Interstage Application Server

V6.0

Tuning Guide

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Fujitsu Limited

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Preface

Purpose of this Document

This manual is the Interstage Application Server Tuning Guide. This manual explains how to tune Interstage.

Who Should Read this Document?

This manual is intended for the engineers who run Interstage.

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

- C
- C++
- COBOL
- OOCOBOL
- Java
- The Internet
- Object-oriented technology
- Distributed object technology (CORBA)
- Relational databases.

Windows

- Windows NT® and Windows® 2000

Solaris OE

- Solaris OE

Linux

- Linux

Organization of this Document

This document is organized as follows:

- *Chapter 1 – Resource Requirements*

  This chapter describes the resource requirements of Interstage Application Server Plus.
- *Chapter 2 - Tuning Interstage*

  This chapter explains how to tune Interstage.
- *Chapter 3 - Tuning J2EE Applications*

  This chapter describes the tuning of J2EE applications.
- *Chapter 4 - System Tuning*

  This chapter describes system tuning.
- *Chapter 5 - Tuning the Database Linkage Service (Windows(R))*

  This chapter contains setup information for the ini file of the Database Linkage Service.
- *Appendix A - CORBA Service Environment Definition*

  This appendix describes the CORBA Service operating environment.
- *Appendix B - Component Transaction Service Environment Definition*

  This appendix explains the Component Transaction Service environment definition file.
- *Appendix C - Database Linkage Service Environment Definition*

  This appendix explains the Database Linkage Service environment definition.
- *Appendix D – Event Service Environment Definition*

  This appendix describes the Event Service operating environment.
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  This appendix explains the WWW Server (Interstage HTTP Server environment definition.
- *Appendix F – InfoDirectory Environment Settings*

  This appendix explains the environment settings required for InfoDirectory.

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Chapter 1

Resource Requirements

This chapter describes the resource requirements of Interstage Application Server Plus.

Disk Space Requirements

Using the Application Server

The free disk space required for operation using the Application Server is shown in Table 1-1.

Table 1-1 Disk Space Required for Operation Using the Application Server

No.	Folder to Use	Required Disk Space (in MB)	Description of Operation
1	Access log storage folder of Web server (Interstage HTTP Server)	(Number of accesses from Web browsers) ∗ 0.00016	Access logs of the Web server (Interstage HTTP Server)
2	Access log storage folder of Web server (InfoProvider Pro)	(Number of accesses from Web browsers) ∗ 0.00016	Access logs of the Web server (InfoProvider Pro)
3	CORBA Service install folder	0.1 or more	CORBA Service. Required disk space depends on data size of implement information, Naming Service and Interface Repository.
4	"var" folder under CORBA Service install folder	2 or more (*1)	Logs of CORBA Service (Other than preinstalled type Java libraries)
5	Working directory of user (location specified by "user.dir" of system property of JVM)	(*2)	When logs of CORBA Service (Preinstalled type Java library) are collected
6	Installation folder of Portable-ORB (*3)	When specifying “Collect log information“ using *porbeditenv* command, this is (“Log file size” you set) ∗ 2 ∗ (Number of working applications / applets)	When logs of Portable-ORB are collected.
7	Folder specified by "TD path for system" of environment definition file of Interstage (*4)	2 or more	Creating Interstage operating environment
8	Storage folder of log file of Database Linkage Service	(Number of transactions) ∗ 0.008 + 0.001	When Database Linkage Service is operated
9	Storage folder of trace log file of Database Linkage Service	(OTS_TRACE_SIZE of operation environment) ∗ 0.001	When Database Linkage Service is operated

No.	Folder to Use	Required Disk Space (in MB)	Description of Operation
10	Storage folder of resource management trace log file of Database Linkage Service.	(RESOURCE_TRACE_ SIZE of operation environment) ∗ 0.001	When Database Linkage Service is operated
11	Storage folder of recovery trace log file of Database Linkage Service.	(RECOVERY_TRACE_ SIZE of operating environment) ∗ 0.001	When Database Linkage Service is operated
12	Storage folder of monitoring process trace log file of Database Linkage Service.	(OBSERVE_TRACE_SIZE of operating environment) ∗ 0.001	When Database Linkage Service is operated
13	Storage folder of the resource definition files of the Database Linkage Service	Number of registered resource definition files ∗ 0.001	When Database Linkage Service is operated
14	"etc" folder under Event Service install folder	0.1 or more	When Event Service is operated
15	"var" folder under Event Service install folder	57 or more (*5)	When Event Service is operated
16	Folder specified by "trandir", "sysdir", or "userdir" of the Event Service unit definition file	38 ∗ number of units created by the Event Service or more (*6)	When non-volatile channel of Notification Service is operated
17	Console file of EJB Service	0.3	When EJB is in operation
18	Interstage Operation Tool log file	5 or more	When Interstage Operation Tool is used
19	Interstage Operation Tool WorkUnit definition backup folder	(Number of WorkUnits created or modified by Interstage Operation Tool) ∗ (Size of WorkUnit definitions) (*7)	When new WorkUnit definitions are created or old definitions are modified by the Interstage Operation Tool
20	log folder in Servlet installation folder	2	When old version Servlet Service is used
21	Servlet Service servlet gateway log folder	2	When old version Servlet Service is used
22	Servlet Service servlet container log folder	0.1 or more	When old version Servlet container log is fetched
23	Log folder under the installation folder of Servlet Service (OperationManagement)	2	When operating the Servlet Service (OperationManagement)
24	Log storage folder of the Servlet gateway of the Servlet Service (OperationManagement)	2	When operating the Servlet Service (OperationManagement)

No.	Folder to Use	Required Disk Space (in MB)	Description of Operation
25	Log storage folder of the Servlet container of the Servlet Service (OperationManagement)	0.1 or more	When collecting the log of the Servlet container (OperationManagement)
26	etc folder under the SOAP Service install path	Number of data conversion servant registrations ∗ 0.00016 or more + reliable messaging function message (*14)	When CORBA/SOAP client gateway is operated and the reliable messaging function is used
27	log folder under the SOAP Service install path	2	When CORBA/SOAP client gateway is operated
28	conf folder under the SOAP Service install path	0.024 (if the client authentication is performed) or 0.020 (if the client authentication is not performed) + high reliability function setting file (*15)	When CORBA/SOAP client gateway or SOAP client application is operated using SSL and the high reliability web service function is used
29	Folder specified for storing the key pair (public key and private key) used for the Web service function of the SOAP Service and the file (keystore) that contains certificates	0.002 * total number of site certificates and certification authority (CA) certificates to be registered	When CORBA/SOAP client gateway or SOAP client application is operated using SSL, and the high reliability web service function is used.
30	CORBA/SOAP server gateway storage location	Number of IDL ∗ 0.01 or more (*8)	When CORBA/SOAP server gateway is operated
31	CORBA/SOAP client gateway storage location	Number of IDL ∗ 0.01 or more (*9)	When CORBA/SOAP client gateway is operated
32	log folder under the Servlet Service install folder	2 (*10)	When Soap Service is operated
33	DSA creation directory of InfoDirectory	Log size + entry registration disk space = 80 ∗ 8 + 2 ∗ n + 0.4 (The unit of n is 1,000 entries. 1 entry corresponds to the size of 388 bytes when described in LDIF) (*11)	When using the default process of the InfoDirectory server
34	Log directory of the InfoDirectory management tool agent	0.1 or more (*12)	When using the InfoDirectory management tool agent
35	Log directory of the InfoDirectory management tool client	0.1 or more (*13)	When using the InfoDirectory management tool client

No.	Folder to Use	Required Disk Space (in MB)	Description of Operation
36	Storage folder of the definition information of Interstage JMS (default: etc folder under Interstage JMS installation folder)	0.01 + (number of durable subscribers ∗ 0.002)	When operating Interstage JMS
37	Storage folder of the console file of Interstage JMS (default: var folder under Interstage JMS installation folder)	0.2 or more	When operating Interstage JMS
38	Access log storage folder of Interstage Single Sign-on	2	Access logs of Interstage Single Sign-on
39	J2EE common directory \ijserver\(IJServer name) \(log folder)	24 or more (*16)	When operating IJServer WorkUnit
40	“var” folder under Web server (Interstage HTTP Server)	2 or more (*17)	When operating IJServer WorkUnit
41	Interstage JMX Service install folder	7	When operating Interstage Management Console

1) The required amount of disk is the value in bytes of (max_processes + 2) ∗ (log_file_size* ∗ 2).

* parameters of the Installation folder \etc\config of the CORBA Service file.

Log files are collected with the name of "appNNNN.log" and "appNNNN.old" (NNNN is alphanumeric) for every server application except for "log" and "log.old". Delete the log files when they become unnecessary.

When NamingService and InterfaceRepository operate on the host, areas of 4MB and 32MB are necessary respectively.

2) The required amount of disk space is the value in bytes of log_file_size.

* parameter of the Installation folder \etc\config of the CORBA Service file.

It is collected by the name of JVxxxxxxxxxx.log/JVxxxxxxxxxx.old (where xxxxxxxxxx is a unique number) for each application. Delete the log files when they become unnecessary.

*3) When operating as an applet, this is the directory specified as "log storage directory" with the *porbeditenv* command in the local disk of the client machine where the applet runs.

*4) The default folder is "Component Transaction Service installation folder\var\td001".

*5) Add the value (in KB) obtained by multiplying the specified value of the **-s -logsize** option of the *essetcnf* command by 2.

*6) "syssize" and "usersize" of each unit definition file are needed for the folders specified by the "sysdir" and "userdir" of each unit definition file respectively. 38 MB or more is needed for the folder specified by "trandir".

*7) The size of the WorkUnit definitions is between 0.02 and 2 MB. The size will vary depending on what is registered.

*8) Estimate the details according to the following formula:

Number of methods in all IDLs ∗ 0.001 + number of parameters in all IDLs ∗ 0.0006 + number of user definition types ∗ 0.0005 + number of IDLs ∗ 0.01 or more

*9) Estimate the details according to the following formula:

Number of methods in all IDLs ∗ 0.001 + number of parameters in all IDLs ∗ 0.0006 + number of user definition types in all IDLs ∗ 0.0005 + number of IDLs ∗ 0.01 or more

*10) This resource is commonly used as the resource used by the same folder when the Servlet Service is operated, and the size is 2MB altogether.

*11) If update operations are performed continuously for a long time, disk usage under "DSA storage folder\Ulogs" will increase. If such operations are expected, prepare a larger disk space.

If an error occurs due to insufficient disk space, delete files under "DSA storage folder\Ulogs" using the DSA database backup procedure in the InfoDirectory User's Guide.

*12)If there is no free disk space, delete archive logs under the log storage folder in order of occurrence.

*13) If there is no free disk space, delete unnecessary logs under the log storage folder.

*14) Disk Capacity = (Maximum message size + 0.001 * (with the sign option: + 0.006)) * maximum number of stored messages *number of message types * number of senders and receivers. The maximum number of stored messages depends on the function of the user application that deletes messages.

*15) Disk Capacity = 0.001 * (number of signature settings + number of verification settings) + 0.0005* (number of encryption settings + number of decryption settings) + 0.001 * number of reliable message types * number of reliable messaging sender and receiver.

*16) Add the following per IJServer WorkUnit.

process multiple x
4 (amount of default disk used of container log and container information log) x
6 (backup for a generation) above

When application timeouts occur frequently and the application outputs a lot of messages in a short time, and when outputting debugging information, the amount of the disk used as a container information log of J2EE common directory\ijserver\(IJServer name) \(log) increases. When such an operation occurs, ensure sufficient disk capacity is available.

*17) 2 MB is the default. When application outputs a lot of messages in a short time and when it outputs debugging information, the amount of disk space used increases. When such an operation occurs, ensure sufficient disk capacity is available.

Using the Portal Function

Estimate the disk space required for operation of the portal function.

Disk usage estimation

Calculate disk usage based on the operation design of the server.

The formula for calculating the estimated disk usage for the whole portal function is as follows:

```
Number of users * 1.5 MB + 40 MB
```

Using the Framework Function

The free disk space required for operation using the framework function is shown in Table 1-2.

Table 1-2 Disk Space Required for Operation Using Framework Function

No.	Folder to be used	Disk space (MB)	Operation description
1	System temporary folder (folder specified in the JVM system property java.io.tmpdir)	Size of file uploaded from client (web browser)	When operating web application using file upload function

Memory Requirements

Using the Application Server

The memory capacity required for operating this software using the Application Server is shown in Table 1-3.

Table 1-3 Memory Requirements (Using the Application Server)

No.	Description of Operation	Memory Required(MB)	Remarks
1	The HTML file on the Web server (Interstage HTTP Server) is accessed by more than one client simultaneously	9 + (0.036 ∗ m) + (0.6 ∗ n)	m: Maximum number of requests to be processed concurrently, which is specified in the environment definition file A value of (ThreadsPerChild) n: Number of clients who access the HTML file concurrently
2	40 clients are accessing an HTML file on the Web server (InfoProvider Pro) simultaneously	9 (*1)	
3	40 clients are accessing a CGI application with an executable file size of about 20 KB on the Web server (InfoProvider Pro) simultaneously.	33 (*1)	
4	CORBA Service is operated.	16 or more (*2)	
5	CORBA Service Naming Service is operated	8 or more	
6	CORBA Service Interface Repository is operated	45.6 or more (*3)	
7	Component Transaction Service is started.	48 or more (*4)	
8	Database Linkage Service is operated.(Operation machine of Database Linkage Service)	18.0 + 10 ∗ n + 0.008 ∗ m	n: Total of "concurrency of each resource manager + 1" m: Number of maximum transaction

No.	Description of Operation	Memory Required(MB)	Remarks
9	Database Linkage Service is operated.(Operation machine of resource management program)	8.9 + 10 * n + 0.008 * m	n: Total of "concurrency of each resource manager + 1" m: Number of maximum transaction
10	Event Service is used.	16 or more	
11	Persistent channel of Notification Service is operated	Total of shmmax of the Event Service unit definition file	
12	When the IJServer WorkUnit is operated at "Web Applications and EJB Applications run in same Java VM", the sample shopping cart is accessed simultaneously by 40 clients	115.7 or more (*5)	
13	When the IJServer WorkUnit is operated at "Web Applications Only", the sample number reliance game is accessed simultaneously by 40 clients	110.7 or more (*5)	
14	When the old version Servlet Service is operated using Fujitsu's VM in Web server (InfoProvider Pro) and JDK1.3 or the sample HelloServlet is accessed simultaneously by 40 clients	59.3 (*6)	
15	When the IJServer WorkUnit is operated at "EJB Applications Only" (*7)	BMP :35.3 or more CMP1.1:35.5 or more CMP2.0:36.9 or more MDB :38.2 or more (*8)	
16	When Interstage Operation Tool is used	20	
17	SOAP Service is operated	19 or more (*9)	
18	CORBA/SOAP client gateway is operated.	16 or more	
19	CORBA/SOAP server gateway is operated.	16 or more	
20	J2EE Deployment Tool is operated.	64 or more	
21	When using the default process of the InfoDirectory server	23.5 or more	
22	When a web process is added to the InfoDirectory server for operation	1.9 or more	Value required to add the default process to the InfoDirectory server

No.	Description of Operation	Memory Required(MB)	Remarks
23	When a synchronous process is added to the InfoDirectory server for operation	4.9 or more	Value required to add the default process to the InfoDirectory server
24	When using the LDAP command	2.2 or more	
25	When all functions are used with only the InfoDirectory management tool agent	10.2 or more (*10)	When using a management tool client on the same machine with a management tool agent, the memory which totaled each value is required.
26	When all functions are used with only the InfoDirectory management tool client	65.2 or more (*10)	Same as above
27	Interstage Management Console is operated	60 or more	

*1) The required memory is calculated as follows:

5 + 0.1 ∗ N + (0.8 + CGI program size + CGI work area) ∗ M (MB)

(N: Number of simultaneous accesses of HTML file)

(M: Number of simultaneous accesses of CGI)

(N + M <= 40)

*2) A memory size of 16M + increment (in Table 1-4) is required, depending on the setting of the CORBA Service operation environment definition (config file).

Table 1-4 Operation Memory Requirements

Description of Operation	Memory Required (increment)
When the CORBA Service is operated	100KB + max_IIOP_resp_con * 16KB + max_IIOP_resp_requests * 16KB + max_impl_rep_entries * 6KB(or more)
When the tracing function is used	Value of (when CORBA Service is operated) + 20KB + max_processes ∗ trace_size_per_process(or more)
When the snapshot function is used	Value of (when CORBA Service is operated) + 10KB + snap_size (or more)

*3) Memory required for the CORBA Service Interface Repository.

Fixed use area

45.6MB

Variable use area

The memory is memory used per object in Interface Repository.

The amount of memory used by each object is shown in Table 1-5, which lists the memory estimation formula for each IDL definition.

Table 1-5 Memory Estimation Formula

IDL Definition	Formula (Bytes)
Module declaration	3902+a ∗ (2 ∗ b+2)
Interface declaration	3902+a ∗ (2 ∗ b+2)+a ∗ b ∗ c
Operation declaration	3934+a ∗ (3 ∗ b+2+f)+b ∗ g+h ∗ (12+a+a ∗ b)
Attribute declaration	3910+a ∗ (3 ∗ b+2)
Constant declaration	7704+a ∗ (3 ∗ b+3)+d
Exception declaration	3836+a ∗ (2 ∗ b+e+1)+e ∗ (78+a+a ∗ b)
String declaration	3882+a ∗ (b+1)
Enumeration type declaration	3918+a ∗ (2 ∗ b+k+2)
Sequence declaration	3882+a ∗ (2 ∗ b+1)
Struct type declaration	3766+a * (2 ∗ b+i+1)+i ∗ (78+a+a ∗ b)
Common type declaration	3840+a ∗ (3 ∗ b+j+1)+(3880+2 ∗ a+a ∗ b)
Fixed decimal point type declaration	3882+a * (b+1)
Array type declaration	3886+a * (2 ∗ b+1)

Table 1-6 lists the items substituted in the estimation formula.

Table 1-6 Items Substituted in the Estimation Formula

Sign	Item	Meaning
a	Length of identifier	Length of identifier of object.
b	Number of hierarchies	Hierarchy where object exists.
c	Number of succession	Number of interfaces that interface declaration inherits.
d	Length of constant value	Length of constant declaration value.
e	Number of exception structural members	Number of exception declarations of struct member.
f	Number of contexts	Number of contexts in operation declaration.
g	Number of exceptions	Number of exceptions in operation declaration.
h	Number of parameters	Number of parameters in operation declaration
i	Number of struct members	Number of members in struct type declaration.
j	Number of union members	Number of members in common type declaration.
k	Number of enum members	Number of members in enumeration type declaration.

*4) This value does not include the memory capacity of the CORBA Service.

Add the amount of the CORBA Service memory capacity to this value.

*5)

Web Server Connector:

2 + 0.2 ∗ k (MB, when using Interstage HTTP Server)

(k: simultaneous access count to the Servlet Service)

IJServer WorkUnit (Per 1 of process multiple):

In the case of Web Applications and EJB Applications run in same Java VM

48 + (1.4 ∗ k) + (0.7 ∗ w) + (P1 + P2 + P3 + .. + Pn) (MB)

In the case of Web Applications Only

47 + (1.3 ∗ k) + (0.7 ∗ w) + (P1 + P2 + P3 + .. + Pn) (MB)

(k: simultaneous access count to the Servlet container)

(w: number of Web applications)

(Pn: execution size of each Servlet or JSP. In the above table, it calculates as 1 M byte.)

Because the Servlet container operates on JavaVM, the actual memory usage (including the heap area) depends on the following factors:

- Class name for "new" processing
- Number of instances for "new" processing
- Lifecycle of an instance
- GC operation status
- Various definitions of the IJServer WorkUnit
- JavaVM to be used

Fujitsu therefore recommends accurately estimating memory usage (heap area) by actually measuring it as shown below:

- Operate the Servlet Service under the same conditions as those at peak time of full operation.
  If the heap area used by Java VM is exhausted, an OutOfMemoryError is output to the log.
  Increase the maximum value of the heap area to an appropriate value.
  Use the determined maximum value of the heap area for full operation.

*6) The memory usage of the old version Servlet Service when operating the Servlet Service is the total of the memory usage of the monitoring process, of the Servlet gateway, and of the Servlet container.

Monitoring process: 2.6 (MB)

Servlet gateway:

0.25 ∗ k (MB, when using InfoProvider Pro)

0.15 ∗ k (MB, when using Interstage HTTP Server)

(k: simultaneous access count to the Servlet Service)

Servlet container:

(0.4 ∗ k) + 30.0 + (0.5 ∗ w) + (P1 + P2 + P3 + .. + Pn) (MB)

(Example when JDK1.3 Fujitsu VCM is used for the environment definition file of the sample)

(k: simultaneous access count to the Servlet container)

(Pn: execution size of each Servlet or JSP. About 0.2 MB is used for the sample HelloServlet.)

(w: number of Web applications)

Because the Servlet container operates on JavaVM, the actual memory usage (including the heap area) depends on the following factors:

- Class name for "new" processing
- Number of instances for "new" processing
- Lifecycle of an instance
- GC operation status
- Various definitions of the Servlet Service
- JavaVM to be used

Fujitsu therefore recommends accurately estimating memory usage (heap area) by actually measuring it as shown below:

(1) Maximum heap area used by JavaVM (value set to [containername].bin.parameters in the JServlet environment definition file by "-Xmx")

Operate the Servlet Service under the same conditions as those at peak time of full operation. If the heap area used by Java VM is exhausted, an OutOfMemoryError is output to the log. Increase the maximum value of the heap area to an appropriate value.
Use the determined maximum value of the heap area for full operation.

(2) Memory usage of JavaVM

When determining the maximum value of the heap area in (1), estimate the memory used by JavaVM by measuring it at the same time.

*7) Required memory of EJB Service sample application.

The required amount of memory (initial value/maximum value) used by JavaVM and total amount of memory required by one process when an EJB application is operated depend on the following sources:

- new class type
- Number of new instances
- Instance life cycle
- GC operation status
- Various definitions of EJB applications

Because the required memory size cannot be calculated simply in each case, estimate the required memory size by measuring it as shown below:

(1) Initial value of the amount of memory used by JavaVM (value specified by -Xms option of the java command)

Operate an EJB application under the same conditions as normal operation (not in peak periods) of actual operation. If the amount of memory (maximum value) used by javaVM is insufficient, the IJServer 21033 or EJB1033 message is output. Determine the optimum amount of memory (maximum value) by trial and error basis. Use the amount of memory (initial value) determined in this way as the amount of memory for actual operation. The default value of the memory amount (initial value) is as follows:

JDK/JRE1.3 and JDK/JRE1.4 : 2MB

(2) Maximum value of the memory amount used by JavaVM (value specified by -Xmx option of the java command)

Operate an EJB application under the same conditions as in peak periods of actual operation. If the amount of memory (maximum value) used by javaVM is insufficient, IJServer 21033 or EJB1033 message is output. Determine the optimum amount of memory (maximum value) by trial and error. Use the amount of memory (maximum value) determined in this way as the amount of memory for actual operation. The default value of the memory amount (maximum value) is as follows:

JDK/JRE1.3 and JDK/JRE1.4 : 64MB

(3) Total amount of memory required for one process

When estimating the amount of memory used by JavaVM (1) and (2), estimate also the total amount of memory required for one process by measuring it.

*8) Required memory size of the sample application of the EJB Service

Use the values for reference when estimating the required memory.

If the number of clients exceeds 16, make calculations assuming that the number of clients is 16.

When the concurrency of the application is increased, calculate the sum total for the concurrency.

*9) Estimate the details by following formula:

(19 * c) + (s + k) * (P + 0.05) (MB)

(c: Number of active Servlets/containers)

(s: Number of sessions to the SOAP Service)

(k: Simultaneous access count to the SOAP Service)

(P: Execution size for one Web service server application)

When operating the CORBA/SOAP server gateway, add the amount of the memory of CORBA/SOAP server gateway.

*10) To display many entries on the entry management console, a larger memory capacity is required. Tune the PKI_MS and PKI_MX environment variables according to the following procedure:

PKI_MS

Specify the minimum heap memory size of the InfoDirectory management tool.

This sets the memory size to be reserved during initial startup of the InfoDirectory management tool.

If this value is too small, the garbage collection (GC) in JavaVM occurs frequently, decreasing performance of the InfoDirectory management tool. Conversely, if this value is too large, it takes too much time for one GC operation, also decreasing performance. The upper limit of the PKI_MS value should be about 1/4 of the real memory size.

This environment variable is not installed automatically by the installer (*). However, 2 MB is applied by default.

"MS < 1.4 * (real memory)"

MS: PKI_MS recommended value (MB)

PKI_MX

Specify the maximum heap memory size of the InfoDirectory management tool.

This value is used to increase the upper limit of the memory size consumed in proportion to the number of display entries on the management tool console.

By increasing the memory size, errors related to insufficient memory and performance deterioration can be minimized. By changing the top entries of the directories, memory consumption can also be reduced.

If this value is too large, the execution time of one GC will be greater, and if the available real memory is exceeded, paging occurs which decreases performance. The upper limit of the PKI_MX value should be about 1/2 of the real memory size. However, even within this range, other applications may be affected and so the memory size extension should be minimized.

This environment variable is not installed automatically by the installer (*). However, 64MB is applied by default.

"M = (0.00154 + B) * E + 24 < 1/2 * (real memory)"

M: PKI_MX recommended value (MB)

0.00154: Memory size consumed by one entry of inetOrgPerson (MB)

B: Binary data such as a certificate and face portrait attached to the entry (MB)

E: Number of entries deployed simultaneously

24: Fixed value required for initial startup of the InfoDirectory management tool (MB)

(*) Environment variable

Set the above environment variables to the user environmental variables and delete them on uninstallation.

Note

The system may not operate correctly unless the required amount of memory is secured.

Using the Portal Function

Estimate the memory capacity required for operation of the portal function.

Memory usage estimation

Calculate memory usage based on the operation design of the server.

The formula for calculating the estimated memory usage for the repository database is as follows:

```
Number of simultaneous users * 100 (KB)
```

Using the Framework Function

32 MB is required, in addition to the amount of memory used by the Application Server.

Chapter 2

Tuning Interstage

This chapter explains how to tune Interstage.

By merely specifying the system scale, you can make Interstage set up a model scenario in which the system can operate, and register a definition for each service. In some cases, however, the system will need to be specified in more detail.

After tuning Interstage, you will need to use the *isregistdef* command to register the definition for each service before executing the system. The changes made in the tuning operation will be put into effect by Interstage's initialization function, and reflected when Interstage is started.

Tuning Interstage is carried out by modifying the following files:

- the Component Transaction Service system environment definition file
- the CORBA Service environment definition file
- the Database Linkage Service system environment definition file (See Note)
- the Interstage operating environment definition file.

Note

These definitions are only used for the Enterprise Edition and the Standard Edition.

Hypothetical System Configuration

Linkages using transaction applications will be set up as model scenarios. The following types of linkage use transaction applications:

- Local transaction linkage
- Global transaction linkage
- Linkage using session control.

Windows Solaris OE

- Linkage with an existing system (global server) (See Note)

Note: Linkage can be performed only with the Enterprise Edition and the Standard Edition.

The transaction applications will be designed to the following conditions.

- It is assumed that all the transaction applications will link to other servers (including linkages within the local system).
- The number of transaction application object processes is one tenth of the maximum number of clients that can connect.
- Transaction application objects can only connect to one server machine.
- There is only one of each resource per server machine, and the multilevel concurrency of resource managers per server machine is 5.
- For database linkage services, the multilevel concurrency is 5, and for recovery programs it is 2.

If the system is going to run CORBA applications, perform load balancing, or use server machine state monitoring, then Interstage will need to be tuned.

Definition File Setting Values

Set the following values in accordance with the scale of the Interstage system.

System Scale Statement

System scale can be:

Small

Moderate

Large

Super

Note

- "WebGateway" and "FJapache" for the Interstage operating environment definitions, are valid only in the Enterprise Edition and the Standard Edition.
- Environment definitions for the Component Transaction Service are valid only in the Enterprise Edition and the Standard Edition.

Linux

- “Super” cannot be specified for the system scale.

Small

Tables 2-1 to 2-3 list the values for the small system scale statement.

Windows

Table 2-1 Small Scale Statement

Definition	Statement	Value
Interstage operating environment definition	Corba Host Name	No value
	Corba Port Number	No value
	IR DB	ObjectFile
	IR path for DB file	TD_HOME\var\IRDB (See Note 3.)
	IR DB size	10
	IR USE	No value (See Note 2.)
	IR Host Name	No value

Definition	Statement	Value
	IR Port Number	8002
	NS USE	No value (See Note 2.)
	NS Host Name	No value.
	NS Port Number	8002
	NS jp	no
	LBO USE	no
	TD path for system	TD_HOME\var (See Note 3.)
	OTS Multiple degree	5
	OTS Recovery	2
	OTS path for system log	No value. (See Note 1.)
	OTS maximum Transaction	5
	OTS Setup mode	sys
	OTS JTS's RMP Multiple degree of Process	5
	OTS JTS's RMP Multiple degree of Thread	16
	OTS Participate	4
	OTS Host	No value
	OTS Port	No value
	OTS Locale	No value
	Event Service	no
	Event maximum Process	2
	Event maximum Connection	5
	Event Auto Disconnect	no
	InfoProvider Pro	no
	InfoProvider Pro Definition	No value
	WebGateway	no
	Servlet	no
	SOAP Client GW	no
	IS Monitor Mode	mode1
	FJapache	no
CORBA Service	max_IIOP_resp_con	Add 33 (See Note 4.)

Definition	Statement	Value
environment definition	max_IIOP_resp_requests	Add 772 (See Note 4.)
	max_processes	Add 29 (See Note 4.)
	max_exec_instance	Add 448 (See Note 4.)
	[SYSTEM ENVIRONMENT] System Scale	small
Component Transaction Service Environment Definition	No statement.	No value.
Database Linkage Service Environment Definition		

Note 1: This must be specified without fail if the system configuration is TYPE2.

Note 2: This must be specified without fail if the system configuration is TYPE3.

Note 3: TD_HOME : Installation folder \td of Interstage.

Note 4: When the *isregistdef* command is initially submitted, the value shown in Table 1-1 is added to the value in the CORBA service definition file. When the *isregistdef* command is submitted the second time or later, the value added when the previous command was submitted is subtracted from the current setting, and the new value specified in SystemScale is added.

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Table 2-2 Small Scale Statement

Definition	Statement	Value
Interstage operating environment definition	Corba Host Name	No value
	Corba Port Number	No value
	IR DB	ObjectFile
	IR path for DB file	TD_HOME/var/IRDB (See Note 1.)
	IR DB size	10
	IR USE	No value (See Note 2.)
	IR User Name	root
	IR Group Name	sys
	IR Host Name	No value (See Note 2)
	IR Port Number	8002
	NS USE	No value (See Note 2.)

Definition	Statement	Value
	NS Host Name	No value (See Note 2)
	NS Port Number	8002
	NS JP	no
	LBO USE	no
	TD path for system	/var/opt/FJSVisas/system/default/FSUNextp
	OTS Multiple degree	5
	OTS Recovery	2
	OTS path for system log	No value (See Note 3.)
	OTS maximum transaction	50
	OTS Setup mode	sys
	OTS JTS's RMP Multiple degree of Process	5
	OTS JTS's RMP Multiple degree of Thread	16
	OTS Participate	4
	OTS Host	No value.
	OTS Port	No value.
	OTS Locale	No value.
	Event Service	no
	Event maximum Process	2
	Event maximum Connection	50
	Event Auto Disconnect	no
	InfoProvider Pro	no
	InfoProvider Pro Definition	No value
	WebGateway	no
	Servlet	no
	SOAP Client GW	no
	IS Monitor Mode	mode1
	FJapache	no
CORBA Service environment definition	max_IIOP_resp_con	Add 80 (See Note 4.)
	max_IIOP_resp_requests	Add 1920 (See Note 4.)
	max_processes	Add 31 (See Note 4.)

Definition	Statement	Value
	max_exec_instance	Add 448 (See Note 4.)
	[SYSTEM ENVIRONMENT] System Scale	small
Component Transaction Service Environment Definition	No statement	No value
Database Linkage Service Environment Definition		

Note 1: TD_HOME : Installation directory of Component Transaction Service.

Note 2: This must be specified without fail if the system configuration is TYPE3.

Note 3: This must be specified without fail if the system configuration is TYPE2.

