" of “Basic Configurations of Authentication Infrastructure” of "Authentication Infrastructure”.

For an example of setting a system configuration in which the repository server (update system) and repository server (reference system) are arranged to distribute the repository server load, see “When Setting Up the Authentication Server and the Repository Server on Multiple Machines Individually" of “Basic Configurations of Authentication Infrastructure” of "Authentication Infrastructure”.

Remark

When repository servers are used separately for update and reference systems, the contents of SSO repositories (master and slave) must be synchronized with each other to prevent illegal authentication due to data inconsistency. A synchronizing method is to copy the content of the SSO repository (master) into the SSO repository (slave) by using the Smart Repository replication function.

Notes

- The repository server (update system) and repository server (reference system) both need to be the same edition/version.
- The load balancer, e.g., Interstage Traffic Director, must be set up so that all authentication servers logically have the same host name.
- To perform SSL communication on the authentication servers, the owner name of each certificate to be used for SSL communication must be the same on every authentication server. In details, the host name of Interstage Traffic Director must be specified as the owner name of the certificate for SSL communication when the certificate is obtained and registered. For further information about the application for the certificate and its registration, refer to "Preparations for SSL Communication".
- The load balancer must be set up so that the requests from the same client transfer to the same authentication servers.
- Use the following settings when the load balancer is Interstage Traffic Director:.
  - Operation Mode : bridge
  - Measure of load Balancing and uniqueness of connection : Balancing for each node

Increase of System Availability

When multiple repository servers (reference systems) are allocated to the authentication server, the system configuration can include active and standby repository servers (reference systems). This system configuration allows the system to continue operation even if a repository server (reference system) fails or an error is posted from an SSO repository.

For example, if the repository server (reference system) that is requested to perform authentication processing by the authentication server has failed, a destination of the authentication request is automatically switched to another repository server (reference system) and the system can respond to the authentication request from the client.

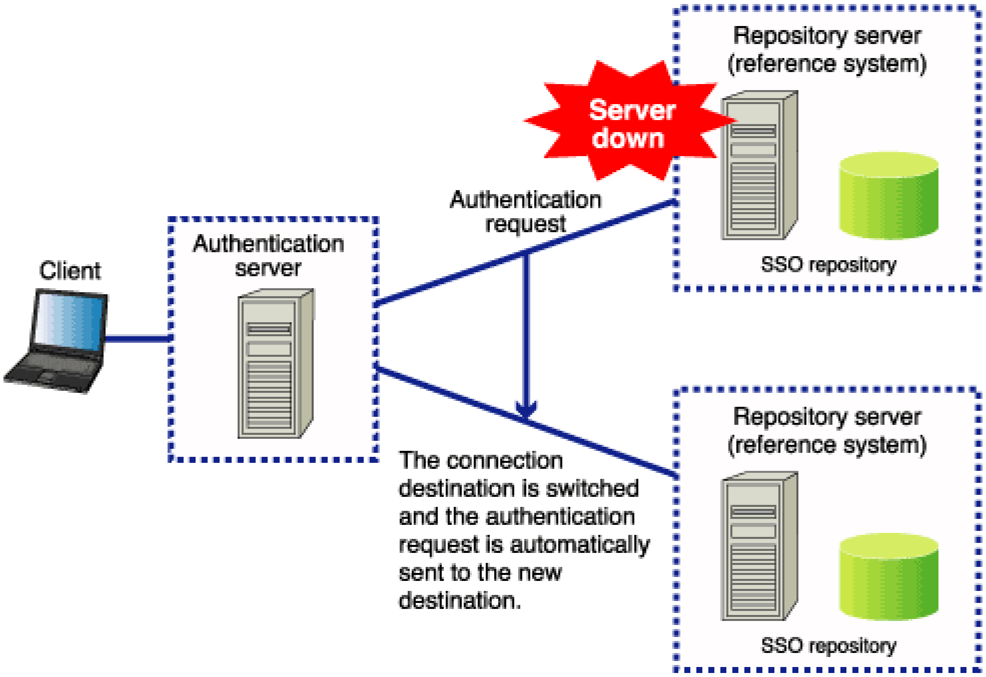


Figure 1-32 Increasing System Availability

When the re-connection interval specified as an environment setting on the authentication server has elapsed after the automatic switching of authentication request destination, repository server (reference system), an attempt is made automatically to connect to the repository server (reference system) that was the destination for the old authentication request.

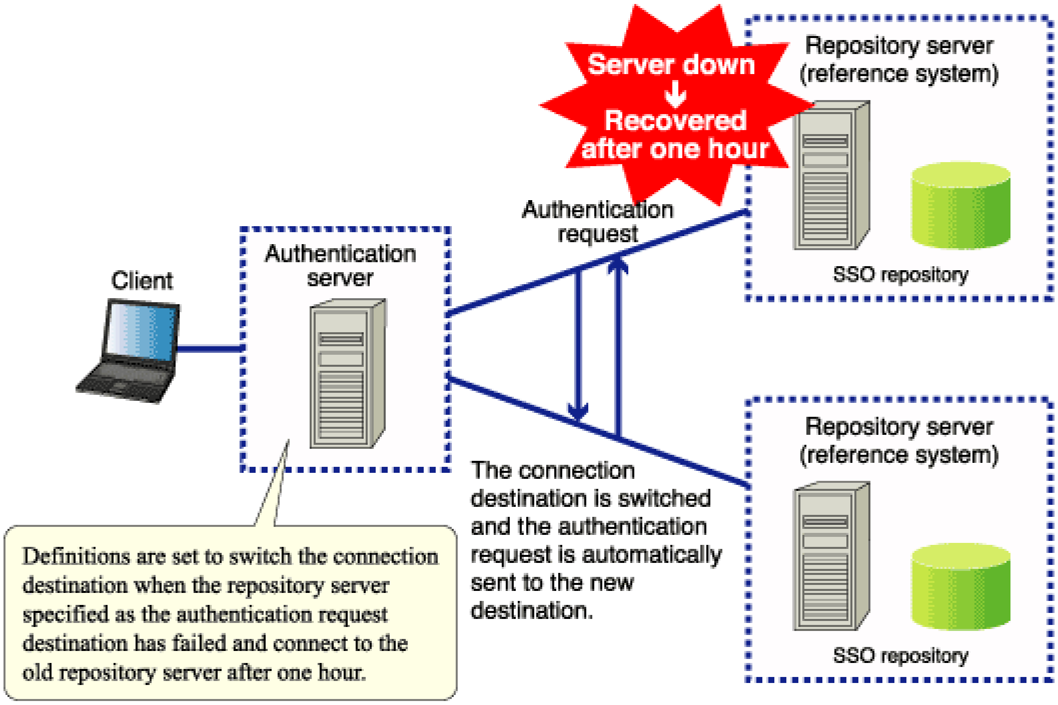

Server down
Recovered after one hour
Repository server (reference system)
SSO repository
Authentication request
Client
Authentication server
Repository server (reference system)
SSO repository
The connection destination is switched and the authentication request is automatically sent to the new destination.
Definitions are set to switch the connection destination when the repository server specified as the authentication request destination has failed and connect to the old repository server after one hour.

Figure 1-33 Standby Repository takes over in the Event of a Failure

This means that the Interstage Single Sign-on service can operate without a halt when multiple repository servers (reference systems) are installed.

To check the sequence of connections to the repository servers (reference systems) from the authentication server, select, on the Interstage Management Console, [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Authentication server] > [Settings] > [Detailed Settings [Show]].   The sequence of connections is indicated by [Host name and Port numberNo.] under [Communication Settings with Repository server (reference system)].

The authentication server attempts to connect to all the specified repository servers (reference systems) sequentially. If the authentication server cannot connect to any other repository servers, it attempts to connect to the first repository server (reference system) again. If the first repository server also cannot be connected, the authentication server notifies the user of the failure in authentication.

Note that the repository server (update system) can be operated as a repository server (reference system). When the repository server (update system) is specified as the last repository server (reference system) to be connected in the setting for [Communication Settings with Repository server (reference system)], the authentication server attempts to connect to the repository server (update system) after it has failed in attempts to connect to every repository server (reference system).

Notes

- Use repository servers with the same edition/version as the repository servers (update and reference systems).
- System availability cannot increase by using multiple repository servers (update systems). Note that Interstage Application Server Enterprise Edition supports the increase of system availability by using a cluster configuration of repository servers (update systems).

- If the repository server (update system) stops operation as the result of some problem, user authentication fails even when the repository server (reference system) can operate normally.

Solaris OE Linux

- The authentication server may attempt to re-connect to the first repository server that failed before the re-connection interval (as specified as an environment setting on the authentication server) elapses.

Linkage with SSL Accelerator

Interstage Single Sign-on allows SSL Accelerator to be installed between the client and authentication server to speed up client certificate authentication and SSL communication when the authentication method is "password authentication," "certificate authentication," or "password authentication and certificate authentication".

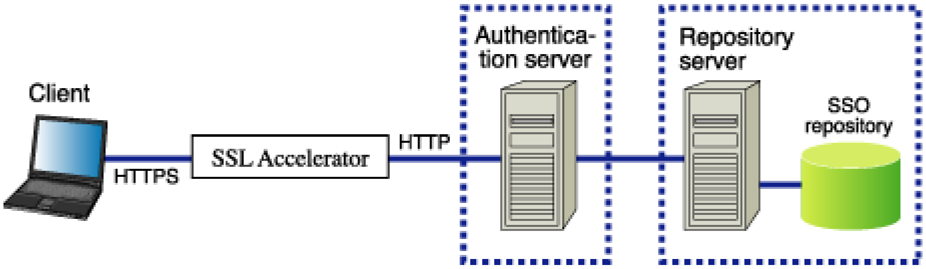


Figure 1-34 SSL Accelerator links the Client and Authentication Server

The linkage with SSL Accelerator must be defined in the authentication server.

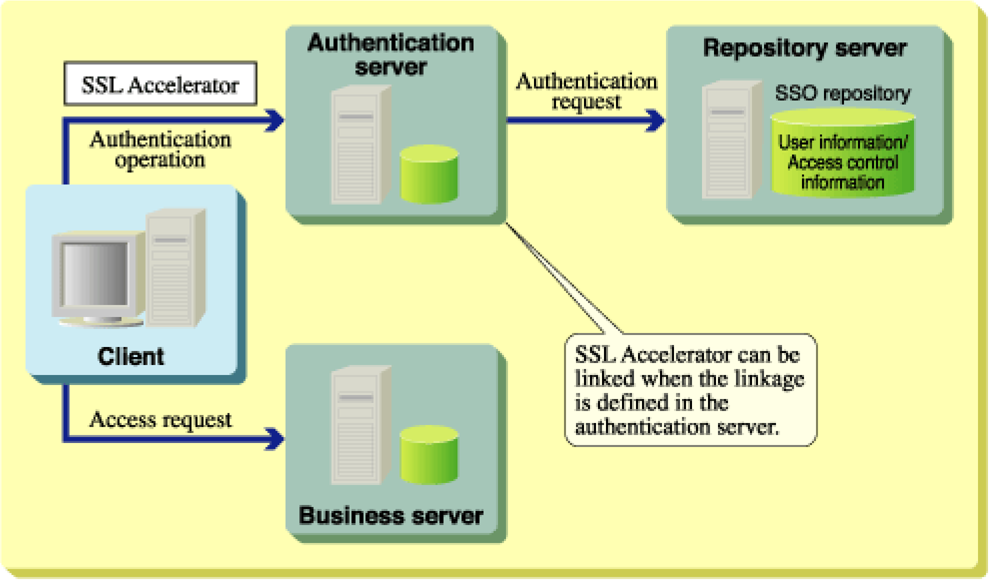


Figure 1-35 Link to SSL Accelerator defined in the Authentication Server

To use SSL Accelerator during Interstage Single Sign-on operations, SSL Accelerator must be set up as follows:

Client Authentication

When the authentication method is "certificate authentication" or "password authentication and certificate authentication," select “client authentication”. For the configuration method, see the relevant SSL accelerator instruction manual.

Notification of Certificate

When the authentication method is "certificate authentication" or "password authentication and certificate authentication," define the HTTP header to notify the authentication server of the certificate sent from the client. For details about the configuration method, refer to the relevant SSL accelerator instruction manual.

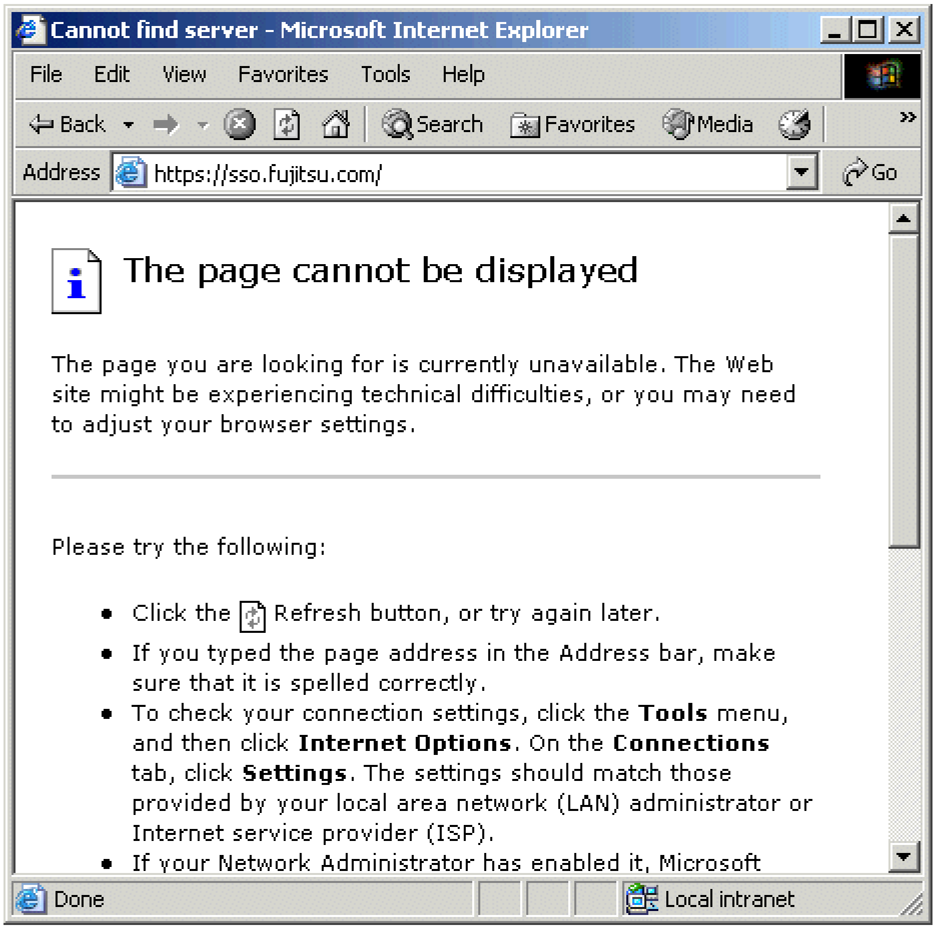
The defined HTTP header must be set on the authentication server. On the Interstage Management Console, select [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Authentication server] > [Settings] > [Detailed Settings [Show]]. Then, set the defined HTTP header name as [HTTP header name for user certificate acquisition] under [Certificate Authentication Settings].

This setting is not required when SSL Accelerator is used for the business system.

For details about the configurations on the Interstage Management Console, refer to the Operator’s Guide.

Notes

- When client authentication is enabled, the certificate to be used must always be selected at authentication request. If certificate transmission is cancelled, SSL Accelerator discontinues communication processing. Set up the authentication server so that the validity of certificate is checked.
- When the authentication method is "password authentication and certificate authentication," the authentication operation in linkage with SSL Accelerator cannot be performed. If certificate authentication fails or no certificate is presented, SSL Accelerator discontinues communication processing, and the access to the target resource, which is requested by displaying the following window (Figure 1-34) is cancelled.
- If an expired certificate is used in the high-performance system in which SSL Accelerator is installed between the client and authentication server, message "500 Internal Server Error" may be sent to the Web browser. If it occurs, acquire a new certificate and register it in the Web browser.


Cannot find server - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites Media
Address https://sso.fujitsu.com/ Go
Done
Local intranet

The page cannot be displayed

The page you are looking for is currently unavailable. The Web site might be experiencing technical difficulties, or you may need to adjust your browser settings.

Please try the following:

- Click the Refresh button, or try again later.
- If you typed the page address in the Address bar, make sure that it is spelled correctly.
- To check your connection settings, click the **Tools** menu, and then click **Internet Options**. On the **Connections** tab, click **Settings**. The settings should match those provided by your local area network (LAN) administrator or Internet service provider (ISP).
- If your Network Administrator has enabled it, Microsoft

Figure 1-36 Example of Screen Shown when Page Cannot be Displayed

Linkage with Application Gateway

The reverse function offered in Application Gateway can be used to access a safer intranet from a client on the Internet.

The reverse function can be used to set up the following systems:

- A Single Sign-on system in which access from a client on the Internet and a client in an intranet is possible
- A Single Sign-on system in which only access from a client on the Internet is possible

In the above systems, the following operation can also be executed, depending on the communication method between Application Gateway and the authentication server:

- Non-SSL communication between Application Gateway and the authentication server
- SSL communication between Application Gateway and the authentication server

The settings for a system that can be set up using the Application Gateway reverse function are explained below.

Remark

- In a system that has linkage with Application Gateway, the following can be used as the authentication method for a user accessing from the Internet.
  - Password authentication
- When SSL communication is used between the Application Gateway and authentication server, security can be further enhanced.

1. Single Sign-on System that can be Accessed from the Clients on the Internet and in the Intranet

The following describes the Single Sign-on system that can be accessed from both the clients on the Internet and also those in the intranet.

Note the following points for the operations of this system.

- The URL information on the business system in the intranet may also be transmitted as a URL parameter to the client who accesses the system via the Internet.

[Using non-SSL communication between Application Gateway and authentication server]

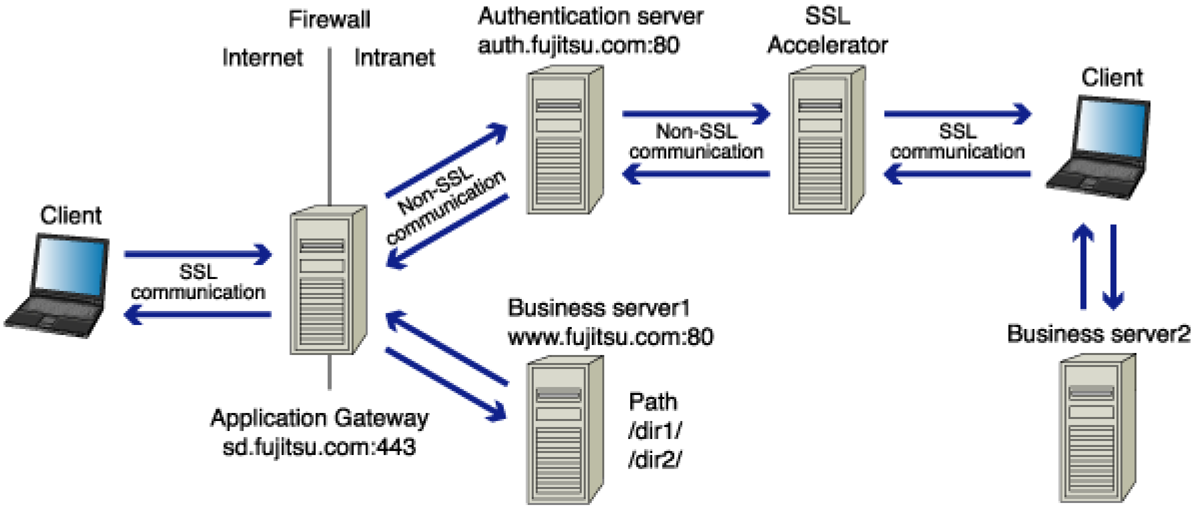


Figure 1-37 Using non-SSL Communication between Application Gateway and Authentication Server

For operation using this system configuration, SSL Accelerator must be installed between the authentication server and client in the intranet. The port number of SSL Accelerator must be the same as that used by Application Gateway.

Remark

This system cannot be configured if the mechanism that is used for communication with the virtual IP address is used in the SSL accelerator.

Setup of Application Gateway

- Reverse Settings

Examples of the reverse settings in the figure above are shown in the table below.
In the URL for the directory from which the request originated that is entered in the business server reverse settings, specify a directory layer for each business server. Example: /www1/, /www2/.

Table 1-7 Reverse Settings

Request-source URL	Conversion control	Relay-destination URL	Remarks
https://sd.fujitsu.com:443/www1/	<---------->	http://www.fujitsu.com:80/	Reverse settings of Business server
https://sd.fujitsu.com:443/auth/	<---------->	http://auth.fujitsu.com:80/	Reverse settings of Authentication server
https://sd.fujitsu.com:443/auth/	<----------	https://auth.fujitsu.com:443/	

When “Set-Cookies Header” is specified in the HTTP response header, and path and domain that are specified to “Set-Cookies Header” are same as directory and server name of Relay-destination URL that is defined in the table (1-7) above, set path and domain as to replace the compatible Request-source URL.

Setup of authentication server

- For a small-scale system

  When using a small-scale system, select, on the Interstage Management Console of the authentication server, [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Authentication infrastructureSettings] tab > [Setup Repository server and Authentication server to a single server.]. Then, specify "On the others" for [Where does SSL operate?] under [General Settings].

- For a middle-scale or large-scale system

  When using a medium-scale or large-scale system, select, on the Interstage Management Console of the authentication server, [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Authentication infrastructureSettings] tab > [Setup Repository server and Authentication server to the separate servers.]. Then, select [Create a new Authentication server], and specify "On the others" for [Where does SSL operate?] under [General Settings].

[Using SSL communication between Application Gateway and authentication server]

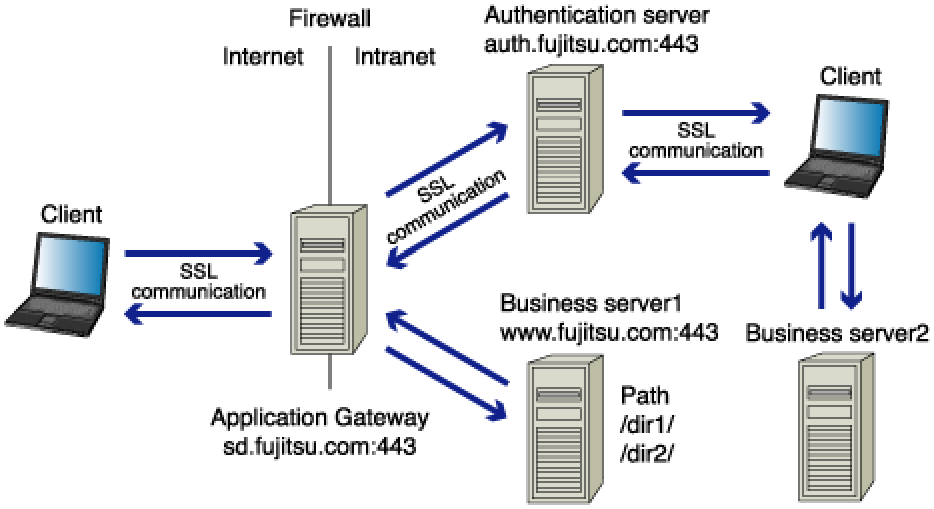


Figure 1-38 Using SSL Communication between Application Gateway and Authentication Server

To operate using this system configuration, use the following settings.

Setup of Application Gateway

- Reverse Settings

  Examples of the reverse settings in the figure above are shown in the table below.
  In the URL for the directory from which the request originated that is entered in the business server reverse settings, specify a directory layer for each business server. Example: /www1/, /www2/.

Table 1-8 Reverse for Application Gateway

Request-source URL	Conversion control	Relay-destination URL	Remarks
https://sd.fujitsu.com:443/www1/	<---------->	https://www.fujitsu.com:443/	Reverse settings of Business server
https://sd.fujitsu.com:443/auth/	<---------->	https://auth.fujitsu.com:443/	Reverse settings of Authentication server

When “Set-Cookies Header” is specified in the HTTP response header, and path and domain that are specified to “Set-Cookies Header” are same as directory and server name of Relay-destination URL that is defined in the table (1-8) above, set path and domain as to replace the compatible Request-source URL.

Setup of authentication server

- To create SSL configurations on the authentication server, select [System] > [Security] > [SSL] > [Create a new SSL Configuration] tab. Then, specify "No" for [Verify Client Certificate?] under [General Settings].

2. Single Sign-on System that can be Accessed Only from the Clients on the Internet

The following describes the Single Sign-on system that can be accessed only from the clients on the Internet.

Note the following points for the operations of this system.

- The clients in the intranet cannot access the protection resources in the business system.
- Note the following points for the design of business systems.
  - The first layer of the URL path of each business system must be unique.
  - The root path ("/") of the business system cannot be accessed by clients.

[Using non-SSL communication between Application Gateway and authentication server]

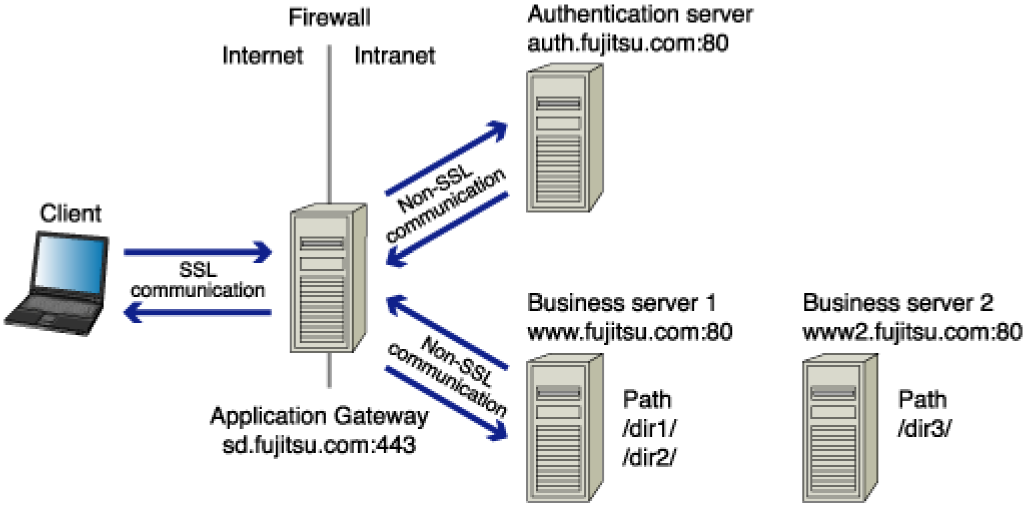


Figure 1-39 Using non-SSL Communication between Application Gateway and Authentication Server

To operate using this system configuration, make the following settings.

Setup of Application Gateway

- Reverse Settings

  Examples of the reverse settings in the figure above are shown in the table below.
  In the business system reverse settings, make sure that the path part for the URL for the directory from which the request originated and the URL for the directory from which the relay originated are the same. Specify everything in the first directory layer of the business system URL.

Table 1-9 Examples of Reverse Settings

Request-source URL	Conversion control	Relay-destination URL	Remarks
https://sd.fujitsu.com:443/dir1/	<---------->	http://www.fujitsu.com:80/dir1/	Reverse settings of Business server 1
https://sd.fujitsu.com:443/dir1/	<----------	https://sd.fujitsu.com:443/dir1/	
https://sd.fujitsu.com:443/dir2/	<---------->	http://www.fujitsu.com:80/dir2/	

https://sd.fujitsu.com:443/dir2/	<----------	https://sd.fujitsu.com:443/dir2/	
https://sd.fujitsu.com:443/dir3/	<---------->	http://www2.fujitsu.com:80/dir3/	Reverse settings of Business server 2
https://sd.fujitsu.com:443/dir3/	<----------	https://sd.fujitsu.com:443/dir3/	
https://sd.fujitsu.com:443/auth/	<---------->	http://auth.fujitsu.com:80/	Reverse settings of Authentication server
https://sd.fujitsu.com:443/auth/	<----------	https://sd.fujitsu.com:443/	Reverse settings required for adding the business servers

When “Set-Cookies Header” is specified in the HTTP response header, and path and domain that are specified to “Set-Cookies Header” are same as directory and server name of Relay-destination URL that is defined in the table (1-9) above, set path and domain as to replace the compatible Request-source URL.

Setup of authentication server

- For a small-scale system

  When using a small-scale system, select, on the Interstage Management Console of the authentication server, [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Authentication infrastructureSettings] tab > [Setup Repository server and Authentication server to a single server.]. Then, specify "On the others" for [Where does SSL operate?] under [General Settings].

- For a middle-scale or large-scale system

  When using a medium-scale or large-scale system, select, on the Interstage Management Console of the authentication server, [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Authentication infrastructure Settings] tab > [Setup Repository server and Authentication server to the separate servers.]. Then, select [Create a new Authentication server], and specify "On the others" for [Where does SSL operate?] under [General Settings].

[Using SSL communication between Application Gateway and authentication server]

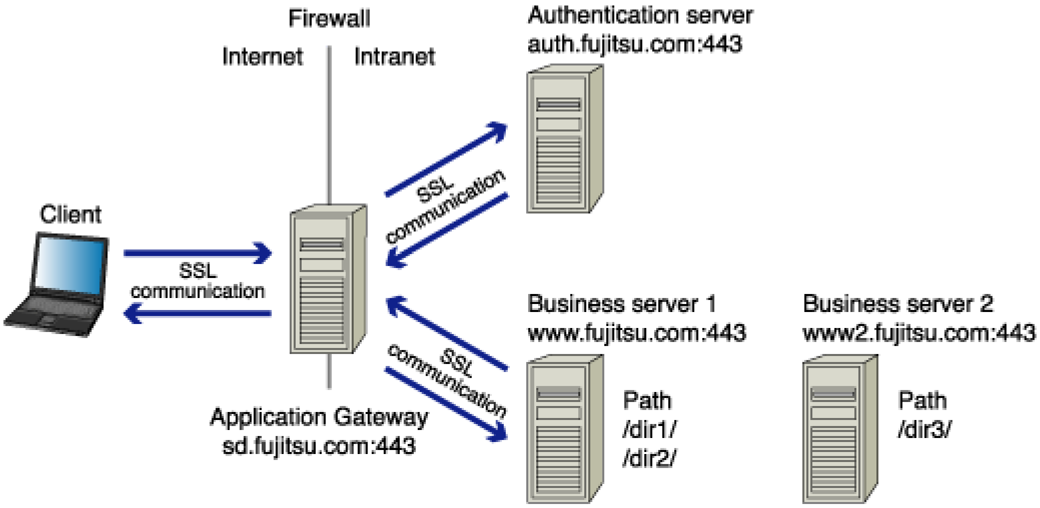


Figure 1-40 Using Using SSL Communication between Application Gateway and Authentication Server

Setup of Application Gateway

- Reverse Settings

  Examples of the reverse settings in the figure above are shown in the table below.
  In the business system reverse settings, make sure that the path part for the URL for the directory from which the request originated and the URL for the directory from which the relay originated are the same. Specify everything in the first directory layer of the business system URL.

Table 1-10 Reverse Settings for Application Gateway Setup

Request-source URL	Conversion control	Relay-destination URL	Remarks
https://sd.fujitsu.com:443/dir1/	<---------->	https://www.fujitsu.com:443/dir1/	Reverse settings of Business server 1
https://sd.fujitsu.com:443/dir2/	<---------->	https://www.fujitsu.com:443/dir2/	
https://sd.fujitsu.com:443/dir3/	<---------->	https://www2.fujitsu.com:443/dir3/	Reverse settings of Business server 2
https://sd.fujitsu.com:443/auth/	<---------->	https://auth.fujitsu.com:443/	Reverse settings of Authentication server
https://sd.fujitsu.com:443/	<----------	https://sd.fujitsu.com:443/	Reverse settings required for adding the business servers

When “Set-Cookies Header” is specified in the HTTP response header, and the path and domain that are specified to “Set-Cookies Header” are the same as the directory and server name of the Relay-destination URL defined in table 1-10, set the path and domain so as to replace the compatible Request-source URL..

Setup of authentication server

- To create SSL configurations on the authentication server, select [System] > [Security] > [SSL] > [Create a new SSL Configuration] tab. Then, specify "No" for [Verify Client Certificate?] under [General Settings].

Linkage with Web Applications

A Web application can acquire the user information stored in the SSO repository with authenticating user to the authentication server.

The two methods that can be used to acquire user information are as follows:

- Java application interface

  The Java application interface provided by Interstage Single Sign-on can be used to develop a Servlet application to receive authentication information from the client and a Java application to request the authentication server to perform authentication with user ID and password. For details, refer to "Developing Java Applications".

- HTTP request header

  User information can be set in the HTTP request header and posted to an application. The application can acquire the user information via a Web application interface, for example CGI. For further details, refer to "Setting User Information Report with Environment Variables".

Choosing URLs

This section describes how to choose the Authentication infrastructure URL, the Business system public URL, and the host name of repository server.

Authentication infrastructure URL

The Authentication infrastructure URL is selected depending on the combination of the load balancer, Application Gateway, and SSL Accelerator. The following describes examples of combinations with Interstage Traffic Director, Application Gateway, and SSL Accelerator.

Combining No Other Equipment or Product

The FQDN and port number for the Authentication infrastructure URL are the same as those used by the authentication server.

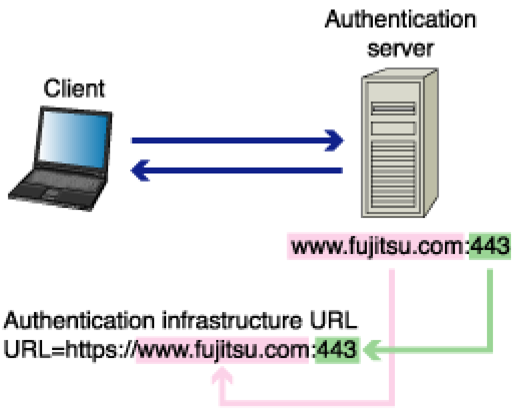

Authentication server
Client
www.fujitsu.com:443
Authentication infrastructure URL
URL=https://www.fujitsu.com:443

Figure 1-41 Combination of No Other Equipment or Product

Using Interstage Traffic Director for Balancing the Load on the Authentication Server

The FQDN and port number of the Authentication infrastructure URL are identical to the virtual IP address that is set for Interstage Traffic Director.

For the virtual IP address, refer to "Load Distribution Using Traffic Director" in the section "For a High-performance, High-reliability System" of the High Availability System Guide for the Interstage Application Server Enterprise Edition.

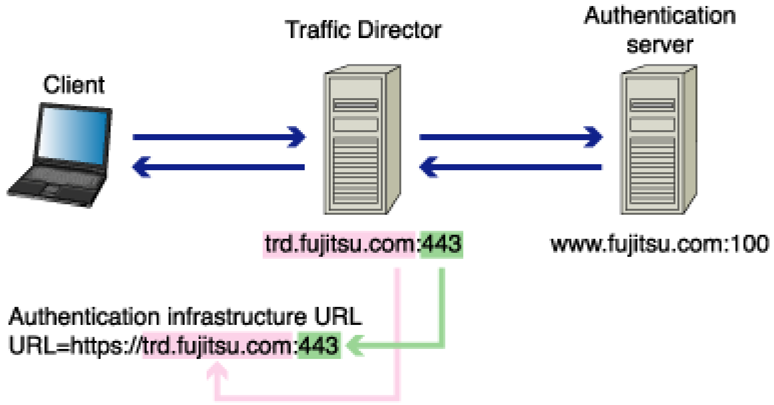


Figure 1-42 Using Interstage Director to Balance the Load on the Authentication Server

Using SSL Accelerator

The FQDN and port number of the Authentication infrastructure URL are identical to the FQDN of the authentication server and the port number of SSL Accelerator, respectively.

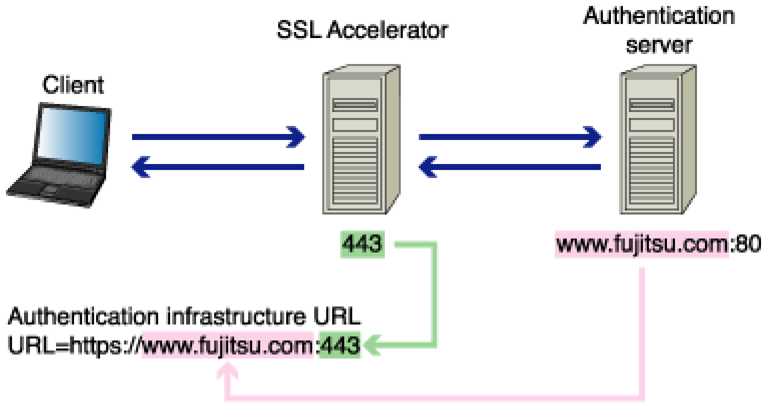

Client
SSL Accelerator
Authentication server
443
www.fujitsu.com:80
Authentication infrastructure URL
URL=https://www.fujitsu.com:443

Figure 1-43 Using SSL Accelerator

Using Both SSL Accelerator and Interstage Traffic Director

The FQDN and port number of the Authentication infrastructure URL are identical to the FQDN of the virtual IP address set for Interstage Traffic Director and the port number of SSL Accelerator, respectively.

For the virtual IP address, refer to "Load Distribution Using Traffic Director" in the section "For a High-performance, High-reliability System" of the High Availability System Guide for the Interstage Application Server Enterprise Edition.

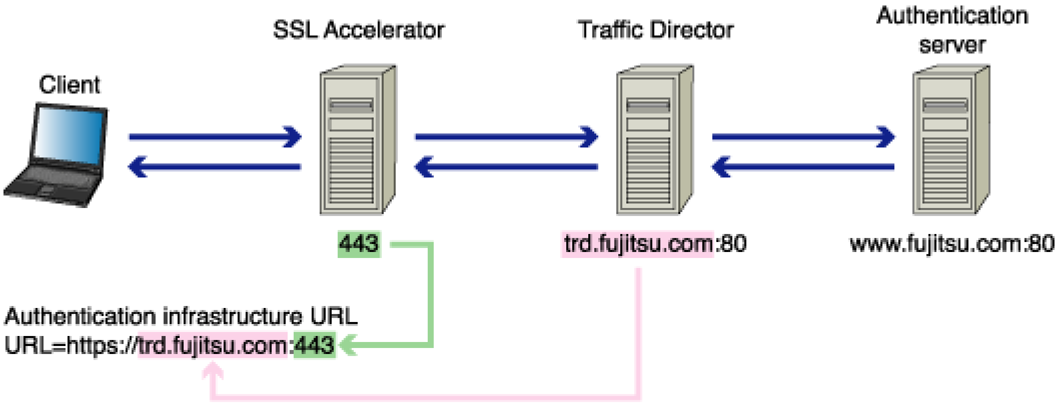


Figure 1-44 Using Both SSL Accelerator and Interstage Traffic Director

Linking with Application Gateway and using SSL Communication between Application Gateway and Authentication Server

The FQDN and port number of the Authentication infrastructure URL are identical to the authentication server (*1).

The Authentication infrastructure URL is different from the URL viewed from the client.

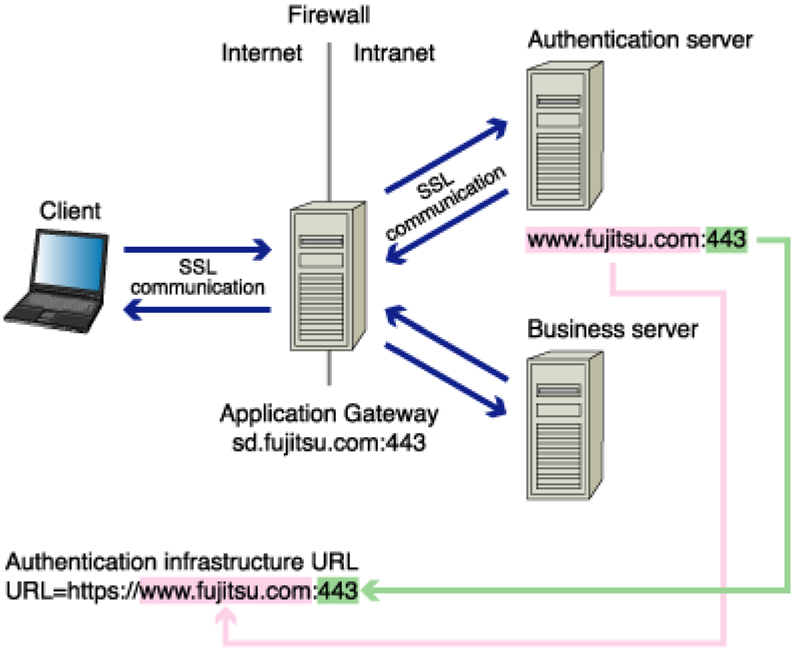


Figure 1-45 Linking with Application Gateway and Using SSL Communication between Application Gateway and Authentication Server

*1 When Interstage Traffic Director or SSL Accelerator is installed between Application Gateway and authentication server, assume that Application Gateway as the client and obtain the Authentication infrastructure URL based on the previous explanation. Use the FQDN and port number of the obtained URL as substitutes for those used in the authentication server.

Linking with Application Gateway and Using Non-SSL Communication between Application Gateway and Authentication Server

[To enable the clients only on the Internet to access]

The FQDN and port number of the Authentication infrastructure URL are the FQDN and the port number of Application Gateway, respectively. The scheme name of the Authentication infrastructure URL is "https".

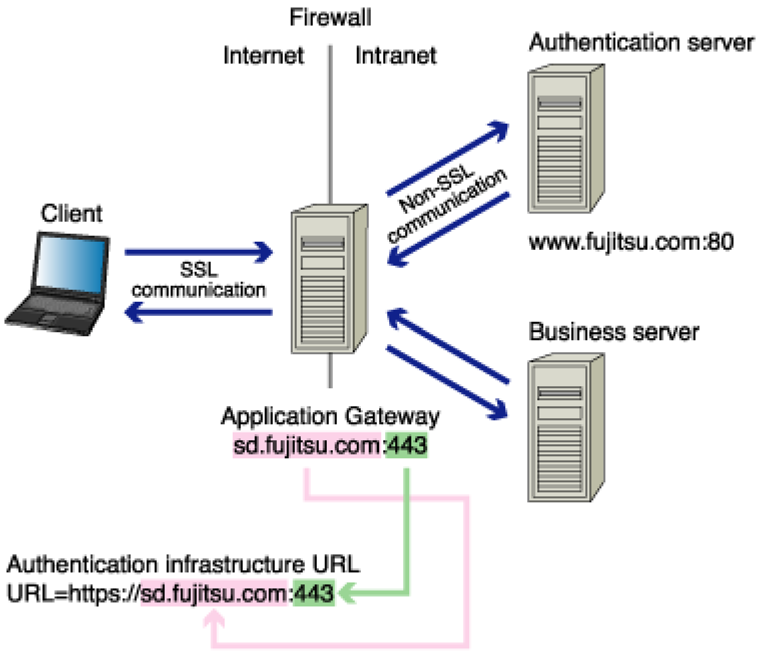


Figure 1-46 Linking with Application Gatewayand Using Non-SSL Communication between Application Gateway and Authentication Server

[To enable access for the clients both on the Internet and in the intranet]

The FQDN and port number of the Authentication infrastructure URL are the FQDN of the authentication server (*2) and the port number of Application Gateway, respectively. The scheme name of the Authentication infrastructure URL is "https".

The Authentication infrastructure URL is different from the URL viewed from the client.

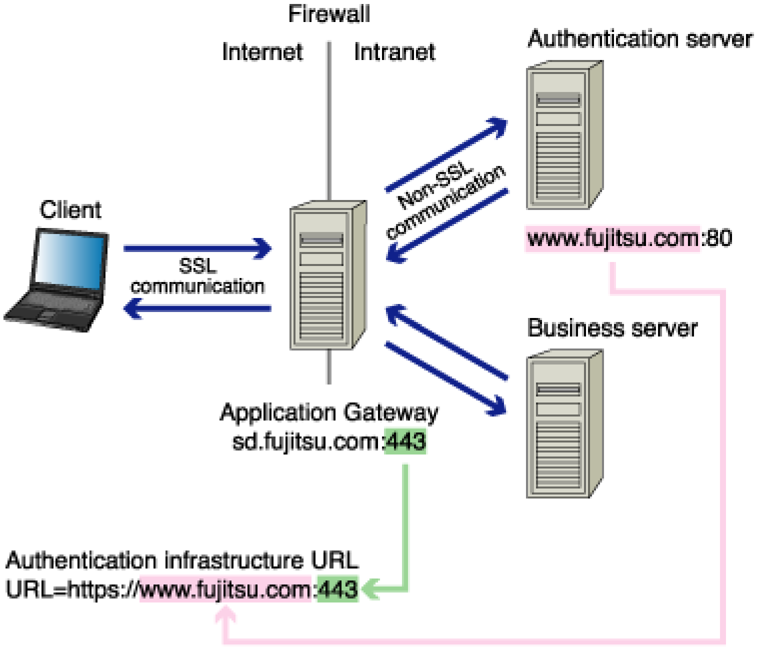


Figure 1-47 Non-SSL Communication between Application Gateway and Authentication Server viewed from the Client

*2 When Interstage Traffic Director is installed between Application Gateway and authentication server, assume Application Gateway as the client and obtain the Authentication infrastructure URL based on the information from the explanation described in figure 1-45. Use the FQDN of the obtained URL as a substitute for the FQDN of the authentication server.

Note

When using SSL Accelerator with the mechanism that uses the virtual IP address as transfer measure, the FQDN of the Authentication infrastructure URL is the FQDN of the IP address set for SSL Accelerator.

Business system public URL

The Business system public URL is selected depending on the combination of the business server with the load balancer, Application Gateway, and/or SSL Accelerator. The following describes examples of combinations with Interstage Traffic Director, Application Gateway, and SSL Accelerator.

Combining No Other Equipment or Product

The FQDN and port number of the Business system public URL are identical to those of the business server.

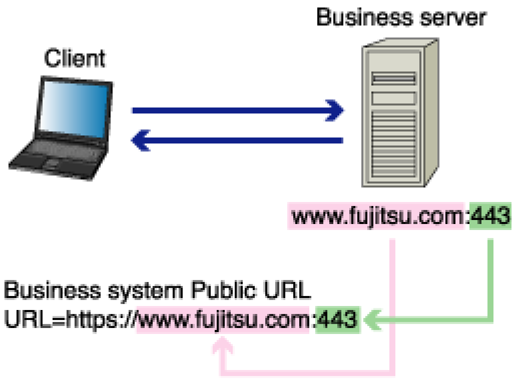


Figure 1-48 Combining No Other Equipment or Product

Using Interstage Traffic Director for Balancing the Load on the Authentication Server

The FQDN and port number of the Business system public URL are identical to those of the virtual IP address set for Interstage Traffic Director.

For details about the virtual IP address, refer to "Load Distribution Using Traffic Director" in the section "For a High-performance, High-reliability System" of the High Availability System Guide for the Interstage Application Server Enterprise Edition.

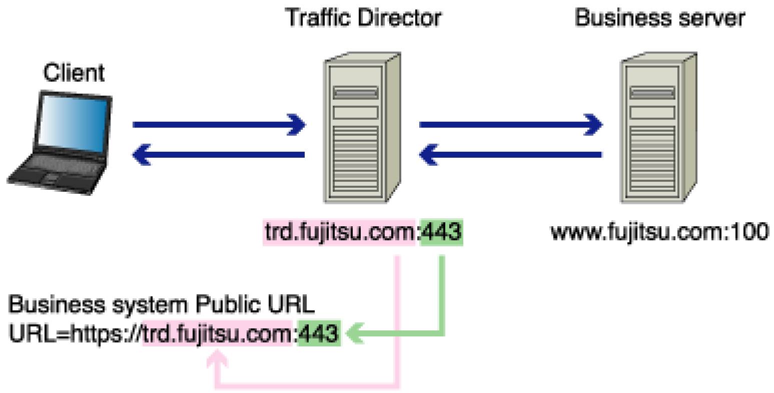


Figure 1-49 Using Interstage Traffic Director for Balancing Load on the Authentication Server

Using SSL Accelerator

The FQDN and port number of the Business system public URL are identical to the FQDN of the business server and the port number of SSL Accelerator respectively.

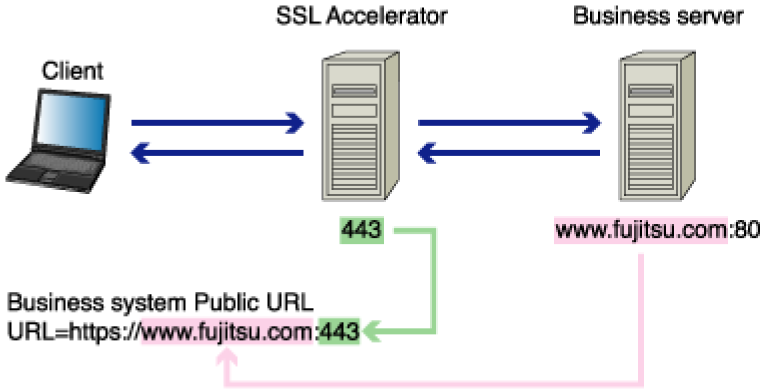


Figure 1-50 Using SSL Accelerator

Using both SSL Accelerator and Interstage Traffic Director

The FQDN and port number of the Business system public URL are identical to the FQDN of the virtual IP address set for Interstage Traffic Director and the port number of SSL Accelerator respectively.

For details about the virtual IP address, refer to "Load Distribution Using Traffic Director" in the section "For a High-performance, High-reliability System" of the High Availability System Guide for the Interstage Application Server Enterprise Edition.

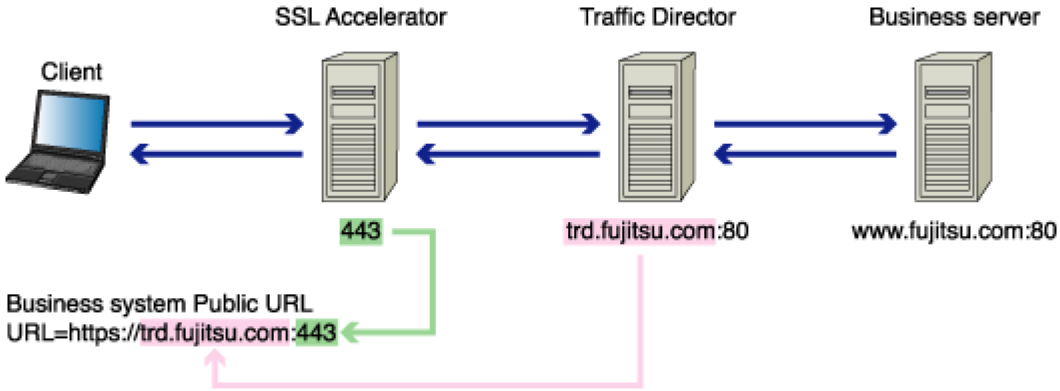


Figure 1-51 Using Both SSL Accelerator and Interstage Traffic Director

Linking with Application Gateway and Enabling the Clients both on the Internet and in the Intranet to Access (*1)

The FQDN and port number of the Business system public URL are identical to those of the business server (*2).

The Business system public URL is different from the URL viewed from the client.

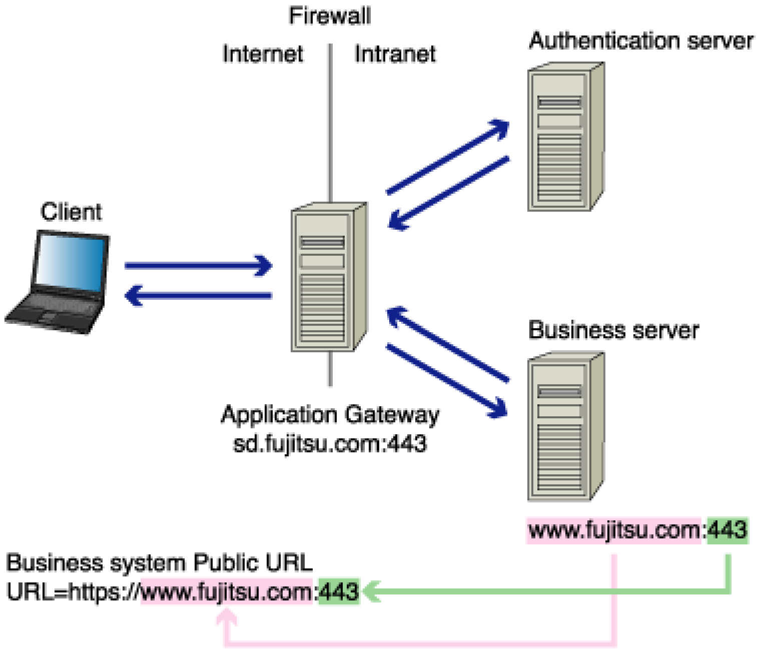


Figure 1-52 Linking with Application Gateway and Enabling Clients on the Internet and Intranet to Access

*1   For further details, refer to "Linkage with Application Gateway".

*2   When Interstage Traffic Director or SSL Accelerator is installed between Application Gateway and business server, assume Application Gateway as the client and obtain the Business system public URL according to the above explanation. Use the FQDN and port number of the obtained URL as substitutes for those of the business server.

Linking with Application Gateway and Enabling Only the Clients on the Internet to Access (*1)

The FQDN and port number of the Business system public URL are identical to those of Application Gateway.

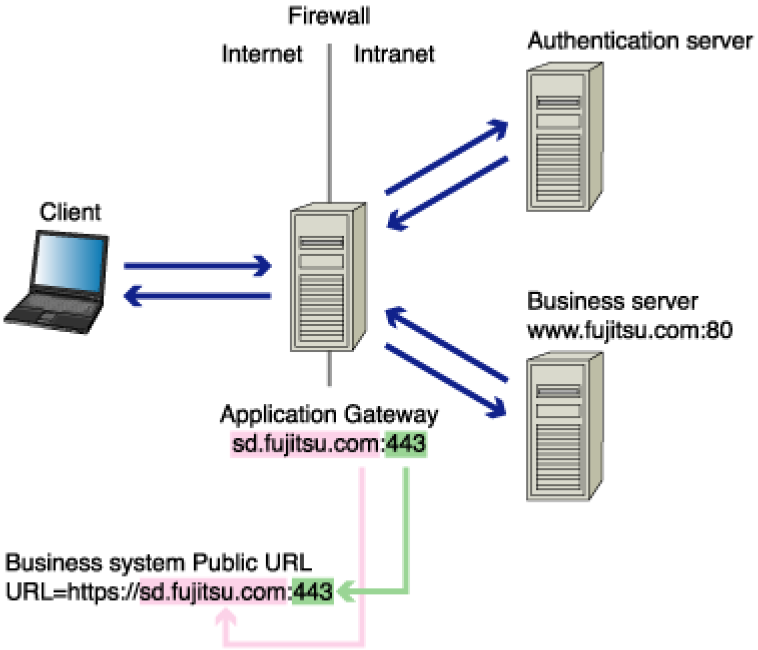


Figure 1-53 Linking with Application Gateway and Enabling only Internet Clients to Access

*1 For further details, refer to "Linkage with Application Gateway".

Note

When using SSL Accelerator with the mechanism that uses the virtual IP address as transfer measure, the FQDN of the Business system public URL are the FQDN of the IP address set for SSL Accelerator.

Host Name of the Repository Server

The host name of the repository server (update system) is selected depending on the repository server configuration. The following describes examples of combinations with a cluster system.

The cluster system is supported only by Interstage Application Server Enterprise Edition. For further details about the cluster system, refer to the High Availability System Guide for Interstage Application Server Enterprise Edition.

Not Using a Cluster System

The host name of the repository server (update system) is the same as the machine on which the repository server (update system) is set up.

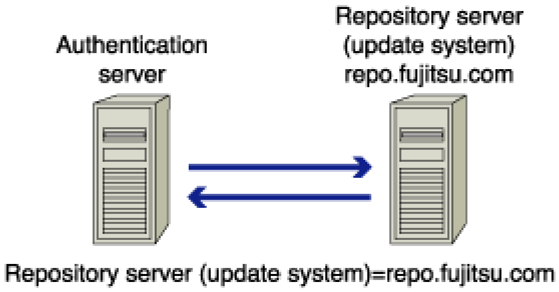

Authentication server
Repository server (update system) repo.fujitsu.com
Repository server (update system)=repo.fujitsu.com

Figure 1-54 Not Using a Cluster System

Using a Cluster System

The host name of the repository server (update system) is the one that is common to the operational node and the standby node of the cluster system.

