Product Overview
Data Centers: Background and Challenges

**Commercial data centers**

**Background**
- Cloud services are expanding
- Service competition with other data center providers is intensifying
- Outsourced commerce is expanding

**Challenges**
- To provide a myriad of XaaS services
- To provide new services at a low cost
- To maintain/improve quality of service (quality of operations)

**Enterprise data centers**

**Background**
- Cloud services are used enterprise-wide
- Individual departmental servers are consolidated in data centers
- Various individual departmental business operations are centralized in data centers

**Challenges**
- To optimize operating costs by consolidating operational work in data centers (consolidation/cloud)
- To maintain/improve a level of service equivalent to departmental operations

The compatibility of "reduced operational costs" and "improved operation quality" is a challenge
What is Systemwalker Runbook Automation?

Operation tasks that used to be performed manually are all automated, so it is possible to achieve reductions in operational costs and improved operation quality.

Reduced operational costs

- The operation procedure manual is defined as a process so that operations are automatic.

More efficient operations

By defining the operation procedure for each business system in the operation procedure manual as an operation process, automation of the operation is achieved.

- Platform differences are absorbed, so operation tasks are standardized.

Standardized operation tasks

OS/middleware differences are absorbed, so operation tasks can be standardized even for different platforms and system configuration business systems.

Improved operation quality

- Task history including human decisions is made visible.

Visible tasks

By defining human tasks (requests, approvals) as operation processes, task history can also be recorded, so visualization of operation quality and subsequent confirmation is easy.

- Flexible support for cloud environments.

Standardized cloud operations

Because the physical and virtual server information is collected automatically in CMDB, operation tasks can be performed without the burden of having to be aware of the number of server increases/decreases.
Reducing Operational Costs Through Systemwalker Runbook Automation

1. Operation tasks are automated by defining the operations procedure as an operation process.
2. OS/middleware differences are absorbed, so standardization is achieved by consolidation of similar procedures.

By proving components and templates, meticulous automated operations that meet business needs are possible.

It is also possible to record human judgment results.

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1. Unified operability that does not depend on a physical or virtual environment
2. Operations that are not affected by the number of server increases/decreases in a cloud environment, for example, can be realized
3. Automatic execution of routine operation tasks using a schedule feature
4. The execution results, including the results of human judgment, are recorded as history

Systemwalker Runbook Automation

- Server name
- OS name:

Server information is collected automatically

Start → Obtains server information → Power OFF → End

Batch operations for the server that matches the conditions e.g. Power OFF for all Windows servers

History

Improved Operation Quality Using Systemwalker Runbook Automation

(1) Resources deployed
(2) Server information is collected automatically
(3) Schedule startup
(4) Automated Operation Process

Resource Management Software

Resources deployed → Resources returned

Resource pool

Virtual servers

Physical servers
Functions
Development/Operation of Automated Operation Processes

<table>
<thead>
<tr>
<th>Development</th>
<th>Environment to create and edit Automated Operation Processes. Automated Operation Process templates that are included within the product can be utilized or customized.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manipulation</td>
<td>Execute / Suspend / Abort Automated Operation Processes.</td>
</tr>
<tr>
<td>Checking</td>
<td>Check the status and progress of Automated Operation Processes.</td>
</tr>
<tr>
<td>Process management</td>
<td>Manage Automated Operation Process Groups and Operation Components which are utilized in Automated Operation Processes.</td>
</tr>
<tr>
<td>Schedule management</td>
<td>Schedule Automated Operation Processes and confirm their status and execution results using Gant Chart views.</td>
</tr>
<tr>
<td>History management</td>
<td>Manage the administrative information of Automated Operation Processes, system configuration information and execution history.</td>
</tr>
<tr>
<td>Access control</td>
<td>Control user access rights for each process.</td>
</tr>
</tbody>
</table>
Flow of Required Tasks: From Design of the Automated Operation Process to Operation