Note 4: When the *isregistdef* command is initially submitted, the value shown in Table 1-2 is added to the value in the CORBA service definition file. When the *isregistdef* command is submitted the second time or later, the value added when the previous command was submitted is subtracted from the current setting, and the new value specified in SystemScale is added.

Linux

Table 2-3 Small Scale Statement

Definition	Statement	Value
Interstage operating environment definition	Corba Host Name	No value
	Corba Port Number	No value
	IR DB	ObjectFile
	IR path for DB file	TD_HOME/var/IRDB (See Note 1.)
	IR DB size	10
	IR USE	No value (See Note 2.)
	IR User Name	root
	IR Group Name	sys
	IR Host Name	No value (See Note 2)
	IR Port Number	8002
	NS USE	No value (See Note 2.)
	NS Host Name	No value (See Note 2)
	NS Port Number	8002

Definition	Statement	Value
	NS JP	no
	LBO USE	no
	TD path for system	/var/opt/FJSVisas/system/default/FJSVextp
	OTS Multiple degree	5
	OTS Recovery	2
	OTS path for system log	No value (See Note 3.)
	OTS maximum transaction	50
	OTS Setup mode	sys
	OTS JTS's RMP Multiple degree of Process	5
	OTS JTS's RMP Multiple degree of Thread	16
	OTS Participate	4
	OTS Host	No value.
	OTS Port	No value.
	OTS Locale	No value.
	Event Service	no
	Event maximum Process	2
	Event maximum Connection	50
	Event Auto Disconnect	no
	Servlet	no
	SOAP Client GW	no
	IS Monitor Mode	mode1
	FJapache	no
CORBA Service environment definition	max_IIOP_resp_con	Add 80 (See Note 4.)
	max_IIOP_resp_requests	Add 1920 (See Note 4.)
	max_processes	Add 31 (See Note 4.)
	max_exec_instance	Add 448 (See Note 4.)
	[SYSTEM ENVIRONMENT] System Scale	small

Definition	Statement	Value
Component Transaction Service Environment Definition	No statement	No value
Database Linkage Service Environment Definition		

Note 1: TD_HOME : Installation directory of Component Transaction Service.

Note 2: This must be specified without fail if the system configuration is TYPE3.

Note 3: This must be specified without fail if the system configuration is TYPE2.

Note 4: When the *isregistdef* command is initially submitted, the value shown in Table 1-3 is added to the value in the CORBA service definition file. When the *isregistdef* command is submitted the second time or later, the value added when the previous command was submitted is subtracted from the current setting, and the new value specified in SystemScale is added.

Moderate

Tables 2-4 to 2-6 list the values for the moderate system scale statement.

Windows

Table 2-4 Moderate Scale Statement

Definition	Statement	Value
Interstage operating environment definition	Corba Host Name	No value
	Corba Port Number	No value
	IR DB	ObjectFile
	IR path for DB file	TD_HOME\var\IRDB (See Note 3.)
	IR DB size	10
	IR USE	No value. (See Note 2.)
	IR Host Name	No value
	IR Port Number	8002
	NS USE	No value. (See Note 2.)
	NS Host Name	No value.
	NS Port Number	8002
	NS jp	no
	LBO USE	no
	TD path for system	TD_HOME\var (See Note 3.)

Definition	Statement	Value
	OTS Multiple degree	5
	OTS Recovery	2
	OTS path for system log	No value. (See Note 1.)
	OTS maximum Transaction	10
	OTS Setup mode	sys
	OTS JTS's RMP Multiple degree of Process	5
	OTS JTS's RMP Multiple degree of Thread	16
	OTS Participate	4
	OTS Host	No value
	OTS Port	No value
	OTS Locale	No value
	Event Service	no
	Event maximum Process	2
	Event maximum Connection	10
	Event Auto Disconnect	no
	InfoProvider Pro	no
	InfoProvider Pro Definition	No value
	WebGateway	no
	Servlet	no
	SOAP Client GW	no
	IS Monitor Mode	mode1
	FJapache	no
CORBA Service environment definition	max_IIOP_resp_con	Add 40 (See Note 4.)
	max_IIOP_resp_requests	Add 896 (See Note 4.)
	max_processes	Add 31 (See Note 4.)
	max_exec_instance	Add 448 (See Note 4.)
	[SYSTEM ENVIRONMENT] System Scale	moderate

Definition	Statement	Value
Component Transaction Service Environment Definition	No statement.	No value.
Database Linkage Service Environment definition		

Note 1: This must be specified without fail if the system configuration is TYPE2.

Note 2: This must be specified without fail if the system configuration is TYPE3.

Note 3: TD_HOME : Installation folder of Interstage\td

Note 4: When the *isregistdef* command is initially submitted, the value shown in Table 1-4 is added to the value in the CORBA service definition file. When the *isregistdef* command is submitted the second time or later, the value added when the previous command was submitted is subtracted from the current setting, and the new value specified in SystemScale is added.

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Table 2-5 Moderate Scale Statement

Definition	Statement	Value
Interstage operating environment definition	IR DB	ObjectFile
	IR path for DB file	TD_HOME/var/IRDB (See Note 1.)
	IR DB size	10
	IR USE	No value (See Note 2.)
	IR User Name	root
	IR Group Name	sys
	IR Host Name	No value (See Note 2.)
	IR Port Number	8002
	NS USE	No value (See Note 2.)
	NS Host Name	No value (See Note 2.)
	NS Port Number	8002
	NS JP	no
	LBO USE	no
	TD path for system	/var/opt/FJSVisas/system/default/FSUNextp
	OTS Multiple degree	5
	OTS Recovery	2
	OTS path for system log	No value (See Note 3.)
	OTS maximum Transaction	100

Definition	Statement	Value
	OTS Setup mode	sys
	OTS JTS's RMP Multiple degree of Process	5
	OTS JTS's RMP Multiple degree of Thread	16
	OTS Participate	4
	OTS Host	No value
	OTS Port	No value
	OTS Locale	No value
	Event Service	no
	Event maximum Process	2
	Event maximum Connection	100
	Event Auto Disconnect	no
	InfoProvider Pro Definition	No value
	WebGateway	no
	Servlet	no
	SOAP Client GW	no
	IS Monitor Mode	mode1
	FJapache	no
CORBA Service environment definition	max_IIOP_resp_con	Add 135 (See Note 4.)
	max_IIOP_resp_requests	Add 2944 (See Note 4.)
	max_processes	Add 36 (See Note 4.)
	max_exec_instance	Add 448 (See Note 4.)
	[SYSTEM ENVIRONMENT] System Scale	moderate
Component Transaction Service Environment Definition	No statement	No value.
Database Linkage Service Environment Definition		

Note 1: TD_HOME : Installation directory of Component Transaction Service

Note 2: This must be specified without fail if the system configuration is TYPE3.

Note 3: This must be specified without fail if the system configuration is TYPE2.

Note 4: When the *isregistdef* command is initially submitted, the value shown in Table 1-5 is added to the value in the CORBA service definition file. When the *isregistdef* command is submitted the second time or later, the value added when the previous command was submitted is subtracted from the current setting, and the new value specified in SystemScale is added.

Linux

Table 2-6 Moderate Scale Statement

Definition	Statement	Value
Interstage operating environment definition	IR DB	ObjectFile
	IR path for DB file	TD_HOME/var/IRDB (See Note 1.)
	IR DB size	10
	IR USE	No value (See Note 2.)
	IR User Name	root
	IR Group Name	sys
	IR Host Name	No value (See Note 2.)
	IR Port Number	8002
	NS USE	No value (See Note 2.)
	NS Host Name	No value (See Note 2.)
	NS Port Number	8002
	NS JP	no
	LBO USE	no
	TD path for system	/var/opt/FJSVisas/system/default/FJSVextp
	OTS Multiple degree	5
	OTS Recovery	2
	OTS path for system log	No value (See Note 3.)
	OTS maximum Transaction	100
	OTS Setup mode	sys
	OTS JTS's RMP Multiple degree of Process	5
	OTS JTS's RMP Multiple degree of Thread	16
	OTS Participate	4
	OTS Host	No value

Definition	Statement	Value
	OTS Port	No value
	OTS Locale	No value
	Event Service	no
	Event maximum Process	2
	Event maximum Connection	100
	Event Auto Disconnect	no
	Servlet	no
	SOAP Client GW	no
	IS Monitor Mode	mode1
	FJapache	no
CORBA Service environment definition	max_IIOP_resp_con	Add 135 (See Note 4.)
	max_IIOP_resp_requests	Add 2944 (See Note 4.)
	max_processes	Add 36 (See Note 4.)
	max_exec_instance	Add 448 (See Note 4.)
	[SYSTEM ENVIRONMENT] System Scale	moderate
Component Transaction Service Environment Definition	No statement	No value.
Database Linkage Service Environment Definition		

Note 1: TD_HOME : Installation directory of Component Transaction Service

Note 2: This must be specified without fail if the system configuration is TYPE3.

Note 3: This must be specified without fail if the system configuration is TYPE2.

Note 4: When the *isregistdef* command is initially submitted, the value shown in Table 1-6 is added to the value in the CORBA service definition file. When the *isregistdef* command is submitted the second time or later, the value added when the previous command was submitted is subtracted from the current setting, and the new value specified in SystemScale is added.

Large

Tables 2-7 to 2-9 list the values for the large system scale statement.

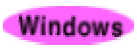

Table 2-7 Large Scale Statement

Definition	Statement	Value
Interstage operating environment definition	Corba Host Name	No value
	Corba Port Number	No value
	IR DB	ObjectFile
	IR path for DB file	TD_HOME\var\IRDB (See Note 3.)
	IR DB size	10
	IR USE	No value. (See Note 2.)
	IR Host Name	No value
	IR Port Number	8002
	NS USE	No value. (See Note 2.)
	NS Host Name	No value.
	NS Port Number	8002
	NS jp	no
	LBO USE	no
	TD path for system	TD_HOME\var (See Note 3.)
	OTS Multiple degree	5
	OTS Recovery	2
	OTS path for system log	No value. (See Note 1.)
	OTS maximum Transaction	50
	OTS Setup mode	sys
	OTS JTS's RMP Multiple degree of Process	5
	OTS JTS's RMP Multiple degree of Thread	16
	OTS Participate	4
	OTS Host	No value
	OTS Port	No value
	OTS Locale	No value

Definition	Statement	Value
	Event Service	no
	Event maximum Process	2
	Event maximum Connection	50
	Event Auto Disconnect	no
	InfoProvider Pro	no
	InfoProvider Pro Definition	No value
	WebGateway	no
	Servlet	no
	SOAP Client GW	no
	IS Monitor Mode	mode1
	FJapache	no
CORBA service environment definition	max_IIOP_resp_con	Add 100 (See Note 4.)
	max_IIOP_resp_requests	Add 1920 (See Note 4.)
	max_processes	Add 51 (See Note 4.)
	max_exec_instance	Add 448 (See Note 4.)
	[SYSTEM ENVIRONMENT] System Scale	large
Component Transaction Service Environment Definition	No statement.	No value.
Database Linkage Service Environment Definition		

Note 1: This must be specified without fail if the system configuration is TYPE2.

Note 2: This must be specified without fail if the system configuration is TYPE3.

Note 3: TD_HOME : Installation folder of Interstage.

Note 4: When the *isregistdef* command is initially submitted, the value shown in Table 1-7 is added to the value in the CORBA service definition file. When the *isregistdef* command is submitted the second time or later, the value added when the previous command was submitted is subtracted from the current setting, and the new value specified in SystemScale is added.

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Table 2-8 Large Scale Statement

Definition	Statement	Value
Interstage operating environment definition	IR DB	ObjectFile
	IR path for DB file	TD_HOME/var/IRDB (See Note 1.)
	IR DB size	10
	IR USE	No value. (See Note 2.)
	IR User Name	root
	IR Group Name	sys
	IR Host Name	No value (See Note 2.)
	IR Port Number	8002
	NS USE	No value (See Note 2.)
	NS Host Name	No value (See Note 2.)
	NS Port Number	8002
	NS JP	no
	LBO USE	no
	TD path for system	/var/opt/FJSVisas/system/default/FSUNextp
	OTS Multiple degree	5
	OTS Recovery	2
	OTS path for system log	No value (See Note 3.)
	OTS maximum Transaction	500
	OTS Setup mode	sys
	OTS JTS's RMP Multiple degree of Process	5
	OTS JTS's RMP Multiple degree of Thread	16
	OTS Participate	4
	OTS Host	No value
	OTS Port	No value
	OTS Locale	No value
	Event Service	no
	Event maximum Process	2
	Event maximum Connection	500

Definition	Statement	Value
	Event Auto Disconnect	no
	InfoProvider Pro Definition	No value
	WebGateway	no
	Servlet	no
	SOAP Client GW	no
	IS Monitor Mode	mode1
	FJapache	no
CORBA service environment definition	max_IIOP_resp_con	Add 575 (See Note 4.)
	max_IIOP_resp_requests	Add 10112 (See Note 4.)
	max_processes	Add 76 (See Note 4.)
	max_exec_instance	Add 1046 (See Note 4.)
	[SYSTEM ENVIRONMENT] System Scale	large
Component Transaction Service Environment Definition	No statement.	No value.
Database Linkage Service Environment Definition		

Note 1: TD_HOME : Installation directory of Component Transaction Service

Note 2: This must be specified without fail if the system configuration is TYPE3.

Note 3: This must be specified without fail if the system configuration is TYPE2.

Note 4: When the *isregistdef* command is initially submitted, the value shown in Table 1-8 is added to the value in the CORBA service definition file. When the *isregistdef* command is submitted the second time or later, the value added when the previous command was submitted is subtracted from the current setting, and the new value specified in SystemScale is added.

Linux

Table 2-9 Large Scale Statement

Definition	Statement	Value
Interstage operating environment definition	IR DB	ObjectFile
	IR path for DB file	TD_HOME/var/IRDB (See Note 1.)
	IR DB size	10
	IR USE	No value. (See Note 2.)
	IR User Name	root
	IR Group Name	sys
	IR Host Name	No value (See Note 2.)
	IR Port Number	8002
	NS USE	No value (See Note 2.)
	NS Host Name	No value (See Note 2.)
	NS Port Number	8002
	NS JP	no
	LBO USE	no
	TD path for system	/var/opt/FJSVisas/system/default/FJSVextp
	OTS Multiple degree	5
	OTS Recovery	2
	OTS path for system log	No value (See Note 3.)
	OTS maximum Transaction	500
	OTS Setup mode	sys
	OTS JTS's RMP Multiple degree of Process	5
	OTS JTS's RMP Multiple degree of Thread	16
	OTS Participate	4
	OTS Host	No value
	OTS Port	No value
	OTS Locale	No value
	Event Service	no
	Event maximum Process	2

Definition	Statement	Value
	Event maximum Connection	500
	Event Auto Disconnect	no
	Servlet	no
	SOAP Client GW	no
	IS Monitor Mode	mode1
	FJapache	no
CORBA service environment definition	max_IIOP_resp_con	Add 575 (See Note 4.)
	max_IIOP_resp_requests	Add 10112 (See Note 4.)
	max_processes	Add 76 (See Note 4.)
	max_exec_instance	Add 1046 (See Note 4.)
	[SYSTEM ENVIRONMENT] System Scale	large
Component Transaction Service Environment Definition	No statement.	No value.
Database Linkage Service Environment Definition		

Note 1: TD_HOME : Installation directory of Component Transaction Service

Note 2: This must be specified without fail if the system configuration is TYPE3.

Note 3: This must be specified without fail if the system configuration is TYPE2.

Note 4: When the *isregistdef* command is initially submitted, the value shown in Table 1-9 is added to the value in the CORBA service definition file. When the *isregistdef* command is submitted the second time or later, the value added when the previous command was submitted is subtracted from the current setting, and the new value specified in SystemScale is added.

Super

Table 2-10 to 2-12 list the values for the super system scale statement.

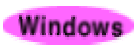

Table 2-10 Super Scale Statement

Definition	Statement	Value
Interstage operating environment definition	Corba Host Name	No value
	Corba Port Number	No value
	IR DB	ObjectFile
	IR path for DB file	TD_HOME\var\IRDB (See Note 3.)
	IR DB size	10
	IR USE	No value. (See Note 2.)
	IR Host Name	No value
	IR Port Number	8002
	NS USE	No value. (See Note 2.)
	NS Host Name	No value
	NS Port Number	8002
	NS jp	no
	LBO USE	no
	TD path for system	TD_HOME/var (See Note 3.)
	OTS Multiple degree	5
	OTS Recovery	2
	OTS path for system log	No value. (See Note 1.)
	OTS maximum Transaction	100
	OTS Setup mode	sys
	OTS JTS's RMP Multiple degree of Process	5
	OTS JTS's RMP Multiple degree of Thread	16
	OTS Participate	4
	OTS Host	No value
	OTS Port	No value
	OTS Locale	No value
	Event Service	no

Definition	Statement	Value
	Event maximum Process	2
	Event maximum Connection	100
	Event Auto Disconnect	no
	InfoProvider Pro	no
	InfoProvider Pro Definition	No value
	WebGateway	no
	Servlet	no
	SOAP Client GW	no
	IS Monitor Mode	mode1
	FJapache	no
CORBA Service environment definition	max_IIOP_resp_con	Add 175 (See Note 1 and Note 5.)
	max_IIOP_resp_requests	Add 3968 (See Note 5.)
	max_processes	Add 76 (See Note 5.)
	max_exec_instance	Add 448 (See Note 5.)
	[SYSTEM ENVIRONMENT] System Scale	super
Component Transaction Service Environment Definition	No statement.	No value.
Database Linkage Service environment definition		

Note 1: A value greater than 1024 may not be set.

Note 2: This must be specified without fail if the system configuration is TYPE3.

Note 3: TD_HOME : Installation folder of Interstage\td.

Note 4: This must be specified without fail if the system configuration is TYPE2.

Note 5: When the *isregistdef* command is initially submitted, the value shown in Table 1-10 is added to the value in the CORBA service definition file. When the *isregistdef* command is submitted the second time or later, the value added when the previous command was submitted is subtracted from the current setting, and the new value specified in SystemScale is added.

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Table 2-11 Super Scale Statement

Definition	Statement	Value
Interstage operating environment definition	IR DB	ObjectFile
	IR path for DB file	TD_HOME/var/IRDB (See Note 1.)
	IR DB size	10
	IR USE	No value (See Note 2.)
	IR User Name	root
	IR Group Name	sys
	IR Host Name	No value (See Note 2.)
	IR Port Number	8002
	NS USE	No value (See Note 2.)
	NS Host Name	No value (See Note 2.)
	NS Port Number	8002
	NS JP	no
	LBO USE	no
	TD path for system	/var/opt/FJSVisas/system/default/FSUNextp
	OTS Multiple degree	5
	OTS Recovery	2
	OTS path for system log	No value (See Note 3.)
	OTS maximum Transaction	1000
	OTS Setup mode	sys
	OTS JTS's RMP Multiple degree of Process	5
	OTS JTS's RMP Multiple degree of Thread	16
	OTS Participate	4
	OTS Host	No value
	OTS Port	No value
	OTS Locale	No value
	Event Service	no
	Event maximum Process	2

Definition	Statement	Value
	Event maximum Connection	1000
	Event Auto Disconnect	no
	InfoProvider Pro	no
	InfoProvider Pro Definition	No value
	WebGateway	no
	Servlet	no
	SOAP Client GW	no
	IS Monitor Mode	mode1
	FJapache	no
CORBA Service environment definition	max_IIOP_resp_con	Add 1024 (See Note 4.)
	max_IIOP_resp_requests	Add 20352 (See Note 4.)
	max_processes	Add 126 (See Note 4.)
	max_exec_instance	Add 2046 (See Note 4.)
	[SYSTEM ENVIRONMENT] System Scale	super
Component Transaction Service Environment Definition	No statement.	No value.
Database Linkage Service Environment Definition		

Note 1: TD_HOME : Installation directory of Component Transaction Service.

Note 2: This must be specified without fail if the system configuration is TYPE3.

Note 3: This must be specified without fail if the system configuration is TYPE2.

Note 4: When the *isregistdef* command is initially submitted, the value shown in Table 1-11 is added to the value in the CORBA service definition file. When the *isregistdef* command is submitted the second time or later, the value added when the previous command was submitted is subtracted from the current setting, and the new value specified in SystemScale is added.

Linux

Table 2-12 Super Scale Statement

Definition	Statement	Value
Interstage operating environment definition	IR DB	ObjectFile
	IR path for DB file	TD_HOME/var/IRDB (See Note 1.)
	IR DB size	10
	IR USE	No value (See Note 2.)
	IR User Name	root
	IR Group Name	sys
	IR Host Name	No value (See Note 2.)
	IR Port Number	8002
	NS USE	No value (See Note 2.)
	NS Host Name	No value (See Note 2.)
	NS Port Number	8002
	NS JP	no
	LBO USE	no
	TD path for system	/var/opt/FJSVisas/system/default/FJSVextp
	OTS Multiple degree	5
	OTS Recovery	2
	OTS path for system log	No value (See Note 3.)
	OTS maximum Transaction	1000
	OTS Setup mode	sys
	OTS JTS's RMP Multiple degree of Process	5
	OTS JTS's RMP Multiple degree of Thread	16
	OTS Participate	4
	OTS Host	No value
	OTS Port	No value
	OTS Locale	No value
	Event Service	no
	Event maximum Process	2

Definition	Statement	Value
	Event maximum Connection	1000
	Event Auto Disconnect	no
	Servlet	no
	SOAP Client GW	no
	IS Monitor Mode	mode1
	FJapache	no
CORBA Service environment definition	max_IIOP_resp_con	Add 1024 (See Note 4.)
	max_IIOP_resp_requests	Add 20352 (See Note 4.)
	max_processes	Add 126 (See Note 4.)
	max_exec_instance	Add 2046 (See Note 4.)
	[SYSTEM ENVIRONMENT] System Scale	super
Component Transaction Service Environment Definition	No statement.	No value.
Database Linkage Service Environment Definition		

Note 1: TD_HOME : Installation directory of Component Transaction Service.

Note 2: This must be specified without fail if the system configuration is TYPE3.

Note 3: This must be specified without fail if the system configuration is TYPE2.

Note 4: When the *isregistdef* command is initially submitted, the value shown in Table 1-12 is added to the value in the CORBA service definition file. When the *isregistdef* command is submitted the second time or later, the value added when the previous command was submitted is subtracted from the current setting, and the new value specified in SystemScale is added.

Timeout Statement

Table 2-13 lists the values for the timeout statement.

Table 2-13 Timeout Statement

Definition	Statement	Value
Interstage operating environment definition	No statement.	No value.
CORBA Service environment definition	period_receive_timeout	Set a value which is one-fifth that of the Timeout statement in the Interstage system definition.

Definition	Statement	Value
Component Transaction Service Environment Definition	No statement.	No value.
Database Linkage Service Environment Definition	No statement.	No value.

How to Tune Interstage

Broadly speaking, Interstage needs to be tuned when new applications have been added and when Interstage functions are to be used.

Tuning Interstage According to the Type of Application Added

This section explains the service definition statements and values to be added when a client application or a server application has been added. The values to be added depend on whether the new application is a CORBA application or a transaction application.

We shall now explain how to perform the tuning required when the application added is one of the following:

- a client application
- a server application (See Note)
- a client/server application (See Note).

Note

These items must be tuned in the Enterprise Edition, Standard Edition and Plus.

If the New Addition is a Client Application

CORBA Application, CORBA/SOAP Server Gateway

Table 2-14 lists the CORBA application and CORBA/SOAP server gateway values.

Table 2-14 CORBA Application, CORBA/SOAP Server Gateway

Definition	Statement	Value to Add
CORBA service environment definition	max_processes (See Note.)	Total number of processes
	max_IIOP_resp_con (See Note.)	

Note

If *max_processes, max_IIOP_resp_con* has been altered, you will need to set the system parameters.

EJB Client Application

Table 2-15 lists the EJB client application values.

Table 2-15 EJB Client Application

Definition	Statement	Value to Add
CORBA service environment definition	max_processes (See Note)	Number of processes of added client applications

Solaris OE Linux

Note

If *max_processes* has been altered, you will need to set the system parameters.

If the New Addition is a Server Application

CORBA Application, CORBA/SOAP Client Gateway

Table 2-16 lists the CORBA application and CORBA/SOAP client gateway values.

Table 2-16 CORBA Server Application

Definition	Statement	Value to Add
CORBA Service environment definition	max_processes (See Note.)	Total number of processes
	max_exec_instance	Total number of threads for request execution

Solaris OE Linux

Note

If *max_processes* has been altered, you will need to set the system parameters.

EJB Application

Table 2-17 lists the EJB application values.

Table 2-17 EJB Application

Definition	Statement	Value to Add
CORBA service environment definition	max_processes (See Note.)	Number of processes of added EJB applications
	max_exec_instance	Windows [When the EJB application is that the thread can operate] Number of processes of added EJB applications * 16 [When the EJB application is that the thread cannot operate] Number of processes of added EJB applications Solaris OE Linux Number of processes of added EJB applications * 16

Solaris OE Linux

Note

If *max_processes* has been altered, you will need to set the system parameters.

Transaction Application

This eventuality does not need to be considered.

If the New Addition is a Client/Server Application

Application to work even if a CORBA client, is taken when other objects are called from the server application and it gets an object reference and session control function, XA connection, and so on are used is shown.

CORBA Application

Table 2-18 lists the CORBA client/server application values

Table 2-18 CORBA Application

Definition	Statement	Value to Add
CORBA Service environment definition	max_processes (See Note.)	Total number of processes
	max_IIOP_resp_con (See Note.)	
	max_exec_instance	Total number of threads for request execution

Solaris OE Linux

Note

If *max_processes, max_IIOP_resp_con* has been altered, you will need to set the system parameters.

Transaction Application

Table 2-19 lists the transaction application values.

Table 2-19 Transaction Application

Definition	Statement	Value to Add
CORBA Service environment definition	max_processes (See Note.)	Total number of processes
	max_IIOP_resp_con (See Note.)	

Solaris OE Linux

Note

If *max_processes, max_IIOP_resp_con* has been altered, you will need to set the system parameters.

Tuning Interstage in Order to Use Interstage Functions

We shall now explain how to perform the tuning required in order to use any of the following Interstage functions:

Also, refer to Table 2-20 and perform tuning for the relevant services that are shown depending on the products used.

Table 2-20 Tuning for Interstage Products

	Interstage Application Server Enterprise Edition	Interstage Application Server Standard Edition	Interstage Application Server Plus	Interstage Application Server Web-J Edition
Database Linkage Services	Must be tuned.	Tuning is not necessary. (See Note 1)	Must be tuned.	Tuning is not necessary. (See Note 1)
Load balancing	Must be tuned.	Tuning is not necessary. (See Note 1)	Tuning is not necessary. (See Note 1)	Tuning is not necessary. (See Note 1)
Event Service (See Note 2)	Must be tuned.	Must be tuned.	Must be tuned.	Tuning is not necessary. (See Note 1)
Server Machine Condition Monitoring	Must be tuned.	Tuning is not necessary. (See Note 1)	Tuning is not necessary. (See Note 1)	Tuning is not necessary. (See Note 1)
Solaris OE Session recovery function of the Servlet Service	Must be tuned.	Must be tuned.	Must be tuned.	Tuning is not necessary. (See Note 1)

Note 1: The service is not available in the relevant product.

Note 2: Tuning for the event service is required when Interstage JMS is used.

Database Linkage Services

Tuning the Multilevel Concurrency of Database Linkage Services

To change the multilevel concurrency of database linkage services, set or augment the values given in Table 2-21.

Table 2-21 Values for Multilevel Concurrency of Database Linkage Services

Definition	Statement	Value to Add or Set
Interstage operating environment definition	OTS Multiple degree (See Note 1.)	Multilevel concurrency of the database linkage services
CORBA Service environment definition	max_exec_instance (See Note 2.)	
	max_IIOP_resp_requests (See Notes 1, 3 and 4.)	

Note 1: Set the value.

Note 2: Augment the value.

Note 3: If the multilevel concurrency of database linkage services is greater than *max_IIOP_resp_requests*, set the former.

Solaris OE Linux

Note 4: If *max_IIOP_resp_requests* has been altered, you will need to set the system parameters.

Tuning the Multilevel Concurrency of Recovery Programs

To change the multilevel concurrency of recovery programs, set or augment the values given in Table 2-22.

Table 2-22 Values for Multilevel Concurrency of Recovery Programs

Definition	Statement	Value to Add or Set
Interstage operating environment definition	OTS Recovery (See Note 1.)	Multilevel concurrency of recovery programs
CORBA service environment definition	max_exec_instance (See Note 2.)	
	max_IIOP_resp_requests (See Note 1 and 3.)	

Note 1: Set the value.

Note 2: Augment the value.

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Note 3: If *max_IIOP_resp_requests* has been altered, you will need to set the system parameters.

Resource Manager Tuning

If you are going to start more than one resource manager, or change the multilevel concurrency of resource managers, augment the values given in Table 2-23.

Table 2-23 Values for Resource Manager Tuning

Definition	Statement	Value to Add
CORBA service environment definition	max_IIOP_resp_con (See Note.)	Total (multilevel concurrency of resource managers + 1)
	max_processes (See Note.)	
	max_exec_instance	

Solaris OE Linux

Note

If *max_IIOP_resp_con, max_processes* has been altered, you will need to set the system parameters.

Load Balancing

If you are going to use the load balancing function, augment the values given in Table 2-24.

Table 2-24 Values for the Load Balancing Function

Definition	Statement	Value to Add
CORBA service environment definition	max_exec_instance	Value specified in **–m** option of *odsetlbo* command
	max_processes (See Note.)	Constant1
	max_IIOP_resp_con (See Note.)	

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Note

If *max_processes, max_IIOP_resp_con* has been altered, you will need to set the system parameters.

Event Service

If you are going to use the Event Service function, augment the values given in Table 2-25.

Table 2-25 Values for the Event Service Function

Definition	Statement	Value to Add
CORBA service environment definition	max_exec_instance	(See Note1.)
	max_IIOP_resp_con (See Note2.)	Total number of consumers and suppliers that are connected to a single event channel group, + 1 (See Note5.)
	max_processes (See Note2.)	Number of processes of the event channels to be activated plus the number of consumers and suppliers plus 2
	period_receive_timeout	Timeout limit before connections are returned in case of a malfunction (See Note6.)

Note1: The sum value is different in the event channel system and in the consumer and supplier systems. Add the following value depending on the system.

[Event channel (In the case of static activation of the event channel)]

Total number of the event channel groups to be activated and the number of connections (specified by the **-m** option of the *esmkchnl* command) of its event channel groups plus 16.

[Event channel (If using event factory)]

Number of processes (specified by the **-p** option of the *essetup* command) multiplied by the number of connections (specified by the **-m** option of the *essetup* command) plus 17.

[Consumers and suppliers]

Number of server applications (number of Push model consumers plus number of Pull model suppliers) multiplied by the initial thread concurrency (the thr_conc_init value specified by the **-ax** option of the *OD_impl_inst* command).

Note2: If *max_IIOP_resp_con, max_processes* has been altered, you will need to set the system parameters.

Note3: To activate an event channel, "3" must also be added.

Note4: When "yes" has been specified for "oneway" in the *essetcnf* or *essetcnfchnl* command in the Push model, the next send processing may be started without confirmation of send processing completion. Therefore, the number of connections handled by send processing may exceed the number of established connections. In such a case, send processing may end abnormally and event data may not be sent.

Note5: If the event channel is to be dynamically activated, set the total number of consumers and suppliers to be connected to all the event channels.

Note6: Set a longer time than the event data queuing time specified in the Event Service (specify it using “-wtime" in the *essetcnf* or *essetcnfchnl* command).

period_receive_timeout x 5 > event data waiting time

If timeout occurs due to the period_receive_timeout before the event data waiting time has elapsed, the following may occur:

Loss of event data

Sending response ends with failure (Error 0d10605)

The event data waiting time must be shorter than the value of period_receive_timeout times 5. (Fujitsu recommends specifying the event data waiting time so that the difference between the two values is at least 20 seconds.)

If the event data waiting time is set to 0, the event data waiting time becomes infinite, which results in a timeout due to period_receive_timeout. For this reason, refrain from specifying 0 for the event data waiting time.

Server Machine Condition Monitoring

If you are going to use the server machine condition monitoring function, augment the values given in Tables 2-26 and 2-27.