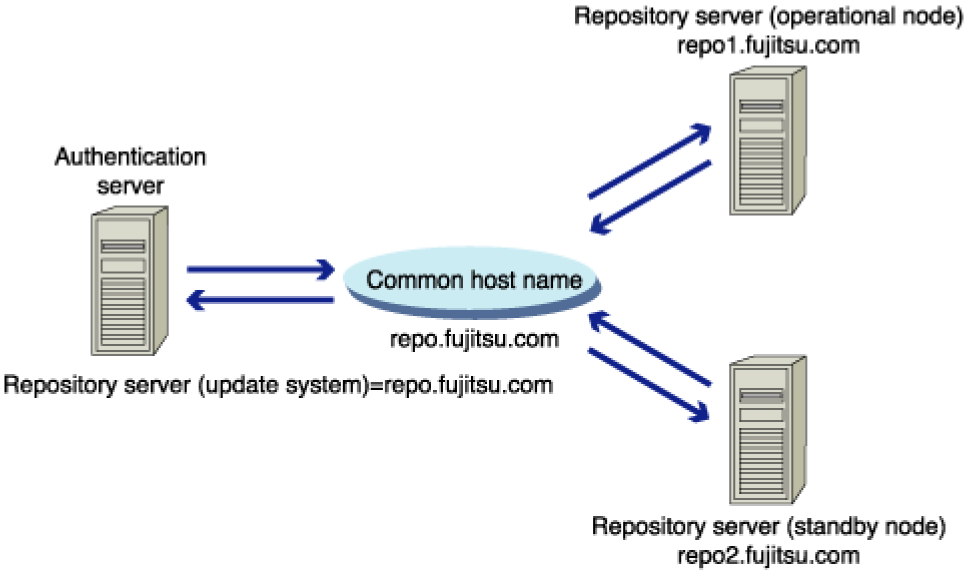

Repository server (operational node) repo1.fujitsu.com
Authentication server
Common host name
repo.fujitsu.com
Repository server (update system)=repo.fujitsu.com
Repository server (standby node) repo2.fujitsu.com

Figure 1-55 Using a Cluster System

Chapter 2

Environment Setup (SSO Administrators)

This chapter explains the setup for the authentication infrastructure environment.

Use the Interstage Management Console to set up the Interstage Single Sign-on environment. Refer to the Operator’s Guide for details of starting the Interstage Management Console and for details of the items to be defined in the Interstage Management Console.

Refer to the Smart Repository Operator's Guide for details of creating an SSO repository that configures the authentication infrastructure.

Notes

- Refer to the Security System Guide in advance to securely set up and operate the system.
- The Administrator's authority is required to set up the authentication infrastructure environment.

Environment Setup Flow

Authentication infrastructure environment setup includes the following four operations:

- Preparation for Environment Setup (SSO repository design, preparation for a user program)
- Repository Server Setup
- Setup of Authentication Server
- Registering a Business System

Set up the environment as to operation, as the steps required for setup will depend on the system configuration.

The authentication infrastructure configuration spreadsheet (an Excel file) is provided to assist the setup of the authentication infrastructure environment. This file helps users to calculate connection information between servers to be configured in the Interstage Management Console.

Refer to Using the Authentication Infrastructure Configuration Spreadsheet for details of how to use the configuration spreadsheet.

Flow of Environment Setup by Systems

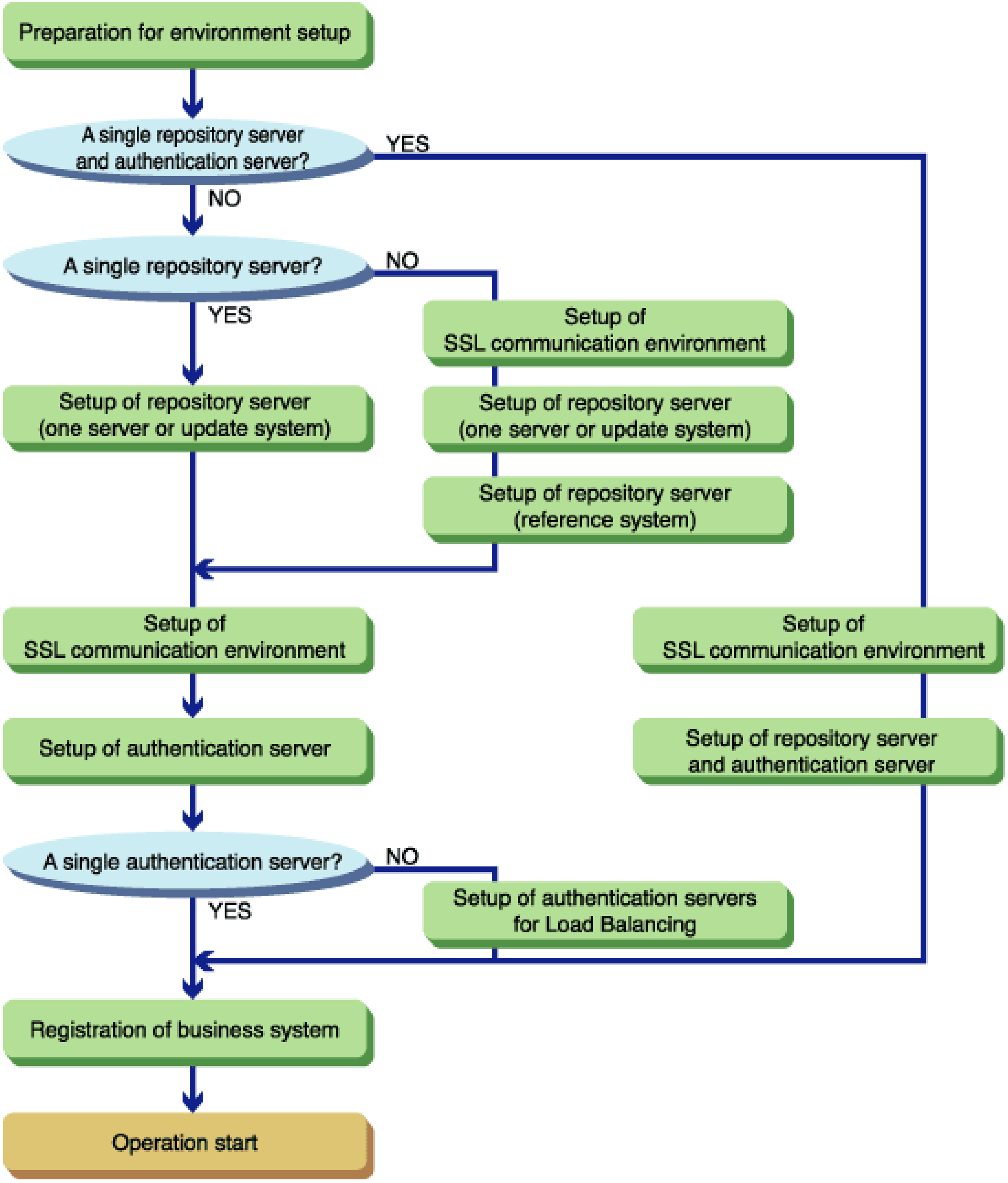

Preparation for environment setup
A single repository server and authentication server?
YES
NO
A single repository server?
NO
YES
Setup of SSL communication environment
Setup of repository server (one server or update system)
Setup of repository server (one server or update system)
Setup of repository server (reference system)
Setup of SSL communication environment
Setup of SSL communication environment
Setup of authentication server
Setup of repository server and authentication server
A single authentication server?
NO
YES
Setup of authentication servers for Load Balancing
Registration of business system
Operation start

Figure 2-1 Flow of Environment Setup

Table 2-1 shows the steps required for the environment setup of various types of systems:

Table 2-1 Environment Setup

	Setting up the authentication server on a machine and the repository server on another machine	**Setting up the authentication server on multiple machines and the repository server on one machine**	**Setting up the authentication server and the repository server on multiple machines individually**	**Adding an authentication server to the authentication infrastructure already set up**	**Adding a repository server (reference system) to the authentication infrastructure already set up (multiserver system)**	**Setting up the repository server and the authentication server on a single machine**
Preparation for Environment Setup	Preparation for Environment Setup	Preparation for Environment Setup	Preparation for Environment Setup			Preparation for Environment Setup
Repository server setup			Setup of SSL communication environment for the repository server (update system) for use of multiple repository servers or addition of a repository server		Setup of SSL communication environment for the repository server (update system) for use of multiple repository servers or addition of a repository server (*1)	
	Creation of SSO repository	Creation of SSO repository	Creation of SSO repository			Creation of SSO repository
	Registering user information and role configuration in SSO repository	Registering user information and role configuration in SSO repository	Registering user information and role configuration in SSO repository			Registering user information and role configuration in SSO repository
	Setting up repository server (server in single configuration or update system server in multiple configuration)	Setting up repository server (server in single configuration or update system server in multiple configuration)	Setting up repository server (server in single configuration or update system server in multiple configuration)			

	Setting up the authentication server on a machine and the repository server on another machine	**Setting up the authentication server on multiple machines and the repository server on one machine**	**Setting up the authentication server and the repository server on multiple machines individually**	**Adding an authentication server to the authentication infrastructure already set up**	**Adding a repository server (reference system) to the authentication infrastructure already set up (multiserver system)**	**Setting up the repository server and the authentication server on a single machine**
			Work for setting up repository server (reference system)		Work for setting up repository server (reference system)	
Setup of authentication server	Setting up of SSL communication environment	Setting up of SSL communication environment	Setting up of SSL communication environment			Setting up of SSL communication environment
	Setting up one authentication server	Setting up one authentication server	Setting up one authentication server			
		Adding authentication server for load distribution	Adding authentication server for load distribution	Adding authentication server for load distribution		
			Setting the repository server (reference system) information in authentication server		Setting the repository server (reference system) information in authentication server	
						Setting up Repository Server and Authentication Server on a Single Machine
Registering Business System	Registering Business System	Registering Business System	Registering Business System			Registering Business System

	Setting up the authentication server on a machine and the repository server on another machine	**Setting up the authentication server on multiple machines and the repository server on one machine**	**Setting up the authentication server and the repository server on multiple machines individually**	**Adding an authentication server to the authentication infrastructure already set up**	**Adding a repository server (reference system) to the authentication infrastructure already set up (multiserver system)**	**Setting up the repository server and the authentication server on a single machine**
Remark Use of authentication infrastructure configuration spreadsheet	The authentication infrastructure configuration spreadsheet (middle-scale system) is available.	The authentication infrastructure configuration spreadsheet (middle-scale system) is available.	The authentication infrastructure configuration spreadsheet (large-scale system) is available.(*2)			The authentication infrastructure configuration spreadsheet (small-scale) is available.

Notes

*1 This work is not required if the SSL communication environment has been set up in the active repository server (update system).

*2 The configuration spreadsheet for the Smart Repository environment setup (an Excel file) is provided by Smart Repository. Using this spreadsheet when creating the SSO master and slave repositories, you can accurately set up the Interstage Management Console. Refer to 'Choosing the Operating Mode' of 'Designing a Repository' of 'Environment Setup' in the Smart Repository Operator's Guide for details of the configuration spreadsheet for Smart Repository environment setup.

Using the Authentication Infrastructure Configuration Spreadsheet

The authentication infrastructure configuration spreadsheet (an Excel file) is provided to assist the setup of the authentication infrastructure environment. This file helps users to calculate connection information between servers to be set in the Interstage Management Console. Fetch the sheet from the following storage directory as necessary. Refer to [Procedure for Use] in the sheet for details of how to use it.

Filenames and Location of the Authentication Infrastructure Configuration Spreadsheet

File name of the Authentication Infrastructure Configuration Spreadsheet:

- SSO_Auth_L.xls

  Use this sheet to set up authentication servers and repository servers on multiple machines.

- SSO_Auth_M.xls

  Use this sheet to set up an authentication server and a repository server on a single machine, or authentication servers and repository servers on multiple machines and a single machine, respectively.

- SSO_Auth_S.xls

  Use this sheet to set up a repository server and authentication server on a single machine.

Location of the Authentication Infrastructure Configuration Spreadsheet:

Folder 'ApplicationServer\tuning' of Manual CD

Conditions for Using the Authentication Infrastructure Configuration Spreadsheet

The authentication infrastructure configuration spreadsheet supports Microsoft® Excel 2000 and Microsoft® Excel 2002. Ensure that either Microsoft® Excel 2000 or Microsoft® Excel 2002 is installed on your computer.

This sheet uses macros. Configure the Microsoft® Excel security level to enable macros. Refer to Microsoft® Excel Help for details of how to set the security level.

Contact your system administrator before changing the Microsoft® Excel security level.

The following procedure describes how to set the security level to use the authentication infrastructure configuration spreadsheet in Microsoft® Excel 2002:

1. Start Microsoft® Excel 2002 and from the menu bar, select [Tool (T)] > [Macro (M)] > [Security (S)].
2. The macro security setting window appears. Select [Medium (M)] in the [Security level] tab.
3. Click OK.
4. Quit Microsoft® Excel and restart.
5. From the menu bar, select [File (F)] > [Open (O)] to open the authentication infrastructure configuration spreadsheet.
6. The dialog asks whether to enable the macro. Click [Enable macro (E)].

After using this sheet, restore the security level as necessary.

Preparation for Environment Setup

Prepare a user program and design an SSO repository before environment setup.

Designing an SSO Repository

In Interstage Single Sign-on, the SSO repository collectively manages information required for authentication and authorization. This section explains the items to be designed before creation of an SSO repository.

Designing Information to be Registered in the SSO Repository

Three information items are registered in the SSO repository: Role configuration, user information, and protection resources. To set up a new authentication infrastructure, role configuration and user information must be designed.

- Role configuration

  Role configuration is mandatory for authorization in Interstage Single Sign-on. Design this information according to the organizational structure and user position. Refer to 'Role Configuration' of 'Information Required for Authorization Using Roles' for details.

- User information

  User information indicates information on the user who uses Interstage Single Sign-on. Design the user ID/password, and role configuration for association for each user. Refer to 'User Information' for details.

Take care not to create invalid SSO repository data when designing role configuration and user information.

The SSO repository data check sheet (an Excel file) is provided. This check sheet contains the notes on SSO repository design. Fetch the check sheet from the following storage directory when designing role configuration and user information.

File Name and Location of the SSO Repository Data Check Sheet

File Name of the SSO Repository Data Check Sheet:

SSO_Data_Chk.xls

Location of the SSO Repository Data Check Sheet:

Folder 'ApplicationServer\tuning' of Manual CD

Register role configuration and user information in the created SSO repository. Design and register protection resources when adding a business system.

Designing a Registration Destination Entry

Design an entry in which role configuration, user information, and protection resources are to be registered in the SSO repository.

Define the registration destination entry when creating an SSO repository.

The following table shows examples of registration destination entries:

Example

Management information	Registration destination entry
Role configuration	ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com
User information	ou=User,ou=interstage,o=fujitsu,dc=com
Protection resource	ou=Resource,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com

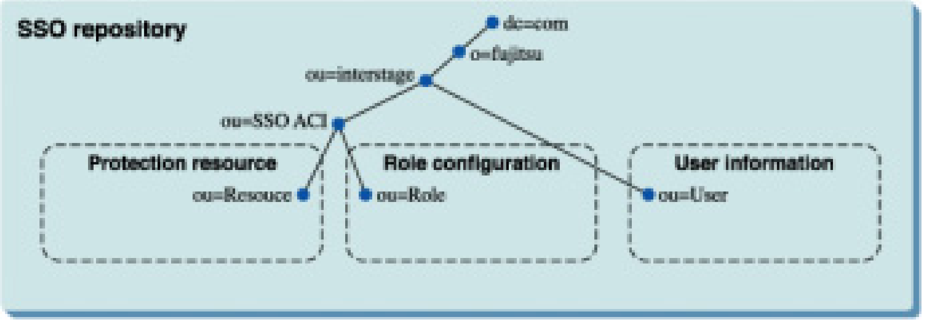


Figure 2-2 Registration Destination Entries

In the Interstage Management Console, when the default value is specified in [Public directory] and 'Create' is selected for [Create default tree?] in creating an SSO Repository, the registration destination entries shown in the above table are created. Samples provided by Interstage Single Sign-on for registering role configuration and user information have been created with the registration destination entries shown in Figure 2-2.

Examples of SSO Repository Design

Role Configuration

Example

This example shows a design of registering three roles classified by roles/organization and one role set having two among the three roles in the following registration destination entry:

Role configuration registration destination entry: ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com

Table 2-2 Register Roles

Role/organization	Role/role set name	Name of role contained in the role set
All employees	All	employee, executives
Executive	Executives	-
Employee	Employee	-
Administration department	Administration	-

User Information

Example

This example shows a design of registering information about two users in the following registration destination entry:

User information registration destination entry: ou=User,ou=interstage,o=fujitsu,dc=com

Table 2-3 Register User Information

Item	**User information**	
	user001 **cn=user001**	**user002** **cn=user002**
Authentication method	Certificate authentication	Certificate authentication
User ID	user001	user002
Password	00123401	00123402
Information identifying a user at certificate authentication	user001@ interstage.fujitsu.com	user002@ interstage.fujitsu.com
Role name/role set name	Executives	employee, administration
Re-authentication interval	60 minutes	60 minutes
Validation start date	00:00:00, January 1, 2004	00:00:00, January 1, 2004
Expiration date	00:00:00, December 31, 2004	00:00:00, December 31, 2004

Registration Destination Entry

Example

The following example shows the registration of role configuration and user information as registration destination entries:

Role configuration registration destination entry: ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com

User information registration destination entry: ou=User,ou=interstage,o=fujitsu,dc=com

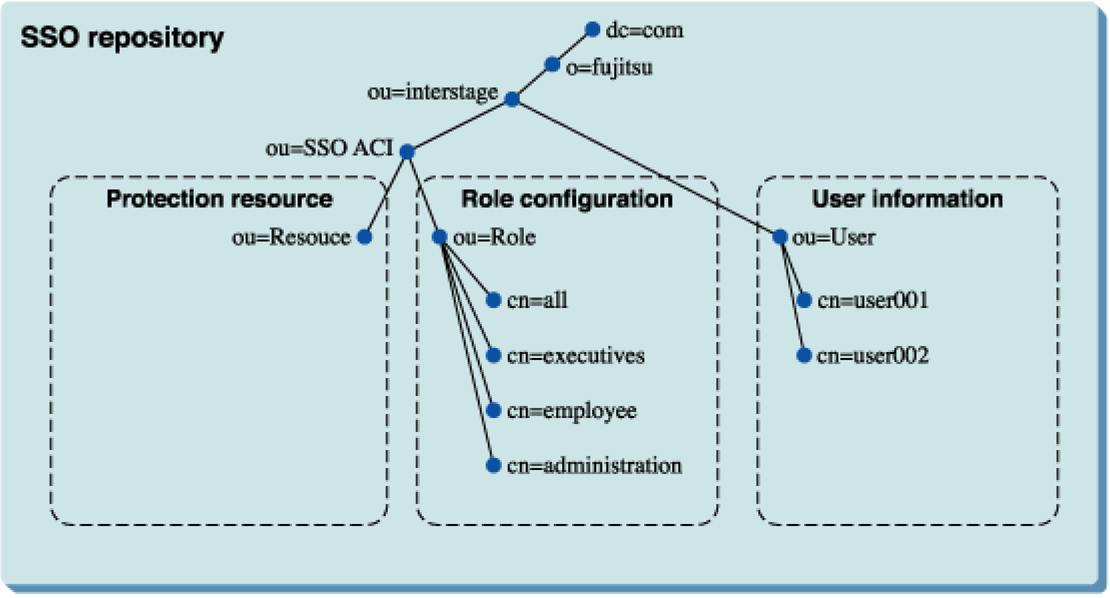


Figure 2-3 Role Configuration and User Information Registration Destinations

Preparation for a User Program

To install Interstage Single Sign-on, prepare a user program for operating the SSO repository in the following ways:

- Registering role configuration in the SSO repository
- Registering user information in the SSO repository
- Deleting user information from the SSO repository
- Adding a user role
- Deleting a user role
- Displaying user lock status
- Displaying and changing the user validity period
- Changing the user password

This manual describes an example of coding a user program in Java. Create a user program that fits in with your operation based on the example. Refer to 'Samples of User Program Descriptions' for details.

Create a user program for operating an SSO repository based on the correct design of an SSO repository. Take care not to create invalid SSO repository data.

Allocate the user program to a place that fits in with your operation, giving due consideration to security.

Refer to 'Role Configuration Entry', and 'User Information Entry' for details of the entry attributes of role configuration and user information in Interstage Single Sign-on.

Repository Server Setup

This section describes the procedure for setting up a repository server that configures the authentication infrastructure.

Use the Interstage Management Console of the machine in which a repository server is set up. Refer to the Operator’s Guide for details of starting the Interstage Management Console. Refer to the Operator’s Guide for details of the items to be defined in the Interstage Management Console.

Setting up a Repository Server in the System with a Single Repository Server

Perform the following procedure to set up a repository server in a single-repository server configuration:

Repository server setup

1. Create an SSO repository.
2. Register user information and role configuration in the SSO repository.
3. Set up the repository server.

Setting up a Repository Server in the Multiple Repository Server Configuration

Perform the following procedure to set up a repository server in the multiple-repository server configuration:

Set up an SSL communication environment of the repository server (update system)

Set up a repository server (update system)

Perform the same procedure as that for setting up a repository server in the single repository server configuration.

1. Create an SSO repository (master) of the repository server (update system).
2. Register user information and role configuration in the SSO repository (master).
3. Set up the repository server (update system).

Set up a repository server (reference system)

1. Back up the SSO repository data for the repository server (update system).
2. Set up an SSL communication environment of the repository server (reference system).
3. Create an SSO repository (slave) for the repository server (reference system).
4. Restore the SSO repository in the repository server (reference system).
5. Change the setting of the SSO repository for the restored repository server (reference system).
6. Set up the repository server (reference system).
7. Change the setting of the SSO repository for the repository server (update system).

Setting up a Repository Server for Addition of a Repository Server (Reference System)

Perform the following procedure to add a repository server (reference system) during operation:

Set up an SSL communication environment of the repository server (update system)

This step is not required when an SSL communication environment has been set up in the repository server (update system).

Set up a Repository Server (Reference System)

Perform the same procedure as that for setting up a repository server (reference system) in the system with multiple repository servers.

1. Back up the SSO repository data for the repository server (update system).
2. Set up an SSL communication environment of the repository server (reference system).
3. Create an SSO repository (slave) for the repository server (reference system).
4. Restore the SSO repository in the repository server (reference system).
5. Change the setting of the SSO repository for the restored repository server (reference system).
6. Set up the repository server (reference system).

7 Change the setting of the SSO repository for the repository server (update system).

Creating an SSO Repository

Create an SSO repository to set up a new authentication infrastructure.

Use the Interstage Management Console of the machine in which a repository server is set up and perform the procedure below. Refer to the Operator’s Guide for details of the items to be defined in the Interstage Management Console.

The SSO administrator must undertake the role of the repository administrator as described in the Interstage Management Console.

1. Select [Services] and then [Repository] from the System menu. Click on the [Create a New Repository] tab.
2. Specify items as described below.

   Items with (*1) can be specified only when creating an SSO repository; they cannot be changed after the SSO repository has been created. Take special care when setting these values.

   General Settings

   – Repository Name (*1)

     Specify the name of an SSO repository to be created.

   – Administrator DN (*1)

     Specify a DN (distinguished name) of the administrator that manages the SSO repository to be created in the DN (distinguished name) format. (Example: cn=manager)

   – Administrator DN password

     Specify a password for the SSO administrator.

- Administrator DN password (re-enter)

  Re-enter the password for the SSO administrator.

- Public Directory (*1)

  'ou=interstage,o=fujitsu,dc=com' has been specified. Change this directory as necessary.

- Create Default Tree? (*1)

  Click 'Yes.'

  When 'Create' is clicked and '**ou=interstage,o=fujitsu,dc=com**' is specified in the public directory, the following directory trees are created:

Tree to be created	**Use**
ou=User,**ou=interstage,o=fujitsu,dc=com**	For registration user information
ou=SSO ACI,**ou=interstage,o=fujitsu,dc=com**	For registering access control information
ou=Resource,**ou=SSO ACI,ou=interstage,o=fujitsu,dc=com**	For registering protection resources
ou=Role,**ou=SSO ACI,ou=interstage,o=fujitsu,dc=com**	For registering role configuration

- Port number (*1)

  Specify a port number to be used in non-SSL communication.

- Enable SSL encryption? (*1)

  Select 'No'.

  If it is necessary for a user application to access the SSO repository using SSL communication, select 'Yes'. In this case, specify [SSL Port number] and [SSL configuration].

- SSL Port number(*1)

  Specify the port number used in SSL communication.

  Specify this to select 'Yes' in [Enable SSL encryption?].

- SSL configuration

  Select the SSL configuration used in SSL communication.

  Specify this to select 'Yes' in [Enable SSL encryption?].

- Connection idle Timeout

  The default is '900 seconds'. Change the value as necessary.

Detailed settings

Database Configuration

- Maximum number of searchable entries

  Maximum number of entries that can be searched The default is '500 entries'. Change the value as necessary.

- Cache Size

  The default is '1,000 pages'. One page consists of 4 kilobytes. Change the value as necessary.

- Search Timeout

  The default is '3,600 seconds'. Change the value as necessary.

- User password encryption method (*1)

  Select 'SHA.'

- Database Storage Directory (*1)

  The following directory has been specified. Change the directory as necessary.

  Windows

  'C:\Interstage\Enabler\EnablerDStores\IREP'

  Solaris OE

  '/var/opt/FJSVena/EnablerDStores/FJSVirep'

  Linux

  '/var/opt/FJSVena/DStores/FJSVirep'

Access log Configuration

- Output Access Log?

  Output access log Always select 'Yes'.

- Output level

  Select 'Client requests' and 'Server errors'. Select other items as necessary.

- Access log storage directory

  Change the value as necessary.

- Rotation Type

  Change the value as necessary.

- Size

  Change the value as necessary.

- Number of access log files

  Change the value as necessary.

3. The status of the SSO repository (master) appears. Check the details.

4. Check the checkbox of the created SSO repository and click the Start button to start the SSO repository.

Registering User Information and Role Configuration in the SSO Repository

Register user information and role configuration in the SSO repository with the user program. Refer to Preparation for a User Program, for details about the user program.

User information can be imported from the database (source data) to the SSO repository using a command. For details on importing user information using a command, see 'Importing User Information From the Database to the SSO Repository'.

Refer to Role Configuration Entry and User Information Entry for details of the entry attributes of role configuration and user information in Interstage Single Sign-on.

A CSV data file or LDIF file can also be used to register user information and role configuration in the SSO repository.

Refer to Using a CSV Data File and Using an LDIF File for details.

Importing User Information From the Database to the SSO Repository

Use the ssoimportum command to import user information from the database (source data) to the SSO repository. For details of the database that can be used, see 'Supported Software' - 'Software Products Required for Application Execution' in the Product Notes.

Before user information is imported from the source data to the SSO repository, the SSO repository must be created. For details on SSO repository creation methods, see 'Creating an SSO Repository'.

In this section, the table temporarily created in the database or the table is called a 'virtual table'.

To make the source data information public, create a virtual table. Enter the table name and column name of the connected source data in the operation information file. Using this method, registered user information can be extracted from this source data and registered in the SSO repository. Specify the operation information file using the parameters of the ssoimportum command.

If information that you do not want to make public is included for security purposes you should use the public user information to create a virtual table and make a connection to that table. In this way, user information can be extracted without having to make an actual table public.

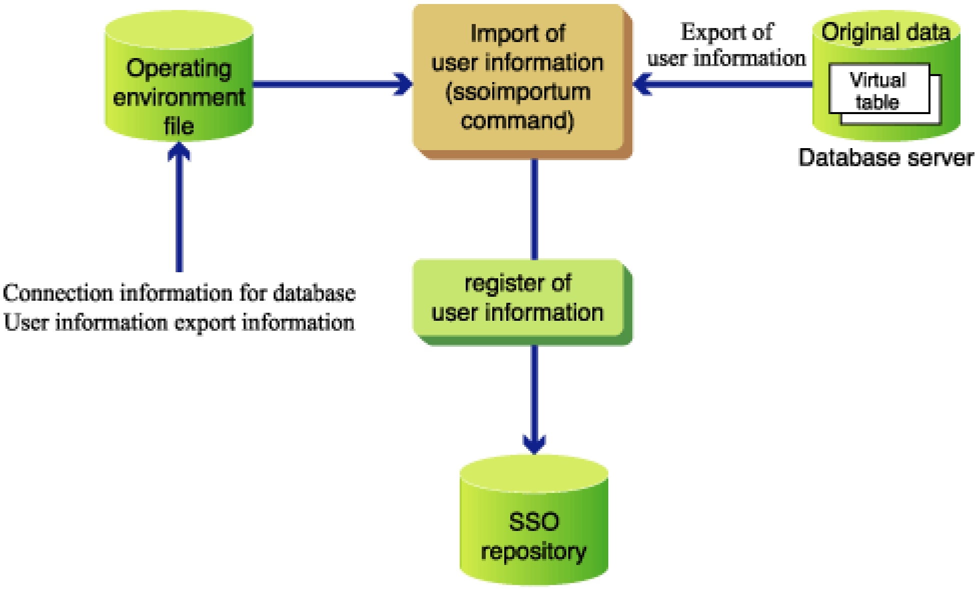

Operating environment file
Import of user information (ssoimportum command)
Export of user information
Original data
Virtual table
Database server
Connection information for database
User information export information
register of user information
SSO repository

Figure 2-4 Importing User Information from the Database to the SSO Repository

The procedure for importing user information from the database (source data) to the SSO repository is described below:

1. Set the CLASSPATH environment variable
2. Create the operation information file
3. Execute the ssoimportum command

(1) Set the CLASSPATH environment variable

Use JDBC to connect to the database. The JDBC driver for connection to the database must be prepared.

Before using the ssoimportum command, add the JDBC driver to be used to the CLASSPATH environment variable.

Windows

The Interstage JDBC driver can only be used to connect to SQL Server.

Example

Windows

Conditions for connection and an example of the settings that should be made are shown below.

Database to be connected to: Symfoware V6.0L10
JDBC driver storage directory   C:\temp\fjsymjdbc2.jar

```
C:\>set CLASSPATH=%CLASSPATH%;C:\temp\fjsymjdbc2.jar
```

Conditions for connection and an example of the settings that should be made are shown below.

Database to be connected to: Oracle8i
JDBC driver storage directory   C:\temp\classes12.zip and C:\temp\nls_charset12.zip

```
C:\>set
CLASSPATH=%CLASSPATH%;C:\temp\classes12.zip;C:\temp\nls_charset12.zip
```

An example of the settings that should be made if the Interstage JDBC driver is used are shown below.

Database to be connected to: SQL Server
JDBC driver storage directory   C:\Interstage\EJB\jdbc\lib\fjisjdbc2.jar

```
C:\>set CLASSPATH=%CLASSPATH%;C:\Interstage\EJB\jdbc\lib\fjisjdbc2.jar
```

Solaris OE

Conditions for connection and an example of the settings that should be made are shown below.

Database to be connected to: Symfoware 6.0
JDBC driver storage directory   /tmp/fjsymjdbc2.jar

```
# CLASSPATH=/tmp/fjsymjdbc2.jar:$CLASSPATH
# export CLASSPATH
```

Conditions for connection and an example of the settings that should be made are shown below.

Database to be connected to: Oracle8i
JDBC driver storage directory   /tmp/classes12.zip and /tmp/nls_charset12.zip

```
# CLASSPATH=/tmp/classes12.zip:/tmp/nls_charset12.zip:$CLASSPATH
# export CLASSPATH
```

Linux

Conditions for connection and an example of the settings that should be made are shown below.

Database to be connected to: Symfoware 6.0
JDBC driver storage directory   /tmp/fjsymjdbc2.jar

```
# CLASSPATH=/tmp/fjsymjdbc2.jar:$CLASSPATH
# export CLASSPATH
```

Conditions for connection and an example of the settings that should be made are shown below.

Database to be connected to:	Oracle9i
JDK/JRE to be used to:	1.4
JDBC driver storage directory	/tmp/ojdbc14.jar and /tmp/nls_charset12.zip

```
# CLASSPATH=/tmp/ojdbc14.jar:/tmp/nls_charset12.zip:$CLASSPATH
# export CLASSPATH
```

(2) Create the operation information file

Create an operation information file in which the settings that are required for extracting the user information are described.

Refer to 'ssoimportum' in 'Single Sign-on Operation Commands' of the Reference Manual (Command Edition) for details of creating the operation information file.

(3) Execute the ssoimportum command

Specify the operation information file created in (2). Execute the ssoimportum command to extract the user information and import it to the SSO repository.

Refer to 'Single Sign-on Operation Commands' in the Reference Manual (Command Edition) for details of the ssoimportum command.

Using a CSV Data File

A large quantity of user information managed by the personnel database, may be added to the SSO repository at system installation, or at another time. To facilitate this, a CSV data file extracted from the personnel database can be used to add entries to the SSO repository in batch. Periodic updates of user information may be required when personnel transfer or new employees join. In this case, a CSV data file containing only updated information can be used to add user information to the SSO repository.

This section explains how to register user information and role configuration using a CSV data file based on the sample CSV data file provided by Interstage Single Sign-on.

The following paragraphs explain the procedure for registering entries using the CSV data file. Refer to the Smart Repository Operator's Guide for details of the CSV format.

Execute the irepaddrole command to register a role and irepmodifyent command to register user information from the CSV data file. Refer to 'Smart Repository Operation Commands' in the Reference Manual (Command Edition) for details of the command.

The CSV data file can also be used to delete or update information. Refer to the Smart Repository Operator's Guide for details of how to delete or update information.

Note

The CSV file contains a password. Ensure that you take sufficient action to protect the CSV file.

For details about securing your data, Refer to 'Security Measures' of 'Interstage Single Sign-on' of 'Security Risks' in the Security System Guide.

Perform the following procedure to add entries using the CSV data file:

1. Extract data in CSV format from the personnel database.
2. Create a rule file.
3. Execute the role configuration import command.

4. Execute the user information import command.

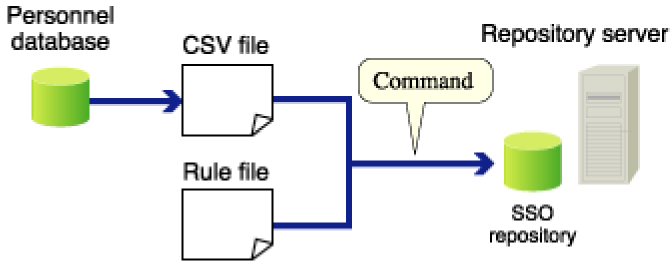


Figure 2-5 Add Entries using the CSV Data File

The sample files provided by Interstage Single Sign-on are as follows:

Sample File Names and Storage Directory

Sample CSV file for entry addition:

sample_add.csv

Sample rule file:

sample_rule.xml

Sample storage directory:

Windows

C:\Interstage\F3FMsso\ssoatcsv\sample\csv

Solaris OE Linux

/opt/FJSVssosv/sample/csv

1. Extracting Data in CSV Format from the Personnel Database

Use the database function to extract user information in CSV format from the personnel database. Extract the following user information items from the database:

Row	Item
Row 1	First and last name
Row 2	Last name
Row 3	First name
Row 4	User ID
Row 5	Password
Row 6	Employee number
Row 7	Mail address
Row 8	Role name

The data in CSV format that corresponds to the above data is as follows:

```
user001,user001,user001,user001,user001,100001,user001@interstage.fujitsu.co
m,Admin
user002,user002,user002,user001,user001,100002,user002@interstage.fujitsu.co
m,Admin
user003,user003,user003,user003,user003,100003,user003@interstage.fujitsu.co
m,Leader
user004,user004,user004,user004,user004,100004,user004@interstage.fujitsu.co
m,Leader
user005,user005,user005,user005,user005,100005,user005@interstage.fujitsu.co
m,General
user006,user006,user006,user006,user006,100006,user006@interstage.fujitsu.co
m,General
```

2. Creating a Rule File

To register CSV data in the SSO repository, the data must be associated with SSO repository information. For the association, create a rule file and set a mapping rule. Refer to the Smart Repository Operator's Guide for details of the mapping rule.

Refer to Role Configuration Entry and User Information Entry for details of the entry attributes that can be changed depending on the operating environment of Interstage Single Sign-on.

Associating CSV Data with User Information Entry Attributes

Associate the data in CSV format with the user entry attributes as shown in Table 2-4, and register the associated data in the SSO repository.

Table 2-4 Associate CSV Data with User Information Entry Attributes

Row	Item	User information entry attribute
Row 1	First and last name	cn
Row 2	Last name	sn
Row 3	First name	givenName
Row 4	User ID	uid
Row 5	Password	userPassword
Row 6	Employee number	employeeNumber
Row 7	Mail address	mail
Row 8	Role name	ssoRoleName

CSV Data

In the CSV data, specify operation for the SSO repository in row 0.

```
ADD,user001,user001,user001,user001,user001,100001,user001@interstage.fujitsu
.com,Admin
ADD,user002,user002,user002,user002,user002,100002,user002@interstage.fujitsu
.com,Admin
ADD,user003,user003,user003,user003,user003,100003,user003@interstage.fujitsu
```

```
.com,Leader
ADD,user004,user004,user004,user004,user004,100004,user004@interstage.fujitsu
.com,Leader
ADD,user005,user005,user005,user005,user005,100005,user005@interstage.fujitsu
.com,General
ADD,user006,user006,user006,user006,user006,100006,user006@interstage.fujitsu
.com,General
```

Rule File

The rule file associates the above CSV data with the user information entry attributes as shown below. In the example of the role file, the following items are set:

Rule Name

sso rule

Public Directory

ou=User,ou=interstage,o=fujitsu,dc=com

Entry Attribute that Uniquely Identifies the User

uid

Operation

ADD (addition)

Attributes to be set According to CSV Data

cn, sn, givenName, uid, userPassword, employeeNumber, mail, ssoRoleName

Attributes to be set as a Fixed Value

ssoAuthType, ssoCredentialTTL, ssoNotBefore (*1)

*1 In the following example, the date is specified in the format YYYYMMDDHHMMSS+XXXX. '+XXXX' refers to the time difference from UTC (Universal Time Coordinate). In cases where '-XXXX' is used, it means the same as above.

```
<?xml version="1.0" encoding="EUC-JP" ?>

<!-- Cannot be modified -->

<!DOCTYPE Csv2Directory [
<!ELEMENT Rule (name, baseDn, midDn?, Rdn+, DnChange?, objectClass+,
attributeSeparator?, unique*, CSV, fixed?)>
<!ELEMENT CSV (ldapop?, Attribute)>
<!ELEMENT ldapop (op?, ldapadd?, ldapdelete?, ldapmodify?)>
<!ELEMENT name (#PCDATA)>
<!ELEMENT baseDn (#PCDATA)>
<!ELEMENT Rdn (#PCDATA)>
<!ELEMENT objectClass (#PCDATA)>
<!ELEMENT attributeSeparator (#PCDATA)>
<!ELEMENT op (#PCDATA)>
<!ELEMENT ldapadd (#PCDATA)>
<!ELEMENT ldapdelete (#PCDATA)>
<!ELEMENT ldapmodify (#PCDATA)>

]>
<!-- Cannot be modified -->


<Csv2Directory>

    <Rule>
        <name>sso rule</name>

<!-- Define baseDn (mandatory). -->

        <baseDn>ou=User,ou=interstage,o=fujitsu,dc=com</baseDn>

<!-- Define attributes to be added before baseDn (arbitrary). -->

<!-- Not required for SSO

        <midDn>ou=8,ou=9,ou=10</midDn>
-->

<!-- Define RDN (Mandatory:  Multiple values allowed:  Same value not 
allowed). -->

<!-- Enter a unique number or attribute name. -->

        <Rdn>cn</Rdn>

<!-- Specify whether the changed DN is assumed to be moved (arbitrary). -->

<!-- If assumed, specify 1. -->

        <DnChange>1</DnChange>

<!-- Define objectClass. -->

        <objectClass>top</objectClass>
        <objectClass>person</objectClass>
        <objectClass>organizationalPerson</objectClass>
        <objectClass>inetOrgPerson</objectClass>
        <objectClass>ssoUser</objectClass>

<!-- Delimiter when creating an attribute value from multiple CSV items 
(arbitrary) -->

<!-- When specifying nothing, a null character is assumed. -->

<!-- A null character cannot be specified. -->

        <attributeSeparator>-</attributeSeparator>

<!-- Specify the attribute that does not allow any same value under baseDn. 
-->

<!-- Specify a unique number or attribute name. -->
```

```
<!-- (Arbitrary:  Multiple values allowed:  Same value not allowed) -->

        <unique>uid</unique>

        <CSV>
            <!-- An item number of CSV indicating a processing item
 (addition, deletion, or change) (arbitrary). -->

            <ldapop>
                <op>0</op>
                <ldapadd>ADD</ldapadd>
                <ldapdelete>DEL</ldapdelete>
                <ldapmodify>MOD</ldapmodify>
                <ldapmove>MOV</ldapmove>
            </ldapop>

<!-- Mapping between each of CSV items and directory attributes (arbitrary)
-->

            <Attribute>
                <cn>1</cn>
                <sn>2</sn>
                <givenName>3</givenName>
                <uid>4</uid>
                <userPassword>5</userPassword>
                <employeeNumber>6</employeeNumber>
                <mail>7</mail>
                <ssoRoleName>8</ssoRoleName>
            </Attribute>
        </CSV>

<!-- Define attributes to be set as fixed values (arbitrary). -->

        <fixed>
            <ssoAuthType>basicAuthOrCertAuth</ssoAuthType>
            <ssoCredentialTTL>60</ssoCredentialTTL>
            <ssoNotBefore>20010101090000+0900</ssoNotBefore>
        </fixed>
    </Rule>
</Csv2Directory>
```

3. Executing the Role Configuration Import Command

To add entry data according to the mapping rules, execute irepaddrole command provided by Smart Repository on the machine in which a repository server is set up.

After execution of the irepaddrole command, fetch entry information and check whether entry data has been added correctly. Refer to 'Entry Management' in the Smart Repository Operator's Guide for details of how to operate the entry.

Example

Windows

For the administrator DN and Bind password, specify the administrator DN and administrator DN password that were set when the SSO repository was created in the Interstage Management Console. In the following example, 389 is specified for the port number of the SSO repository and 'cn=manager,ou=interstage,o=fujitsu,dc=com' is specified for the administrator DN:

Administrator DN: 'cn=manager,ou=interstage,o=fujitsu,dc=com'

Rule file: C:\Interstage\F3FMsso\ssoatcsv\sample\csv\sample_rule.xml

CSV file: C:\Interstage\F3FMsso\ssoatcsv\sample\csv\sample_add.csv

Role configuration registration destination entry: ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com

Enter the administrator DN password if you are prompted to enter the Bind password. The entered password is not displayed.

```
C:\>irepaddrole -h localhost -p 389 -D
"cn=manager,ou=interstage,o=fujitsu,dc=com" -r
C:\Interstage\F3FMsso\ssoatcsv\sample\csv\sample_rule.xml -i
C:\Interstage\F3FMsso\ssoatcsv\sample\csv\sample_add.csv -b "ou=Role,ou=SSO
ACI,ou=interstage,o=fujitsu,dc=com"
Enter Bind password:
IREP: INFO: irep13570: adding new entry cn=Admin,ou=Role,ou=SSO
ACI,ou=interstage,o=fujitsu,dc=com
IREP: INFO: irep13570: adding new entry cn=Leader,ou=Role,ou=SSO
ACI,ou=interstage,o=fujitsu,dc=com
IREP: INFO: irep13570: adding new entry cn=General,ou=Role,ou=SSO
ACI,ou=interstage,o=fujitsu,dc=com
C:\>
```

Solaris OE Linux

For the administrator DN and Bind password, specify the administrator DN and administrator DN password that were set when the SSO repository was created in the Interstage Management Console. In the following example, 389 is specified for the port number of the SSO repository and 'cn=manager,ou=interstage,o=fujitsu,dc=com' is specified for the administrator DN:

Administrator DN: 'cn=manager,ou=interstage,o=fujitsu,dc=com'

Rule file: /opt/FJSVssosv/sample/csv/sample_rule.xml

CSV file: /opt/FJSVssosv/sample/csv/sample_add.csv

Role configuration registration destination entry: ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com

Enter the administrator DN password if you are prompted to enter the Bind password. The entered password is not displayed.

```
# irepaddrole -h localhost -p 389 -D
"cn=manager,ou=interstage,o=fujitsu,dc=com" -r
/opt/FJSVssosv/sample/csv/sample_rule.xml -i
/opt/FJSVssosv/sample/csv/sample_add.csv -b "ou=Role,ou=SSO
ACI,ou=interstage,o=fujitsu,dc=com"
Enter Bind password:
```

```
UX:IREP: INFO: irep13570: adding new entry cn=Admin,ou=Role,ou=SSO
ACI,ou=interstage,o=fujitsu,dc=com
UX:IREP: INFO: irep13570: adding new entry cn=Leader,ou=Role,ou=SSO
 ACI,ou=interstage,o=fujitsu,dc=com
UX:IREP: INFO: irep13570: adding new entry cn=General,ou=Role,ou=SSO
ACI,ou=interstage,o=fujitsu,dc=com
#
```

Note

Ensure that you take sufficient action to protect your administrator DN password.

For details about securing your data, refer to 'Security Measures' of 'Interstage Single Sign-on' of 'Security Risks' in the Security System Guide.

4. Executing the User Information Import Command

To add entry data according to the mapping rules, execute the irepmodifyent command provided by Smart Repository on the machine in which a repository server is set up.

After execution of the irepmodifyent command, fetch entry information and check whether entry data has been added correctly. Refer to 'Entry Management' in the Smart Repository Operator's Guide for details of how to operate the entry.

Example

Windows

For the administrator DN and Bind password, specify the administrator DN and administrator DN password that were set when the SSO repository was created in the Interstage Management Console. In the following example, 389 is specified for the port number of the SSO repository and 'cn=manager,ou=interstage,o=fujitsu,dc=com' is specified for the administrator DN:

Administrator DN: 'cn=manager,ou=interstage,o=fujitsu,dc=com'

Rule file: C:\Interstage\F3FMsso\ssoatcsv\sample\csv\sample_rule.xml

CSV file: C:\Interstage\F3FMsso\ssoatcsv\sample\csv\sample_add.csv

Enter the administrator DN password if you are prompted to enter the Bind password. The entered password is not displayed.

```
C:\>irepmodifyent -h localhost -p 389 –D
 "cn=manager,ou=interstage,o=fujitsu,dc=com" –r
 C:\Interstage\F3FMsso\ssoatcsv\sample\csv\sample_rule.xml -i
C:\Interstage\F3FMsso\ssoatcsv\sample\csv\sample_add.csv
Enter Bind password:
IREP: INFO: irep13570: adding new entry
cn=User001,ou=User,ou=interstage,o=fujitsu,dc=com
IREP: INFO: irep13570: adding new entry
 cn=User002,ou=User,ou=interstage,o=fujitsu,dc=com
IREP: INFO: irep13570: adding new entry
cn=User003,ou=User,ou=interstage,o=fujitsu,dc=com
IREP: INFO: irep13570: adding new entry
cn=User004,ou=User,ou=interstage,o=fujitsu,dc=com
IREP: INFO: irep13570: adding new entry
```

```
cn=User005,ou=User,ou=interstage,o=fujitsu,dc=com
IREP: INFO: irep13570: adding new entry
cn=User006,ou=User,ou=interstage,o=fujitsu,dc=com
C:\>
```

Solaris OE Linux

For the administrator DN and Bind password, specify the administrator DN and administrator DN password that were set when the SSO repository was created in the Interstage Management Console. In the following example, 389 is specified for the port number of the SSO repository and 'cn=manager,ou=interstage,o=fujitsu,dc=com' is specified for the administrator DN:

Administrator DN: 'cn=manager,ou=interstage,o=fujitsu,dc=com'

Rule file: /opt/FJSVssosv/sample/csv/sample_rule.xml

CSV file: /opt/FJSVssosv/sample/csv/sample_add.csv

Enter the administrator DN password if you are prompted to enter the Bind password. The entered password is not displayed.

```
# irepmodifyent -h localhost -p 389 –D
 "cn=manager,ou=interstage,o=fujitsu,dc=com" -r
/opt/FJSVssosv/sample/csv/sample_rule.xml -i
/opt/FJSVssosv/sample/csv/sample_add.csv
Enter Bind password:
UX:IREP: INFO: irep13570: adding new entry
cn=User001,ou=User,ou=interstage,o=fujitsu,dc=com
UX:IREP: INFO: irep13570: adding new entry
cn=User002,ou=User,ou=interstage,o=fujitsu,dc=com
UX:IREP: INFO: irep13570: adding new entry
cn=User003,ou=User,ou=interstage,o=fujitsu,dc=com
UX:IREP: INFO: irep13570: adding new entry
cn=User004,ou=User,ou=interstage,o=fujitsu,dc=com
UX:IREP: INFO: irep13570: adding new entry
cn=User005,ou=User,ou=interstage,o=fujitsu,dc=com
UX:IREP: INFO: irep13570: adding new entry
cn=User006,ou=User,ou=interstage,o=fujitsu,dc=com
#
```

Note

Ensure that you take sufficient action to protect your administrator DN password.

For details about securing your data, refer to 'Security Measures' of 'Interstage Single Sign-on' of 'Security Risks' in the Security System Guide.

Using an LDIF File

This section explains how to register user information and role configuration based on the sample LDIF file provided by Interstage Single Sign-on. Perform the following procedure to register entries using the LDIF file. Execute the ldapmodify command to register entries using the LDIF file.

Refer to the Smart Repository Operator's Guide for details of the LDIF file. Refer to the Reference Manual (Command Edition) for details of the ldapmodify command.

The LDIF file also can be used to delete or update information. Refer to the Smart Repository Operator's Guide for details of how to delete or update information.

1. Create an LDIF file.
2. Execute the ldapmodify command.

1. Creating an LDIF File

Specify in the LDIF file role configuration and user information to be registered in the SSO repository. Modify role configuration and user information set in the sample LDIF file as necessary.

Refer to Role Configuration Entry and User Information Entry for details of the entry attributes of role configuration and user information.

Note the following points for creating an LDIF file:

- Do not insert a blank line at the beginning of the LDIF file. If a blank line is inserted, none of the entries in the LDIF file are registered.
- Insert a blank line between entry information items to separate entry information. If two or more blank lines continue, subsequent entries are not registered.

If the default value of [Public directory] has been changed during creation of an SSO repository, change the bold characters of the sample LDIF file to the directory set in [Public directory].

If 'No' is selected in [Create default tree?], add the following specification example to the beginning of the sample LDIF file.

Example

In this example, the following entries are registered:

Public directory: ou=interstage,o=fujitsu,dc=com

Access control information registration destination entry: ou=SSO ACI,ou=interstage,o=fujitsu,dc=com

Role configuration registration destination entry: ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com

Protection resource registration destination entry: ou=Resource,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com

User information registration destination entry: ou=User,ou=interstage,o=fujitsu,dc=com

When a registration destination entry has been changed, also change the registration destination entry set in the sample LDIF file.

```
dn: ou=SSO ACI,ou=interstage,o=fujitsu,dc=com
objectClass: organizationalUnit
objectClass: top
ou: SSO ACI

dn: ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com
```

```
objectClass: organizationalUnit
objectClass: top
ou: Role

dn: ou=Resource,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com
objectClass: organizationalUnit
objectClass: top
ou: Resource

dn: ou=User,ou=interstage,o=fujitsu,dc=com
objectClass: organizationalUnit
objectClass: top
ou: User
```

The following section shows the name of the sample LDIF file and storage directory:

LDIF File Name

sample.ldif

LDIF file storage directory

Windows

C:\Interstage\F3FMsso\ssoatcsv\sample\ldif

Solaris OE Linux

/opt/FJSVssosv/sample/ldif

```
#
#
# Interstage Single Sign-on
#
#       Repository(Directory) Entry sample LDIF
#
#
#*******************************************************
#
# Role definition
#
#*******************************************************
# Entry: Role: Admin
dn: cn=Admin,ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com
                    <- Registration destination entry of role name "Admin"

objectClass: ssoRole                   <- Mandatory object class

objectClass: top                       <- Mandatory object class

cn: Admin                              <- Role name

# Entry: Role: Leader
dn: cn=Leader,ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com
                    <- Registration destination entry of role name "Leader"

objectClass: ssoRole                   <- Mandatory object class
```

```
objectClass: top                   <- Mandatory object class

cn: Leader                         <- Role name

# Entry: Role: General
dn: cn=General,ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com
                    <- Registration destination entry of role name "General"

objectClass: ssoRole               <- Mandatory object class

objectClass: top                   <- Mandatory object class

cn: General                        <- Role name

# Entry: RoleSet: AdminSet
dn: cn=AdminSet,ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com
               <- Registration destination entry of role set name "AdminSet"

ssoRoleName: Admin                 <- Role to be set in role set

objectClass: ssoRoleSet            <- Mandatory object class

objectClass: top                   <- Mandatory object class

cn: AdminSet                       <- Role set name

# Entry: RoleSet: LeaderSet
dn: cn=LeaderSet,ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com
              <- Registration destination entry of role set name "LeaderSet"

ssoRoleName: AdminSet              <- Role set to be set in role set

ssoRoleName: Leader                <- Role to be set in role set

objectClass: ssoRoleSet            <- Mandatory object class

objectClass: top                   <- Mandatory object class

cn: LeaderSet                      <- Role set name

# Entry: RoleSet: GeneralSet
dn: cn=GeneralSet,ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com
             <- Registration destination entry of role set name "GeneralSet"

ssoRoleName: LeaderSet             <- Role set to be set in role set

ssoRoleName: General               <- Role to be set in role set

objectClass: ssoRoleSet            <- Mandatory object class

objectClass: top                   <- Mandatory object class

cn: GeneralSet                     <- Role set name


#******************************************************
#
```

```
# User definition
#
#******************************************************
# Entry: User: user001
dn: cn=user001,ou=User,ou=interstage,o=fujitsu,dc=com
                   <- Registration destination entry of user "user001"

objectClass: top                   <- Mandatory object class

objectClass: person                <- Mandatory object class

objectClass: organizationalPerson  <- Mandatory object class

objectClass: inetOrgPerson         <- Mandatory object class

objectClass: ssoUser               <- Mandatory object class

uid: user001                         <- User ID at password authentication

userPassword: user001                <- Password at password authentication

mail: user001@interstage.fujitsu.com         <- Mail address

employeeNumber: 100001             <- Employee number

ssoRoleName: Admin                 <- Role name

ssoAuthType: basicAuthOrCertAuth   <- Authentication method

ssoCredentialTTL: 60               <- Re-authentication interval

ssoNotBefore: 20010101090000+0900  <- Use start time

sn: user001                        <- Last name

cn: user001                  <- First and last name

# Entry: User: user002
dn: cn=user002,ou=User,ou=interstage,o=fujitsu,dc=com
                <- Registration destination entry of user "user002"

objectClass: top                   <- Mandatory object class

objectClass: person                <- Mandatory object class

objectClass: organizationalPerson  <- Mandatory object class

objectClass: inetOrgPerson         <- Mandatory object class

objectClass: ssoUser               <- Mandatory object class

uid: user002                        <- User ID at password authentication

userPassword: user002               <- Password at password authentication

mail: user002@interstage.fujitsu.com        <- Mail address

employeeNumber: 100002             <- Employee number
```

```
ssoRoleName: Admin                 <- Role name

ssoAuthType: basicAuthOrCertAuth   <- Authentication method

ssoCredentialTTL: 60               <- Re-authentication interval

ssoNotBefore: 20010101090000+0900  <- Use start time

sn: user002                        <- Last name

cn: user002                 <- First and last name


# Entry: User: user003
dn: cn=user003,ou=User,ou=interstage,o=fujitsu,dc=com
                 <- Registration destination entry of user "user003"

objectClass: top                   <- Mandatory object class

objectClass: person                <- Mandatory object class

objectClass: organizationalPerson  <- Mandatory object class

objectClass: inetOrgPerson         <- Mandatory object class

objectClass: ssoUser               <- Mandatory object class

uid: user003                         <- User ID at password authentication

userPassword: user003                <- Password at password authentication

mail: user003@interstage.fujitsu.com         <- Mail address

employeeNumber: 100003             <- Employee number

ssoRoleName: Leader                <- Role name

ssoAuthType: basicAuth             <- Authentication method

ssoCredentialTTL: 60               <- Re-authentication interval

ssoNotBefore: 20010101090000+0900  <- Use start time

sn: user003                        <- Last name

cn: user003                  <- First and last name


# Entry: User: user004
dn: cn=user004,ou=User,ou=interstage,o=fujitsu,dc=com
                   <- Registration destination entry of user "user004"

objectClass: top                   <- Mandatory object class

objectClass: person                <- Mandatory object class

objectClass: organizationalPerson  <- Mandatory object class
```

```
objectClass: inetOrgPerson         <- Mandatory object class

objectClass: ssoUser               <- Mandatory object class

uid: user004                         <- User ID at password authentication

userPassword: user004                <- Password at password authentication

mail: user004@interstage.fujitsu.com         <- Mail address

employeeNumber: 100004             <- Employee number

ssoRoleName: Leader                <- Role name

ssoAuthType: basicAuth             <- Authentication method

ssoCredentialTTL: 60               <- Re-authentication interval

ssoNotBefore: 20010101090000+0900  <- Use start time

sn: user004                        <- Last name

cn: user004                  <- First and last name


# Entry: User: user005
dn: cn=user005,ou=User,ou=interstage,o=fujitsu,dc=com
                 <- Registration destination entry of user "user005"

objectClass: top                   <- Mandatory object class

objectClass: person                <- Mandatory object class

objectClass: organizationalPerson  <- Mandatory object class

objectClass: inetOrgPerson         <- Mandatory object class

objectClass: ssoUser               <- Mandatory object class

uid: user005                       <- User ID at password authentication

userPassword: user005              <- Password at password authentication

mail: user005@interstage.fujitsu.com       <- Mail address

employeeNumber: 100005             <- Employee number

ssoRoleName: General               <- Role name

ssoAuthType: basicAuthAndCertAuth  <- Authentication method

ssoCredentialTTL: 60               <- Re-authentication interval

ssoNotBefore: 20020101090000+0900  <- Use start time

sn: user005                        <- Last name
```

```
cn: user005                <- First and last name

# Entry: User: user006
dn: cn=user006,ou=User,ou=interstage,o=fujitsu,dc=com
                <- Registration destination entry of user "user006"

objectClass: top                   <- Mandatory object class

objectClass: person                <- Mandatory object class

objectClass: organizationalPerson  <- Mandatory object class

objectClass: inetOrgPerson         <- Mandatory object class

objectClass: ssoUser               <- Mandatory object class

uid: user006                        <- User ID at password authentication

userPassword: user006               <- Password at password authentication

mail: user006@interstage.fujitsu.com        <- Mail address

employeeNumber: 100006             <- Employee number

ssoRoleName: General               <- Role name

ssoAuthType: CertAuth              <- Authentication method

ssoCredentialTTL: 60               <- Re-authentication interval

ssoNotBefore: 20020101090000+0900  <- Use start time

ssoNotAfter: 20021201085959+0900   <- Use exit time

sn: user006                        <- Last name

cn: user006                 <- First and last name
```

2. Executing the ldapmodify Command

Specify the created LDIF file and execute the ldapmodify command to register user information and role configuration in the SSO repository.