- **Operation process developer (*)**
  Considers the procedures for operation tasks. Their role is to create operation processes.
  - Designs the Automated Operation Process
  - Develops the Automated Operation Process

- **Operation process administrator (*)**
  Responsible for applying operation processes. Their role is to manage the operation status of the entire data center, and to be responsible for analyzing and improving operation tasks.
  - Registers the Automated Operation Process
  - Publishes the Automated Operation Process
  - Creates the Schedule Definition

- **Operator (*)**
  Executes operation processes as directed. Their role is to monitor the execution status of operation processes.
  - Starts, tracks progress, and checks status of the Automated Operation Process

- **Systemwalker Runbook Automation V15**
  - Manages the Automated Operation Process
  - Manages the schedule
  - Access control

*: These roles are examples. The actual roles will depend on the system that is used for operations.
Automated Operation Process Development

- Create an Automated Operation Process
- Debug the Automated Operation Process
- Automated Operation Process template
Predefined Operation Components simplify creating Automated Operation Processes

- In the development environment, processes can be created by utilizing ICT specific Operation Components
- Processes can be created without connecting to the Management Server

Development screen

Create processing flow
Connect Operation Components specifying the flow of operations

Operation Components
Drag and drop Operation Components from the palette

Operation Components properties
Enter action details for Operation Components
Forms for data entry with human interaction

- Data entry can be performed by humans with the use of Forms, or decision making confirmations can be created and built into the processes.

**Design view**
Create labels and fields for data entry

**UI Components**
Drag and drop User Interface Components available from palette

**Properties**
Enter action details for UI Component

Development screen

Place UI Components by drag and drop

Form design
Defining Normal / Abnormal routes that are visually recognizable

- Alternate execution routes can be defined that are represented by success or fail icons for each Operation Component when placed in the editor.
- Processes are easier to develop as the execution result routes are easy to recognize at a glance.

Execution routes dependant on the result.
Customizing output result of Operation Components with pre-defined filters

- The output of components can be customized using 15 types of filtering features like "Extract string" or "Convert into upper case or lower case"
- The customized output can then be input to the next component easily without scripting

E.g.) Extract the IP address of local host from the result of `ipconfig` command

[Diagram showing the process of extracting and using IP addresses]
Debug

Step by step debugging function

- The action of each Operation Component defined in the process can be graphically confirmed during debug mode.
- The variable values can be viewed and checked during the execution of each component while the process is running.

Debugging screen

Variable information
Display values of variables at each step

Automated Operation Process
Confirm the transition of flow

Overview
Display the whole process
Pre-defined Templates

Templates based on Fujitsu's Data Center Management Knowledge

- A template consists of Process Definitions and Operation Components

Process Definition (Example)

- Obtain a process status
- Check the process
- Collect logs
- Decision
- Reboot

Template

Operation Components

<table>
<thead>
<tr>
<th>Pre-defined templates</th>
<th>Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Checking operation status</td>
<td>Periodically (3 times a day) confirm if the target server is operating normally by:</td>
</tr>
<tr>
<td></td>
<td>- Checking the server power supply status (hardware)</td>
</tr>
<tr>
<td></td>
<td>- Checking the connectivity status of the server</td>
</tr>
<tr>
<td></td>
<td>- Checking related events collected by event monitoring tools</td>
</tr>
<tr>
<td>Problem detection and initial handling of</td>
<td>Perform a sequence of checks to identify server type.</td>
</tr>
<tr>
<td>certain server types</td>
<td>Perform email notification for certain types of server.</td>
</tr>
<tr>
<td></td>
<td>Perform primary recovery tasks dependant on events from event monitoring tool.</td>
</tr>
<tr>
<td>Starting and stopping Web 3-Tier systems</td>
<td>Starts and stops the entire Web 3-tier system consisting of database, application and web server including load balancers. This template also sends notifications automatically when faults are detected in the process.</td>
</tr>
<tr>
<td>Starting, deploying and restoring virtual</td>
<td>Starts, stops, restarts, deploys and returns virtual servers resources.</td>
</tr>
<tr>
<td>servers</td>
<td>This template has the ability to take snapshots and restore virtual servers.</td>
</tr>
<tr>
<td>Release automation</td>
<td>Automates the application release tasks. By specifying the release date/time beforehand, it is possible to release at a predetermined date/time.</td>
</tr>
<tr>
<td>VMware HA operations management</td>
<td>Automatically stops ESX servers in the appropriate order when a power failure occurs.</td>
</tr>
</tbody>
</table>