Tuning the Server Performing the Monitoring

Table 2-26 Values for the Server Machine Condition Monitoring Function

Definition	Statement	Value to Add
CORBA Service environment definition	max_exec_instance	Constant4
	max_processes (See Note.)	Constant1
	max_IIOP_resp_con (See Note.)	

Note

If *max_processes, max_IIOP_resp_con* has been altered, you will need to set the system parameters.

Tuning the Server to be Monitored

Table 2-27 Values for the Server to be Monitored

Definition	Statement	Value to Add
CORBA Service environment definition	max_exec_instance	Constant1
	max_processes (See Note.)	
	max_IIOP_resp_con (See Note.)	

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Note

If *max_processes*, *max_IIOP_resp_con* has been altered, you will need to set the system parameters.

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Session recovery function of the Servlet Service

If you are going to use the Session recovery function of the Servlet Service, augment the values given in Table 2-28 and Table 2-29.

Table 2-28 Machine on which the SessionRegistry Server Runs (Server Side)

Definition	Statement	Value to Add
CORBA service environment definition	max_exec_instance	16
	max_IIOP_resp_requests (See Note)	Maximum value of maximum number of servlet container threads (max_threads) that run on all machines
	max_IIOP_resp_con (See Note)	Total number of servlet container processes that run on all machines
	max_processes (See Note)	1
	max_impl_rep_entries (See Note)	1

Table 2-29 Machine on which the SessionRegistry Server Runs (Client Side)

Definition	Statement	Value to Add
	max_processes (See Note)	Number of servlet containers that run on a machine

Note

If *max_IIOP_resp_requests, max_IIOP_resp_con*, *max_processes,* or *max_impl_rep_entries* has been altered, you will need to set the system parameters.

Chapter 3

Tuning J2EE Applications

With Interstage, service definitions are registered based on a model case where you can enable system operation only by specifying a system scale. To run a J2EE application, you must tune each of the components that make up J2EE in addition to the above definitions.

This section describes the tuning-related settings using the following pattern of a J2EE application as an example.

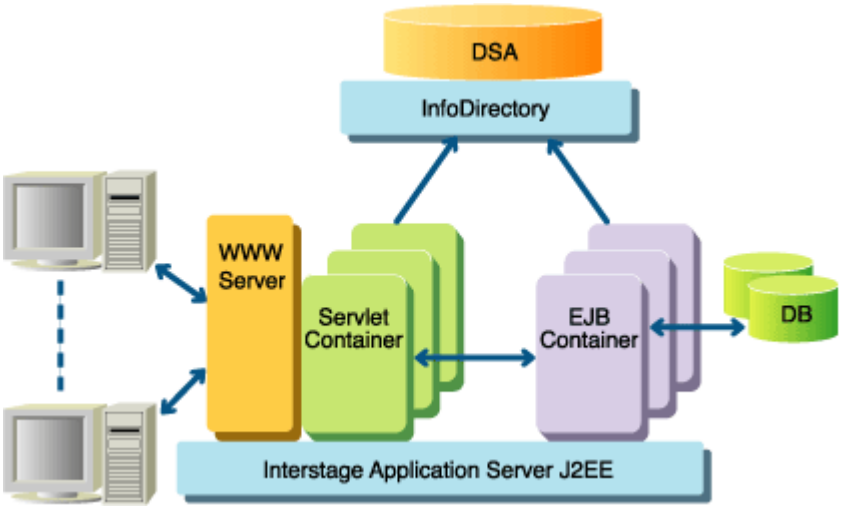

Figure 3-1 Tuning a J2EE Application

- Tuning of IJServer
- Tuning of servlet containers
- Tuning of EJB containers
- Tuning of IIOP communication *1
- Tuning of InfoDirectory as an LDAP server

*1 Refer to Appendix A, CORBA Service Environment Definition for more information on how to tune IIOP communication.

Tuning of IJServer

The points to be considered when tuning IJServer are as follows:

- Process concurrency
- Size of Java VM heap area
- JDBC connection
- Automatic JDBC reconnection function
- Transaction Isolation Level

Process Concurrency

Two or more processes can activate one IJServer. Doing so can distribute the load.

The process concurrency of the IJServer can be defined in the WorkUnit setting on the Interstage Management Console. For details, refer to Help on the Interstage Management Console.

Size of Java VM Heap Area

The Java VM option can be specified in the WorkUnit setting on the Interstage Management Console. Doing so can change the parameters of the Java VM in which the IJServer runs.

The size of the Java VM heap area can be changed using parameters. An example of the maximum size of the heap area under JDK1.3 is shown below.

The default maximum size of the heap area varies depending on the Java VM. Refer to the JDK document for details. If a java.lang.OutOfMemoryError occurs frequently, increase the maximum size of the Java VM heap area using this definition item.

Sample

Setting the maximum size of Java VM heap area to 128 megabytes

```
-Xmx128m
```

Interstage provides a proactive monitoring function that posts an alarm message for heap area problems.

If work is continued after an alarm message is output, a problem such as a memory shortage or response deterioration may occur. To solve such a problem, tune the IJServer, based on the resource shortage information provided by the alarm message.

The cause of the JavaVM error is a space shortage in the heap area or Perm area. To avoid the problem, increase the current upper limit by 20% and restart the operation. If an alarm message is still produced, increase the upper limit by another 20%. Repeat this operation until no alarm message is posted. To construct a system with stable operation, repeat the tuning until the alarm message does not appear.

Refer to the Operator's Guide for the proactive monitoring function.

JDBC Connection

When a JDBC data source from the Interstage JNDI service provider is used, the JDBC connection is pooled and re-used. The following parameters can be tuned using the Interstage Management Console:

Table 3-1 Parameters

Parameter	Explanation
Pre-opened connection count (Note1)	The connections required for operation can be obtained in advance during startup. Doing so can obtain the same processing speed from the very beginning of connection as that obtained for the second and subsequent connections.
Maximum connection count (Note2)	The memory space can be suppressed by suppressing the maximum number of connections. If a connection request is received while J2EE applications use all of the connections that can be set up, the container waits for a connection to be returned to the pool within the period specified for Connection Timeout. If a connection is returned to the pool, the container allocates it. If no connection is returned, the container returns an SQL Exception.
Idle timeout (Note2)	Abandoning unused connections according to timeout can free memory that has been used wastefully. Note that pre-opened connections are excluded from the idle timeout.

Note1)

At startup of the IJServer to which a CMP2.0 EJB application has been deployed, it checks the maximum value for the DBMS identifier length. For this reason, only one connection to the DBMS is set up even if pre-opened connection optimization is not used.

If Interstage pools connections, the connections are released after completion of start processing.

Note2)

The maximum connection count, idle connection, and connection timeout functions are valid only when all of the following conditions are satisfied:

Table 3-2 Conditions

1	An Oracle data source is used.	
2	When "Create .bindings file" is checked for ".bindings file" on the Interstage Management Console	Select one of the following: - Use Interstage for connection pooling. - Use the distributed transaction function.
	When "Create .bindings file" is not checked for ".bindings file" on the Interstage Management Console	OracleConnectionPoolDataSource or OracleXADataSource is registered in the File System Service Provider (*1)

*1 File System Service Provider is the JNDI service provider released by Sun Microsystems, Inc. Oracle manages data sources by using the File System Service Provider.

Transaction Isolation Level

The Transaction Isolation Level (Isolation Level) is the exclusive consistency level for the database. When an EJB application accesses the database, the appropriate Isolation Level must be selected to improve multiprocessing of the EJB application. Select one of the following Isolation Levels, as required. For details of the Isolation Level, refer to the relevant database manual.

- Transaction-read-committed
- Transaction-read-uncommitted
- Transaction-repeatable-read
- Transaction-serializable

The Isolation Level is valid from when the UserTransaction.begin() method is issued to when the UserTransaction.commit() or UserTransaction.rollback() method is issued.

Setting Method

Use the Interstage Management Console to set the Isolation Level. For details of the setting method, refer to Help on the Interstage Management Console.

Tuning Servlet Containers

The point to be considered when tuning the Servlet container is the number of simultaneous processing tasks.

Number of Simultaneous Processing Tasks

Increasing the number of simultaneous processing tasks or the process concurrency can increase the execution concurrency of Web applications.

Increasing the number of simultaneous processing tasks can increase the execution concurrency per process but may not always be effective because it also increases loads and resources. The default value is recommended for normal operation.

Specify the number of simultaneous processing tasks in the Servlet container setting on the Interstage Management Console.

Tuning of EJB Containers

The points to be considered when tuning the EJB container are as follows:

- Number of simultaneous processing tasks
- Session Bean
- Entity Bean
- Message-driven Bean

Number of Simultaneous Processing Tasks

Increasing the number of simultaneous processing tasks or the process concurrency can increase the execution concurrency of EJB applications.

Increasing the number of simultaneous processing tasks can increase the execution concurrency per process but may not always be effective because it also increases loads and resources.

As shown below, the maximum and minimum values can be set for the number of simultaneous processing tasks.

The default values are recommended for normal operation.

Table 3-3 Recommended Values

Definition item	Default value	Explanation
Minimum value	16	Number of threads that the EJB container can process simultaneously from the very beginning after the IJServer is started. When the number of threads requested by the client exceeds the minimum value, the available number of threads is automatically increased for operation.
Maximum value	64	Maximum number of threads that can be processed simultaneously. If the number of threads requested by the client exceeds the maximum value, the excess request is queued.

Session Bean

To use resources effectively, make the following settings for the Session Bean.

Selecting STATEFUL or STATELESS

Using a STATELESS Session Bean suppresses the number of times memory resources and objects are generated and accordingly improves the processing performance.

The differences between STATEFUL and STATELESS are listed below.

Table 3-4 STATEFUL and STATELESS Beans

	STATEFUL	STATELESS
Interactive status	Because access is made to the same object from "create" to "remove," the interactive status with the client can be maintained.	Because the interactive status with the client is not maintained, the client must retain information.
Transaction	The synchronization function of the Session Bean can be used for synchronization with transactions.	A transaction must be completed within one method.
Performance	An EJB object is generated for each client and therefore more memory space is used than STATELESS.	Memory usage can be suppressed because the same instance and EJB object are used for multiple clients. The object generation frequency is also suppressed.

No-Communication Monitoring for STATEFUL Session Bean

If an object created with the create method ends without executing the remove method, the remaining object is automatically removed. This function can thus prevent unnecessary consumption of memory.

Maximum Number of Times a Session Bean Can Execute the Create Method

The number of times the create method can be executed can be changed according to the high load execution environment.

If the value calculated from the following expression exceeds the default value of 1,024, change the maximum number of times the Session Bean can execute the create method.

(Number of client application processes) x (average number of execution threads per process)

* Use the Interstage Management Console to set the number of times the create method can be executed.

Note

If an object created with the create method is not deleted with the remove method, the object remains and consumes memory space until a timeout is detected by the no-communication monitoring function. Set an adequate value for the maximum number of times the create method can be executed.

Table 3-5 Settings

Parameter	Setting
Initial setting value	1024
Minimum value	1
Maximum value	2147483647

Entity Bean

Notes on Calling an Entity Bean

An Entity Bean frequently executes a method to obtain record information. If an Entity Bean is called from outside of processes, IIOP communication occurs frequently and performance is deteriorated.

Fujitsu recommends calling an Entity Bean from an application within the same IJServer.

Number of Instances

The number of instances relate to the number of records retrieved from the database and the number of concurrent client connections. An effective value can be obtained by multiplying the number of records normally retrieved by 1.25.

The expression for this calculation is shown below:

Number of instances = a x b x 1.25 (the rate of safety)

a: Number of records that can be retrieved at a time

b: Number of clients that access simultaneously per process

Sample)

When ten clients retrieve 100 records simultaneously

Number of instances = 10 x 100 x 1.25 = 1250

Note)

Note that increasing the number of instances consumes more memory space.

Instance Management Mode

Database processing can be tuned using Entity Bean instance management modes.

The table below lists the instance management modes and their optimum usage for processing.

Table 3-6 Instance Management Modes

ReadWrite	Effective for executing a retrieval or updating an online database
ReadOnly	Effective for retrieving (referencing) major data that is not updated
Sequential	Effective for batch processing of mass data

Message-Driven Bean

If the number of instances of a message-driven bean is defined, multiple messages can be processed simultaneously.

Usually, define the number of instances to the extent that messages will not be stacked in the queue. Because the optimum number depends on the number of clients and the processing time of the message-driven bean, carry out a trial run according to the environment, make adjustments, and then define the appropriate number of instances.

Note)

This function is valid only when the transaction management type is "Container" and the transaction attribute is "NotSupported".

Tuning InfoDirectory as an LDAP Server

The default environment setting values are not effective for using InfoDirectory on a large-scale user system, and as a result tuning is required. The tuning is also required for some moderate- and small-scale user systems.

For details about the method of tuning, refer to "Tuning" in the "Operation" section of the InfoDirectory User's Guide.

Chapter 4

System Tuning

This chapter describes system tuning.

System Resources for Operating Interstage Services

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This section describes the system resources that are required for operating each Interstage service.

Refer to Table 4-1 and perform tuning of the relevant services, depending on the products used.

Table 4-1 Tuning for Interstage Products

Operating Service	Interstage Application Server Enterprise Edition	Interstage Application Server Standard Edition	Interstage Application Server Plus	Interstage Application Server Web-J Edition
Setting the System Environment for a CORBA Service	Must be tuned.	Must be tuned.	Must be tuned.	Must be tuned.
Setting the System Environment for a Component Transaction Service	Must be tuned.	Must be tuned.	Must be tuned.	Tuning is not necessary. (See Note 1)
Setting the System Environment of Database Linkage Services	Must be tuned.	Tuning is not necessary. (See Note 1)	Must be tuned.	Tuning is not necessary. (See Note 1)
System Resources Required by an Event Service System	Must be tuned.	Must be tuned.	Must be tuned.	Tuning is not necessary. (See Note 1)
System Resources of the EJB Service	Must be tuned.	Must be tuned.	Must be tuned.	Must be tuned.
Solaris OE System Resources of MessageQueueDirect	Must be tuned.	Tuning is not necessary. (See Note 1)	Tuning is not necessary. (See Note 1)	Tuning is not necessary. (See Note 1)
Solaris OE System Resources of ebXML Message Service	Must be tuned.	Tuning is not necessary. (See Note 1)	Tuning is not necessary. (See Note 1)	Tuning is not necessary. (See Note 1)

Note 1: The service is not available in the relevant product.

Setting the System Environment for a CORBA Service

When running a system using a CORBA Service, the system resources will need to be increased according to the number of clients/servers to be connected, the number of objects, and so forth. This section describes the system resources (system parameters, processes, threads and file descriptors) required by the CORBA Service and the client and server applications.

System Parameters

The example below shows typical additions to the kernel parameters for shared memory, semaphores, and message queues used by an ordinary CORBA Service.

If any application other than the CORBA Service is also going to use shared memory, semaphores and message queues, add the resource quantities for the CORBA Service to those required by the other application.

Changing the System Parameters

Solaris OE

System parameter modification method: Modify the parameter by editing /etc/system. After completing the modification, reboot the system.

For details about how to change the system parameters, refer to the Solaris(TM) Operating Environment documents.

In this document, Solaris(TM) Operating Environment is hereafter abbreviated as Solaris OE.

Linux

In the case of Red Hat

Modify the parameter value by editing /etc/sysctl.conf. After completing the modification, either execute "sysctl -p /etc/sysctl.conf" or reboot the system.

For the modification procedure, refer to the OS documentation.

In the case of Turbolinux

Modify the parameter value by editing /etc/sysconfig/kparam. After completing the modification, either execute "/etc/rc.d/init.d/kparam restart" or reboot the system.

For the modification procedure, refer to the OS documentation.

CORBA Service

The system resources required by the CORBA Service are shown in Tables 4-2 to 4-7.

Shared Memory

Solaris OE

Table 4-2 System Resources Required by the CORBA Service

Parameter	Number Required (value to add)	Remarks (description)
shmmax	The maximum is specified using the following values. - max_IIOP_resp_con ∗ 16KB + (max_IIOP_resp_con_extend_number + 1) * 0.2KB + max_IIOP_resp_requests ∗16KB + (max_IIOP_resp_requests_extend_number + 1) * 0.2KB + max_impl_rep_entries ∗ 6KB + 100KB or more [For trace_use=yes] The above value + max_processes ∗ trace_size_per_process + 20KB or more [For snap_use=yes] The above value + snap_size + 10KB or more - number_of_common_buffer (See Note1)∗4KB or more - (Buffer Size + 0.2KB) ∗ Buffer Number or more (See Note 2)	Maximum shared memory segment size
shmseg	max_IIOP_resp_con_extend_number + max_IIOP_resp_requests_extend_number + number_of_common_buffer_extend_number + The number of WorkUnit which specified Buffer Size and Buffer Number (WorkUnit definition) + 14	Number of shared memory segments that can be attached in one process

Note 1: The default is shown below. If 0 is specified, the default values are as follows:

– max_IIOP_resp_requests * 0.2

Note 2: When the WorkUnit which specified Buffer Size and Buffer Number (WorkUnit definition) starts, this value is used.

Linux

Table 4-3 System Resources Required by the CORBA Service

Parameter (See Note 1)	Number Required (value to add)	Remarks (description)
kernel.shmmax /proc/sys/kernel/shmmax	The maximum is specified using the following values. - max_IIOP_resp_con ∗ 16KB + (max_IIOP_resp_con_extend_number + 1) * 0.2KB + max_IIOP_resp_requests ∗16KB + (max_IIOP_resp_requests_extend_number + 1) * 0.2KB + max_impl_rep_entries ∗ 6KB + 100KB or more [For trace_use=yes] The above value + max_processes ∗ trace_size_per_process + 20KB or more [For snap_use=yes] The above value + snap_size + 10KB or more - number_of_common_buffer(See Note 2)∗4KB or more - (Buffer Size + 0.2KB) ∗ Buffer Number or more (See Note 3)	Maximum shared memory segment size

Note 1: The upper row indicates the value for Red Hat and the lower row indicates the value for Turbolinux.

Note 2: The default is shown below. If 0 is specified, the default values are as follows:

- max_IIOP_resp_requests * 0.2

Note 3: When the WorkUnit which specified Buffer Size and Buffer Number (WorkUnit definition) starts, this value is used.

Semaphores

Solaris OE

Table 4-4 Semaphores

Parameter	Number Required (value to add)	Remarks (description)
semmap (See Note 1)	semmsl or more	Number of maximum semaphores
semmni	The maximum value (either semmns value or 512)	Total number of semaphore identifiers in system
semmns	limit_of_max_IIOP_resp_con * 4 + max_IIOP_resp_con_extend_number + max_IIOP_resp_requests_extend_number + max_impl_rep_entries + max_processes *3 + [Number of WorkUnit which specified Buffer Size and Buffer Number (WorkUnit definition)] * 2 + 12 or more	Total number of semaphores in system
	The above value + 1 or more	When the trace function is used
	The above value + 1 or more	When the snapshot function is used
semmnu	max_impl_rep_entries + max_processes * 3 + [Number of WorkUnit which specified Buffer Size and Buffer Number (WorkUnit definition)] * 2 + 6 or more	Total number of cancel record groups for semaphore operations in the system
	The above value + 1 or more	When the trace function is used
	The above value + 1 or more	When the snapshot function is used
semmsl	Whichever is higher: (max_IIOP_resp_con +1) or max_processes	Maximum number of semaphores for each semaphore identifier
semopm	50 or more	Maximum number of operators for each semaphore call

Parameter	Number Required (value to add)	Remarks (description)
semume	limit_of_max_IIOP_resp_con * 3 + max_IIOP_resp_con_extend_number + max_IIOP_resp_requests_extend_number + max_impl_rep_entries + max_processes * 2 + [Number of WorkUnit which specified Buffer Size and Buffer Number (WorkUnit definition)] * 2 + 9 or more	Maximum number of cancel records for semaphore operations for each process
	The above value + 1 or more	When the trace function is used
	The above value + 1 or more	When the snapshot function is used

Note 1: Parameters are not required to be specified for Solaris 8 OE or later.

Linux

For the semaphore setting value, specify each parameter in the following format.

In the case of Red Hat

kernel.sem = *para1 para2 para3 para4*

In the case of Turbolinux

/proc/sys/kernel/sem = *para1 para2 para3 para4*

Table 4-5 Semaphores

Parameter	Number Required (value to add)	Remarks (description)
para1	Whichever is higher: (max_IIOP_resp_con +1) or max_processes	Maximum number of semaphores for each semaphore identifier
para2	limit_of_max_IIOP_resp_con * 4 + max_IIOP_resp_con_extend_number + max_IIOP_resp_requests_extend_number + max_impl_rep_entries + max_processes *4 + max_exec_instance + [Number of WorkUnit which specified Buffer Size and Buffer Number (WorkUnit definition)] * 2 + 12 or more	Total number of semaphores in system
	The above value + 1 or more	When the trace function is used
	The above value + 1 or more	When the snapshot function is used

Parameter	Number Required (value to add)	Remarks (description)
para3	50 or more	Maximum number of operators for each semaphore call
para4	The maximum value (either *para2* value or 512)	Total number of semaphore identifiers in system

Message Queues

Solaris OE

Table 4-6 Message Queues

Parameter	Number Required (value to add)	Remarks (description)
msgmap (See Note 1)	200 or more	Number of message map entries
msgmax	16384 or more	Maximum message size
msgmnb	32768 or more (See Note 2)	Maximum number of messages that can be held in one message queue
msgmni	512 or more (See Note 2)	Maximum number of message queue IDs
msgseg (See Note 1)	32767 (Fixed (See Note 3))	Number of message segments that can be attached in one process

Note 1: Parameters are not required to be specified for Solaris 8 OE or later.

Note 2: In Solaris 7 OE, this parameter is set on the following conditions. Change the value of msgssz if it is necessary.

– msgmnb * msgmni < msgseg * msgssz

Note 3: Specify 32767 for msgseg. (Not to be added)

Linux

Table 4-7 Message Queues

Parameter (See Note 1)	Number Required (value to add)	Remarks (description)
kernel.msgmax /proc/sys/kernel/msgmax	16384 or more	Maximum message size
kernel.msgmnb /proc/sys/kernel/msgmnb	32768 or more	Maximum number of messages that can be held in one message queue

Parameter (See Note 1)	Number Required (value to add)	Remarks (description)
kernel.msgmni /proc/sys/kernel/msgmni	512 or more	Maximum number of message queue IDs

Note1: The upper row indicates the value for Red Hat and the lower row indicates the value for Turbolinux.

Interface Repository

The system resources required to use an Interface Repository are as shown in Table 4-8 and Table 4-9.

Shared Memory

Solaris OE

Table 4-8 Shared Memory

Parameter	Number Required (value to add)	Remarks (description)
shmmax	Database size or more	Maximum shared memory segment size
	The above value + "logging memory size" * 2 or more (See Note 1)	When collecting log data (The EJB Service is not used.)
	The above value + "logging memory size" * 3 or more (See Note 1)	When collecting log data (The EJB Service is used.)
shmseg	4 or more	Number of shared memory segments that can be attached in one process

Note 1: Specify "logging memory size" in the CORBA Service irconfig file. Refer to irconfig for details.

Linux

Table 4-9 Shared Memory

Parameter (See Note 1)	Number Required (value to add)	Remarks (description)
kernel.shmmax /proc/sys/kernel/shmmax	Database size or more	Maximum shared memory segment size
	The above value + "logging memory size" * 2 or more (See Note 2)	When collecting log data (The EJB Service is not used.)
	The above value + "logging memory size" * 3 or more (See Note 2)	When collecting log data (The EJB Service is used.)

Note1: The upper row indicates the value for Red Hat and the lower row indicates the value for Turbolinux.

Note 2: Specify "logging memory size" in the CORBA Service irconfig file. Refer to irconfig for details.

Naming Service

The system resources required to create multiple naming contexts in the Naming Service are shown in Table 4-10.

Table 4-10 Naming Service

Parameter	Number Required (value to add)	Remarks (description)
(see Note 1)	Number of naming contexts + 16 or more	Number of files that can be opened for each process

Note 1: The relevant parameter does not exist.

Using the ulimit command for the bourne shell and the limit command for the C shell, set the values only as far as required for opening the file with the naming service process. For details about commands, refer to the OS documents.

Number of Threads and Processes Used by Applications

When applications are to be executed in the CORBA Service, system parameters will need to be changed if large numbers of processes and threads are going to be generated by the applications.

The targets for the number of (multiple) threads started when applications are started are shown in Table 4-11 and Table 4-13.

Solaris OE

Table 4-11 Targets for the Number of Threads

Component	Number of Threads
CORBA Service	25 + number of connections to client application
Server application	(6 + number of thread primary multiples) for each process
Client application	8 (maximum) per process

The system parameters that require modification are as shown in Table 4-12.

Table 4-12 System Parameters

Parameter	Description
max_nprocs	Total number of processes started in the system

Table 4-13 Targets for the Number of Threads

Component	Number of Threads (See Note 1)
CORBA Service	25 + number of connections to client application
Server application	(6 + number of thread primary multiples) for each process
Client application	8 (maximum) per process

Note 1: The maximum number of threads that can be started by one process is 1024.

The system parameters that require modification are shown in Table4-14.

Table 4-14 System Parameters

Parameter (See Note 1)	Description
kernel.threads-max /proc/sys/kernel/threads-max	Total number of processes started in the system

Note1: The upper row indicates the value for Red Hat and the lower row indicates the value for Turbolinux.

Number of File Descriptors

If multiple applications are going to be executed in the CORBA Service (because multiple terminals are connected, for instance), and the number of file descriptors used exceeds 1024, also set the parameter of the config file.

Table 4-15 File Descriptors

Parameter	Description
max_file_descriptors (config file parameter)	Number of file descriptors used, minus 1024
Linux fs.file-max /proc/sys/fs/file-max (System parameter) (See Note 1)	Set when the number of file descriptors in use exceeds the default value.

Note1: The upper row indicates the value for Red Hat and the lower row indicates the value for Turbolinux.

Setting the System Environment for a Component Transaction Service

When the Component Transaction Service is in operation, the system resources must be expanded depending on the functions used. The system resources (system parameters) required by the Component Transaction Service and the system resources (system parameters) required by each function are described below.

Solaris OE

Refer to the Solaris OE System Management manuals for details of system parameter settings.

Linux

Refer to the OS document for details of system parameter settings.

Note

The following values are not included in the values of the CORBA Service. Refer to Setting the System Environment for a CORBA Service and add the values as required.

System Parameters

This section describes tuning of the system parameters of shared memory as well as semaphores and message queues that the Component Transaction Service uses.

When various functions are going to be used in addition to the basic function of the Component Transaction Service, add the amount of resources that are used by each function to the resources of the Component Transaction Service basic function.

Note

In the subsequent descriptions, "type" has the following meaning.

Setting value

Change the values according to conditions applying to necessary values.

Additional value

Add the required value to the already set value.

Basic Function of the Component Transaction Service

The system resources that are required to use the basic function of the Component Transaction Service are shown in the following tables.

Shared Memory

Solaris OE

Table 4-16 Shared Memory

Parameter	Type	Required value	Description
shmmax	Setup value	10,629,296 or more	Maximum size of shared memory segment
shmmin	Setup value	372 or less	Minimum size of shared memory segment
shmseg	Additional value	Add 17	Number of shared memory segment for each process
shmmni	Additional value	Add 22	Number of shared memory IDs (See Note 1)

Note 1: When the multi system is used, the total of the extension system numbers should be added.

The multi system function can be used in the Enterprise Edition.

Linux

Table 4-17 Shared Memory

Parameter (See Note 1)	Type	Required value	Description
kernel.shmmax /proc/sys/kernel/shmmax	Setup value	10,629,296 or more	Maximum size of shared memory segment
kernel.shmmni /proc/sys/kernel/shmmni	Additional value	Add 22	Number of shared memory IDs

Note 1: The upper row indicates the value for Red Hat and the lower row indicates the value for Turbolinux.

Semaphores

Solaris OE

Table 4-18 Semaphores

Parameter	Type	Required value	Description
semmni	Additional value	Add 29	Number of semaphore IDs (See Note 1)
semmns	Additional value	Add 21	Number of semaphores of the entire system (See Note 1)
semmsl	Setup value	12 or more	Maximum number of semaphores for each semaphore ID (See Note 1)
semopm	Setup value	3 or more	Maximum number of operations for each semaphore call

Note 1: When the multi system is used, the total of the extension system numbers should be added.

The multi system function can be used in the Enterprise Edition.

Linux

For the semaphore setting value, specify each parameter in the following format.

- In the case of Red Hat

  kernel.sem = para1 para2 para3 para4

- In the case of Turbolinux

  /proc/sys/kernel/sem = para1 para2 para3 para4

Table 4-19 Semaphores

Parameter	Type	Required value	Description
para1	Setup value	12 or more	Maximum number of semaphores for each semaphore ID
para2	Additional value	Add 21	Number of semaphores of the entire system
para3	Setup value	3 or more	Maximum number of operations for each semaphore call
para4	Additional value	Add 29	Number of semaphore IDs

Message Queues

Solaris OE

Table 4-20 Message Queues

Parameter	Type	Required value	Description
msgmax	Setup value	528 or more	Maximum message size
msgmnb	Setup value	4572 + (528 * number of simultaneously executed commands) (See Note 1 and 2)	Maximum number of bytes in the queue
msgmni	Additional value	Add 11 (See Note 1)	Number of message queue IDs (See Note 3)
msgtql	Additional value	15 + number of simultaneously executed commands (See Notes 2 and 4)	Number of system message headers (See Note 3)

Note 1: In Solaris 7 OE, this parameter is set on the following conditions. Change the value of msgssz if it is necessary.

- msgmnb * msgmni < msgseg * msgssz

Note 2: Number of simultaneously executed commands refers to the number of commands when the following commands are executed at the same time.

For Standard Edition and Enterprise Edition:

isstartwu, *isstopwu*, *tdstartwu*, *tdstopwu*, *tdinhibitobj*, *tdpermitobj*, *tdmodifyprocnum*, *tdmodifywu*, *tdstandbywu*, *tdreleasewu*

For Plus:

isstartwu, *isstopwu*

When start/stop of the WorkUnit, object closure/closure release and acquisition of the wrapper WorkUnit object information are executed using the Interstage Operation Tool, Systemwalker OperationMGR and Interstage operation API, the number of simultaneous operations is counted as the number of simultaneously executed commands.

Object closure and closure cancellation can be used in the Enterprise Edition. Object information allocation of the wrapper work unit can be used in Enterprise Edition and Standard Edition.

Note 3: When the multi system is used, the total of the extension system numbers should be added.

The multi system function can be used in the Enterprise Edition.

Note 4: When AIM linkage is used, add 2040.

The AIM linkage function can be used in Enterprise Edition and Standard Edition.

Linux

Table 4-21 Message Queues

Parameter (See Note 1)	Type	Required value	Description
kernel.msgmax /proc/sys/kernel/msgmax	Setup value	528 or more	Maximum message size
kernel.msgmnb /proc/sys/kernel/msgmnb	Setup value	4572 + (528 * number of simultaneously executed commands)(See Note 2)	Maximum number of bytes in the queue
kernel.msgmni /proc/sys/kernel/msgmni	Additional value	Add 11	Number of message queue IDs

Note 1: The upper row indicates the value for Red Hat and the lower row indicates the value for Turbolinux.

Note 2: Number of simultaneously executed commands refers to the number of commands when the following commands are executed at the same time:

For Standard Edition and Enterprise Edition:

isstartwu, *isstopwu*, *tdstartwu*, *tdstopwu*, *tdinhibitobj*, *tdpermitobj*, *tdmodifyprocnum*, *tdmodifywu*

For Plus:

isstartwu, *isstopwu*

When start/stop of the WorkUnit and object closure/closure release are executed using the Interstage Operation Tool, Systemwalker OperationMGR and Interstage operation API, the number of simultaneous operations is counted as the number of simultaneously executed commands.

Object closure and closure cancellation can be used in the Enterprise Edition.

Interstage Operation Tool

This section describes the system resources that are additionally required when the Interstage Operation Tool is used.

Shared Memory

Solaris OE

Table 4-22 Shared Memory

Parameter	Type	Required value	Description
shmseg	Additional value	Add 11	Number of shared memory segment for each process
shmmni	Additional value	Add 11	Number of shared memory IDs (See Note 1)

Note 1: When the multi system is used, the total of the extension system numbers should be added.

The multi system function can be used in the Enterprise Edition.