After executing the ldapmodify command, fetch entry information and check whether user information and role configuration have been registered correctly. Refer to 'Entry Management' in the Smart Repository Operator's Guide for details of how to operate the entry.

Example

Windows

For the administrator DN and Bind password, specify the administrator DN and administrator DN password that were set when the SSO repository was created in the Interstage Management Console. In the following example, 389 is specified for the port number of the SSO repository and 'cn=manager,ou=interstage,o=fujitsu,dc=com' is specified for the administrator DN:

LDIF file: C:\Interstage\F3FMsso\ssoatcsv\sample\ldif\sample.ldif

Role configuration registration destination entry: ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com

User information registration destination entry: ou=User,ou=interstage,o=fujitsu,dc=com

Administrator DN: cn=manager,ou=interstage,o=fujitsu,dc=com

Enter the administrator DN password if you are prompted to enter the Bind password. The entered password is not displayed.

```
C:\> C:\Interstage\ID\Dir\sdk\C\bin\ldapmodify -p 389 -D
"cn=manager,ou=interstage,o=fujitsu,dc=com" -W -a -f
C:\Interstage\F3FMsso\ssoatcsv\sample\ldif\sample.ldif
Enter Bind password:
adding new entry cn=Admin,ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com

adding new entry cn=Leader,ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com

adding new entry cn=General,ou=Role,ou=SSO
ACI,ou=interstage,o=fujitsu,dc=com

adding new entry cn=AdminSet,ou=Role,ou=SSO
ACI,ou=interstage,o=fujitsu,dc=com

adding new entry cn=LeaderSet,ou=Role,ou=SSO
ACI,ou=interstage,o=fujitsu,dc=com

adding new entry cn=GeneralSet,ou=Role,ou=SSO
ACI,ou=interstage,o=fujitsu,dc=com

adding new entry cn=user001,ou=User,ou=interstage,o=fujitsu,dc=com

adding new entry cn=user002,ou=User,ou=interstage,o=fujitsu,dc=com

adding new entry cn=user003,ou=User,ou=interstage,o=fujitsu,dc=com

adding new entry cn=user004,ou=User,ou=interstage,o=fujitsu,dc=com

adding new entry cn=user005,ou=User,ou=interstage,o=fujitsu,dc=com

adding new entry cn=user006,ou=User,ou=interstage,o=fujitsu,dc=com
C:\>
```

Solaris OE Linux

For the administrator DN and Bind password, specify the administrator DN and administrator DN password that were set when the SSO repository was created in the Interstage Management Console. In the following example, 389 is specified for the port number of the SSO repository and 'cn=manager,ou=interstage,o=fujitsu,dc=com' is specified for the administrator DN:

LDIF file: /opt/FJSVssosv/sample/ldif/sample.ldif

Role configuration registration destination entry: ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com

User information registration destination entry: ou=User,ou=interstage,o=fujitsu,dc=com

Administrator DN: cn=manager,ou=interstage,o=fujitsu,dc=com

Enter the administrator DN password if you are prompted to enter the Bind password. The entered password is not displayed.

```
# /opt/FJSVidsdk/C/bin/ldapmodify -p 389 -D
"cn=manager,ou=interstage,o=fujitsu,dc=com" -W -a -f
/opt/FJSVssosv/sample/ldif/sample.ldif
Enter Bind password:
adding new entry cn=Admin,ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com

adding new entry cn=Leader,ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com

adding new entry cn=General,ou=Role,ou=SSO
ACI,ou=interstage,o=fujitsu,dc=com

adding new entry cn=AdminSet,ou=Role,ou=SSO
ACI,ou=interstage,o=fujitsu,dc=com

adding new entry cn=LeaderSet,ou=Role,ou=SSO
ACI,ou=interstage,o=fujitsu,dc=com

adding new entry cn=GeneralSet,ou=Role,ou=SSO
ACI,ou=interstage,o=fujitsu,dc=com

adding new entry cn=user001,ou=User,ou=interstage,o=fujitsu,dc=com

adding new entry cn=user002,ou=User,ou=interstage,o=fujitsu,dc=com

adding new entry cn=user003,ou=User,ou=interstage,o=fujitsu,dc=com

adding new entry cn=user004,ou=User,ou=interstage,o=fujitsu,dc=com

adding new entry cn=user005,ou=User,ou=interstage,o=fujitsu,dc=com

adding new entry cn=user006,ou=User,ou=interstage,o=fujitsu,dc=com

#
```

Note

Ensure that you take sufficient action to protect the administrator password.

For details about securing your data, refer to 'Security Measures' of 'Interstage Single Sign-on' of 'Security Risks' in the Security System Guide.

Role Configuration Entry

This section describes the entry used to register role configuration in the SSO repository. Specify the role name and role set name in the user information and protection resources.

The role name and role set name must both be unique.

<Role>

The entry used to register a role in the SSO repository is described below.

Object Classes

The role registered in the SSO repository is managed by the following object classes. Specify the following object classes when registering a role in the SSO repository:

Object class	Description
top	Basic LDAP object class
ssoRole	SSO role information

Attributes

Specify the name of a role as an attribute of the above object classes.

Table 2-5 ssoRole Attributes

Role object class	Attribute name	Explanation
ssoRole	cn	Name
	ssoAuthType	Authentication method Not used in this version

(1) cn

Description

Specify the name of a role.

The role name specified here is set in the ssoRoleName attribute of user information and the role set entry.

The following characters are valid:

- Alphanumeric characters
- Space ( ), exclamation mark (!), question mark (?), at symbol (@), Hash (#), dollar sign ($), percent (%), ampersand (&), left parenthesis ((), right parenthesis ()), left brace ({), right brace (}), left bracket ([), right bracket (]), hyphen (-), equal sign (=), asterisk (*), slash (/), vertical line (|), underscore (_), single quotation mark ('), colon (:), period (.), caret (^), back quotation mark (`), tilde (~)

Example of Specification

Admin

Notes

- Specify this attribute only once.
- Use only alphanumeric characters and symbols when providing user information using environment variables.
- Specified values are not case-sensitive.
- The role name or role set name must be defined only once.

(2) ssoAuthType

Description

This attribute is not used in this version.

Note

Do not specify or change this attribute.

Example of Role

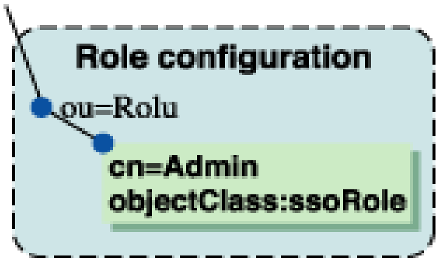


Figure 2-6 Example of Role

<Role set>

The entry used to register a role set in the SSO repository is described below.

Object Classes

The role set registered in the SSO repository is managed by the object classes shown in the table below. Specify the following object classes when registering a role set in the SSO repository.

Object class	Description
top	Basic LDAP object class
ssoRoleSet	SSO role set information

Attributes

Specify the name of a role set and role to be included in the role set as the attributes of the above object classes.

Table 2-6 ssoRoleSet Attributes

Role set object class	Attribute name	Explanation
ssoRoleSet	cn	Name
	ssoRoleName	Role name

(1) cn

Description

Specify the name of a role set.

The role set name specified here is set in the ssoRoleName attribute of user information and the role set entry.

The following characters are valid

- Alphanumeric characters
- Space ( ), exclamation mark (!), question mark (?), at symbol (@), Hash(#), dollar sign ($), percent (%), ampersand (&), left parenthesis ((), right parenthesis ()), left brace ({), right brace (}), left bracket ([), right bracket (]), hyphen (-), equal sign (=), asterisk (*), slash (/), vertical line (|), underscore (_), single quotation mark ('), colon (:), period (.), caret (^), back quotation mark (`), tilde (~)

Example of Specification

AdminSet

Notes

- Specify this attribute only once.
- Specified values are not case-sensitive.
- The role name or role set name must be defined only once.

(2) ssoRoleName

Description

Specify a role to be included in the role set or a role set.

When specifying multiple roles or role sets, specify the ssoRoleName attribute more than once.

Always specify this attribute.

The following characters are valid:

- Alphanumeric characters
- Space ( ), exclamation mark (!), question mark (?), at symbol (@), backslash (\), hash (#), dollar sign ($), percent (%), ampersand (&), left parenthesis ((), right parenthesis ()), left brace ({), right brace (}), left bracket ([), right bracket (]), less than (<), greater than (>), plus (+), hyphen (-), equal sign (=), asterisk (*), slash (/), vertical line (|), underscore (_), double quotation mark ("), single quotation mark ('), colon (:), semicolon (;), period (.), caret (^), back quotation mark (`), tilde (~)

Example of Specification

Admin

Notes

- Specified values are not case-sensitive.
- Overlapped roles or role sets are invalid.
- Specify only existing roles or role sets.
- If a loop is created in the configuration of a role set, the loop portion becomes invalid.

Example of Role Set

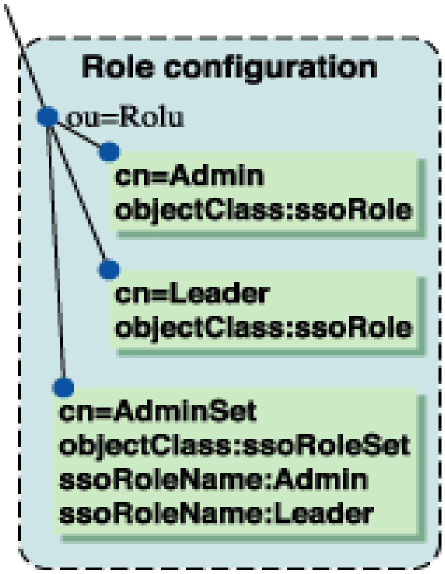


Figure 2-7 A Role Set

Example of Role Set Whose Configuration Includes a Loop (Looped Portion is Assumed to be Invalid)

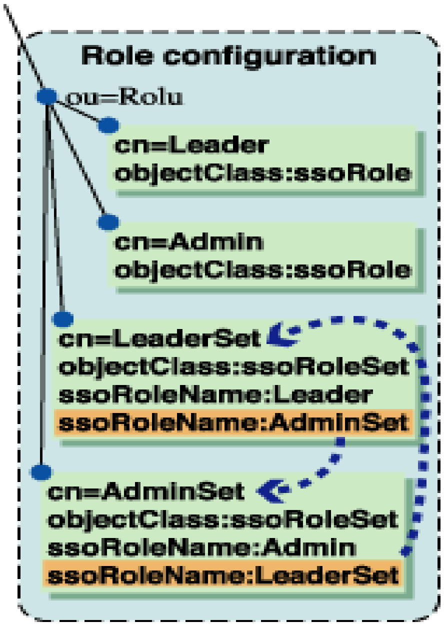


Figure 2-8 A Role Set with a Loop

In Figure 2-8:

- Role set 'LeaderSet' indicates role 'Leader' and role set 'AdminSet.'
- Role set 'AdminSet' indicates role 'Admin' and role set 'LeaderSet.'
- Role set 'LeaderSet' set in role set 'AdminSet' causes a loop. In this case, role set 'LeaderSet' indicated by role set 'AdminSet' becomes invalid.
- Finally, role set 'LeaderSet' is assumed to be a role set that indicates role 'Leader' and role 'Admin.'

User Information Entry

This section explains the entry used to register user information in the SSO repository.

Specify each attribute in the user information entry depending on operation.

- Attributes that must always be specified:
  - cn
  - sn
- Attributes that must be set for executing password authentication
  - uid
  - userPassword

- Attributes that must be set for executing certificate authentication (Note)
  - mail
  - employeeNumber
  - uid
  - serialNumber
  - dnQualifier
- Attributes that must be specified depending on operation:
  - ssoAuthType
  - ssoRoleName
  - ssoCredentialTTL
  - ssoNotBefore
  - ssoNotAfter
- Attributes that need not be specified:
  - ssoUserStatus
  - ssoFailureCount
  - ssoLockTimeStamp

Note

If the attribute for identifying user information uniquely from the owner name information in the certificate does not use cn, one of the above attributes must be set.

Object Classes

The user registered in the SSO repository is managed by the following object classes. Always specify the following object classes when registering user information in the SSO repository:

User information object class	Description
top	Basic LDAP object class
person	User information
organizationalPerson	
inetOrgPerson	
ssoUser	SSO user information

Attributes

Specify the user ID, password, and authentication method as the attributes of the above object classes. The following attributes are used in Interstage Single Sign-on:

Table 2-7 Attributes Used by Interstage Single Sign-on

User information object class	Attribute name	Explanation
person	cn	Name Example: user001
	sn	Last name Example: user001
	userPassword	Password Example: user001
organizationalPerson	No attribute is required in SSO operation.	-
inetOrgPerson	uid	User ID Example: user001
	employeeNumber	Employee number Example: 000001
	mail	E-mail address Example: user001@interstage.fujitsu.com
device	serialNumber	Serial number Example: 1234-1234-AB
ssoUser	ssoRoleName	Role name or role set name Example: Admin
	ssoAuthType	Authentication method Example: basicAuthOrCertAuth
	ssoCredentialTTL	Re-authentication interval Example: 60
	ssoUserStatus	User status
	ssoNotBefore	Validity period start date Example: 20030101000000+0900
	ssoNotAfter	Expiration date Example: 20030102000000+0900
	ssoFailureCount	Number of authentication failures due to invalid user name or password
	ssoLockTimeStamp	Lockout time
	dnQualifier	DN qualifier

(1) cn

Description

Specify the first and last name to identify the user entry.

Always specify this attribute.

The following characters are valid:

- Alphanumeric characters
- Space ( ), exclamation mark (!), question mark (?), at symbol (@), hash (#), dollar sign ($), percent (%), ampersand (&), left parenthesis ((), right parenthesis ()), left brace ({), right brace (}), left bracket ([), right bracket (]), hyphen (-), equal sign (=), slash (/), vertical line (|), underscore (_), single quotation mark ('), colon (:), period (.), caret (^), back quotation mark (`), tilde (~)

Example of Specification

user001

Note

Specified values are not case-sensitive.

(2) sn

Description

Specify the last name. It is a mandatory attribute of the person object class.

The following characters are valid:

- Alphanumeric characters
- Space ( ), exclamation mark (!), question mark (?), at symbol (@), hash (#), dollar sign ($), percent (%), ampersand (&), left parenthesis ((), right parenthesis ()), left brace ({), right brace (}), left bracket ([), right bracket (]), hyphen (-), equal sign (=), slash (/), vertical line (|), underscore (_), single quotation ('), colon (:), period (.), caret (^), back quotation mark (`), tilde (~)

Example of Specification

user001

Note

Specified values are not case-sensitive.

(3) userPassword

Description

Specify the password used for user password authentication.

The following characters are valid:

- Alphanumeric characters
- Space ( ), exclamation mark (!), question mark (?), at symbol (@), back slash (\), hash (#), dollar sign ($), percent (%), ampersand (&), left parenthesis ((), right parenthesis ()), left brace ({), right brace (}), left bracket ([), right bracket (]), less than sign (<), greater than sign (>), plus sign (+), hyphen (-), equal sign (=), asterisk (*), slash (/), vertical line (|), underscore (_), double quotation mark ("), single quotation mark ('), colon (:), semicolon (;), comma (,), period (.), caret (^), back quotation mark (`), tilde (~)

Size that can be Specified

128 bytes

Example of Specification

user001

Notes

- If a character set in this attribute does not belong to the group of valid characters, user authentication fails.
- Specified values are case-sensitive.
- Do not set this attribute more than once. If it is set more than once, user authentication may not be executed correctly.

(4) uid

Description

Specify the user ID used for user password authentication.

Specify a unique ID.

The following characters are valid:

- Alphanumeric characters
- Space ( ), exclamation mark (!), question mark (?), at symbol (@), back slash (\), hash (#), dollar sign ($), percent (%), ampersand (&), left parenthesis ((), right parenthesis ()), left brace ({), right brace (}), left bracket ([), right bracket (]), plus sign (+), hyphen (-), equal sign (=), slash (/), vertical line (|), underscore (_), double quotation mark ("), single quotation mark ('), semicolon (;), comma (,), period (.), caret (^), back quotation mark (`), tilde (~)

Example of Specification

user001

Notes

- Specified values are not case-sensitive.
- If an invalid character is used for this attribute, user authentication fails.
- If this attribute is specified more than once, user authentication is not performed correctly.

(5) employeeNumber

Description

Specify the number allocated for each user, e.g., employee number.

If the employee number is used to identify the user in the certificate authentication process, specify a unique number.

The following characters are valid:

- Alphanumeric characters
- Space ( ), exclamation mark (!), question mark (?), at symbol (@), back slash (\), hash(#), dollar mark ($), percent (%), ampersand (&), left parenthesis ((), right parenthesis ()), left brace ({), right brace (}), left bracket ([), right bracket (]), plus sign (+), hyphen (-), equal sign (=), slash (/), vertical line (|), underscore (_), double quotation mark ("), single quotation mark ('), colon (:), semicolon (;), comma (,), period (.), caret (^), back quotation mark (`), tilde (~)

Example of Specification

000001

Note

Specified values are not case-sensitive.

(6) mail

Description

Specify the E-mail address.

If the E-mail address is used to identify the user in the operation using certificate authentication, specify a unique address.

The following characters are valid:

- Alphanumeric characters
- Space ( ), exclamation mark (!), question mark (?), at symbol (@), back slash (\), hash (#), dollar sign ($), percent (%), ampersand (&), left parenthesis ((), right parenthesis ()), left brace ({), right brace (}), left bracket ([), right bracket (]), plus sign (+), hyphen (-), equal sign (=), slash (/), vertical line (|), underscore (_), double quotation mark ("), single quotation mark ('), colon (:), semicolon (;), comma (,), period (.), caret (^), back quotation mark (`), tilde (~)

Example of Specification

user001@interstage.fujitsu.com

Note

Specified values are not case-sensitive.

(7) serialNumber

Description

Specify the serial number.

If the serial number is used to identify the user in the certificate authentication process, specify a unique number.

The following characters are valid:

- Alphanumeric characters
- Space ( ), single quotation mark ('), left parenthesis ((), right parenthesis ()), plus sign (+), comma (,), hyphen (-), period (.), slash (/), colon (:), equal sign (=), question mark (?)

Example of Specification

1234-1234-AB

Note

Specified values are not case-sensitive.

(8) ssoRoleName

Description

Specify the name of a role or role set to which the user belongs. This attribute can be specified more than once if the user belongs to multiple roles.

The following characters are valid:

- Alphanumeric characters
- Space ( ), exclamation mark (!), question mark (?), at symbol (@), back slash (\),hash (#), dollar sign ($), percent (%), ampersand (&), left parenthesis ((), right parenthesis ()), left brace ({), right brace (}), left bracket ([), right bracket (]), less than sign (<), greater than sign (>), plus sign (+), hyphen (-), equal (=), asterisk (*), slash (/), vertical line (|), underscore (_), double quotation mark ("), single quotation mark ('), colon (:), semicolon (;), period (.), caret (^), back quotation mark (`), tilde (~)

Size that can be Specified

32 bytes

Example of Specification

Admin

Note

If a role or roleset that is not registered in the role configuration is set in this attribute (including cases in which a role or roleset no longer exists because it has been deleted), this attribute is ignored. If, as a result of the attribute being ignored, no role belongs to the user, that user will not be able to access a site protected by Interstage Single Sign-on.

(9) ssoAuthType

Description

Specify the user authentication method.

The default value is 'basicAuthOrCertAuth.'

- basicAuth: Password authentication
- certAuth: Certificate authentication

- basicAuthAndCertAuth: Password authentication and certificate authentication
- basicAuthOrCertAuth: Password authentication or certificate authentication

The following character types are valid:

- basicAuth
- certAuth
- basicAuthAndCertAuth
- basicAuthOrCertAuth

Example of Specification

basicAuthOrCertAuth

Note

Specified values are not case-sensitive.

(10) ssoCredentialTTL

Description

Specify the re-authentication interval as a range between 30 to 1440 minutes.

If 0 is specified, re-authentication is not performed.

If this attribute is omitted, its value defaults to the configuration value in [Re-authentication interval] of [Operation after authentication] in the environment setup of the authentication server.

Character Types that can be Specified

- Numbers

Example of Specification

60

Note

If a value less than 30 is specified, the value defaults to 30 minutes. If a value greater than 1440 is specified, the value defaults to 1440 minutes (24 hours).

(11) ssoUserStatus

Description

This attribute specifies the lock status of the user account as follows:

- good: Not locked
- locked: Locked

Example of Specification

good

Note

[Release user lock] of the Interstage Management Console is used to unlock the user account.

Do not directly set or change the user account for the SSO repository. Refer to 'Release lockout' for details of how to unlock the user account.

(12) ssoNotBefore

Description

Specify the date when user Single Sign-on is started.

If the user uses Single Sign-on before the specified date, authentication fails.

Specify the format of YYYYMMDDHHMMSS+XXXX.(*1) For Greenwich Mean Time, specify the format of YYYYMMDDHHMMSSZ. If this attribute is omitted, the user can immediately uses Single Sign-on.

YYYY: Year (four digits of the year)

MM : Month (two digits)

DD : Day (two digits)

HH : Hour (two digits for 24 hours)

MM : Minute (two digits)

SS : Second (two digits)

*1 '+XXXX' refers to the time difference from UTC (Universal Time Coordinate). In cases where '-XXXX' is used, it means the same as above.

Character Types that can be Specified

- Numbers

Example of Specification

20030101000000+0900

Notes

- Set a different date and time for ssoNotBefore and ssoNotAfter. If the same date and time is specified, user authentication fails.
- Set a date and time for ssoNotBefore that is earlier than the date and time set for ssoNotAfter. If the date and time set for 'ssoNotBefore' is later than the date and time set for 'ssoNotAfter', user authentication fails.
- Specify a date between '20000101000000' and '20371231235959' in ssoNotBefore and ssoNotAfter regardless of Japan time or Greenwich Mean Time. If a date out of range is specified, user authentication fails.

(13) ssoNotAfter

Description

Specify the date after which Single Sign-on is not available to users. If the user uses Single Sign-on after the specified date, authentication fails.

Specify the date in the format YYYYMMDDHHMMSS+XXXX. (*1) For Greenwich Mean Time, specify the date in the format YYYYMMDDHHMMSSZ. If this attribute is omitted, the user can use Single Sign-on for an indefinite period.

YYYY:	Year (four digits of the year)
MM	: Month (two digits)
DD	: Day (two digits)
HH	: Hour (two digits for 24 hours)
MM	: Minute (two digits)
SS	: Second (two digits)

*1 '+XXXX' refers to the time difference from UTC (Universal Time Coordinate). In cases where '-XXXX' is used, it means the same as above.

Character Types that can be Specified

- Numbers

Example of Specification

20030102000000+0900

Notes

- Set a different date and time for ssoNotBefore and ssoNotAfter. If the same date and time is specified, user authentication fails.
- Set a date and time for 'ssoNotAfter' that is later than the date and time set for 'ssoNotBefore'. If the date and time set for 'ssoNotAfter' is earlier than the date and time set for 'ssoNotBefore', user authentication fails.
- Specify a date between '20000101000000' and '20371231235959' in ssoNotBefore and ssoNotAfter regardless of Japan time or Greenwich Mean Time. If a date out of range is specified, user authentication fails.

(14) ssoFailureCount

Description

This attribute specifies the number of user authentication failures due to incorrectly entering the user name/password.

If the correct user name/password is specified and authentication succeeds, this attribute is reset to 0. This value is set by the repository server.

Note

Do not specify or change this attribute.

(15) ssoLockTimeStamp

Description

This attribute specifies the date when the user was locked by the repository server in (Greenwich Mean Time (YYYYMMDDHHMMSSZ).

Note

Do not specify or change this attribute.

(16) dnQualifier

Description

Specify the DN qualifier.

If the DN qualifier is used to identify the user in the certificate authentication process, specify a unique number.

Character Types that can be Specified

- Alphanumeric characters
- Space ( ), single quotation mark ('), left parenthesis ((), right parenthesis ()), plus sign (+), comma (,), hyphen (-), period (.), slash (/), colon (:), equal sign (=), question mark (?)

Note

Specified values are not case-sensitive.

Constructing a Repository Server (One Server or Update System)

This section explains how to set up one repository server or an update-system repository server in multiple-repository server configuration.

The setup described below is performed using the Interstage Management Console on the machine where the repository server is to be set up. Refer to the Operator's Guide for details of the items to be defined on the Interstage Management Console.

To set up a repository server, the SSO Repository must be previously created. Refer to Creating an SSO Repository for an explanation of SSO Repository creation.

1. Select [Security] and then [Single Sign-on] from the System menu. Click [Authentication infrastructure] and then click the [Authentication infrastructure Settings] tab.
2. Select [Setup Repository server and Authentication server to the separate servers.], and click [Next]. The window for selecting a server to be created is displayed.
3. Select [Create a new Repository server] > [Repository server (update system)], and click [Next]. [General Settings] is displayed.
4. Enter [Authentication infrastructure URL], and in [Repository Name], select the SSO repository to be used. To use a cluster system, click [Detailed Settings [Show]]. In [Host name of Repository server], enter the host name common to the cluster systems.
5. Click [Create].
6. The repository server is created. A list of the created servers is displayed. Confirm the port number.

7. Activate the created repository server. Refer to 'Starting a Repository Server' in 'Operation and Maintenance', for an explanation of repository server start.
8. Download the authentication infrastructure setup file necessary for setting up the authentication server or repository server (update system).

Downloading the Authentication Infrastructure Setup File

Download the authentication infrastructure setup file from the Interstage Management Console of the machine where the repository server (update system) was created.

On the Interstage Management Console, click [Single Sign-on] and then [Authentication infrastructure] from the Security menu. Click the [Authentication infrastructure setup file] tab. Set the [Password], and click [Download] to download the authentication infrastructure setup file to the machine on which the Web browser is operating.

The authentication infrastructure setup file is important for security, and is encrypted using the password. Protect the password from exposure to third parties. After the authentication server or repository server (reference system) is set up, always delete the password.

Remarks

The repository server does not use the port number of the Web server (Interstage HTTP server). That is, it does not use the [Port number] configured in the [Web Server Settings] tab (found by clicking on [Services] and then [Web Server] on the System menu).

When only the Web server (Interstage HTTP server) is used from the repository server, the above port number is not used. Setting the port number in the [Web Server Settings] tab to be the same as the port number specified at repository server setup prevents an unnecessary port from opening.

Constructing an SSL Communication Environment for a Repository Server (Update System)

For replication between SSO repositories, data must be transferred from the master SSO repository of the repository server (update system) to the slave SSO repository of the repository server (reference system). SSL communication is performed by the repository server (reference system).

To enable SSL communication for performing replication, the SSL communication environment must be set up on the repository server (update system).

This setup is unnecessary when one repository server (reference system) is to be added to an already set-up authentication infrastructure, and the SSL communication environment is already set up on the active repository server.

The SSL communication environment is set up in the following steps:

1. Setting SSL Communication

1. Preparations for SSL communication (acquiring the SSL site certificate and registering it in the Interstage certificate environment)

   When the site certificates for the repository server (update system) and repository server (reference system) are issued by different certificate authorities, the certificate for the repository server (reference system) must also be registered in the repository server (update system). For details, refer to Preparations for SSL Communication.

2. Setup for SSL communication (creation of SSL configuration)

   On the Interstage Management Console, select [Security] and then [SSL] from the [System] menu. From the [Create a new SSL Configuration] tab, perform setup for SSL communication as follows:

   - Configuration Name

     Set the name identifying the SSL configuration.

   - Site Certificate Nickname

     Set the nickname that was specified when the SSL certificate was registered in the Interstage certificate environment as described in Preparations for SSL Communication. The registered SSL site certificate can be accessed in the Interstage Management Console by selecting [Security] and then [Certificates] on the [System] menu. Click [Site Certificate] to access the SSL site certificate.

   - Protocol Version

     Select 'SSL 3.0' only.

   - Client certificate

     Select 'Yes (Authenticate when client certificate is presented).'

   - Encryption Method

     Change the encryption method when necessary.

   - Nickname of Certificate of Certificate Authority

     Change the nickname when necessary.

   For details of the above items, refer to the Operator’s Guide.

2. Confirming the Validity of a Certificate

In addition to the above setup, the validity of the certificate must be confirmed. This process includes acquiring and registering the CRL in the Interstage certificate environment. When the site certificates for the repository server (update system) and repository server (reference system) are issued by different authorities, acquire the CRL from the certificate authority that issued the certificate of the repository server (reference system). Then register this CRL on the repository server (update system).

For details, refer to Preparations for Confirming Validity of Certificate Authentication.

Remark

Replication using SSL communication can protect confidential information since risks such as electrical interception, alteration, and spoofing are avoided by SSL client-server authentication, and communication between respective SSO repositories is encrypted. SSL communication is, therefore, highly recommended for security.

Adding a Repository Server (Reference System)

This section explains how to set up a repository server (reference system) when two or more repository servers are to be set up.

Backing up the SSO Repository of the Repository Server (Update System)

To create the SSO slave repository of the reference system repository server, back up the copy of the SSO repository (master) data of the repository server (update system). Restore the backed-up data onto the repository server (reference system).

Back up the SSO repository (master) data of the repository server (update system) according to the following procedure:

Windows

1. On the Interstage Management Console of the repository server (update system), select [Services] and then [Repository] from the System menu.
2. On [Repository: View Status], check the check box of the SSO repository for master operation. Then click the [Stop] button to stop the SSO repository.
3. On the repository server (update system), execute the irepbacksys command with the -dataonly option specified. Back up the SSO repository data in the directory. Execute the irepbacksys command as the administrator.

Solaris OE Linux

1. On the Interstage Management Console of the repository server (update system), select [Services] and then [Repository] from the System menu.
2. On [Repository: View Status], check the check box of the SSO repository for master operation. Then click the [Stop] button to stop the SSO repository.

3.. On the repository server (update system), execute the irepbacksys command with the -dataonly option specified. Back up the SSO repository data in a file. Execute the irepbacksys command as the administrator.

Refer to 'Backup Commands' in the Reference Manual (Command Edition) for details of the irepbacksys command.

Example

Windows

Backup destination directory: C:\WINDOWS\temp\backup

SSO repository name   : ssorep

Specify the backup destination directory as the directory in which the SSO repository data is to be backed up.

After execution of the irepbacksys command, the backup folder is created under the C:\WINDOWS\temp folder.

```
C:\>irepbacksys -d C:\WINDOWS\temp\backup -R ssorep –dataonly
IREP: INFO: irep11000: Backup has completed. C:\WINDOWS\temp\backup [ssorep]
```

Solaris OE Linux

Backup file name (without extension): /home/user1/backup

SSO repository name: ssorep

Specify the backup file name as the name of the file in which the SSO repository data is to be backed up. In this case, the specified file name must not include the extension.

After execution of the irepbacksys command, the /home/user1/backup.tar.Z is created.

```
# irepbacksys -f /home/user1/backup -R ssorep –dataonly
UX:IREP: INFO: irep11000: Backup has completed.
/home/user1/backup.tar.Z[ssorep]
```

Setting up the SSL Communication Environment for the Repository Server (Reference System)

To use SSL communication for replication between SSO repositories, the SSL communication environment must be set up on the repository server (reference system).

Set up the SSL communication environment according to the following procedure:

1. Setting SSL Communication

1. Preparations for SSL communication (acquiring SSL site certificate and registering it in Interstage certificate environment)

   When the site certificates for the repository server (update system) and repository server (reference system) are issued by different authorities, the certificate of the repository server (reference system) must also be registered in the repository server (update system. For details, refer to Preparations for SSL Communication.

2. SSL communication setup (creation of SSL configuration) using the Interstage Management Console

   Select [Security] and then [SSL] from the System menu. On the [Create a new SSL Configuration] tab, set up SSL communication as follows:

   – Configuration Name

     Enter the name identifying the SSL configuration.

   – Site Certificate Nickname

     Enter the nickname that was specified when the SSL certificate was registered in the Interstage certificate environment as described in Preparations for SSL Communication. The registered SSL site certificate can be accessed on the Interstage Management Console by selecting the [Security] and then [Certificate] from the System menu. Click [Site Certificate] to view the site certificate.

- Protocol Version

  Select 'SSL 3.0' only.

- Client Certificate

  Select 'Yes (Authenticate when client certificate is presented)'.

- Encryption Method

  Change the encryption method when necessary.

- Nickname of Certificate Authority

  Change the nickname when necessary.

For details of the above items, refer to the Operator’s Guide.

2. Confirming the Validity of the Certificate

In addition to the above setup, the validity of the certificate authentication must be confirmed. This process includes acquiring and registering the CRL in the Interstage certificate environment. When the site certificates for the repository server (update system) and repository server (reference system)are issued by different authorities, acquire the CRL from the certificate authority that issued the certificate of the repository server(update system). Then register this CRL in the machine of the repository server (reference system).For details, refer to Preparations for Confirming Validity of Certificate Authentication.

Remarks

- Replication using SSL communication can protect confidential information since risks such as electrical interception, alteration, and spoofing are avoided by SSL client-server authentication, and communication between respective SSO repositories is encrypted. SSL communication is, therefore, highly recommended for security.
- To set up the SSL communication environment on the repository server (reference system), do not use a site certificate for test.

Creating an SSO Slave Repository of the Repository Server (Reference System)

Create the SSO repository for slave operation of replication on the machine on which the repository server (reference system) is set up. On the Interstage Management Console of the machine on which this repository server (reference system) is to be set up, perform the following procedure:

1. Select [Services] and then [Repository] from the System menu. Click the [Create a New Repository] tab.
2. Specify the items as described below, and click the Create button.

   Descriptions in bold indicate settings that must be the same as those of the SSO repository (master). Items marked with (*1) can be specified only when the SSO repository is to be created. These items cannot be changed after the SSO repository is created. Carefully set these items. For other items, check values and change them when necessary.

General Settings

- **Repository Name** (*1)

  Enter the same name as that of the SSO repository (master) that was created for the repository server (update system).

- Administrator DN (*1)

  Enter the DN (distinguished name) of the administrator who manages the created SSO repository. This value must be specified in dn=distinguished-name format (example: cn=manager).

- Administrator DN password

  Enter the password for the SSO administrator.

- Administrator DN password (re-enter)

  Enter the password for the SSO administrator again.

- **Public Directory** (*1)

  Set the same directory as that for the SSO repository (master) that was created for the repository server (update system).

- **Create default tree?** (*1)

  Set the same tree as that of the SSO repository (master) that was created for the repository server (update system).

- Port number (*1)

  Specify the port number for non-SSL communication.

- Enable SSL encryption? (*1)

  Select 'Yes'.

- SSL Port number(*1)

  Specify the port number for SSL communication. The default value is '636'. Change this value when necessary.

- SSL configuration

  Select the SSL configuration that was defined as described in Setting up the SSL Communication Environment for the Repository Server (Reference System)

Detailed Settings

Database Configuration

- Database Definition

  Maximum Number of Entries to be Retrieved The default value is '500'. Change this value when necessary.

- Cache Size

  The default value is '1000' pages. One page consists of 4 KB. Change this value when necessary.

- Retrieval Processing Timeout

  The default value is '3600' seconds. Change this value when necessary.

- **User password encryption method** (*1)

  Select 'SHA'.

- **Database Storage Directory** (*1)

  Set the same directory as that of the SSO repository (master) that was created for the repository server (update system).

Access Log Configuration

- Output Access Log

  Always select 'Yes'.

- Output Level

  Select 'Client requests' and 'Server errors'. For other cases, select other items.

- Storage Directory

  Change the directory when necessary.

- Rotation Type

  Change the type when necessary.

- Size

  Change the size when necessary.

- Number of Log Files to Maintain

  Change the value when necessary.

3. Confirm the displayed status of the SSO repository (slave).

On the Interstage Management Console of the machine where the repository server (update system) was created, confirm the setting status of the SSO repository (master). Select [Services] and then [Repository] from the System menu. On [Repository: View Status], select the SSO repository that was created for the master system. Confirm the settings on the [General Settings], or that displayed after clicking [Detailed Settings [Show]].

Remark

If the [Administrator DN password] of the SSO slave repository was changed during replication operation, the [Replication connection Settings] of the SSO master repository must be edited. Refer to the Smart Repository Operator's Guide for details.

Restoring the SSO Repository in the Repository Server (Reference System)

To create the SSO slave repository of the repository server (reference system), back up the SSO repository (master) data of the repository server (update system) and restore it to the repository server (reference system).

This section explains how to restore the SSO master repository data of the repository server (update system) in the repository server (reference system).

The SSO master repository data of the update system repository server is restored according to the following procedure:

Windows

1. To restore the repository server (reference system), transfer the backup destination directory that was created as described in Backing up the SSO Repository of the Repository Server (Update System).

   Ensure that there is adequate security in place to prevent third parties from electronically intercepting data during the above transfer. Always delete the directory after use.

2. On the machine of the repository server (reference system), execute the ireprestsys command with the -dataonly option specified to restore data in the backup destination directory. The same SSO repository name as the name of the backed-up SSO repository must be specified in this command.

Solaris OE Linux

1. To restore the repository server (reference system), transfer the backup file that was created as described in Backing up the SSO Repository of the Repository Server (Update System).

   Ensure that there is adequate security in place to prevent third parties from electronically intercepting data during the above transfer. Always delete the file after use.

2. On the machine of the repository server (reference system), execute the ireprestsys command with the -dataonly option specified to restore the backup file. The same SSO repository name as the name of the backed-up SSO repository must be specified in this command.

Refer to 'Backup Commands' in the Reference Manual (Command Edition) for details of the ireprestsys command.

Example

Windows

Backup destination directory : C:\WINDOWS\temp\backup

SSO repository name : ssorep

Database storage directory : C:\Interstage\Enabler\EnablerDStores\IREP\ssorep\data

The same SSO repository name as the name of the backed-up SSO repository must be specified in the command.

A message asking the user to confirm if they want to overwrite the database is displayed. To replace it and continue restoring the data, enter ‘y’.

```
C:\>ireprestsys -d C:\WINDOWS\temp\backup -R ssorep –dataonly
Data already exists in database store.
(C:\Interstage\Enabler\EnablerDStores\IREP\ssorep\data)
Are you sure of deleting data in database store? (y/n):y
IREP: INFO: irep11001: Restore has completed. C:\WINDOWS\temp\backup
[ssorep]
```

Solaris OE

Backup file name: /home/user1/backup.tar.Z

SSO repository name: ssorep

Database storage directory : /var/opt/FJSVena/EnablerDStores/FJSVirep/ssorep/data

The same SSO repository name as the name of the backed-up SSO repository must be specified in the command.

A message asking the user to confirm that they wish to replace the database is displayed. Then entery.

```
# ireprestsys -f /home/user1/backup.tar.Z -R ssorep –dataonly
Data already exists in database store.
(/var/opt/FJSVena/EnablerDStores/FJSVirep/ssorep/data)
Are you sure of deleting data in database store? (y/n):y
UX:IREP: INFO: irep11001: Restore has completed.
/home/user1/backup.tar.Z[ssorep]
```

Linux

Backup file name: /home/user1/backup.tar.Z

SSO repository name: ssorep

Database storage directory: /var/opt/FJSVena/DStores/FJSVirep/ssorep/data

The same SSO repository name as the name of the backed-up SSO repository must be specified in the command.

A message asking the user to confirm that they wish to replace the database is displayed. Then enter y.

```
# ireprestsys -f /home/user1/backup.tar.Z -R ssorep –dataonly
Data already exists in database store.
(/var/opt/FJSVena/DStores/FJSVirep/ssorep/data)
Are you sure of deleting data in database store? (y/n):y
UX:IREP: INFO: irep11001: Restore has completed.
/home/user1/backup.tar.Z[ssorep]
```

Changing the Settings of the SSO Repository of the Restored Repository Server (Reference System)

Set replication slave operation for the restored SSO repository as described in Restoring the SSO Repository in the Repository Server (Reference System). Perform the following procedure on the Interstage Management Console of the repository server (reference system):

1. Select [Services] and then [Repository] from the System menu, and select the SSO repository for slave operation on [Repository: View Status].
2. Click [Detailed Settings [Show]], and select 'Slave' as the [Operation mode] of [Replication Settings].
3. In the newly displayed [Slave operation Settings], enter the host name of the machine of the repository server (update system).
4. Click [Update].
5. Check the check box of the updated SSO repository, and click [Start] to start the SSO repository.

Setting up for Adding the Repository Server (Reference System)

This section explains how to set up the repository server (reference system). On the Interstage Management Console of the machine where the repository server is to be set up, perform the following procedure. Refer to the Operator's Guide for details of the items to be defined on the Interstage Management Console.

You will need an authentication infrastructure setup file to set up the repository server (reference system). Refer to Downloading the Authentication Infrastructure Setup File under Constructing a Repository Server (One Server or Update System) for how to create the authentication infrastructure setup file. To create the repository server (reference system), the slave SSO repository must be created in advance. Refer to Creating an SSO Slave Repository of the Repository Server (Reference System) for how to create the SSO repository (slave).The following procedure describes how to set up the repository server (reference system):

1. Select [Security] and then [Single Sign-on] from the System menu. Click [Authentication infrastructure] and then click the [Authentication infrastructure Settings] tab.
2. Select [Setup Repository server and Authentication server to the separate servers.], and click [Next]. The selection window for the server to be created is displayed.
3. Select [Create a new Repository server] and then [Repository server (reference system)], and click [Next].
4. [General Settings] is displayed. Select the authentication infrastructure setup file that was downloaded from the repository server (update system) in [Authentication infrastructure setup file].
5. Enter the password that was set for the authentication infrastructure setup file. In [Repository Name], select the SSO repository to be used. Click [Create].
6. The repository server is created. A list of the created servers is displayed. Confirm the port number.
7. Activate the created repository server. Refer to 'Starting a Repository Server' in 'Operation and Maintenance', for an explanation of repository server start.
8. Delete the authentication infrastructure setup file.

Notes

- When the Microsoft® Internet Explorer is used as the browser, an authentication infrastructure setup file with an absolute path length that exceeds 200 bytes may not be able to be specified with the Browse button. In this case, change the location of the authentication infrastructure setup file so that its absolute path length is shorter.
- The authentication infrastructure setup file is important for security. Always delete this file after the repository server (reference system) is set up.

Changing the Settings of the SSO Repository of the Repository Server (Update System)

Set the information on the SSO slave repository of the added repository server (reference system) in the SSO master repository of the repository server (update system). Perform the following procedure on the Interstage Management Console of the repository server (update system):

1. Click [Services] and then [Repository] from the System menu, and from the [Repository: View Status] window select the SSO repository for master operation.
2. Click [Detailed Settings [Show]]. Go to Step 3 when 'Master' is selected as the [Operation mode] of [Replication Settings].

   When 'Master' is not selected, select 'Master'. [Replication destination host list] is displayed.
3. Click [Add], and enter the machine information of the repository server (reference system) to be added in each item field of the newly displayed [Replication connection Settings] Click [Update].

   Host name

   Enter the host name of the SSO slave repository.

   Port number

   Enter the [SSL Port number] that was set for the SSO slave repository.

   Enable SSL encryption?

   Select 'Yes'.

   Present client certificate?

   Select 'Yes' or 'No'.

   SSL configuration

   When 'Yes' is selected in [Present client certificate?], select the SSL configuration that was defined as described in Setup of the SSL communication environment for repository server (update system).

   DN for the connection

   Enter the same administrator DN as that specified for the SSO repository (slave).

   Password for the connection

   Enter the same password as the administrator DN password specified for the SSO repository (slave).
4. Check the check box of an SSO repository for which settings are changed, and click [Start] to start the SSO repository.

Setup of Authentication Server

This section explains the procedure for setting up of the authentication server that provides the authentication infrastructure. Use the Interstage Management Console to set up the authentication server.

SSL Communication Environment Setup

The SSL environment must be set up before the authentication infrastructure.

The flow of setting up SSL communication environment is shown below.

SSL Communication using Authentication Server

If using SSL communication on the authentication server, perform the following steps according to the operating conditions:

1. Required settings

   Refer to Preparations for SSL Communication.

   Refer to Settings for SSL Communication.

2. Confirming validity of certificate

   In addition to the above settings, perform the operations explained in Preparations for Confirming Validity of Certificate Authentication.

3. Operation using Application Gateway

   In addition to the above settings, perform the operations explained in Settings for Operation using Application Gateway.

SSL Communication using SSL Accelerator

To execute SSL communication using the SSL accelerator, configure the settings according to the operation shown below.

1. Required settings

   Refer to Settings for Settings for SSL Communication Using SSL Accelerator

2. Confirming validity of certificate

   In addition to the above settings, perform the operations explained in Preparations for Confirming Validity of Certificate Authentication.

SSL Communication using Application Gateway

For operation using non-SSL communication between the Application Gateway complete the following settings according to the operating conditions:

1. Required settings

   Refer to Settings for Operation using Application Gateway.

2. Confirming validity of certificate

   In addition to the above settings, perform the operations explained in Preparations for Confirming Validity of Certificate Authentication.

Preparations for SSL Communication

For SSL communication using each server, acquire the site certificates and register them in the Interstage certificate environment. For explanations of site certificate acquisition and registration in the Interstage certificate environment, refer to 'Setting and Use of the Interstage Certificate Environment' of the Security System Guide.

When the site certificate is already acquired and registered, the registered site certificate can be used.

The following is an example of preparations for SSL communication.

Setting Access Permission of Interstage Certificate Environment Solaris OE Linux

To set up the Interstage certificate environment, an owner group with permission to access the Interstage certificate environment must be created. The created owner group must be specified in the -g option of the scsmakeenv command when the Interstage certificate environment is set up.

The effective users who are to be registered in the owner group of the Interstage certificate environment must be already set in the User directive of the environment configuration file (httpd.conf) of the Interstage HTTP server.

For an explanation of the access permission of the Interstage certificate environment, refer to 'Setting and Use of the Interstage Certificate Environment' of the Security System Guide.

Signing Request of a Certificate for SSL Communication

Specify distinguished names such as country code, alphanumeric first and last name, alphanumeric organization name, alphanumeric organizational unit name, prefecture name, and municipality name to create a certificate signing request (CSR) for signing requesting the certificate for the SSL communication.

Use the scsmakeenv command to create the certificate signing request (CSR). Send the CSR to a certificate authority (VeriSign Inc.) to request to issue the certificate.

Executing the scsmakeenv command prompts the operator to enter distinguished names. In response to the message, 'What is your first and last name?' specify the Fully Qualified Domain Name (FQDN) of the URL of the authentication infrastructure, as the Web server host name. If the load of the authentication server is distributed using a load balancer such as the Interstage Traffic Director, specify the FQDN of the Interstage Traffic Director. FQDN is a host name including a domain name. To request the certificate of a Web server, FQDN must be specified as the owner name of the certificate. (For example: authenticate_server.fujitsu.com)

In the scsmakeenv command, specify the password and private-key nickname for access to the Interstage certificate environment. The password is required to access the Interstage certificate environment. The nickname is required to register the site certificate that was acquired from the certificate authority. Be sure to remember the nickname.

Refer to 'SSL Commands' in Reference Manual (Command Edition) for details of the scsmakeenv command for CSR creation.

Example

Windows

The following is an example in which the name of the CSR output destination file is 'C:\WINNT\temp\ssocert.txt'. When necessary, change the name of the CSR output destination file.

When password entry is requested, enter the password for access to the Interstage certificate environment. The entered password is not displayed.

When you are requested to enter distinguished names, enter them in the bold as shown below.

Site Certificate Nickname: 'SERVERCERT'

CSR output destination file name : 'C:\WINNT\temp\ssocert.txt'

Country code: jp

Alphanumeric first and last name: authenticate_server.fujitsu.com

Alphanumeric organization name: FUJITSU

Alphanumeric organizational unit name: FUJITSU TOKYO

Prefecture name: Tokyo

Municipality name: Shinjuku

```
C:\>scsmakeenv -n SERVERCERT -f C:\WINNT\temp\ssocert.txt
New Password:
Retype:

Input X.500 distinguished names.
What is your first and last name?
  [Unknown]:  authenticate_server.fujitsu.com
What is the name of your organizational unit?
  [Unknown]:  FUJITSU TOKYO
What is the name of your organization?
  [Unknown]:  FUJITSU
What is the name of your City or Locality?
  [Unknown]:  Shinjuku
What is the name of your State or Province?
  [Unknown]:  Tokyo
What is the two-letter country code for this unit?
  [Un]:  jp

Is <CN=authenticate_server.fujitsu.com, OU=FUJITSU TOKYO, O=FUJITSU,
L=Shinjuku, ST=Tokyo,C=jp> correct?
  [no]:  yes
SCS: INFO: scs0101: CSR was issued <C:\WINNT\temp\ssocert.txt>
C:\>
```

When the scsmakeenv command is terminated normally, the CSR is output to the file specified with the -f option of the scsmakeenv command. Send the file to the certificate authority and request to issue the CSR. The requesting method depends on the certificate authority.

Solaris OE

The following is an example in which the Interstage certificate environment with the access permission by 'nobody' is newly created and a CSR is created. When the Interstage certificate environment is already created, set the access permission in the Interstage certificate environment when necessary.

In this example, the name of the CSR output destination file is '/tmp/ssocert.txt'. Change the CSR output destination file when necessary.

Before requesting the CSR, set the JDK or JRE installation path in environment variable JAVA_HOME.

The following example uses the Bourne shell. When password input is requested, enter the password for access to the Interstage certificate environment. The entered password is not displayed.

When you are requested to enter distinguished names, enter them in bold as shown below.

Site Certificate Nickname: 'SERVERCERT'

CSR output destination file name: '/tmp/ssocert.txt'

Country code: jp

Alphanumeric first and last name: authenticate_server.fujitsu.com

Alphanumeric organization name: FUJITSU

Alphanumeric organizational unit name: FUJITSU TOKYO

Prefecture name: Tokyo

Municipality name: Shinjuku

Group which is permitted to access to Interstage certificate environment: nobody

```
# JAVA_HOME=/opt/FJSVawjbk/jdk14;export JAVA_HOME
# scsmakeenv -n SERVERCERT -f /tmp/ssocert.txt –g nobody
New Password:
Retype:

Input X.500 distinguished names.
What is your first and last name?
  [Unknown]:  authenticate_server.fujitsu.com
What is the name of your organizational unit?
  [Unknown]:  FUJITSU TOKYO
What is the name of your organization?
  [Unknown]:  FUJITSU
What is the name of your City or Locality?
  [Unknown]:  Shinjuku
What is the name of your State or Province?
  [Unknown]:  Tokyo
What is the two-letter country code for this unit?
  [Un]:  jp

Is <CN=authenticate_server.fujitsu.com, OU=FUJITSU TOKYO, O=FUJITSU,
L=Shinjuku, ST=Tokyo,C=jp> correct?
  [no]:  yes
UX:SCS: INFO: scs0101: CSR was issued </tmp/ssocert.txt>
UX:SCS: INFO: scs0180: The owners group of Interstage certificate
environment was set
#
```

When the scsmakeenv command is terminated normally, the CSR is output to the file specified with the -f option of the scsmakeenv command. Send the file to the certificate authority and request to issue the CSR. The requesting method depends on the certificate authority.

Linux

The following is an example in which the Interstage certificate environment granted access permission by using iscertg and then the CSR is created.

In this example, iscertg is created as the owner group permitted access to the Interstage certificate environment. The effective user 'nobody' is added to the owner group iscertg. 'Nobody' is set as the initial value in the User directive of the environment configuration file (httpd.conf) of the Interstage HTTP server. The name of the CSR output destination file is '/tmp/ssocert.txt'. Change the CSR output destination file when necessary.

Before requesting the CSR, set the JDK or JRE installation path in environment variable JAVA_HOME.

The following example uses the Bourne shell. When password input is requested, enter the password for access to the Interstage certificate environment. The entered password is not displayed.

When you are requested to enter distinguished names, enter them in bold as shown below.

Site Certificate Nickname: 'SERVERCERT'

CSR output destination file name: '/tmp/ssocert.txt'

Country code: jp

Alphanumeric first and last name: authenticate_server.fujitsu.com

Alphanumeric organization name: FUJITSU

Alphanumeric organizational unit name: FUJITSU TOKYO

Prefecture name: Tokyo

Municipality name: Shinjuku

Group which is permitted to access to Interstage certificate environment: iscertg

```
# groupadd iscertg
# usermod -G iscertg nobody
# JAVA_HOME=/opt/FJSVawjbk/jdk14;export JAVA_HOME
# scsmakeenv -n SERVERCERT -f /tmp/ssocert.txt –g iscertg
New Password:
Retype:

Input X.500 distinguished names.
What is your first and last name?
  [Unknown]:  authenticate_server.fujitsu.com
What is the name of your organizational unit?
  [Unknown]:  FUJITSU TOKYO
What is the name of your organization?
  [Unknown]:  FUJITSU
What is the name of your City or Locality?
  [Unknown]:  Shinjuku
What is the name of your State or Province?
  [Unknown]:  Tokyo
What is the two-letter country code for this unit?
  [Un]:  jp
```

```
Is <CN=authenticate_server.fujitsu.com, OU=FUJITSU TOKYO, O=FUJITSU,
L=Shinjuku, ST=Tokyo,C=jp> correct?
  [no]:  yes
UX:SCS: INFO: scs0101: CSR was issued </tmp/ssocert.txt>
UX:SCS: INFO: scs0180: The owners group of Interstage certificate
#
```

When the scsmakeenv command is terminated normally, the CSR is output to the file specified with the -f option of the scsmakeenv command. Send the file to the certificate authority and request to issue the CSR. The requesting method depends on the certificate authority.

Registering the Certificates for SSL Communication

The site certificate issued by a certificate authority and the CA certificate of the certificate authority that issued the site certificate must be acquired and registered.

Use the certificate and CRL registration command (scsenter) to register these certificates.