*: The latest templates will be published on the FUJITSU Software Systemwalker technical information website as soon as they are available.
Automated Operation Process Operations

- Starting Automated Operation Processes
- Checking the Status of Automated Operation Processes
- Human Decisions and Approvals using the Automated Operation Process
- Other Management Features
Process Start Methods

Automated Operation Processes can be started by various methods

- Operator can manually start the processes
- Collaborating with a system monitoring tool enables processes to start when specific events occur
- Processes can be started according to defined schedules

- **Manual start**
  - Non-regular work
  - E.g. Applying patches

- **Event-triggered start**
  - Problem detection and initial handling of event

- **Schedule-triggered start**
  - Regular work
  - E.g. Regular backup

**Automated Operation Process**

- FUJITSU Software Systemwalker
- Runbook Automation

**Managed servers**

- Windows
- Linux
- Solaris
Start Manually

Manual start and operation of Automated Operation Processes

- Operator can manually start processes for unscheduled maintenance work
- Operator has control to suspend or abort processes in case an unexpected problem occurred (e.g. An unknown error occurred)

Screen for starting
Screen for suspending/aborting/resuming

Operator Manual start

Start Manually

FUJITSU Software Systemwalker Runbook Automation

Managed servers

Windows Linux Solaris
Automated Operation Processes triggered by events

- Processes can be triggered to start on detection of specific events using a system monitoring tool like Systemwalker Centric Manager.
- Allows for initial handling of problems by sending email notifications or collecting data logs automatically for investigation.

FUJITSU Software Systemwalker Runbook Automation

Start by Event

Managed servers

Windows

Linux

Solaris
Process Status Check (Start by Schedule)

- Regular maintenance work can be automatically started by the Schedule Definition
- The schedule and execution status on the day can be seen at a glance on the screen in the form of a Gant chart
- User can easily change or disable the defined schedule in the event of an operational change

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**Scheduling Automated Operation Processes**

- Regular maintenance work can be automatically started by the Schedule Definition
- The schedule and execution status on the day can be seen at a glance on the screen in the form of a Gant chart
- User can easily change or disable the defined schedule in the event of an operational change

---

**Process Status Check (Start by Schedule)**

- Regular maintenance work can be automatically started by the Schedule Definition
- The schedule and execution status on the day can be seen at a glance on the screen in the form of a Gant chart
- User can easily change or disable the defined schedule in the event of an operational change

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**Monthly schedule**

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**Daily schedule and result**
The flow diagram of the Automated Operation Processes can be checked for its progress

- The status of running processes can be confirmed from the process list
- The progress can be checked from the flow diagram in the Process Instance list

Web Console screen

The Process List displays the execution status

A selected Process is displayed as a flow diagram
Automated Operation Processes can also be controlled by human decision making

- Processes can be designed to include an approval process. The process will continue based on an approve or reject decision
- The web forms allow data input or data to be checked

E.g. Ask the business manager whether or not the business system can be rebooted when a problem occurs

Decide whether or not the reboot of business system should be performed

Send an email automatically

- Request
- URL

Attached information

- Process list
- Log files

Decision

Business manager

Operator

Startup screen

Automated Operation Processes

- Obtain process status
- Check process
- Collect logs
- Decision
- Reboot
### Management Category Overview