Linux

Table 4-23 Shared Memory

Parameter (See Note 1)	Type	Required value	Description
kernel.shmmni /proc/sys/kernel/shmmni	Additional value	Add 11	Number of shared memory IDs

Note 1: The upper row indicates the value for Red Hat and the lower row indicates the value for Turbolinux.

Semaphores

Solaris OE

Table 4-24 Semaphores

Parameter	Type	Required value	Description
semmni	Additional value	Add 2	Number of semaphore IDs (See Note 1)
semmns	Additional value	Add 2	Number of semaphores of the entire system (See Note 1)

Note 1: When the multi system is used, the total of the extension system numbers should be added.

The multi system function can be used in the Enterprise Edition.

Linux

For the semaphore setting value, specify each parameter in the following format.

- In the case of Red Hat
  kernel.sem = para1 para2 para3 para4
- In the case of Turbolinux
  /proc/sys/kernel/sem = para1 para2 para3 para4

Table 4-25 Semaphores

Parameter	Type	Required value	Description
para2	Additional value	Add 2	Number of semaphores of the entire system
para4	Additional value	Add 2	Number of semaphore IDs

Message Queues

Solaris OE

Table 4-26 Message Queues

Parameter	Type	Required value	Description
msgmap (See Note 1)	Additional value	Add 34	number of message map entries
msgmni	Additional value	Add 16	Number of message queue IDs (See Note 2)
msgtql	Additional value	Add 34	Number of message queue IDs (See Note 2)

Note 1: Parameters are not required to be specified for Solaris 8 OE or later.

Note 2: When the multi system is used, the total of the extension system numbers should be added.

Linux

Table 4-27 Message Queues

Parameter (See Note 1)	Type	Required value	Description
kernel.msgmmi /proc/sys/kernel /msgmni	Additional value	Add 16	Number of message queue IDs

Note 1: The upper row indicates the value for Red Hat and the lower row indicates the value for Turbolinux.

Session Information Management Function

This section describes the system resources that are additionally required when the session information management function is used.

Shared Memory

Solaris OE

Table 4-28 Shared Memory

Parameter	Type	Required value	Description
shmseg	Additional value	Add 1	Number of shared memory segment for each process
shmmni	Additional value	Add 1	Number of shared memory IDs (See Note 1)

Note 1: When the multi system is used, the total of the extension system numbers should be added.

The multi system function can be used in the Enterprise Edition.

Linux

Table 4-29 Shared Memory

Parameter (See Note 1)	Type	Required value	Description
kernel.shmmni /proc/sys/kernel/shmmni	Additional value	Add 1	Number of shared memory IDs

Note 1: The upper row indicates the value for Red Hat and the lower row indicates the value for Turbolinux.

Semaphores

Solaris OE

Table 4-30 Semaphores

Parameter	Type	Required value	Description
semmni	Additional value	Add 1	Number of semaphore IDs (See Note 1)
semmns	Additional value	Add 1	Number of semaphores of the entire system (See Note 1)

Note 1: When the multi system is used, the total of the extension system numbers should be added.

The multi system function can be used in the Enterprise Edition.

Linux

For the semaphore setting value, specify each parameter in the following format.

- In the case of Red Hat
  kernel.sem = para1 para2 para3 para4
- In the case of Turbolinux
  /proc/sys/kernel/sem = para1 para2 para3 para4

Table 4-31 Semaphores

Parameter	Type	Required value	Description
para2	Additional value	Add 1	Number of semaphores of the entire system
para4	Additional value	Add 1	Number of semaphore IDs

Performance Monitoring Tool

Refer to Environment Setup for Performance Monitoring Tool for the additional system resources that are required when using the performance monitoring tool.

Setting the System Environment of Database Linkage Services

When the Database Linkage Service is in operation, the system resource must be expanded depending on the system configuration used. The system resources (system parameters) that the Database Linkage Service requires are described for each system configuration.

System Parameters

This section describes for each system configuration the tuning of system parameters of the shared memory, semaphore and message queues that the Database Linkage Service uses.

Note

In the subsequent descriptions, "type" has the following meaning.

Setting value

Change the values according to the conditions that apply to the necessary values.

Additional value

Add the required value to the already set value.

When Only the OTS System Operates

The system resources that are required when only the OTS system operates are shown below.

Shared Memory

Table 4-32 Shared Memory

Parameter	Type	Required value	Description
shmmax	Setup value	6,820,156 or more (See Note 1)	Maximum size of shared memory segment
shmmin	Setup value	1 or less	Minimum size of shared memory segment
shmseg	Additional value	Add 20	Number of shared memory segment for each process
shmmni	Additional value	Add 12	Number of shared memory IDs

Note 1: The exact value should be calculated using the equations shown below.

There is only one type of resource management program. The respective value can be calculated from the following definition values.

config file of the Database Linkage Service environment definition

RESOURCE_TRANMAX = 5
OTS_TRACE_SIZE = 512
RESOURCE_TRACE_SIZE = 512
RECOVERY_TRACE_SIZE = 512
OBSERVE_TRACE_SIZE = 512

Resource definition file

OTS_RMP_PROC_CONC = 5

Setup information file of the Database Linkage Service environment definition

TRANMAX = 100
PARTICIPATE = 4

A = OTS_TRACE_SIZE * 1024
B = RECOVERY_TRACE_SIZE * 1024
C = OBSERVE_TRACE_SIZE * 1024
D = PARTICIPATE * TRANMAX * 2048
E = TRANMAX * 284
Required amount = A + B + C + D + E + 4399692

Linux

Table 4-33 Shared Memory

Parameter	Type	Required value	Description
kernel.shmmax	Setup value	6,820,156 or more (See Note 1)	Maximum size of shared memory segment
kernel.shmmni	Additional value	Add 12	Number of shared memory IDs

Note 1: The exact value should be calculated using the equations shown below.

There is only one type of resource management program. The respective value can be calculated from the following definition values.

config file of the Database Linkage Service environment definition

RESOURCE_TRANMAX = 5
OTS_TRACE_SIZE = 512
RESOURCE_TRACE_SIZE = 512
RECOVERY_TRACE_SIZE = 512
OBSERVE_TRACE_SIZE = 512

Resource definition file

OTS_RMP_PROC_CONC = 5

Setup information file of the Database Linkage Service environment definition

TRANMAX = 100
PARTICIPATE = 4

A = OTS_TRACE_SIZE * 1024
B = RECOVERY_TRACE_SIZE * 1024
C = OBSERVE_TRACE_SIZE * 1024
D = PARTICIPATE * TRANMAX * 2048
E = TRANMAX * 284
Required amount = A + B + C + D + E + 4399692

Semaphores

Solaris OE

Table 4-34 Semaphores

Parameter	Type	Required value	Description
semmni	Additional value	Add 8	Number of semaphore IDs
semmns	Additional value	Add 24	Number of semaphores of the entire system
semmsl	Setup value	12 or more	Maximum number of semaphores for each semaphore ID
semopm	Setup value	3 or more	Maximum number of operations for each semaphore call

Linux

For the semaphore setting value, specify each parameter in the following format.

- In the case of Red Hat
  kernel.sem = para1 para2 para3 para4

Table 4-35 Semaphores

Parameter	Type	Required value	Description
para1	Setup value	12 or more	Number of semaphore IDs
para2	Additional value	Add 24	Number of semaphores of the entire system
para3	Setup value	3 or more	Maximum number of operations for each semaphore call
para4	Additional value	Add 8	Number of semaphore IDs

Message Queues

Solaris OE

Table 4-36 Message Queues

Parameter	Type	Required value	Description
msgmax	Setup value	528 or more	Maximum message size
msgmnb	Setup value	4,572 or more(See Note 1)	Maximum number of bytes in the queue
msgmni	Additional value	Add 3(See Note 1)	Number of message queue IDs
msgtql	Additional value	Add 2,040	Number of system message headers

Note 1: In Solaris 7 OE, this parameter is set on the following conditions. Change the value of msgssz if it is necessary.

- msgmnb * msgmni < msgseg * msgssz

Linux

Table 4-37 Message Queues

Parameter	Type	Required value	Description
kernel.msgmax	Setup value	528 or more	Maximum size of messages
kernel.msgmnb	Setup value	4572 or more	Maximum number of bytes in the queue
kernel.msgmni	Additional value	Add 3	Number of message queue IDs

When Only the Resource Manager Operates

The system resources that are required when only the resource manager are shown below

Shared Memory

Solaris OE

Table 4-38 Shared Memory

Parameter	Type	Required value	Description
shmmax	Setup value	5,488,484or more (See Note 1)	Maximum size of shared memory segment
shmmin	Setup value	1 or less	Minimum size of shared memory segment
shmseg	Additional value	Add 20	Number of shared memory segment for each process

Parameter	Type	Required value	Description
shmmni	Additional value	Types of resource management program * 11 added	Number of shared memory IDs

Note 1: The exact value should be calculated using the equations shown below.

There is only one type of resource management program. The respective value can be calculated from the following definition values.

config file of the Database Linkage Service environment definition

RESOURCE_TRANMAX = 5
OTS_TRACE_SIZE = 512
RESOURCE_TRACE_SIZE = 512
RECOVERY_TRACE_SIZE = 512
OBSERVE_TRACE_SIZE = 512

Resource definition file

OTS_RMP_PROC_CONC = 5

Setup information file of the Database Linkage Service environment definition

TRANMAX = 100
PARTICIPATE = 4

A = OTS_TRACE_SIZE * 1024
B = RECOVERY_TRACE_SIZE * 1024
C = OBSERVE_TRACE_SIZE * 1024
D = PARTICIPATE * TRANMAX * 2048
E = TRANMAX * 284

Required amount = A + B + C + D + E + 4399692

Linux

Table 4-39 Shared Memory

Parameter	Type	Required value	Description
kernel.shmmax	Setup value	5,488,484 or more (See Note 1)	Maximum size of shared memory segment
kernel.shmmni	Additional value	Types of resource management program * 11 added	Number of shared memory IDs

Note 1: The exact value should be calculated using the equations shown below.

The respective value can be calculated from the following definition values.

config file of the Database Linkage Service environment definition

RESOURCE_TRANMAX = 5
OTS_TRACE_SIZE = 512
RESOURCE_TRACE_SIZE = 512
RECOVERY_TRACE_SIZE = 512
OBSERVE_TRACE_SIZE = 512

Resource definition file

OTS_RMP_PROC_CONC = 5

Setup information file of the Database Linkage Service environment definition

TRANMAX = 100
PARTICIPATE = 4

A = RESOURCE_TRACE_SIZE * 1024
B = OBSERVE_TRACE_SIZE * 1024
C = (TRANMAX + 1) * 332
D = Types of resource management program * RESOURCE_TRANMAX * OTS_RMP_PROC_CONC * 144
E = Types of resource management program * RESOURCE_TRANMAX * OTS_RMP_PROC_CONC * 332

Required amount = A + B + C + D + E + 4394476

Semaphores

Solaris OE

Table 4-40 Semaphores

Parameter	Type	Required value	Description
semmni	Additional value	Types of resource management program * 7 added	Number of semaphore IDs

Linux

For the semaphore setting value, specify each parameter in the following format.

- In the case of Red Hat

  kernel.sem = para1 para2 para3 para4

Table 4-41 Semaphores

Parameter	Type	Required value	Description
para4	Additional value	Types of resource management program * 7 added	Number of semaphore IDs

When Both the OTS System and the Resource Manager Operates

The system resources that are required when both the OTS system and the resource manager operates are shown below.

Shared Memory

Solaris OE

Table 4-42 Shared Memory

Parameter	Type	Required value	Description
shmmax	Setup value	7,393,040or more (See Note 1)	Maximum size of shared memory segment
shmmin	Setup value	1 or less	Minimum size of shared memory segment
shmseg	Additional value	Add 20	Number of shared memory segment for each process
shmmni	Additional value	Addition of 12 + types of resource management programs ∗ 11	Number of shared memory IDs

Note 1: The exact value should be calculated using the equations shown below.

Required number = Number required when only the OTS system operates + number required when only the resource management program operates - 4915600

Linux

Table 4-43 Shared Memory

Parameter	Type	Required value	Description
kernel.shmmax	Setup value	7,393,040 or more (See Note 1)	Maximum size of shared memory segment
kernel.shmmni	Additional value	Addition of 12 + types of resource management programs ∗ 11	Number of shared memory IDs

Note 1: The exact value should be calculated using the equations shown below.

Required number = Number required when only the OTS system operates + number required when only the resource management program operates - 4915600

Semaphores

Solaris OE

Table 4-44 Semaphores

Parameter	Type	Required value	Description
semmni	Additional value	Addition of 8 + types of resource management programs * 7	Number of semaphore IDs
semmns	Additional value	Add 24	Number of semaphores of the entire system
semmsl	Setup value	12 or more	Maximum number of semaphores for each semaphore ID
semopm	Setup value	3 or more	Maximum number of operations for each semaphore call

Linux

For the semaphore setting value, specify each parameter in the following format.

- In the case of Red Hat
  kernel.sem = para1 para2 para3 para4

Table 4-45 Semaphores

Parameter	Type	Required value	Description
para1	Setup value	12 or more	Maximum number of semaphores for each semaphore ID
para2	Additional value	Add 24	Number of semaphores of the entire system
para3	Setup value	3 or more	Maximum number of operations for each semaphore call
para4	Additional value	Addition of 8 + types of resource management programs * 7	Number of semaphore IDs

Message Queues

Solaris OE

Table 4-46 Message Queues

Parameter	Type	Required value	Description
msgmax	Setup value	528 or more	Maximum message size
msgmnb	Setup value	4,572 or more (See Note 1)	Maximum number of bytes in the queue
msgmni	Additional value	Add 3 (See Note 1)	Number of message queue IDs
msgtql	Additional value	Add 2,040	Number of system message headers

Note 1: In Solaris 7 OE, this parameter is set on the following conditions. Change the value of msgssz if it is necessary.

– msgmnb * msgmni < msgseg * msgssz

Linux

Table 4-47 Message Queues

Parameter	Type	Required value	Description
kernel.msgmax	Setup value	528 or more	Maximum message size
kernel.msgmnb	Setup value	4,572 or more	Maximum number of bytes in the queue
kernel.msgmni	Additional value	Add 3	Number of message queue IDs

System Resources Required by an Event Service System

To run a system using an Event Service, you will need to increase the system resources according to the number of channels, the number of consumers/suppliers to be connected, and so forth. This section describes how to set the system resources (system parameters) required by the Event Service.

Note

The following values are not included in the values of the CORBA Service. Refer to Setting the System Environment for a CORBA Service and add the values as required.

System Parameters

The example below shows typical additions to the kernel parameters for shared memory, semaphores, and message queues used by an ordinary Event Service.

Changing the System Parameters

Solaris OE

System parameter modification method: Modify the parameter by editing /etc/system.

Upon completion of modification, reboot the system.

For details about how to change the system parameters, refer to Solaris OE documents.

Linux

In the case of Red Hat

Modify the parameter value by editing /etc/sysctl.conf. After completing the modification, either execute "sysctl -p /etc/sysctl.conf" or reboot the system.

In the case of Turbolinux

Modify the parameter value by editing /etc/sysconfig/kparam. After completing the modification, either execute "/etc/rc.d/init.d/kparam restart" or reboot the system.

For the modification procedure, refer to the OS documentation.

Shared Memory

Solaris OE

Table 4-48 Shared Memory

Parameter	Number Required (value to add)	Remarks (description)
shmmax	1040 bytes ∗ maximum number of event channel creations (Note 1) + 600 kilobytes	Maximum segment size of shared memory (when global transaction is not used)
	1040 bytes ∗ maximum number of event channel creations (Note 1) + 184 bytes ∗ number of simultaneously executable global transactions (Note 2) + 600 kilobytes	Maximum segment size of shared memory (when global transaction is used)
	17 * 1024 * 1024 + 576*Number of concurrent transactions + 88*(Number of system data storage areas + Number of event data storage areas) + Size of shared memory to be used by unit * 1024 * 1024 bytes (to be added in units of “unit”) (See Note 3)	Maximum segment size of shared memory (when in non-volatile operation)
	Average size of event data (Note 4) x packmsg_cnt keyword value of CHANNEL section specified by service definition of the event channel linkage service of MessageQueueDirector ∗ 23 – 42 * 1024 * 1024 bytes However, if the above value is smaller than 0, the value need not be set	Maximum segment size of shared memory (when the packing transfer function of the event channel linkage service of MessageQueueDirector is used)
shmmni	Value of 100 or more (to be added in units of unit)	Number of identifiers of shared memory (when operating in non-volatile)
shmseg	Value of 50 or more (to be added in units of unit)	Number of shared memory segments that can be attached with a single process (when in non-volatile operation)

Note 1:

Maximum number of event channels created = maximum number of static generation event channels created + maximum number of dynamic generation event channels created.

Note 2:

Number of global transactions that can be executed simultaneously =

The setting value of the **-gtrnmax** option using the configuration information management command (*essetcnf*) of Event Service

Note 3:

Number of concurrent transactions =
Setting value of the unit definition (tranmax) using the unit generation command (*esmkunit*) of Event Service
Number of system data storage areas =
Setting value of the unit definition (sysqnum) using the unit generation command (*esmkunit*) of Event Service
Number of event data storage areas =
Setting value of the unit definition (userqnum) using the unit generation command (*esmkunit*) of Event Service
Size of shared memory to be used by unit =
Setting value of the unit definition (shmmax) using the unit generation command (*esmkunit*) of Event Service (When the size of shared memory to be used by unit is smaller than 42, it is 42.)

Note 4:

[In the case when the average size of event data sent and received within an application is 2 kilobytes or less]

Average size of event data =

((Average size of event data that are send and received within application +1)/512) ∗ 512 bytes

Average size of event data =

2 KB + ((Average size of event data that are send and received within application -2KB) /16KB) ∗16KB

(Numbers after the decimal point are rounded up.)

Linux

Table 4-49 Shared Memory

Parameter (See Note 1)	**Number Required (value to add)**	**Remarks (description)**
Kernel.shmmax /proc/sys/kernel/shmmax	1040 bytes ∗ maximum number of event channel creations (See Note 2) + 600 kilobytes	Maximum segment size of shared memory (when global transaction is not used)
	1040 bytes ∗ maximum number of event channel creations (See Note 2) + 184 bytes x number of simultaneously executable global transactions (See Note 3) + 600 kilobytes	Maximum segment size of shared memory (when global transaction is used)

Parameter (See Note 1)	Number Required (value to add)	Remarks (description)
	17 ∗ 1024 ∗ 1024 + 576 ∗ Number of concurrent transactions + 88 ∗ (Number of system data storage areas + Number of event data storage areas) + Size of shared memory to be used by unit ∗ 1024 ∗ 1024 bytes (to be added in units of “unit”) (See Note 4)	Maximum segment size of shared memory (in non-volatile operation)
Kernel.shmmni /proc/sys/kernel/shmmni	Value of 100 or more (to be added in units of “unit”)	Number of identifiers of shared memory (in non-volatile operation)

Note 1:

The upper row indicates the value for Red Hat and the lower row indicates the value for Turbolinux.

Note 2:

Maximum number of event channels created = maximum number of static generation event channels created + maximum number of dynamic generation event channels created.

Note 3:

Number of global transactions that can be executed simultaneously = -gtrnmax (use the configuration information management command (*essetcnf*) of the Event Service to set -gtrnmax)

Note 4:

Number of concurrent transactions =
Setting value of the unit definition (tranmax) using the unit generation command (*esmkunit*) of Event Service
Number of system data storage areas =
Setting value of the unit definition (sysqnum) using the unit generation command (*esmkunit*) of Event Service
Number of event data storage areas =
Setting value of the unit definition (userqnum) using the unit generation command (*esmkunit*) of Event Service
Size of shared memory to be used by unit =
Setting value of the unit definition (shmmax) using the unit generation command (*esmkunit*) of Event Service (When the size of shared memory to be used by unit is smaller than 42, it is 42.)

Semaphores

Solaris OE

Table 4-50 Semaphores

Parameter	Number Required (value to add)	Remarks (description)
semmax	3 or more (4 or more in non-volatile operation)	Total number of semaphores in system

Linux

For the semaphore setting value, specify each parameter in the following format.

In the case of Red Hat

kernel.sem = para1 para2 para3 para4

In the case of Turbolinux

/proc/sys/kernel/sem = para1 para2 para3 para4

Table 4-51 Semaphores

Parameter	Number Required (value to add)	Remarks (description)
Para1	No value	Maximum number of semaphores for each semaphore identifier
Para2	6 or more	Total number of semaphores in system (in volatile operation)
Para2	Unit number * 28 + 13 or more	Total number of semaphores in system (in non-volatile operation)
Para3	No value	Maximum number of operators for each semaphore call
Para4	No value	Maximum number of semaphores for each semaphore identifier

Message Queues

Solaris OE

Table 4-52 Message Queues

Parameter	Required value	Description
msgmax	2,048 or more	Maximum message size memory (in non-volatile operation)
msgmnb	4,096 or more (See Note 1)	Maximum number of bytes in the queue memory (in non-volatile operation)
msgmni	Unit number * 3 (See Note 1)	Number of message queue IDs memory (in non-volatile operation)
msgtql	Unit number * 3	Number of headers of system message memory (in non-volatile operation)

Note 1: In Solaris 7 OE, this parameter is set on the following conditions. Change the value of msgssz if it is necessary.

- msgmnb * msgmni < msgseg * msgssz

Linux

Table 4-53 Message Queues

Parameter (See Note 1)	Required value	Description
kernel.msgmax /proc/sys/kernel/msgmax	2,048 or more	Maximum message size (in non-volatile operation)
kernel.msgmnb /proc/sys/kernel/msgmnb	4,096 or more	Maximum number of bytes in the queue (in non-volatile operation)
kernel.msgmni /proc/sys/kernel/msgmni	Unit number * 3	Number of message queue Ids (in non-volatile operation)

Note1: The upper row indicates the value for Red Hat and the lower row indicates the value for Turbolinux.

System Resources of the EJB Service

In the EJB Service, the system resources should be expanded when the following functions are used. The system resources (system parameter) that the EJB Service requires are described below.

System Parameters

When the EJB Service is used, tune the following system parameters.

Changing the System Parameters

Linux

In the case of Red Hat

Modify the parameter value by editing /etc/sysctl.conf. Upon completion of modification, either execute "sysctl -p /etc/sysctl.conf" or reboot the system.

For the modification procedure, refer to the OS documentation.

In the case of Turbolinux

Modify the parameter value by editing /etc/sysconfig/kparam. Upon completion of modification, either execute "/etc/rc.d/init.d/kparam restart" or reboot the system.

For the modification procedure, refer to the OS documentation.

Message Queues

Solaris OE

Table 4-54 Message Queues

Parameter	Required amount	Remarks (description)
msgmax	4,096 or more	Maximum size of message
msgmnb	4,096 or more (See Note 1)	Maximum value of message that a single message queue can hold.
msgmni	Present value + 2 or more (See Note 1)	Maximum value of message queue ID
msgtql	Present value + 512 or more (Value of 1024 or more is recommended)	Maximum number of messages that can be created

Note 1: In Solaris 7 OE, this parameter is set on the following conditions. Change the value of msgssz if it is necessary.

- msgmnb * msgmni < msgseg * msgssz

Linux

Table 4-55 Message Queues

Parameter (See Note 1)	Required amount	Remarks (description)
kernel.msgmax /proc/sys/kernel/msgmax	4096 or more	Maximum message size
kernel.msgmnb /proc/sys/kernel/msgmnb	4096 or more	Maximum number of bytes in the queue
kernel.msgmni /proc/sys/kernel/msgmni	Present value + 2 or more	Maximum value of message queue ID

Note 1: The upper row indicates the value for Red Hat and the lower row indicates the value for Turbolinux.

System Resources of MessageQueueDirector

Solaris OE

When the system that uses MessageQueueDirector is in operation, the system resources must be expanded depending on the number of MQD systems and on the types of MQD host services. The system resources (system parameters) that MessageQueueDirector requires are described below.

System Parameters

This part describes tuning of the system parameters that MessageQueueDirector uses.

Changing the System Parameters

System parameter modification method: Modify the parameter by editing /etc/system. Upon completion of modification, reboot the system.

For details about how to change the system parameters, refer to the Solaris OE documents.

Shared Memory

Table 4-56 Shared Memory

Parameter	Required amount (value to be added/setup value)	Remarks (description)
shmmax	MessageBufferMaxSize (Note 1) ∗ 1000000 or more (setting value)	Maximum segment size of shared memory
shmmin	1 (setup value)	Minimum segment size of shared memory
shmseg	50 ∗ number of MQD systems (value to be added)	Number of shared memory segments that can be attached with a single process
shmmni	100 ∗ number of MQD systems (value to be added)	Number of identifiers of shared memory

Note 1: MessageBufferMaxSize: Specify at MQDConfiguration section of MQD environment definition.

Message Queues

Table 4-57 Message Queues

Parameter	Required amount (value to be added/setup value)	Remarks (description)
msgmax	2,048 or more (setting value)	Maximum size of message
msgmnb	4,096 or more (setting value) (See Note 1)	Maximum value of message that a single message queue can hold.
msgmni	3 ∗ number of MQD systems (value to be added) (See Note 1)	Maximum value of message queue ID

Note 1: In Solaris 7 OE, this parameter is set on the following conditions. Change the value of msgssz if it is necessary.

- msgmnb * msgmni < msgseg * msgssz

Number of File Descriptors

When the SMTP linkage service is used in MessageQueueDirector, the parameters that are set using the *ulimit* command for the shell starting up MQD must be modified.

Table 4-58 File Descriptors

Parameter	Description
descriptors	20 + (number of definitions of send queue number ∗ 2)

System Resources of ebXML Message Service

Solaris OE

The system resources (system parameters) required by the ebXML Message Service are described below.

System Parameters

This section describes tuning the system parameters used by the ebXML Message Service.

Changing the System Parameters

System parameter modification method: Modify the parameter by editing /etc/system.

After completing the modification, reboot the system.

For details about how to change the system parameters, refer to Solaris OE documents.

Shared Memory

Table 4-59 Shared Memory

Parameter	Required amount (value to be added/setup value)	Remarks (description)
shmmax	20000000 or more (setting value)	Maximum segment size of shared memory
shmmin	1 (setup value)	Minimum segment size of shared memory
shmseg	50 (value to be added)	Number of shared memory segments that can be attached with a single process
shmmni	100 (value to be added)	Number of identifiers of shared memory

Message Queues

Table 4-60 Message Queues

Parameter	Required amount (value to be added/setup value)	Remarks (description)
msgmax	2,048 or more (setting value)	Maximum size of message
msgmnb	4,096 or more (setting value) (See Note 1)	Maximum number of messages that a single message queue can hold.
msgmni	3 (value to be added) (See Note 1)	Maximum number of message queue IDs

Note 1: In Solaris 7 OE, this parameter is set on the following conditions. Change the value of msgssz if it is necessary.

- msgmnb * msgmni < msgseg * msgssz

Environment Setup for Performance Monitoring Tool

Windows

This section describes how to estimate the shared memory used by the performance monitoring tool as the performance monitoring environment.

Solaris OE Linux

This section describes how to estimate the resources used by the performance monitoring tool as the performance monitoring environment.

Estimating Shared Memory

Use the following reference estimation formula for determining the amount of shared memory. Round off the value obtained to the nearest megabyte.

Memory Estimation (Bytes)

1. For all objects that are to be monitored by the performance monitoring tool, find the amount of common memory required for each object.
   - Determine the total process concurrency defined for each application.
   - Find the average number of operations registered in each application. (Find the number of operations from the IDL definition file. Discard decimals in the averages.)
   - Depending on the average number of operations, find the amount of common memory required for each object in the following way:

     If the average number of operations is 3 or less

     Common memory required for each object = (Total process concurrency ∗ 1536) + 400

     If the average number of operations is greater than 3

     Common memory required for each object = (Average number of operations ∗ Total process concurrency ∗ 546) + 400
2. Find the amount of shared memory required in the following way:

   Amount of shared memory required = Total amount of shared memory required for WorkUnits + 261188
3. Find the amount of shared memory in the following way:

   Amount of shared memory = Amount of shared memory required / 1048576

Round up any decimals in this calculation.

Estimating System Configuration Information

Solaris OE Linux

This section describes how to estimate system configuration information. Set values that are equal to or greater than the estimated values. Table 4-64 shows the system configuration values.

Solaris OE

Table 4-61 System Configuration Values

System Configuration Information	Estimation
Semsys: Seminfo_semmnu	semsys:seminfo_semmnu >= Existing value + Semaphore quantity Semaphore quantity Share memory capacity specified when performance monitoring tool started (MB) * 10 + 2 Maximum is 52

Linux

- In the case of Red Hat
  kernel.sem = para1 para2 para3 para4
- In the case of Turbolinux
  /proc/sys/kernel/sem = para1 para2 para3 para4

Table 4-62 System Configuration Values

System Configuration Information	Estimation
para2	para2>= Existing value + Semaphore quantity Semaphore quantity Share memory capacity specified when performance monitoring tool started (MB) * 10 + 2 Maximum is 52

Tuning TCP/IP Parameters

Tune the TCP/IP parameters as follows.

Windows

Using the registry editor, add the following registry information and then restart the system.

- Registry key
  HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters
  - Name : TcpTimedWaitDelay
  - Type : REG_DWORD
  - Recommended value: 1E(30 seconds)
- Registry key
  HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters
  - Name : MaxUserPort
  - Type : REG_DWORD
  - Recommended value: 65534(decimal)

Note

Create registry information if it does not exist.

To turn the TCP/IP parameters, change the values of the above two registry keys.

Solaris OE

Use the ndd command to change tcp_time_wait_interval to 30 seconds.

When confirming a setup permanently, registration is required for RC procedure (/etc/rc2.d).

An example of RC procedure is shown below.

```
#!/bin/sh
ndd -set /dev/tcp tcp_time_wait_interval 30000
```

Other Customization Items

Solaris OE Linux

The other required customization items are described below.

Customizing the IPC Key Value of the System V IPC Resource

Interstage uses the System V IPC resources (message queue, semaphore and shared memory) that the OS provides for communication between the processes constituting Interstage. These IPC resources can be uniquely identified within the system by the value (IPC key value) specified during resource creation.

The IPC key value must be unique in a system, but can be duplicated with the products and application programs using other IPC resource because arbitrary value can be used.

If duplication of the IPC key value occurs, Interstage issues the following message to notify duplication of the IPC key value.

Example of message that is output from the Component Transaction Service when duplication of IPC key values is detected.

TD: ERROR: td11038: Could not get IPC resource due to duplicated key(key=%x path=%s)

In such a case, various functions of the Interstage service that uses the IPC resource corresponding to the IPC key value cannot be used.

The IPC key value that Interstage uses can be customized in order to prevent occurrence of this problem. This measure can be used when the message notifying duplication of IPC key value is output.

Overview

The IPC key value consists of 4 bytes (32 bits). Duplication with the IPC key values used in other products can be prevented by defining an arbitrary value in the lower 12 bits (3 digits in hexadecimal notation). The remaining upper 20 bits are determined by Interstage.

Method of Defining the IPC Key Value

Create a new IPC key value definition file as shown below to specify the lower 12 bits of the IPC key value using a 3-digit hexadecimal number.

Solaris OE

For services except for MessageQueueDirector, the specification in the common definition file is effective.

For MessageQueueDirector, the specification in the unique definition file is valid.

Common definition file

/var/opt/FJSVisas/system/system name/FJSVisas/etc/ipc_key

Definition file of the MQD system

/opt/FJSVmqd/mqd/MQD system name/ipc_key

Definition file of the MQD operation tool

/opt/FJSVmqd/gui/def/ipc_key

Linux

Common definition file

/var/opt/FJSVisas/system/default/FJSVisas/etc/ipc_key

Note

- If the contents of the definition file is other than a 3-digit hexadecimal number, the same operation as when no IPC key value is specified is performed.

Solaris OE

- "System name" is the system name of the multi system function. If the multi system function is not used, "default" is set. For "MQD system name", refer to the MessageQueueDirector Handbook.
- When a cluster system is used, create a definition file (ipc_key) in the directory that is specified by the mqd environment definition file as the definition file of the MQD system.

  [Cluster]

  SystemDirectory = Name of directory that the MQD cluster service uses.

Example

```
FFF
```

In the case of this definition example, the IPC key value will have the following value in hexadecimal notation when the upper 20 bits that Interstage uses is 0x01280.

```
0x01280FFF
```

Note

- When defining the IPC key value, stop Interstage using the all forced stop mode beforehand. Do not modify this definition while Interstage is operating.