In the scsenter command, specify the passwords and certificate nicknames that are specified in the scsmakeenv command for access to the Interstage certificate environment. To register the site certificate that was acquired from the certificate authority, use the scsmakeenv command to specify the nickname specified in the private-key. Be sure to specify the -o option for registering the site certificate.

Refer to 'SSL Commands' in Reference Manual (Command Edition) for details of the scsenter command.

Example

Windows

CA certificate: 'C:\WINNT\temp\ca-cert.cer'

CA Certificate Nickname: 'CACERT'

Site certificate: 'C:\WINNT\temp\server-cert.cer'

Site Certificate Nickname: 'SERVERCERT'

The following shows an example of the scsenter command in which C:\WINNT\temp\ca-cert.cer is specified as the CA certificate and C:\WINNT\temp\server-cert.cer is specified as the site certificate. Change the file path of each certificate when necessary.

When password entry is requested, enter the password for access to the Interstage certificate environment. The entered password is not displayed.

```
C:\>scsenter –n CACERT –f C:\WINNT\temp\ca-cert.cer
Password:
Certificate was added to keystore
SCS: INFO: scs0104: Certificate was imported
C:\>scsenter –n SERVERCERT –f C:\WINNT\temp\server-cert.cer –o
Password:
Certificate reply was installed in keystore
SCS: INFO: scs0104: Certificate was imported
C:\>
```

Solaris OE Linux

CA certificate: '/tmp/ca-cert.cer'

CA Certificate Nickname: 'CACERT'

Site certificate: '/tmp/server-cert.cer'

Site Certificate Nickname: 'SERVERCERT'

The following shows an example of the scsenter command in which /tmp/ca-cert.cer is specified as the CA certificate and /tmp/server-cert.cer is specified as the site certificate. Change the file path of each certificate when necessary.

Before requesting the certificates, set the JDK or JRE installation path in environment variable JAVA_HOME.

The following example uses the Bourne shell. When password input is requested, enter the password for access to the Interstage certificate environment. The entered password is not displayed.

```
# JAVA_HOME=/opt/FJSVawjbk/jdk14;export JAVA_HOME
# scsenter –n CACERT –f /tmp/ca-cert.cer
Password:
Certificate was added to keystore
UX:SCS: INFO: scs0104: Certificate was imported
# scsenter –n SERVERCERT –f /tmp/server-cert.cer -o
Password:
Certificate reply was installed in keystore
UX:SCS: INFO: scs0104: Certificate was imported
#
```

Settings for SSL Communication

SSL configuration must be defined using the Interstage Management Console.

To define the SSL configuration, select the [Security] and then [SSL] from the System menu. Click the [Create a new SSL Configuration] tab, and then perform [General Settings]. Select the nickname of the confirmed site certificate, and define the SSL configuration.

Refer to the Operator’s Guide for an explanation of the start of the Interstage Management Console. Refer to the Operator’s Guide for details of the items to be defined on the Interstage Management Console.

Set each item of the SSL environment configuration as follows:

Configuration Name

Set the identifying the SSL configuration. The configuration name specified here is used for setting the authentication server.

Site Certificate Nickname

Enter the nickname that was specified when the site certificate was registered in the Interstage certificate environment as described in Preparations for SSL Communication. The registered site certificate can be accessed on the Interstage Management Console by selecting [Security] and then [Certificate] from the System menu and then clicking [Site Certificate].

Protocol Version

Select 'SSL 2.0' and 'SSL 3.0'.

Verify Client Certificate?

Select 'Yes (Authenticate when client certificate is presented)'.

Encryption Method

When necessary, change the method. Refer to the Operator’s Guide.

CA Certificate Nickname

When necessary, change the nickname. Refer to the Operator’s Guide.

Preparations for Confirming Validity of Certificate Authentication

The validity of a certificate can be confirmed using the certificate revocation list (CRL) at certificate authentication. The following explains the preparations for certificate validity confirmation.

SSL Communication using Authentication Server

If using SSL communication on the authentication server, perform the following steps.

1. Registering the Certificate of the CRL-issuing Authority (*1)
2. Registering CRL

*1 Register the CRL that was issued from a certificate authority that was not specified in the site certificate described in Preparations for SSL Communication.

SSL Communication using SSL Accelerator or Application Gateway

When the authentication infrastructure uses SSL Accelerator or Application Gateway perform the following describes:

1. Creating Interstage certificate environment
2. Registering the Certificate of the CRL-issuing Authority
3. Registering CRL

Creating Interstage certificate environment

Set up the Interstage certificate environment using scsmakeenv command when the Interstage certificate environment is not set up.

For details about scsmakeenv command, refer to 'SSL Commands' in the Reference Manual (Command Edition)

Example

Windows

The following shows an example in which the Interstage certificate environment is created for the first time using the scsmakeenv command.

When password to input is requested, enter the password for access to the Interstage certificate environment. The entered password is not displayed.

```
C:\> scsmakeenv –e
New Password:
Retype:
SCS: INFO: scs0100: Interstage certificate environment was created
C:\>
```

Solaris OE

The following shows an example in which the Interstage certificate environment access permission is granted to the user 'nobody' when it is created for the first time using the scsmakeenv command.

Before requesting the certificates, set the JDK or JRE installation path in environment variable JAVA_HOME.

The following example uses the Bourne shell. When the password input is requested, enter the password for access to the Interstage certificate environment. The entered password is not displayed.

```
# JAVA_HOME=/opt/FJSVawjbk/jdk14;export JAVA_HOME
# scsmakeenv -e -g nobody
New Password:
Retype:
UX:SCS: INFO: scs0100: Interstage certificate environment was created
UX:SCS: INFO: scs0180: The owners group of Interstage certificate
environment was set
#
```

Linux

The following shows an example in which the Interstage certificate environment in whichaccess permission is granted to iscertg for the first time using the scsmakeenv command.

In this example, iscertg is created as the owner group permitted access to the Interstage certificate environment. The effective user 'nobody' is added to the owner group iscertg. 'Nobody' is set as the initial value in the User directive of the environment configuration file (httpd.conf) for the Interstage HTTP server.

Before requesting the CSR, set the JDK or JRE installation path in environment variable JAVA_HOME.

The following example uses the Bourne shell. When password input is requested, enter the password for access to the Interstage certificate environment. The entered password is not displayed.

```
# groupadd iscertg
# usermod -G iscertg nobody
# JAVA_HOME=/opt/FJSVawjbk/jdk14;export JAVA_HOME
# scsmakeenv -e -g iscertg
```

```
New Password:
Retype:
UX:SCS: INFO: scs0100: Interstage certificate environment was created
UX:SCS: INFO: scs0180: The owners group of Interstage certificate
environment was set
#
```

Registering the Certificate of the CRL-issuing Authority

The certificate of the authority that issued the CRL must be acquired and registered before registering the CRL. If the certificate of the CRL-issuing authority has not been registered, register the certificate of the CRL-issuing authority.

To register the certificate of the CRL-issuing authority, use the certificate and CRL registration command (scsenter).

In the scsenter command, specify the password and certificate nickname that were specified in the scsmakeenv command for access to the security environment.

Refer to 'SSL Commands' in the Reference Manual (Command Edition)the Reference Manual (Command Edition) for details of the scsenter command.

Example

Windows

Certificate of CRL-issuing authority: 'C:\WINNT\temp\crlca-cert.cer'

Nickname of certificate of CRL-issuing authority: 'CRLCACERT'

The following shows an example of the scsenter command in which C:\WINNT\temp\crlca-cert.cer is specified as the certificate of the CRL-issuing authority. Change the file path of the certificate when necessary.

When password entry is requested, enter the password for access to the Interstage certificate environment. The entered password is not displayed.

```
C:\>scsenter –n CRLCACERT –f C:\WINNT\temp\crlca-cert.cer
Password:
Certificate was added to keystore
SCS: INFO: scs0104: Certificate was imported
C:\>
```

Solaris OE Linux

Certificate of CRL-issuing authority: '/tmp/crlca-cert.cer'

Nickname of certificate of CRL-issuing authority: 'CRLCACERT'

The following shows an example of the scsenter command in which /tmp/crlca-cert.cer is specified as the certificate of the CRL-issuing authority. Change the file path of the certificate when necessary.

Before requesting the certificates, set the JDK or JRE installation path in environment variable JAVA_HOME.

The following example uses the Bourne shell. When password input is requested, enter the password for access to the Interstage certificate environment. The entered password is not displayed.

```
# JAVA_HOME=/opt/FJSVawjbk/jdk14;export JAVA_HOME
# scsenter –n CRLCACERT –f /tmp/crlca-cert.cer
Password:
Certificate was added to keystore
UX:SCS: INFO: scs0104: Certificate was imported
#
```

Registering CRL

To confirm the validity of a certificate, the CRL that was acquired from the certificate authority must be registered using the certificate and CRL registration command (scsenter).

In the scsenter command, specify the password that was specified in the scsmakeenv command to access the security environment.

The -o option must always be specified to register the CRL.

Refer to 'SSL Commands' in the Reference Manual (Command Edition) for details of the scsenter command.

The validity of a user's certificate can be confirmed by setting [Yes] in [Enable Certificate Revocation Check?] of [Certificate Authentication Settings] during setup of the environment authentication server after CRL registration.

Example

Windows

CRL that was acquired from certificate authority: 'C:\WINNT\temp\crl.crl'

The following is an example of the scsenter command in which C:\WINNT\temp\crl.crl is specified as the acquired CRL. Change the CRL file path when necessary.

When password input is requested, enter the password for access to the Interstage certificate environment. The entered password is not displayed.

```
C:\>scsenter –c –f C:\WINNT\temp\crl.crl
Password:
SCS: INFO: scs0105: CRL was imported
C:\>
```

Solaris OE Linux

CRL that was acquired from certificate authority: '/tmp/crl.crl'

The following shows an example of the scsenter command in which /tmp/crl.crl is specified as the acquired CRL. Change the CRL file path when necessary.

Before registering the CRL, set the JDK or JRE installation path in environment variable JAVA_HOME.

The following example uses the Bourne shell. When password input is requested, enter the password for access to the Interstage certificate environment. The entered password is not displayed.

```
# JAVA_HOME=/opt/FJSVawjbk/jdk14;export JAVA_HOME
# scsenter –c –f /tmp/crl.crl
Password:
UX:SCS: INFO: scs0105: CRL was imported
#
```

Settings for SSL Communication Using SSL Accelerator

To use SSL Accelerator, perform the settings depending on the operating conditions. Refer to “Linkage with SSL Accelerator” for an explanation of setting SSL Accelerator.

Settings for Operation using Application Gateway

To operate using Application Gateway the environment for the Application Gateway must be set up. For details, refer to the explanation for the setting of the Application Gateway for 'Linkage with Application Gateway'.

Setting up One Authentication Server

Set up an authentication server as follows using the Interstage Management Console of the machine on which the authentication server is to be set up. For details of the items to be defined on the Interstage Management Console, refer to the Operator’s Guide.

An authentication infrastructure setup file is required to set up the authentication server. Refer to Downloading the Authentication Infrastructure Setup File under Constructing a Repository Server (One Server or Update System) for an explanation of creating the authentication infrastructure file.

1. Select [Security] and then [Single Sign-on] from the System menu. Click [Authentication infrastructure] and then the [Authentication infrastructure Settings] tab.

2. Select [Setup Repository server and Authentication server to the separate servers.], and then click [Next].

3. The window for selecting a server to be created is displayed. Select [Create a new Authentication server], and then click [Next].

4. [General Settings] is displayed. In [Authentication infrastructure setup file], select the authentication infrastructure setup file that was downloaded from the repository server (update system).

5. Enter the password that was set for the authentication infrastructure setup file, and set the items for SSL when necessary.

   When SSL communication uses SSL Accelerator specify the HTTP header that is used by SSL Accelerator to post the user certificate in [HTTP header name for user certificate acquisition].

6. To distribute load by setting multiple repository servers, specify [Host name and Port number of Repository server (reference system)]. Up to five repository servers can be set at a time. To set six or more repository servers (reference system), create an authentication server. Then click [Authentication server] and the [Settings] tab, and select [Detailed Settings [Show]]. Specify the servers using [Host name and Port number] of [Communication Settings with Repository server (reference system)].

   In this item, the same host name cannot be specified two or more times. A repository server (update system) can also be specified.

7. The UserID/Password input window of the password authentication is normally used as the Form authentication page.

   Using the basic authentication dialog on which the Web browser is operating, from the Interstage Management Console, select [Detailed Settings [Show]], and specify 'Basic authentication dialog' under [Input User ID/Password] of the [User ID/password authentication Settings].

8. Click [Create]. The authentication server is created. A list of the created servers is displayed. Confirm the port number.

9. Activate the created authentication server.

   Refer to 'Starting an Authentication Server' in 'Operation and Maintenance', for an explanation of authentication server start.

10. Delete the authentication infrastructure setup file.

Remarks

The authentication server does not use the port number of the Web server (Interstage HTTP Server). That is, it does not use the [Port Number] field in [Web Server Settings], which is found by clicking [Services] and then [Web Server] on the System menu.

To use the Web server (Interstage HTTP Server) only from the authentication server, the above port number is not used. Therefore, the value specified in [Port Number] must be the same as the port number specified at authentication server setting. This setting prevents the unnecessary port from opening.

Notes

- When the Microsoft® Internet Explorer is used as the browser, an authentication infrastructure setup file with an absolute path length exceeding 200 bytes may not be able to be specified with the Browse button. In this case, change the location of the authentication infrastructure setup file so that its absolute path length is shorter.

- The authentication infrastructure setup file is important for security. Always delete this file after the authentication server is set up.

Adding an Authentication Server for Load Distribution

This section explains the process of adding an authentication server for load distribution.

To distribute the authentication server load using a load balancer such as the Interstage Traffic Director, an authentication server must be configured to have the same environment as that of the already set authentication server.

The Interstage Single Sign-on system provides the ssocloneac command to constitute the authentication server in the same environment.

The ssocloneac command is also used to make copies of the messages to be displayed on a Web browser. Customize these messages before making the copy of the authentication server. Refer to 'Customizing Messages Displayed on a Web Browser' for details of how to customize messages displayed on a Web browser.

The following explains how to transfer the environment of the original authentication server already installed to the additional authentication server using the ssocloneac command. Refer to 'Single Sign-on Operation Commands' in the Reference Manual (Command Edition) for details of the ssocloneac command.

Preparations for Load Distribution

Note the following to add a load balancer such as the Interstage Traffic Director to an active authentication infrastructure.

- Do not change the URL of the authentication infrastructure by setting the host name of the already-installed authentication server in the load balancer such as the Interstage Traffic Director. Refer to 'Authentication Infrastructure URL' for an explanation of the URL of the authentication infrastructure.

  Refer to the manual of the Interstage Traffic Director for details of the Interstage Traffic Director.

Preparing Target Machine

Set up the machine you are copying to with the same platform as that of the machine you are copying from. Ensure the same Interstage version, edition, and installation directory is installed. The Interstage Single Sign-on, Interstage HTTP Server, and SSL configuration (for SSL communication) on the destination machine must be in the initial state immediately after installation.

Getting Environment Information

1. On the source machine, execute the ssocloneac command with the -p option in order to fetch environment information such as authentication server information, Interstage HTTP Server information, and the SSL configuration for SSL communication (*1). When you are permitted to use the same certificate for the load-balancing machine, and SSL Accelerator is not used, use the scsexppfx command to transfer the site certificate and private-key. Refer to 'SSL Commands' in the Reference Manual (Command Edition) for details of the scsexppfx command.
2. Transfer the fetched environment information to the destination machine. Ensure that there is adequate security to prevent third parties from electronically intercepting information during the transfer. Additionally, during transfer, do not change the permission of the fetched environment information file.

*1 The SSL configuration for SSL communication is fetched only when the authentication server uses SSL communication.

Setting Up Environment for Destination Machine for Copying

1. For SSL communication using the authentication server, create the Interstage certificate environment by executing the scsmakeenv command with the -e option on the destination machine for copying.

   Refer to 'SSL Commands' in the Reference Manual (Command Edition) for details of the scsmakeenv command.

2. When SSL communication is used by the authentication server and you are permitted to use the same certificate for the load-balancing machines, transfer the site certificate and private-key using the scsimppfx command. Refer to the Reference Manual (Command Edition) for details of the scsimppfx command.

   When SSL communication is used by the authentication server but using the same certificate for the load-balancing machines is not permitted, newly acquire a site certificate and register it in the site certificate environment as described in Preparations for SSL Communication. In this case, the nickname of the site certificate to be used when requesting the certificate for SSL communication must be the same as that specified in the authentication server already installed. Also the nickname of the CA certificate to be used at registering the certificate for SSL communication must be the same as that specified in the already set authentication server.

3. On the destination machine for copying, execute the ssocloneac command with the -c option. The environment for the authentication server, Interstage HTTP Server, and the SSL communication for SSL communication (*1) are duplicated.

4. On the Interstage Management Console, select [Security] and then [Single Sign-on] from the System menu. Click [Authentication infrastructure] and [Authentication server]. On the [Settings] tab, click [Detailed Settings [Show]]. The environment of the original authentication server for copying is set in [Host name and Port number] of [Communication Settings with Repository server (reference system)]. Therefore, change this environment depending on the operating conditions, and click [Update].

   For details of the items to be set on the Interstage Management Console, refer to the Operator's Guide.

5. After the repository server (reference system) is set, start the authentication server.

   Refer to 'Starting an Authentication Server' for an explanation of the authentication server start.

6. Delete the environment information file of the authentication server.

*1 The SSL configuration for SSL communication is copied only when the authentication server uses SSL communication.

Notes

- For load distribution of the authentication server, the related multiple authentication servers must have the Interstage Single Sign-on of the same version, edition, and installation directory. The same platform must also be used.
- The load balancer must be set up so that the requests from the same client transfer to same authentication servers.
- Use the following settings when the load balancer is Interstage Traffic Director.
  - Operation Mode: bridge
  - Measure of load Balancing and uniqueness of connection: Balancing for each node

- The environment information file of the authentication server is important for security. After the authentication server is set up, always delete the environment information file.

Setting the Reference System Repository Server Information in the Authentication Server

When a repository server (reference system) is set up, the information on the repository server must be set in the authentication server using the Interstage Management Console according to the following procedure. Refer to the Operator’s Guide for details of the items to be set on the Interstage Management Console.

1. Select [Security] and then [Single Sign-on] from the System menu. Click [Authentication infrastructure], and then from [Authentication server] click the [Settings] tab.
2. Set the host name and port number of the repository server (reference system) in [Host name and Port number] of [Communication Settings with Repository server (reference system)] of [Detailed Settings [Show]]. Then click [Update].
3. After the reference system repository server is set, start the authentication server.

   Refer to 'Starting an Authentication Server' for an explanation of the authentication server start.

Setting up a Repository Server and Authentication Server on a Single Machine

This section explains how to set a repository server and an authentication server on a single machine according to the following procedure using the Interstage Management Console. Refer to the Operator’s Guide for details of the items to be set on the Interstage Management Console.

1. Select [Security] and then [Single Sign-on] from the System menu. Click [Authentication infrastructure] and then click the [Authentication infrastructure Settings] tab.
2. Select [Setup Repository server and Authentication server to a single server.] and click [Next].
3. [General Settings] is displayed. Enter [Authentication infrastructure URL], and enter a necessary SSO repository in [Repository Name]. Configure the items related to SSL as necessary.

   When SSL communication uses SSL Accelerator the HTTP header that is used by SSL Accelerator to post the user certificate must be specified in [HTTP header name for user certificate acquisition].
4. The UserID/Password input window of the password authentication is normally used as the Form authentication page.

   Using the basic authentication dialog on which the Web browser is operating from the Interstage Management Console, select [Authentication server Detailed Settings [Show]] and specify 'Basic authentication dialog' under [Input User ID/Password] in the [Password Authentication Settings].
5. Click [Create] to create the repository server and authentication server. A list of the created servers is displayed. Confirm the port number.
6. After the repository server and authentication server are created, start the repository server. When the repository server is started, the authentication server is also started. Refer to 'Starting a Repository Server' for an explanation of the repository server start.

Remark

The repository server and authentication server do not use the port number of the Web server (Interstage HTTP Server). That is, they do not use the [Port Number] in the [Web Server Settings] tab, which is found by clicking [Services] and then [Web Server] from the System menu.

To use the Web server (Interstage HTTP Server) only from the repository server and authentication server, the above port number is not used. The value specified in the [Port Number] must be the same as the port number of the repository server and authentication server. This setting prevents unnecessary ports from opening.

Registering a Business System

If a business server administrator requests an SSO administrator to add a business system to the Interstage Single Sign-on system, the SSO administrator registers the business system.

This section explains SSO-administrator's work for business system addition.

Registration Flow of Business System

If a business server administrator requests an SSO administrator to add a business system to the Interstage Single Sign-on system, the SSO administrator registers the business system. Refer to 'Environment Setup (Business Server Administrators)' for an explanation of business-server-administrator's work.

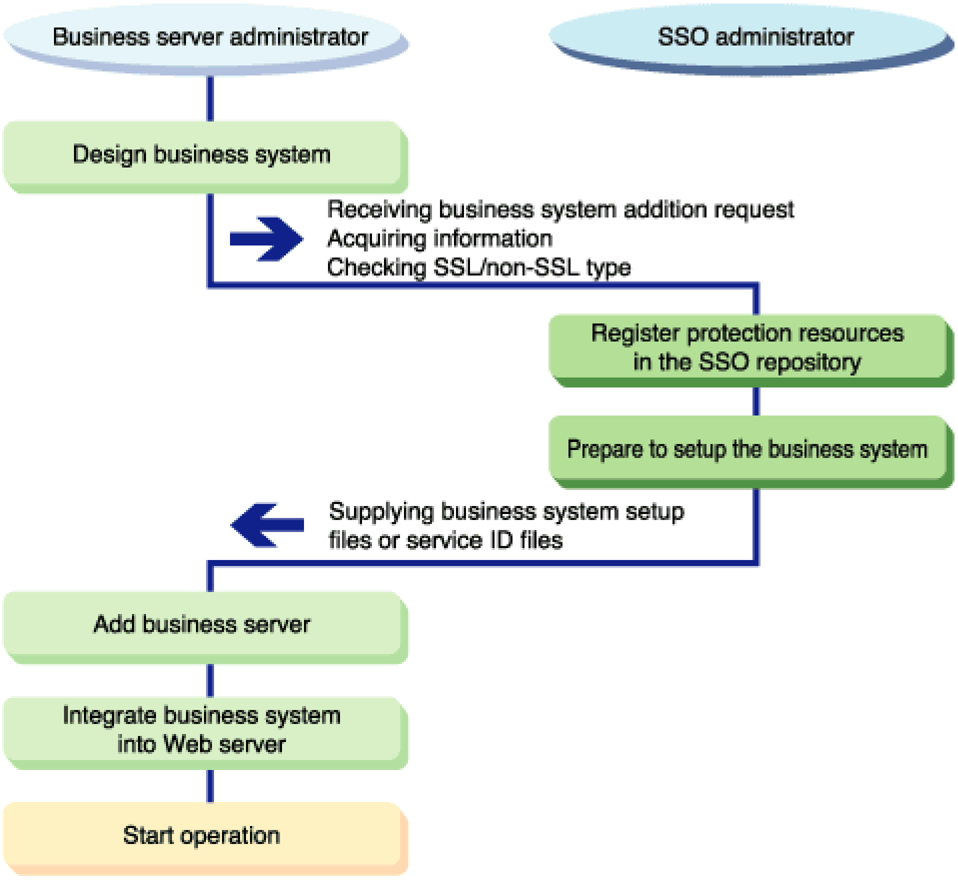

Business server administrator
SSO administrator
Design business system
Receiving business system addition request
Acquiring information
Checking SSL/non-SSL type
Register protection resources in the SSO repository
Prepare to setup the business system
Supplying business system setup files or service ID files
Add business server
Integrate business system into Web server
Start operation

Figure 2-9 Registration Flow of Business Systems

Information to be Acquired from Business Server Administrator

When a business server administrator requests you to add a business system to the Interstage Single Sign-on system, acquire the following information from the business server administrator:

- Business system public URL
- Path configuration to be authorized
- Use of SSL communication
- Use of Interstage Portalworks linkage
- Version and edition of Interstage

When non-SSL communication is not permitted in the Single Sign-on system, request the business system administrator for SSL support.

Remark

Access to protection resources on the business server is restricted by the Interstage Single Sign-on system. However, if SSL communication is not used on the business server, protection resources on the network may be electrically intercepted. SSL communication on the business server avoids such interception. Operating the business server using SSL communication is highly recommended.

Registering Protection Resources

The following information that was acquired from the business server administrator must be registered in the SSO repository and the authentication server:

- Business system public URL
- Path configuration to be authorized

Registering Site Configuration of Business System

The site configuration of the business system must be registered.

Perform the following operations on the Interstage Management Console of the machine on which the repository server (update system) was set up. Refer to the Operator’s Guide for details of the items to be defined on the Interstage Management Console.

1. Select the [Security] and then [Single Sign-on] from the System menu. Click [Authentication infrastructure] and [Repository server]. Click [Protection resource] and then click the [Create a New Site configuration] tab.
2. Set [FQDN and Port number] in [Site Configuration Settings].

   When a load balancer such as Interstage Traffic Director is installed before the business server, the host name of the virtual IP address that was set in the load balancer (such as Interstage Traffic Director) must be set in the business system public URL. When SSL Accelerator is installed before the business server, the port number of SSL Accelerator must be set in the business system public URL.
3. Click [Create]. The added site configuration is displayed on the [Protection resource: List]. Confirm the FQDN and port number of the business system.

Remarks

When this system is linked with the Application Gateway and can be accessed only by clients on the Internet, multiple business systems may have the same public URL. Therefore, the new site configuration may be already registered. In this case, as the above registration procedure is unnecessary, go to 'Registering protection path', below. Refer to 'Settings for Operation using Application Gateway' for details.

Registering Protection Path

Access control information must be set for Web contents to be opened on the business server. In addition to the access control information, set the access control path and access permission role.

Perform the following procedure on the Interstage Management Console of the machine on which the repository server (update system) was created. Refer to the Operator’s Guide for details of the items to be defined on the Interstage Management Console.

1. Select [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Repository server] >[Protection resource]. A list of defined sites is displayed in the [Protection resource] tree. Select the site for which a protection path is to be set.
2. Click [Protection path] in the tree. A list of path configurations is displayed. Click the [Create a New Path configuration] tab.
3. In [Path], set the path that is to be access-controlled. To control the access to a directory, always write "/" at the end of the path. To control the access to a file, do not write "/" at the end of the path.
4. After the path to be access-controlled is set, select the name of the role or role set that can access the path. To permit the access by all users that are registered in the SSO repository, specify nothing as the role name or role set name.
5. Click [Create] to display a list of the specified paths and role information and check them.
6. Request the business server administrator to update the access control information.

Refer to 'Information Required for Authorization Using Roles' in 'Overview' for an explanation of permission by a role. Refer to 'Setting User Information Report with Environment Variables' in 'Developing Applications' for an explanation of the user attributes to be posted at authorization setting.

Note

When this system is linked with the Application Gateway and can be accessed only by clients on the Internet, multiple business systems may have the same public URL. To avoid such duplication, these business systems must be designed to have different protection paths.

If an already registered protection path was reported by the business server administrator, request the business server administrator to review the business system design to prevent the protection paths from duplicating.

Refer to Settings for Operation using Application Gateway for details.

Settings for Protection Resource

In the authentication server, configure both the site configuration of the business system registered in the SSO repository, and the protection path information.

Use a text editor to open the configuration file of the authentication server, and add the protection resource information. If modifying the configuration file, restart the authentication server. For details on how to start and stop the authentication server, refer to 'Starting an Authentication Server and 'Stopping an Authentication Server' in Chapter 4, Operation and Maintenance.

The file name and file path of the authentication server configuration file

Configuration file name:

ssoatcag.conf

Configuration file path (directory)

Windows

C:\Interstage\F3FMsso\ssoatcag\conf

Solaris OE Linux

/etc/opt/FJSVssoac/conf

Configuration items to Add

Table 2-8 Configuration Items to Add

Item	Configuration Name	Setting Contents	Omissible or Required
Restraint of authentication requests (except from the protection resource)	reject-incorrect-protection-resource-url	Set whether authentication requests (except those from the business system protection resource) are restrained. YES : restrained NO : unrestrained Omitting this setting is the same as specifying "NO". If values other than those above are set, sso02040 is output to system log, and “NO" is considered to have been set. If users operate form authentication, and directly access authentication Infrastructure for authentication, the restraint of the authentication request is invalid.	Omissible.
The protection resource URL which accepts authentication requests	protection-resource-url	If authentication requests, except those from the business system protection resource are restrained, set the protection resource URL which accepts authentication requests. This configuration is valid only when “YES” is set to “reject-incorrect-protection-resource-url”. In the protection resource URL, set the site configuration and path configuration registered in the SSO repository using the following URL forms. <URL form> [Protocol Scheme][Host Name][: Port number][Path] [Protocol Scheme]: Set “http://” or “https://"	Omissible. If “YES” is specified for “reject-incorrect-protection-resource-url”, this setting is required.

Item	Configuration Name	Setting Contents	Omissible or Required
		[Host Name]: Set the host name defined in the protection resource site configuration using FQDN. In the host name, "@", "?" and "&" are invalid. [: Port number]: Set the port number defined in the protection resource site configuration. The Port number can be omitted. If it is omitted, the port number is considered to have been set as the following: - If protocol scheme is "https://" Port number: ":443" - If protocol scheme is "http://" Port number: ":80" [Path]: Set the path configuration of the protection resource. The Path cannot be omitted. Set carefully with the following: - The path must start with "/". - Relative paths ("/./", "/../"), continued "/" ("//") and ";" are invalid. - The path cannot end with the characters "/." or "/..". Set the above URL form carefully as the following: - Only alphanumeric characters and symbols can be used. However, the following symbols cannot be used. "<”, “>”, “'”", “{”, “}”, “|”, “\”, “^”, “[”, “]”, “`”, “ ”, “%” - Multi-bytes string (for example kanji code) cannot be used. - Specify the length of string within 2048 bytes. - In URL form, query strings are invalid. **Example of setting the protection resource URL:**	

Item	Configuration Name	Setting Contents	Omissible or Required
		Specifying the protection path "/protect/" of the protection site "bus.example.com" of operated port number 443 on https: protection-resource-url=https://bus.example.com:443/protect/ If the set protection resource URL ends with “/”, it will be handled as a directory. In order for the protection resource to be authenticated, when authentication is requested, the characters of the set value and the URL must match from the first character forward. If the URL ends with a character other than “/”, it will be handled as a file. In order for the protection resource to be authenticated, when authentication is requested, the characters of the set value and the URL must match completely from the first character forward. If setting more than one protection resource URL, set the first protection resource URL on one line, and subsequent URLs on separate lines. If multiple URLs are set, decide whether the set URL corresponds to the protection resource URL which accepts the authentication request from the head in order. Setting example: Setting two protection resource URLs. protection-resource-url=https://bus.example.com:443/protect/ protection-resource-url=https://bus.example.com:443/bussystem/ If these details are omitted when "reject-incorrect-protection-resource-url" is set to "YES", sso02008 error message is output to the system log when the authentication server starts and stops.	

Item	Configuration Name	Setting Contents	Omissible or Required
		If the value set for the protection resource URL is incorrect, sso02007 error message is output to the system log when the authentication server starts and stops.	

Note

- If the configuration file is not correct (for example, a required item is not set, or set with invalid values), Interstage HTTP Server cannot be started.
- The error messages output when invalid settings are configured are registered in the system log. When Interstage HTTP Server starts up, errors can be registered in this log more than once.
- If the configuration item does not allow multiple lines, when multiple lines are entered only the top line is valid, and other lines will be ignored.
- Set the configuration file items using the “<configuration name>=<set value>” form from the head of line. Do not include blanks in front of or behind “=”.
- Set the items of configuration file without unnecessary blanks.

  For example, “<configuration name>=123 ” (with a blank behind 123) and “<configuration name>= NO” (with a blank in front of NO) are incorrect. Such entries will be ignored.
- If an invalid configuration name is set, it is ignored.
- Lines starting with “#” are regarded as comment lines.

The following example shows how to set a configuration file.

Example

The following is an example of a protection resource URL which accepts the authentication request and restrains all authentication requests except those from the protection resource:

Protection resource URL:

https://bus.example.com:443/protect/

https://bus.example.com:443/bussystem/

```
Reject-incorrect-protection-resource-url=YES
protection-resource-url=https://bus.example.com:443/protect/
protection-resource-url=https://bus.example.com:443/bussystem/
```

About the set value of configuration item "protection-resource-url"

Set all protection resource information registered in the SSO repository in the configuration item “protection-resource-url” of the authentication server correctly.

If the set value does not correspond to the protection resource information, restraint of authentication requests, except those from the protection resource, cannot be performed correctly.

Addition, modification or deletion of protection resource information

If adding, modifying or deleting protection resource information of the SSO repository, modify the configuration item “protection-resource-url” of the authentication server, and then restart the authentication server.

Moreover, ask the business server administrator for access to real protection resources, or to confirm that the authentication server is functioning with the configuration correctly.

Preparations for Setting up a Business System

When the business server administrator sets up a business system, a business system setup file must be created.

The following operations also require the service ID file for the business server:

- JAAS authentication
- User authentication in response to SOAP message

The business server administrator must prepare the business system setup file or business-server service ID file according to the products and operating conditions of the business system configuration.

Downloading Business System Setup File

Download the business system setup file according to the following procedure using the Interstage Management Console of the machine on which the repository server (update system) was set up. Refer to the Operator’s Guide for details of the items to be defined on the Interstage Management Console.

1. Select the [Security] and then [Single Sign-on] from the System menu. Select [Authentication infrastructure] and then click the [Business system setup file] tab.
2. Enter necessary items.

   To link the business system to Interstage Portalworks, select [Yes] in [Linkage with Interstage Portalworks?], and specify a domain name as the authentication validity range.

   When the authentication infrastructure uses two or more repository servers, specify the URL of the repository server (reference system) in [Repository Server URL] of [Authentication Infrastructure Information Settings].
3. Click [Download] to download the business system setup file to the machine on which the Web browser is operating.
4. Send the business system setup file to the business server administrator, and then delete the business system setup file.

The business system setup file is important for security, and is encrypted with a password. Ensure the password is protected from unauthorized access. Pass the password and downloaded information file to the business server administrator by secure means. The password must be arranged with the business server administrator in advance so that the correctness of the distributed business system setup file can be confirmed.

Notes

- In the business system with the same domain, the business system setup file that was created by specifying 'Yes' in [Linkage with Interstage Portalworks?] cannot be used together with the business system setup file that was created by specifying 'No' in [Linkage with Interstage Portalworks?].

- The business system setup file is important for security. Be sure to delete this file after it was sent to the business server administrator.

Creating a Service ID File for a Business Server

What is the service ID file?

The authentication information on a user registered in the SSO repository, such as mail address and employee number is fetched from the repository server on the basis of the certificate, user ID, and password the user used for authentication. The authentication information is posted to the business server through the authentication server. The service ID file is required to securely communicate the authentication information.

There is no need to be conscious of the service ID file when using the Interstage Management Console to make the Interstage Single Sign-on environment settings.

Method to create the service ID file

Create a service ID file for a business server by using the ssomksid command.

The service ID file for a business server is important for security. Ensure that the file is protected from unauthorized access by third parties. After the service ID file for the business server is sent to the business server administrator, be sure to delete it.

Refer to 'Single Sign-on Operation Commands' in the Reference Manual (Command Edition) for details of the ssomksid command.

More Secure Use

Communication data and authentication information between servers are encrypted in the Interstage Single Sign-on system. The following two methods make operation more secure:

Using Ipsec Windows Solaris OE

IPsec is the encryption communication protocol defined as the standard protocol of the Virtual Private Network (VPN) by IETF. IPsec encrypts data on the IP protocol level. Therefore, higher-level protocols and applications need not be changed for the encryption.

Since communication between servers is protected on the IP protocol level by using IPsec, more secure operation can be made to prevent electrical interception or alteration.

To use IPsec, set up IPsec so that IPsec encryption communication is performed between all of the Interstage-Single-Sign-on repository servers, authentication servers, and business servers. IPsec is provided as the standard function of the operating system from Windows ® 2000 or Solaris 8 0E.

Using firewall

A firewall controls access to data that flows between networks.

Using a firewall, authentication servers and repository servers can be set in an independent, secure network. Since accesses using the Interstage Single Sign-on system are controlled, invalid accesses are avoided.

To use a firewall, separately prepare a firewall product.

Using IPsec

To use IPsec, set up IPsec on all of the Interstage-Single-Sign-on repository servers, authentication servers, and business servers so that IPsec encryption communication can be performed between these servers.

IPsec provides encryption of communication data in the following cases:

- Communication between business server and repository server
- Communication between authentication server and repository server

The following shows an example of Interstage Single Sign-on configuration using IPsec in which authentication-server load distribution and repository-sever availability are considered.

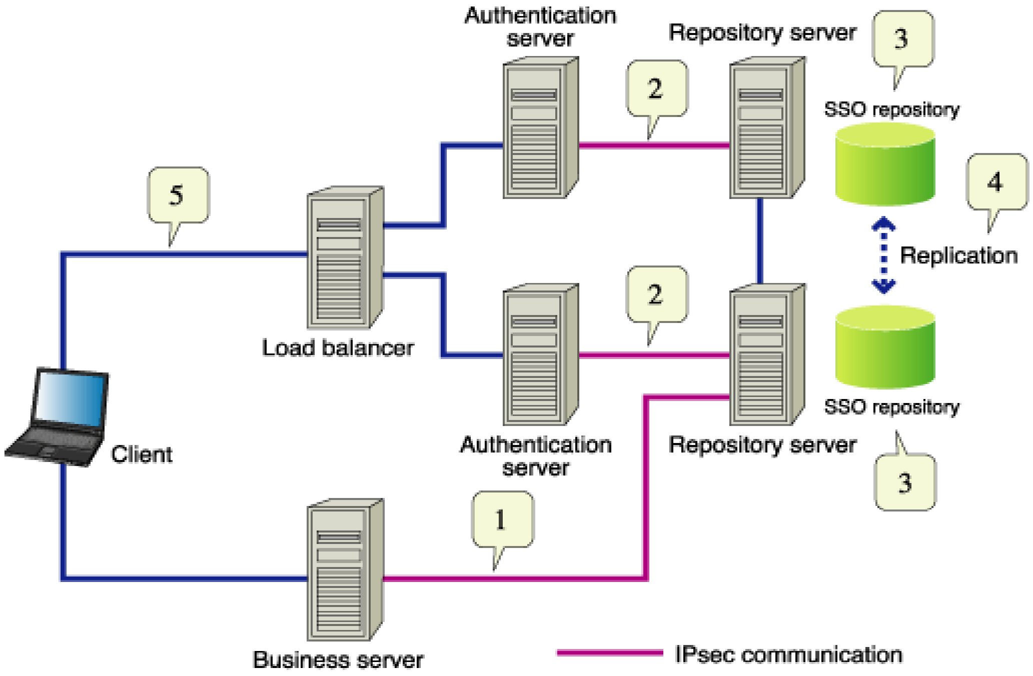


Figure 2-10 Interstage Single Sign-on Using IPsec

1. The IPsec encryption communication is set between the business server and repository server so that communication from the business server is encrypted to prevent electrical interception or alteration.
2. The IPsec encryption communication is set between the authentication server and repository server so that communication from the authentication server is encrypted to prevent electrical interception or alteration.
3. If SSO repository is set up in a repository server, data that the repository server fetches from the SSO repository does not flow to the network. This prevents electronic interception or alteration.
4. SSL communication is set between the replicating repository servers to prevent electronic interception or alteration.
5. SSL communication is set in authentication servers to prevent electronic interception or alteration by encrypting communication from clients.

Refer to the operation manual of the related operating system for an explanation of the IPsec setting method.

Using a Firewall

When a firewall is set, a group of authentication servers and repository servers must be set up in an independent network, and all accesses to the authentication serves and repository servers pass through the firewall.

Any accesses from other than business servers or clients are blocked by the filtering function of the firewall.

The following shows an example of the Interstage Single Sign-on configuration using a firewall:

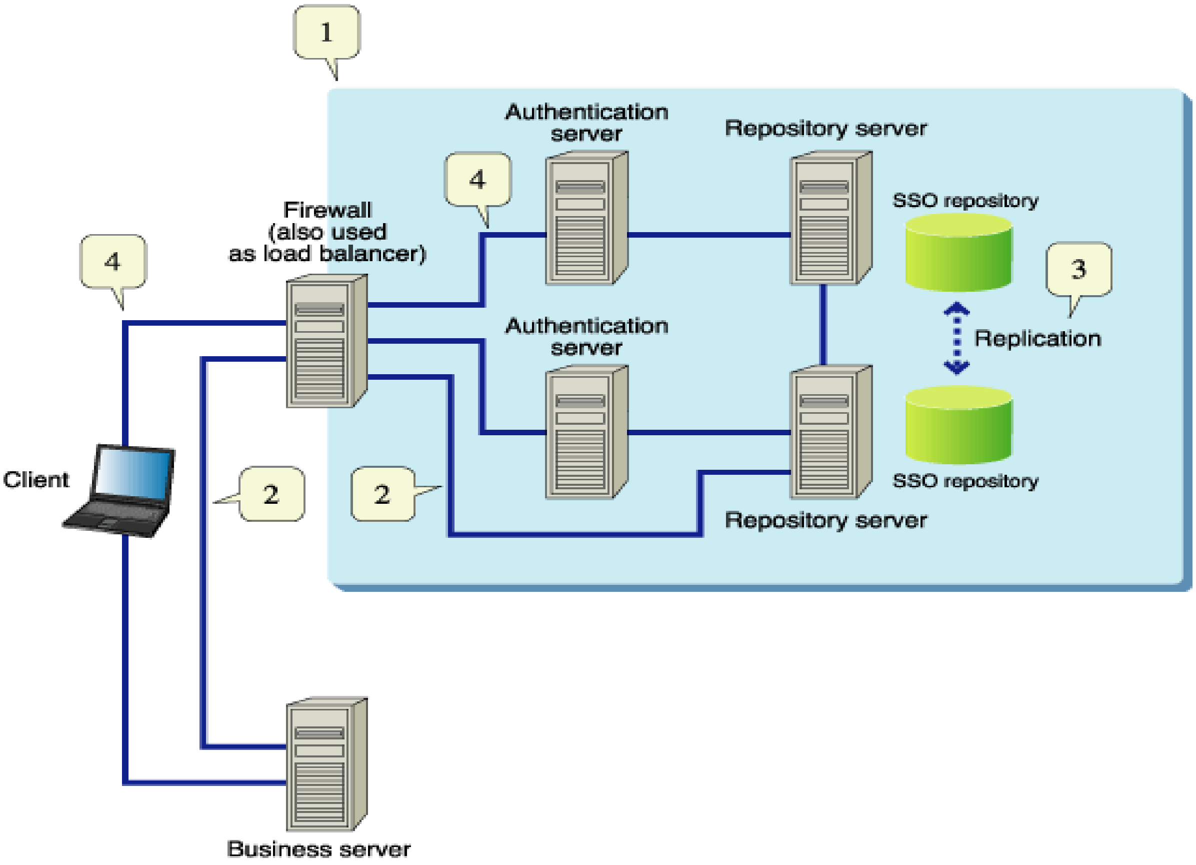


Figure 2-11 Interstage Single Sign-on Using a Firewall

1. A firewall is installed so that authentication servers and repository servers make up an independent, secure network.
2. The access control is set in the firewall so that accesses to repository servers through the firewall can be made only from the business server, and other accesses are blocked as invalid accesses.
3. Replication is secure because it is performed within the network protected by the firewall.
4. SSL communication is set for authentication servers to prevent electrical interception or alteration by encrypting communication from clients.

For an explanation of installing the firewall and setting filtering function, refer to the manual of the product in which the firewall is to be set up.

Table 2-9 lists an example of general filtering conditions common to the firewall products:

Table 2-9 Firewall Filtering Conditions

Service	Sender	Receiver	Processing
http (repository-server port number/tcp)	Business server	Repository server	Transmitting
https (authentication-server port number/tcp)	Client	Authentication server	Transmitting
domain-udp (port number: 53/udp)	Authentication server	DNS server	Transmitting

Chapter 3

Environment Setup (Business Server Administrators)

This chapter explains the flow of, and method for, setting up the business system environment.

Use the Interstage Management Console to set up the Interstage Single Sign-on environment. Refer to the Operator’s Guide for details of starting the Interstage Management Console. Refer to the Operator’s Guide for details of the items to be defined in the Interstage Management Console.

Notes

- Refer to the Security System Guide for information on how to set up and operate the system.
- Administrator's authority is required to set up the business system environment.

Environment Setup Flow

This section explains how to add a business system. Refer to “Registering a Business System” for further information.

Figure 3-1 shows the flow of environment setup as follows:

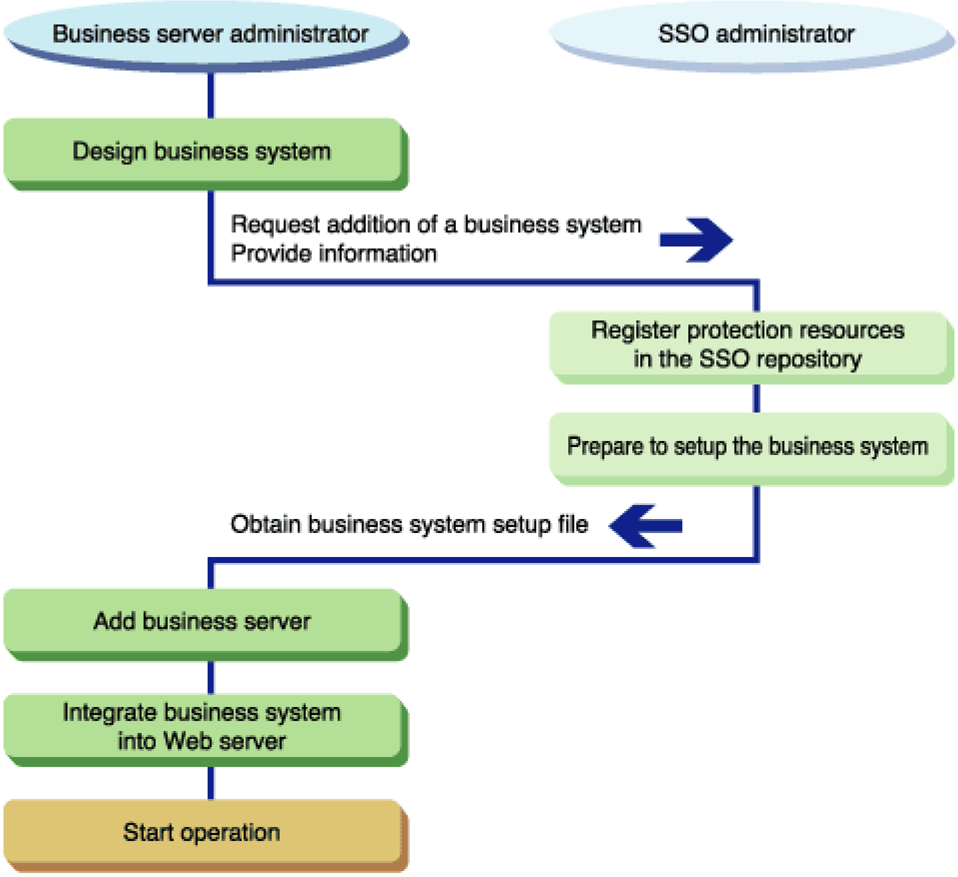

Business server administrator
SSO administrator
Design business system
Request addition of a business system
Provide information
Register protection resources in the SSO repository
Prepare to setup the business system
Obtain business system setup file
Add business server
Integrate business system into Web server
Start operation

Figure 3-1 Environment Setup Flow

Remarks

To add a business system, you need to setup the target Web system and the Web services (all services other than authentication and authorization) in advance:

- To operate the business system using SSL communication, configure the settings for SSL communication.
- Set the port number for the Web server.
- Prepare and setup Web services and Web contents.
- Configure the Web system and Web services for operation.

For details regarding the set up of Web system and Web service environments, refer to the Web server manual.

The configuration spread sheet (Excel file) for business systems is also provided to support the calculation of connection information between servers to be set up on the Internet Management Console during setup of the business system environment.

For details about the configuration spreadsheet for business systems, refer to “Using the Configuration Spreadsheet for Business Systems.”

Environment Setup Flow by Case

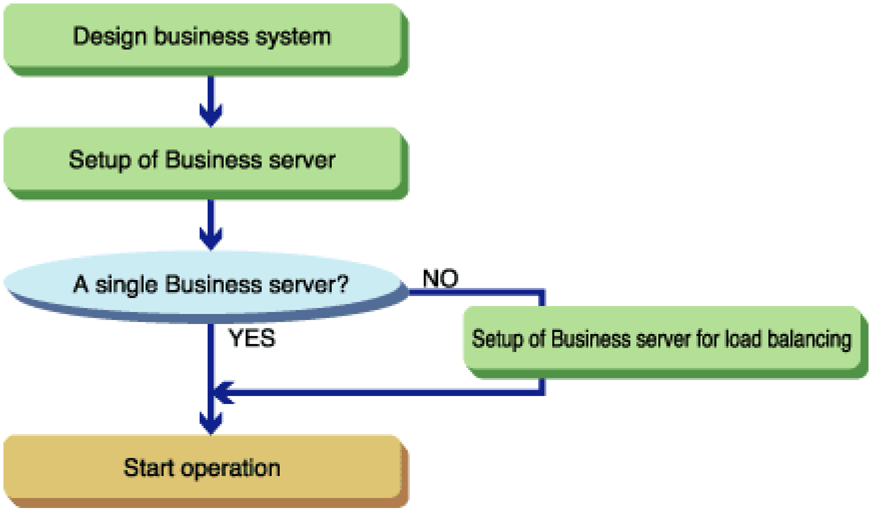

Design business system
Setup of Business server
A single Business server?
NO
YES
Setup of Business server for load balancing
Start operation

Figure 3-2 Environment Setup Flow by Case

The stages required to set up the environment according to the operating mode is listed in table 3-1.

Table 3-1 Environment Setup According to Operating Mode

System configuration	Setting up a business server on a server	Setting up business servers on multiple servers	Adding a business server to the set up business system
Designing a business system	Designing a business system.	Designing a business system.	
Setting up the first business server	Setting up the first business server.	Setting up the first business server.	
	Integrating into the Web server	Integrating into the Web server	

System configuration	**Setting up a business server on a server**	**Setting up business servers on multiple servers**	**Adding a business server to the set up business system**
Setting up the second and subsequent business servers		Setting up the second and subsequent business servers for load balancing.	Setting up the second and subsequent business servers for load balancing.
		Integrating into the Web server	Integrating into the Web server
Using the configuration spread sheet for business systems as required.	Using the configuration spreadsheet for the business system “SSO_Business.xls”	Using the configuration spreadsheet for the business system “SSO_Business.xls”	

Using the Configuration Spreadsheet for Business Systems

The configuration spreadsheet (Excel file) for business systems is provided to support the calculation of connection information between servers during setup of the business system environment when using the Internet Management Console. Access and run the file from the following storage destination, as required. For details about how to use the file, refer to [Procedure for Use] in this spreadsheet.

File Name and Storage Destination of Configuration Spreadsheet for Business Systems

File name of configuration spreadsheet for business systems

SSO_Business.xls

Storage destination of configuration spreadsheet for business systems

Folder "ApplicationServer\tuning" of Manual CD

Conditions for Using the Business System Configuration Spreadsheet

The business system configuration spreadsheet supports Microsoft(R) Excel 2000 and Microsoft(R) Excel 2002. Ensure that Microsoft(R) Excel 2000 or Microsoft(R) Excel 2002 is installed on your computer.

This spreadsheet uses a macro. Set the Microsoft(R) Excel security level beforehand to enable this macro. Refer to Help for Microsoft(R) Excel for details of how to set the security level.

Contact your system administrator before changing the Microsoft(R) Excel security level.

The following procedure can be used for setting and enabling the macro security level in Microsoft(R) Excel 2002:

1. From Microsoft(R) Excel 2002 select [Macros], then [Security] from the Tool menu to display the macro security setting window.
2. Select [Medium] on the [Security level] page and click OK.
3. Close Microsoft(R) Excel and restart.
4. From the menu bar, select Open from the File menu and choose the business system configuration spreadsheet.
5. The dialog box asks if you want to enable the macro. Click [Enable macro].

After using this spreadsheet, restore the security level as necessary.

Designing a Business System

The business system administrator must clarify and report the following items to the SSO administrator when adding a business system to the Interstage Single Sign-on:

- Business system public URL
- Path configuration to be authenticated
- Whether to use SSL communication
- Whether to use Interstage Portalworks linkage
- Interstage version and edition

If the business system does not support SSL, the SSO administrator must check whether a non-SSL connection is permitted.

Caution

Interstage Single Sign-on controls access to protect resources in the business server. However, if the business server is not operated in SSL communication mode, the protected resources may be tapped from the network. Operating the business server in SSL communication mode enables the communication contents to be encrypted and protected from tapping. It is strongly recommended to operate the business server in SSL communication mode.

Notes

- Interstage Single Sign-on disables change of the business system public URL being operated. If the public URL is to be changed, the business system must be set up again.
- To set up a business system that links with Application Gateway and can be accessed from clients only on the Internet, prevent all the first hierarchies of the URL path of the business system from being the same as those of other business systems. The root path (“/”) of the business system cannot be accessed from the clients. For details, refer to “Linkage with Application Gateway.”

Setting up Business Servers

This section explains the procedure for setting up business servers. The Interstage Management Console is used to add business servers.

Setting up the First Business Server

The SSO administrator (who has completed registration of a business system), notifies the business server administrator regarding the business system setup file and its password.

The business server administrator uses the business system setup file to add a business server.

The Interstage Management Console (for the server on which the business server is to be set up) is used to take the following steps. For details about the items defined on the Interstage Management Console, refer to the Operator's Guide.

Windows

1. Select [Security] > [Single Sign-on] > [Business system] and the [Addition of Business server] tab from the System menu.
2. Enter the required items in [Server Settings].
3. Specify the [Business system setup file] and [Password of file] as supplied by the SSO administrator.
4. If Interstage HTTP Server is not being used, select [Others (Excluding Interstage HTTP Server)] for [Web server to use] and set [Port number].
5. To update access control information automatically when the business server is started, select [Execute when Business server is started] for [When updating Access Control Information?].
6. Click the [Add] button to display a list of servers.
7. Check the name of the added business system, port number, and business system public URL.
8. To use linkage with Interstage Portalworks, select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Settings] tab to click [Detailed Settings [Show]]. Specify "No" for [Enable Client IP Address Check?] in [Authentication Information Settings] and "Yes" for [Notify User Information?] in [Linkage with Web applications], then click the [Update] button.
9. Delete the business system setup file.

Note

- Multiple types of Web servers can be used as the business servers for Single Sign-on in one system.
  - Multiple InfoProvider Pro servers can be started and operated as business servers.
  - The following Web servers can be operated concurrently as business servers:
    - Interstage HTTP Server
    - InfoProvider Pro

  - Microsoft(R) Internet Information Service

- If multiple types of Web servers are to be used as business servers for Single Sign-on on one system, assign a different name to the access log file of each business server. If the same file name is assigned, the access log cannot be collected normally.
- If “multi-host” of InfoProvider Pro is to be used, define the Web server and business server so that a port number is not doubly specified in one system.
- If Microsoft(R) Internet Information Services are to be used, operation using multiple sites is not supported.

Set up a business server for Single Sign-on for only one site. If it is set up for multiple sites, it is access controlled for only the first site accessed after the Web server is started.

- If Microsoft(R) Internet Explorer is used as a Web browser, a business system setup file with an absolute path name exceeding 200 bytes in length may not be able to be specified using the Browse button. In this case, allocate the business system setup file so that the absolute path is sufficiently short.
- If Interstage HTTP Server is to be used, operation using the virtual host function of Interstage HTTP Server is not supported.

If a business server is set up for the port number to be used by the virtual host function, it is not access controlled.

- When a business server is started, the configurations of all business servers on the same system are checked for errors. If one of the configurations is invalid, information is output to the system log. In this case, the Web server starts, but returns the message “500 Internal Server Error” for all accesses from the user.
- The business system setup file is important for security. After the business server has been set up, ensure that the business system setup file is deleted.