#### History Management
- **History of registering/deleting Automated Operation Processes**
  - Outputs operation information based on registering / deleting Automated Operation Processes to the Management Server:
  - "Name of Automated Operation Process", "Operator", "Operating date"

- **History of executing Automated Operation Processes**
  - Outputs the following information when Automated Operation Processes are executed:
    - "Start/End time, Input / Output parameters, Execution result (Success or Error) and execution time of each Operation Component in Automated Operation Process"

#### User Management / Access Control
- **Role Management**
  - Manages users according to the role of an operation.
  - Role: Automated Operation Processes Developer, Automated Operation Processes Administrator, Operator

- **User Control**
  - Registers/Updates/Deletes users

- **Access Authority**
  - Configures rights to "register/delete", "execute", "refer" Automated Operation Processes for each user

- **Access Control**
  - Restricts user access for each Automated Operation Process
Benefits
Benefit 1: Reduced Costs (More Efficient Operations)

Procedure manuals and human know-how are defined as operation processes, so operations can be made more efficient through unified control.

Before
- Inconsistent procedure manual formats and operating procedures
- Parts not covered in the procedure manuals are compensated for with human know-how (operation dependent on individual expertise)

After installation
- The method for describing operating procedures is unified, and progress has also been made towards standardizing procedures
- Establishment of operating procedures
- Reduction in development man-hours though the use of templates

Procedure manual

Start the service
Check whether the service has started

Check with an expert for information on detailed procedures

System A
User

System B
User

System C
User

Operation procedures are specified using a common mechanism

Automated Operation Process

System A

System B

System C

Define detailed procedures that include human know-how

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**Benefit 2: Reduced Costs (Standardized Operation Tasks)**

OS/middleware differences are absorbed, so operation tasks can be standardized so that procedures/time required/results will be the same regardless of who has performed the task.

**Before**
- Systems operated by creating different operation management procedures for each range managed by each operation management tool

**After installation**
- Overall operation management procedures can now be automated over multiple systems, without having to be aware of differences in operation management tools

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**Operator**

1. **Detect event**
2. **Check events on other systems**
3. **Fault isolation**
4. **Collect logs**
5. **Check results**
6. **Issue an incident**

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**CMDB**

- It is now possible to create the operation procedures required for stable operations, targeting the entire system.
Benefit 3: Improved Operation Quality (Tasks are Visible)

By recording tasks that include the results of human judgments, all the operation tasks are made visible so that operations can be improved.

Before
- No records indicating who decided what or when
- Analysis work using task reports and other information is time-consuming

After installation
- Reliable task logs, including who decided what, and when
- Analysis can be performed quickly and reliably based on task logs
Benefit 4: Improved Operation Quality (Standardized Cloud Operations)

Enables operations without the need to consider daily increases or decreases in the number of servers

**Before**
- Operations are complex because of daily increases/decreases in number of servers
- Cannot control which servers are increased/decreased

**After installation**
- Uniform operations without the burden of having to be aware of the number of server increases/decreases
- Number of server increases/decreases, including virtual servers, are managed using CMDB
Use Case
Checking hardware Status

**Before** Time-consuming, low quality of service

Need to check the status of hardware on site at specified times

- OK
- NG

 chrono

10:00
11:00
12:00

**Time and man-power consuming**

- Need to check the hardware status LED's(*) directly at specified time
- Can't check the status simultaneously

*: Hardware devices detect internal issues i.e. CPU temperature high, fan failure, which show the status by changing LED colors to alert engineers.