Solaris OE

- Define the IPC key value so that it is not duplicated among the systems.

Chapter 5

Tuning the Database Linkage Service (Windows(R))

This chapter contains setup information for the ini file of the Database Linkage Service.

ini File Setup Information of Database Linkage Service

The parameter which is shown in Table 5-1 is set up in the ini file of the Database Linkage Service. The parameter which it had a * mark in the parameter inside the table about can be tuned up. (As for the parameter except for that, employ it fundamentally by the initial value.)

An ini file is changed when system tuning is done and a Database Linkage Service is used. When ini file isn't changed, a Database Linkage Service works by the initial value.

An ini file is made in database-linkage-service-installation-folder\ etc of the Interstage installation folder follower at the time of the installation. A file name is ots.ini.

Table 5-1 Database Linkage Service ini File Parameters

Parameter type	Parameter	Initial value	Minimum value	Maximum value	Explanation
Shared memory	shmmni	100	25	16777215	Number of shared memory identifier
	shmseg	100	25	16777215	Number of segments of each processes
	shmaddr	1711276032	-	-	Shared memory mapping address (Note 1)
Semaphore	semmni *	100	25	16777215	Number of semaphore id (Note 2)
	semmsl *	25	25	16777215	Number of maximum semaphore of each id (Note 2)
	semvmx	32768	32768	16777215	Value of maximum semaphore
Message queue	msgmap	50	25	16777215	Number of entries in message map
	msgmax	4096	4096	16777215	Maximum size of message
	msgmni	10	10	16777215	Number of id of message queues
	msgssz	8	8	255	Message segment size
	msgtql	20	20	16777215	Number of headers of each message message queues
	msgseg	2048	2048	16777215	Number of message segment

Parameter type	Parameter	Initial value	Minimum value	Maximum value	Explanation
Windows NT® Windows® 2000 peculiarity parameter	msgemuwait *	64	64	16777215	Number of message queue wait process (Note 2)
	insmax	32768	32768	16777215	Length of the communication message between internal processes
	msgwait *	64	64	16777215	Number of communication meeting between internal processes (Note 2)
	execmax *	64	64	16777215	Number of maximum processes (Note 2)
	prntmax *	64	10	16777215	Maximum number of parent processes (Note 2)
	ftokmax *	64	64	16777215	Maximum number of file (Note 2)
	interval	1	1	16777215	Interval when end of process is observed (second)
	inthndl	10	1	16777215	Resources watch interval time (second)
	mutexmax	300	150	16777215	The number of maximum mutex

Note 1: Specify the starting address for the shared memory used by the database linkage service. This is normally unchanged, but may require tuning if it duplicates addresses used by other products.

Note 2: Refer to following Semaphore Resource and Windows NT®/Windows® 2000 Peculiarity Parameter in case of the tuning.

Example ini File

An example ini file is shown below:

```
[shminfo]
#       shared memory id count
shmmni=100
#       segment count of process
shmseg=100
#       shared memory to allocation address
shmaddr=1711276032
[seminfo]
#       semaphore id count
semmni=100
#       semaphore count of id
semmsl=25
#       maximum semaphore
semvmx=32768
[msginfo]
#       entry count in message map
msgmap=50
#       maximum message size
msgmax=4096
#       message queue count(id count)
msgmni=10
#       message segment size
msgssz=8
#       header count of system message
msgtql=20
#       message segment count
msgseg=2048
#       message queue WAIT process count
msgemuwait=64
[insinfo]
#       length of interprocess communication
insmax=32768
#       wait count of interprocess communication
msgwait=64
#       maximum process count
execmax=64
#       maximum parent process count
prntmax=64
#       maximum count of ftok file name
ftokmax=64
#       process finish observation space time
interval=1
#       space time
inthndl=10
#       mutex count
mutexmax=300
```

A line beginning with # becomes a comment.

Only a half-corner number can be used for the setup value.

Semaphore Resource

Semaphore resources are used due to a synchronous control, exclusion control. Semaphore resources can be computed with the computed-type shown in Table 5-2.

Table 5-2 Semaphore Resource Computed Type

Use Semaphore Resource	Use Quantity Estimate Form
semmni (The party of semaphore)	When a Database Linkage Service is used, the following value is increased to semmni. Value to add = 5 + x x: Only the following number is used when a resource control program is started. The kind of a resource control program to start * 4
semmsl (The number of maximums of semaphore of around the party)	More than 25 is specified when a Database Linkage Service is used.

Windows NT®/Windows® 2000 Peculiarity Parameter

Windows NT®/Windows ® 2000 peculiarity parameter is calculated with the following computed type listed in Table 5-3.

Table 5-3 Windows NT®/Windows® 2000 Peculiarity Parameter Computed Type

Windows NT® Peculiarity Parameter	Computed-Type
msgemuwait (The number of message queue wait processes)	Initial value : 64 10 + a a : Maximum concurrency of the resource control program
msgwait (Between the internal process, the number of communication waiting)	Initial value : 64 10 + a + b a : Total of concurrency of the resource control program b : Total of concurrency of the WorkUnit (total of server application)
execmax (The number of maximum processes)	Initial value : 64 10 + a + b a : Total of concurrency of the resource control program b : Total of concurrency of the WorkUnit (total of server application)

Windows NT® Peculiarity Parameter	Computed-Type
prntmax (The number of maximum parents processes)	Initial value : 64 10 + a + b a : Total of concurrency of the resource control program b : Total of concurrency of the WorkUnit (total of server application)
ftokmax (The number of maximum files)	Initial value : 64 25 + a a : Total of resource definition file

Shared Memory Mapping Address

Specify the starting address of the shared memory used by the database linkage service in the *shmaddr* parameter. The initial value is decimal 1711276032 (hex 0x66000000). Specify this parameter in decimal. The address of the shared memory that can be specified is the range of the area for the applications shown in Figure 5-1.

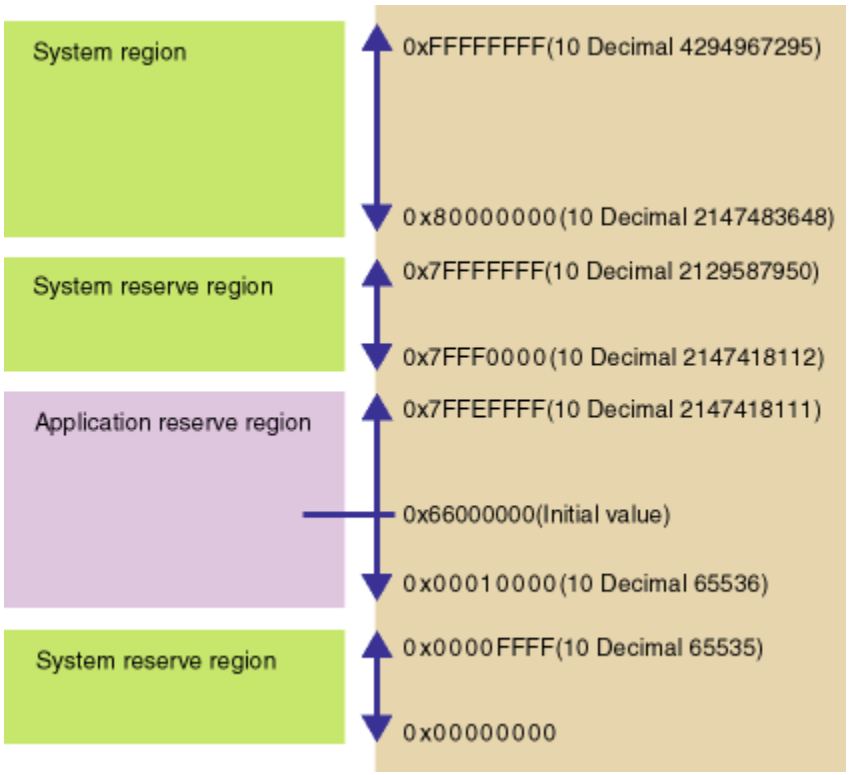


Figure 5-1 Allocation of Process Space for Windows NT®/Windows® 2000

Appendix A

CORBA Service Environment Definition

This appendix describes the CORBA Service operating environment.

Each file is stored as follows:

Storage directory

Windows

(Default installation path)

```
C:\INTERSTAGE\ODWIN\etc
```

Solaris OE

(Default installation path. The directory specified as the operating environment file (fixed configuration install directory).)

```
/etc/opt/FSUNod
```

Linux

```
/opt/FJSVod/etc
```

Files (Provided with the Enterprise Edition, Standard Edition, and Plus products.)

config
gwconfig
inithost/initial_hosts
queue_policy
nsconfig
irconfig

Files (Provided with the Web-J Edition product.)

config
inithost/initial_hosts

Note:

Files other than the above-mentioned files cannot be customized as the CORBA Service environment definition. Do not edit files other than those listed above using an editor or similar.

Notes

The Environment definition comes into context when there is an abnormal termination of the CORBA Service. The CORBA Service may not start normally if a resource such as a movement environment file is destroyed.

When resources are destroyed, there is a possibility that the CORBA Service will not start normally or that one of the following messages is displayed:
Message numbers: od10400, od10402, od10404, od10406, od10504, od10509, od10510

To restore the destroyed resources, restart the CORBA Service.

After an emergency reconstruction of the application environment, it is advisable to backup the resources.

For the procedure of creating a backup copy, see Maintenance (Backup of resources) in the Operator’s Guide. For the Web-J Edition, see "Resource Backup" in the Web-J Edition.

config

Overview

The *config* file contains definitions relating to CORBA Service operating environments.

File Name

Windows

(Default installation path)

```
C:\INTERSTAGE\ODWIN\etc\config
```

Solaris OE

(Default installation path)

```
/etc/opt/FSUNod/config
(Windows® Client: C:\INTERSTAGE\ODWIN\etc\config)
```

Linux

```
/etc/opt/FJSVod/config
(Windows® Client: C:\INTERSTAGE\ODWIN\etc\config)
```

File Contents

Format

In the *config* file, values are specified in the following format.

Parameter name = value set

Parameters

Parameter values can be modified for the following operating environments:

- Operating environment relating to host information
- Operating environment relating to network environment
- Operating environment of application resources
- Operating environment of timeout monitoring
- Operating environment of security function
- Operating environment of maintenance function

Windows Solaris OE

- Operating Environment regarding the Compatibility of Previous Versions.

Notes

- The CORBA Services use one connection for each machine on which the server application is running.
- The parameters for which values can be changed are shown in Table A-1.

Table A-1 Operating Environment Relating to Host Information

Parameter	Initial value Maximum value	Meaning	Remarks
IIOP_hostname	- -	If more than one IP address (or host name) has been set for the machine, specify this parameter when you operate the CORBA server application using the limited IP address. If you specify an IP address (or host name), the specified IP address is incorporated when the server application object reference is generated. The IP address is used at connection from clients.	Valid only for servers function. This cannot be specified for Web-J Edition. (See Note 1)
IIOP_port	8002 -	Port number used by CORBA Service. Always specify this parameter when specifying a value other than the default (8002).	Solaris OE Linux (See Note 2)

Note 1

Connection requests can be received from only a particular LAN card on a machine on which more than one LAN card is mounted.

If a host name is specified, name solution is performed according to the IP-version value.

If IP-version is v4-dual, name solution under IPv4 is given priority.

If IP-version is v6, name solution under IPv6 is given priority.

If a link local or site local IPv6 address is specified in a Windows version, scope-id must also be specified.

Example: fe80::1234:5678:9abc:def0%4

Note 2

In Solaris OE and Linux systems, if this value becomes invalid, the value set in /etc/services becomes valid.

Table A-2 Operating Environment Relating to Network Environment

Parameter	Initial value Maximum value	Meaning	Remarks
client_bind	default -	When IP address binding (specifying the IP address of your own host in the socket communication) is executed between the client/server data communication, specify the IP address. If "default" is specified, communication with the default IP address decided by the OS is performed. If an IP address other than the one for your own host is specified, communication is performed with the "default" being assumed to be specified. If an IP address for the local loop back (127.0.0.1) is specified, connection with a remote host becomes unavailable. Specify this parameter when the client side IP address needs to be fixed because more than one IP address is allocated because of a dual network (LAN and network card). When IIOP_hostname is set, the value set in client_bind is ignored in the connection to the local host and communications is performed with the IP address specified in IIOP_hostname.	Set on the client side.
con_accept	all -	Specify "localhost" for this parameter when receiving client connections is limited to your own host. With this specification, only the connections from your own host are received. If, however, "all" is specified, connections from all machines are received. Specify "localhost" when you do not want to permit connection requests from other hosts for system security reasons.	Valid only for server function. When the Web-J Edition is used, do not change the default value.
IP-version	v4-dual	Set the IP version to be operated: v4: Only IPv4 is used to run CORBA applications (IPv6 is not used.) v4-dual: IPv4 and IPv6 are used to run	Solaris OE

Parameter	Initial value Maximum value	Meaning	Remarks
	-	CORBA applications. When the CORBA service operates as a server, both IPv4 and IPv6 are accepted. When the CORBA service operates as a client, IPv4 is used preferentially. v6: IPv4 and IPv6 are used to run CORBA applications. When the CORBA service operates as a server, both IPv4 and IPv6 are accepted. When the CORBA service operates as a client, IPv6 is used preferentially.	
read_interval_timeout	30 100000000	Read response time for socket. If read cannot be completed during the read response time, a system exception (COMM_FAILURE) is reported to applications. The value represents the actual time (in seconds). If 0 is specified, time monitoring is not performed. Monitoring based on this parameter begins when message receive processing begins. For instance, if no packet is received in reply message wait state, monitoring based on this parameter is not performed. Instead, monitoring based on period_receive_timeout is performed. If at least one package is received, monitoring based on read_interval_timeout is performed because receive processing begins.	
write_interval_timeout	30 100000000	Write response time for socket. If write cannot be completed during the read response time, a system exception (COMM_FAILURE) is reported to applications. The value represents the actual time (in seconds). If 0 is specified, time monitoring is not performed. Monitoring based on this parameter begins when message transmission processing begins.	

Table A-3 Operating Environment of Application Resources (such as Process/Thread Concurrency, Number of Used Connections)

The values that can actually be specified for these parameters are restricted by OS resources.

Parameter	Initial value Maximum value	Meaning	Remarks
max_exec_instance	512 1000000	Maximum number of threads (or processes) used for server application request execution.	Valid only for server functions. When the Web-J Edition is used, do not change the default value. (See Notes 1 and 2)
max_IIOP_local_init_con	256 1000000	Maximum number of connections to the server host that are used by a client application.	(Refer to Notes)
max_IIOP_local_init_requests	4096 1000000	Maximum number of requests that a client application can send simultaneously.	
max_IIOP_resp_con	8 (See Note 5) 500000	Maximum number of connections that can be set up with a client application.	Valid only for servers function. When the Web-J Edition is used, do not change the default value. (See Cautions) (See Note 2)
limit_of_max_IIOP_resp_con	0 1000000	Maximum number to which max_IIOP_resp_con can automatically be increased. If 0 is specified, the following value is used: max_IIOP_resp_con x 1.3 (decimal portion is discarded)	Valid only for the server function. Cannot be specified under Web-J Edition (See Note 2 and 4)
max_IIOP_resp_con_ex	0	Number of connections that can	Valid only for

Parameter	Initial value Maximum value	Meaning	Remarks
tend_number	1000000	automatically be increased from max_IIOP_resp_con. If 0 is specified, the following value is used: (limit_of_max_IIOP_resp_con - max_IIOP_resp_con) / max_IIOP_resp_con (decimal portion is rounded up)	the server function. Cannot be specified under Web-J Edition (See Note 4 and 5)
max_IIOP_resp_requests	0 500000	Maximum number of requests that the server host can receive simultaneously.	Valid only for the server function. (See Note 2)
limit_of_max_IIOP_resp_requests	0 1000000	Maximum number to which max_IIOP_resp_requests can automatically be increased. If 0 is specified, the following value is used: max_IIOP_resp_requests x 1.3 (decimal portion is discarded)	Valid only for the server function. Cannot be specified under Web-J Edition (See Note 2 and 4)
max_IIOP_resp_requests_extend_number	0 1000000	Number of requests that can automatically be increased from max_IIOP_resp_requests. If 0 is specified, the following value is used: (limit_of_max_IIOP_resp_requests - max_IIOP_resp_requests) / max_IIOP_resp_requests (decimal portion is rounded up)	Valid only for the server function. Cannot be specified under Web-J Edition (See Note 4 and 5)
max_processes	20 2147483467 (Maximum value for long type)	Maximum number of processes (number of clients + servers started)	Valid only for server functions. (See Notes 2 and 6).
max_impl_rep_entries	512 -	Maximum number of registrations in the Implementation Repository.	Valid only for servers function. When the Web-J Edition is used, do not change the default value.

Parameter	Initial value Maximum value	Meaning	Remarks
number_of_common_buffer	0 500000	The buffer queue limit for the CORBA Service is specified. It is used in the CORBA Service communication, excluding the CORBA application in which "Buffer Number: the number of communication buffers" is specified in the WorkUnit definition in the CORBA application, which is operated as a WorkUnit. Specify the maximum number of requests processed at the same time on the server machine. If 0 is specified, the following values are set: max_IIOP_resp_requests * 0.2	Valid only for servers function. This cannot be specified for the Web-J Edition. (See Note 2)
limit_of_number_of_common_buffer	0 1000000	Maximum number to which number_of_common_buffer can automatically be increased. If 0 is specified, the following value is used: limit_of_max_IIOP_resp_requests	Valid only for the server function. Cannot be specified under Web-J Edition (See Note 2 and 4)
number_of_common_buffer_extend_number	0 1000000	Number of buffers that can automatically be increased from number_of_common_buffer. If 0 is specified, the following value is used: (limit_of_number_of_common_buffer - number_of_common_buffer) / number_of_common_buffer (decimal portion is rounded up)	Valid only for the server function. Cannot be specified under Web-J Edition (See Note 4 and 5)

Note 1

To estimate what value to set, calculate:

Number of registered applications (*1) * maximum number of concurrent threads (*2) + 64 + Number of connected clients (*3)

*1) Number of applications registered with the OD_impl_inst command

*2) thr_conc_maximum value set in *OD_impl_inst* command

*3) Number of connected clients corresponding to scale-value of *isgendef* command.

Note 2

With the server function, the parameter setting and the consumption amount can be checked using the *odprtcurparam* command.

Note 3

This also includes the CORBA Services (CORBA Service, Naming Service, Interface Repository server and Interface Repository cache server).

Note 4

Automatic Expansion

The CORBA service supports two types of parameters for automatic expansion: limit_of_parameter-name and parameter-name_extend_number. For instance, limit_of_max_IIOP_resp_con and max_IIOP_resp_con_extend_number are available as the expansion parameters for the max_IIOP_resp_con parameter.

Each type of element is defined by parameter_name for the initial value and limit_of_parameter-name for the maximum value, and can be expanded in divisions of parameter-name_extend_number as needed.

An example is shown below:

Example:

```
max_IIOP_resp_con = 100
limit_of_max_IIOP_resp_con = 140
max_IIOP_resp_con_extend_number = 2
```

With the above parameters specified, max_IIOP_resp_con can be increased up to twice to 120 and 140 from the initial value of 100.

If MANUAL is specified for definition item AutoConfigurationMode in the isconfig.xml file, the parameters related to automatic expansion are ignored and no elements are increased. For details on isconfig.xml, refer to the "Interstage Application Server Operations Guide."

Note 5

The size that can be increased in single expansion processing is restricted by the initial size.

If expansion is set in such a way that the single expansion size exceeds the initial size, the expansion count is corrected to the same value assumed when 0 is specified.

If the expansion count exceeds the difference between the initial value and the maximum value for automatic expansion, the expansion count is corrected to the difference between initial value and the maximum value for automatic expansion.

Example

```
max_IIOP_resp_con = 100
limit_of_max_IIOP_resp_con = 300
max_IIOP_resp_con_extend_number = 1
```

With the above parameters specified, max_IIOP_resp_con_extend_number is corrected to 2.

Cautions

For *max_IIOP_local_init_con*, specify the maximum number of connections to the server host that are used by each application.

The values *max_IIOP_resp_con* specify the number of connections between applications used on the hosts.

As a general rule, connections between applications are generated in units of client application processes. For example, even if several requests are issued concurrently from client applications to a single server application, the number of connections will be one.

Since one connection is used for each when executing the commands and when operating the Interface Repository, increase the number of connections when necessary. When starting more than one command at a time, add the number of the commands to specify the value.

Figure A-1 shows the counting of connections between applications used on hosts.

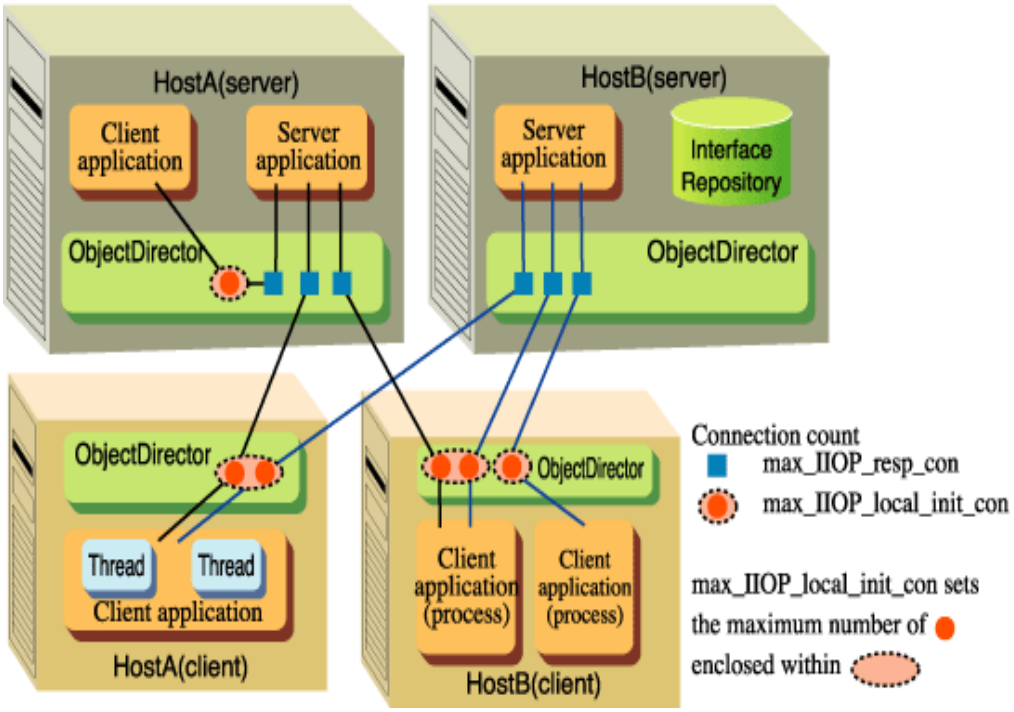


Figure A-1 max_IIOP_resp_con/max_IIOP_init_con Connection Count

The following paragraphs explain how to count the number of connections for each parameter.

max_IIOP_local_init_con

Specify the maximum number of connections to the server application (host unit) from the client application (process unit) on a host in which a client application runs.

Formula for estimating the *max_IIOP_local_init_con* value (when an Interface Repository is going to be run):

> max_IIOP_local_init_con = 256 or ["maximum number of server hosts to which one client application is connected" + 2], whichever is greater

max_IIOP_resp_con

Specify a value calculated by adding up the total number of client application processes connecting on hosts where server applications are running. This number of connections will also need to be added in cases where the client application and the server application are connecting on the same host.

Formula for estimating the *max_IIOP_resp_con* value (when an Interface Repository is going to be run):

> max_IIOP_resp_con = number of client application processes connecting + 2

About max_IIOP_local_init_requests and max_IIOP_resp_requests

> For the CORBA service, max_IIOP_local_init_requests must be set according to the number of requests that a client application sends simultaneously. Similarly, *max_IIOP_resp_requests* must be set according to the number of requests that a server application receives simultaneously.

max_IIOP_local_init_requests

Specify the maximum number of requests that that a client application can send simultaneously. In the following example, client application 1 sends five requests simultaneously and application 2 sends one request simultaneously. Thus, *max_IIOP_local_init_requests* must be set to 5 or a greater value.

If the calculated value is 4,096 or less, the default value of 4,096 can be used as is. In this example, the calculated value is less than 4,096 and therefore *max_IIOP_local_init_requests* need not be changed from default 4,096.

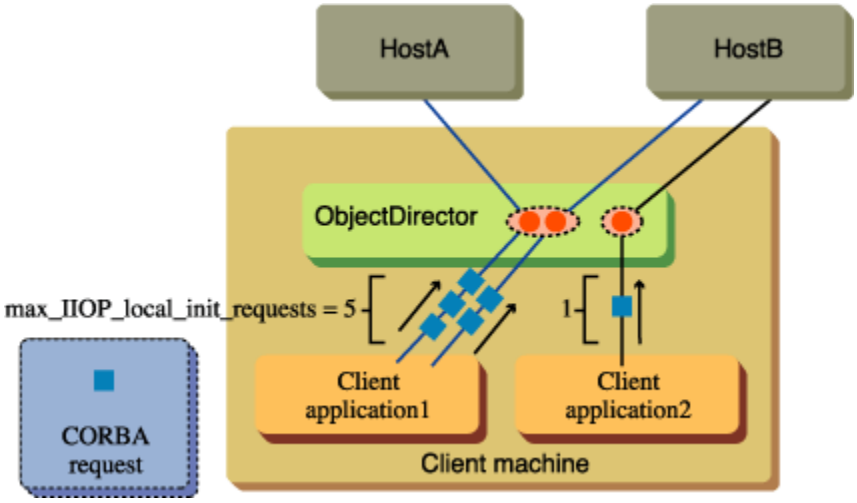


Figure A-2 max_IIOP_local_init_requests

max_IIOP_resp_requests

Specify the maximum number of requests that the CORBA server application can receive simultaneously.

This value is the number of requests that are processed simultaneously by the CORBA server application after the requests issued from individual client machines reach the server machine. Thus, the total number of requests issued simultaneously from individual client machines must be estimated.

In the following example, a total of nine requests issued from individual client machines reach the server machine. *max_IIOP_resp_requests* must be set to 9 or more.

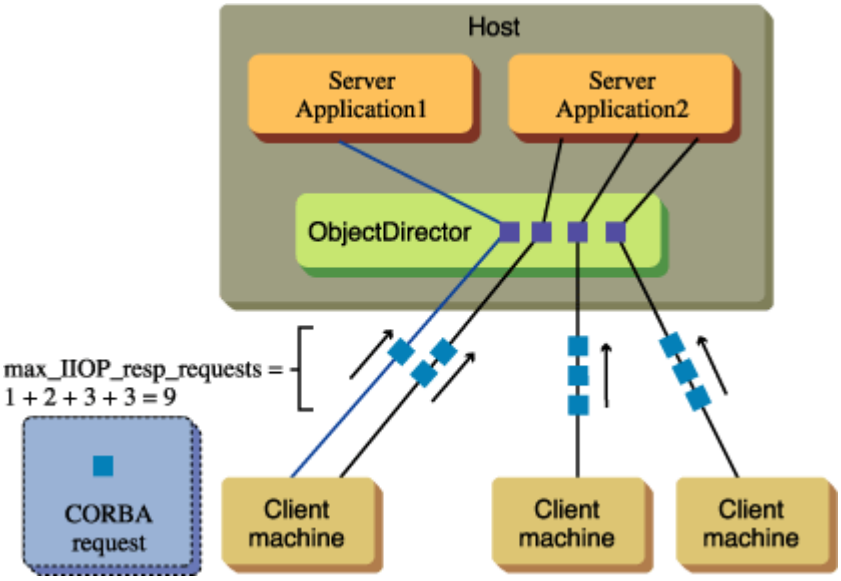


Figure A-3 max_IIOP_resp_requests

Table A-4 Operating Environment of Timeout Monitoring

Parameter	Initial value Maximum value	Meaning	Remarks
period_client_ idle_con_timeout	0 20000000	The monitoring time (connection maintenance time after request reply is completed) in client no communication status (no request to server is transmitted). When the next request is transmitted, the connection with the server is cut and reconnected when there is no request transmission to the server, even if this time is exceeded. This value multiplied by 5 becomes the actual value (in seconds). If this value is set to zero, no timeouts will occur.	
period_idle_con_ timeout	120 (600 sec) 20000000	The monitoring time (connection maintenance time after request reply is completed) of no communication status (no request from client is transmitted) in the server. The connection with the client is cut when there is no request transmission from the client even if this time is exceeded, and the memory resource used to process the request is released. This value multiplied by 5 becomes the actual value (in seconds). If this value is set to zero, no timeouts will occur.	Valid only for server functions. Cannot be specified under Web-J Edition
period_receive_ timeout	72 (360 sec) 20000000	The response time between the time of request and the time of response in the client. The client is notified of the timeout when there is no reply from the server even if this time is exceeded. This value multiplied by 5 becomes the actual value (in seconds).	
period_server_ timeout	120 (600 sec) (See Note 1)	This parameter works differently between server applications other than the	Valid only for server functions.

Parameter	Initial value Maximum value	Meaning	Remarks
	20000000	Persistent type and other application types. For server applications other than the Persistent type, the parameter specifies the monitoring time from the start of an application to the completion of the CORBA_ORB_init method. If the CORBA_ORB_init method is not completed within this time, a system exception (NO_IMPLEMENT) is posted to the client. For client applications and server applications of the Persistent type, the parameter specifies the monitoring time from the issuance of a CORBA_ORB_init method to its completion. This value multiplied by 5 becomes the actual value (in seconds).	Cannot be specified under Web-J Edition

Note 1

The Interface Repository may not start if the initial value is reduced.

Remarks

The timeout parameter must be set with consideration to the timeout applied to a linkage application. For details, refer to CORBA Application Timeouts in the OLTP Server User's Guide (Provided with Enterprise Edition and Standard Edition products) or Designing a WorkUnit in the J2EE User's Guide.

Windows Solaris OE

Table A-5 Operating Environment of Security Function

Parameter	Initial value Maximum value	Meaning	Remarks
http_proxy	proxy_host -	Host name of HTTP proxy server.	Cannot be specified under Web-J Edition (See Note 1)
http_proxy_port	8080 -	Port number used by HTTP proxy server.	Cannot be specified under Web-J Edition (See Note 1)
http_proxy_use	No -	Specifies use of HTTP tunneling function: "yes": Used "no": Not used	Cannot be specified under Web-J Edition (See Note 1)

Note 1

These parameters are referred to when HTTP tunneling is used via an HTTP proxy server with pre-installed runtime (an executive environment except for Portable-ORB).

http_proxy and http_proxy_port are valid when http_proxy_use = yes is specified.

Specify the host name and port number of the HTTP proxy server used by the Web browser.

Solaris OE Linux

Table A-6 Operating Environment of Security Function (Resource Protection)

Parameter	Initial value Maximum value	Meaning	Remarks
iss_use	no -	Specifies whether the resource protection function is valid. If "yes" is specified, the CORBA application can only be started by the user ID of iss_uid (or the root).	(See Note 1)
iss_uid	root -	Specifies the user ID for operating applications when the resource protection function is valid (iss_use = yes).	(See Note 2)
iss_gid	- -	Specifies the group ID for operating applications when the resource protection function is valid (iss_use = yes). If omitted, the primary group ID of iss_uid is assumed.	

Note 1

To set the resource protection function to valid (iss_use=yes), the procedure is different before and after the environment setting of Interstage (CORBA Service). For details, refer to Enhancing Security (Protecting Interstage Resources) in the Security System Guide.

In the Web-J Edition, if the following files have already been (dynamically) generated when iss_use=yes is specified, change the permission attribute of the file.

Dynamically Generated File

```
Under /var/opt/FSUNod (Solaris OE) or /opt/FJSVod/var (Linux)
     .log_pipe
     .share
     .named_pipe
     log
     log.old
     pid
```

Permission Attribute Procedure

```
# chown  Specific ID  <Dynamically generated file>
# chmod  0644      <Dynamically generated file>
```

Note 2

Note that CORBA applications can only be executed by the user specified in iss_uid or the "root" and it cannot be executed by general users. (It is also applicable to the execution users registered in impl.db.) For details, refer to "OD_impl_inst" in the Reference Manual (Command Edition).