Solaris OE

1. Select [System] > [Security] > [Single Sign-on] > [Business system] > [Addition of Business server] tab.
2. Enter the required items in [Server Settings].
3. Specify the [Business system setup file] and [Password of file] as supplied by the SSO administrator.
4. If Interstage HTTP Server is not being used, select [Others (Excluding Interstage HTTP Server)] for [Web server to use] and set [Port number].

   If [Others (Excluding Interstage HTTP Server)] has been selected, set the effective user name of the Web server. For details about the effective user name, refer to “To change the effective user name of the Web server for the business server.”
5. To update access control information automatically when the business server is started, select [Execute when Business server is started] for [When updating Access Control Information?].
6. Click the [Add] button.
7. A list of servers is displayed. Check the name of the added business system, port number, and business system public URL.

8. To use linkage with Interstage Portalworks, select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Settings] tab to click [Detailed Settings [Show]]. Set [Enable Client IP Address Check?] in [Authentication Information Settings] to “No” and [Notify User Information?] in [Linkage with Web applications] to “Yes,” then click the [Update] button.
9. Delete the business system setup file.

Note

- Multiple types of Web servers can be used as business servers for Single Sign-on in one system. To use multiple types of Web servers, be sure to make the effective user name of the Web servers the same. For details about the effective user name of Web server, refer to “To Change Effective User of Web Server for Business Server”
  - Multiple InfoProvider Pro servers can be started and operated as business servers.
  - Interstage HTTP Server, InfoProvider Pro, and Sun ONE Web Server, Enterprise Edition can be operated concurrently as business servers.
- If multiple types of Web servers are to be used as business servers for Single Sign-on on one system, assign a different name to the access log file of each business server. If the same file name is assigned, the access log cannot be collected normally.
- If “multi-host” of InfoProvider Pro is to be used, define the Web server and business server so that a port number is not doubly specified in one system.
- If Sun ONE Web Server Enterprise Edition is to be used, operation using the virtual server is not supported.

If access control for Single Sign-on is set up for the virtual server, it is not access controlled normally.

- If Microsoft(R) Internet Explorer is used as a Web browser, a business system setup file with an absolute path name exceeding 200 bytes in length, may not be able to be specified using the Browse button. In this case, allocate the business system setup file so that the absolute path is sufficiently short.
- If Interstage HTTP Server is to be used, operation using the virtual host function of Interstage HTTP Server is not supported.

If a business server is set up for the port number to be used by the virtual host function, it is not access controlled.

- When a business server is started, the configurations of all business servers on the same system are checked for errors. If one of the configurations is invalid, information is output to the system log. In this case, the Web server starts, but returns the message “500 Internal Server Error” for all accesses from the user.
- The business system setup file is important for security. After the business server has been set up, ensure that the business system setup file is deleted.

Linux

1. Select [System] > [Security] > [Single Sign-on] > [Business system] > [Addition of Business server] tab.
2. Enter the required items in [Server Settings].
3. Specify the [Business system setup file] and [Password of file] as supplied by the SSO administrator.

4. To update access control information automatically when the business server is started, select [Execute when Business server is started] for [When updating Access Control Information?].
5. Click the [Add] button.
6. A list of servers is displayed. Check the name of the added business system, port number, and business system public URL.
7. To use linkage with Interstage Portalworks, select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Settings] tab to click [Detailed Settings [Show]]. Specify “No” for [Enable Client IP Address Check?] in [Authentication Information Settings] and “Yes” for [Notify User Information?] in [Linkage with Web applications], then click the [Update] button.
8. Delete the business system setup file.

Notes

- Only one Web server (Interstage HTTP Server) can be used as the business server for Single Sign-on in one system.
- If Microsoft(R) Internet Explorer is used as a Web browser, a business system setup file with an absolute path name that exceeds 200 bytes in length, may not be able to be specified by using the Browse button. In this case, allocate the business system setup file so that the absolute path is sufficiently short.
- If Interstage HTTP Server is to be used, operation using the virtual host function of Interstage HTTP Server is not supported.

  If a business server is set up for the port number to be used by the virtual host function, it is not access controlled.
- When a business server is started, the configurations of all business servers on the same system are checked for errors. If one of the configurations is invalid, information is output to the system log. In this case the Web server starts, but returns the message “500 Internal Server Error” for all accesses from the user.
- The business system setup file is important for security. After the business server has been set up, ensure that the business system setup file is deleted.

Setting up the Second and Subsequent Business Servers for Load Balancing

This section explains how to add business servers for load balancing.

If a load balancer (such as Interstage Traffic Director) is used to distribute business server load, the second and subsequent servers must be configured with the same environment as the first server.

Interstage Single Sign-on provides the ssocloneaz command to set up business servers with the same environment.

The ssocloneaz command also replicates messages to be displayed in a Web browser. Before making a replicate of business server, customize messages. For details about how to customize messages to be displayed in a Web browser, refer to “Customizing Messages Displayed on a Web Browser”.

The following procedure describes how to use the ssocloneaz command to migrate the environment of the existing business server (replication source server) to the new business server (replication destination server). For details about the ssocloneaz command, refer to “Single Sign-on Operation Commands” in the Reference Manual (Command Edition).

Preparation before Load Balancing

When adding a new load balancer (such as Interstage Traffic Director) to an existing business system:

- Set the host name of the installed business server in the load balancer (such as Interstage Traffic Director) so that the business system public URL is not changed. For details about the business system public URL, refer to “Business System Public URL”.

For details about Interstage Traffic Director, refer to the Interstage Traffic Director manual.

Preparing the Replication Destination Server

1. Prepare a server that contains Interstage with the same platform, version, edition, and install directory as the replication source server.

   The Interstage Single Sign-on in the replication destination server must be in the status immediately after installation.

2. If the business system setup file notified from the SSO administrator is invalid, all business servers to be added for load balancing purpose are re-created. Therefore, before fetching the environment information about the business server, confirm that the access from the client is correctly authenticated and authorized in the replication source server.

Fetching Environment Information

1. Execute the ssocloneaz command using the -p option in the replication source server to fetch environment information about the business server.

2. Transfer the environment information fetched in the above Step 1 to the replication destination server.

   Transfer the environment information carefully so that the third party does not tap it. During transfer, do not change the permission of the environment information file fetched in the above Step 1.

Setting up the Replication Destination Server Environment

1. Execute the ssocloneaz command using the –c option in the replication destination server to replicate the business server environment.

2. Replicate the environment of the Web server with the same version on the replication destination server so that the Web system, Web service, and replication source server environments are the same.

3. If Interstage HTTP Server is used, select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Settings] tab, and then click the [Update] button.

4. Delete the environment information file for the business server.

Notes

- If business server load is to be distributed, the version, edition, and install directory of Interstage Single Sign-on for multiple business servers must be the same.

- The load balancer must be set up so that the requests from a particular client transfer to the relevant authentication servers.

- Configure the following settings when the load balancer is Interstage Traffic Director
  - Operation Mode: bridge
  - Measure of load Balancing and uniqueness of connection: Balancing for each node
- The environment information file for business server is important for security. After the business server is set up, be sure to delete the environment information file.

Integrating into the Web Server

Business server is integrated into a Web server.

Use the procedure of your Web server to install a business server and restart the Web server. For details about how to start a Web server, refer to “Starting a Business Server.”

Windows Solaris OE

To use multiple Web servers on one server, integrate a business server in all Web servers to be used as the business system for Single Sign-on.

Integrating into Interstage HTTP Server

If Interstage HTTP Server is used, the Interstage Single Sign-on module is automatically integrated into Interstage HTTP Server.

However the Interstage Single Sign-on module is only automatically integrated into Interstage HTTP Server when the port number specified in the Business system public URL and the port number used by Interstage HTTP Server, match.

Integrating into InfoProvider Pro

To use InfoProvider Pro, edit the environment configuration file for InfoProvider Pro.

Environment Configuration File Name and Storage Destination

Environment configuration file name

Windows

F3FMwww.dat(*1)

Solaris OE

HTTPD.conf(*1)

Environment configuration file name

Windows

C:\Interstage\F3FMwww\conf

Solaris OE

/etc/opt/FSUNprovd(*1)

*1 The configuration file name can be changed.

Table 3-2 Environment configuration file for InfoProvider Pro

Item name	Contents
hostname	Set the host name of the server to which a business server has been added. The name (FQDN) registered in Domain Name System (DNS) must be specified for the host name. The IP address cannot be set.
filter-file	Set the business server program with the absolute path. Windows filter-file: C:\Interstage\F3FMsso\ssoatzag\lib\F3FMssoatzipp.dll Solaris OE filter-file: /opt/FJSVssoaz/lib/ssoatzipp.so

Example

Windows

```
hostname: test.fujitsu.com
filter-file: C:\Interstage\F3FMsso\ssoatzag\lib\F3FMssoatzipp.dll
```

Solaris OE

```
hostname: test.fujitsu.com
filter-file: /opt/FJSVssoaz/lib/ssoatzipp.so
```

To use the multihost function of InfoProvider Pro to operate a business server, set the above items for each environment configuration file for InfoProvider Pro.

Integrating into Sun ONE Web Server Enterprise Edition 4.1

To use Sun ONE Web Server Enterprise Edition 4.1, edit the environment configuration file for Sun ONE Web Server.

The following shows the items to be added to the environment configuration file for Sun ONE Web Server as required for operation of a business server.

Environment Configuration File Name and Storage Destination

Environment configuration file name

obj.conf

Storage destination of environment configuration file

/usr/netscape/server4/https-INSTANCE_NAME/config(*1)

*1 https-INSTANCE_NAME is the name of the server set up as a server by the user. It becomes https-www.fujitsu.com if the server name is https-www.fujitsu.com

/usr/netscape/server4/https-www.fujitsu.com/config/obj.conf

Table 3-3 Sun ONE Web Server EE 4.1 environment configuration file

Item name	Contents
Init	Create two settings for initialization of a business server. [First] Specify “load-modules” for the fn argument. Specify “/usr/lib/ssoatzipl.so” for the shlib argument. Specify “GetFilterVersion,HttpFilterProc,sso_error” for the funcs argument. [Second] Specify “GetFilterVersion” for the fn argument. Specify “yes” for EarlyInit. Specify the settings as follows: Init fn="load-modules" shlib="/usr/lib/ssoatzipl.so" funcs="GetFilterVersion,HttpFilterProc,sso_error" Init fn="GetFilterVersion" EarlyInit=yes
NameTrans	Specify “HttpFilterProc” for the fn argument as follows: NameTrans fn="HttpFilterProc"
Error	Specify “sso_error” for the fn argument as follows: Error fn="sso_error"

Example

```
Init fn="load-modules" shlib="/usr/lib/ssoatzipl.so"
funcs="GetFilterVersion,HttpFilterProc,sso_error"
Init fn="GetFilterVersion" EarlyInit=yes(*2)

<Object name=default>
NameTrans fn="HttpFilterProc"(*3)
Error fn="sso_error"
...
</Object>
```

*2 Code the initialization (Init) command for a business server in the first line of obj.conf.

*3 Code the “NameTrans fn=”HttpFilterProc” command at the beginning of <Object name=default>. Code the Error fn=”sso_error” command after NameTrans fn=”HttpFilterProc.”

For details about the environment configuration file for Sun ONE Web Server, refer to “NSAPI Programmer’s Guide for Sun ONE Web Server” in the Sun ONE Web Server manual.

Integrating into Sun ONE Web Server Enterprise Edition 6.0

To use Sun ONE Web Server Enterprise Edition 6.0, edit the environment configuration file for Sun ONE Web Server.

The following shows the items to be added to the environment configuration file, for Sun ONE Web Server required for operation as a business server.

Environment Configuration File Name and Storage Destination

Environment configuration file name

magnus.conf
obj.conf

Storage destination of environment configuration file

/usr/iplanet/servers/https-INSTANCE_NAME/config(*1)

*1 https-INSTANCE_NAME is the name of the server set up by the user. For example, it becomes https-www.fujitsu.com if the server name is https-www.fujitsu.com

/usr/iplanet/servers/https-www.fujitsu.com/config/magnus.conf

Table 3-4 Settings for initialization of a business server

Item name	Contents
Init	There are two settings for initialization of a business server. [First] Specify “load-modules” for the fn argument. Specify “/usr/lib/ssoatzipl.so” for the shlib argument. Specify “GetFilterVersion,HttpFilterProc,sso_error” for the funcs argument. [Second] Specify “GetFilterVersion” for the fn argument. Specify “yes” for EarlyInit. Specify the settings as follows: Init fn=load-modules shlib="/usr/lib/ssoatzipl.so" funcs="GetFilterVersion,HttpFilterProc,sso_error" Init fn="GetFilterVersion" EarlyInit=yes

Example

```
Init fn="load-modules" shlib="/usr/lib/ssoatzipl.so"
funcs="GetFilterVersion,HttpFilterProc,sso_error"
Init fn="GetFilterVersion" EarlyInit=yes(*2)
```

*2 Code the initialization (Init) command for a business server in the first line of magnus.conf.

/usr/iplanet/servers/https-www.fujitsu.com/config/obj.conf

Table 3-5 Environment configuration file settings

Item name	Contents
NameTrans	Specify “HttpFilterProc” for the fn argument. Specify the setting as follows: NameTrans fn="HttpFilterProc"
Error	Specify “sso_error” for the fn argument. Specify the setting as follows: Error fn="sso_error"

Example

```
<Object name=default>
NameTrans fn="HttpFilterProc"(*3)
Error fn="sso_error"
...
</Object>
```

*3 Code the NameTrans fn=”HttpFilterProc” command at the beginning of <Object name=default>.
Code the Error fn=”sso_error” command after NameTrans fn=”HttpFilterProc.”

For details about the environment configuration file for Sun ONE Web Server, refer to “NSAPI Programmer’s Guide for Sun ONE Web Server” in the Sun ONE Web Server manual.

Notes

In the following cases, Sun ONE Web Server 6.0 cannot be started:

- The environment configuration for the business server is invalid or resource shortage occurs.
- The “/” (root path) is registered for protection resource.

To ensure that Sun ONE Web Server 6.0 can be started, comment out the servlet configurations of magnus.conf and obj.conf of Sun ONE Web Server 6.0 according to the examples below.
If the servlet configurations are commented out, servlet operation cannot be done under Sun ONE Web Server 6.0.

Example

Examples of magnus.conf and obj.conf that have been set immediately after installation of Sun ONE Web Server 6.0 are used to explain how to comment out the servlet configurations.

Example of magnus.conf

```
#Init fn="load-modules"
shlib="/usr/iplanet/servers/bin/https/lib/libNSServletPlugin.so"
funcs="NSServletEarlyInit,NSServletLateInit,NSServletNameTrans,
NSServletService" shlib_flags="(global|now)"
#Init fn="NSServletEarlyInit" EarlyInit=yes
#Init fn="NSServletLateInit"  LateInit=yes
```

Example of obj.conf

```
#NameTrans fn="NSServletNameTrans" name="servlet"
#NameTrans fn="pfx2dir" from="/servlet" dir="$docroot/servlet"
name="ServletByExt"
#Service type="magnus-internal/jsp" fn="NSServletService"
#<Object name="servlet">
#ObjectType fn=force-type type=text/html
#Service fn="NSServletService"
#</Object>
#<Object name="jsp092">
#ObjectType fn="type-by-extension"
#ObjectType fn="change-type" type="magnus-internal/jsp092" if-type="magnus-
internal/jsp"
#Service fn="NSServletService" type="magnus-internal/jsp092"
#</Object>
#<Object name="ServletByExt">
#ObjectType fn=force-type type=magnus-internal/servlet
#Service type="magnus-internal/servlet" fn="NSServletService"
#</Object>
```

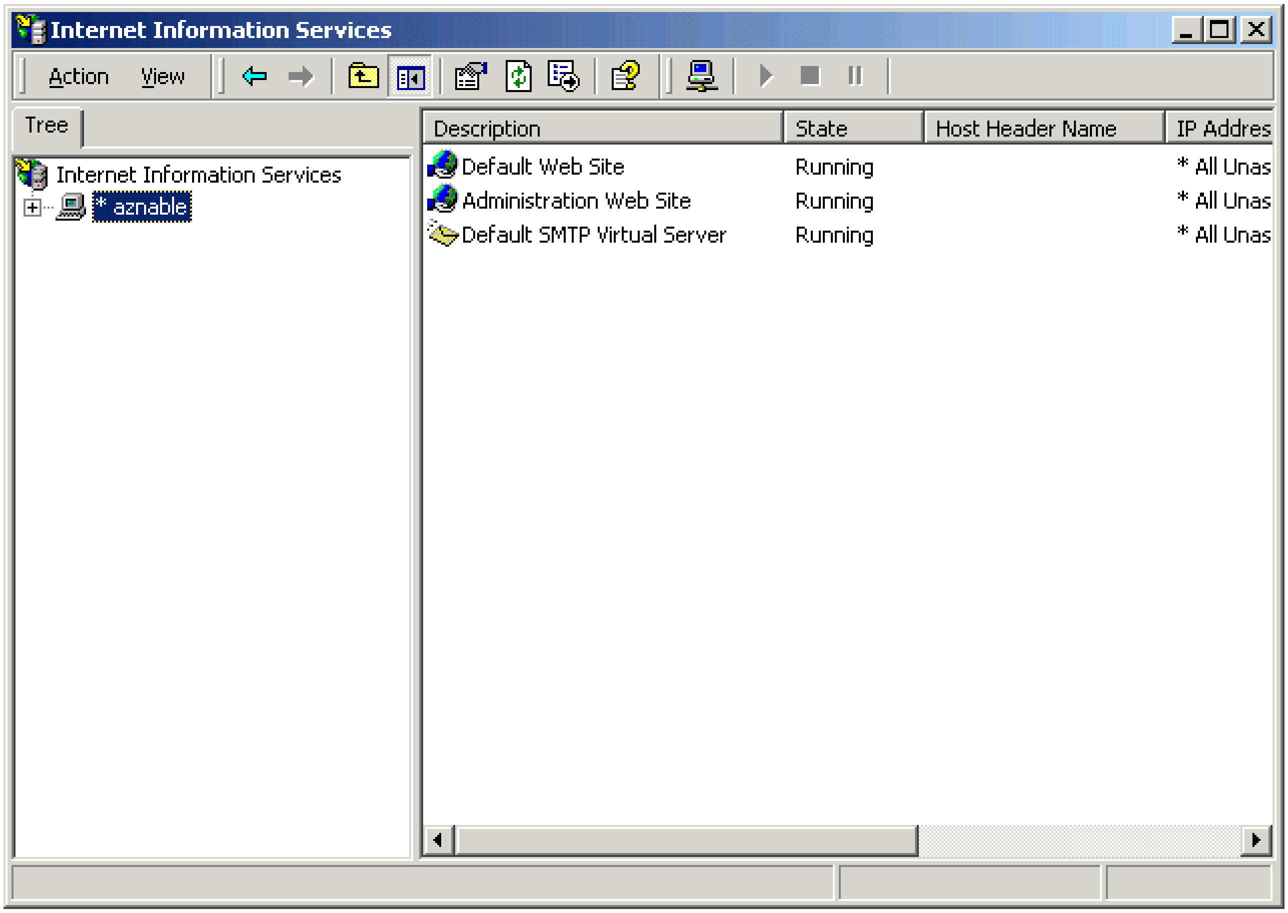
If invalid environment configuration for business server, and resource shortage have been removed, or “/” (root path) for protection resource has been deleted, return the servlet configurations commented out (according to the above examples) to their original state. Servlets can be operated.

If the protection resource has been changed, update access control information. For details about how to update access control information, refer to “Updating Access Control Information”.

Microsoft(R) Internet Information Services 5.0 and 6.0

This section explains the procedure for installing a business server in Microsoft(R) Internet Information Services (IIS). In this example Microsoft(R) Windows(R) 2000 Server is used to explain the procedure for installing a business server in the Web site used under Microsoft(R) Internet Information Services 5.0.

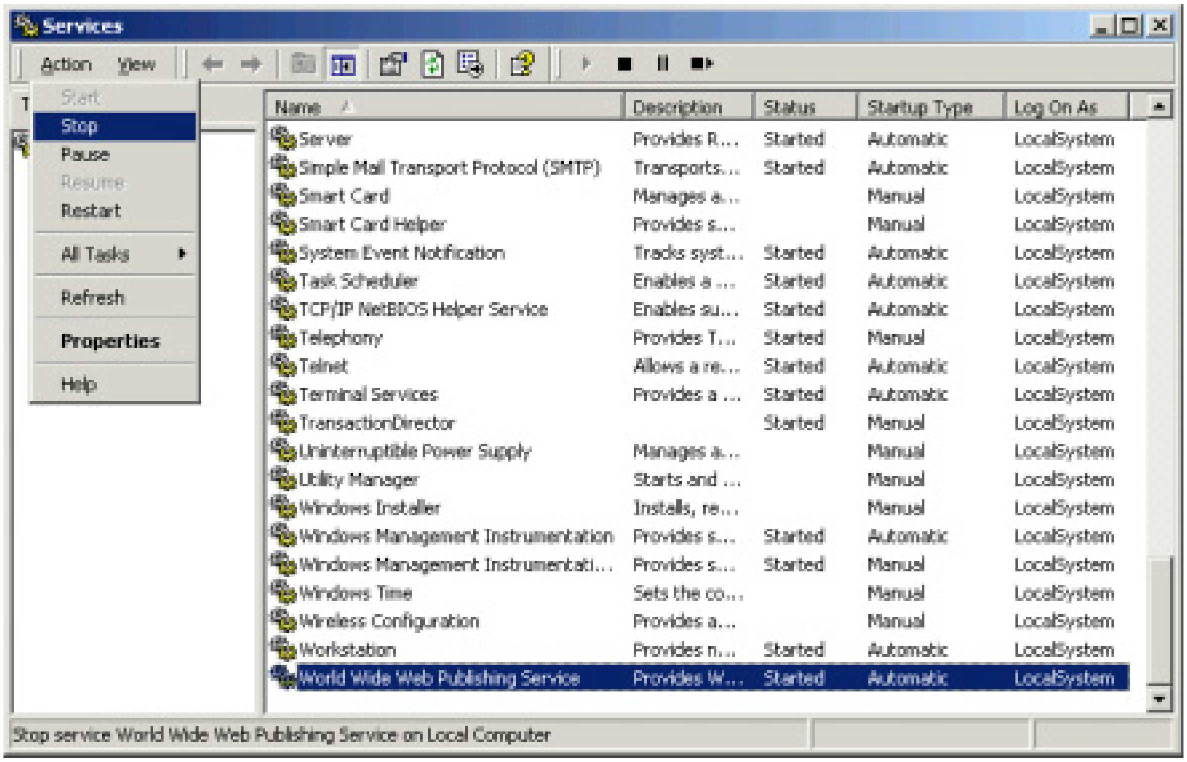
1. Select [Start] > [Programs] > [Administrative Tools] > [Internet Services Manager].



Description	State	Host Header Name	IP Addres
Default Web Site	Running		* All Unas
Administration Web Site	Running		* All Unas
Default SMTP Virtual Server	Running		* All Unas

Figure 3-3 Internet Service Manager

2. If Microsoft(R) Internet Information Services is running, stop it. To stop Microsoft(R) Internet Information Services, select [Start] > [Programs] > [Administrative Tools] > [Services], select [World Wide Web Publishing Service] from the window, and select [Action]. Then, select [Stop] from the list.



Name	Description	Status	Startup Type	Log On As
Server	Provides R...	Started	Automatic	LocalSystem
Simple Mail Transport Protocol (SMTP)	Transports...	Started	Automatic	LocalSystem
Smart Card	Manages a...		Manual	LocalSystem
Smart Card Helper	Provides s...		Manual	LocalSystem
System Event Notification	Tracks syst...	Started	Automatic	LocalSystem
Task Scheduler	Enables a ...	Started	Automatic	LocalSystem
TCP/IP NetBIOS Helper Service	Enables su...	Started	Automatic	LocalSystem
Telephony	Provides T...	Started	Manual	LocalSystem
Telnet	Allows a re...	Started	Automatic	LocalSystem
Terminal Services	Provides a ...	Started	Automatic	LocalSystem
TransactionDirector		Started	Manual	LocalSystem
Uninterruptible Power Supply	Manages a...		Manual	LocalSystem
Utility Manager	Starts and ...		Manual	LocalSystem
Windows Installer	Installs, re...		Manual	LocalSystem
Windows Management Instrumentation	Provides s...	Started	Automatic	LocalSystem
Windows Management Instrumentati...	Provides s...	Started	Manual	LocalSystem
Windows Time	Sets the co...		Manual	LocalSystem
Wireless Configuration	Provides a...		Manual	LocalSystem
Workstation	Provides n...	Started	Automatic	LocalSystem
World Wide Web Publishing Service	Provides W...	Started	Automatic	LocalSystem

Stop service World Wide Web Publishing Service on Local Computer

Figure 3-4 Stop Microsoft IIS

3. Select the Web site into which a business server is to be integrated.

   In the following example a business server is integrated into the Web site called “Business server.”

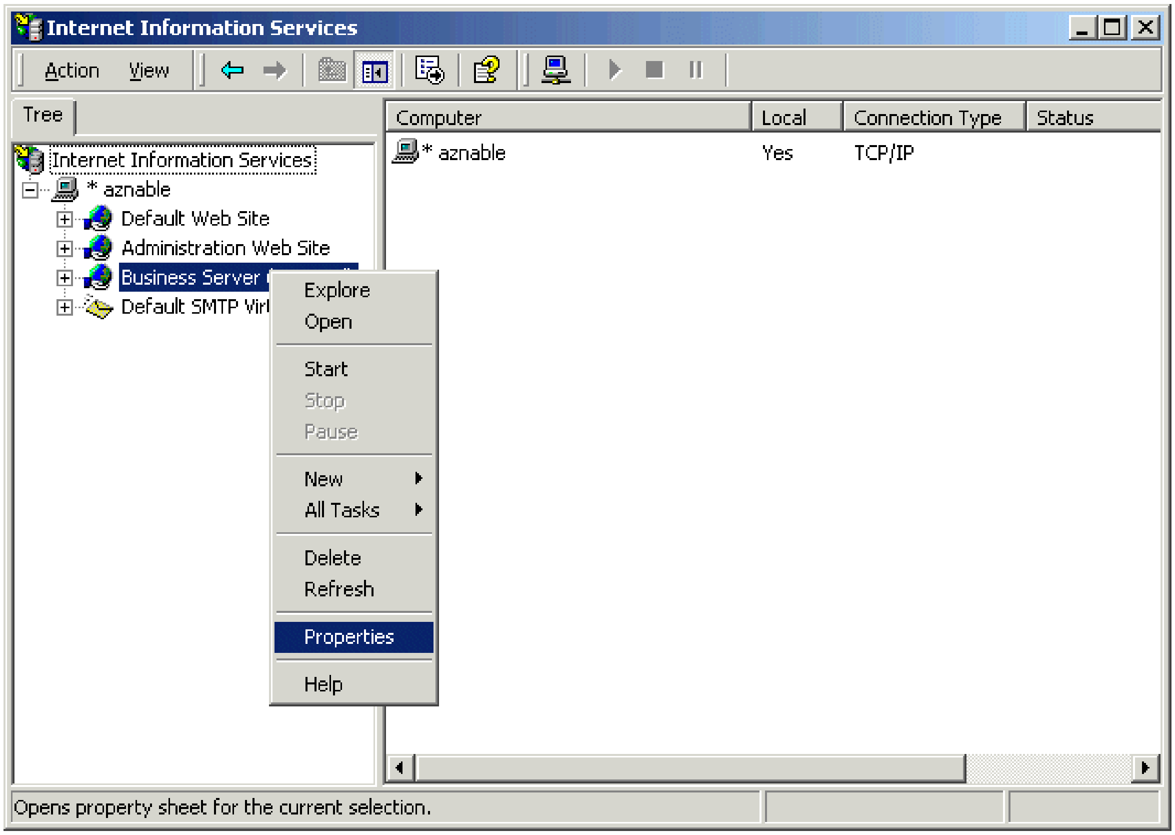
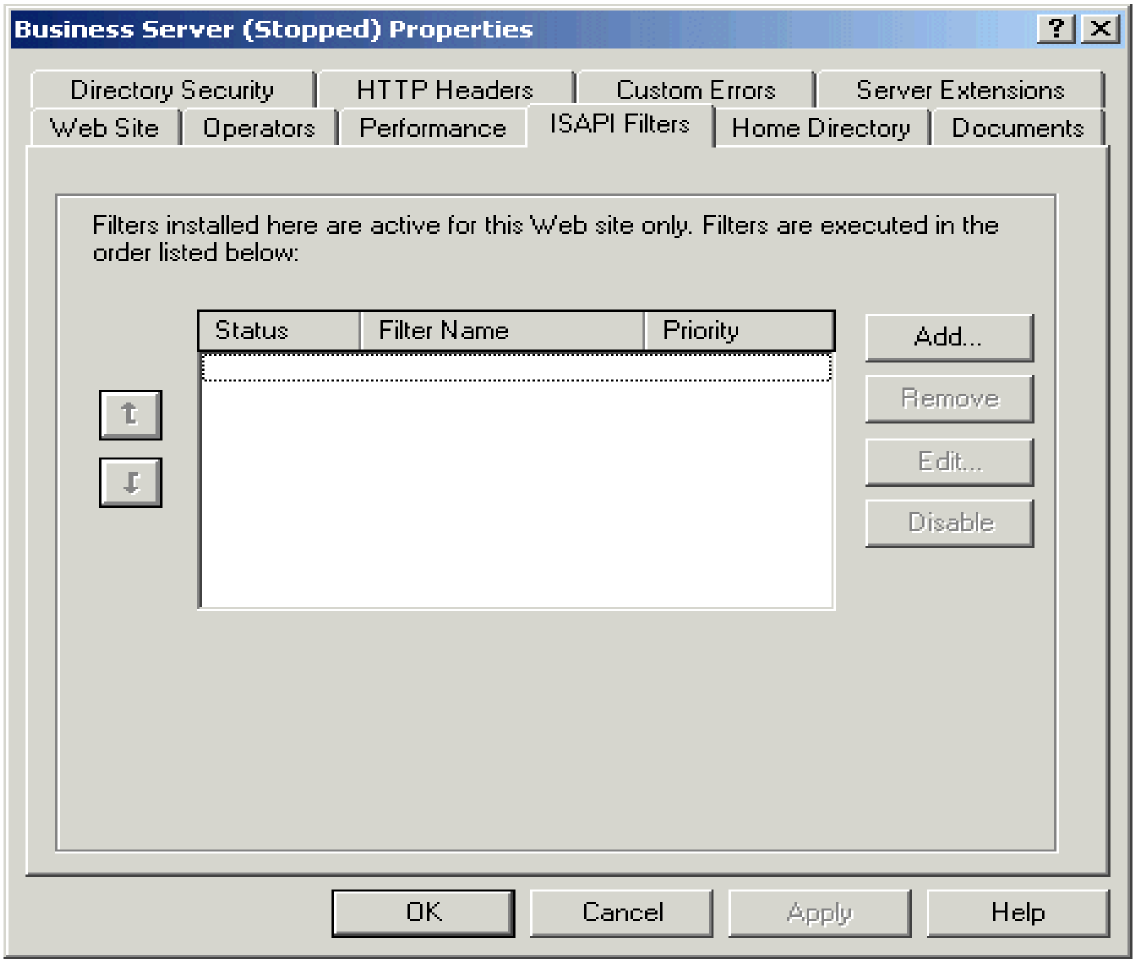


Figure 3-5 Select a Web Site for Integration

4. Select Properties to open the property sheet. Select the [ISAPI Filters] tab, and then click the Add button.

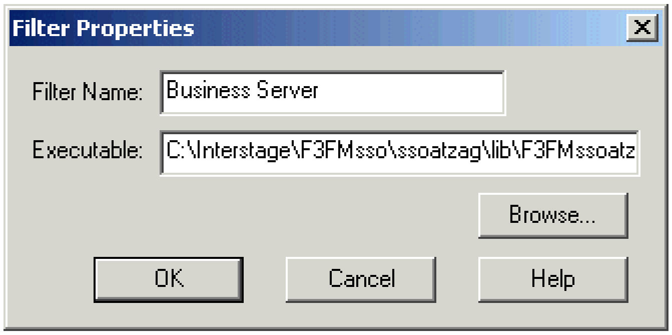


Filters installed here are active for this Web site only. Filters are executed in the order listed below:

Figure 3-6 Select Properties

5. Enter a filter name, and specify the business server program with an absolute path name for the executable file.

   In the following example, “Business server” is specified for filter name and “C:\Interstage\F3FMsso\ssoatzag\lib\F3FMssoatziis.dll” for executable file.

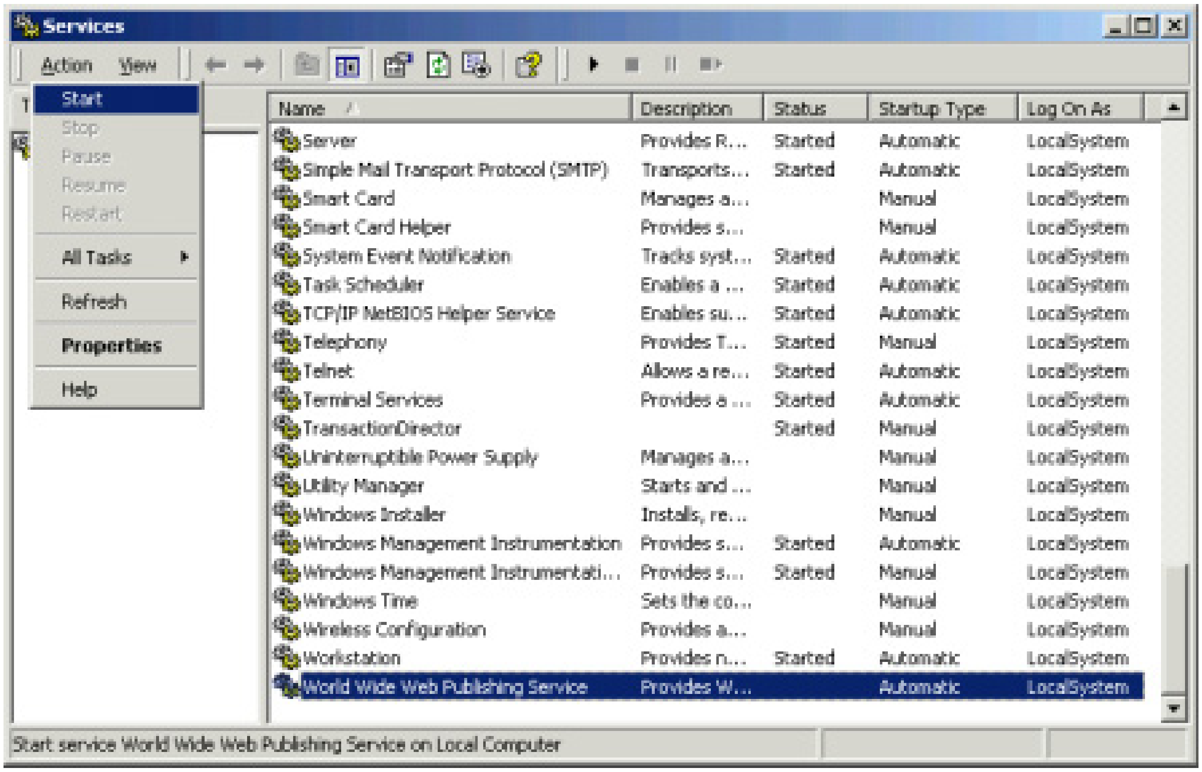


Filter Name: Business Server

Executable: C:\Interstage\F3FMsso\ssoatzag\lib\F3FMssoatz

Figure 3-7 Specify Business Server

6. After the settings have been made, click the [OK] button to start Microsoft(R) Internet Information Services. To start, select [Start] > [Programs] > [Administrative Tools] > [Services], select [World Wide Web Publishing Service] from the window, and select [Action]. Then, select [Start] from the list.



Name	Description	Status	Startup Type	Log On As
Server	Provides R…	Started	Automatic	LocalSystem
Simple Mail Transport Protocol (SMTP)	Transports…	Started	Automatic	LocalSystem
Smart Card	Manages a…		Manual	LocalSystem
Smart Card Helper	Provides s…		Manual	LocalSystem
System Event Notification	Tracks syst…	Started	Automatic	LocalSystem
Task Scheduler	Enables a …	Started	Automatic	LocalSystem
TCP/IP NetBIOS Helper Service	Enables su…	Started	Automatic	LocalSystem
Telephony	Provides T…	Started	Manual	LocalSystem
Telnet	Allows a re…	Started	Automatic	LocalSystem
Terminal Services	Provides a …	Started	Automatic	LocalSystem
TransactionDirector		Started	Manual	LocalSystem
Uninterruptible Power Supply	Manages a…		Manual	LocalSystem
Utility Manager	Starts and …		Manual	LocalSystem
Windows Installer	Installs, re…		Manual	LocalSystem
Windows Management Instrumentation	Provides s…	Started	Automatic	LocalSystem
Windows Management Instrumentati…	Provides s…	Started	Manual	LocalSystem
Windows Time	Sets the co…		Manual	LocalSystem
Wireless Configuration	Provides a…		Manual	LocalSystem
Workstation	Provides n…	Started	Automatic	LocalSystem
World Wide Web Publishing Service	Provides W…		Automatic	LocalSystem

Start service World Wide Web Publishing Service on Local Computer

Figure 3-8 Start Microsoft IIS

For details regarding Microsoft(R) Internet Information Services sites, refer to “Help (H)” of “Internet Information Service” of Microsoft(R) Internet Information Services.

Note

To use Microsoft(R) Internet Information Services 6.0, operate it in IIS5.0 process isolation mode.

Setting the Access Permission for Operation Resources of a Web Server Used by a Business Server

The Web server used by a business server can use access log functions to record the request contents. These access logs contain important information that controls authentication and authorization of the users.

To ensure more trustworthy use, set the access permission for the business server to prevent its access log from leaking out.

This section explains how to set the access permission for the Web server access logs.

Windows

Only permit users who belong to the Administrators group and SYSTEM, to access the access log output destination folder.

Use Windows Explorer to set access permission for the folder, to users with Administrator permission.

The following table lists examples of access log output destinations. In this example, the access log output destinations may differ depending on the operating environment.

Table 3-6 Windows access log output destinations

Web server	Example of access log output folder
Interstage HTTP Server	C:\Interstage\F3FMihs\logs\
InfoProvider Pro	C:\Interstage\F3FMwww\log\
Microsoft(R) Internet Information Services	C:\WINNT\system32\LogFiles\W3SVC1\

For details about the settings for Microsoft(R) Internet Information Services, refer to “Help Topics (H)” in “Help (H)” for “Internet Information Service” of Microsoft(R) Internet Information Services.

Solaris OE

Permit only the owner and group to access the access log output destination directory. To set the access permission for the files and directory, use the chmod command and chown command.

Set the access permission as a super user (root).

Table 3-7 Solaris access log output destinations

Web server	Example of access log output destination directory
Interstage HTTP Server	/opt/FJSVihs/logs/
InfoProvider Pro	/var/opt/FSUNprovd/
Sun ONE Web Server Enterprise Edition	/usr/netscape/server4/https-server-name/logs/ (SunOne4) /usr/iplanet/servers/https-server-name/logs/ (SunOne6)

Linux

Permit only the owner and group to access the access log output destination directory. To set the access permission for the files and directory, use the chmod command and chown command.

Set the access permission as a super user (root).

Table 3-8 Linux access log output destinations

Web server	Example of access log output destination directory
Interstage HTTP Server	/opt/FJSVihs/logs/

Chapter 4

Operation and Maintenance

This chapter explains the operation and maintenance of Interstage Single Sign-on, including starting and stopping the system. It includes the following sections:

- Starting Single Sign-on
- Stopping Single Sign-on
- Changing Environment Settings
- User Related Operation
- Authorization-related Operation
- Maintenance Using Access Logs
- Operating Notes for Large Systems

Starting Single Sign-on

This section explains how to start the servers.

- Starting a Repository Server
- Starting an Authentication Server
- Starting a Business Server

Starting a Repository Server

To start a repository server, use the Interstage Management Console on the server where the repository server has been set up. Before starting the repository server, ensure that the SSO repository has started.

For details on starting the Interstage Management Console, refer to the Operator's Guide. For details on using the Interstage Management Console window, refer to the Operator's Guide.

Starting an SSO Repository

Use the Interstage Management Console to select [System] > [Services] > [Repository] > [Repository: View Status], and then start the SSO repository.

For details on starting the SSO repository, refer to the Smart Repository Operator's Guide.

Starting a Repository Server

Starting Interstage HTTP Server starts a repository server. Use the Interstage Management Console to select [System] > [Services] > [Web server] > [Web Server: Web Server Status], and then start the Interstage HTTP Server. If the repository server starts normally, information is output to the system log.

If the authentication server and repository server have been set up on the same server, both the authentication server and repository server will start automatically when Interstage HTTP Server starts.

Depending on the number of role configuration entries and site configuration entries registered in the SSO repository, delays may be experienced when starting Interstage HTTP Server. If a delay occurs, a message "ihs81215: An error occurred when Interstage HTTP Server was started." will be displayed on the Interstage Management Console for the server in which the repository server has been installed. If no error message is displayed in the system log, wait for a short time, and then select [System] > [Services] > [Web Server] > [Web Server: Web Server Status] to check that Interstage HTTP Server is running.

Windows

Service linkage with the SSO repository enables the SSO repository and the repository server, to be started when the service is started. For details regarding service linkage with the SSO repository, refer to "Service Linkage with SSO Repository."

Starting an Authentication Server

To start an authentication server, use the Interstage Management Console on the server where the authentication server has been set up. The repository server must be running correctly in order for the authentication server to operate.

For details on starting the Interstage Management Console, refer to the Operator's Guide. For details on using the Interstage Management Console window, refer to the Operator's Guide.

Starting Interstage HTTP Server starts the authentication server. Use the Interstage Management Console to select [System] > [Services] > [Web server] > [Web Server: Web Server Status], and then start Interstage HTTP Server. If the authentication server starts normally, information is output to the system log.

If the authentication server and repository server are installed on the same server, both the authentication server and repository server will start when the Interstage HTTP Server starts.

Starting a Business Server

The method for starting a business server depends on the Web server where the business server runs. The following examples show how to start a business server for each Web server being used as the business server.

If the business server is started normally, information is output to the system log. The repository server and authentication server must be running correctly in order for the business server to operate.

- If Interstage HTTP Server is used

  To start a business server, use the Interstage Management Console on the server where the business server has been installed. Starting Interstage HTTP Server starts the business server. Use the Interstage Management Console to select [System] > [Services] > [Web server] > [Web Server: Web Server Status], and then start Interstage HTTP Server.

  For details on starting the Interstage Management Console, refer to the Operator's Guide. For details on using the Interstage Management Console window, refer to the Operator's Guide.

Windows

- If InfoProvider Pro is used

  Starting InfoProvider Pro automatically starts a business server. To start InfoProvider Pro, execute the ippstart command.

  For details on starting InfoProvider Pro, refer to "Web Server Operation Edition" – "InfoProvider Pro Operation Commands" in the Reference Manual (Command Edition).

- If Microsoft Internet Information Services 5.0 is used

  Starting Microsoft Internet Information Services automatically starts a business server. To start Microsoft Internet Information Services, select 'Start' in 'World Wide Web Publishing Service' in Service.

  For details on starting Microsoft Internet Information Services 5.0, refer to the online help in the Microsoft Internet Information Services.

- If Microsoft Internet Information Services 6.0 is used

  To start a business server, start Microsoft Internet Information Services, and then access the Web server from a Web browser. To start Microsoft Internet Information Services, select ‘Start’ in ‘World Wide Web Publishing Service’ in Service.

  For details on starting Microsoft Internet Information Services 6.0, refer to the online help in the Microsoft Internet Information Services.

Solaris OE

- If InfoProvider Pro is used

  Starting InfoProvider Pro automatically starts a business server. To start InfoProvider Pro, execute the ippstart command.

  For details on starting InfoProvider Pro, refer to “Web Server Operation Edition” – “InfoProvider Pro Operation Commands” in the Reference Manual (Command Edition).

- If Sun ONE Web Server is used

  Starting Sun ONE Web Server automatically starts a business server. To start Sun ONE Web Server, execute the ‘start’ shell.

  For details on starting Sun ONE Web Server, refer to the NSAPI Programmer’s Guide for Sun ONE Web Server.

Notes

- If the access log file for a business server cannot be initialized, the Web server where the business server is operated has not been started. If the Web server does not start, check the contents of the message starting with SSO output in the system log, and then remove the cause of the problem. For details about the messages, refer to “Messages with Message Number Beginning ‘sso’” in Messages.
- If the setting “update the access control information in starting a business server” is selected, start a repository server before starting a business server. For access control information, refer to “Updating Access Control Information”.
- After a business server has started, access the protection resource and ensure that authentication and authorization are performed. If authentication and authorization are not performed, the business server environment may be invalid. Check the contents of the message output to the system log, and then remove the cause of the problem. For details about the message, refer to ‘Messages with Message Number Beginning ‘sso’” in Messages.

Stopping Single Sign-on

This section explains how to stop the servers.

- Stopping a Business Server
- Stopping an Authentication Server
- Stopping a Repository Server

Stopping a Business Server

The method for stopping a business server is dependent on the Web server where the business server operates. The following examples show how to stop a business server for each type of Web server on which a business server may operate. If the business server stops normally, information is output to the system log. Stopping the Web server may take several minutes depending on the load status.

- If Interstage HTTP Server is used

  To stop a business server, use the Interstage Management Console on the server where the business server has been installed. Stopping Interstage HTTP Server automatically stops the business server. Use the Interstage Management Console to select [System] > [Services] > [Web server] > [Web Server: Web Server Status], and then stop Interstage HTTP Server.

  For details about how to on starting the Interstage Management Console, refer to the Operator's Guide. For details on using the Interstage Management Console window, refer to the Operator's Guide.

Windows

- If InfoProvider Pro is used

  Stopping InfoProvider Pro automatically stops a business server. To stop InfoProvider Pro, execute the ippstop command.

  For details on stopping InfoProvider Pro, refer to "Web Server Operation Edition" – "InfoProvider Pro Operation Commands" in the Reference Manual (Command Edition).

- If Microsoft Internet Information Services 5.0 is used

  Stopping Microsoft Internet Information Services automatically stops a business server. To stop Microsoft Internet Information Services, select 'Stop' in 'World Wide Web Publishing Service' in Service.

  For details on stopping Microsoft Internet Information Services, refer to the online help in the Microsoft Internet Information Services.

- If Microsoft Internet Information Services 6.0 is used

  Stopping Microsoft Internet Information Services automatically stops a business server. To stop Microsoft Internet Information Services, select 'Stop' in 'World Wide Web Publishing Service' in Service.

  For details on stopping Microsoft Internet Information Services 6.0, refer to the online help in the Microsoft Internet Information Services.

Solaris OE

- If InfoProvider Pro is used

  Stopping InfoProvider Pro automatically stops a business server. To stop InfoProvider Pro, execute the ippstop command.

  For details on stopping InfoProvider Pro, refer to “Web Server Operation Edition” – “InfoProvider Pro Operation Commands” in the Reference Manual (Command Edition).

- If Sun ONE Web Server is used

  Stopping Sun ONE Web Server automatically stops a business server. To stop Sun ONE Web Server, execute the ‘stop’ shell.

  For details on stopping Sun ONE Web Server, refer to the NSAPI Programmer’s Guide for Sun ONE Web Server.

Stopping an Authentication Server

To stop an authentication server, use the Interstage Management Console on the server where the authentication server has been installed. If an authentication server is stopped, a business server cannot operate. Extreme care must be taken when stopping authentication servers.

For details on starting the Interstage Management Console, refer to the Operator’s Guide. For details on using the Interstage Management Console window, refer to the Operator’s Guide.

Stopping Interstage HTTP Server stops an authentication server. Use the Interstage Management Console to select [System] > [Services] > [Web server] > [Web Server: Web Server Status] and then stop the Interstage HTTP Server. If the authentication server stops normally, information is output to the system log.

Stopping a Repository Server

To stop a repository server, use the Interstage Management Console on the server where the repository server has been set up. If a repository server is stopped, an authentication server and business server cannot operate. Extreme care must be taken when stopping repository servers.

Before stopping an SSO repository, ensure that the repository server has been stopped.

For details on starting the Interstage Management Console, refer to the Operator’s Guide. For details on using the Interstage Management Console window, refer to the Operator’s Guide.

Stopping a Repository Server

Stopping Interstage HTTP Server automatically stops a repository server. Use the Interstage Management Console to select [System] > [Services] > [Web server] > [Web Server: Web Server Status], and then stop the Interstage HTTP Server. If the repository server stops normally, information is output to the system log.

Stopping an SSO Repository

Use the Interstage Management Console to select [System] > [Services] > [Repository] > [Repository: View Status] and then stop the SSO repository.

For details on stopping the SSO repository, refer to the Smart Repository Operator’s Guide.

Changing Environment Settings

This section explains how to change the operating environments of the repository server, authentication server, and business server after environment setup.

- Changing the Environment Settings of Repository Server, Authentication Server and Business Server
- Changing Effective User for Web Server

Changing the Environment Settings of Repository Server, Authentication Server and Business Server

To change the environment settings of the repository server, authentication server, or business server, use the following tabs on the Interstage Management Console. Select the server whose environment setting requires changing in the bold portion.

- Repository server

  [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [**Repository server**] > [Settings] tab

- Authentication server

  [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [**Authentication server**] > [Settings] tab

- Business server

  [System] > [Security] > [Single Sign-on] > [Business system] > [**Business system Name**] > [Settings] tab

If the environment settings of the repository server, authentication server, and business server have been changed, stop and then restart the servers.

If the Java application using JavaAPI provided by Single Sign-on has been used to change the setting of [Notify User Information?] in [Linkage with Web applications] during environment setup of business server, the Java application must be restarted to enable the change.

Notes

- If the SSL environment setting used by an authentication server has been changed, stop and then restart the authentication server. To change the SSL environment setting, use the following tab on the Interstage Management Console:

  [System] > [Security] > [SSL] > [Configuration Name] > [SSL Settings] tab

- If the following settings of the repository server (update system) have been changed using the Interstage Management Console, re-create the repository server (reference system):
  - User information registration entry
  - Role configuration registration entry

– Protection resource registration entry

For details on creating the repository server (reference system), refer to “Adding a Repository Server (Reference System)”.

Changing Effective User for Web Server

Solaris OE Linux

This section provides notes on changing the effective user for the Web server.

To change the effective user name specified in [Setting point of effective user name of Web server], follow the procedure described in [Actions for Changing Effective User].

To Change Effective User for Repository Server

[Setting of Effective User Name for Web Server]

The effective user name for the Web server (Interstage HTTP Server) can be set using the User directive in the configuration file (httpd.conf) for the Interstage HTTP Server.

[Actions for Changing Effective User]

After the effective user of the Web server is changed, use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Repository server] > [Settings] tab, and then click the [Update] button.

To Change Effective User for Authentication Server

[Setting of Effective User Name for Web Server]

The effective user name for the Web server (Interstage HTTP Server) can be set using the User directive in the configuration file (httpd.conf) for the Interstage HTTP Server.

[Actions for Changing Effective User]

After the effective user of the Web server is changed, use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Authentication server] > [Settings] tab, and then click the [Update] button.

To Change Effective User for Business Server

[Setting of Effective User Name for Web Server]

- If Interstage HTTP Server is used

  The effective user name of the Web server (Interstage HTTP Server) can be set using the User directive in the configuration file (httpd.conf) for the Interstage HTTP Server.

Solaris OE

- If InfoProvider Pro is used

  The effective user name of InfoProvider Pro is fixed to the root and cannot be changed.

- If Sun ONE Web Server Enterprise Edition is used

  The effective user name of the Sun ONE Web Server Enterprise Edition can be set using the User Directive in the configuration file (magnus.conf) for the Sun ONE Web Server Enterprise Edition.

[Actions for Changing Effective User]

- If Interstage HTTP Server is used

  After the effective user of the Web server is changed, use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Settings] tab, and then click the [Update] button.

Solaris OE

- If Sun ONE Web Server Enterprise Edition is used

  After the effective user of the Web server is changed, use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Settings] tab, and then click [Detailed Settings [Show]]. Specify the effective user name set in the Web server configuration file for [Effective user name] in [Web server to use] of [Web ServerSettings], and then click the [Update] button.

Notes

Solaris OE

If multiple business servers operate on one server, specify as follows:

- To use InfoProvider Pro and other Web servers, set the effective user of the other Web server.
- Specify the same effective user as the effective user for the Interstage HTTP Server of the Sun ONE Web Server Enterprise Edition.

For example, the relationship between effective users set in the configuration files of Web servers and effective users set on the Interstage Management Console is shown in Table 4-1.

Table 4-1 The Relationship Between Effective Users

Web server	Effective user of Web server	Setting on Interstage Management Console
Interstage HTTP Server	nobody	Setting disabled (the value in the left column is automatically set)
InfoProvider Pro	root	nobody
Sun ONE Web Server Enterprise Edition	nobody	nobody

User Related Operation

This section explains how to manage user-related operations. Single Sign-on users are managed in the SSO repository. To add a user, add the user entry to the user information in the SSO repository and specify the user ID, password, and role name.

- Adding a User
- Deleting a User
- Amending the Role of a User
- Changing User Passwords
- Taking Corrective Action if the User Password is Forgotten
- Canceling Lockout
- Checking User Lock Status
- Checking and Changing User Validity Period

Adding a User

To add a user entry to the user information managed in the SSO repository, use the user program. For details about the user program, refer to “Preparation for a User Program”.

When adding a user entry, note the following points:

- If the authentication method is “certificate authentication” or “password authentication and certificate authentication,” a certificate must be distributed to the user.
- If the authentication method is “password authentication or certificate authentication,” a certificate must also be distributed to a certificate authenticated user.
- The addition of new users is effective immediately. The repository server, authentication server, and business server need not be running.

For details on adding a user to the SSO repository, refer to “Registering User Information and Role Configuration in the SSO Repository”.

Deleting a User

To delete a user entry from the user information managed in the SSO repository, use the user program. For details about the user program, refer to “Preparation for a User Program”.

Deletion of users is effective immediately. The repository server, authentication server, and business server need not be running.

Amending the Role of a User

If the section or title of a user changes, the accessible resources can be amended by changing or adding a user role.

To change or add a user role use the user program. For details about user program, refer to “Preparation for a User Program”.

Changing User Passwords

To change a user password managed in the SSO repository, use the user program. For details about user program, refer to “Preparation for a User Program”’

Note

When changing user passwords managed in the SSO repository, pay careful attention to password security.

For details on password security refer to “Security Risks” – “Interstage Single Sign-on” – “Security Measures” in the Security System Guide.

Taking Corrective Action if the User Password is Forgotten

If a user password managed in the SSO repository is forgotten, a new password must be set. To set a new password, use the user program. For details about user program, refer to “Preparation for a User Program”.

Note

When setting new user passwords managed in the SSO repository, pay careful attention to password security.

For details on password security refer to “Security Risks” – “Interstage Single Sign-on” – “Security Measures” in the Security System Guide.

Canceling Lockout

The Interstage Management Console is used to release lockout as follows:

1. Select [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Repository server] > [Release User Lock] tab, and then specify the ID of the user whose lockout is to be released.
2. Clicking the [Search] button displays information about the specified user.
3. Check the user information, and then click the [Apply] button.

If the user is locked out because the password is forgotten, the user password can be reset by setting a new password.

To reset a password, use the user program. For details about user program refer to “Preparation for a User Program”.

Notes

- When resetting a password, pay careful attention to password security.

  For details on password security refer to “Security Risks” – “Interstage Single Sign-on” – “Security Measures” in the Security System Guide.

- If the Interstage Management Console has been used to release user lockout, the consecutive failure count will also be cleared.

Checking User Lock Status

To check the user lock status, use the user program. For details about user program, refer to “Preparation for a User Program”.

To release a user lockout refer to “Canceling Lockout”.

Checking and Changing User Validity Period

To check and change the user validity period, use the user program. For details about user program, refer to “Preparation for a User Program”.

Authorization-related Operation

This section explains changing role configurations and protection resources.

- Amending Role Configurations
- Amending Protection Resource

Amending Role Configurations

Role configuration amendments may be required due to organization change.

The role configuration is changed or added as follows:

The SSO administrator uses the SSO repository and repository server as follows:

1. Change or add the role configuration in the SSO repository.
2. Change or add the role to the path configuration of the protection resource as required.
3. Change or add the role to the user entry as required.
4. Use the repository server to retrieve role information and update the cache.

   Use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Repository server] > [Update Role information] tab, and then click the [Update] button.