**After** Instant alerts, high quality of service

Status of hardware checked automatically according to the schedule

- OK
- NG

10:00 11:00 12:00

**Status checked automatically**

- Check the status of multiple servers from a single site
- Operator knows status of servers at a glance from the Web Console

*: Information to be collected is dependent on hardware

Get the hardware status by IPMI Protocol (*)
**Before**
Long manual sequence to Start/Stop servers

Need to comply with specified procedure to start/stop servers manually

- Complicated manual procedures tend to involve human error
- Time consuming to perform manual status checks of every server

**After**
Automated sequence to Start/Stop servers

Just execute the defined process to start/stop servers

- The executed process starts/stops servers in the defined order, so human error is avoided
- Time saving as processes automatically check the status of servers

**Controlled Server startup/shutdown**

- Must follow exact sequence to start/stop
- Not required to remember start/stop process
Product Information
- **Management Server**
  This is the server that manages the execution of the Automated Operation Process, automates the operation tasks, and the execution results. Systemwalker Runbook Automation Manager runs on this server.

- **Managed Server/Managed node**
  The Managed Server is the server on which the actual operations from the Management Server are performed by the execution of the Automated Operation Process. The Systemwalker Runbook Automation Agent can also be installed on this server. The managed node is a node such as a network device. It also performs operations and obtains information from the Management Server.

- **Relay Server**
  This is the server that is installed to balance the automatic collection processing load for configuration information to the Systemwalker Runbook Automation Management Server. It is installed to manage large-scale systems.

- **Linkage Server**
  The products that link with Systemwalker Runbook Automation run on this server. Depending on the linkage method, it will not always be necessary to install the Agents of this product. FUJITSU Software Systemwalker Centric Manager or FUJITSU Software ServerView Resource Orchestrator are examples of linked products.

- **Business Server**
  This is the server that is the target of operations from the Management Server.

- **Development computer**
  This is the computer that is used to create Automated Operation Processes.

- **Web Console**
  This can be used to execute, operate, and check the operational status of Systemwalker Runbook Automation Automated Operation Processes.
### Operating Environment

<table>
<thead>
<tr>
<th>Type/usage</th>
<th>OS</th>
</tr>
</thead>
</table>
| **Management Server** | Microsoft® Windows Server® 2012  
Microsoft® Windows® Small Business Server 2011 Essentials  
Microsoft® Windows Server® 2008 R2  
Microsoft® Windows Server® 2008  
Microsoft® Windows Server® 2003 R2  
Red Hat Enterprise Linux 6  
Red Hat Enterprise Linux 5 |
| **Managed Server** | Microsoft® Windows Server® 2012  
Microsoft® Windows® Small Business Server 2011 Essentials  
Microsoft® Windows Server® 2008 R2  
Microsoft® Windows Server® 2008  
Microsoft® Windows Server® 2003 R2  
Microsoft® Windows Server® 2003  
Japanese Solaris(TM) 11 Operating System *3  
Japanese Solaris(TM) 10 Operating System *3  
Red Hat Enterprise Linux 6  
Red Hat Enterprise Linux 5 |
| **Linkage Server** | Microsoft® Windows Server® 2012  
Microsoft® Windows® Small Business Server 2011 Essentials  
Microsoft® Windows Server® 2008 R2  
Microsoft® Windows Server® 2008  
Microsoft® Windows Server® 2003 R2  
Microsoft® Windows Server® 2003  
Japanese Solaris(TM) 11 Operating System *3  
Japanese Solaris(TM) 10 Operating System *3  
Red Hat Enterprise Linux 6  
Red Hat Enterprise Linux 5 |
| **Relay Server** | Microsoft® Windows Server® 2012  
Microsoft® Windows® Small Business Server 2011 Essentials  
Microsoft® Windows Server® 2008 R2  
Microsoft® Windows Server® 2008  
Microsoft® Windows Server® 2003 R2  
Microsoft® Windows Server® 2003  
Japanese Solaris(TM) 11 Operating System *3  
Japanese Solaris(TM) 10 Operating System *3  
Red Hat Enterprise Linux 6  
Red Hat Enterprise Linux 5 |
| **Managed node** | *1 |
| **Development computer** | Microsoft® Windows 8  
Microsoft® Windows 7  
Microsoft Windows® Vista  
Microsoft® Windows XP  
Microsoft® Windows Server® 2012  
Microsoft® Windows® Small Business Server 2011 Essentials  
Microsoft® Windows Server® 2008 R2  
Microsoft® Windows Server® 2008  
Microsoft® Windows Server® 2003 R2  
Microsoft® Windows Server® 2003 |
| **Web client** | Windows® Internet Explorer 10*4  
Windows® Internet Explorer 9  
Windows® Internet Explorer 8  
Windows® Internet Explorer 7  
Windows® Internet Explorer 10  
Windows® Internet Explorer 9  
Windows® Internet Explorer 8  
Windows® Internet Explorer 7 |
| **Virtualization software** *2 | VMware vSphere 5  
VMware vSphere 4  
Hyper-V 2.0  
Red Hat Enterprise Linux 6 Virtual Machine (KVM)  
Red Hat Enterprise Linux 5 Virtual Machine (Xen) |