Table A-7 Operating Environment of Maintenance Function

Parameter	Initial value Maximum value	Meaning	Remarks
access_log_policy	start (Default value is recommended.) -	Specifies if an access log is to be kept when the CORBA Service starts. "start": a log is to be kept when the CORBA Service starts. "standby": no log is to be kept.	Valid only for server functions (See Note 1)
access_log_size	3000000 2147483467 (Maximum value for *long* type)	Maximum size of access log (bytes)	Valid only for server functions (See Note 1)
access_log_level	send_stex: recv_stex: send_userex: recv_userex -	The key word at the access log collection level is specified. The delimiter is a colon (":"). Blanks cannot be specified. When "all" is specified, it is considered that all the collection levels are specified.	Valid only for server functions (See Note 1)
error_log_policy	start (Default value is recommended.) -	Specifies if an error log is to be kept when the CORBA Service starts. "start": a log is to be kept when the CORBA Service starts. "standby": no log is to be kept.	(See Note 1)
error_log_size	3000000	Maximum size of error log (bytes)	(See Note 1)

Parameter	Initial value Maximum value	Meaning	Remarks
	2147483467 (Maximum value for *long* type)		
info_log_policy	start (Default value is recommended.)	Specifies whether to collect log information when the CORBA service starts. "start": a log is to be kept when the CORBA Service starts. "standby": no log is to be kept.	(See Note 1)
	-		
info_log_size	3000000	Maximum size of information log file (bytes)	(See Note 1)
	2147483467 (Maximum value for *long* type)		
logging	no	Specifies if an internal log is to be kept. "no": no log is to be kept "yes": a log is to be kept.	(See Note 2)
	-		
log_file_size	1000000	Maximum size of internal log (bytes)	(See Note 2)
	-		
process_log_policy	start (Default value is recommended.)	Specifies if a process log is to be kept when the CORBA Service starts. "start": a log is to be kept when the CORBA Service starts. "standby": no log is to be kept.	(See Note 1)
	-		
process_log_size	3000000	Maximum size of process log (bytes)	(See Note 1)
	2147483467 (Maximum value for *long* type)		
snap_size	40000	Upper limit for snapshot size (in bytes)	Valid only for server functions
	2147483467 (Maximum value for *long* type) (See Note 3)		
snap_use	Yes	Specifies collection of snapshot: "yes": collected "no": not collected	Valid only for server functions
	-		

Parameter	Initial value Maximum value	Meaning	Remarks
trace_file_synch_ level	stop -	Specifies trace file output timing. Multiple files can be specified. (Separator is "&"). none: It is output to trace file only when the *odformtrace* command is used. exit: The trace information of the completed application is output to the trace file when the application ends normally. vanish: The trace information of the completed application is output to the trace file when the application ends abnormally. stop: The trace information of all applications is output to the trace file when the CORBA service has ended. loop: It is output to the trace file when size of the trace information acquired on memory has exceeded the trace_size_per_process.	Valid only for server functions
trace_size_per_ process	10000 2147483467 (Maximum value for *long* type) (See Note 3)	The maximum of the trace information size for each process. (in byte unit)	Valid only for server functions
trace_use	yes (Default value is recommended.) -	Specifies acquisition of the trace information: yes: Acquire no: Not acquire	Valid only for server functions

Note 1

The access log, process log, error log, and information log are collected in the following directories. It is necessary to add the following log file sizes to the disk area.

Windows

Storage Directory (Default installation path)

```
C:\INTERSTAGE\ODWIN\var
```

Solaris OE

Storage Directory (Default installation path)

```
/var/opt/FSUNod
```

Linux

Storage Directory

```
/var/opt/FJSVod
```

Table A-8 Log File Name and File Size

Log name	Log file name	Log file size
Access log	accesslog accesslog.old	access_log_size * 2
Process log (If server library (ODSV.DLL) is linked.)	proclog proclog.old	process_log_size * 2
Process log (If client library (ODWIN.DLL) is linked.)	proclogcl proclogcl.old	process_log_size * 2
Error log (If server library (ODSV.DLL) is linked.)	errlog errlog.old	error_log_size * 2
Error log (If client library (ODWIN.DLL) is linked.)	errlogcl errlogcl.old	error_log_size * 2
Information log	infolog infolog.old	info_log_size * 2

Note 2

When “logging=yes” is specified, an internal log is output to the following files:

- Windows®: Under the C:\INTERSTAGE*ODWIN**var*
  log (*log.old*)
  appNNNN.log (appNNNN.old) (NNNN: alphanumeric characters) for each server application
- Solaris OE: /var/opt/FSUNod/log (log.old)
- Linux: /var/opt/FJSVod/log (log.old)

When the pre-installed type Java library is used, logging is output to the following files as well as those described above:

Under the work directory (to the position that is indicated with user.dir of the JVM system property)

JVxxxxxxxxxx.log (where xxxxxxxxxx is a number)

Note 3

In the Web-J Edition of the Linux system, do not specify a value larger than the initial value.

Windows Solaris OE

Table A-9 Operating Environment Regarding the Compatibility of Previous Versions

Parameter	Initial value Maximum value	Meaning	Remarks
msg_compatible	No -	Specifies the message format. If "yes" is specified, messages in old format (V3 or earlier) are output. If "no" is specified, messages in new format are output. When a CORBA application of versions older than V3 is used and when it processes a message issued from CORBA service, specify “yes.”	This cannot be specified for the Web-J Edition.

gwconfig

Windows Solaris OE

Overview

The *gwconfig* file defines the system requirements of the HTTP-IIOP gateway started by the Web Server when HTTP tunneling is used.

When an item that relates to timeout monitoring of the CORBA Service is corrected, it is necessary to correct the definition of similar items.

The *gwconfig* file does not need to be corrected when not changing from an initial value.

File Name

Windows

(Default installation path)

```
C:\INTERSTAGE\ODWIN\etc\gwconfig
```

Solaris OE

(Default installation path)

```
/etc/opt/FSUNod/gwconfig
```

File Contents

In the *gwconfig* file, values are specified in the following format.

Format

Parameter name=value set

Sample Statement

timeout_response=60

Parameters

The parameters for which the values can be changed are shown in Table A-10.

Table A-10 Modifiable gwconfig Parameters

Parameter	Initial value	Maximum value	Meaning
timeout_response	360	600	Reply waiting time for request. Standby time from request transmission in HTTP-IIOP gateway to reply (seconds). The timeout is notified to the client if there is no reply from the method of the server in this time. Change this parameter to below the period_receive_timeout value (the response time between the time of request and the time of response by the client defined with the config file) when you change period_receive_timeout for the CORBA Service on the client side.
timeout_session	180	900	Session hold time (no communication monitoring time between clients). Hold time in HTTP-IIOP gateway for each handling of the client (seconds). The administrative information for the client is deleted when there is no new request transmission in this time from the client and there is no reply waiting from the server.
timeout_connection	60	600	Connection hold time (no communication monitoring time between servers). The monitoring time in the HTTP-IIOP gateway is not communicated. The connection with the server is cut when there is no new request transmission in this time from the client and there is no replay waiting from the server.
logmode	5	-	Collection of internal log for HTTP-IIOP gateway. When an internal log is collected, 1 is set. (See Note1) Specify from the following: - 5: Internal log information is not collected. - 3: Request data and information at error occurrence are collected. - 2: In addition to information collected in 3, reply data and internal processing information are collected. - 1: In addition to information collected in 2, trace information is collected.
max_log_file_size	1048576	10485760	Log file size (in bytes).

Note 1

- The internal log of the HTTP-IIOP gateway is output as follows.
  Windows®: C:\INTERSTAGE\ODWIN\var\httpgw*.log
  Solaris OE: /opt/FSUNod/var/httpgw*.log
- It is necessary to stop the Web Server to stop internal log collection.

Solaris OE

- Execute the following commands with manager authority to output the log to memory when an internal log is collected after the Web server has stopped.

  cd /opt/FSUNod/var

  /opt/FSUNod/bin/httplog ./httpgw.key

Notes

- Modified definition information becomes valid the next time the Web server is started.
- Storage directory of *gwconfig* file
  The storage directory of the *gwconfig* file is specified with the OD_HTTPGW_HOME or OD_HOME environment variable. If both variables are specified, OD_HTTPGW_HOME is given priority. It stores the file in the etc directory under the specified directory.

inithost/initial_hosts

Overview

The *inithost/initial_hosts* file is where host information of the naming service and the interface repository are defined. Because the naming service and the interface repository contain the location of applications and interface information, they are necessary for linkage with CORBA applications.

In the *inithost/initial_hosts* file, specify the host name where the service is present (or an IP address), and a CORBA services port number (default value is 8002). Up to 16 combinations of the host name and the port number can be specified.

Inquiries of the service are made in the order of definition, and if the service referenced does not exist, an inquiry is made to the host defined in the next line.

When the naming service and the interface repository are operated on a local host, setting of the host name and port number is not necessary.

File Name

Windows

(Default installation path)

```
C:\INTERSTAGE\ODWIN\etc\inithost
```

Solaris OE

(Default installation path)

```
/etc/opt/FSUNod/initial_hosts
(Windows® Client: C:\INTERSTAGE\ODWIN\etc\inithost)
```

Linux

```
/opt/FJSVod/etc/initial_hosts
(Windows® Client: C:\INTERSTAGE\ODWIN\etc\inithost)
```

File Contents

In the *inithost/initial_hosts* file, values are specified in the following format.

Format

Hostname port number

Sample Statement

hostname 8002

Parameters

The parameters for which the values can be changed are shown in Table A-11.

Table A-11 Modifiable inithost Parameters

Parameter	Initial value	Meaning
Host name	No value	Specify the host name (or an IP address) where the naming service or the interface repository is operating. A host name can be up to 64 bytes long. (Note 1)
Port number	No value	Specify the port number of the CORBA service defined in the host where the above service is running.

Note 1

It must be set to the same host name on the local host side and on the server side which operates the service.

Local host side:

- Windows NT®/Windows® 2000/Windows® XP:

  lmhosts or hosts of Windows ®System directory\system32\drivers\etc.

- Windows® 9x/Windows® Me:

  lmhosts or hosts of Windows® System directory

- Solaris OE/Linux:

  /etc/hosts or NIS+ etc.

Server side:

- Host name definition on server side

Notes

1. Modification of definition information

   When definition information is modified, it becomes valid after the CORBA service is next started.

2. Set up the inithost file using the *isinit* command and *ismodifyservice* command:

   - Comment out, or delete, the host name of Interface Repository Service and Naming Service specified in the *inithost/initial_hosts* file when you execute an *isinit* command and an *ismodifyservice* command.
   - The setup of the *inithost/initial_hosts* file becomes possible after an *isinit* command and an *ismodifyservice* command are executed.
   - Even when a host name is set up in the *inithost/initial_hosts* file, it gives priority to the host name set up with the *isinit* command and the *ismodifyservice* command. And, it doesn't need to set up the host name set up with the *isinit* command and the *ismodifyservice* command in the *inithost/initial_hosts* file.
   - When environment setting was performed by the *isinit* command and *ismodifyservice* command, remote host operation of the naming service using the *inithost/initial_hosts* file cannot be performed. This is because when the *isinit* command and *ismodifyservice* command are used, the remote host name of the naming service is set in the initial service (meaning the *inithost/initial_hosts* file cannot be used).
   - Remote host operation of the naming service using the *inithost/initial_hosts* file can be performed only during operation of the CORBA service client, in which neither the *isinit* command nor the *ismodifyservice* command is included.

3. Unnecessary host information definition

   If a non-existent host (or a host unable to communicate) is specified as the host name when the inithost file in Windows is edited, the operation of the client application, IDL compiler, and so on may slow down. Delete unnecessary host names.

Remarks

Setting of the host name and the port number can be performed by the *odsethost* command also.

queue_policy

Overview

queue_policy is the file used as the queue policy by the queue control function.

A "queue_policy.default" file is provided as a sample. Edit the sample file, and make a "queue_policy" file when you use the queue control function.

File Name

Windows

(Default installation path)

```
C:\INTERSTAGE\ODWIN\etc\queue_policy
```

Solaris OE

(Default installation path)

```
/etc/opt/FSUNod/queue_policy
```

Linux

```
/opt/FJSVod/etc/queue_policy
```

File Contents

The *queue_policy* file is divided into three sections

- [QUEUEGROUP] section
- [QUEUE] section
- [GUARANTY] section.

The [QUEUEGROUP] and [QUEUE] sections can be updated using the *odsetque* command.

Change the [GUARANTY] section by using an editor. If the [GUARANTY] section is undefined, refer to the *odsetque* command in the Reference Manual (Command Edition) for details of the maximum value.

Format

[GUARANTY]

Queue name = maximum limit for queue

Sample Statement

```
[GUARANTY]
queue1    = 64
```

Parameters

The parameters for which the values can be changed are shown in Table A-12.

Table A-12 Modifiable queue_policy Parameters

Parameter	Maximum Value	Meaning
Queue name (Note)	-	Specifies the queue name registered using the *odsetque* command.
Maximum limit for queue	2147483467 (Maximum value for *long* type)	Specifies the queue threshold value (this may not be omitted).

Note

The queues and set values used by the CORBA service are shown in Table A-13.

Table A-13 Queues Used by CORBA Services

Queue name	Value set (upper limit value of the queue)
SYSTEM_GLOBAL	Cannot be edited
OD_ORB_QUEUE	Cannot be edited
COS_NAMING_QUE	A value equal to or greater than max_IIOP_resp_con
INTERFACE_REP_QUE	A value equal to or greater than max_IIOP_resp_con

Notes

- When definition information is modified, it becomes valid only after restarting the CORBA service.
- When registration is carried out using the *odsetque* command, queue information is not added to [GUARANTY]. If you set a maximum limit, you will need to add a new definition.

nsconfig

Overview

nsconfig is the file which sets the operating environment for the Naming Service.

File Name

Windows

(Default installation path)

```
C:\INTERSTAGE\ODWIN\etc\nsconfig
```

Solaris OE

(Default installation path)

```
/etc/opt/FSUNod/nsconfig
```

Linux

```
/opt/FJSVod/etc/nsconfig
```

File Contents

In the *nsconfig* file, values are specified in the following format.

Format

Parameter name = value set

Sample Statement

```
file_sync = yes
trace_level = update
bl_how_many=65536
ext_intf=yes
```

Parameters

The parameters for which the values can be changed are shown in Table A-14.

Table A-14 Modifiable nsconfig Parameters

Parameter	Initial value Specifiable value	Meaning
file_sync	yes yes, no	Specifies whether synchronous file writing should be performed when the Naming Service is being updated. yes: Enable synchronous file writing. no: Disable synchronous file writing. When updating large volumes of data in the course of an initial build, for example, you can increase the processing speed by setting this parameter to no. While the Naming Service is in operation, this parameter should be set to yes for increased reliability.
trace_level	update update, all	Specifies the trace level when collecting an automatic trace of method executions: update: Collect only the updated log. all: Collect all the traces.
bl_how_many	65536 0~65536	Specifies the maximum numbers of bindings returned by NamingContext::list and BindingIterator::next_n
ogl_how_many	256 (Default value is recommended.) 128~256	Specifies the maximum value of the load balance object group list. Note) If the list for the load balance object group is created in the naming service, memory is allocated according to the setting of this parameter. This directly affects the memory usage, therefore, specify only the minimum value required, while taking the overall memory capacity into consideration.
ext_intf	yes yes, no	Specifies whether the extended functions provided by Naming Service are used. yes: Enable the naming service extended function. no: Disable the naming service extended function. If no is specified, naming context extended interface (NamingContexExt interface) cannot be used. Specify no, when working with V2.X or earlier clients.

Note

When a value is changed, the new value does not take effect until the next time the Naming Service is started.

irconfig

Overview

The *irconfig* file specifies backup and logging settings and other operating environment parameters of the Interface Repository.

File Name

Windows

(Default installation path)

```
C:\INTERSTAGE\ODWIN\etc\irconfig
```

Solaris OE

(Default installation path)

```
/etc/opt/FSUNod/irconfig
```

Linux

```
/opt/FJSVod/etc/irconfig
```

File Contents

In the *irconfig* file, values are specified in the following format.

Format

Parameter name = value set

Sample Statements

```
auto backup = no(yes)
auto backup path =
logging = no(yes)
logging memory size = 512
logfile path =
sync = no
select cache obj =
```

Parameters

The parameters for which the values can be changed are shown in Table A-15.

Table A-15 Modifiable irconfig Parameters

Parameter	Initial value Specifiable value	Meaning
auto backup	no yes, no	Specifies whether to take a backup automatically when the Interface Repository is started. yes: Enable automatic backup. no: Disable automatic backup. Note: The backup is only taken once, when the Interface Repository is started.
auto backup path	- -	Specifies the storage location for the backup data. If "auto backup" is set to "yes", the path must be specified. If no path is specified, the backup will not be taken. Note that the storage location requires an amount of free space equal to or greater than the size of the database created.
auto recovery	no yes, no	Specifies whether recovery is to be performed (based on the backup data), for example if an error is found in the database due to a shutdown during transaction processing. yes: Enable automatic recovery. no: Disable automatic recovery. Note that if you want to use this function you will need to set "auto backup" to "yes", and to specify the auto backup path.
ir_timeout	1800 (sec) 0~100000000(sec)	Specifies the response time needed to get a response from the interface repository in the IDL compile (IDLc) and the interface information import (*odimportir*). If "0" is specified, the response time is not monitored.
iss_use Solaris OE Linux	no yes, no	Specifies whether the resource protection function is valid. yes: Enable the resource protection function. no: Disable the resource protection function. If "yes" is specified, the Interface Repository can only be operated by the database administrator (or the root). (Specify the database administrator with "IR User Name" (or with the *ismodifyservice* command) of the "Interstage Operating Environment Definition File.")
logging	no	If this parameter is set to "yes", log information will be collected

Parameter	Initial value Specifiable value	Meaning
	yes, no	when problems arise. yes: Collect log information. no: Do not collect log information. The log collected can be output to a file using the *irlogdump* command.
logging memory size	512(KB) 1~4096(KB)	Specifies the size of the shared memory storing the log information. If logging is set to “no”, this value has no meaning.
logfile path	- -	This parameter is used to specify the full path for the directory containing the log information output by the *irlogdump* command when logging has been set to “yes”. If no path is specified, the information will be stored in the same directory where the CORBA Service is running (refer to the config command). If logging is set to “no”, this value has no meaning.
select cache obj	- -	Specifies the objects to be cached when the Interface Repository is started. The objects to be cached should be listed by repository Id in a text file, whose file name is specified by the full path. If no file name is specified, all registered objects are cached. Refer to the specification method description below for examples of creating the files, and additional notes.
sync	no yes, no	Specifies whether to enable synchronous mode. yes: Enable synchronous mode. no: Disable synchronous mode. If this parameter is set to “no”, the throughput of the renewal management in the Interface Repository improves. This is because data access is asynchronous (that is, one write is not synchronized with another) and therefore, if during renewal the database goes down, it cannot be detected. If this parameter is set to “yes”, the system will run in sync mode to guarantee that Write operations are carried out one transaction at a time. This option should be set when reliability in the system is required. (Destruction of an database can be recognized.) In synchronous mode, the throughput of the renewal management declines and therefore a timeout may occur. The timeout period is set by period_receive_timeout of config.

Specifying Objects to be Cached

Restricting the objects that are cached when the Interface Repository is started improves startup performance when large numbers of objects are registered in the Interface Repository.

However, when objects are specified for caching, the reference performance for uncached objects is degraded, and this affects operations.

In addition, if the Interface Repository is started with objects specified for caching, no further objects can be added to or updated (IDLc, tdc, *odimportir*) in the Interface Repository. This should only be done during production runs (when no additions to or updating of the Interface Repository is done).

To cache objects, specify the Interface Repository ID of the objects to be cached in a text file.

Only the ModuleDef object or InterfaceDef object that directly includes the Repository object (route object) need be specified for the repository ID. All objects included in the specified object are then cached.

When an association is established with another module through inheritance or scope reference, that module must also be specified for caching.

Refer to information on Interface Repository Service Programming in the Distributed Application Development Guide (CORBA Service Edition), for details of the types of objects managed by the Interface Repository service, and the inclusion/inheritance of Interface Repository objects. This manual is provided with Enterprise Edition and Standard Edition products.

The *odlistdir* command can be used to display the inclusive relationships of objects registered in an Interface Repository.

The following are examples of coding files to specify objects to be cached:

```
IDL:testmodule1:1.0

IDL:testmodule2:1.0

IDL:testmodule3:1.0
```

Note: Enter only one repository ID for an object to be cached per line. Comments cannot be used.

Notes

- When a value is changed, the new value does not take effect until the next time the Naming Service is started.
- When setting up the environment using the *ismodifyservice* command, if “auto backup” has been set to “yes”, a backup will be taken when the database is empty. A database which has been backed up in this state cannot be used.
- The auto backup function takes a backup when the interface has just been started up. This means that interface definition information updated after the interface is started up will not be backed up. If you need to back up information updated after the startup, use the *obfbkup* command.
- The *odbackupsys* command cannot be used to back up files that specify cached objects. Back up these files with the copy commands.

Appendix B

Component Transaction Service Environment Definition

This appendix explains the Component Transaction Service environment definition file.

This definition file is supported with the following products:

- Interstage Application Server Enterprise Edition
- Interstage Application Server Standard Edition.

Windows

This definition file is C:\INTERSTAGE\etc\sysdef.

Solaris OE

This definition file is /var/opt/FSUNtd/etc/sysdef.

Linux

This definition file is /var/opt/FJSVtd/etc/sysdef.

This definition file can be modified only while the Component Transaction Service is stopped.

The environment definition of the Component Transaction Service is described in the following format.

Note

Upon completion of structuring the application environment, creating a backup copy of the resources is recommended for the possible crash of resources.

For the procedure of creating a backup copy, see Maintenance (Backup of resources) of the Operator's Guide.

Syntax

The standard file description format is set up according the following structure. If a syntax error occurs in the file, the contents of the file are ignored.

- Statement
- Section
- Comment line
- Blank line

Statement

A statement is a line for setting the information, and is specified in the following format:

Keyword: Setup information \n

A statement consists of a keyword, a colon :, and the setup information. The statement description rules are as follows:

- To omit a statement, either delete the applicable statement, or omit only the setup information.
- A statement and a comment cannot exist on the same line.

The components of a statement are detailed as follows:

Keyword

The keyword is a registered identifier, and conforms to the following rules:

- Keywords consist of alphanumeric characters and spaces, and must begin with an alphanumeric character.
- Keywords are not case sensitive.
- Multiple spaces in succession a keyword are treated as a single space.
- Spaces or tabs at the beginning of the line are ignored.

Colon

The colon separates the keyword from the setup information, and conforms to the following rules:

- An en-size colon must be specified.
- Spaces or tabs before or after the colon are ignored.

Setup information

The setup information defines the settings for the keyword, and conforms to the following rules:

- Any colons : included in the setup information are treated as literal characters.
- Setup information ends with a space, tab, line feed “\n”, or EOF.
- Setup information is case sensitive.
- Only one character string can be specified in setup information.
- Spaces or tabs must be enclosed in double quotation marks.
- There can be only one setup information item per statement. To include more than one setup information item, write a new statement.
- All statements are analyzed in the same way.

Examples

The following examples show valid statements:

```
keyword:Information\n
KEYWORD:Information\n
KeyWord:Information\n
Keyword:”Information Area”\n
```

The following examples show invalid statements causing syntax errors:

```
# Two types of setup information are specified.
Keyword: Information Area\n
# A statement and a comment are written on the same line.
Keyword: Information #This is a statement\n
# The ending double quotation mark is missing.
Keyword: “START  Information.\n
# Keyword and setup information are specified on two lines.
Keyword: “START  Information.\n
Information END” \n
```

Specifying an unregistered keyword also causes a syntax error.

Section

A section is a group of statements described in the following format:

section-name \n

keyword: setup information \n

keyword: setup information \n

A section is comprised of a “section name” and multiple statements, and conforms to the following rules:

- A section begins with the “section name” identifier, and ends when a new section is defined, or with an EOF.
- To omit a section, delete the entire section, or make it a comment.
- A section cannot contain the “section name” identifier only.
- Nothing else can exist on the same line as the “section name” identifier, including comments.
- “Section name” must be enclosed in square brackets .
- The section name consists of alphanumeric characters and spaces, and must begin with an alphanumeric character.
- The section name is not case sensitive.

The following example shows a valid section:

Section\n

Keyword1: Information\n

Keywordn: Information\n

The following examples show invalid sections, causing syntax errors:

section-name and a comment are written on the same line.

Section # This is a Section\n

Keyword: Information\n

The Section end bracket is missing.

Section\n

Keyword: Information.\n

Specifying an unregistered section name also causes a syntax error.

Comment Line

A comment line is used by the programmer to insert non-executable yet useful information, and is described in the following format:

```
# comment \n
```

A comment is preceded by the single byte hash character (#). All text following the # is ignored.

Blank Line

A blank line can be inserted, but is ignored during analysis.

Control Statement of System Environment Definition

This section details the control statements that can be specified in the system environment definition file.

[SYSTEM ENVIRONMENT] Section

System Scale:

System scale

Using Session Information Management Object:

Presence of use of SMO

Name of Session Information Management Object:

Name of SMO

Using Authentication Server Object: Windows Solaris OE

Presence specification of start of attestation object

Name of Authentication Server Object: Windows Solaris OE

Name of attestation object

Authentication Server Object Trace: Windows Solaris OE

Trace collection existence specification of attestation object

Host of InfoDirectory: Windows Solaris OE

Host name of InfoDirectory

Port of InfoDirectory: Windows Solaris OE

Port number of InfoDirectory

Number of Number of Maximum WRAPPER Hold Session Windows Solaris OE

system maximum reservation sessions

Number of Communication Buffer

Number of communication buffers of the transaction application

Using Interface Check

Specification of whether the Interface Check function is used or not

IP version Solaris OE

The version of the network to be used

The following parameters are filled in on each line.

System Scale

Please specify the scale of the system.

If the system is initialized by using the Interstage integration command, an appropriate system scale is set, and you do not have to modify the scale.

Determine the system scale based on the number of the clients connected. The following values can be specified according to the system scale.

Windows

“small”	Small scale (Number of clients connected: 1 to 5)
“moderate”	Inside scale (Number of clients connected: 6 to 10)
“large”	Large scale (Number of clients connected: 11 to 50)
“super”	Super-large scale (Number of clients connected: 51 to 100)

Solaris OE Linux

“small”	Small scale (Number of clients connected: 1 to 50)
“moderate”	Inside scale (Number of clients connected: 51 to 100)
“large”	Large scale (Number of clients connected: 101 to 500)
“super”	Super-large scale (Number of clients connected: 501 to 1000)

Using Session Information Management Object

Specifies whether or not the session information management function is used.

“YES”	SMO is used.
“NO”	SMO is not used.

When this statement is omitted, “NO” is set by default.

Name of Session Information Management Object

Specify the SMO name when registering the Naming Service.

A value of up to 256 bytes can be specified at the OD_or_adm command -n option, however, the naming context cannot be specified.

Default value is “ISTD::SMO”.

If NO is specified in the statement “Using Session Information Management Object”, this statement is ignored.

Using Authentication Server Object

Specifies whether or not Authentication Object starts up.

“YES”	The attestation object is started.
“NO”	The attestation object is not started.

If this statement is omitted, “NO” is set by default.

Name of Authentication Server Object

The name when naming service of the attestation object is registered with the server that starts the attestation object is specified.

The value can be specified is an alphanumeric character within 255 bytes. In the server on which the Authentication Object runs, specify the name that was specified when the Authentication Object Naming Service was registered.

Specify the name in up to 255 alphanumeric characters. You cannot specify a naming context.

If this statement is omitted, “ISTD::ASO” is set.

This statement is ignored if “NO” is set for the Using Authentication Server Object statement. The default value is “ISTD::ASO”

When “NO” is specified for the Using Authentication Server Object statement, this statement is disregarded.

Authentication Server Object Trace

Determines whether the Authentication Server Object is traced.

“ENABLE”	The trace is gathered.
“DISABLE”	The trace is not gathered.

When this statement is omitted, “DISABLE” is set as a default value.

When “DISABLE” is specified for the Using Authentication Server Object statement, this statement is disregarded.

Host of InfoDirectory

Host name of InfoDirectory

The host name of the server of InfoDirectory is specified in the server that executes the server or the access control by which the attestation object is started.

The value that can be specified is limited to 255 bytes.

The default value is assumed to be host's host name.

Port of InfoDirectory

Port number of InfoDirectory

The port number of InfoDirectory is specified in the server that starts the attestation object and the server which executes the access control.

The value that can be specified is 1-65535.

The default value is 389.

Number of Maximum WRAPPER Hold Session

The number of session reservations in the entire system maximum reservation session number system is specified.

When 0 is specified, the session is not controlled.

This definition becomes effective when the PSYS Name statement and the Number of Maximum Session statement specified in the WRAPPER section are defined.

The value that can be specified is 0-1000.

The default value is 0.

Number of Communication Buffer: Number of Communication Buffers of Transaction Application

Represents the number of communication buffers that are used for communication of the transaction application. The size of the communication buffer is given as a product of the number of communication buffers specified in this statement and 4096 bytes.

A value in the range of 500 to 10000 can be specified.

Multiply the number of communications happening at a single time by the number of clients connected concurrently, then estimate the number of communication buffers based on the product.

Specify the sufficient number of the communication buffers.

The following default values are set based on the system scale:

Small	500
moderate	1000
large	1500
super	2000

Using Interface Check: Specification of Whether the Interface Check Function is Used or Not

Specifies whether or not the Interface Check function is used.

“YES”: The Interface Check function is used.

“NO”: The Interface Check function is not used.

When this statement is omitted, “NO” is set.

IP Version: The Version of the Network to be Used

Solaris OE

The version of the network to be used is specified.

"v6": An IPv6 network is used.

"v4": IPv4 conventional network is used.

When this statement is omitted, “v4” is set.

[WRAPPER] Section

Windows Solaris OE

Enter the [WRAPPER] section in the following format:

[WRAPPER]

PSYS Name:

Communication path for load control name

Number of Maximum Session:

Number of communication sessions at maximum

PSYS Name:

Communication path for load control name

The DPCF communication path name which the load control targets is specified in the alphanumeric character of eight characters or less.

Windows

Refer to IDCM Help for the DPCF communication path name.

Solaris OE

Refer to the IDCM User's Guide for the DPCF communication path name.

Number of Maximum Session:

Maximum number of simultaneous communication sessions.

The maximum values of the number of sessions which can be the reservation in the DPCF communication path set by the PSYS Name statement it are specified.

The value that can be specified is 0-1000. If a session exceeds this number, it is subject to load restrictions.

Notes

- Define all of each statement of the SYSTEM ENVIRONMENT section and the WRAPPER section when you use the load control function.
- The PSYS Name statement and the Number of Maximum Session statement of the WRAPPER section are specified by the pair.
- When the load is controlled to two or more DPCF communication path, the PSYS Name statement and the Number of Maximum Session statement are specified for two or more WRAPPER sections by the pair.
- Specify the value specified for the Number of Maximum Session statement when the DPCF communication path name which uses the OSI-TP communication function or the TCP/IP communication function for the PSYS Name statement is specified below the number of priority conversation connections specified by the IDCM network definition. When bigger value than the number of priority conversation connections is specified, the load might not be controlled.

  Windows

  Refer to IDCM Help for details of the IDCM network definition.

  Solaris OE

  Refer to the IDCM User's Guide for details of the IDCM network definition.

Appendix C

Database Linkage Service Environment Definition

The Database Linkage Service environment definition is specified in the following format:

<Parameter> = <Setup value>

config File

The config file is the definition file maintaining the information that applies to the OTS system at the startup of the system. To reflect modifications to the config file in the OTS system, the system must be re-started.

Windows

The config file is placed in the C:\INTERSTAGE\ots\etc\config.

```
OBSERVE_CYCLE_TIME=6
TRAN_TIME_OUT=300
2PC_TIME_OUT=60
COM_RETRY_TIME=2
COM_RETRY_MAX=3
RECOVER_RETRY_TIME=30
RECOVER_RETRY_MAX=60
RESOURCE_TRANMAX=5
OTS_TRACE_SIZE=512
RESOURCE_TRACE_SIZE=512
RECOVERY_TRACE_SIZE=512
OBSERVE_TRACE_SIZE=512
DATABASE_RETRY_TIME=5
DATABASE_RETRY_MAX=5
MEM_RETRY_TIME=5
MEM_RETRY_MAX=5
RSCSTOP_CHECK_COUNT=100
OTS_VERSION=4
JTS_VERSION=4
TRACE_MODE=1
TRACE_LEVEL=1
JAVA_VERSION=13
PATH=c:\APWEJB\JBK3\jdk\jre\bin\java.exe
```

The config file is placed in the following location.