   If the repository server (update system) and the repository server (reference system) are used, update the cache on both servers.
5. Request the business server administrator to update the access control information.

The business server administrator then operates the business server as follows: (*1).

1. Update access control information on the business server.

   Use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Update access control information] tab, and then click the [Update] button to update the access control information.

*1 If “Execute when business server is started” is selected in [Update access control information] in the business server environment setup, this operation is required only when the business server is running. If “Execute manually as needed” is selected, this operation is required regardless of whether the business server is running or stopped.

For details about the setting [Update access control information], refer to “Updating Access Control Information”.

For details about the role of the SSO repository, refer to “Role Configuration Entry”’.

Notes

- If the repository server (update system) and repository server (reference system) are allocated for load balancing, change or add roles during off-peak hours (e.g. night hours) when only a few users are accessing the servers.
- Changing the role configuration in the SSO repository and then updating the role information in the repository server will not reflect the changes in the authorization operation of the business server. After role information in the repository server is updated, the access control information must be updated on the business server.
- If access control information is updated and an error message is output, the business server remains in the state where it performs authorization according to the previous access control information. Correct the error, and then stop the business server as required until the access control information is updated normally.

Amending Protection Resource

If the user issues a request to access resources such as a Web application in a business server, the business server determines whether the resource is an authentication or authorization target based on the protection resource. If the business server determines that the resource is an authentication or authorization target, it performs authentication and determines whether the user can access the resource based on the user information and role managed in the SSO repository.

The SSO administrator amends protection resources in the SSO repository as follows:

1. Change the protection resource in the SSO repository.

   For details on how to change the resource, refer to 'Registering Site Configuration of Business System' and 'Registering Protection Path' in Chapter 2, Environment Setup (SSO Administrators)

2. Change the information of the business server's protection resources (the authentication server accepts authentication request) which were set in the authentication server's configuration file.

   For details on how to change the information, refer to the 'Settings for Protection Resource' in Chapter 2, Environment Setup (SSO Administrators).

3. Request the business server administrator to update access control information.

The business server administrator then operates the business server as follows: (*1)

1. On the business server, use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Update access control information] tab, and then click the [Update] button to update the access control information.

*1 f [Update access control information] in the business server environment setup is set to “Execute when business server is started,” this operation is required only when the business server is running. If it is set to “Execute manually as needed”,” this operation is required regardless of whether the business server is running or stopped.

For details about setting for [Update access control information], refer to “Updating Access Control Information”.

For details about the protection resource in the SSO repository, refer to “Protection resource” in “Information Required for Authorization Using Roles”.

Notes

- If the repository server (update system) and repository server (reference system) are allocated for load balancing, amend the role during the off-peak hours (eg. night hours) when only a few users are accessing the servers..
- Amendments to protection resource information in the SSO repository will not reflect in the authorization operation of the business server without updating access control information. On the business server, update access control information.
- If an error message is output when access control information is updated, the business server remains in the state where the server performs authorization according to the previous access control information. Correct the error by stopping and restarting the business server as required until access control information is updated normally.

Maintenance Using Access Logs

Interstage Single Sign-on records authentication and authorization processing performed by the repository server, authentication server, and business server as access logs. An access log (containing authentication and authorization results, date and time, access source identification information and user identification information) is recorded for each server. Each access log is output as a text file with one record per line.

Use the Interstage Management Console of each server to specify the access log output destination file name, maximum file size, and preferred saving method. These methods are described below;

For details about the configuration of the Interstage Management Console, refer to the Operator's Guide.

Repository Server

[System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Repository server] > [Settings] tab > [Repository server : Settings]window

Authentication Server

System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Authentication server] > [Authentication server : Settings]window

Business Server

[System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Settings] tab > [Business system Name : Settings]window

Access Log of Repository server

The access log of the repository server records the results of obtaining user information contained in the SSO repository after user authentication processing is requested from the authentication server.

The record format and contents are as follows:

```
Authentication-server – client [date/time] – “user-identification-
information” processing-result (supplementary-information)
```

Authentication Server

IP address of authentication server that requested authentication processing

"unknown" is recorded if the authentication request is not provided from the authentication server.

Client

IP address of the client that requested authentication

Date/Time

Access date/time is recorded in the “YYYY/MM/DD HH:MM:SS+XXXX” format.

"+XXXX" refers to the time difference from UTC (Universal Time Coordinate). In cases where "-XXXX" is used, it means the same as above.

User Identification Information

User identification information (dn or uid) identifies the user who has requested authentication or has been authenticated and records the information. If the user cannot be identified, ‘unknown’ is recorded. If the certificate presented during certificate authentication is not registered in the SSO repository or the user cannot be uniquely specified from the presented certificate, the serial number, issuer distinguished name, and owner distinguished name of the certificate are recorded.

Processing Result

The processing result is recorded in the following format:

- If user authentication processing is requested from the authentication server

  Authentication (authentication method) [succeeded|failed]

  One of the following is recorded for authentication method:

  {basicAuth|certAuth|basicAuthAndCertAuth|unknown}

  The meanings of the above authentication methods are as follows:

  – basicAuth

    “Password Authentication”

  – certAuth

    “Certificate Authentication”

  – basicAuthAndCertAuth

    “Password Authentication and Certificate Authentication”

  – unknown

    “The authentication method cannot be determined.”

  If "password authentication” or “certificate authentication" was performed, the "basicAuth" or "certAuth" access log is recorded.

- Using the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Repository server] > [Update Role information] tab and click the [Update] button

  RoleInfoUpd {succeeded|failed}.

- Using the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Update access control information] tab and click the [Update] button

  ResourceInfo {succeeded|failed}.

- Updating the SSO repository for the repository server (update system)

  Modification {succeeded|failed}.

Supplementary Information

The cause of authentication failure is recorded in the access log.

For details about supplementary information in the access log, refer to “Messages Logged and Output in Single Sign-on” – ‘Access Log In Single Sign-on Mode” – “Access Log of the Repository Server”’ – “Supplementary Information in the Access Log of the Repository Server” in Messages.

The cause of the authentication failure will not always be recorded.

*1 This access log may be output two or more times.

Example

```
10.131.201.10 – 10.131.201.199 [2002/09/11 20:28:22 +0900] –
"cn=User001,ou=User,ou=interstage,o=fujitsu,dc=com"
Authentication(basicAuth)failed. (Count up failure count)
```

Access Log of Authentication Server

The access log of the authentication server records the result of the repository server authentication processing in response to a user authentication request from the business server.

If load balancing is being performed using multiple authentication servers, the access log may be distributed and recorded depending on the load balancing setting.

The record format and contents are as follows:

```
client – business-server – repository-server [date/time] – “user-
identification-information” processing-result (supplementary-information)
```

Client

IP address of the client that requests authentication.

Business Server

IP address of the business server that issued the authentication request

For an authentication request from an application using Single Sign-on JavaAPI, the character string “SSO-JavaAPI” is recorded. In this case, the IP address of the computer on which the application is running is recorded.

"unknown" is recorded if the authentication request generation source cannot be determined.

Repository Server

IP address of the repository server requested for authentication processing. If repository server load is distributed using the repository server (update system) and repository server (reference system), the IP address of the repository server (reference system) is recorded.

"unknown" is recorded if the repository server is not requested to perform authentication processing.

Date/Time

Access date/time is recorded in the “YYYY/MM/DD HH:MM:SS+XXXX” format.

"+XXXX" refers to the time difference from UTC (Universal Time Coordinate). In cases where "-XXXX" is used, it means the same as above.

User Identification Information

User identification information (dn or uid) identifies the user who has requested authentication or has been authenticated and records the information. If the user cannot be identified, ‘unknown’ is recorded. If the certificate presented during certificate authentication is not registered in the SSO repository or the user cannot be uniquely specified from the presented certificate, the serial number, issuer distinguished name, and owner distinguished name of the certificate are recorded.

Processing Result

The processing result is recorded in the following format:

- If user authentication processing is requested from the authentication server

  Authentication (authentication method) [succeeded|failed]

  One of the following is recorded for authentication method:

  {basicAuth|certAuth|basicAuthAndCertAuth|unknown}

  The meanings of the above authentication methods are as follows:

  – basicAuth

    “Password Authentication”

  – certAuth

    “Certificate Authentication”

  – basicAuthAndCertAuth

    “Password Authentication and Certificate Authentication”

  – unknown

    “The authentication method cannot be determined.”

  If "password authentication or certificate authentication" was performed, the "basicAuth" or "certAuth" access log is recorded.

Supplementary Information

The cause of authentication failure is recorded.

For details about supplementary information in the access log, refer to “Messages Logged and Output in Single Sign-on” – “Access Log in Single Sign-on Mode” – “Access Log of the Authentication Server” – ‘Supplementary Information in the Access Log of the Authentication Server” in Messages.

The cause of the authentication failure will not always be recorded.

Example

```
10.131.201.199 – 10.131.201.34 – 10.131.201.88 [2002/09/11 20:28:22 +0900]
– "cn=User001,ou=User,ou=interstage,o=fujitsu,dc=com" Authentication
(basicAuth) failed. (authentication by ID and password is required)
```

Access Log of Business Server

The access log of the business server records user access.

The record format and contents are as follows:

```
client [date/time] – “user-identification-information” “access-target”
 processing-result (supplementary-information)
```

Client

IP address of the client that requested access

Date/Time

Access date/time is recorded in the “YYYY/MM/DD HH:MM:SS+XXXX” format.

"+XXXX" refers to the time difference from UTC (Universal Time Coordinate). In cases where "-XXXX" is used, it means the same as above.

User Identification Information

User identification information (dn or uid) identifies the user that requested access and records the information in the access log. If the user cannot be identified, ‘unknown’ is recorded.

Access Target

Information that specifies the access target.

Processing Result

The processing result is recorded in the following format:

- If access is requested from the user

  Authorization {succeeded|failed}.

Supplementary Information

The cause of authentication failure is recorded.

For details about supplementary information in the access log, refer to “Messages Logged and Output in Single Sign-on” – “‘Access Log In Single Sign-on Mode” – “Access Log of the Business Server” – “Supplementary Information in the Access Log of the Business Server’ in Messages.

The cause of the authentication failure will not always be recorded.

Example

```
10.131.201.199 [2002/09/11 20:28:22 +0900] –
 "cn=User001,ou=User,ou=interstage,o=fujitsu,dc=com" "/oa-admin/"
 Authorization failed. (Role check error)
```

Operating Notes for Large Systems

For operation using large systems, note the following points:

- To update the SSO repository information in the repository server (update system), check whether operation stopped because of a problem such as the SSO repository being down in the repository server (reference system). If the SSO repository is stopped, start it immediately.
- If the repository server (reference system) stays down for an extensive period of time, the data integrity of the SSO repository may not be guaranteed. If irep15071 is output to the system log of the repository server (update system), check the message contents and recover SSO repository data. For details about messages output to the system log, refer to “Messages with Message Number Beginning ‘irep’” in Messages.

  If irep15071 is not output, restore the repository server (reference system). The update of the SSO repository of the repository server (update system) is reflected in the SSO repository of the repository server (reference system). The reflection is completed when the last update information output to the access log of the SSO repository of the repository server (update system) is output to the access log of the SSO repository of the repository server (reference system).

Chapter 5

Single Sign-on Customization

This chapter explains Interstage Single Sign-on Customization and includes the following sections:

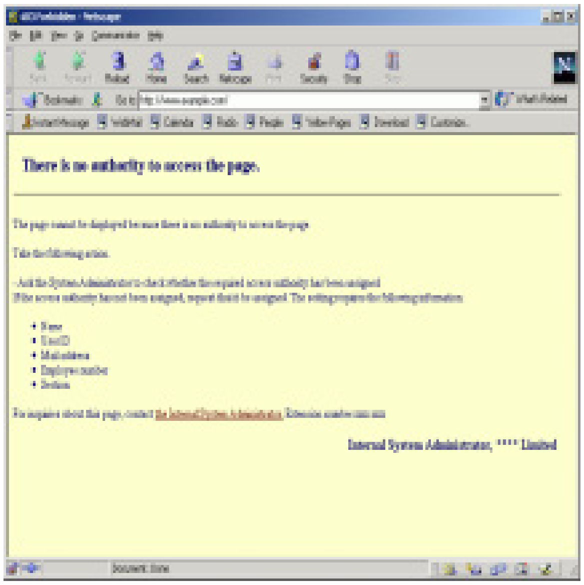
- Customizing Messages Displayed on a Web Browser
- Service Linkage with SSO Repository

Customizing Messages Displayed on a Web Browser

Interstage Single Sign-on provides a function that customizes messages to be displayed on a Web browser. Specifically, the messages displayed on a Web browser can be changed as required by editing the message file in HTML format.

For example, this function enables messages displayed on the Web browser to include the destination specific information) and also mail used for direct inquiries. Using this function, the contents of a message can be modified to include more detailed information.

The Figure 5-1 shows an example of a customized message:



There is no authority to access the page.

The page cannot be displayed because there is no authority to access the page.

Take the following action.

- Ask the System Administrator to check whether the required access authority has been assigned
If the access authority has not been assigned, request that it be assigned. The setting requires the following information:

- Name
- User ID
- Mail address
- Employee number
- Section

For inquiries about this page, contact the Internal System Administrator. Extension number xxxx-xxxx

Internal System Administrator, **** Limited

Figure 5-1 Error Message Example

Messages that Can be Customized

Interstage Single Sign-on enables the customization of the following three types of messages.

- Messages displayed for form authentication
- Authentication error messages
- Authorization error messages

Messages are customized by editing the message file in HTML format.

Messages Displayed for Form Authentication

Messages displayed for form authentication can be customized. Customize the messages on the machine on which the authentication server was built while the authentication server is stopped.

If an authentication server has already been added for load balancing, also customize the messages for the added authentication server. When customizing the messages for the added authentication server, copy them from the replication source to the replication destination (added authentication server). Be sure to back up the messages used before customization so that they are not overwritten by mistake.

Table 5-1 Form Authentication Messages

Cause of the message to be displayed	Message Contents	Message File Name
The form authentication page was accessed from a Web browser, or the protection resource was accessed and authentication is required.	Enter your user name and password.	403auth_form_en.template(*1)
Sign-on has been performed directly from the form authentication page with no protection resource accessed.	Welcome to Single Sign-on.	200auth_succeeded_ en.template
The user name or password is incorrect, or user information corresponding to the certificate could not be found.	User name or password is incorrect.	403passwderr_form_ en.template(*1)
Authentication needs to be re-started because the authentication information is invalid, possibly due to term expiration.	Authentication has been expired.	403authexpired_en _template(*1)
The form authentication page was accessed when authentication had already taken place.	User was already authenticated.	403alreadyauth_en_template
The protection resource was accessed at any time from display of the form authentication page to the end of authentication.	Authentication is processing.	403processingauth_ en.template
The correct certificate was not used for authentication or the relevant user information is not contained in the certificate.(*2)	Certificate authentication is needed.	403requestcert_en.template

Cause of the message to be displayed	Message Contents	Message File Name
The specified certificate is damaged or user identification information is not contained in the certificate.	Certificate is invalid.	403certinvalid_en.template
The certificate has expired.	Certificate has expired.	403certexpired_en.template
The specified certificate has been revoked.	Certificate has been revoked.	403certrevoke_en.template
The user was locked out because the password was re-entered more than the allowed number of times. (*2)	User was locked out.	403locked_en.template
Resources managed by Interstage Single Sign-on could not be accessed because the user was locked out. (*2)	User has been locked.	403alreadylocked_en.template
The user information is not contained in the SSO repository (*2).	User has not been found.	403noentry_en.template
An internal error occurred during the Single Sign-on operation.	An internal error has occurred.	500internalerr_en.template

The applicable message file is stored in the directory shown below. When editing messages, see "Setting Access Authority for a Message File" to confirm message file access authorization.

Windows

```
C:\Interstage\F3FMsso\ssoatcag\pub\template\
```

Solaris OE Linux

```
/etc/opt/FJSVssoac/pub/template/
```

Notes

- Message files are available in Japanese and English versions. Select the appropriate message files to be edited according to the language set for the client Web browser.
  If languages other than Japanese are set for the client Web browser, messages will be displayed in English.
- A form tag for authentication must exist beforehand in the message file contents indicated in (*1) in the table. For details on the authentication form tag specifications, see Authentication Form Tag Specifications
- If [No] is specified for [Notify Cause of Authentication Failure to user?] when the authentication server environment is set up, the error causes marked (*2) in the above table are incorporated into the message: “User name or password is incorrect.”

  To specify [Notify Cause of Authentication Failure to user?], use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Authentication server] > [Authentication Server: Settings] window.

Authentication Error Messages

Messages that are displayed when authentication errors occur can be customized. The types of error messages are displayed in Table 5.2. Customize the messages on the server where the authentication server is set up and stopped.

If an authentication server has been added for load balancing purposes, also customize the messages for the additional authentication server. To customize error messages for the additional authentication server, copy the error messages from the replication source to the replication destination (the additonal authentication server). Ensure that the messages have been backed up before customization so that error messages are not overwritten inadvertently.

Table 5-2 Authentication Error Messages

Cause of Error	Message Contents	Message File Name
The user name or password is invalid or the relevant user information is not contained in the certificate.	User name or password is incorrect.	401passwderr_en.template
The correct certificate was not used for authentication or the relevant user information is not contained in the certificate.(*3)	Certificate authentication is needed.	403requestcert_en.template
The specified certificate is damaged or user identification information is not contained in the certificate.	Certificate is invalid.	403certinvalid_en.template
The certificate has expired.	Certificate has expired.	403certexpired_en.template
The specified certificate has been revoked.	Certificate has been revoked.	403certrevoke_en.template

Cause of Error	**Message Contents**	**Message File Name**
The user was locked out because the password was re-entered more than the allowed number of times. (*3)	User was locked out.	403locked_en.template
Resources managed by Interstage Single Sign-on could not be accessed because the user was locked out. (*3)	User has been locked.	403alreadylocked_en.template
The specified resource could not be accessed because an user identification was registered delicately (*3).	User is duplicated.	403notspecified_en.template
The user cannot access the resource managed by Interstage Single Sign-on because the validity period has not started or has expired. (*3).	User is not available.	403notavailable_en.template
The user information is not contained in the SSO repository (*3).	User has not been found.	403noentry_en.template
An internal error occurred during the Single Sign-on operation.	An internal error has occurred.	500internalerr_en.template

When editing the messages, refer to “Setting Access Authority for Message Files” to check the access authority for message files. The relevant message files are contained in the following directories.

Windows

```
C:\Interstage\F3FMsso\ssoatcag\pub\template\
```

Solaris OE Linux

```
/etc/opt/FJSVssoac/pub/template/
```

Notes

- Message files are available in Japanese and English versions. Select the appropriate message files to be edited according to the language set for the client Web browser.
  If languages other than Japanese are set for the client Web browser, messages will be displayed in English.

- If [No] is specified for [Notify Cause of Authentication Failure to user?] when the authentication server environment is set up, the error causes marked (*3) in the above table are incorporated into the message: “User name or password is incorrect.”

  To specify [Notify Cause of Authentication Failure to user?], use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Authentication server] > [Authentication server:Settings] window.

Authorization Error Messages

Messages that are displayed when authorization errors occur can be customized. The types of error messages are displayed in Table 5-3. The messages can be customized for each operation server. Customize the messages on the server where the business server is set up and stopped.

If a business server has been added for load balancing purposes, also customize the messages for the additional business server. To customize error messages for the additional business server, copy the error messages from the replication source to the replication destination (the additional business server). Ensure that the messages have been backed up before customization so that error messages are not overwritten inadvertently.

Table 5-3 Authorization Error Messages

Cause of Error	Message Contents	Message File Name
The information cannot be displayed because the user has not been assigned to the required role.	Access is not allowed.	403roleerr_en.template
The browser is not set to accept cookies.	Browser does not accept cookies.	403cookieerr_en.template
The authentication operation must be retried because the authentication information has expired.	Authentication has been expired.	403postdecodeerr_en.template
Authentication information could not be found.	Authentication is needed. Try again after authentication.	403postrequesterr_en.template
Authentication information is not correct. The IP address for accessing the authentication server and the IP address for accessing the business server may be different.	Authentication information is invalid.	403ipcheckerr_en.template

Cause of Error	Message Contents	Message File Name
The system does not support generation of an 8.3-format file name from a long file name or URLs that include folders or filenames ending with a period.	Requested path is invalid form.	403patherr_en.template
An internal error occurred during the Single Sign-on operation.	An internal error has occurred.	500internalerr_en.template

When editing the messages, refer to "Setting Access Authority for Message files" to check the access authority for message files. The relevant message files are contained in the following directories.

Windows

```
C:\Interstage\F3FMsso\ssoatzag\pub\template\
```

Solaris OE Linux

```
/etc/opt/FJSVssoaz/pub/template/
```

Notes

- Message files are available in Japanese and English versions. Select the appropriate message files to be edited according to the language set for the client Web browser.
- If languages other than Japanese are set for the client Web browser, messages will be displayed in English.

Windows

- "403patherr_en.template" is message file used only for Windows.

Customizing a Message

The following explains how to customize a message file.

1. Edit the message file. Refer to the example below for more information about editing message files.

   When editing the authentication form tag, refer to Authentication Form Tag Specifications.

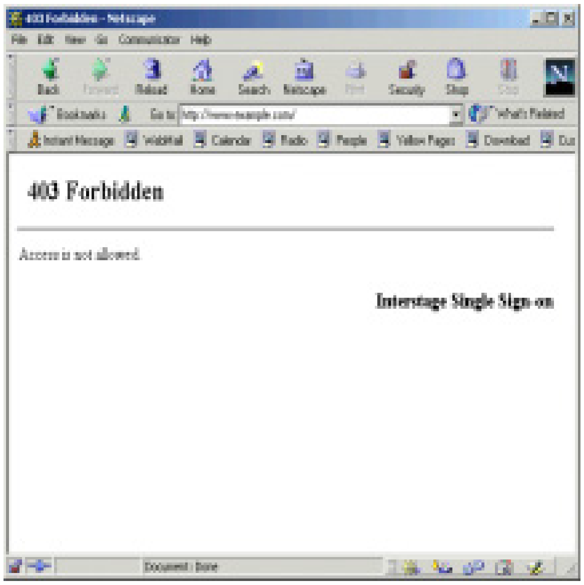
2. Display the edited message file to confirm that the message file displays correctly. The edited message will be displayed the next time that type of error occurs. The Interstage Single Sign-on does not need to be restarted for the edited messages to take effect.

Example

An example of editing message file “403roleerr_en.template” is shown below.

Unedited Message Output

Figure 5-2 shows an unedited example of message file “403roleerr_en.template.”


403 Forbidden - Netscape
File Edit View Go Communicator Help
Back Forward Reload Home Search Netscape Print Security Shop Stop
Bookmarks Go to: http://www.example.com/
What's Related
Instant Message WebMail Calendar Radio People Yellow Pages Download
Document: Done

403 Forbidden

Access is not allowed.

Interstage Single Sign-on

Figure 5-2 Unedited Example of the Message File

Edited Message File

Open and edit the 403roleerr_en.template file.

In the following example, bold text indicates a change:

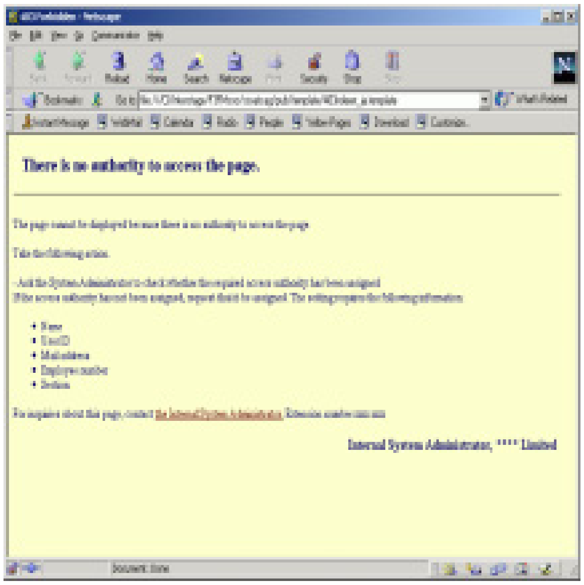
```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 3.2 Final//EN">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=euc-jp">
<title> 403 Forbidden </title>
</head>

<body TEXT="#000066" BGCOLOR="#FFFFCC" LINK="#660000" VLINK="#660000"
ALINK="#FFCC33">
<table border="0" cellpadding="10" width="100%">
<tr><td>
<b><font size="+2"> There is no authority to access the page.</font></b>
</td></tr>
</table>
<hr size="2" noshade>
<P>
  The page cannot be displayed because there is no authority to access the
page.</P>
<P> Take the following action.<BR><BR>
```

```
- Ask the System Administrator to check whether the required access
authority has been assigned<BR>
  If the access authority has not been assigned, request that it be assigned.
The setting requires the following information:
<UL>
<LI> Name
<LI> User ID
<LI> Mail address
<LI> Employee number
<LI> Section </UL>
  For inquiries about this page, contact the Internal System Administrator
<a href="mailto:admin@syanai-system.fujitsu.com</a> Extension number xxxx-
xxxx</P>
<h3 align="right"> Internal System Administrator, **** Limited </h3>
</body>
</html>
```

Edited Message Output

In the following example, the error message file has been edited using Netscape Communicator as the Web browser.

Ensure that the edited message file can be displayed using any Web browser.



There is no authority to access the page.

The page cannot be displayed because there is no authority to access the page.

Take the following action.

- Ask the System Administrator to check whether the required access authority has been assigned
If the access authority has not been assigned, request that it be assigned. The setting requires the following information:

- Name
- User ID
- Mail address
- Employee number
- Section

For inquiries about this page, contact the Internal System Administrator Extension number xxxx-xxxx

Internal System Administrator, **** Limited

Figure 5-3 Edited Error Message Example

Notes

- Be extremely careful when changing a message.   Changes to an error message may prevent the user from referencing the Messages and checking the details of the error that has occurred.
- Do not use special HTML tags that are only effective on the server and specific Web browsers.

- If a message file is deleted or there is no authority to access a message file, the system log of Interstage Single Sign-on is output and the non-edited English message will be displayed on the Web browser. Do not delete message files or change their access authority. For details on the messages output to the system log, refer to “Messages with a Message Number Beginning sso” in Messages.
- The error detail code is displayed in the “<!-SSO_DETAIL_CODE->” portion of the 500internalerr_en.template message file. Note that the error detail code is not displayed if “<!-SSO_DETAIL_CODE->” is deleted.
- When specifying images to be displayed or hyperlinks to other pages, note the following points:
  - Use the URL or the absolute path from the root path (“/”) to specify the location of the content.
  - To read the content from an active business server, do not specify files that are under a protected path.
  - To read the content from the same port number as the authentication server, store the target file in the following directory. The following directory becomes the root path (“/”) that can be referenced from a Web browser.

  Windows

  ```
  C:\Interstage\F3FMsso\ssoatcag\pub\docroot\
  ```

Solaris OE Linux

```
/opt/FJSVssoac/pub/docroot/
```

- Information to be displayed as a message may pose a security risk. When editing a message, be extremely careful not to display information that could threaten security..

Setting Access Authority for a Message File

This section explains how to set the access authority for a message file.

Windows

To set the access authority, use Explorer to change the access permissions for the user and group. Users require administrator authority to change user and group permissions.

Solaris OE Linux

To set the access authority, use the chmod or chown command.Set the access authority to superuser (root).

Access Authorization for the Message File Output at Form Authentication

Windows

Table 5-4 Windows Access Authorization

Resource	Setting Authority to Access Content
Message file to be displayed on a Web browser	Grant full control only to administrators and SYSTEM.

Solaris OE Linux

Table 5-5 Solaris and Linux Setting Authority

Resource	Setting Authority to Access Content
Message file to be displayed on a Web browser	Set the access authority mode to 0600 and grant read and write permission only to the user, such as nobody, that has been specified for user name (User) in the configuration file (httpd.conf) of the Interstage HTTP Server.

Access Authority for the Authentication Error Message File

Windows

Table 5-6 Windows Authentication Authority

Resource	Setting Authority to Access Content
Message file to be displayed on a Web browser	Grant full control only to administrators and SYSTEM.

Solaris OE Linux

Table 5-7 Solaris and Linux Authentication Authority

Resource	Setting Authority to Access Content
Message file to be displayed on a Web browser	Set the access authority mode to 0600 and grant read and write permission only to the user, such as nobody, that has been specified for user name (User) in the configuration file (httpd.conf) of the Interstage HTTP Server.

Access Authority for the Authorization Error Message File

Windows

The setting contents vary depending on the types of Web servers being used.

Table 5-8 [Microsoft Internet Information Services 6.0]

Resource	Setting Authority to Access Content
Message file to be displayed on a Web browser	Grant full control only to administrators, SYSTEM, and the account or user specified for the application pool ID of the application pool.

For details on setting Microsoft Internet Information Services, refer to “Help Topics (H)” of “Help (H)” for the Internet Information Service of Microsoft Internet Information Services.

Table 5-9 [Other than Microsoft Internet Information Services 6.0]

Resource	Setting Authority to Access Content
Message file to be displayed on a Web browser	Grant full control only to administrators and SYSTEM.

Solaris OE

The setting contents vary depending on the types of Web servers being used.

Table 5-10 [Interstage HTTP Server]

Resource	Setting Authority to Access Content
Message file to be displayed on a Web browser	Set the access authority mode to 0600 and grant read and write permission only to the effective user, such as nobody, that has been specified for user name (User) in the configuration file (httpd.conf) of Interstage HTTP Server.

Table 5-11 [InfoProvider Pro]

Resource	Setting Authority to Access Content
Message file to be displayed on a Web browser	Set the access authority mode to 0600 and grant read and write permission only to the superuser.

Table 5-12 [Sun ONE Web Server Enterprise Edition]

Resource	Setting Authority to Access Content
Message file to be displayed on a Web browser	Set the access authority mode to 0600 and grant read and write permission only to the effective user, such as nobody, that has been specified for user account (User) in the configurationfile (magnus.conf) of Interstage Sun ONE Web Server Enterprise Edition.

Notes

If multiple Web servers are operating on one server, set the effective user as follows:

- Set the access authority mode for the message file to 0600, and grant read and write permission only to the effective user:

- To use InfoProvider Pro and other Web servers, set the effective user to other Web servers.
- Set the same effective user for the Interstage HTTP Server and Sun ONE Web Enterprise Edition.

For details on setting the effective user, refer to “To Change Effective User for the Business Server” in “Changing the Effective User for the Web Server”.

Linux

Table 5-13 [Interstage HTTP Server]

Resource	Setting Authority to Access Content
Message file to be displayed on a Web browser	Set the access authority mode to 0600 and grant read and write permission only to the effective user, such as nobody, that has been specified for user name (User) in the configuration file (httpd.conf) of Interstage HTTP Server.

Authentication Form Tag Specifications

The following explains the specifications for the password authentication form tags to be inserted into the messages displayed at form authentication:

Example

The authentication form tags already inserted into the message file "403auth_form_en.template" are shown below.

The bold portions are required.

```
<form action="/ssoatcag" method="post" autocomplete="off">
<table border="0">
  <tr>
    <td nowrap align="right">user name</td>
    <td><input name="fj_is_sso_user_name" type="text" maxlength="255"></td>
  </tr>
  <tr>
    <td nowrap align="right">password</td>
    <td><input name="fj_is_sso_password" type="password"
maxlength="255"></td>
  </tr>
  <tr><td colspan="2">&nbsp;</td></tr>
  <tr><td colspan="2" nowrap align="center"><input type="submit"
value="sign-on">&nbsp;<input type="reset" value="reset"></td></tr>
</table>
</form>
```

The following explains the specification of each tag:

Form definition

```
<form action="/ssoatcag" method="post">
```

- Set "/ssoatcag" for the action attribute value. (*1)
- Set "post" for the method attribute value.
- Omit the enctype attribute

User ID

```
<input name="fj_is_sso_user_name" type="text">
```

- This text area is used for user ID input and is required.
- Set "fj_is_sso_user_name" for the name attribute value.
- Set "text" for the type attribute value.

Password

```
<input name="fj_is_sso_password" type="password">
```

- This password input area is used for password input and is required.
- Set "fj_is_sso_password" for the name attribute value.
- Set "password" for the type attribute value.

*1 If the incorrect URL is specified, the following error occurs and authentication may fail.

- The following message may output on the Web browser.
  - “403 Not Found”
  - “The requested page is not available”
- The message sso02012 may output to the system log.
- If client authentication is processed through SSL communication, the request window for the client certificate is displayed several times.
- Content may be displayed without authentication.

Service Linkage with SSO Repository

Windows

Before the repository server of the Interstage Single Sign-on is started, the SSO repository must be started.

If the service dependency is set between the SSO repository and repository server, the repository server is started after the SSO repository is started, and when a service starts at system start.

Interstage Single Sign-on provides the command that sets and cancels the service dependency. This command enables setting and cancellation of the service dependency between the SSO repository and repository server.

The following explains how to set and cancel the service dependency.

Setting the Service Dependency

1. Check the repository name of the SSO repository.

   Use the Interstage Management Console on the repository server to select [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Repository server] > [Settings] tab, and then click [Detailed Settings [Show]] to check [Repository Name] in [Repository Settings].

2. Specify the repository name checked in Step 1 for the option of the ssosetsvc command and execute the command to set the service dependency.

For details on the ssosetsvc command, refer to “Single Sign-on Operation Commands” in the Reference Manual (Command Edition).

Example

“ssorep” is specified for the repository name of the SSO repository.

```
C:\>ssosetsvc ssorep
```

Notes

- When the cluster service is to be used, the service dependency should not be set using this command.
- If the repository name of the SSO repository has changed, ensure that the service dependency has been set for the changed repository name. The service dependency for the unchanged repository name does not need to be canceled.

Canceling the Service Dependency

Use the ssounsetsvc command to cancel the service dependency.

For details on the ssounsetsvc command, refer to “Single Sign-on Operation Commands” in the Reference Manual (Command Edition).

Example

```
C:\>ssounsetsvc
```

Note

To delete the SSO repository or to stop the SSO repository, cancel the service dependency.

Chapter 6

Troubleshooting

This chapter explains the action to be taken if an error occurs during operation of the Interstage Single Sign-on system.

Error Handling

This section explains how to respond to abnormalities that may occur during operation.

Error Investigation and Corrective Action

User

The user needs to respond to any messages displayed on the Web browser. When an error occurs that the user cannot correct (for example a "500 Internal Server Error") they contact the Business Server Administrator. In this case, the user must supply the following information:

- Error-detected date and time
- User ID or certificate used for authentication
- Message and status code displayed on the Web browser.

Business Server Administrator

The Business Server Administrator must do the following:

- Investigate the business server status
- Request changes to the SSO repository, repository server, and authentication server

When receiving an inquiry from a user, investigate the cause of the error in the following sequence:

1. Check the message and status code displayed on the Web-browser that are reported by the user. Remove the cause of the trouble.

   Refer to "Status Codes Reported from the Browser" in Messages for details of the message or status code displayed on the Web browser.

   When [Business Server Administrator Action] in "Status Codes Reported from the Browser" describes user actions for the SSO repository, repository server, or authentication server errors, post the user-reported information to the SSO administrator for investigation and any necessary modification of settings.

2. Check the "Trouble detection date and time" and "User ID or certificate used for authentication" reported by the user. Also check the access log of the business server and remove the cause of the error.

   Refer to "Access Log of the Business Server" of "Access Log In Single Sign-on Mode" of "Messages Logged and Output in Single Sign-on" of Messages for details of the access log of the business server.

3. If you cannot identify the cause of the trouble from the access log of the business server, use the system log of the business server to remove the cause.

   Refer to "sso03000 to sso03051" section in “Messages Beginning with sso" in Messages for details of the system log of the business server.

4. If you cannot identify the cause of the trouble from the system log of the business server, post the user-reported information to the SSO administrator, and request the investigation.

SSO Administrator

The SSO administrator must perform the following steps as necessary:

- Change the SSO repository settings
- Investigate and change the authentication server settings
- Investigate and change the repository server settings.

When receiving an investigation request or a request to change settings from the business server administrator, the SSO administrator must investigate the cause of the error or change settings,in the following order:

1. When receiving a request to change settings from the business server administrator, check the status code displayed on the Web browser, and change the settings according to [SSO Administrator Action] in "Status Codes Reported from the Browser" of Messages.
2. When receiving an investigation request from the business server administrator, check the "Trouble detection date and time" and "User ID or certificate used for authentication" that were posted by the business server administrator. Then refer to the authentication server access log to remove the cause of the error.

   Refer to "Access Log of the Authentication Server" of "Access Log In Single Sign-on Mode" of "Messages Logged and Output in Single Sign-on" of Messages for details of the access log of the authentication server.
3. If the cause of the error cannot be identified from the authentication server access log, refer to the authentication server system log and remove the cause of the error.

   Refer to "sso02000 to sso02050" of "Messages with Message Numbers Beginning sso" of Messages for details of the system log of the authentication server.
4. If the cause of the error cannot be identified from the authentication server system log, check the "Trouble detection date and time" and "User ID or certificate used in authentication" that were reported by the business server administrator. Then refer to the repository server access log and remove the cause of the error.

   Refer to "Access Log of the Repository Server" of "Access Log In Single Sign-on Mode" of " Messages Logged and Output in Single Sign-on " of Messages for details of the access log of the repository server.
5. If the cause of the error cannot be identified from the repository server access log refer to the repository server system log and remove the cause of the error.

   Refer to "sso01000 to sso01080" of "Messages with Message Numbers Beginning sso" of Messages for details of the system log of the repository server.

Log output destination

The logs of the Single Sign-on system are output to the following destinations:

- Output destination of system log

  Windows

  Event viewer (application log)

Solaris OE

/var/adm/messages

Linux

/var/log/messages

- Output destination of access log of business server

  The access log is output to the file that is set using the Interstage Management Console. Select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Settings] tab and click [Access Log Settings] > [File name].

  Storage destination of access log file

  Windows

  C:\Interstage\F3FMsso\ssoatzag\log

  Solaris OE Linux

  /var/opt/FJSVssoaz/log

- Output destination of access log of authentication server

  The access log is output to the file that is set using the Interstage Management Console. Select [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Authentication server] > [Settings] tab and click [Access Log Settings] > [File name].

  Storage destination of access log file

  Windows

  C:\Interstage\F3FMsso\ssoatcag\log

  Solaris OE Linux

  /var/opt/FJSVssoac/log

- Output destination of access log of repository server

  The access log is output to the file that is set using the Interstage Management Console. Select [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Repository server] > [Settings] tab and click [Access Log Setting] > [File name].

  Storage destination of access log file

  Windows

  C:\Interstage\F3FMsso\ssoatcsv\log

  Solaris OE Linux

  /var/opt/FJSVssosv/log

Examples of Errors

Errors are generally classified into the following items:

- Errors that can be encountered while using the Smart Repository Replication Function
- Errors in Authentication
- Errors in Business Server Authentication
- Errors in the Interstage Management Console

Errors that can be encountered while using the Smart Repository Replication Function

The role information has been updated from the Interstage Management Console, but these modifications or additions are not successful.

If the SSO repository has been synchronized using the Smart Repository replication function, synchronization may take several seconds in certain conditions; for example under heavy network load.

If role information is updated before being able to undertake a synchronization, the contents of a role configuration will not be reflected correctly.

In this case, update the role information, but ensure that the modifications made to the SSO repository (on the repository server (update system)) have been reflected in the SSO repository (on the repository server (reference system)), beforehand.

For information on how to make modifications or additions to the role configuration, see "Amending Role Configurations" in the "Authorization-related Operation" section of the Single Sign-on Operator’s Guide.

The Entry Administration Tool can be used to identify entries in the SSO repository. For more information, refer to the "Entry Management" section of the Smart Repository Operator’s Guide.

For further information regarding the replication function, refer to the “Overview “ section of the Smart Repository Operator’s Guide.

Errors in Authentication

Although a business system protection resource is accessed, the content is displayed without authentication.

Confirm that the [Port number] value of [Network Settings] in the business-server environment setup is the same as the port number of the Web server on which the business server operates. (*1)

Although a business system protection resource is accessed, unexpected content is displayed.

Confirm that the [Public URL] of [Business system Information] or the [URL] of [Authentication Infrastructure Information Settings] of the business-server environment setup is correctly set. (*2)

Although a business system protected resource is accessed, no response is returned.

Confirm the following:

- The business server and authentication server are operating.
- The [Public URL] of [Business system Information] or the [URL] of [Authentication Infrastructure Information Settings] of the business-server environment is setup correctly. (*2)
- Check the following points before linking a business system with Interstage Portalworks.
  - The business system setup file used to configure the business server was created for linking the business system with Interstage Portalworks. (*3)
  - In the business server environment settings, [Authentication Information Setting] > [Enable Client IP Address Check?] is set to “No”. (*1)
- If a load balancer such as the SSL accelerator or Interstage Traffic Director, or Application Gateway is placed before the authentication server, check that the settings are correct. (*4)

Launching reauthentication before the user information validity period expires

Check that the system time on the repository server, authentication server, and business server is the same. (*5)

User information expired so re-authentication does not occur.

Confirm the following:

- If any re-authentication request is not issued to the user, the cache information of the Web browser may be displayed.
- Check that the system time for the repository server, authentication server, and business server is the same. (*5)

*1 To check or modify [Port number] in [Network Settings], and [Enable Client IP Address Check?] in [Authentication Information Settings], in the Interstage Management Console, click the [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Settings] tabs, and then click [Detailed Settings [Show]].

*2 For the [Public URL] of [Business system Information] or the [URL] of [Authentication Infrastructure Information Settings], use the Interstage Management Console to select the [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Settings] tab, and check [Detailed Settings [Show]] in the tab.

To change the value, set up the business server again.

To set up the business server again, use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Business system] window > [List] tab to delete the current business server from [List] tab. Then, add a new business server by using the [Addition of Business server] tab.

*3 To create a business system configuration file for linkage with the Interstage Portalworks business system, use the Interstage Management Console for the repository server (update system). Click [Security] > [Single Sign-on] > [Authentication infrastructure] > [Business system setup file], and in [Linkage with Interstage Portalworks?] select “Yes”. Specify the validity range for authentication in the domain name.

*4 Refer to “Linkage with SSL Accelerator” for details of the SSL accelerator settings. Refer to “Load Balancing” for details of the load balancer. Refer to “Linkage with Application Gateway” for details of the Application Gateway settings.

*5 When setting a system time for each server, take care with the time zone settings.

Errors in Business Server Authentication

Although a protection resource or path configuration for the SSO repository has been added, changed, or deleted, it is not correctly authorized.

When a protection resource or path configuration for the SSO repository has been added, changed, or deleted, always select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Update access control information] tab > [Update] on the Interstage Management Console.

When the role configuration has been changed, always update the role information and then update the access control information. To update the role information, use the Interstage Management Console of the repository server (update system) to select [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Repository server] > [Update Role information] tab and click [Update].

The access control information file has been updated; however, authentication is not performed correctly.

When the access control information update command (ssorfinfaz) is executed, determine whether the values specified in arguments host:port and -ac are correct.

Note

When load is distributed using a repository server for both update and reference, perform changes to protection resources, path and role configurations during off-peak hours when fewer users access the servers.

Errors in the Interstage Management Console

When a business server was added, warning message sso04604 or sso04608 is displayed.

The access control information was not updated successfully because the authentication infrastructure was not ready. Take action according to the error message. After that action, always select the [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Update access control information] tab to click [Update] to confirm that the access control information is updated successfully.

The setting procedure of the authentication infrastructure needs to be confirmed.

To confirm the authentication infrastructure setting procedure using the Interstage Management Console, refer to the Operator’s Guide.

The site configuration or path configuration created in the SSO repository is not displayed on the List of Site configuration Setting, Path configuration Setting, or Download Business-System Setup File.

The site configuration or path configuration in the SSO repository may have been changed into an invalid state by using the entry management tool or *ldapmodify* command of the Smart Repository. Refer to "Entry Attributes To Be Registered in SSO Repository" and correct the site configuration, or path configuration by using the entry management tool or *ldapmodify* command of the Smart Repository. For further information regarding entry operation of SSO repository, refer to the "Entry Management" section of the Smart Repository Operator’s Guide.

Message "ihs81215: The error occurred in start processing of Interstage HTTP Server. " is displayed on the Interstage Management Console at repository server start.

It may take a while to start the Interstage HTTP Server if many role-configuration entries, or many site-configuration entries, have been defined in the SSO repository. In this case, message "ihs81215: The error occurred in start processing of Interstage HTTP Server." is displayed on the Interstage Management Console of the server on which the repository server was setup. Check the system log. When the system is normal, wait for a while and select [System] > [Services] > [Web Server]. On [Web Server: Status], confirm that the Interstage HTTP Server is operating.

Chapter 7

Developing Applications

Interstage SSO (single sign-on) supports authentication to Interstage single sign-on authentication servers and to develop applications with the use of reported user information.

The authentication server function and repository server function for authentication environment setup are provided with the following products:

- Interstage Application Server Enterprise Edition
- Interstage Application Server Standard Edition
- Interstage Application Server Plus

This chapter explains the provided application interface and describes how to develop applications.

From this point onwards, single sign-on authentication executed via a Web browser when accessing a protection resource in a business server is referred to as "SSO authentication". Authentication using a provided Java application interface is referred to as "JAAS authentication".

For details on application security, refer to "Security Risks and Measures" of "Security Risks" in "Application Programming" of the Security System Guide.

Windows

JDK installation folder

A JDK installation folder can be specified in implementation. In the following sections, it is assumed that the default JDK installation folder (C:\Interstage\JDK13 or C:\Interstage\JDK14) is used. If a folder other than the default is specified, replace the default value with the specified folder name in the following sections.

J2EE common folder

The J2EE common folder can be specified in implementation. In the following sections, it is assumed that the default J2EE common folder (C:\Interstage\J2EE\var\deployment) is used. If a folder other than the default is specified, replace the default value with the specified folder name in the following sections.

Developing Java Applications

This section explains how to develop Java applications using the Java application interface (hereafter referred to as "single sign-on JavaAPI") supported by Interstage single sign-on. The single sign-on JavaAPI class library is contained in the business server function.

The single sign-on JavaAPI uses the Java(TM) Authentication and Authorization Service (hereafter referred to as "JAAS") framework. Knowledge of JAAS application development is therefore required. For details on Java application development using JAAS, refer to the JAAS documents provided by Sun Microsystems, Inc.

To enable the use of JAAS authentication and JAAS authorization from a Java application, Interstage single sign-on supports the JAAS functions listed in the table below. For the API specifications for classes supported by the single sign-on JavaAPI (classes in packages under "com.fujitsu.interstage.sso"), refer to the attached JavaDoc.

Table 7-1 Functions Supported by Interstage Single Sign-on

Packaged Function	**Explanation**
Callback	Class for transferring information to be used for JAAS authentication (user ID/password or SSO authentication confirmation) to LoginModule
CallbackHandler	Class for setting information to be used for JAAS authentication (user ID/password or SSO authentication confirmation) in Callback. The application creator can implement this class separately.
LoginModule	Class with interface for JAAS authentication implemented
Credential	Class for storing credentials information set when JAAS authentication is successful
Principal	Class indicating an actor (such as user and role) set when JAAS authentication is successful

The following two types of Java applications can be developed using the single sign-on JavaAPI:

- Servlet application that receives authentication information from a client.

  After SSO authentication in a client (Web browser), this application uses a servlet to receive authentication success information (confirming successful execution of SSO authentication) from the client. It then uses the received information to perform JAAS authentication and reference user information.

- Java application that receives a user ID/password from a client to perform authentication.

  This client-server type Java application uses a user ID/password to perform authentication. For example, a servlet application set up in a business server receives a user ID/password entered from a Web browser. The servlet application uses the received user ID/password to perform JAAS authentication and reference user information. It is possible to develop such a servlet application.

Program Development Flow

Servlet Application that Receives Authentication Information from a Client

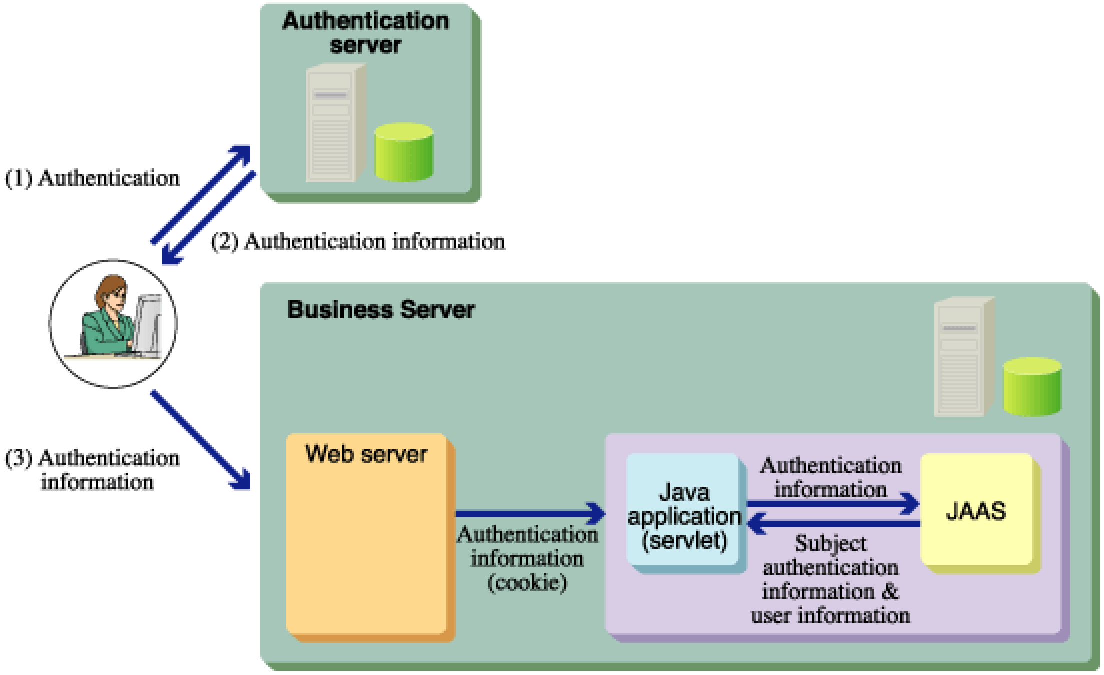

Authentication server
(1) Authentication
(2) Authentication information
Business Server
(3) Authentication information
Web server
Authentication information (cookie)
Java application (servlet)
Authentication information
Subject authentication information & user information
JAAS

Figure 7-1 Servlet Application That Receives Authentication Information from a Client

After SSO authentication in a client (Web browser), a servlet application can receive authentication success information (confirming successful execution of SSO authentication) from the client via a Cookie. The Cookie key name is "fj-is-sso-credential." An application can be created that uses the Cookie value for JAAS authentication and uses user information.

Processing Flow

Table 7-2 provides processing flow information.

Table 7-2 Process Flow Information

Processing Flow	Required?	Explanation
1. Converting CallbackHandler to instance	Required	Set login information for JAAS authentication. Use the Cookie information set when SSO authentication succeeded for conversion.
2. Converting LoginContext to instance	Required	To prepare for JAAS authentication, specify the LoginModule and CallbackHandler to be used for JAAS authentication.
3. Calling LoginContext login method	Required	Perform JAAS authentication processing. Since JAAS authentication succeeded in SSO authentication, actual authentication is not executed for the authentication server.
4. Obtaining user information	Required to obtain authentication information on an authenticated user	Obtain user information (Credential object, Principal object).
5. Executing authorization	Not available	The JAAS authorization function cannot be used with a servlet.

Environment Setup

Table 7-3 lists the environment setup items required for application execution.

Table 7-3 Process Flow Information for Application Execution

Setup Item	Required?	Explanation
Setting environment variable	Required	Set the environment variables required for operation.
Obtaining service ID file	Not Required	This file is obtained automatically during business server environment setup.
Creating login configuration file	Required	Create a login configuration file corresponding to the entry name specified when converting LoginContext to an instance.
Creating security policy file	Not Required	-
Creating truststore file	Not Required	-
Setting access permission for operated resources	Required	Set the access permission for the login configuration and security policy files. For security reasons, it is recommended that the permission settings be minimized..
Registering	Required	Register the servlet as a protection resource.

Setup Item	Required?	Explanation
protection resources		
Executing application	Required	Set the JavaVM options.

Obtaining User Information Without Using the JAAS Framework

Information on a user can be obtained as a character string from the HTTP header without using the JAAS framework. For information on obtaining the HTTP header value with a servlet application, refer to the servlet documents provided by Sun Microsystems, Inc. For details of the header names reported from a business server, refer to Setting User Information Report with Environment Variables.

Note

The JAAS authorization function cannot be used with Servlet.

Java Application that Receives User ID/Password from a Client for Authentication

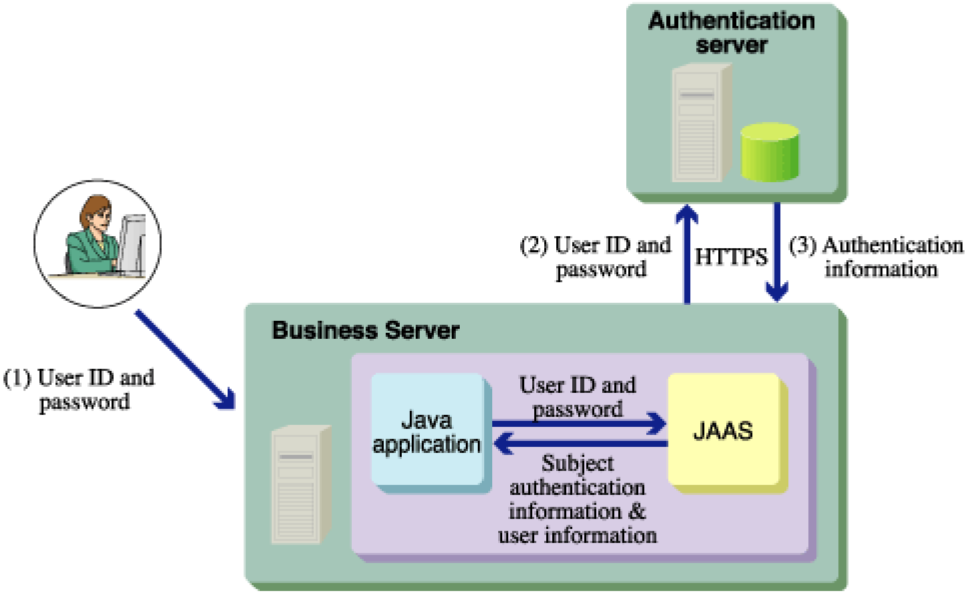


Figure 7-2 Java Application that Receives User or ID from a Client for Authentication

Enter the user ID/password from a client (Web browser). The Java application can then execute authentication processing by specifying the user ID/password sent from the client for the authentication server. Authentication processing is executed through communication with the authentication server within the single sign-on JavaAPI. An application can be developed that uses information on the authenticated user and application for JAAS authorization after authentication succeeds.

Preventing User ID/Password Security Breaches

When developing an application with Servlet application, set the Web server that runs the Servlet to use SSL communication. This will prevent user ID/password security breaches.

When an Application Runs as a Stand-alone Application

Windows

When an application is run as a stand-alone application (server application), develop the application as a service so that it can be run without login for security reasons.

Solaris OE Linux

When an application is run as a stand-alone application (server application), develop the application so that it can be run as a daemon process without login for security reasons.

Processing Flow

Table 7-4 provides processing flow information.

Table 7-4 Process Flow Information

Processing Flow	Required?	Explanation
1. Converting CallbackHandler to instance	Required	Set the login information to be used for JAAS authentication. Pass the user ID/password received from the client to a constructor argument for converting CallbackHandler to instance.
2. Converting LoginContext to instance	Required	Specify the LoginModule and CallbackHandler to be used for JAAS authentication.
3. Calling LoginContext login method	Required	Execute JAAS authentication processing. Execute authentication processing for the authentication server.
4. Obtaining user information	Required - to obtain authentication information for an authenticated user	Obtain user information (Credential object and Principal object).
5. Executing authorization	Optional	Code access permission can be controlled using the authenticated user information.

Environment Setup

Table 7-5 lists the environment setup items required for execution.

Table 7-5 Environment Setup Items for Execution

Setup Items	Required?	Explanation
Setting environment variables	Required	Set the environment variables required for operation.
Obtaining service ID file	Required - when an authentication server is specified as the authentication destination without using a business server configuration.	Use a repository server command to obtain the file.