*1 Managed nodes are devices whose IP address on the network can be identified, and which can be operated on using remote access protocols (such as `telnet`, `ftp`, `ssh`, and PowerShell).

*2 "Virtualization software" refers to the virtual environment for both the Management Server and the Managed Server.

*3 Only the Business Server is supported.

*4 Only Internet Explorer 10 present in Windows Server 2012 or Windows(R) 8 is supported.
Appendix

FUJITSU Software Systemwalker
List of functions to customize the output of Operation Components

15 filtering features for customizing the output of a component that can be passed as the input to the next Operation Component without programming

<table>
<thead>
<tr>
<th>Filter Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convert to upper case or lower case</td>
<td>Converts all the characters to upper case or lower case.</td>
</tr>
<tr>
<td>Count the number of lines</td>
<td>Counts the number of lines.</td>
</tr>
<tr>
<td>Add a string</td>
<td>Adds an arbitrary text or values of the variables.</td>
</tr>
<tr>
<td>Extract a string</td>
<td>Extracts any string which matches the pattern of a defined regular expression.</td>
</tr>
<tr>
<td>Format</td>
<td>Divides the result of Operation Components or the output of filtering by a defined delimiter and puts it into the specified format string.</td>
</tr>
<tr>
<td>Delete the overlapped lines</td>
<td>Detects the overlapped lines and then deletes all but one line. This filter can also delete only the sequential overlapped lines.</td>
</tr>
<tr>
<td>Replace</td>
<td>Searches a specified string and then replaces it with another string.</td>
</tr>
<tr>
<td>Extract lines</td>
<td>Extracts lines which match the specified condition.</td>
</tr>
<tr>
<td>Sort</td>
<td>Sorts the result of Operation Components or the output of filtering by lines.</td>
</tr>
<tr>
<td>Delete lines</td>
<td>Deletes the forward or backward lines with reference to the specified line. This filter can delete all the empty lines as well. This also can keep only $n$ lines from the top or bottom and deletes all the other lines.</td>
</tr>
<tr>
<td>Delete spaces</td>
<td>Deletes one-byte and two-byte blanks, tabs, line feed characters (CRLF/CR/LF) from the head or end.</td>
</tr>
<tr>
<td>Extract CSV format data</td>
<td>Treats the result of Operation Components or the output of filtering as a table by sorting or selecting the column, row and block.</td>
</tr>
<tr>
<td>Extract attributes of XML</td>
<td>Extracts attributes from the XML format.</td>
</tr>
<tr>
<td>Change the format of date</td>
<td>Changes the format of a date.</td>
</tr>
<tr>
<td>Calculate</td>
<td>Adds / Subtracts the fixed value or value of a variable or the execution result (Integer) to (from).</td>
</tr>
</tbody>
</table>
List of pre-defined Operation Components (1/3)