Solaris OE

/opt/FSUNots/etc/config

Linux

/opt/FJSVots/etc/config

```
OBSERVE_CYCLE_TIME=6
TRAN_TIME_OUT=300
2PC_TIME_OUT=60
COM_RETRY_TIME=2
COM_RETRY_MAX=3
RECOVER_RETRY_TIME=30
RECOVER_RETRY_MAX=60
RESOURCE_TRANMAX=5
```

```
OTS_TRACE_SIZE=512
RESOURCE_TRACE_SIZE=512
RECOVERY_TRACE_SIZE=512
OBSERVE_TRACE_SIZE=512
DATABASE_RETRY_TIME=5
DATABASE_RETRY_MAX=5
MEM_RETRY_TIME=5
MEM_RETRY_MAX=5
RSCSTOP_CHECK_COUNT=100
OTS_VERSION=4
JTS_VERSION=4
TRACE_MODE=1
TRACE_LEVEL=1
JAVA_VERSION=13
PATH=/opt/FJSVawjbk/jdk12e/bin/java
```

Note

- For description on timeout, refer to the OLTP Server User's Guide.
- All the items of a config file can be omitted. A default value becomes effective when it omits.

OBSERVE_CYCLE_TIME

Specify the Database Linkage Service observe cycle time in seconds. If this time is less then observe cycle of the system increases which leads to low performance. On the other hand, if the observe cycle time is greater, abnormality detection is delayed. Set the parameters by taking these two points into consideration.

A value from 1 to 60 can be specified. The default value is 5.

TRAN_TIME_OUT

Specify the Database Linkage Service transaction timeout from begin to commit, in seconds.

The default value is 300.

If the timeout is specified in the application set_timeout method, the application's value will override TRAN_TIME_OUT. Specify a value from 1 to the maximum value permitted for ‘long’.

2PC_TIME_OUT

Specify the commit timeout for the resource manager, between phase 1 and phase 2 for the 2PC 2-phase commit of the Database Linkage Service transaction, in seconds.

Specify a value from 1 to the maximum value permitted for ‘long’. The default value is 60.

COM_RETRY_TIME

If a communication abnormality occurs during the transaction process, set the retry time for that communication.

A value from 1 to 600 can be specified. The default value is 2.

COM_RETRY_MAX

If a communication abnormality occurs during the transaction process, set the maximum retry time for that communication.

Specify a value from 1 to the maximum value permitted for ‘long’. The default value is 3.

RECOVER_RETRY_TIME

If a communication abnormality occurs in the Database Linkage Service recovery process, set the retry time for that communication.

A value from 1 to 600 can be specified. The default value is 30.

RECOVER_RETRY_MAX

If a communication abnormality occurs during the Database Linkage Service recovery process, set the maximum retry time for that communication.

Specify a value from 1 to the maximum value permitted for ‘long’. The default value is 60.

RESOURCE_TRANMAX

Specify the maximum multiple level of transactions for each resource control program.

Specify a value from 1 to the maximum value permitted for ‘long’. The default value is 5.

Note

Set up the degree of thread multiplex of an OTS system, and the degree of maximum multiplex of the transaction of 1 resource control program to maintain the following relations.

```
the degree of thread multiplex of an OTS system =< the degree of maximum
multiplex of the transaction of 1 resource control program
```

OTS_TRACE_SIZE

Specify the Database Linkage Service trace log size, in Kb.

A value from 128 to the maximum value permitted for ‘long’ can be specified. The default value is 512.

RESOURCE_TRACE_SIZE

Specify the resource manager trace log size, in Kb.

A value from 128 to the maximum value permitted for ‘long’ can be specified. The default value is 512.

RECOVERY_TRACE_SIZE

Specify the recovery process trace log size, in Kb.

A value from 128 to the maximum value permitted for ‘long’ can be specified. The default value is 512.

OBSERVE_TRACE_SIZE

Specify the observe process trace log size, in Kb.

A value from 128 to the maximum value permitted for ‘long’ can be specified. The default value is 512.

DATABASE_RETRY_TIME

Specify the retry time if recoverable errors, such as insufficient resources occur while accessing the Database Linkage Service database system.

A value from 1 to 600 can be specified. The default value is 5.

DATABASE_RETRY_MAX

Specify the maximum retry time if recoverable errors, such as insufficient resources occur while accessing the Database Linkage Service database system.

A value from 128 to the maximum value permitted for ‘long’ can be specified. The default value is 5.

MEM_RETRY_TIME

Specify the retry time in seconds if recoverable errors, such as insufficient resources occur while processing the Database Linkage Service.

A value from 1 to 600 can be specified. The default value is 5.

MEM_RETRY_MAX

Specify the maximum retry time if recoverable errors, such as insufficient resources occur while processing the Database Linkage Service.

Specify a value from 1 to the maximum value permitted for ‘long’. The default value is 5.

RSCSTOP_CHECK_COUNT

The resource control program is usually stopped in transaction processing and the meeting frequency by which the transaction completion is matched to the watch synchronization of OBSERVE_CYCLE_TIME is specified.

When the completion of the transaction during the OBSERVE_CYCLE_TIME*RSCSTOP_CHECK_COUNT second cannot be completed in the meeting time, the stop of the resource control program is usually switched from the stop to the compulsion stop.

The range that can be pointed out can specify the value that can be specified with 1 to the maximum value for ‘long’.

When this parameter is omitted, 100 is set.

OTS_VERSION

Specify the version of the OTS. Usually, do not change.

When this parameter is omitted, 5 is set.

JTS_VERSION

Specify the version of the JTS. Usually, do not change.

When this parameter is omitted, 5 is set.

JAVA_VERSION

Specify the version of Java that will be used by the resource control program for JTS. 13 or 14 can be specified as the version number. Specify 13 for using JDK/JRE 1.3 and 14 for using JDK/JRE 1.4. This specification is not required in ordinary cases. If JDK/JRE 1.4 must be used in accordance with the operating conditions of resources (such as a database) that are to be used, then specify 14.

The default value of this parameter is 13.

PATH

Specify the full path to the java command which the resource control program for JTS uses.

Windows

If this parameter is omitted, the paths specified in the environment variable PATH are searched for the commands java.exe and jre.exe. The first path found which contains either of these commands is the one that will be used to start the system.

Solaris OE Linux

When the resource control program for JTS is used, specifying this parameter is mandatory.

TRACE_MODE

The output form of the trace output in the environment using JTS is specified.

The value of 1 to 3 can be specified. The meaning is as follows.

1 : Only when abnormalities occur, a trace file is output to the installation directory / var subordinate of OTS. Usually, please choose 1.

2 : Regardless of the state of a system, trace is always output to the installation directory / var subordinate of OTS. Since it is always output, be careful of file size.

3 : A file output is not carried out. However, a trace file can be output by using the otsgetdump command.

TRACE_LEVEL

The mode of the trace output in the environment using JTS is specified.

The numbers from 1 to 5 can be put in and such fine trace can be output that a number is large. Usually, 1 is specified at the time of employment. Since performance is also influenced, it does not usually change.

Moreover, trace is not output when 0 is specified This is the default when the a number outside the range is specified.

Setup Information File

The setup information file is specified when the *otssetup* command sets the OTS system operating environment. If the setup processing is done using the Interstage integration command (*isinit* command), the Interstage operating environment definition needs to customize the definition. Refer to the Interstage Operator's Guide for details of the Interstage operating environment definition.

The setup information file must be created before the *otssetup* command is entered. Save the setup information file once created, because it can be reused when performing the setup processing next time.


```
MODE=SYS
LOGFILE=c:\ots\logfile
TRANMAX=10
PARTICIPATE=4
OTS_FACT_THR_CONC=5
OTS_RECV_THR_CONC=2
JTS_RMP_PROC_CONC=5
JTS_RMP_THR_CONC=16
HOST=otshost
PORT=8002
LOCALE=EUC
```


```
MODE=SYS
LOGFILE=/dev/rdsk/c0t0d0s0
TRANMAX=10
PARTICIPATE=4
OTS_FACT_THR_CONC=5
OTS_RECV_THR_CONC=2
JTS_RMP_PROC_CONC=5
JTS_RMP_THR_CONC=16
HOST=otshost
PORT=8002
LOCALE=EUC
```

Linux

```
MODE=SYS
LOGFILE=/dev/raw/raw1
TRANMAX=10
PARTICIPATE=4
OTS_FACT_THR_CONC=5
OTS_RECV_THR_CONC=2
JTS_RMP_PROC_CONC=5
JTS_RMP_THR_CONC=16
HOST=otshost
PORT=8002
LOCALE=EUC
```

Note

All of the items in bold are mandatory. Any or all of the rest can be omitted. A default value becomes effective when an item is omitted.

MODE

Either the host in which the OTS system works, or the host in which only the Resource Management Program works, can be specified.

SYS: The host in which the OTS system and the Resource Management Program work.

RMP: The host in which only the Resource Management Program works.

Specify both “SYS” and ”RMP” in upper case letters.

When “SYS” is specified, setup of the OTS system operating environment and the Resource Management Program operating environment will be performed, and the system log file will be created. When ”RMP” is specified, setup of the Resource Management Program operating environment only will be performed. The OTS system cannot be activated in an environment where setup was performed by specifying ”RMP”.

Corresponds to the “OTS Setup mode” of the Interstage operating environment definition file.

When ”RMP” is specified, it is necessary to refer to the Naming Service of the host in which the OTS system works in order to correctly operate the Resource Management Program. Carry out the setup using either of the following methods:

- Specify ”RMP” and at the same time specify “HOST”, ”PORT” , and ”LOCALE” and carry out setup. In this case, the Naming Service of not the OTS system, but that of the host in which “RMP” was specified will be used. It is then possible to operate separately both the Naming Service of the host in which “RMP” was specified, and that of the host in which the OTS system works.
- After initializing Interstage using *isinit* type3 (Setup Naming Service of the host in which NS Use, NS Host, NS Port Number, and NS work), specify “RMP”, and set up using the *otssetup* command. In this case, the Naming Service of the host in which the OTS system works, and that of the host in which “RMP” is specified, will be shared.

Note

- Sharing the Naming Service of hosts in which “SYS” is specified is not possible. For each Naming Service, one host must exist in which “SYS” is specified. When “RMP” is specified, it is possible to share the Naming Service among multiple hosts.

- When “RMP” is specified, it is not possible to start the OTS system using the *otsstart* command. Starting the Resource Management Program, using the *otsstartrsc* command, can only be performed.

LOGFILE

Windows

Specify the path to the OTS system log file.

Solaris OE Linux

Specify the OTS system log file and the raw device file to be used will be specified.

This item is valid only when “SYS” is set in “MODE”.

Windows

Specify using the absolute path including the drive name. Character strings must be specified. However, use of both upper and lower case characters is possible.

Solaris OE Linux

Specify the character strings excluding spaces beginning with "/".

The maximum length is 255 characters.

Corresponds to the “OTS path for system log” of the Interstage operating environment definition file.

Linux

Point

The following shows how to create a raw device:

1. Create partitions for the raw device.

   Use the *fdisk* command to create partitions.

2. Bind the partitions created.

The following shows an example. # indicates a prompt symbol.

```
# fdisk /dev/sda
Command (m for help): p

Disk /dev/sda: 255 heads, 63 sectors, 1106 cylinders
Units = cylinders of 16065 * 512 bytes

Device Boot   Start    End    Blocks   Id  System
/dev/sda1        1    523   4200997   83  Linux
/dev/sda2      524   1106   4682947+   5  Extended
/dev/sda5      524   1106   4682947   83  Linux

Command (m for help): q
#
#  raw  /dev/raw/raw1  /dev/sda5
```

Binding using the raw command must be executed each time the machine is started. To automate this process:

Describe the parameter passed to the above raw command in /etc/sysconfig/rawdevices.

```
/dev/raw/raw1 /dev/sda5
```

3. Give the read authority to the raw device controller and the disk partitions. Give the read/write partitions to the raw device.

```
# chmod a+r /dev/rawctl
# chmod a+r /dev/sdb1
# chmod a+rw /dev/raw/raw1
```

TRANMAX

Specify the maximum number of the transaction.

It is necessary to surely specify. Moreover, when "RMP" is set as MODE, set up the same value as the OTS system (system by which MODE is "SYS") which cooperates.

A value from 1 to 256 can be specified.

A value from 1 to 1024 can be specified.

Corresponds to the “OTS maximum Transaction” of the Interstage operating environment definition file.

PARTICIPATE

Specify the maximum number of resources permitted to participate in 1 transaction.

Valid only when “SYS” is specified in "MODE".

An integer value in the range of 2 to 32 can be specified. The default value is 4.

Corresponds to the “OTS Participate” of the Interstage operating environment definition file.

OTS_FACT_THR_CONC

Specify the thread concurrency of the OTS system.

Valid only when “SYS” was specified in "MODE".

A value from 1 to 31 can be specified.

The default value is 5.

As many Concurrent interfaces of begin, commit, and rollback and UserTransaction interfaces as specified can be concurrently operated.

Corresponds to the “OTS Multiple degree” of the Interstage operating environment definition file.

When maximum is exceeded, a warning message (ots9013) is output and 31 is set up automatically.

Note

Since the degree of thread multiplex of an OTS system is tuned up so that a transaction processing performance may be pulled out to the maximum extent, it does not need to change a default value.

When you change, set up to maintain the following relations.

```
the degree of thread multiplex of an OTS system =< the degree of multiplex
of a resource control program (*1)
the degree of thread multiplex of an OTS system =< the degree of maximum
multiplex of the transaction of 1 resource control program
```

(*1) Ask for the degree of multiplex in the resource control program for JTS by the following formulas.

```
the degree of process multiplex of the resource control program for JTS :
JTS_RMP_PROC_CONC * the degree of thread multiplex of the resource control
program for JTS : JTS_RMP_THR_CONC
```

OTS_RECV_THR_CONC

Specify the thread concurrency of the recovery program.

Valid only when “SYS” is specified in "MODE".

A value from 1 to 214748367 can be specified.

The default value is 2. Recovery up to the number can be operated simultaneously.

Corresponds to the “OTS Recovery” of the Interstage operating environment definition file.

JTS_RMP_PROC_CONC

Specify the process concurrency of the resource control program for JTS.

A value from 1 to 32 can be specified.

The default value is 5. It is recommended that you specify the number of the resource (databases or resource adapter etc.) to be used If the number is less than or equal to 5, modification of this setting is not necessary.

Corresponds to the “OTS JTSs RMP Multiple degree of Process” of the Interstage operating environment definition file.

When maximum is exceeded, a warning message (ots9013) is output and 31 is set up automatically.

Note

Since the degree of thread multiplex of an OTS system is tuned up so that a transaction processing performance may be pulled out to the maximum extent, it does not need to change a default value.

When you change, set up to maintain the following relations.

```
the degree of thread multiplex of an OTS system =< the degree of multiplex
of a resource control program (*1)
the degree of thread multiplex of an OTS system =< the degree of maximum
multiplex of the transaction of 1 resource control program
```

(*1) Ask for the degree of multiplex in the resource control program for JTS by the following formulas.

```
the degree of process multiplex of the resource control program for JTS :
JTS_RMP_PROC_CONC * the degree of thread multiplex of the resource control
program for JTS : JTS_RMP_THR_CONC
```

JTS_RMP_THR_CONC

Specify the thread concurrency of the resource control program for JTS.

A value from 1 to 2147483647 can be specified.

The default value is 16. Modification of this setting is not usually necessary.

Corresponds to the “OTS JTSs RMP Multiple degree of Thread” of the Interstage operating environment definition file.

Note

Since the degree of thread multiplex of an OTS system is tuned up so that a transaction processing performance may be pulled out to the maximum extent, it does not need to change a default value.

When you change, set up to maintain the following relations.

```
the degree of thread multiplex of an OTS system =< the degree of multiplex
of a resource control program (*1)
the degree of thread multiplex of an OTS system =< the degree of maximum
multiplex of the transaction of 1 resource control program
```

(*1) Ask for the degree of multiplex in the resource control program for JTS by the following formulas.

```
the degree of process multiplex of the resource control program for JTS :
JTS_RMP_PROC_CONC * the degree of thread multiplex of the resource control
program for JTS : JTS_RMP_THR_CONC
```

HOST

Specify the name of the host in which the OTS system operates.

Valid only when “RMS” is specified in MODE.

Set up using a character string of a maximum of 64 characters, starting with an alphabetic character, consisting of alphanumerics, minus symbols, and periods. The string must not end with a minus symbol or period.

This statement can be omitted. When specifying this statement, specify also PORT and LOCALE concurrently.

Refer to MODE for information on how to apply this statement.

Corresponds to the “OTS Host” of the Interstage operating environment definition file.

Note

Do not use this statement if “type3” has been selected in the *isinit* command.

PORT

Specify the port number of CORBA Service of the node in which the OTS system works.

Valid only when “RMP” was specified in MODE.

A value from 1024 to 65535 can be specified.

This statement can be omitted. When this statement is specified, specify also HOST and LOCALE at the same time.

Refer to MODE for information on how to apply this statement.

Corresponds to the “OTS Port” of the Interstage operating environment definition file.

Note

Do not use this statement if “type3” has been selected in the *isinit* command.

LOCALE

Specify LOCALE of the node in which the OTS system works.

Valid only when “RMP” was specified in MODE.

The following three types can be specified.

“SJIS”: ShiftJIS

“EUC”: EUC

“UNICODE”: UNICODE

This statement can be omitted. When it is specified, specify also HOST and PORT at the same time.

Refer to MODE for information on how to apply this statement.

Corresponds to the “OTS Locale” of the Interstage operating environment definition file.

Note

Do not use this statement if “type3” has been selected in the *isinit* command.

RMP Property

The RMP property file is a property file for the resource control program for JTS.

The RMP property file is placed in the C:\INTERSTAGE\ots\etc\RMP.properties.

The RMP property file is placed in the /opt/FSUNots/etc/RMP.properties.

The RMP property file is placed in the /opt/FJSVots/etc/RMP.properties.

Moreover, a RMP property is the form of the property list of Java, and can also set up other keys. The set-up key and a value are reflected to the system property of JavaVM with which the resource control program for JTS operates.

```
RecoveryTarget=target1 target2 ...
```

Note

At the time of a RecoveryTarget abbreviation, recovery processing is not performed at the time of resource control program starting for JTS.

RecoveryTarget

Specify the resource definition name for a recovery target that is to be recovered at JTS startup. If the recovery target is not specified, recovery processing is not executed even after re-starting the JTS resource control program. When there is more than one recovery target, insert a blank between each target.

When there are three recovery targets:

```
RecoveryTarget=Oracle_resource1 Oracle_resource2 Oracle_resource3
```

JavaPath

Description is added when required. Usually, please do not specify. When specified, there is no guarantee of operation.

JavaCommandOption

Description is added when required. Usually, please do not specify. When specified, there is no guarantee of operation.

ClassPath

Description is added when required. Usually, please do not specify. When specified, there is no guarantee of operation.

When you use a cluster service function, please set up the path to the class library which is needed in order to cooperate with a resource. Refer to "from creation of a resource control program to starting" for the detailed contents about a class library in the Distributed Application Development Guide (Database Linkage Service Edition).

Resource Definition File

It is the file which defines the information for connecting with the resources (a database, resource adapter, etc.) with which OTS and JTS cooperate. It registers per resource using the otssetrsc command.

It defines as the form of a "key = value."

Resource definition file for OTS

```
# Environment variable
ENVIRON ORACLE_SID=orac
# Database system name to be used An OPENINFO character sequence, CLOSEINFO
character sequence
NAME=oracle_rmp_thread
RMNAME=Oracle_XA
OPENINFO=Oracle_XA+Acc=p/system/manager+SesTm=0+Threads=true
CLOSEINFO=
```

Resource definition file for JTS

```
# database1
 name=xads1
 rscType=JTS
 type=JDBC
 lookUpName=jdbc/XADataSource
 initialContextFactory=com.sun.jndi.fscontext.RefFSContextFactory
 providerURL=file:/tmp/JNDI
 user=dbuser
 password=dbpass
 logfileDir=c:\interstage\ots\var
```

Resource definition file for OTS

```
# Environment variable
ENVIRON ORACLE_SID=orac
ENVIRON ORACLE_HOME=/opt/oracle
ENVIRON LD_LIBRARY_PATH=/opt/oracle/lib
# Database system name to be used An OPENINFO character sequence, CLOSEINFO
character sequence
NAME=oracle_rmp_thread
RMNAME=Oracle_XA
OPENINFO=Oracle_XA+Acc=p/system/manager+SesTm=0+Threads=true
CLOSEINFO=
THREADS=TRUE
```

Resource definition file for JTS

```
# database1
 name=xads1
 rscType=JTS
 type=JDBC
 lookUpName=jdbc/XADataSource
 initialContextFactory=com.sun.jndi.fscontext.RefFSContextFactory
 providerURL=file:/tmp/JNDI
 user=dbuser
 password=dbpass
 logfileDir=/opt/FSUNots/var
```

Linux

Resource definition file for OTS

```
# Environment variable
ENVIRON ORACLE_SID=orac
ENVIRON ORACLE_HOME=/opt/oracle
ENVIRON LD_LIBRARY_PATH=/opt/oracle/lib
# Database system name to be used An OPENINFO character sequence, CLOSEINFO
character sequence
NAME=oracle_rmp_thread
RMNAME=Oracle_XA
OPENINFO=Oracle_XA+Acc=p/system/manager+SesTm=0+Threads=true
CLOSEINFO=
THREADS=TRUE
```

Resource definition file for JTS

```
# database1
 name=xads1
 rscType=JTS
 type=JDBC
 lookUpName=jdbc/XADataSource
 initialContextFactory=com.sun.jndi.fscontext.RefFSContextFactory
 providerURL=file:/tmp/JNDI
 user=dbuser
 password=dbpass
 logfileDir=/opt/FJSVots/var
```

Point

Although the name of a key has the difference between a capital letter and a small letter by OTS and JTS, it has the same meaning.

ENVIRON

The environment variable env passed to the database library which operates within the same process as a resource control program or a resource control program is set as a value data. It is omissible.

Please specify the same environment variable as the environment variable to the database specified at the time of starting of the server application which uses a resource control program.

Moreover, $ specification cannot be carried out to a resource definition file like LD_LIBRARY_PATH=$LD_LIBRARY_PATH:/opt/oracle/lib.

When the database to be used is Symfoware/RDB, please specify the path name of the library which is the indispensable product of Symfoware/RDB to be environment variable LD_LIBRARY_PATH.

NAME

When registered by the *otssetrsc* command, it is registered as a resource definition name indicated here. It becomes possible to treat all the resource definition files registered at once by the resource definition name. It is necessary to describe a resource definition name within 32 characters.

Since "JTSRMP" is a reservation word, it cannot be used for a resource definition name (it cannot be used even if it makes a part or all into a small letter).

Specify the "definition name" of the resource used as the candidate for connection registered by J2EE resource access definition in the resource definition file for JTS. For details, please refer to the J2EE User's Guide.

It is not omissible.

RMNAME

The system name of a database is specified to be system_name. In Oracle, in "Oracle_XA" and Symfoware/RDB, in "RDBII" and in SQL Server , in "XA_MQD" and in MQD, in "MS_SQL_Server" .

The system name of a database is specified to be system_name. In Oracle, in "Oracle_XA" and Symfoware/RDB, in "RDBII" and, in "XA_MQD" and in MQD .

OPENINFO

When it opens the database which the vender of a database opens to open_data, a required open character sequence is specified.

open_data is specified by 256 or less characters.

Refer to the manual of each database about the contents to specify.

Note

If there is no access authority over each database, starting of a resource control program will fail in the user name specified to be OPENINFO. Please refer to the manual of each database about required authority.

Since the starting of a resource control program may incorrectly-operate when the type in process mode and thread mode is different at the time of resource control program creation and operation (thread specification in a resource definition file), please be sure to apply in accordance with a type.

CLOSEINFO

When it closes the database which the vender of a database opens to close_data, a required close character sequence is specified.

open_data is specified by 256 or less characters.

Refer to the manual of each database about the contents to specify.

THREADS

A resource control program specifies process mode (FALSE) and thread mode (TRUE). It is set to FALSE (process mode) when it omits.

OTS_RMP_PROC_CONC

The multiplex number of the resource control program for OTS is specified. When it omits, it becomes the degree 5 of multiplex. Usually, it is not necessary to change. When specifying, specifying in 1-31 is possible.

When maximum is exceeded, a warning message (ots9017) is outputted and 31 is set up automatically.

Note

Since the degree of multiplex of a resource control program is tuned up so that a transaction processing performance may be pulled out to the maximum extent, it does not need to change a default value.

When you change, please set up the relation between the degree of thread multiplex of an OTS system, and the degree of multiplex of a resource control program as follows.

```
the degree of thread multiplex of an OTS system  =< the degree of multiplex
of a resource control program
```

RSCTYPE

The classification of a resource definition file is specified. When using OTS, "OTS" is specified, and "JTS" is specified when using JTS. "OTS" is specified when it omits.

type

When you connect with a database using JDBC, please specify "JDBC" or "DBMS" (the specification method in the old version). Please specify "JCA", when you connect with a resource adapter using J2 EE Connector Architecture. It is not omissible.

lookupName

When connecting with a database using JDBC, the name which bound the data sauce which a database offers is specified. Please specify the same value as the data sauce name set up by the J2EE resource access definition.

initialContextFactory

The initialContextFactoruy name used when referring to the bound data sauce is specified. Please specify the same value as the class name set up by the J2EE resource access definition. It is indispensable only when connecting with a database using JDBC.

providerURL

Provider URL used when referring to the bound data sauce is specified. Please specify the same value as the class name set up by the J2EE resource access definition. The initialContextFactoruy name used when referring to the bound data sauce is specified. It is indispensable only when connecting with a database using JDBC.

USER

A database administrator's user name is specified. When it omits, it comes to start by a superuser's authority. When -u option is specified at the time of otssetrsc command execution, the user name specified to be an option becomes effective. It is necessary to specify it as "GROUP" simultaneously.

user

In case it connects with a resource, it specifies, when a user name is required. Please specify the user name set up by J2EE resource access definition.

password

In case it connects with a resource, it specifies, when a password is required. Please specify the user name set up by J2EE resource access definition.

GROUP

A database administrator's group name is specified. When it omits, it comes to start by a superuser's authority. When -g option is specified at the time of *otssetrsc* command execution, the group name specified to be an option becomes effective. It is necessary to specify it as "USER" simultaneously.

logfileDir

When you conduct trouble investigation of the connected resource, please specify the directory which extracts a trace log. Please do not add separator to the last of a directory name. Usually, it does not specify.

Appendix D

Event Service Environment Definition

This appendix describes the Event Service operating environment.

Each file is stored as follows:

Storage directory

Windows

(Default installation path)

```
C:\Interstage\eswin\etc
```

Solaris OE

(Default installation path)

```
/etc/opt/FJSVes
```

Linux

```
/etc/opt/FJSVes
```

Files

traceconfig

Note:

Files other than the above-mentioned files cannot be customized as the Event Service environment definition. Do not edit files other than those listed above using an editor or similar.

traceconfig

Overview

The *traceconfig* file contains the definition related to the Event Service trace operating environment.

File Name

Windows

(Default installation path)

```
C:\Interstage\eswin\etc\traceconfig
```

Solaris OE

(Default installation path)

```
/etc/opt/FJSVes/traceconfig
```

Linux

```
/etc/opt/FJSVes/traceconfig
```

File Contents

Format

In the *traceconfig* file, values are specified in the following format.

Parameter name = value set

Parameters

Parameter values can be modified for the following operating environments:

Notes

- The parameter value changes made in the environment definition file take effect from the next startup of the Event Service.

Table D-1 Parameter and Meaning

Parameter	Initial value Specifiable range	Meaning
trace_size	1024 512 - 102400	Specifies the size of the buffer used to collect trace information in kilobytes. (See Note 1)
trace_file_number	50 50 - 1000	Specifies the maximum number of trace information files to be collected. If the number of trace information files exceeds the specified number, old trace information files are overwritten.
trace_auto	yes yes, no	Specifies whether to enable automatic collection of trace information. yes: Enables automatic collection of trace information. no: Disables automatic collection of trace information.

Note 1:

The size of trace information to be collected varies depending on the numbers of channels, consumers, suppliers, and communication frequency.

The size of the trace information buffer used for each type of processing is shown below.

- Start processing

  Event channel start processing: 3.2 KB
  Supplier start processing (until a push method is issued): 1.0 KB
  Consumer start processing (until a pull method is issued): 1.0 KB
- Communication processing

  push method: 0.8 KB
  pull method (reception successful): 1.2 KB
  pull method (COMM_FAILURE[minor=0x464a09c1]): 1.0 KB
- Stop processing

  Event channel stop processing: 3.4 KB
  Supplier disconnect processing: 0.5 KB
  Consumer disconnect processing: 0.8 KB

The following shows an example of calculation for operation with the default value set for the trace information buffer size.

Example: One channel with the number of consumers equal to the number of suppliers

One cycle of push-pull communication requires 2.0 KB (0.8 KB + 1.2 KB) of buffer size.

Because the trace information buffer is used half by half cyclically, the buffer (1024 KB) can contain 256 sets of communication trace information.

("Trace information buffer size" / 2) / "buffer size required for one cycle of communication"

= (1024 KB / 2) / 2.0 KB = 256

Suppose one cycle of communication is performed every 40 seconds, then communication for about 2.8 hours can be logged.

256 x 40 s = 10240 s = about 2.8 h

The above example can collect trace information for about 2.8 hours until an event that triggers automatic collection of trace information occurs.

Specify the size of the trace information buffer so that it can collect trace information for at least five minutes.

If the default size of the trace information buffer is changed, utilization of shared memory increases as much as the buffer size (in units of kilobytes).

Appendix E

Web Server (Interstage HTTP Server) Environment Definition

The Interstage HTTP Server operating conditions can be tuned in two ways:

1. Make setting changes from the Interstage Management Console
2. Make settings changes in the Interstage HTTP Server environment definition file (httpd.conf).

To make settings using the Interstage Management Console, start the Interstage Management Console and log in. Select [Services] > [Web Server] > [Web Server Setting] tab on the [Web Server: Web Server Status] screen, and then [Web Server: Web Server Setting] (Detailed Settings [Show]) screen. Use this screen for setting. For information on starting the Interstage Management Console, refer to the Operator's Guide. For information on the definition detail functionality of the Interstage Management Console, refer to Interstage Management Console's Help.

This appendix explains how to define the environment definition file (httpd.conf).

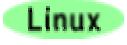
The environment definition file of the Interstage HTTP Server is stored in the following:

(Default installation path)

```
C:\Interstage\F3FMihs\conf\httpd.conf
```

(Default installation path)

```
/etc/opt/FJSVihs/conf/httpd.conf
```




```
/etc/opt/FJSVihs/conf/httpd.conf
```

Tuning the Maximum Number of Simultaneous Accesses

Setting the Timeout Time

Set the timeout time by editing the following directive in the environment definition file (httpd.conf).

Timeout seconds

Specifies the time Interstage HTTP Server waits when the data packet is sent and received between clients. Specify a value from 0 to 65535 seconds.

When the packet cannot be received even if reaching at the specified time, the Interstage HTTP Server closes the connection. When traffic on the connected network increases, and the connection closes frequently, increasing this time will decrease the number of closed connections.

The default value is 300.

Setting the HTTP Keep-Alive Function

To set the HTTP Keep-Alive function, edit the following directive in the environment definition file (httpd.conf).

KeepAlive On|Off

With the Interstage HTTP Server, a continuous between clients of a Web browser etc. can be kept.

If "Off" is specified, the connection is closed whenever a request is completed, and reconnected for the next request.

However, if "On" is specified the client response time improves as the connection is not closed after each request.

The default value is "On. "

KeepAliveTimeout seconds

The number of seconds that Interstage HTTP Server will wait for a subsequent request before closing the connection is specified. This directive can be used only for "KeepAlive On". A value from 0 to 65535 can be specified for the connection keep-alive time. The connection is closed when there is no new request after this time elapses.

The default value is 15.

Setting the Number of Clients that can be Connected Concurrently

To set the number of clients that can be connected concurrently, edit the following directive in the environment definition file (httpd.conf).

Windows

ThreadsPerChild number

The maximum number of requests that Interstage HTTP Server can accept from a Web browser at the same time is specified.