Setup Items	Required?	Explanation
Creating login configuration file	Required	Create a login configuration file corresponding to the entry name specified when converting LoginContext to an instance.
Creating security policy file	Required to use the JAAS authorization function	Create a file in which the security policy for JavaVM operation is written.
Creating trust store file	Required	Created when a certificate is registered in an Interstage certificate environment.
Setting access permission for operated resources	Required	Specify the access permission for the login configuration, trust store, and security policy files. For security reasons, it is recommended that permission settings be minimized.
Registering protection resources	Not Required	-
Executing application	Required	Set the JavaVM options.

Notes

- The JAAS authorization function cannot be used with a servlet.
- If “certificate authentication” or “ password authentication and certificate authentication” is registered in the SSO repository as the user information authentication method for a user, the user ID of the user cannot be authenticated. If “password authentication or certificate authentication” is specified as the user authentication method, certificate authentication cannot be used.
- The application cannot be used if the SSL setting for the Web server in which the authentication server is set up specifies that a client certificate must always be authenticated.
- The following message is displayed in the authentication server access log on authentication. This message can be ignored as it does not indicate an operating error.

```
192.168.10.10 - SSO-JavaAPI - unknown [2003/11/10 13:05:45 +XXXX] -"unknown"
Authentication(unknown) failed. (User's ID/password and certificate do not
exist.)
```

Note

"+XXXX" indicates the time difference to UTC (Universal Time Coordinate). If used, "-XXXX" has the same meaning.

Developing Programs

This section explains how to develop a program that uses the single sign-on JavaAPI. The single sign-on JavaAPI uses the JAAS framework.

An example with sample code ISSsoJaas.java is shown below. In this example, authentication is executed for an authentication server by using a user ID/password entered from a business server window and JAAS authorization is executed according to the security policy.

Example

```
import java.io.BufferedReader;
import java.io.InputStreamReader;
import java.io.IOException;
import java.util.Arrays;
import java.util.Iterator;
import java.util.Map;
import java.util.Set;
import java.security.Principal;
import java.security.PrivilegedAction;
import javax.security.auth.Subject;
import javax.security.auth.callback.CallbackHandler;
import javax.security.auth.login.FailedLoginException;
import javax.security.auth.login.LoginContext;
import javax.security.auth.login.LoginException;
import com.fujitsu.interstage.sso.auth.ISAuthenticationCredential;
import com.fujitsu.interstage.sso.auth.ISAuthorizationCredential;
import com.fujitsu.interstage.sso.auth.callback.ISCallbackHandler;

public class ISSsoJaas{
  private Subject subject;
  public ISSsoJaas(){
    subject = new Subject();
  }
  public boolean login() throws Exception{
  LoginContext loginContext = null;
    BufferedReader reader = null;
    reader = new BufferedReader(new InputStreamReader(System.in));
    // attempt 3 times
    for (int i=0 ; i<3; i++) {
      // username is set from prompt
      System.out.print("UserName=");
      String username = reader.readLine();
      // password is set from prompt
      int PASSWORD_MAX_LENGTH = 128;
      char[] tmp = new char[PASSWORD_MAX_LENGTH];
      System.out.print("Password=");
      int count = reader.read(tmp);
      int lineSeparatorLength =
System.getProperty("line.separator").length();
      char[] password = new char[count - lineSeparatorLength];
      System.arraycopy(tmp, 0, password, 0, password.length);
      // callback is created here by userid and password
      // Converting CallbackHandler to instance
      CallbackHandler myHandler = new ISCallbackHandler(username, password);
      // create LoginContext object
      // Converting LoginContext to instance
      loginContext = new LoginContext(
          "com.fujitsu.interstage.sso", subject, myHandler);
      // Calling LoginContext login method
      try{
        loginContext.login();
        return true;
      }
      catch(FailedLoginException ex){
        System.out.println("Authenticate failed");
        continue;
      }
      finally {
        Arrays.fill(password,' ');
        Arrays.fill(tmp,' ');
      }
    }
    return false;
  }
  public void authorize(){
    System.out.println("\n" + "*** Credential Information ***");
    // get privateCredential Set
    // Obtaining user information
    Set credentials = subject.getPrivateCredentials();
    // display credential information
    Iterator iterator = credentials.iterator();
    while (iterator.hasNext()) {
      Object credential = iterator.next();
      // this credential identify login user
      if (credential instanceof ISAuthorizationCredential){
        ISAuthorizationCredential isCredential =
          (ISAuthorizationCredential) credential;
        System.out.println("AuthorizationCredential=" +
                isCredential.getEncryptedCredential());
        System.out.println("Dn=" + isCredential.getDN());
        System.out.println("Uid=" + isCredential.getUID());
        Set roles = isCredential.getRoles();
        if (roles != null) {
          Iterator ite = roles.iterator();
          while(ite.hasNext()){
            System.out.println("Role=" + ite.next());
          }
        }
        System.out.println("ClientAddress=" +
          isCredential.getClientAddress());
        System.out.println("AuthMethod=" +
          isCredential.getAuthMethod());
        System.out.println("AuthTime=" + isCredential.getAuthTime());
        System.out.println("Expiration=" +
          isCredential.getExpiration());
      }
    }
    System.out.println("\n" + "*** Principals Information ***");
    // display principal information
    // Obtaining user information
    Set principals = subject.getPrincipals();
    iterator = principals.iterator();
    while (iterator.hasNext()) {
      Principal principal = (Principal)iterator.next();
      System.out.println("Principal=" + principal.getName());
    }
    System.out.println("\n" + "*** Execute PrivilegedAction ***");
    // Privileged operation execute by the attested authority.
    // Executing authorization
    PrivilegedAction myAction = new ISSsoAction();
    subject.doAs(subject, myAction);
  }
  public static void main(String args[]) {
    ISSsoJaas sample = new ISSsoJaas();
    try{
      if (sample.login()) {
        sample.authorize();
      }
      else{
        System.out.println("Login failed");
      }
    }
    catch(Exception ex){
      ex.printStackTrace();
    }
  }
}
```

Converting CallbackHandler to an Instance

To use JAAS, CallbackHandler must be converted to an instance. The single sign-on JavaAPI supports a CallbackHandler implementation class with the class name:

com.fujitsu.interstage.sso.auth.callback.ISCallbackHandler.

The information required for authentication is passed from CallbackHandler to LoginModule via Callback.

For a Java application that receives a user ID/password from a client for authentication, convert ISCallbackHandler with the user ID/password obtained from the client.

```
CallbackHandler myHandler = new ISCallbackHandler(username, password);
```

When developing an application as a stand-alone application, security must be considered. For example, use javax.net.ssl.SSLSocket for communication with a client.

For a servlet application that receives authentication information from a client, convert ISCallbackHandler to an instance with information indicating SSO authentication success obtained from the client. The target information is stored in a Cookie with the key name fj-is-sso-credential. The key name is defined in variable COOKIE_KEY of class com.fujitsu.interstage.sso.auth.ISAuthorizationCredential. The code is shown below.

```
Cookie cookie = null;
Cookie[] cookies = request.getCookies();
if (cookies != null){
  for (int i=0; i< cookies.length;i++){
    if (cookies[i].getName().equals(
      ISAuthorizationCredential.COOKIE_KEY)){
      cookie = cookies[i];
    }
  }
}
String credentialStr = cookie.getValue();
CallbackHandler myHandler = new ISCallbackHandler(credentialStr);
```

Converting LoginContext to an Instance

Convert the LoginContext to an instance. The code is shown below.

```
LoginContext loginContext = new LoginContext("com.fujitsu.interstage.sso",
                                             subject,  myHandler);
```

Use the following arguments for conversion:

- First argument

  Login configuration file entry name. For login configuration file details, refer to Creating Login Configuration File.

- Second argument

  Instance of a Subject object in which user authentication information set for successful authentication is stored

- Third argument

  Instance created as described in Converting CallbackHandler to an Instance.

Note

For JDK1.3, java.lang.SecurityException may be generated if a Java application converts the LoginContext simultaneously from two or more threads, so use JDK1.4 or synchronize the LoginContext conversion items. The following is an example:

```
LoginContext loginContext = null;
synchronized (LoginContext.class) {
    loginContext = new LoginContext("com.fujitsu.interstage.sso",
                                    subject, myHandler);
}
```

Calling LoginContext Login Method

Authentication processing is executed by calling the LoginContext login method. LoginException or its subclass is thrown in the login method. Catch a thrown LoginException or its subclass. This is shown in the following example:

```
try{
  loginContext.login();
  return true;
}
catch(FailedLoginException ex){
  System.out.println("Authenticate failed");
  continue;
}
```

Obtaining User Information

When JAAS authentication is executed successfully, the objects listed below are associated with the Subject object specified when converting the LoginContext to an instance.

- Credential object that indicates authentication information
- Principal object that indicates the user ID of the authenticated user
- Principal object that indicates the name of the role to which the user belongs
- Principal object that indicates the unique distinguished name in the SSO repository.

The object that indicates authentication information can be obtained with the following Subject object methods:

- public Set getPrivateCredentials()
- public Set getPrivateCredentials(Class c)

A set of all Credential objects associated with the Subject object can be obtained with the getPrivateCredentials() method. A set of Credential objects in the Class class (or a subclass of the Class class) that are associated with the Subject object can be obtained with the getPrivateCredentials(Class c) method

Table 7-6 lists the class of objects that can be associated with the Subject object.

Table 7-6 Object Classes Associated with the Subject Object

Class Name	Explanation
com.fujitsu.interstage.sso.auth.ISAuthorizationCredential	Retains information (a value obtained from the Cookie) indicating SSO authentication success and data in authentication information.

The code is shown below.

```
Set credentials = subject.getPrivateCredentials();
// display credential information
Iterator iterator = credentials.iterator();
while (iterator.hasNext()) {
  // Processing for referencing authentication information
  if (credential instanceof ISAuthorizationCredential){
  }
}
```

Principal objects can be obtained with the following Subject object methods:

- public Set getPrincipals();
- public Set getPrincipals(Class c);

The difference between these methods is the same as the difference between the getPrivateCredentials methods.

Table 7-7 lists the classes of objects that can be associated with the Subject object.

Table 7-7 Object Classes Associated with the Subject Object

Class Name	Explanation
com.fujitsu.interstage.sso.auth.ISUserPrincipal	Indicates the user ID of an authenticated user.
com.fujitsu.interstage.sso.auth.ISRolePrincipal	Indicates the name of the role to which the user belongs. If the user belongs to a role set, roles in the role set are associated as ISRolePrincipal objects. No object is set unless the user belongs to a role.
For JDK1.3 com.sun.security.auth.X500Principal For JDK1.4 javax.security.auth.x500.X500Principal	Indicates the unique distinguished name (DN) of the user in the SSO repository. There is a difference between JDK1.3 and JDK1.4 in the implementation of the java.security.Principal interface getName method. When using the getName method, note the following difference. - JDK1.3: An space is inserted immediately after a DN delimiter (comma). - JDK1.4: No space is inserted immediately after a DN delimiter (comma). Example: Value returned with getName method JDK1.3: CN=user001, OU=User, OU=interstage, O=fujitsu, DC=com JDK1.4: CN= user001,OU=User,OU=interstage,O=fujitsu,DC=com

The code is shown below.

```
Set principals = subject.getPrincipals();
iterator = principals.iterator();
while (iterator.hasNext()) {
  Principal principal = (Principal)iterator.next();
  System.out.println("Principal=" + principal.getName());
}
```

Reported User Information

When a business server configuration is used to specify an authentication server of the authentication destination, the following information (which is retained in the object ISAuthorizationCredential) is reported when “Yes” is selected for [Notify User Information?] on the Interstage Management Console.

- User DN, role name
- Authentication method
- User UID

- Client IP address
- Authentication time
- Re-authentication time
- Scope of authentication information.

On the Interstage Management Console, select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name]. Select the [Settings] tab and click [Detailed Settings [Show]] then check [Notify User Information?] in [Linkage with Web applications]. For details, refer to the Operator's Guide.

The application must be restarted to reflect the [Report User Information] settings. If the application is a servlet application, restart IJServer. For login configuration details, refer to Creating Login Configuration File.

Reporting User Information At Indefinite Re-authentication Intervals

The re-authentication interval can be obtained using the ISAuthorizationCredential object getExpiration method. If the re-authentication interval is indefinite, the time obtained with the getAuthTime method is the same as that obtained with the getExpiration method.

Note

The X500Principal object cannot be used if JDK1.3 is used and a character other than alphanumeric characters and symbols is contained in a unique distinguished name in the SSO repository. To obtain a character-string object indicating the unique name, use the ISAuthorizationCredential object getDN method or JDK1.4.

Executing Authorization

When JAAS authentication is executed successfully, the Subject object can be used to use the JAAS authorization function.

The JAAS authorization function differs from the single sign-on authorization function that controls access to resources opened by a Web server. It controls access for Java application processing on the basis of principal information about an authenticated user.

In single sign-on JavaAPI, the user ID, role name, and unique distinguished name in the SSO repository are defined as principal information, and the Java Security manager is used for access control. For information on the Java Security manager, refer to the Java Security manager document from Sun Microsystems, Inc.

Access control is explained below using sample ISSsoAction.java code as an example. In this class, java.security.PrivilegedAction is implemented, and a run method is executed by assuming an authenticated user.

Example

```
import java.security.AccessControlException;
import java.security.PrivilegedAction;

public class ISSsoAction implements PrivilegedAction{
  public Object run() {
    try{
      System.out.println("java.home=" + System.getProperty("java.home"));
    }catch(AccessControlException ex){
      System.out.println("This user does not have a permission to " +
        "read java.home property");
    }
    try{
      System.out.println("user.home=" + System.getProperty("user.home"));
    }catch(AccessControlException ex){
      System.out.println("This user does not have a permission to " +
        "read user.home property");
    }
    return null;
  }
}
```

A run method is executed with the access permission for principal information by passing the Subject object and instances in the above classes to the Subject doAs method.

The code is shown below.

```
PrivilegedAction myAction = new ISSsoAction();
subject.doAs(subject, myAction);
```

To provide access permission to principal information, write a security policy file. For security policy file details, refer to Creating a Security Policy File.

Authorization with Role Set

The JAAS authorization function cannot execute authorization by using the role set name. In a Java application, if an authenticated user belongs to a role set, authorization is executed using the role name in the role set.

Authorization by Re-authentication Intervals

The JAAS authorization function cannot execute authorization by using the re-authentication interval contained in the authentication information for an authenticated user in an authentication server. A Java application can use the ISAuthorizationCredential object getExpiration method to obtain and check the re-authentication interval.

Setting the Application Execution Environment

This section explains how the administrator for the operating application should set the environments required for application execution.

Setting Environment Variables

Set the following paths (directory names/file names) in the environment variables CLASSPATH, JAVA_HOME, and PATH required for application operation:

JDK1.3

Windows

Table 7-8 Setting Environment Variables for Windows (JDK1.3)

Environment Variable	Values
CLASSPATH	Specify the Java Archive (jar) files listed below. An isj2ee.jar CLASSPATH value must be specified after the jsse.jar, jnet.jar, and jcert.jar values. - [Interstage install directory] \J2EE\lib\jsse.jar - [Interstage install directory] \J2EE\lib\jnet.jar - [Interstage install directory] \J2EE\lib\jcert.jar - [Interstage install directory] \J2EE\lib\isj2ee.jar - [Interstage install directory] \F3FMsso\ssoatzag\lib\isssomod.jar
JAVA_HOME	Set the following directory: - JDK install directory
PATH	Set the following directory: -%JAVA_HOME%\bin

The environment variables can be set as system environment variables. If a system environment variable is changed, restart the system.

Example

Interstage install directory: C:\Interstage
JDK install directory: "C:\Interstage\JDK13"

```
C:\>set CLASSPATH=
C:\Interstage\J2EE\lib\jsse.jar;C:\Interstage\J2EE\lib\jcert.jar;
C:\Interstage\J2EE\lib\jnet.jar;C:\Interstage\J2EE\lib\isj2ee.jar;
C:\Interstage\F3FMsso\ssoatzag\lib\isssomod.jar
C:\>set JAVA_HOME=C:\Interstage\JDK13
C:\>set PATH=%JAVA_HOME%\bin;%PATH%
```

Solaris OE Linux

Table 7-9 Setting Environment Variables for Solaris OE and Linux (JDK1.3)

Environment Variable	Values
CLASSPATH	Specify the Java Archive (jar) files listed below. An isj2ee.jar CLASSPATH value must be specified after the jsse.jar, jnet.jar, and jcert.jar values. - /opt/FJSVj2ee/lib/jsse.jar - /opt/FJSVj2ee/lib/jnet.jar - /opt/FJSVj2ee/lib/jcert.jar - /opt/FJSVj2ee/lib/isj2ee.jar - /opt/FJSVssoaz/lib/isssomod.jar
JAVA_HOME	Set the following directory: - JDK install directory
PATH	Set the following directory: - $JAVA_HOME/bin

Example

JDK install directory: "/opt/FJSVawjbk/jdk13"

```
# sh
# CLASSPATH=
/opt/FJSVj2ee/lib/jsse.jar:/opt/FJSVj2ee/lib/jcert.jar:
/opt/FJSVj2ee/lib/jnet.jar:/opt/FJSVj2ee/lib/isj2ee.jar:
/opt/FJSVssoaz/lib/isssomod.jar
# export CLASSPATH
# JAVA_HOME=/opt/FJSVawjbk/jdk13
# export JAVA_HOME
# PATH=$JAVA_HOME/bin:$PATH
# export PATH
```

JDK1.4

Windows

Table 7-10 Setting Environment Variables for Windows (JDK1.4)

Environment Variable	Values
CLASSPATH	Specify the following Java Archive (jar) file: - [Interstage install directory] \F3FMsso\ssoatzag\lib\isssomod14.jar
JAVA_HOME	Set the following directory: - JDK install directory
PATH	Set the following directory: - %JAVA_HOME%\bin

The environment variables can be set as system environment variables. If a system environment variable is changed, restart the system.

Example

Interstage install directory: C:\Interstage
JDK install directory: "C:\Interstage\JDK14"

```
C:\>set CLASSPATH=C:\Interstage\F3FMsso\ssoatzag\lib\isssomod14.jar
C:\>set JAVA_HOME=C:\Interstage\JDK14
C:\>set PATH=%JAVA_HOME%\bin;%PATH%
```

Solaris OE Linux

Table 7-11 Setting Environment Variables for Solaris OE and Linux (JDK1.4)

Environment Variable	Values
CLASSPATH	Specify the following Java Archive (jar) file: - /opt/FJSVssoaz/lib/isssomod14.jar
JAVA_HOME	Set the following directory: - JDK install directory
PATH	Set the following directory: - $JAVA_HOME/bin

Example

JDK install directory: "/opt/FJSVawjbk/jdk14"

```
# sh
# CLASSPATH=/opt/FJSVssoaz/lib/isssomod14.jar
# export CLASSPATH
# JAVA_HOME=/opt/FJSVawjbk/jdk14
# export JAVA_HOME
# PATH=$JAVA_HOME/bin:$PATH
# export PATH
```

CLASSPATH Setting for Using JAAS Authorization Function

To use the security manager, specify the jar files specified for the environment variable CLASSPATH for the security policy file URL. If a class contained in a jar file specified for the security policy file is loaded from jar files other than those specified for the security policy file, the specified security policy becomes invalid. This occurs, for example, when a class is loaded from a class file with directories specified for CLASSPATH.

CLASSPATH Set Automatically When Executed in IJServer

For IJServer of the Interstage Management Console, isj2ee.jar does not need to be set in the class path. For details on IJServer CLASSPATH, refer to “IJServer file configuration” in “Environment Where J2EE Applications are Operated (IJServer)” in “Design of J2EE Application” in the J2EE User’s Guide.

Note

The IJServer, jsse.jar, jcert.jar, and jnet.jar contained in the J2EE package are copied to an ext directory under the IJServer directory so they can be accessed and used.

Obtaining Service ID File

If an authentication server of the authentication destination is specified with a Java application that receives a user ID/password from a client for authentication (without using a business server configuration), the application operation administrator requests the SSO administrator to obtain the service ID file. Store the obtained service ID file in the server where the Java application is to be executed using a secure method.

A service ID file can be created by executing an ssomksid command in a repository server in which the authentication infrastructure is set up.

For information on obtaining a service ID file, refer to “ssomksid” in “Single Sign-on Operation Commands” in the Reference Manual (Command Edition).

Use the serviceidpath option for the login configuration file to specify a service ID file. For details of the login configuration and login configuration file, refer to Creating Login Configuration File.

Creating Login Configuration File

The application operation administrator creates a login configuration file required for application execution. Any file name can be specified for system property java.security.auth.login.config at application execution time. In the login configuration file, write the login configuration in which a LoginModule provided by single sign-on JavaAPI is set. For login configuration file details, refer to the J2SDK and JAAS documents provided by Sun Microsystems, Inc.

Write the login configuration in the following format:

```
<entry-name> {
    <loginmodule-class-name> <flag> <module-option>;
};
```

Write the name specified when LoginContext is converted to an instance in entry-name. All symbols can be used if the entry name is enclosed with double or single quotation marks. Guidelines on the symbols that can be used if the entry name is not enclosed with double or single quotation marks are as follows.

Symbols that can be used without enclosing the entry name with double or single quotation marks:

- JDK1.3
  - Hyphen (-)
  - Period (.)
- JDK1.4
  - Dollar sign ($)
  - Hyphen (-)
  - Period (.)
  - Underscore (_)

Set either of two LoginModules provided by the single sign-on JavaAPI in loginmodule-class-name.

- Servlet application that receives authentication information from a client

  com.fujitsu.interstage.sso.auth.module.ISCredentialLoginModule

- Java application that receives a user ID/password from a client for authentication

  com.fujitsu.interstage.sso.auth.module.ISLoginModule

Generally, "required" should be set in the flag. “requisite”, “sufficient”, and “optional” can also be set. For details, refer to the J2SDK and JAAS documents provided by Sun Microsystems, Inc.

In module-option, write the information used by LoginModule such as authentication infrastructure information of the authentication destination and the service ID file path name in list format where a blank character is used as a delimiter. Insert an equals sign between an option name and a value and enclose the value with double quotation marks. Use only lowercase letters to specify an option name to be used by LoginModule provided by the single sign-on JavaAPI. If an uppercase letter is used in an option name (or if an option name is specified incorrectly), it is assumed that the option name is omitted. Insert a semicolon at the end of LoginModule specification items.

Table 7-12 lists the option that can be used with the com.fujitsu.interstage.sso.auth.module.ISCredentialLoginModule.

Table 7-12 Option for module ISCredentialLoginModule

Option	Explanation
serverport	Specify the port number of the business server. Use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name]. Select the [Settings] tab and click [Detailed Settings [Show]] then specify the value specified for [Port number] in [Network Settings]. For details on Interstage Management Console definition, refer to the Operator’s Guide.

Table 7-13 lists the options that can be used with the com.fujitsu.interstage.sso.auth.module.ISLoginModule.

Table 7-13 Option for module ISLoginModule

Option	Explanation
serviceidpath	When specifying an authentication server of the authentication destination without using a business server configuration, specify a service ID file by using the absolute path name. If this option is specified, the authserver option must also be specified. Windows When writing the path name of the specified service ID file, use \\ as a file separator because \ is an escape character.
authserver	Specify this option when specifying an authentication server of the authentication destination without using a business server configuration in authentication infrastructure-URL+"/ ssoatcag” format Example: https://www.fujitsu.com:443/ssoatcag If this option is specified, the serviceidpath option must also be specified.
timeout	Specify a read timeout time from 0 to 300 (seconds), which is used for communication with an authentication server. When 0 is specified, timeout is not monitored. When omitted, 60 is assumed.

Option	Explanation
authservertrusted	Specify whether the site certificate of an authentication server presented from the authentication server is verified in SSL communication with the authentication server. Set “yes” for no verification. "yes" is not case sensitive. If "yes" is omitted or a value other than “yes” is specified, the certificate is verified.
serverport	Specify the port number specified in the business server configuration when an authentication server of the authentication destination is specified using the configuration. This option is required when authentication is executed for an authentication server with information set in business server environment setup. Do not specify the serviceidpath and authserver options. Use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Business System] > [Business System Name]. Select the [Setup Environment] tab and click [Show Detailed Setup] then specify the port number specified for [Port Number] in [Network]. For details on Interstage Management Console definition, refer to the Operator’s Guide.

File Encoding Mode for Login Configuration File

When a character other than alphanumeric characters and symbols is used in a login configuration file, store the login configuration using the following file encoding mode:

- JDK1.3

  JavaVM default encoding mode

- JDK1.4

  UTF-8 encoding mode

Note

The site certificate destination CommonName registered at authentication server SSL environment setup must correspond with the authentication server host name specified for the authserver option in the login configuration file.

Login configuration file examples are provided below. In the examples, the login configuration entry name com.fujitsu.interstage.sso is used.

Examples

Execution of a Servlet Application that Receives Authentication Information from a Client

Business server port number: 80

```
com.fujitsu.interstage.sso {
com.fujitsu.interstage.sso.auth.module.ISCredentialLoginModule required
    serverport="80"
    ;
};
```

Execution of a Java Application that Receives a User ID/Password from a Client for Authentication

Windows

Business server configuration: Unused
Timeout time: 300 seconds
Connected authentication infrastructure URL: https://auth.fujitsu.com:443
Service ID file: "C:\Interstage\F3FMsso\ssoatzag\sample\javaapi\serviceid"

```
com.fujitsu.interstage.sso {
com.fujitsu.interstage.sso.auth.module.ISLoginModule required
  timeout="300"
  authserver="https://auth.fujitsu.com:443/ssoatcag"

serviceidpath="C:\\Interstage\\F3FMsso\\ssoatzag\\sample\\javaapi\\serviceid
"
  ;
};
```

Solaris OE Linux

Business server configuration: Unused
Timeout time: 300 seconds
Connected authentication infrastructure URL: https://auth.fujitsu.com:443
Service ID file: "/home/jaastest/javaapi/serviceid"

```
com.fujitsu.interstage.sso {
com.fujitsu.interstage.sso.auth.module.ISLoginModule required
  timeout="300"
  authserver="https://auth.fujitsu.com:443/ssoatcag"
  serviceidpath="/home/jaastest/javaapi/serviceid"
  ;
};
```

Creating a Security Policy File

The application operation administrator creates a security policy file when the JAAS authorization function is used by a Java application. Any file name can be specified for the system property java.security.policy at execution of the java application. For details on the security policy file, refer to the J2SDK and JAAS documents provided by Sun Microsystems, Inc.

The three grant entry formats shown below can be used to write a security policy.

To Grant Permission for all Codes

```
grant{
permission <access-permission-class-name> “<target-name>”, “<action-name>”;
permission <access-permission-class-name> “<target-name>”, “<action-name>”;
    ...
};
```

To Grant Permission for Each Code Base

```
grant codeBase <URL>{
 permission <access-permission-class-name> “<target-name>”, “<action-name>”;
 permission <access-permission-class-name> “<target-name>”, “<action-name>”;
    ...
};
```

To Grant Permission for Each User Principal

```
grant codeBase <URL>,
 principal <principal-class-name> “<principal-name>”,
 principal <principal-class-name> “<principal-name>”,
      ... {
permission <access-permission-class-name> “<target-name>”, “<action-name>”;
permission <access-permission-class-name> “<target-name>”, “<action-name>”;
    ...
};
```

- codeBase Field

  The codeBase value (<URL>) indicates the position where a code is set. Access permission is given for a code loaded from the specified position. If this field is omitted, access permission is granted for all codes regardless of the original code position.

- principal Field

  Specify both a principal-class-name and principal-name in this field as a pair. Access permission is granted for a pair in a principal set for a thread under process. The Subject object associates the principal set with a code to be executed. If this field is omitted, access permission is granted for all pairs.

- Access Permission Entry

  This entry starts with permission. Specify an access permission class name such as java.util.PropertyPermission or java.io.FilePermission in access-permission-class-name. Write a target-name and action-name as required after the access permission class name. For example, when java.util.PropertyPermission is specified, the system property name can be specified for target-name and “read” and “write” can be specified for action-name. For information on setting access permission, refer to the J2SDK and JAAS documents provided by Sun Microsystems, Inc.

Escape Character

The symbol \ is processed as an escape character in a security policy file. Therefore, use \\ as a file separator when writing a path name in URL.

File Encoding for Security Policy File

When a character other than alphanumeric characters and symbols is used in a security policy file, store the security policy file with the following file encoding format:

- JDK1.3

  JavaVM default encoding format

- JDK1.4

  UTF-8 encoding format format or the default encoding format used by JavaVM
  To use the default encoding format, the system property com.sun.security.policy.utf8 should be assigned the value false.

Granting Permission for Each Distinguished Name that is Unique Within the User SSO Repository

- JDK1.3

  Insert a space after each comma between the attributeType=attributeValue values making up a principal name.

Example

```
grant codeBase "file:isssoaction.jar" ,principal
com.sun.security.auth.X500Principal "CN=user001, OU=User, OU=interstage,
O=fujitsu, DC=com" {
permission java.util.PropertyPermission "java.home","read";
};
```

- JDK1.4

  Do not insert a space after each comma between the attributeType=attributeValue values making up a principal name.

Example

```
grant codeBase "file:isssoaction.jar" , principal
javax.security.auth.x500.X500Principal "CN=
user001,OU=User,OU=interstage,O=fujitsu,DC=com" {
    permission java.util.PropertyPermission "java.home","read";
};
```

Note

JDK1.3 cannot be used for JAAS authorization using a distinguished name unique within an SSO repository where a value other than alphanumeric characters and symbols is used. In this situation, use JDK1.4.

File Description

Specifying a security policy file used in an application that executes JAAS authorization is explained below. To use the JAAS authorization function, the codes to be processed for each principal and other codes must be set in different jar files as described in Table 7-14.

Table 7-14 Jar File Descriptions

Jar File	Explanation
Jar file used by the single sign-on JavaAPI (*1)	Specify permission for each code base.
Jar file that contains codes not processed for each principal by a user application	Specify minimal permissions for each code base
Jar file that contains codes processed for each principal by a user application	Specify minimal permissions for each user principal.

*1 For details of the jar file used with the single sign-on JavaAPI and JSSE jar file, refer to CLASSPATH setting information in Setting Environment Variables.

Examples of security policy files set in applications that use a user ID/password for authentication and authorization are shown below.

Example

JDK1.3

Java application jar file: "isssojaas.jar"

```
grant codeBase "file:C:\\Interstage\\J2EE\\lib\\jsse.jar" { Windows
grant codeBase "file:/opt/FJSVj2ee/lib/jsse.jar" { Solaris OE  Linux
  permission java.security.AllPermission;
};

grant codeBase "file:C:\\Interstage\\J2EE\\lib\\jcert.jar" { Windows
grant codeBase "file:/opt/FJSVj2ee/lib/jcert.jar" { Solaris OE  Linux
  permission java.security.AllPermission;
};

grant codeBase "file:C:\\Interstage\\J2EE\\lib\\jnet.jar" { Windows
grant codeBase "file: /opt/FJSVj2ee/lib/jnet.jar" { Solaris OE  Linux
  permission java.security.AllPermission;
};

grant codeBase "file:C:\\Interstage\\J2EE\\lib\\isj2ee.jar" { Windows
grant codeBase "file:/opt/FJSVj2ee/lib/isj2ee.jar" { Solaris OE  Linux
  permission java.security.AllPermission;
};

grant codeBase "file:C:\\Interstage\\F3FMsso\\ssoatzag\\lib\\isssomod.jar"
{ Windows
grant codeBase "file:/opt/FJSVssoaz/lib/isssomod.jar" { Solaris OE  Linux
  permission java.lang.RuntimePermission "loadLibrary.F3FMssojdec";
  ...
  permission javax.security.auth.PrivateCredentialPermission
```

```
    "com.fujitsu.interstage.sso.auth.ISAuthorizationCredential
  com.fujitsu.interstage.sso.auth.ISUserPrincipal \"*\"", "read";
};

grant codeBase "file:isssojaas.jar" {
  permission java.util.PropertyPermission "java.home","read";
  permission java.util.PropertyPermission "user.home","read";
  permission javax.security.auth.AuthPermission "createLoginContext";
  permission javax.security.auth.AuthPermission "doAs";
  permission javax.security.auth.PrivateCredentialPermission
    "com.fujitsu.interstage.sso.auth.ISAuthenticationCredential
    com.fujitsu.interstage.sso.auth.ISUserPrincipal \"*\"", "read";
  permission javax.security.auth.PrivateCredentialPermission
    "com.fujitsu.interstage.sso.auth.ISAuthorizationCredential
    com.fujitsu.interstage.sso.auth.ISUserPrincipal \"*\"", "read";
};
```

Jar file containing classes to be processed based on access permission granted to an authenticated user: "isssoaction.jar"

```
grant codeBase "file:isssoaction.jar" ,
principal com.fujitsu.interstage.sso.auth.ISUserPrincipal "guest" {
    permission java.util.PropertyPermission "java.home","read";
};

grant codeBase "file:isssoaction.jar" ,
  principal com.fujitsu.interstage.sso.auth.ISRolePrincipal "administrator"
{
    permission java.util.PropertyPermission "user.home","read";
};
```

JDK1.4

Java application jar file: "isssojaas.jar"

Jar file containing classes to be processed based on access permission granted to an authenticated user: "isssoaction.jar"

```
grant codeBase "file:isssoaction.jar" ,
principal com.fujitsu.interstage.sso.auth.ISUserPrincipal "guest" {
    permission java.util.PropertyPermission "java.home","read";
};

grant codeBase "file:isssoaction.jar" ,
  principal com.fujitsu.interstage.sso.auth.ISRolePrincipal "administrator"
{
    permission java.util.PropertyPermission "user.home","read";
};

grant codeBase "file:isssojaas.jar" {
  permission java.util.PropertyPermission "java.home","read";
  permission java.util.PropertyPermission "user.home","read";
  permission javax.security.auth.AuthPermission
    "createLoginContext.com.fujitsu.interstage.sso";
  permission javax.security.auth.AuthPermission "doAs";
  permission javax.security.auth.PrivateCredentialPermission
    "com.fujitsu.interstage.sso.auth.ISAuthenticationCredential
    com.fujitsu.interstage.sso.auth.ISUserPrincipal \"*\"", "read";
  permission javax.security.auth.PrivateCredentialPermission
    "com.fujitsu.interstage.sso.auth.ISAuthorizationCredential
    com.fujitsu.interstage.sso.auth.ISUserPrincipal \"*\"", "read";
};

grant codeBase "file:C:\\Interstage\\F3FMsso\\ssoatzag\\lib\\isssomod14.jar
" { Windows
grant codeBase "file:/opt/FJSVssoaz/lib/isssomod14.jar " { Solaris OE  Linux
  permission java.lang.RuntimePermission
    "accessClassInPackage.sun.net.www.protocol.https";
    ...
    com.fujitsu.interstage.sso.auth.ISUserPrincipal \"*\"", "read";
  permission javax.security.auth.PrivateCredentialPermission
    "com.fujitsu.interstage.sso.auth.ISAuthorizationCredential
    com.fujitsu.interstage.sso.auth.ISUserPrincipal \"*\"", "read";
};
```

Creating a Trust Store File

A trust store file is required when a Java application that receives a user ID/password from a client to perform authentication uses a user ID/password for authentication with an authentication server in SSL communication. By using the trust store file, the Java application can verify the site certificate of the authentication server.

If the site certificate of an authentication server is not to be verified in SSL communication with the authentication server, specify authservertrusted="yes" in the login configuration file. In this case, no trust store file is required. For login configuration file details, refer to Creating Login Configuration File.

The following two methods can be used to create a trust store file:

1. Using the Interstage certificate environment
2. Using the JDK keytool command.

Using the Interstage Certificate Environment

Obtain the site certificate of the authentication server and the CA certificate that is a certificate of the site certificate issuer. If a load balancer (such as Interstage Traffic Director) is used, use a site certificate issued with the load balancer FQDN. Register the obtained certificate in the Interstage certificate environment. For registration details, refer to “Configuring Environments” in “Setting and Use of the Interstage Certificate Environment” in the Security System Guide.

When the certificate is registered, the trust store file is stored in a file with the paths shown below. Specify the file name with the system property javax.net.ssl.trustStore when the application starts.

Windows

Interstage install directory: C:\Interstage
C:\Interstage\etc\security\env\keystore\.keystore

Solaris OE Linux

/etc/opt/FJSVisscs/security/env/keystore/.keystore

Using the Keytool Command

Obtain the site certificate of the authentication server and the CA certificate that is a certificate of the site certificate issuer. If a load balancer (such as Interstage Traffic Director) is used, use a site certificate issued with the load balancer FQDN then use a keytool command to create a trust store file.

For keytool command details, refer to the J2SDK documents provided by Sun Microsystems, Inc.

Usage

```
keytool -import –file certificate-file-absolute-pathname –keystore trust-store-file-absolute-pathname
```

A trust store file can be specified by specifying its file name with the system property javax.net.ssl.trustStore. If no file name is specified, the following default files are used:

- JDK default file

  Windows

  %JAVA_HOME%\jre\lib\security\cacerts

  Solaris OE Linux

  $JAVA_HOME/jre/lib/security/cacerts

  The initial password is “changeit.”

- JSSE default file

  Windows

  %JAVA_HOME%\jre\lib\security\jssecacerts

  Solaris OE Linux

  $JAVA_HOME/jre/lib/security/jssecacerts

Note

Use JDK1.4 if UTF-8 is used for the authentication server site certificate and CA certificate.

Setting Access Permission for Operation Resources

Resources (such as the configuration file and service ID file) are required for Java application operation and must be securely protected. This section explains how to set access permission to protect these resources.

The actual setting methods are shown below.

When Servlet Application Uses Business Server Configuration for Specifying an Authentication Server of the Authentication Destination

Windows

Execute a Java application that uses a business server configuration as a user belonging to the Administrators group.

Solaris OE Linux

To read a business server configuration, match an IJServer user with a user specified in the User directive in the Interstage HTTP Server environment configuration file (httpd.conf).

When Nobody is specified as an IJServer user, set the environment as follows:

1. Use the WorkUnit automatic activation and activate the IJServer with user nobody.

When an IJServer user other than nobody is specified, set the environment as follows:

1. Use the useradd command to create an IJServer user. Grant user authority equivalent to the file access permission of the user specified in the httpd.conf file User directive to the created user.
2. Set access permission for the created user as explained below.
3. Specify the user in the httpd.conf User directive.
4. Use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Settings] tab and click [Update].(*1)

*1 For further details, refer to “Changing Effective User for Web Server” in Chapter 4 – Operation and Maintenance.

Setting Access Permission for Files

Windows

Use Windows explorer to change user and group access permission. Set access permission as a user with Administrator authority.

Table 7-15 Setting Access Permissions for Files (Windows)

Resource	Explanation
Service ID file	Set access permission when a Java application that receives a user ID/password from a client to perform authentication is not to use the business server configuration. Permit only a Java application execution user (or IJServer user for a servlet application) to read the file.
Login configuration file	Permit only a Java application execution user (or IJServer user for a servlet application) to read the file.
Security policy file	Permit only a Java application execution user to read the file.
Trust store file	Set access permission when a Java application that receives a user ID/password from a client to perform authentication is to be used. - When a file is created using the Interstage certificate environment Permit a Java application execution user (or IJServer user for a servlet application) to read the file. - When a file is created using a keytool command Permit only a Java application execution user (or IJServer user for a servlet application) to read the file.

Solaris OE Linux

Use a chmod or chown command. Set access permission with super user (root) authority.

Table 7-16 Setting Access Permissions for Files (Solaris and Linux)

Resource	Explanation
Service ID file	Set access permission when a Java application that receives a user ID/password from a client to perform authentication is not to use the business server configuration. Permit only a Java application execution user (or IJServer user for a servlet application) to read the file.
Login configuration file	Permit only a Java application execution user (or IJServer user for a servlet application) to read the file.
Security policy file	Permit only a Java application execution user to read the file.
Trust store file	Set access permission when a Java application that receives a user ID/password from a client for authentication is to be used: - When a file is created using the Interstage certificate environment Permit a Java application execution user (or IJServer user for a servlet application) to read the file. - When a file is created using a keytool command Permit only a Java application execution user (or IJServer user for a servlet application) to read the file.

Registering Protection Resources

For a servlet application that receives authentication information from a client, the SSO administrator must register the servlet application path in the SSO repository as a protection resource and set its role name or role set name to enable its use.

For details, refer to “Registering Protection Resources” and “Using an LDIF File.”

Information about the registered resource must then be stored in the business server. The business server administrator must use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Update access control information] tab and click [Update]. For details on Interstage Management Console definition, refer to the Operator’s Guide.

For information on updating access control information, refer to “Amending Role Configuration” and “Amending Protection Resource” in Chapter 4 – Operation and Maintenance.

Protection resource to be registered:

```
Business-server-name:port-number/servlet-application-path
```

Exceptions and Exception Handling

When an exception occurs in a single sign-on JavaAPI, check the exception object type and detailed message obtained with the exception object getMessage method and take the required action after referring to the Messages manual.

Example

Message displayed for an incorrect password

```
Error: Authentication failed
```

If an OutOfMemoryError occurs in a Java application that receives a user ID/password from a client to perform authentication, the following Interstage HTTP Server messages may be displayed:

```
ERROR: ihs66999: SSL: unexpected error
(SSL_ServerHandshake,00700002,00020014)
```

Or

```
ERROR: ihs66038: SSL: chipher handshake error
(SSL_ServerHandshake,00700001,00020028)
```

Required Action If An OutOfMemoryError Error Occurs

If an OutOfMemoryError error occurs when a Java application is executed, the following causes are possible.

- The memory (heap area) used in Java is insufficient

An OutOfMemoryError error typically occurs in this situation.

The memory used in Java can be broadly divided into the following three categories:

- New generation area
- Old generation area
- Permanent generation area

- The amount of virtual memory is insufficient

  An OutOfMemoryError error may also occur if the system virtual memory outside the heap area is insufficient. In this situation, increase the virtual memory.

  If a thread cannot be generated because the virtual memory is insufficient, an OutOfMemoryError error containing the following information occurs.

  ```
  java.lang.OutOfMemoryError: unable to create new native thread
  ```

- The Java process user space is insufficient

  Even if there is enough room in the heap area or system virtual memory, an OutOfMemoryError error might occur if the upper limit for the memory determined by the OS for each process is exceeded. This is particularly the case if, when a thread is generated, memory is secured in a different area to the heap area. If a large number of threads is generated, the secured memory exceeds the upper limit determined by the OS, causing the thread generation to fail, and an OutOfMemoryError error containing the following information to occur.

  ```
  java.lang.OutOfMemoryError: unable to create new native thread
  ```

  In this situation, take the following action:

  - To generate a thread in the Java program, reduce the number of thread generations.
  - If the error is output along with message IJServer17654 in the IJServer WorkUnit container log, check that the value set for the number of simultaneous processing events in the WorkUnit Servlet container is not too large. If it is too large, reduce it. In this situation, the IJServer process concurrency can be increased to maintain the number of requests (number of simultaneous processing events x process concurrency) that can actually be processed simultaneously in one WorkUnit, if required. However, if the process concurrency is increased unnecessarily, it will use up a considerable amount of system memory.
  - If the Java process heap area is excessively large, the value specified for the Java command -Xmx option can be reduced to relieve the upper limit.

  Linux

  - If the Java process stack size is excessively large, reduce the stack size using the ulimit command (B shell type) or the limit command (C shell type).

New Generation Area and Old Generation Area

The New generation area and Old generation area are areas for managing objects such as instances and arrays. Areas are divided into New and Old generations so that garbage collection (GC) processing for the generations can be executed separately.

The New generation area manages objects with short life spans. An object for which a request for generation has occurred in a Java program is typically generated in the New generation area.

Objects that have been in a New generation area for a fixed period of time are moved to the Old generation area.

Objects in an Old generation area that are no longer required are recovered using FullGC processing.

The total memory size of the New generation area and the Old generation area is determined by the "-Xmx" option that is specified when Java starts up. The default value is 64MB.

If the New generation area and Old generation area are insufficient (the number of objects is large), use the Xmx option to increase the maximum value of the heap area. Specify the Xmx option in the JavaVM option of the Interstage Management Console.

The GC "-verbose:gc" option can be set to check the extent to which the heap area is being used.

Example

The following is an output example when the "-verbose:gc" option is specified.

```
----------------------------------------------------------------------
[GC 80229K->31691K(259776K), 0.4795163 secs]
[FullGC 57654K->4623K(259776K), 0.3844278 secs]
   (1)        (2)           (3)         (4)              (5)
----------------------------------------------------------------------
```

(1) This is the GC type ("GC" refers only to the New generation area; "FullGC" refers to the New, Old, and Permanent generation areas).

(2) This is the size used for the heap (before GC).

(3) This is the size used for the heap (after GC).

(4) This is the heap size.

(5) This is the GC processing time.

The value in (2) is the amount used for the heap area.

Data for a heap area that is being executed can also be collected using "jheap".

FJVM changes the New generation area and the Old generation area dynamically.

In HotSpot Server VM and HotSpot Client VM, the ratio for the New generation area and the Old generation area is fixed. It is possible to change the ratio by specifying an option on startup. For details, refer to the following website:

http://java.sun.com/docs/hotspot/VMOptions.html

Permanent Generation Area

In addition to the heap area that is managed by the maximum value in "-Xmx", there is also a Permanent generation area in the heap area for storing classes. An OutOfMemoryError error also occurs if this area is insufficient.

The default value is 32MB in 1.3.1, and 64MB in 1.4.2.

The maximum value is determined by the "-XX:MaxPermSize" option that is specified when Java starts up. For example, to set the maximum value of the Permanent generation area to 128MB, specify "-XX:MaxPermSize=128m" in the option when Java starts up.

If an OutOfMemoryError error occurs even if the maximum value of the heap area in the "-Xmx" option is increased, and the amount of heap area used appears to increase with time, there might be a memory leak. In this situation, check the application.

"Qualyzer" can be used to investigate any possible memory leaks.

Executing Applications

This section explains how to execute a Java application that uses the single sign-on JavaAPI.

(1) Setting System Property

To execute a Java application that uses the single sign-on JavaAPI, the following system property must be set on JavaVM activation.

Table 7-17 Setting System Properties (JavaAPI)

System Property	Value to be Set
java.security.auth.login.config	Login configuration file absolute path name

If the Java application uses the JAAS authorization function, the following system properties must also be set.

Table 7-18 Setting System Properties (JAAS)

System Property	Value to be Set
java.security.manager	None
java.security.policy	Security policy file absolute path name
java.security.auth.policy	Absolute path name of the principal base security policy file (can be written in a security policy file set with java.security.policy for JDK1.4)
sun.security.policy.utf8	Can be set for JDK1.4 only. Specify "false" to read the security policy file using the default encoding format. If "true" or nothing is specified, UTF-8 is read

When a proxy server is used between the Java application and authentication server, the following system properties must be set:

Table 7-19 Setting System Properties when Proxy Server is used

System Property	Value to be Set
http.nonProxyHosts	Name of a server that is not to be connected through a proxy server Set this value if a proxy server is set but there is a server that is not to be connected through the proxy server. Insert the symbol (|) between the server names when specifying multiple servers. A corresponding wild card character can also be specified"..
https.proxyHost	Name of a proxy server in HTTPS communication Set this value when the authentication server is in an SSL environment.
https.proxyPort	Port number of a proxy server Set this value when the authentication server is in an SSL environment.

If the Java application to be executed uses a trust store file other than the JDK or JSSE default, a system property must be specified as shown in the table below. For default file details, refer to Creating a Trust Store File.

Table 7-20 Setting System Properties for Java Applications (Trust File other than JDK or JSEE)

System Property	Value to be Set
javax.net.ssl.trustStore	Absolute path name of trust store file to be used.

Remark

The same system property value is used by all applications that operate within the same VM.

(2) Activating Application

Information on how to activate an application is provided below.

Activation of a Servlet Application that Receives Authentication Information from a Client

Before activating a servlet application that uses the single sign-on JavaAPI, the Interstage Management Console must be used to set an IJServer WorkUnit and copy JSSE libraries to a directory ext under the IJServer directory.

- Setting an IJServer WorkUnit

  Use the Interstage Management Console to select [System] > [WorkUnit] > [IJServer] > [Settings] tab and implement WorkUnit settings. The table below lists the values to be set. To change the servlet JavaVM version, change the Java version.

Table 7-21 Values That Need To Be Set

Definition Name	Value to be Set
JavaVM option	-Djava.security.auth.login.config=login-configuration-file-absolute-pathname Add the system properties required for the environment. For the required system properties, refer to “Setting System Property.”
Class path	JDK1.3 Absolute path name of isssomod.jar JDK1.4 Absolute path name of isssomod14.jar
Java version	Select 1.3 or 1.4

- Copying JSSE libraries

  Copy the JSSE library modules (jsse.jar, jcert.jar, jnet.jar) to an ext directory under the IJServer directory where the servlet application is deployed.

  The copy source directories are shown below.

  Windows

  C:\Interstage\J2EE\lib

Solaris OE Linux

/opt/FJSVj2ee/lib

The copy destination directories are shown below.

Windows

C:\Interstage\J2EE\var\deployment\ijserver\IJServer name\ext

Solaris OE Linux

/opt/FJSVj2ee/var/deployment/ijserver/IJServer name/ext

For details on servlet application operation, refer to “Calling Servlets” in “How to Call Web Applications” in the J2EE User’s Guide.

Activation of a Java Application that Receives a User ID/Password from a Client to Perform Authentication

Information on how to activate a Java application that uses the single sign-on JavaAPI from a command line is provided below.

Activating a Java application that uses only authentication:

```
java
-Djava.security.auth.login.config=login-configuration-file-absolute-pathname
application-class-name
```

Activating a Java application that uses a trust store file other than the default:

```
java
-Djava.security.auth.login.config=login-configuration-file-absolute-pathname
-Djavax.net.ssl.trustStore=trust-store-file-absolute-pathname
application-class-name
```

Activating a Java application that uses authentication and authorization:

JDK1.3

```
java
-Djava.security.auth.login.config=login-configuration-file-absolute-pathname
-Djava.security.manager
-Djava.security.policy=security-policy-file-absolute-pathname
-Djava.security.auth.policy=principal-base-security-policy-file-absolute-
pathname application-class-name
```

JDK1.4

```
java
-Djava.security.auth.login.config=login-configuration-file-absolute-pathname
-Djava.security.manager
-Djava.security.policy=principal-base-security-policy-file-absolute-pathname
application-class-name
```

When an application to be operated is developed with a servlet application, the Interstage Management Console must be used to set an IJServer WorkUnit and copy JSSE libraries to an ext directory under the IJServer directory in advance.

- Setting an IJServer WorkUnit

  Use the Interstage Management Console to display [System] > [WorkUnit] > [IJServer] > [Settings] tab. The table below lists the values to be set. To change the servlet JavaVM version, change the Java version.

Table 7-22 Values to be Set (JDK1.4)

Definition Name	Value to be Set
JavaVM option	-Djava.security.auth.login.config=login-configuration-file-absolute-pathname Add the system properties required for the environment. For the required system properties, refer to “Setting System Property.”
Class path	JDK1.3 Absolute path name of isssomod.jar JDK1.4 Absolute path name of isssomod14.jar
Java version	Select 1.3 or 1.4

- Copying JSSE libraries

  Copy the JSSE library modules (jsse.jar, jcert.jar, jnet.jar) to an ext directory under the IJServer directory where the servlet application is deployed.

  The copy source directories are shown below.

  Windows

  C:\Interstage\J2EE\lib

  Solaris OE Linux

  /opt/FJSVj2ee/lib

  The copy destination directories are shown below.

  Windows

  C:\Interstage\J2EE\var\deployment\ijserver\IJServer name\ext

Solaris OE Linux

/opt/FJSVj2ee/var/deployment/ijserver/IJServer name/ext

For details on servlet application operation, refer to “Calling Servlets” in “How to Call Web Applications” in the J2EE User’s Guide.

When Reactivation of an Application is Required

An application must be reactivated if a security policy, login configuration, or service ID file is updated; settings are changed in [Report User Information] in [Linkage with Web Application] in the business server environment setup; or the business system is re-set up. If the application is a servlet application, stop IJServer before reactivating it.

Sample Code

This section explains how to use single sign-on JavaAPI sample codes. The sample codes are classified into two groups as follows:

- Servlet application

  Servlet application that receives authentication information from a client

  Servlet application that receives a user ID/password from a client to perform authentication

- Application that uses a user ID/password for authentication and authorization

Executing these samples requires single sign-on environments set up according to “Environment Setup (SSO Administrators)” and “Environment Setup (SSO Business Server Administrators).”

Servlet Application

Outline

A servlet application sample receives authentication information confirming successful authentication from a client and displays information on the authenticated user, or uses a user ID/password received from a client to perform authentication for an authentication server. To use a sample, a Web server linked to the servlet must be set up as a business server.

Table 7-23 Business Server setup

URL	Application	Registration of Protection Resource
http(s)://Business server name:port number/jaassample/SampleServlet	Servlet application that receives authentication success confirmation from a client	Required
http(s)://Business server name:port number/jaassample/UidPasswordServlet	Servlet application that receives a user ID/password from a client to perform authentication	Not Required

Sample Code Storage Location

Sample codes are stored in the following directories (hereafter referred to as sample directories).

Windows

Interstage install directory: C:\Interstage

C:\Interstage\F3FMsso\ssoatzag\sample\javaapi

Solaris OE Linux

/opt/FJSVssoaz/sample/javaapi

Table 7-24 lists the files required to execute the sample code.

Table 7-24 Sample Code

File	Explanation
jaassample.war	War file
webapp/jaassample/WEB-INF/isssojaaslogin.conf	Servlet login configuration file
webapp/jaassample/WEB-INF/web.xml	Web application environment configuration file (Deployment Descriptor)
SampleServlet.java	Servlet java source file
UidPasswordServlet.java	Servlet java source file for authentication using user ID/password

Execution Procedure

(1) Servlet Service Environment Setup

Solaris OE Linux

To enable the IJServer user to read the business server configuration, set up the environment as follows.

1. Use the useradd command to create an IJServer user.
2. Grant the created user authority equivalent to the file access permission of the user specified in the User directive in the Interstage HTTP Server environment configuration file (httpd.conf).
3. Specify the name of the created user in the User directive in the httpd.conf file.
4. Use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Settings] tab and click [Update]. (*1)

*1 For details, refer to “Changing Effective User for Web Server" in Chapter 4 – Operation and Maintenance.

(2) Deploying Servlet Application

Use the Interstage Management Console to deploy the servlet application in a servlet container. The example below shows how to deploy an application in the IJServer WorkUnit “IJServer”. For IJServer details, refer to “Design of J2EE Application “ in “Environment Where J2EE Applications are Operated (IJServer)” in the J2EE User’s Guide.

If the IJServer workUnit "IJServer" has not been created, create a new IJServer with the name "IJServer" of either of the following types:

- IJServer(Web + EJB[1VM])
- IJServer(Web + EJB[other VM])
- IJServer(Web Only)

Use the following procedure to deploy a servlet application:

1. Use the Interstage Management Console to select [System] > [WorkUnit] > [IJServer] tab and click [Deploy].
2. Uncheck the check box specifying not to start IJServer automatically after completing deployment.
3. Click [Reference] in [Deployment File] to select jaassample.war stored in the sample directory.

   The Interstage Management Console may be installed on a server different from the Web browser execution server on which the console is operated. If so, specify the jaassample.war path in the server containing the console directly in the deployment file text box as shown below, after choosing the radio button “Deploys files stored on the server”.

   Windows

   Interstage install directory: C:\Interstage

   C:\Interstage\F3FMsso\ssoatzag\sample\javaapi\jaassample.war

   Solaris OE Linux

   /opt/FJSVssoaz/sample/javaapi/jaassample.war
4. Click [Deploy] to deploy the file after specifying the jaassample.war path.

The sample application is deployed in the following directories:

Windows

Interstage install directory: C:\Interstage

```
C:\Interstage\J2EE\var\deployment\ijserver\IJServer\webapps\jaassample
```

Solaris OE Linux

```
/opt/FJSVj2ee/var/deployment/ijserver/IJServer/webapps/jaassample
```

(3) Setting IJServer WorkUnit

Use the Interstage Management Console to select the [System] > [WorkUnit] > [IJServer] tab and click [Settings]. Set a class path and JavaVM options with [WorkUnit] as shown below. To change the JDK version used with the servlet, select the Java version pull-down menu. After completing the settings, press the Update button to save the changes to the system.