The default operation components of the development environment

Operation Components which perform basic operation to ICT systems

<table>
<thead>
<tr>
<th>Standard Components*</th>
<th>Command Execution</th>
<th>Email Operation</th>
<th>File Operation</th>
<th>Configuration Information Operation</th>
<th>Communication Components</th>
<th>Service/Process Operation</th>
<th>Load Balancing and Cluster Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Execute an arbitrary command</td>
<td>Send emails</td>
<td>Transfer files</td>
<td>Obtain configuration information</td>
<td>Perform REST-based communications</td>
<td>Check that the service/process has started</td>
<td>Remove as a load balancing target</td>
</tr>
<tr>
<td></td>
<td>Issue WMI query</td>
<td></td>
<td>Move files/directory</td>
<td>Update configuration information</td>
<td>Obtain value by using SNMP</td>
<td>Check that the service/process has stopped</td>
<td>Include as a load balancing target</td>
</tr>
<tr>
<td></td>
<td>Execute multiple commands</td>
<td></td>
<td>Obtain the list of files/directory</td>
<td>Delete configuration information</td>
<td>Set value by using SNMP</td>
<td>Start service</td>
<td>Obtain resource status of cluster system</td>
</tr>
<tr>
<td></td>
<td>Multi-Operation flow set execution</td>
<td></td>
<td>Obtain the size of files/directory</td>
<td>Register a logical node</td>
<td>Issue SNMP trap</td>
<td>Stop service</td>
<td>Switch resource of cluster system</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check the access permission of files/directory</td>
<td></td>
<td>Execute web service</td>
<td>Suspend service</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Obtain the modified date of files/directory</td>
<td></td>
<td></td>
<td>Change the account of service</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Change the access permissions for the directory</td>
<td></td>
<td></td>
<td>Change the startup type of service</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Compress files</td>
<td></td>
<td></td>
<td>Stop virtual server on the VM host</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Decompress files</td>
<td></td>
<td></td>
<td>Set maintenance mode of VM host</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Get Finger Print</td>
<td></td>
<td></td>
<td>Forcibly stop VM host</td>
<td></td>
</tr>
</tbody>
</table>

*: Operation Components can be customized and also newly created.
List of pre-defined Operation Components (2/3)

The default operation components of the development environment

- Operation Components which perform basic operation to ICT systems

<table>
<thead>
<tr>
<th>Standard Components*</th>
<th>Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Server Operation</strong></td>
<td></td>
</tr>
<tr>
<td>Start the server</td>
<td>Stop Workunit Build virtual server</td>
</tr>
<tr>
<td>Stop the server</td>
<td>Restart Wprlimot Delete virtual server</td>
</tr>
<tr>
<td>Stop OS</td>
<td>Start virtual server Change virtual server system</td>
</tr>
<tr>
<td>Restart OS</td>
<td>Stop virtual server Obtain a list of virtual servers</td>
</tr>
<tr>
<td>Start Workunit</td>
<td>Restart virtual server</td>
</tr>
<tr>
<td></td>
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*: Operation Components can be customized and also newly created.
List of pre-defined Operation Components (3/3)

The default operation components of the development environment

- Operation Components which perform basic operation to ICT systems

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| Linked Product Monitoring, Startup and Stop | Notify/Confirm the event  
Change the status of event  
Obtain the event  
Enable/Disable the server monitoring | FUJITSU Software Systemwalker Centric Manager |
| | Start Job Nets  
Obtain Job Net status | FUJITSU Software Systemwalker Operation Manager |
| | Obtain resource status of cluster system  
Which resource of cluster system | FUJITSU Software PRIMECLUSTER |
| | Start / Stop / Restart Workunit | FUJITSU Software Interstage Application Server |
| | Remove as a load balancing target  
Include as a load balancing target | FUJITSU Network System IPCOM |
| | Issue the incident | FUJITSU Software Systemwalker IT Service Management |
| Virtual Server Operation | Start / Stop / Restart virtual servers  
Build / Delete / Change virtual server system  
Obtain the list of virtual servers / detailed information about the virtual server  
Create / Restore snapshot of virtual server | FUJITSU Software ServerView Resource Orchestrator |
| | Stop virtual servers at a time  
Start / Stop ESX maintenance mode | VMware vCenter |

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