The specifiable range is from 1 to 2048. The default value is 50.

The larger the value specified, the more concurrent access requests can be accepted, but also more memory resources or temporary files are used which may affect system performance.

Solaris OE Linux

MaxClients number

The maximum number of requests that Interstage HTTP Server can accept from a Web browser at the same time is specified.

The specifiable range is from 1 to 4096. The default value is 150.

The larger the value specified, the more concurrent access requests can be accepted, but also more memory resources or temporary files are used which may affect system performance.

Appendix F

InfoDirectory Environment Settings

Structure of InfoDirectory

InfoDirectory executes a number of processes in the course of carrying out processing. Passing of data between processes is performed using IPC resources.

Also, the definition information for starting each process is set in the environment variables and the DSA definition information.

Therefore, tuning is necessary because the shortage of resources may occur if many client access to InfoDirectory concurrently.

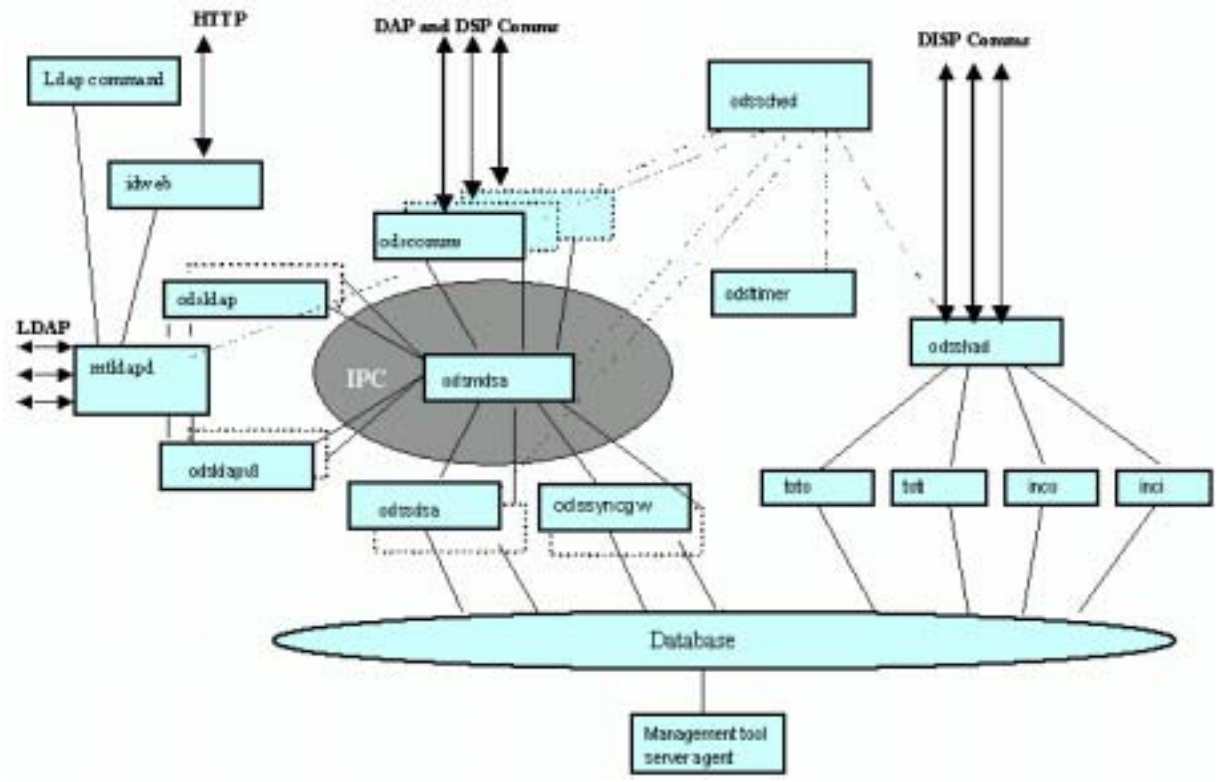


Figure F-1 Structure of InfoDirectory

LDAP : Lightweight Directory Access Protocol

DAP : Directory Access Protocol

DSP : Directory System Protocol

DISP : Directory Information Shadowing Protocol

Cases in which Tuning is Required

Although it is not applied in all cases, in the following cases, tuning is needed.

Note that the DSA must be restarted after tuning is performed.

- Tuning about the maximum number of concurrent connections

Solaris OE

When the number of the maximum concurrent connection exceeds 100 clients

Windows

When the number of the maximum concurrent connection exceeds 16 clients

- Tuning about searching a lot of entries

  When you want to get the data of 300 or more entries by one search request

- Tuning about timeout

Tuning Maximum Number of Concurrent Connections

It's necessary to tune up the following parameters.

Note that it is necessary that an estimation of the maximum number of concurrently connected clients be made in advance.

Maximum Concurrent Connections Exceed 16 Clients Solaris OE

Environment Variables

Specify the following environment variables, referring to Environment Variables.

Further, these environment variables must be specified before starting DSA.

Note that for cases in which these environment variables are not set as the environment variables of the system root user, they do not become valid if the DSA is started using the Administration Tool.

In this case, start DSA using the command line.

- IP_MX_CALL
- INFODIR_MAX_CLIENTS

IPC Message Queues

Set the following environment variables, referring to IPC Message Queues.

Note that the system must be rebooted and DSA started after the kernel parameters have been set.

- MSGMNB
- MSGSSZ
- SGTQL
- MSGSEG

Network Parameters (Database Configuration)

Refer to "2.4.4.2 [Network Parameters] Dialog" of the "InfoDirectory User's Guide Part 2 Administration Tool". Set the Associated Maxima DAP parameter according to the description provided in Network Parameters.

DAP

Sample Specification (Maximum Number of Concurrently Connected Clients: 256)

1. Environment Variables

Table F-1 Environment Variables

Setting item	Parameter	Value
The number of the maximum concurrent connection clients	IP_MX_CALL	256
	INFODIR_MAX_CLIENTS	256

Before starting the DSA, specify the environment variables shown above.

When the DSA is to be started by means of the user shell command, specify the settings in the same manner as shown in the following example:

```
#!/bin/sh
# Set environment variable
IP_MX_CALL=256
export IP_MX_CALL
INFODIR_MAX_CLIENTS=256
export INFODIR_MAX_CLIENTS
   .
   .
# Change to the DSA Directory
cd /dsa-directory
# Start DSA
odsstart
```

2. IPC Message Queues (Solaris Kernel Configuration Parameter)

Table F-2 IPC Message Queues (Solaris Kernel Configuration Parameter)

Setting item	Parameter	Value
Maximum number of bytes for the message queue	MSGMNB	256,000
Message segment size	MSGSSZ	32
Number of message headers	MSGTQL	1,024
Number of message segments	MSGSEG	32,000

a) Specify the values for the above settings in the /etc/system file

```
#view /etc/system
* InfoDirectory configuration information:
set msgsys:msginfo_msgmnb=256000
set msgsys:msginfo_msgssz=32
set msgsys:msginfo_msgtql=1024
set msgsys:msginfo_msgseg=32000
```

b) Re-confirm that there are no mistakes in the changes to the settings of the kernel parameter

```
#grep set /etc/system
set msgsys:msginfo_msgmnb=256000
set msgsys:msginfo_msgssz=32
set msgsys:msginfo_msgtql=1024
set msgsys:msginfo_msgseg=32000
```

c) Reboot the system.

While the kernel is being automatically configured, the syntax of the /etc/system file is analyzed, and the parameter values specified in the file are overwritten with the default values.

3. Network Parameters(Database Configuration)

Refer to "2.4.4.2 [Network Parameters] Dialog" of the "InfoDirectory User's Guide Part2 Administration Tool". Set the Associated Maxima DAP parameter to 256.

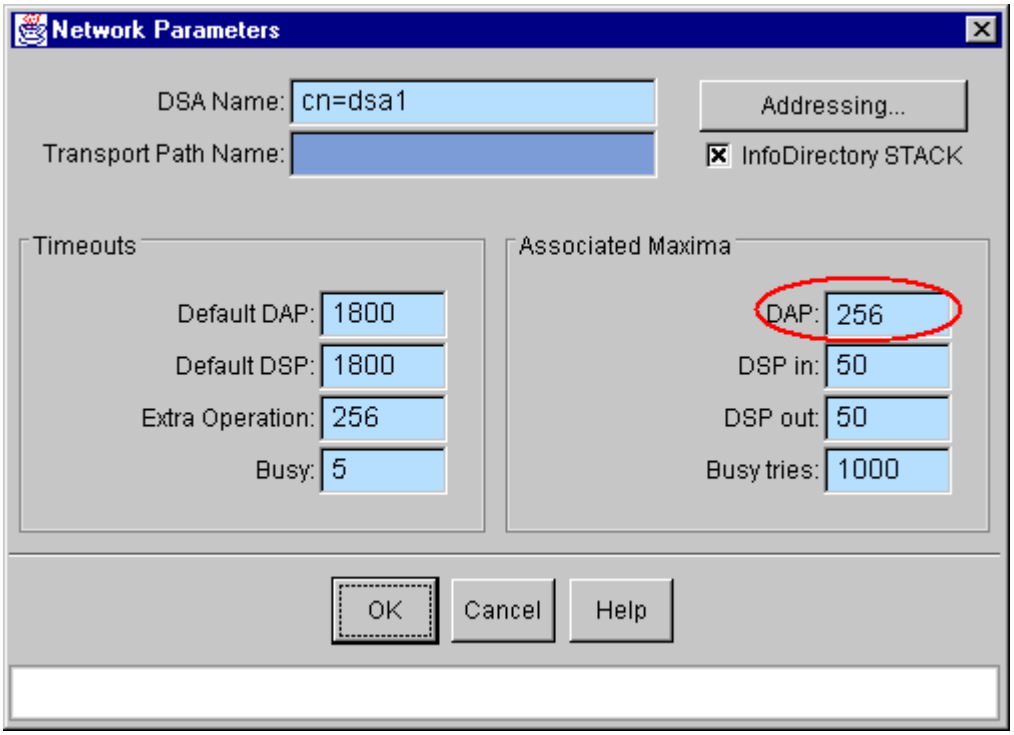


Figure F-2 Network Parameters

Maximum Concurrent Connections Exceed 100 Clients Windows

It is necessary to tune up the following parameters.

Environment Variables

Specify the following environment variables, referring to Environment Variables.

Further, these environment variables must be specified before starting DSA

- IP_MX_CALL
- INFODIR_MAX_CLIENTS

IPC Message Queues

Refer to "4.11.2 Advanced Configuration" of the "InfoDirectory User's Guide Part 1 Directory Service". Set the Maximum Msgs Per IPC Queue parameter according to the description provided in IPC Message Queues.

- Maximum Msgs Per IPC Queue (Maximum number messages per IPC queue)

Network Parameters (Database Configuration)

Refer to "2.4.4.2 [Network Parameters] Dialog" of the "InfoDirectory User's Guide Part 2 Administration Tool". Set the Associated Maxima DAP parameter according to the description provided in Network Parameters.

- DAP

Sample Specification (Maximum Number of Concurrently Connected Clients: 512)

1. Environment Variables

Table F-3 Environment Variables

Setting item	Environment variable	Value
The number of the maximum concurrent connection clients	IP_MX_CALL	512
	INFODIR_MAX_CLIENTS	512

Specify the values of the above environment variables in the Windows server system environment variables settings.

Table F-4 Environment Variables

Variables	Values
IP_MX_CALL	512
INFODIR_MAX_CLIENTS	512

2. Property

Table F-5 Property

Tab	Parameter	Value
Advanced Configuration	Maximum Msgs Per IPC Queue	1,706

Refer to "4.11.2 Advanced Configuration" of the "InfoDirectory User's Guide Part1 Directory Service". Set the Maximum Msgs Per IPC Queue parameter to 1706.

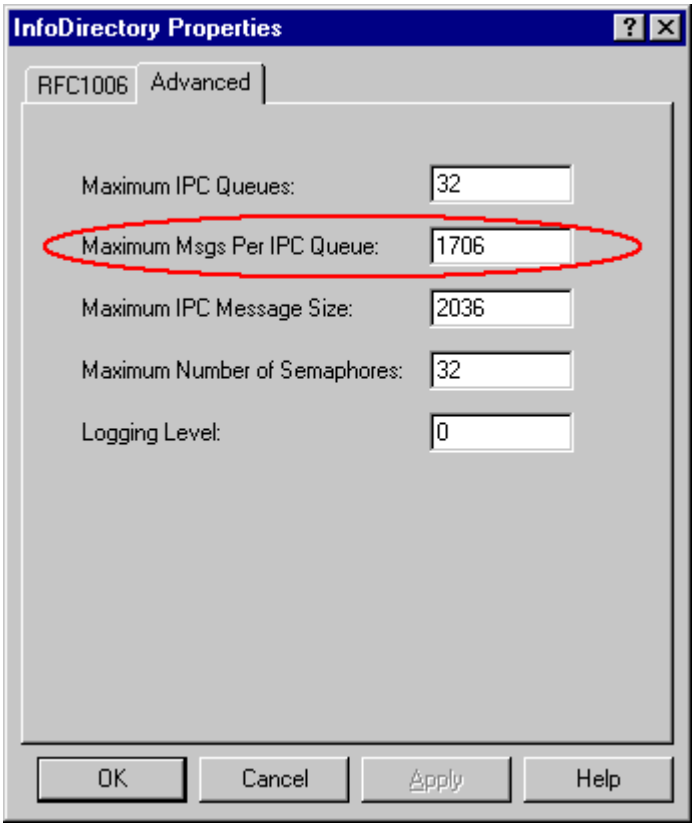


Figure F-3 InfoDirectory Properties

3. Network Parameters (Database Configuration)

Refer to "2.4.4.2 [Network Parameters] Dialog" of the "InfoDirectory User's Guide Part 2 Administration Tool". Set the Associated Maxima DAP parameter to 512.

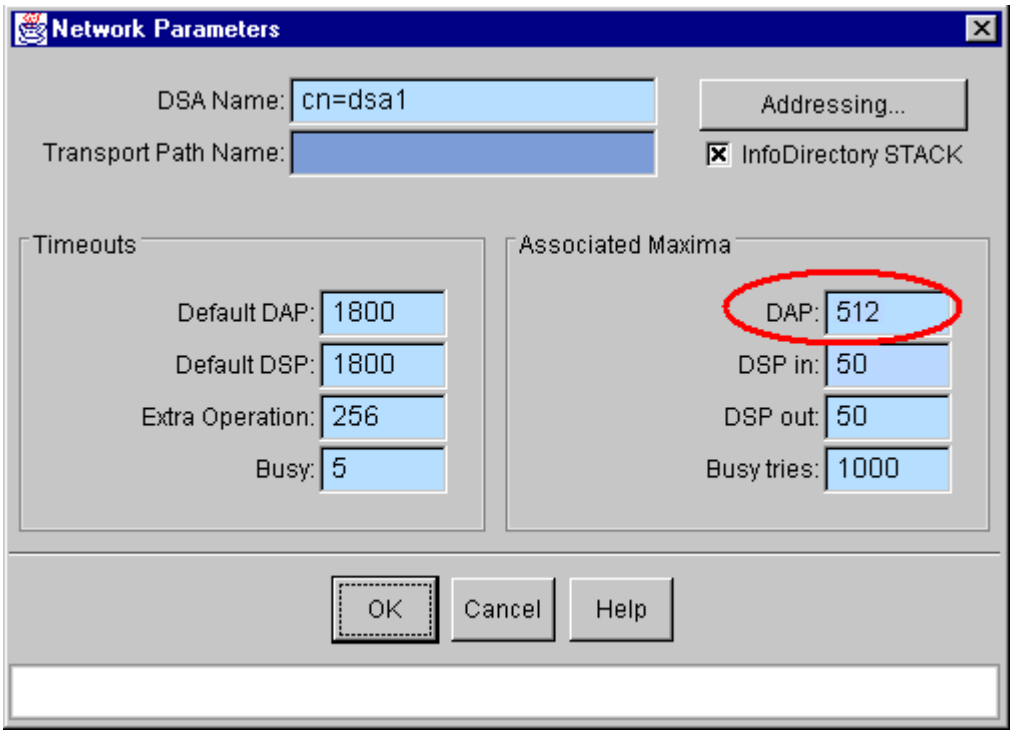


Figure F-4 Network Parameters

Search Many Entries

Search Request for more than 300 Entries

It is necessary to tune up the following parameters.

Note that an estimate of the maximum number of searches to be performed during operation must be made in advance.

Environment Variables

Set the following environment variables, referring to Environment Variables.

Further, these environment variables must be specified before starting DSA

```
MAXAPDUOUT
```

Directory Configuration Parameters (Database Configuration)

Refer to "2.4.4.1 [Directory Configuration] Dialog" of the "InfoDirectory User's Guide Part 2 Administration Tool". Set the Admin Limits Size limit and Time Limit parameters according to the description provided in Directory Configuration Parameters.

- Size limit (Admin Limits)
- Time Limit (Admin Limits)

It is not mandatory that the Time Limit parameter be modified, however, if it becomes impossible to perform a search, reset the present setting to a larger value.

Sample Specification (When 10,000 Entries are to be Retrieved)

For a case in which the size of each entry is 300 bytes:

(When the search cannot be performed using the following settings, set an even larger value.)

1. Environment Variables

Table F-6 Environment Variables

Setting item	Environment variable	Value
Maximum size of the reception data protocol	MAXAPDUOUT	4400

The above environment variables must be specified before the DSA is started.

Solaris OE

When the DSA is to be started by means of the user shell command, specify the settings in the same manner as shown in the following example.

```
#!/bin/sh
# Set environment variablre
MAXAPDUOUT=4400
export MAXAPDUOUT
   .
   .
# Change to the DSA Directory
cd /dsa-directory
# Start DSA
odsstart
```

Windows

Specify the values of the above environment variables in the Windows server system environment variables settings.

Table F-7 Environment Variables

Variable	Value
MAXAPDUOUT	4400

2. Directory Configuration (Database Configuration)

Table F-8 Directory Configuration

Setting item	Parameter	Value
Directory Configuration（Admin Limits	Size Limit	10000
	Time Limit	600

Refer to "2.4.4.1 [Directory Configuration] Dialog" of the "InfoDirectory User's Guide Part2 Administration Tool". Set the Admin Limits Size Limit and Time Limit parameters to the values shown above.

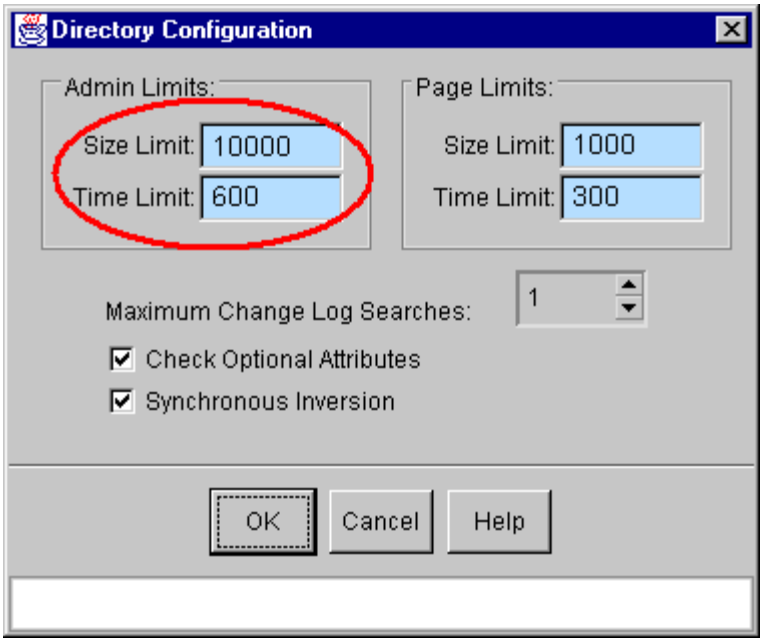


Figure F-5 Directory Configuration

If other accesses are performed while performing all-entry reference, when a LDAP error code: DSA is unavailable (0x34) will be notified

During all entry (Tens of thousands of entries) reference, if other accesses are performed, a LDAP error code: DSA is unavailable (0x34) may be notified to the BIND demand of the access.

In such a case, it is necessary to set up the following environment variables. Refer to Environment Variables for the details of a setup.

```
INFODIR_IPCBIND_RETRY
```

Tuning Timeout

A session can be forcibly terminated if communications with the client has not occurred over a predetermined period of time during the session. The default setting is 60 minutes (3,600 seconds).

Add the –t option to the mtldapd line in the exec file of the DSA directory, and then start DSA.

Note that the addition of the –t option is performed using the text editor.

Specify the timeout time in the -t option.

```
1r mtldapd -n -t TIME
```

When performing the above-described tuning, set the values of the Timeouts Default DAP parameter so that the following conditions are satisfied:

```
TIME < Default DAP
Default DAP = TIME * 1.5-2 times
```

The following is an example where 15 minutes (900 seconds) has been set.

Example:

```
1r mtldapd -n -t 900
```

Tuning Parameters

Environment Variables

Table F-9 Environment Variables to be Tuned

No	Environment Variable	Description	Default	Range min-max
1	IP_MX_CALL	Specifies the number of the IPC management table used between odsmdsa-odssdsa.	256	1-2048
2	MAXAPDUOUT(Kbyte)	DSA specifies the maximum size of the transmission protocol data that can be transmitted by DAP/DSP.	1024	1-2097151
3	MAXAPDUIN(Kbyte)	DSA specifies the maximum size of the transmission protocol data that can be transmitted by DAP/DSP.	1024	1-2097151
4	MAXSEARCH(entry)	Specifies the maximum number of entries retrievable when search is performed using an index.	102400	1-2147483647
5	INFODIR_MAX_CLIENTS	Specifies the maximum number of clients that can be connected.	256	8-2048
6	INFODIR_IPCBIND_RETRY(Number of times)	The number of times of Bind-ReTry between odsldap or odsldapv3, and odsmdsa is set up.	5	0-2147483647

The details of each environment variable are described below.

IP_MX_CALL

Specifies the IPC management table used between dsmdsa-odssdsa.

When access is performed using the LDAP and DSP protocols, a respective table is used for each protocol. When operation is performed using only a single directory server, because access is performed only by LDAP, the maximum number of clients is specified as a criterion in this parameter.

When DSA is chained with a number of DSA (DSP), the number of chaining definitions is added is added to the maximum number of clients. The chaining definition refers to the number added when chaining from one's DSA to a counterpart DSA and when chaining from a counterpart DSA to one's DSA.

```
IP_MX_CALL = INFODIR_MAX_CLIENTS + chaining definition number
```

MAXAPDUOUT (MAXimum Association Protocol Data Unit OUT)

DSA specifies the maximum transmission protocol data size that can be transmitted by DAP/DSP. The specification unit is kilobytes. If access is performed by LDAP, because the access is finally performed by DAP, tuning is required.

```
MAXAPDUOUT = 1 entry size * number of hits per search * approximately 1.5
```

MAXAPDUIN (MAXimum Association Protocol Data Unit IN)

DSA specifies the maximum transmission protocol data size that can be transmitted by DAP/DSP. The specification unit is kilobytes.

When registering an entry such as a CRL (Certificate Revocation List) entry or the like in which the size of one entry exceeds 1MByte, tuning is required.

MAXSEARCH

Specifies the maximum number of entries that can be processed for a search performed using an index. If this limit is exceeded, 0x0b(admin limit exceeded) is outputted as an LDAP error code.

Note that, because the maximum number of entries retrieved when a search is performed is also restricted by the Size Limit parameter, if the number of entries exceeds 102,400 entries, MAXSEARCH and Size Limit must be modified.

Further, because time required to perform the search becomes longer if the number of entries becomes large, the Time Limit must be modified.

INFODIR_MAX_CLIENTS

Specifies the maximum number of clients that can be concurrently connected.

INFODIR_IPCBIND_RETRY

The number of times of Retry when BIND between odsldap or odsldapv3 - odsmdsa goes wrong is set up. In one BIND processing, waiting is performed for 30 seconds. For example, when "0" is set up, ReTry processing is not performed even if waiting of 30 seconds goes wrong. Default 5 performs waiting for 180 seconds (for 3 minutes).

IPC Message Queues

The parameters to be specified differ for Solaris and Windows.

Solaris OE

On Solaris, the IPC kernel parameter must be changed.

The IPC kernel parameter setting value is calculated according to the following procedure.

Explanation of the IPC kernel parameter and equation for deriving the value of the parameter:

1. The calculation of the maximum number of clients that can be concurrently connected is derived based on the calculation of the MSGMNB. This calculation is used to obtain the amount of buffer resources required for IPC messages by the system.
2. Obtain MSGSEG.
3. Obtain MSGSSZ.

An explanation of each IPC parameter and the respective equation for deriving its value is shown below.

MSGMNB

(Meaning): Specifies the maximum number of bytes that can be used per message queue.

(Setting value): In InfoDirectory, the maximum size (msgsnd) per transmission is approximately 1,000 (984) bytes.

```
MSGMNB = maximum number of clients that can be connected concurrently * 1,000
```

MSGSSZ

(Meaning): The size of one segment. The buffer region used by IPC for a message queue is divided into segments.

(Setting value): In InfoDirectory, because the maximum size (msgsnd) per transmission is 24 bytes, the lowest value is set as 24.If it is not possible to secure an region for the MSGMNB portion at the smallest 24 byte value, a value at which the region can be secured must be specified. However, the value specified must be a multiple of 4.

Further, when 256 clients or more concurrently access the system (MSGSEG exceeds 32,767), the following equation applies.

```
MSGSSZ  >=  (MSGMNB * 4) / 32,767 (multiple of 2)
```

MSGSEG

(Meaning): Maximum number of segments.

(Setting value): MSGMNB and MSGSSZ, and MSGSEG are related as follows.

```
MSGMNB = (MSGSSZ * MSGSEG) / 4
Accordingly, MSGSEG can be obtained by the following equation.
MSGSEG = (MSGMNB * 4) / MSGSSZ
```

Note that in InfoDirectory, because the maximum value is reached very quickly as the number of clients connected increases, the setting is to be set at the maximum value for the number of segments: 32,767.

MSGTQL

(Meaning): Message heading number. One header is used per message.

(Setting value): In InfoDirectory, because four messages are used when one client connects, the number is quadrupled.

```
MSGTQL = maximum number of clients that can be connected concurrently * 4
```

MSGMNI

(Meaning): Number of message queues used in the system.

(Setting value): In InfoDirectory, 5 are used.

The default value does not require tuning.

MSGMAP

(Meaning): The table number managing the name message map.

(Setting value): The default value does not require tuning.

MSGMAX

(Meaning): Maximum length of one message.

(Setting value): Because the maximum length of an InfoDirectory message (984 bytes) is less than that of the default value (2,048 bytes), tuning is not required.

Required Memory (Kernel Memory)

Use the following equation to obtain the required memory.

```
msgseg * msgssz  +
msgmap * 8 (map structure)  +
msgmni * 112 (msgds_id structure)  +
msgmni * 4 (msglock structure)  +
msgtql * 12 (msg structure)
```

If the value obtained according to the above equation is within 25% of the kernel memory, the kernel memory is correctly assigned after rebooting the computer and starting DSA.(This is checked by the OS.)

In the case that the obtained value is more than 25%, the DSA will not start and a core dump is generated; therefore it is necessary to provide the system with enough memory so that the value obtained according to the above equation is within 25% of the kernel memory.

Solaris OE

Settings on Solaris8 OE

On Solaris8 OE, because the segment size (MSGSSZ) and maximum number of segments (MSGSEG) parameters have been done away with, no setting is required.

Up through Solaris7, the kernel memory has been assigned on the basis of these two parameters when the module is loaded; however, from Solaris8 onward, because memory is assigned dynamically when a message is transmitted, it is unnecessary to set the parameters.

Also, the 25% limit on the IPC resources occupied by the kernel memory is eliminated. However, the calculations must be performed to obtain the value of the MSGMNB.

Windows

Refer to "4.11.2 Advanced Configuration" of the "InfoDirectory User's Guide Part1 Directory Service". Calculate the Maximum Msgs Per IPC Queue parameter using the following equation.

```
Maximum Msgs Per IPC Queue = (maximum number of concurrently connectable clients
/ 3) * 10
```

Network Parameters

Table F-10 Network parameters that can be Tuned

Parameter		Description	Default	Range min-max
Associated Maxima	DAP	Specifies the maximum number of sessions when access is performed by DAP. When access is performed by LDAP, the final connection is carried out by DAP.	100	0-2147483647
	DSP in	Specifies the maximum number of sessions by another DSA by means of DSP (chaining).When DSP (chaining) is not used, tuning is not required.	50	0-2147483647
	DSP out	Specifies the maximum number of sessions by another DSA by means of DSP (chaining).When DSP (chaining) is not used, tuning is not required.	50	0-2147483647
	Busy tries	Specifies the number of times the attempt to connect is to be retried when a session to another DSA by means of DSP (chaining) has failed to be established. When DSP (chaining) is not used, tuning is not required.	1000	0-2147483647
Timeouts	default DAP	Specifies the session timeout (in sec) for a session established by DAP. If there is no access whatsoever to the DSA within the specified time limit, a timeout occurs and the DAP session is abandoned. Note: Session timeout monitoring is also performed in the LDAP process. Therefore, when the DAP session is abandoned first, an inconsistency occurs with the LDAP session. Perform tuning in accordance with the conditions described in section 5., Timeout related tuning.	1800	0-2147483647

Parameter		Description	Default	Range min-max
	default DSP	Specifies the session timeout (in sec) for a session established by DSP from another DSA. If there is no access whatsoever within the specified time limit, a timeout occurs and the DSP session is abandoned. When DSP (chaining) is not used, tuning is not required.	1800	0-2147483647
	extra operation	Specifies the internal processing time limit (in sec) for processes other than authentication by DAP and DSP, or search requests. No tuning is required.	256	0-2147483647
	busy	Specifies the interval at which connection retries are to be performed when a session fails to be established by connecting to another DSA by DSP. When DSP (chaining) is not used, tuning is not required.	5	0-2147483647

Directory Configuration Parameters

Table F-11 Directory Configuration parameters that can be tuned

Parameter		Description	Default	Range min-max
Admin Limits	Size Limit	Specifies the maximum number of searches that can be performed when searching from the directory server side.(Number of searches)	300	1-2147483647
	Time Limit	Specifies the response time limit at the directory server side with respect to a request from a client.(Number of sec)	120	1-2147483647
Page Limits	Size Limit	Specifies the maximum number of searches that can be performed when searching by means of the paging function from the directory server side.(Number of searches) This parameter has no relevance to cases in which paging and server sorting are not used.(Number of searches)	1000	1-2147483647

Parameter		Description	Default	Range min-max
	Time Limit	Specifies the timeout time (sec) for the case where a search is performed using the paging function. This parameter has no relevance to cases in which paging and server sorting are not used.	300	1-2147483647

Maximum Number of Concurrently Connected Clients Parameters

Table F-12 Environment variable and Network Parameter

OS common environment variable	Maximum number of concurrently connected clients					Default
	64	128	256	512	1024	
INFODIR_MAX_CLIENTS	64	128	256	512	1024	256
DAP(Associated Maxima)	64	128	256	512	1024	100
IP_MX_CALL	64 +α	128 +α	256 +α	512 +α	1024 +α	100

α :Number of Chaining = Associated Maxima DSP in + Associated Maxima DSP out

Note

When DSP (chaining) is not used, this setting is not required.

Solaris OE

Table F-13 IPC Message Queues (Solaris)

Solaris	Maximum number of concurrently connected clients					Notes
	64	128	256	512	1024	
MSGMNB	64000	128000	256000	512000	1024000	Max Clients * 1000
MSGSSZ	24	24	32	64	128	No set up it in Solaris8
MSGSEG	12800	25600	32767	32767	32767	No set up it in Solaris8
MSGTQL	256	512	1024	2048	4096	Max Clients * 4
MSGMNI	50	50	50	50	50	Default
MSGMAP	100	100	100	100	100	Default
Required Kernel Memories(byte)	316872	627144	1247688	2488766	4970952	Memory assignment is possible if it is less than 25% of the kernel memory.(OS checks)

Windows

Table F-14 IPC Message Queues

Windows	Maximum number of concurrently connected clients					Notes
	64	128	256	512	1024	
Maximum Msgs PerIPC Queue	213	426	853	1706	3413	(Max Clients / 3)* 10

Note: default: 853

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