JDK1.3

Windows

Interstage install directory: C:\Interstage

Class path

```
C:\Interstage\F3FMsso\ssoatzag\lib\isssomod.jar
```

JavaVM option

```
-
Djava.security.auth.login.config=C:\Interstage\J2EE\var\deployment\ijserver\
IJServer\webapps\jaassample\WEB-INF\isssojaaslogin.conf
-Djavax.net.ssl.trustStore=C:\Interstage\etc\security\env\keystore\.keystore
```

Solaris OE Linux

Class path

```
/opt/FJSVssoaz/lib/isssomod.jar
```

JavaVM option

```
-Djava.security.auth.login.config=/opt/FJSVj2ee/var/deployment/ijserver
/IJServer/webapps/jaassample/WEB-INF/isssojaaslogin.conf
-
Djavax.net.ssl.trustStore=/etc/opt/FJSVisscs/security/env/keystore/.keystore
```

JDK1.4

Windows

Interstage install directory: C:\Interstage

Class path

```
C:\Interstage\F3FMsso\ssoatzag\lib\isssomod14.jar
```

JavaVM option

```
-Djava.security.auth.login.config=C:\Interstage\J2EE\var\deployment\ijserver
\IJServer\webapps\jaassample\WEB-INF\isssojaaslogin.conf
-Djavax.net.ssl.trustStore=C:\Interstage\etc\security\env\keystore\.keystore
```

Solaris OE Linux

Class path

```
/opt/FJSVssoaz/lib/isssomod14.jar
```

JavaVM option

```
-Djava.security.auth.login.config=/opt/FJSVj2ee/var/deployment/ijserver/
IJServer/webapps/jaassample/WEB-INF/isssojaaslogin.conf
-Djavax.net.ssl.trustStore=/etc/opt/FJSVisscs/security/env/keystore/
.keystore
```

(4) Editing Login Configuration File

If the port number of the Web server set up as a business server is not 80, use the text editor to edit the serverport value of login configuration file isssojaaslogin.conf in the servlet application deployed in Step (2).

Path name in which the login configuration file is deployed by default:

Windows

Interstage install directory: C:\Interstage

```
C:\Interstage\J2EE\var\deployment\ijserver\IJServer\webapps\jaassample\WEB-
INF\isssojaaslogin.conf
```

Solaris OE Linux

```
/opt/FJSVj2ee/var/deployment/ijserver/IJServer/webapps/jaassample/WEB-
INF/isssojaaslogin.conf
```

Example

Login configuration file for a business server operating with port number 81

Entry “com.fujitsu.interstage.sso” is used by a servlet application that receives authentication information from a client.

Entry “com.fujitsu.interstage.sso.uidpass” is used with a servlet application that uses a user ID/password received from a client to execute authentication for an authentication server.

```
/**
*  sample login config file
*/

com.fujitsu.interstage.sso{
  com.fujitsu.interstage.sso.auth.module.ISCredentialLoginModule Required
  serverport="81" <- Edit here.
  ;
};
com.fujitsu.interstage.sso.uidpass{
  com.fujitsu.interstage.sso.auth.module.ISLoginModule Required
  serverport="81" <- Edit here.
  ;
};
```

(5) Copying JSSE Libraries

Copy JSSE library modules to directory ext under the IJServer directory.

Windows

```
C:\Interstage\J2EE\var\deployment\ijserver\IJServer\ext>copy
 C:\Interstage\J2EE\lib\jsse.jar
    copy one file.
C:\Interstage\J2EE\var\deployment\ijserver\IJServer\ext>copy
C:\Interstage\J2EE\lib\jnet.jar
    copy one file.
C:\Interstage\J2EE\var\deployment\ijserver\IJServer\ext>copy
C:\Interstage\J2EE\lib\jcert.jar
    copy one file.
```

Solaris OE Linux

```
# cp /opt/FJSVj2ee/lib/jsse.jar
 /opt/FJSVj2ee/var/deployment/ijserver/IJServer/ext
# cp /opt/FJSVj2ee/lib/jnet.jar
/opt/FJSVj2ee/var/deployment/ijserver/IJServer/ext
# cp /opt/FJSVj2ee/lib/jcert.jar
 /opt/FJSVj2ee/var/deployment/ijserver/IJServer/ext
```

(6) Registering Certificate

For a servlet application that receives a user ID/password from a client to perform authentication, the SSL environment must be set up as a Java application operation environment. Obtain the site certificate of the authentication server and CA certificate issued by the site certificate issuer and register them in the business server Interstage certificate environment. For details, refer to Creating a Trust Store File. If a load balancer (such as Interstage Traffic Director is used), use a site certificate issued with the load balancer FQDN.

Note

Use JDK1.4 if the UTF-8 type is used for the site certificate or CA certificate.

(7) Defining Servlet Application as a Protection Resource

The SSO administrator should register the servlet application URL in the SSO repository as a protection resource.

1. Use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Authentication infrastructure] > [Repository server] tab and click [Protection resource]. When [Protection resource] is displayed, a list of sites is displayed under the [Protection resource] tree.
2. Click the site configuration of the business server to which the sample application is deployed.
3. Click [Protection path] to display the path configuration list window and then select the [Create a New Path configuration] tab.
4. Enter /jaassample/SampleServlet in [Path] as the access control target path then select the check box for a role name with which the protection resource can be used.
5. Click [Create] to display and check the specified path and role information.

Servlet application URL

```
http(s)://Business server name:port number/jaassample/SampleServlet
```

Protection resource to be registered

```
Business server name:port number/jaassample/SampleServlet
```

Example

Protection resource to be registered: "www.fujitsu.com:80/jaassample/SampleServlet"

Name of role name that can use protection resources: "Admin"

The business server site configuration (www.fujitsu.com:80) and role configuration need be registered in the SSO repository before registering a protection resource. If these configuration s are not registered in the SSO repository, refer to “Using an LDIF File” and “Registering Protection Resources" to register them.

(8) Updating Business Server Access Control Information

The business server administrator stores information on a protection resource registered in the business server in Step (7). Use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Update access control information] tab and click [Update]. For details on Interstage Management Console definition, refer to the Operator’s Guide. For information on updating access control information, refer to “Amending Role Configuration” and “Amending Protection Resource” in Chapter 4 – Operation and Maintenance.

(9) Changing Setting for Business Server Linkage to Web Application

The default setting for authenticated user information reported by the business server is "No." Change this value to "Yes" because the user information is to be referenced in the sample application.

Use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Settings] tab. Click [Detailed Settings [Show]] then select [Linkage with Web applications] > [Notify User Information?] to change the setting to “Yes” and click [Update].

(10) Activating Business Server

Activate the business server. For Web server activation details, refer to “Starting Business Server.”

(11) Activating Servlet Service

Use the Interstage Management Console to select [System] > [WorkUnit] > [IJServer] tab. Click [Status] then click [Start] to activate the WorkUnit.

(12) Calling Servlet Application from Web Browser

Specify the URL in the business server by using the Web browser as shown below.

Example

When the business server runs with www.fujitsu.com:80

```
http://www.fujitsu.com:80/jaassample/
https://www.fujitsu.com:80/jaassample/( For the business server is set up in
SSL)
```

(13) Execution Result

“SSO Authentication”　and　“Uid and Password Authentication” are displayed in the Web browser.

- SSO Authentication: Servlet application that receives authentication information from a client
- Uid and Password Authentication: Servlet application that receives a user ID/password from a client to perform authentication

Click “SSO Authentication”　to display the certificate selection window, the form authentication page, and basic authentication window. Select the certificate of a user belonging to the role with which the protection resource was registered in Step (7) or enter the user ID/password. When the authentication is successful, authentication information on the authenticated user is displayed in the Web browser window.

An execution example is shown below.

Example

When user “user001” belonging to role “Admin” is authenticated successfully.

```
com.fujitsu.interstage.sso.auth.ISUserPrincipal user001
com.sun.security.auth.X500Principal CN=user001, OU=User, OU=interstage,
 O=fujitsu, DC=com
com.fujitsu.interstage.sso.auth.ISRolePrincipal Admin
```

Click “Uid and Password Authentication”, enter the Uid and password, and click the Login button. When the authentication is successful, authentication information on the authenticated user is displayed in the Web browser window.

An execution example is shown below.

Example

```
AuthorizationCredential  ···
Dn                    cn=user002,ou=User,ou=interstage,o=fujitsu,dc=com
Uid                   user002
Role                  Admin
ClientAddress         /10.34.157.109
AuthMethod            basicAuth
AuthTime              Tue Sep 30 18:15:12 JST 2003
Expiration            Tue Sep 30 18:45:12 JST 2003
Principal             user002
Principal             CN=user002,OU=User,OU=interstage,O=fujitsu,DC=com
Principal             Admin
```

Application that Uses a User ID/Password for Authentication and Authorization

Outline of Sample Code

This sample code is for an application using a user ID/password entered from the business server window for authentication and executing authorization according to a security policy.

Sample Code Storage Location

The sample code is stored in the following directories (hereafter referred to as the sample directories).

Windows

Interstage install directory: C:\Interstage

C:\Interstage\F3FMsso\ssoatzag\sample\javaapi

Solaris OE Linux

/opt/FJSVssoaz/sample/javaapi

The table below lists the files required to execute the sample code.

Table 7-25 Sample Code

File	Explanation
ISSsoJaas.java	Sample Java source (class for authentication and authorization)
ISSsoAction.java	Sample Java source (class for accessing protection resource)
isssojaaslogin.conf	Login configuration file sample
isssojaas.policy	Sample of security policy file used for JDK1.3
isssojaasauth.policy	Sample of principal base security policy file used for JDK1.3
isssojaas14.policy	Sample of security policy file used for JDK1.4

Execution Procedure

(1) Preparation

Perform the following steps:

1. Obtain the authentication infrastructure URL to be connected.
2. Obtain the site certificate of the authentication server and the CA certificate of the issuer of the site certificate. If a load balancer (such as Interstage Traffic Director) is used, use the site certificate issued with the load balancer FQDN.
3. Obtain user information for the authentication server (user ID/password/role name for the password authentication target user).

(2) Setting Environment Variables

Set the environment variables CLASSPATH, JAVA_HOME, and PATH.

Example

JDK1.3

Windows

Interstage install directory: C:\Interstage

JDK install directory: "C:\Interstage\JDK13"

```
C:\>set CLASSPATH=
C:\Interstage\J2EE\lib\jsse.jar;C:\Interstage\J2EE\lib\jcert.jar;
C:\Interstage\J2EE\lib\jnet.jar;C:\Interstage\J2EE\lib\isj2ee.jar;
C:\Interstage\F3FMsso\ssoatzag\lib\isssomod.jar;%CLASSPATH%
C:\>set JAVA_HOME=C:\Interstage\JDK13
C:\>set PATH=%JAVA_HOME%\bin;%PATH%
```

Solaris OE Linux

```
# sh
# CLASSPATH=
/opt/FJSVj2ee/lib/jsse.jar:/opt/FJSVj2ee/lib/jcert.jar:/opt/FJSVj2ee/lib/jne
t.jar:
/opt/FJSVj2ee/lib/isj2ee.jar:/opt/FJSVssoaz/lib/isssomod.jar:$CLASSPATH
# export CLASSPATH
# JAVA_HOME=/opt/FJSVawjbk/jdk13
# export JAVA_HOME
# PATH=$JAVA_HOME/bin:$PATH
# export PATH
```

JDK1.4

Windows

Interstage install directory: C:\Interstage

JDK install directory: "C:\Interstage\JDK14"

```
C:\>set CLASSPATH=C:\Interstage\F3FMsso\ssoatzag\lib\isssomod14.jar
C:\>set JAVA_HOME=C:\Interstage\JDK14
C:\>set PATH=%JAVA_HOME%\bin;%PATH%
```

Solaris OE Linux

```
# sh
# CLASSPATH=/opt/FJSVssoaz/lib/isssomod14.jar
# export CLASSPATH
# JAVA_HOME=/opt/FJSVawjbk/jdk14
# export JAVA_HOME
# PATH=$JAVA_HOME/bin:$PATH
# export PATH
```

(3) Compiling Sample Java Sources and Converting Them to Files

Use the javac command to compile sample Java sources under the sample directory, then use the jar command to convert them to jar files. For javac and jar command details, refer to the J2SDK documents provided by Sun Microsystems, Inc.

Example

Windows

Interstage install directory: C:\Interstage

```
C:\>cd C:\Interstage\F3FMsso\ssoatzag\sample\javaapi
C:\Interstage\F3FMsso\ssoatzag\sample\javaapi>javac -d . ISSsoJaas.java
ISSsoAction.java
C:\Interstage\F3FMsso\ssoatzag\sample\javaapi>jar cf isssojaas.jar
sample\ISSsoJaas.class
C:\Interstage\F3FMsso\ssoatzag\sample\javaapi>jar cf isssoaction.jar
 sample\ISSsoAction.class
C:\Interstage\F3FMsso\ssoatzag\sample\javaapi>
```

Solaris OE Linux

Working directory: "/home/jaastest"

```
# cp -r /opt/FJSVssoaz/sample/javaapi /home/jaastest
# cd /home/jaastest/javaapi
# javac -d . ISSsoJaas.java ISSsoAction.java
# jar cf isssojaas.jar sample/ISSsoJaas.class
# jar cf isssoaction.jar sample/ISSsoAction.class
#
```

(4) Obtaining Service ID File

Request that the SSO administrator creates a service ID file for the business server that executes the sample. Store the created service ID file in the business server. For details, refer to Obtaining Service ID File.

Example

Windows

Interstage install directory: C:\Interstage

Name of service ID file obtained from SSO administrator: "C:\ssosid\domainsid"

```
C:\Interstage\F3FMsso\ssoatzag\sample\javaapi>copy C:\ssosid\domainsid
C:\Interstage\F3FMsso\ssoatzag\sample\javaapi
    copy one file.
```

Solaris OE Linux

Name of service ID file obtained from SSO administrator: "/ssosid/domainsid"

```
# cp /ssosid/domainsid /home/jaastest/javaapi
```

(5) Registering Certificates

Obtain the site certificate of the authentication server and the CA certificate of the issuer of the site certificate and register them in the Interstage certificate environment. For details, refer to Creating a Trust Store File.

Note

Use JDK1.4 if the authentication server site certificate or CA certificate is encoded in UTF-8 format.

(6) Editing Login Configuration File

Edit the sample login configuration file isssojaaslogin.conf to suit the execution environment. Set the authentication infrastructure URL+"/ssoatcag" following the authserver option. Also set the absolute path name of the service ID file to be used in the serviceidpath option.

Example

Windows

Interstage install directory: C:\Interstage

Authentication infrastructure URL: "https://authenticate_server.fujitsu.com:10443"

Absolute path name of service ID file: "C:\Interstage\F3FMsso\ssoatzag\sample\javaapi\domainsid"

```
/**
*  sample login config file
*/

/* This sample does not use Business server configuration. */
```

```
com.fujitsu.interstage.sso{
   com.fujitsu.interstage.sso.auth.module.ISLoginModule Required
authserver="https://authenticate_server.fujitsu.com:10443/ssoatcag" <- Edit
here.
serviceidpath="C:\\Interstage\\F3FMsso\\ssoatzag\\sample\\javaapi\\domainsid
" <- Edit here.
   timeout="20"
   ;
};
```

Solaris OE Linux

Authentication infrastructure URL: "https://authenticate_server.fujitsu.com:10443"

Absolute path name of service ID file: "/home/jaastest/javaapi/domainsid"

```
/**
*  sample login config file
*/

/* This sample does not use Business server configuration. */
com.fujitsu.interstage.sso{
   com.fujitsu.interstage.sso.auth.module.ISLoginModule required
authserver="https://authenticate_server.fujitsu.com:10443/ssoatcag" <- Edit
here.
   serviceidpath="/home/jaastest/javaapi/domainsid" <- Edit here.
   timeout="20"
   ;
};
```

(7) Editing Security Policy File

JDK1.3

Edit the security policy file isssojaasauth.policy. In the sample security policy file, read permission of property java.home is set for the user ID “guest” and read permission of property user.home is set for the role name “administrator.” Change the user ID and role name to the user ID and role name registered in the SSO repository.

The example below shows how to grant read permission of property java.home and read permission of property user.home for user ID “user001” and role name “Admin.”

Example

```
/* sample policy file */

grant codeBase "file:isssoaction.jar" ,
principal com.fujitsu.interstage.sso.auth.ISUserPrincipal "user001" { <-
Change the user ID in the sample file.
    permission java.util.PropertyPermission "java.home","read";
};

grant codeBase "file:isssoaction.jar" ,
  principal com.fujitsu.interstage.sso.auth.ISRolePrincipal "Admin" { <-
Change the role name in the sample file.
    permission java.util.PropertyPermission "user.home","read";
};
```

JDK1.4

Edit the security policy file isssojaas14.policy. In the sample security policy file, read permission of property java.home is set for the user ID “guest” and read permission of property user.home is set for the role name “administrator.” Change the user ID and role name to the user ID and role name registered in the SSO repository.

The example below shows how to grant read permission of property java.home and read permission of property user.home for user ID “user001” and role name “Admin.”

Example

```
/* sample policy file */

grant codeBase "file:isssoaction.jar" ,
  principal com.fujitsu.interstage.sso.auth.ISUserPrincipal "user001" { <-
Change the user ID in the sample file.
  permission java.util.PropertyPermission "java.home","read";
};

grant codeBase "file:isssoaction.jar" ,
  principal com.fujitsu.interstage.sso.auth.ISRolePrincipal "Admin" { <-
Change the role name in the sample file.
};

grant codeBase "file:isssojaas.jar" {
  permission java.util.PropertyPermission "java.home","read";
  permission java.util.PropertyPermission "user.home","read";
  permission javax.security.auth.AuthPermission
  "createLoginContext.com.fujitsu.interstage.sso";
  permission javax.security.auth.AuthPermission "doAs";
  permission javax.security.auth.PrivateCredentialPermission
  "com.fujitsu.interstage.sso.auth.ISAuthenticationCredential
  com.fujitsu.interstage.sso.auth.ISUserPrincipal \"*\"", "read";
  permission javax.security.auth.PrivateCredentialPermission
  "com.fujitsu.interstage.sso.auth.ISAuthorizationCredential
  com.fujitsu.interstage.sso.auth.ISUserPrincipal \"*\"", "read";
};
```

Windows

```
grant codeBase "file:C:\\Interstage\\F3FMsso\\ssoatzag\\lib\\isssomod14.jar"
{
  ...
};
```

Solaris OE Linux

```
grant codeBase "file:/opt/FJSVssoaz/lib/isssomod14.jar" {
  ...
};
```

(8) Activating Sample Application

Activation examples are shown below.

Example

JDK1.3

Windows

Trust store file name: "C:\Interstage\etc\security\env\keystore\.keystore"

```
C:\>cd C:\Interstage\F3FMsso\ssoatzag\sample\javaapi
C:\Interstage\F3FMsso\ssoatzag\sample\javaapi>set CLASSPATH=
C:\Interstage\J2EE\lib\jsse.jar;C:\Interstage\J2EE\lib\jcert.jar;
C:\Interstage\J2EE\lib\jnet.jar;C:\Interstage\J2EE\lib\isj2ee.jar;
C:\Interstage\F3FMsso\ssoatzag\lib\isssomod.jar;
C:\Interstage\F3FMsso\ssoatzag\sample\javaapi\isssojaas.jar;
C:\Interstage\F3FMsso\ssoatzag\sample\javaapi\isssoaction.jar
C:\Interstage\F3FMsso\ssoatzag\sample\javaapi>java
-Djava.security.auth.login.config=C:\Interstage\F3FMsso\ssoatzag\sample\
javaapi\isssojaaslogin.conf
-Djava.security.manager
-Djava.security.policy=C:\Interstage\F3FMsso\ssoatzag\sample\javaapi\
isssojaas.policy
-Djavax.net.ssl.trustStore=C:\Interstage\etc\security\env\keystore\.keystore
sample.ISSsoJaas
```

Solaris OE Linux

Trust store file name: "/etc/opt/FJSVisscs/security/env/keystore/.keystore"

```
# sh
# CLASSPATH=
/opt/FJSVj2ee/lib/jsse.jar:/opt/FJSVj2ee/lib/jcert.jar:/opt/FJSVj2ee/lib/jne
t.jar:
/opt/FJSVj2ee/lib/isj2ee.jar:/opt/FJSVssoaz/lib/isssomod.jar:
isssojaas.jar:isssoaction.jar
# export CLASSPATH
# java -Djava.security.auth.login.config=isssojaaslogin.conf \
-Djava.security.manager -Djava.security.policy=isssojaas.policy \
-Djava.security.auth.policy=isssojaasauth.policy \
-
Djavax.net.ssl.trustStore=/etc/opt/FJSVisscs/security/env/keystore/.keystore
 sample.ISSsoJaas
```

JDK1.4

Windows

Trust store file name: "C:\Interstage\etc\security\env\keystore\.keystore"

```
C:\>cd C:\Interstage\F3FMsso\ssoatzag\sample\javaapi
C:\Interstage\F3FMsso\ssoatzag\sample\javaapi>set CLASSPATH=
C:\Interstage\F3FMsso\ssoatzag\lib\isssomod14.jar;
C:\Interstage\F3FMsso\ssoatzag\sample\javaapi\isssojaas.jar;
C:\Interstage\F3FMsso\ssoatzag\sample\javaapi\isssoaction.jar
C:\Interstage\F3FMsso\ssoatzag\sample\javaapi>java
-Djava.security.auth.login.config=C:\Interstage\F3FMsso\ssoatzag\sample\
javaapi\isssojaaslogin.conf
-Djava.security.manager
-Djava.security.policy=C:\Interstage\F3FMsso\ssoatzag\sample\javaapi\
isssojaas14.policy
-Djavax.net.ssl.trustStore=C:\Interstage\etc\security\env\keystore\.keystore
sample.ISSsoJaas
```

Solaris OE Linux

Trust store file name: "/etc/opt/FJSVisscs/security/env/keystore/.keystore"

```
# sh
# CLASSPATH=
/opt/FJSVssoaz/lib/isssomod14.jar:isssojaas.jar:isssoaction.jar
# export CLASSPATH
# java -Djava.security.auth.login.config=isssojaaslogin.conf \
-Djava.security.manager \
-Djava.security.policy=isssojaas14.policy \
-
Djavax.net.ssl.trustStore=/etc/opt/FJSVisscs/security/env/keystore/.keystore
sample.ISSsoJaas
```

(9) Execution Result

Enter the user ID registered in the authentication server when the “UserName=” prompt is displayed. Enter the user password when the "Password=” prompt is displayed. When authentication is successfully executed, user authentication information is displayed. As shown in the examples below, the information displayed depends on the authentication server, repository server setting, and user execution environment.

Example

When user “user001” belongs to role “Admin”

```
UserName=user001
Password=user001

*** Credential Information ***
AuthorizationCredential=AZEer+r5szu3Ha8Vw1kSGNMw13D1K92da9WvEtqo5Kf5niUzaAX/
```

```
psy6
zsl2A6d6FBzIsw7NeTkhBdjhq1Z506GaprHQ2zfqhWIzItto3x9dzSo2wQev/v4wn3Vc53lpWA/v
Mqkj
oMeVjQssloKIJfcF6gWBEHawuLDr1cwyx8VCE1+CPa+BtV4=
Dn=cn=user001,ou=User,ou=interstage,o=fujitsu,dc=com
Uid=user001
Role=Admin
ClientAddress=10.124.60.139/10.124.60.139
AuthMethod=basicAuth
AuthTime=Fri Feb 07 22:05:51 JST 2003
Expiration=Fri Feb 07 22:35:51 JST 2003

*** Principals Information ***
Principal=user001
Principal=CN=user001, OU=User, OU=interstage, O=fujitsu, DC=com
Principal=Admin
```

Windows

```
*** Execute PrivilegedAction ***
java.home=C:\Interstage\JDK13\jre
user.home=C:\Documents and Settings\jaastest
```

Solaris OE Linux

```
*** Execute PrivilegedAction ***
java.home=/opt/FJSVawjbk/jdk13/jre
user.home=/home/jaastest
```

When user “user001” does not belong to role “Admin”

```
UserName=user001
Password=user001

*** Credential Information ***
AuthorizationCredential=AR1Z/CEv51vGO1kNAN7QCR+46c1f28tz6VZYOPtWmh4BBaTN3Azw
shGR
7t+v2Lpj4NNHh+N09f7B5T6tdLQoTd6aInP49i0t1WsI7Ili0dhwTktciL5UCgwrCciD5WObi2LR
xtJq
XVsiBnmmByrfsLW+amOKw4x4w+wPwSWUyVJVvRStpu4v2l7qwjrGxxFGLg==
Dn=cn=user001,ou=User,ou=interstage,o=fujitsu,dc=com
Uid=user001
Role=General
ClientAddress=10.124.60.139/10.124.60.139
AuthMethod=basicAuth
AuthTime=Fri Feb 07 23:57:27 JST 2003
Expiration=Sat Feb 08 00:27:27 JST 2003

*** Principals Information ***
Principal=user001
Principal=CN=user001, OU=User, OU=interstage, O=fujitsu, DC=com
Principal=General
```

Windows

```
*** Execute PrivilegedAction ***
java.home=C:\Interstage\JDK13\jre
This user does not have a permission to read user.home property
```

Solaris OE Linux

```
*** Execute PrivilegedAction ***
java.home=/opt/FJSVawjbk/jdk13/jre
This user does not have a permission to read user.home property
```

Setting User Information Report with Environment Variables

Information on an authenticated user can be used in a Web application such as a CGI operating on a business server. A business server reports information to a Web application by attaching it to an HTTP request header. The Web application can obtain the information by referencing the HTTP request header through the corresponding interface. For example, a CGI can obtain information from an environment variable.

The table below lists the information that can be obtained by a Web application.

Table 7-26 Information that can be Obtained by a Web Application

User Information	Explanation	Example
User DN	The user entry stored in user information in the SSO repository is reported using DN.	cn=user001,ou=interstage,o=fujitsu,dc=com
Role name	The role name set in the user entry stored in user information in the SSO repository is reported. If two or more role names are set, they are reported by inserting commas between them. If a role set is set, the role name(s) set in it are reported.	Admin,General,Leader
Number of role names	The number of reported role names is reported.	3
Authentication method	The authentication method (basicAuth, CertAuth, or basicAuthAndCertAuth) of the authenticated user is reported. When the authentication method “password authentication or certificate authentication” is set, basicAuth is reported for success in password authentication or CertAuth is reported for success in certificate authentication.	basicAuth
User ID	The user ID presented by the user for password authentication is reported.	user001
Client IP address	The client IP address used for authentication is reported.	xxx.xxx.xxx.xxx
Authentication time	The time at which the user was authenticated is reported in Greenwich time (YYYYMMDDHHMMSSZ).	20030901151118Z
Re-authentication time	The time at which re-authentication was required is reported in Greenwich time (YYYYMMDDHHMMSSZ).	20030901154118Z

User Information	Explanation	Example
Valid range for authentication information	The valid range for the authentication information is reported.	www.fujitsu.com

To report user information to a Web application, use the Interstage Management Console to select [System] > [Security] > [Single Sign-on] > [Business system] > [Business system Name] > [Settings] tab. Click [Detailed Settings [Show]] then select [Linkage with Web applications] > [Notify User Information?] and click "Yes."

Usage in Web Application

User information is reported with the environment variable names and HTTP request headers listed below. Values to be reported are encoded in UTF-8 format.

Table 7-27 User Information in Web Applications

User Information	Environment Variable Names	HTTP Request Header
User DN	HTTP_X_FJ_SSO_CREDENTIAL_DN	X-FJ-SSO-CREDENTIAL-DN: Value
Role name	HTTP_X_FJ_SSO_CREDENTIAL_ROLELIST	X-FJ-SSO-CREDENTIAL-ROLELIST: Value
Number of role names	HTTP_X_FJ_SSO_CREDENTIAL_ROLECOUNT	X-FJ-SSO-CREDENTIAL-ROLECOUNT: Value
Authentication method	HTTP_X_FJ_SSO_CREDENTIAL_AUTHMETHOD	X-FJ-SSO-CREDENTIAL-AUTHMETHOD: Value
User UID	HTTP_X_FJ_SSO_CREDENTIAL_UID	X-FJ-SSO-CREDENTIAL-UID: Value
Client IP address	HTTP_X_FJ_SSO_CREDENTIAL_IPADDRESS	X-FJ-SSO-CREDENTIAL-IPADDRESS: Value
Authentication time	HTTP_X_FJ_SSO_CREDENTIAL_FIRSTACCESS	X-FJ-SSO-CREDENTIAL-FIRSTACCESS: Value
Re-authentication time	HTTP_X_FJ_SSO_CREDENTIAL_EXPIRATION	X-FJ-SSO-CREDENTIAL-EXPIRATION: Value
Valid range for authentication information	HTTP_X_FJ_SSO_CREDENTIAL_DOMAIN	X-FJ-SSO-CREDENTIAL-DOMAIN: Value

Notes

- Information reported to a Web application must be within the size specified below. If it exceeds the maximum size, authentication fails.

  2048 bytes less than or equal to ((128 bytes + DN character string length) + user ID character string length + 8 bytes * number of roles + sum of role name character string lengths) * 1.5 + character string length of business server URL accessed by the user at authentication

  * Each character string length is represented in units of bytes.

- Only alphanumeric characters and symbols can be used in the user information reported to a Web application. If other characters are used in information reported to a Web application, the Web application may not obtain the correct value.

Appendix A

Samples of User Program Descriptions

This appendix provides examples of user programs developed with Java that are used to operate the SSO repository.

- Registering a Role Configuration in the SSO Repository
- Registering User Information in the SSO Repository
- Deleting User Information from the SSO Repository
- Adding a User Role
- Deleting a User Role
- Displaying the User Lock Status
- Displaying the User Validity Period
- Changing the User Validity Period
- Changing the User Password

When other user programs to operate the SSO repository are required, create the required user programs based on the description examples below.

All the above processing requires common preprocessing and postprocessing. Each user processing must be inserted between the pre-processing and post processing programs.

The common processing programs are explained below.

Pre-processing (opening the connection with the repository)

Example

Connect the sample program below to the host named "ssohost" using port number "389" in the security level "simple."

Specify the administrator DN and password as Java strings in the "bindDn" and "password" parameters, respectively.

```
java.util.Hashtable env = new java.util.Hashtable();
env.put(Context.INITIAL_CONTEXT_FACTORY,
"com.sun.jndi.ldap.LdapCtxFactory");
env.put(Context.PROVIDER_URL, "ldap://ssohost:389");
env.put(Context.SECURITY_AUTHENTICATION, "simple");
env.put(Context.SECURITY_PRINCIPAL, bindDn);
env.put(Context.SECURITY_CREDENTIALS, password);
```

```
DirContext ctx = new InitialDirContext(env);
```

Note

Carefully handle the administrator DN and password to protect the password from attack.

For measures that can be taken against password attack, refer to "Security Measures" under "Interstage Single Sign-on" of "Security Risks" of “Security Risks and Measures“ in the Security System Guide.

Postprocessing (closing the connection with the repository)

Example

Close the connection between the sample program and the repository made by the pre-processing. Use the result obtained by the common pre-processing as the value of "ctx".

```
ctx.close();
```

A user program to operate the SSO repository must be based on a correct design of the SSO repository and created very carefully to prevent invalid SSO repository data from being created.

For details about the design of the SSO repository, see "Designing a SSO Repository".

Remarks

- Knowledge of LDAP and the Java programming language are necessary prerequisites. If you are using the Java API, refer to Java API specifications and other JAVA resources.

  For details about the environment properties required for the pre-processing and other details on application programming using the Java language, refer to "Creating an Application (JNDI)" in the Smart Repository Operator’s Guide. The sample programs shown here exclude the package notation of classes to be used and the handling of exceptions. The actual user programs must include the following import declarations and exception processing:

  – Add the import declarations below.

    import javax.naming.*;
    import javax.naming.directory.*;

  – Add the exception processing below.

    javax.naming.NamingException

- Arrange the user program in the location that satisfies the operation, while fully considering security. In addition, add any error-handling descriptions when it is needed.

Registering a Role Configuration in the SSO Repository

This sample program assumes the environment setup below. Change the setup according to the actual environment used.

- The public directory at creation of the repository is "ou=interstage,o=fujitsu,dc=com".
- The storage location of role information is "ou=Role,ou=SSO ACI,ou=interstage,o=fujitsu,dc=com".
- The relevant role name is specified for "roleName" in java.lang.String.
- The result of common preprocessing is used as the value of "ctx".

Description of User Program

Example

Close the connection between the sample program and the repository made by the pre-processing. Use the result obtained by the common pre-processing as the value of "ctx".

```
          Pre-processing
              :

Attributes attrs = new BasicAttributes();

Attribute objectClass = new BasicAttribute("objectClass");
objectClass.add("top");
objectClass.add("ssoRole");
attrs.put(objectClass);
attrs.put("cn", roleName);

String dn = "cn=" + roleName + ",ou=Role,ou=SSO
ACI,ou=interstage,o=fujitsu,dc=com";

ctx.createSubcontext(dn, attrs);

              :
           Postprocessing
```

Registering User Information in the SSO Repository

This sample program assumes the environment setup below. Change the setup according to the actual environment used.

- The public directory at creation of the repository is "ou=interstage,o=fujitsu,dc=com".
- The storage location of user information is "ou=User,ou=interstage,o=fujitsu,dc=com".
- RDN of user information is expressed by "cn".
- The result of common preprocessing is used as the value of "ctx".
- User information is read from the CSV file named "sample.csv" to be processed.

Note

Since the CSV file includes passwords, the file must be handled carefully to protect the password from attack.

For details about the measures that can be taken against password attack, refer to "Security Measures" under "Interstage Single Sign-on" of "Security Risks" of “Security Risks and Measures“ of the Security System Guide.

Description of CSV File

Example

The CSV format uses the comma (,) as the delimiter. In this sample file, user attributes are described in the following order:
1. cn 2. sn 3. uid 4. userPassword
5. employeeNumber 6. mail 7. ssoAuthType 8. ssoCredentialTTL
9. ssoNotBefore (*1) 10. ssoNotAfter 11. ssoUserStatus 12. ssoRoleName

The numbers shown at the top of the sample file below indicate the correspondence between user information and the above attributes. Do not describe the numbers in the actual CSV file.

*1 In the following example, the date is specified in the format YYYYMMDDHHMMSS+XXXX. "+XXXX" refers to the time difference from UTC (Universal Time Coordinate). In cases where "-XXXX" is used, it means the same as above.

```
1        2        3        4      5             6              7
8           9         10  11   12
user001, user001, user001, user001,100001,
 user001@interstage.fujitsu.com,basicAuthOrCertAuth,60,20010101090000+0900,,
good,Admin
user002, user002, user002, user002,100002,
user002@interstage.fujitsu.com,basicAuthOrCertAuth,60,20010101090000+0900,,
good,Admin
user003, user003, user003, user003,100003,
user003@interstage.fujitsu.com,basicAuthOrCertAuth,60,20010101090000+0900,,
good,Leader
                                       :
```

Description of User Program

Example

```
// Associating the values in CSV file with attributes
private static final int INDEX_CN = 0;
private static final int INDEX_SN = 1;
private static final int INDEX_UID = 2;
private static final int INDEX_USERPASSWORD = 3;
private static final int INDEX_EMPLOYEENUMBER = 4;
private static final int INDEX_MAIL = 5;
private static final int INDEX_SSOAUTHTYPE = 6;
private static final int INDEX_SSOCREDENTIALTTL = 7;
private static final int INDEX_SSONOTBEFORE = 8;
private static final int INDEX_SSONOTAFTER = 9;
private static final int INDEX_USERSTATUS = 10;
private static final int INDEX_SSOROLENAME = 11;
private static final int INDEX_RDN = 0;
private static final String [] attributeNames = {
    "cn",
    "sn",
    "uid",
    "userPassword",
    "employeeNumber",
    "mail",
    "ssoAuthType",
    "ssoCredentialTTL",
    "ssoNotBefore",
    "ssoNotAfter",
    "ssoUserStatus",
    "ssoRoleName"
};

              :
          Pre-processing
              :

// Opening the CSV file (current simple.csv)
java.io.FileInputStream fis = new java.io.FileInputStream("sample.csv");
java.io.InputStreamReader isr = new java.io.InputStreamReader(fis);
java.io.BufferedReader br = new java.io.BufferedReader(isr);

// Processing the CSV file by reading it line by line
String line;
String [] data;
while((line = br.readLine()) != null) {
        java.util.StringTokenizer st = new java.util.StringTokenizer(line,
",", true);
        int index = 0;
        java.util.ArrayList al = new java.util.ArrayList(64);

        al.add(0, null);
        String s;
        while(st.hasMoreTokens()) {
               s = st.nextToken();
               if(s.equals(",")) {
                       index++;
```

```
                        al.add(index, null);
                } else {
                        al.set(index, s);
                }
        }

        data = (String[])al.toArray(new String[0]);

        if( data == null || data.length == 0 ) {
                continue;
        }

        Attributes attrs = new BasicAttributes();

        Attribute objectClass = new BasicAttribute("objectClass");
        objectClass.add("top");
        objectClass.add("person");
        objectClass.add("organizationalPerson");
        objectClass.add("inetOrgPerson");
        objectClass.add("ssoUser");
        attrs.put(objectClass);

        // Setting the values before ssoRoleName
        for(int i = 0; i < INDEX_SSOROLENAME; i++ ) {
                if( data[ i ] != null ) {
                        attrs.put( attributeNames[ i ], data[ i ] );
                }
        }

        // Setting the value of ssoRoleName
        Attribute ssoRoleName = new BasicAttribute( "ssoRoleName" );
        for(int i = INDEX_SSOROLENAME; i < data.length; i++ ) {
                if( data[ i ] != null ) {
                        ssoRoleName.add( data[ i ] );
                }
        }
        if( ssoRoleName.size() > 0 ) {
                attrs.put( ssoRoleName );
        }

        String dn = "cn=" + data[INDEX_RDN] +
",ou=User,ou=interstage,o=fujitsu,dc=com";

        ctx.createSubcontext( dn, attrs );
}

              :
          Postprocessing
```

Deleting User Information from the SSO Repository

This sample program assumes the environment setup below. Change the setup according to the actual environment used.

- The public directory for creation of the repository is "ou=interstage,o=fujitsu,dc=com".
- The storage location of user information is "ou=User,ou=interstage,o=fujitsu,dc=com".
- RDN of user information is expressed by "cn".
- The user name to be deleted is specified for "user" in java.lang.String.
- The result of common preprocessing is used as the value of "ctx".

Description of User Program

Example

```
          Pre-processing
              :

String dn = "cn=" + user + ",ou=User,ou=interstage,o=fujitsu,dc=com";
ctx.destroySubcontext(dn);

              :
          Postprocessing
```

Adding a User Role

This sample program assumes the environment setup below. Change the setup according to the actual environment used.

- The public directory for creation of the repository is "ou=interstage,o=fujitsu,dc=com".
- The storage location of user information is "ou=User,ou=interstage,o=fujitsu,dc=com".
- RDN of user information is expressed by "cn".
- The name of the user whose role is to be added is specified for "user" in java.lang.String.
- The role to be added is specified for "role" in java.lang.String.
- The result of common pre-processing is used as the value of "ctx".

Description of User Program

Example

```
          Pre-processing
              :

String [] retAttributes = new String[1];
retAttributes[0] = "ssoRoleName";

SearchControls sc = new SearchControls();
sc.setSearchScope(SearchControls.OBJECT_SCOPE);
sc.setReturningAttributes(retAttributes);
sc.setCountLimit(1);
sc.setTimeLimit(5*1000); // 5 seconds

String filter = "(cn=" + user + ")";

String dn = "cn=" + user + ",ou=User,ou=interstage,o=fujitsu,dc=com";

NamingEnumeration ne = ctx.search(dn, filter, sc);

Attribute roleAttr = null;
while(ne.hasMore()) {
          SearchResult sr = (SearchResult)ne.next();
          Attributes attrs = sr.getAttributes();
          if(attrs != null) {
                    roleAttr = attrs.get("ssoRoleName");
                    if(roleAttr != null) {
                              break;
                    }
          }
}
if(roleAttr == null) {
          roleAttr = new BasicAttribute("ssoRoleName", role);
} else {
          // No processing if the role already exists
          for(int i = 0; i < roleAttr.size(); i++) {
                    if(role.compareToIgnoreCase((String)roleAttr.get(i)) ==
0) {
                              ctx.close();
                              return;
                    }
          }
          roleAttr.add(role);
}
ModificationItem[] mods = new ModificationItem[1];
mods[0] = new ModificationItem(DirContext.REPLACE_ATTRIBUTE, roleAttr);
ctx.modifyAttributes(dn, mods);

              :
          Postprocessing
```

Deleting a User Role

This sample program assumes the environment setup below. Change the setup according to the actual environment used.

- The public directory for creation of the repository is "ou=interstage,o=fujitsu,dc=com".
- The storage location of user information is "ou=User,ou=interstage,o=fujitsu,dc=com".
- RDN of user information is expressed by "cn".
- The name of the user whose role is to be deleted is specified for "user" in java.lang.String.
- The role to be deleted is specified for "role" in java.lang.String.
- The result of common preprocessing is used as "ctx".

Description of User Program

Example

```
          Pre-processing
              :

String [] retAttributes = new String[1];
retAttributes[0] = "ssoRoleName";

SearchControls  sc = new SearchControls();
sc.setSearchScope(SearchControls.OBJECT_SCOPE);
sc.setReturningAttributes(retAttributes);
sc.setCountLimit(1);
sc.setTimeLimit(5*1000); // 5 seconds

String filter = "(cn=" + user + ")";

String dn = "cn=" + user + ",ou=User,ou=interstage,o=fujitsu,dc=com";

NamingEnumeration ne = ctx.search(dn, filter, sc);

Attribute roleAttr = null;
while(ne.hasMore()) {
          SearchResult sr = (SearchResult)ne.next();
          Attributes attrs = sr.getAttributes();
          if(attrs != null) {
                    roleAttr = attrs.get("ssoRoleName");
                    if(roleAttr != null) {
                              break;
                    }
          }
}

if(roleAttr != null) {
          if(roleAttr.remove(role)) {
                    ModificationItem[] mods = new ModificationItem[1];
                    mods[0] = new
ModificationItem( DirContext.REPLACE_ATTRIBUTE, roleAttr );

                    ctx.modifyAttributes(dn, mods);
          }
}

              :
          Postprocessing
```

Displaying the User Lock Status

This sample program assumes the environment setup below. Change the setup according to the actual environment used.

- The public directory at creation of the repository is "ou=interstage,o=fujitsu,dc=com".
- The storage location of user information is "ou=User,ou=interstage,o=fujitsu,dc=com".
- RDN of user information is expressed by "cn".
- The name of the user whose lock status is to be displayed is specified for "user" in java.lang.String.
- The result of common preprocessing is used as the value of "ctx".

Description of User Program

Example

```
          Pre-processing
              :

String [] retAttributes = new String [1];
retAttributes[0] = "ssoUserStatus";

SearchControls  sc = new SearchControls();
sc.setSearchScope(SearchControls.OBJECT_SCOPE);
sc.setReturningAttributes(retAttributes);
sc.setCountLimit(1);
sc.setTimeLimit(5 * 1000); // 5 seconds

String filter = "(cn=" + user + ")";

String dn = "cn=" + user + ",ou=User,ou=interstage,o=fujitsu,dc=com";

NamingEnumeration ne = ctx.search(dn, filter, sc);

while(ne.hasMore()) {
        SearchResult sr = (SearchResult)ne.next();
        Attributes attrs = sr.getAttributes();
        if(attrs != null) {
               Attribute a = attrs.get("ssoUserStatus");
               if(a == null) {
                       System.out.println("Not locked");
                       return;
               } else {
                       String value = (String)a.get();
                       if(value.compareToIgnoreCase("locked") == 0) {
                               System.out.println("Locked");
                               return;
                       } else {
                               System.out.println("Not locked");
                               return;
                       }
```

```
                }
        }
}

              :
          Postprocessing
```

Displaying the User Validity Period

This sample program assumes the environment setup below. Change the setup according to the actual environment used.

- The public directory for creation of the repository is "ou=interstage,o=fujitsu,dc=com".
- The storage location of user information is "ou=User,ou=interstage,o=fujitsu,dc=com".
- RDN of user information is expressed by "cn".
- The name of the user whose validity period is to be displayed is specified for "user" in java.lang.String.
- The result of common pre-processing is used as the value of "ctx".

Description of User Program

Example

```
          Pre-processing
              :

String [] ret = new String[2];
String [] retAttributes = { "ssoNotBefore", "ssoNotAfter" };

SearchControls  sc = new SearchControls();
sc.setSearchScope(SearchControls.OBJECT_SCOPE);
sc.setReturningAttributes(retAttributes);
sc.setCountLimit(1);
sc.setTimeLimit(5 * 1000); // 5 seconds

String filter = "(cn=" + user + ")";

String dn = "cn=" + user + ",ou=User,ou=interstage,o=fujitsu,dc=com";

NamingEnumeration ne = ctx.search(dn, filter, sc);

ret[0] = ret[1] = null;
while(ne.hasMore()) {
          SearchResult sr = (SearchResult)ne.next();
          Attributes attrs = sr.getAttributes();
          if(attrs != null) {
                    Attribute ba = attrs.get("ssoNotBefore");
                    if(ba != null) {
                              ret[0] = (String)ba.get();
                    }

                    Attribute aa = attrs.get("ssoNotAfter");
                    if(aa != null) {
                              ret[1] = (String)aa.get();
                    }
                    break;
          }
}
if(ret[0] != null) {
          System.out.println("Validity period start time = " + ret[0]);
} else {
          System.out.println("Validity period start time not specified");
}
if(ret[1] != null) {
          System.out.println("Validity period end time = " + ret[1]);
} else {
          System.out.println("Validity period end time not specified");
}

              :
          Postprocessing
```

Changing the User Validity Period

This sample program assumes the environment setup below. Change the setup according to the actual environment used.

- The public directory for creation of the repository is "ou=interstage,o=fujitsu,dc=com".
- The storage location of user information is "ou=User,ou=interstage,o=fujitsu,dc=com".
- RDN of user information is expressed by "cn".
- The name of the user whose validity period is to be changed is specified for "user" in java.lang.String.
- The validity period start time is specified for "before" in java.lang.String.
- The validity period end time is specified for "after" in java.lang.String.
- The result of common pre-processing is used as the value of "ctx".

Description of User Program

Example

```
          Pre-processing
              :

String dn = "cn=" + user + ",ou=User,ou=interstage,o=fujitsu,dc=com";

ModificationItem[] mods = new ModificationItem[2];
mods[0] = new ModificationItem(DirContext.REPLACE_ATTRIBUTE,
                                      new BasicAttribute("ssoNotBefore",
before));
mods[1] = new ModificationItem(DirContext.REPLACE_ATTRIBUTE,
                                      new BasicAttribute("ssoNotAfter",
after));

ctx.modifyAttributes(dn, mods);

              :
          Postprocessing
```

Changing the User Password

This sample program assumes the environment setup below. Change the setup according to the actual environment used.

- The public directory for creation of the repository is "ou=interstage,o=fujitsu,dc=com".
- The storage location of user information is "ou=User,ou=interstage,o=fujitsu,dc=com".
- RDN of user information is expressed by "cn".
- The new user password is specified for "newPassword" in java.lang.String.
- The name of the user whose password is to be changed is specified for "user" in java.lang.String.
- The result of common preprocessing is used as the value of "ctx".

Note

When a password is changed to new one, the new password must be handled carefully to protect the password from attack.

For details about measures that can be used against password attack, refer to "Security Measures" under "Interstage Single Sign-on" of "Security Risks" of “Security Risks and Measures” of the Security System Guide.

Description of User Program

Example

```
          Pre-processing
              :

ModificationItem[] mods = new ModificationItem[1];
mods[ 0 ] = new ModificationItem(DirContext.REPLACE_ATTRIBUTE,
                    new BasicAttribute("userPassword", newPassword));

String dn = "cn=" + user + ",ou=User,ou=interstage,o=fujitsu,dc=com";

ctx.modifyAttributes(dn, mods);

              :
          Postprocessing
```

Appendix B

Entry Attributes To Be Registered in SSO Repository

This appendix describes the user information, role configurations and protection resources required by Interstage Single Sign-on for authentication and authorization, and that must be registered in the SSO repository.

- User Information

  This section describes the user information managed by Interstage Single Sign-on such as user ID, password, and authentication method.

- Role Configuration

  This section describes the role information required by Interstage Single Sign-on for authorization.

- Protection Resources

  This section describes the target domain information required by Interstage Single Sign-on for access control.

User Information

This section describes the user information managed by Interstage Single Sign-on such as user ID, password, and authentication method.

Table B-1 Object class and Description

Object class	Description
top	Basic LDAP object class
person	User information
inetOrgPerson	
device	
ssoUser	SSO user information

Table B-2 User information

Attribute name	Explanation	Description	Example of registration
cn	Name	Specifies the user's full name. (*1)	user001
sn	Second name	Specifies the user's second name.	user001
uid	User ID	Specifies the user ID that identifies the user and is used for password authentication. (*1) (*2)	user001
userPassword	Password	Specifies the password to be used for password authentication. (*3)	user001
employeeNumber	Employee number	Specifies the number, such as employee number, assigned to the user. (*1)	000001
mail	E-mail address	Specifies the e-mail address. (*1)	user001@interstage.fujitsu.com
Other information required for authentication (Attributes that must be specified depending on operation.)			
ssoRoleName	Role name	Specifies the name of the role assigned to the user. (*1) (*4)	Admin

Attribute name	Explanation	Description	Example of registration
ssoAuthType	Authentication method	Specifies the user authentication method from one of the following values: basicAuth: Password authentication certAuth :Certificate authentication basicAuthAndCertAuth : Password authentication and certificate authentication basicAuthOrCertAuth : Password authentication or certificate authentication When this attribute is omitted, specification of "basicAuthOrCertAuth" is assumed. (*1)	basicAuthOrCertAuth
ssoCredentialTTL	Re-authentication interval	Specifies the interval of time (in unit of minutes) from user authentication to re-authentication. Specify the re-authentication interval as 0 or a value (in minutes) between 30 and 1440. When 0 is specified, the interval is unlimited, and re-authentication is not necessary. When a value less than 30 is specified, specification of 30 minutes is assumed. When a value over 1440 is specified, specification of 1440 minutes (24 hours) is assumed. If this attribute is omitted, its value defaults to the configuration value in [Re-authentication Interval] of [Operation after Authentication] in the environment setup of the authentication server.	60
ssoUserStatus	User status	Specifies whether the user is locked. The repository server sets one of the following values: good: The user is not locked. locked: The user is locked.(*5)	good

Attribute name	Explanation	Description	Example of registration
ssoNotBefore	Validity period start time	Specifies the date and time from when the user can use Single Sign-on. Specify a date between "20000101000000" and "20371231235959" in ssoNotBefore If the user attempts to use Single Sign-on before the specified time, authentication will fail. Use the format "YYYYMMDDHHMMSS+XXXX". (*8) To specify a Greenwich Mean Time, use the format "YYYYMMDDHHMMSSZ". When this attribute is omitted, the user can use Single Sign-on immediately. (*6)	20030101000000+0900
ssoNotAfter	Validity period end time	Specifies the date and time from when the user ends to access Single Sign-on. Specify a date between "20000101000000" and "20371231235959" in ssoNotBefore. If the user attempts to use Single Sign-on after the specified time, the authentication will fail. Use the format "YYYYMMDDHHMMSS+XXXX". (*8) To specify a Greenwich Mean Time, use the format "YYYYMMDDHHMMSSZ". When this attribute is omitted, the user can use Single Sign-on for an indefinite period. (*6)	20030102000000+0900
ssoFailureCount	Count of failures in authentication with user name/password	Specifies the number of times the user failed in password authentication due to incorrect password. When the user succeeds in authentication by entering the correct password, the count is reset to 0. The repository server sets this value. (*7)	0

Attribute name	Explanation	Description	Example of registration
ssoLockTimeStamp	Lockout time	Specifies the date and time the user was locked in the Greenwich Mean Time (YYYYMMDDHHMMSSZ). The repository server sets this value. (*7)	20020101090000Z
serialNumber	Serial number	Specifies the serial number of the user. (*1)	1234-1234-AB
dnQualifier	DN qualifier	Specifies the DN qualifier of the user. (*1)	000001

*1 Set values are not case sensitive.

*2 Alphanumeric characters and symbols except the colon (:) can be used for this attribute. If any other character is used for this attribute, user authentication will fail. Do not set this attribute more than once. If it is set more than once, user authentication fails.

*3 Alphanumeric characters and symbols can be set in this attribute. If any other character is set in this attribute, user authentication fails. Do not set this attribute more than once. If it is set more than once, user authentication may not be executed correctly.

*4 If a deleted or unregistered role or role set name is set in this attribute, the role or role name will be ignored. When a role set name is specified, it is assumed that the user belongs to only the registered roles in the role set. If the user does not belong to a specified role or role set name, they will be prevented from accessing the site protected by Single Sign-on.

*5 [Release User Lock] of the Interstage Management Console is used to unlock the user account.

*6 Do not set the same date and time in "ssoNotBefore" and "ssoNotAfter" or user authentication will fail. User authentication will also fail if the date and time set in "ssoNotBefore" is later than the date and time set in "ssoNotAfter". If a date and time outside of this range is set, user authentication will fail.

*7 Do not change the setting of this attribute.

*8 "+XXXX" refers to the time difference from UTC (Universal Time Coordinate). In cases where "-XXXX" is used, it has the same meaning.

Role Configuration

This section describes the role information required by Interstage Single Sign-on for authorization.

Table B-3 Object class and Description

Object class	Description
top	Basic LDAP object class
ssoRole	SSO role information

Table B-4 Role configuration

Attribute	Explanation	Description	Example of registration
cn	Name	Specifies a role name. (*1) (*2) (*3)	Admin
ssoAuthType	Authentication method	Specifies the authentication method. This attribute is not used in this version. (*4)	—

*1 Set values are not case sensitive.

*2 The role name must not include a comma (,).

*3 This attribute must always be unique.

*4 This attribute must not be set or changed.

The role configuration can also be a role set that contains multiple roles. An example of role set configuration is shown below.

Table B-5 Object class and Description

Object class	Description
top	Basic LDAP object class
ssoRoleSet	SSO role set information

Table B-6 Role set configuration

Attribute	Explanation	Description	Example of registration
cn	Name	Specifies a role set name. (*1) (*2) (*3)	AdminSet
ssoRoleName	Role name	Specifies the names of the roles contained in the role set. Another role set can be specified as a role included in the specified role set. (*1) (*4) (*5) (*6)	Admin

*1 Set values are not case sensitive.

*2 The role name must not include a comma (,).

*3 This attribute must always be unique.

*4 Duplicated roles or role sets are invalid.

*5 If a role set that causes a loop of configurations is set, the looped portion of configuration is invalid.

*6 Non-existent roles or role sets must not be specified.

Protection Resources

This section describes the target domain information required by Interstage Single Sign-on for access control.

Table B-7 Object class and Description

Object class	Description
Top	Basic LDAP object class
domain	Domain information

Table B-8 Protection resources

Attribute	Explanation	Description	Example of registration
dc	Domain component	Specifies a domain component name. (*1) (*2)	com or fujitsu

*1 Set values are not case sensitive.

*2 The domain component name must not include a period (.).

Site Configuration

This section describes the target site information required by Interstage Single Sign-on for access control.

Table B-9 Object class and Description

Object class	Description
top	Basic LDAP object class
domain	Domain
ssoSite	SSO site information

Table B-10 Site configuration

Attribute	Explanation	Description	Example of registration
dc	Domain component	Specifies a site name. (*1) (*2)	www
ssoPortNumber	Port number	Specifies a port number.	443

*1 Set values are not case sensitive.

*2 The domain component name must not include a period (.).

Path Configuration

This section describes the target path information required by Interstage Single Sign-on for access control.

Table B-11 Object class and Description

Object class	Description
top	Basic LDAP object class
ssoResource	SSO path information

Table B-12 Path configuration

Attribute	Explanation	Description	Example of registration
cn	Name	Specifies a path. (*1) (*2) (*3)	/admin/
ssoRoleName	Role name	Specifies the name of the role or role set that can use the relevant resource. (*2) (*4) (*5)	AdminSet
ssoUserAttribute	User attribute	Specifies user attribute name that is set in the user information to be posted to Web applications, e.g., CGI. This attribute is not used in this version. (*6)	

*1 Alphanumeric characters and symbols can be set in this attribute.

*2 Set values are not case sensitive.

*3 This attribute must always be unique.

*4 Do not set a role name that includes a comma (,) in this attribute.

*5 Multiple role names can be specified. When multiple role names are specified, the user is allowed to access the protection resource when the user's role and any of the specified roles match.

*6 Do not set or change this attribute.

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