

**MasterScope Service  
Governor3.26.0  
Installation Guide  
(Windows)**

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# Preface

## Notation Rules of This Document

This document describes the precautions and related information as follows:

### Note

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A functional, operational, or configurational notice, warning, or complement is described.

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### Tip

---

Indicates the location of additional information or reference destination information

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### Notation list

The following notation rules are applied in this document.

Notation	How to use	Example
[ ] square brackets	Placed before and after an item (such as a text box, check box, or tab) on the screen	Enter the machine name in the [Machine Name] text box. The [All] check box
"" double quotes	Placed before and after a screen name (such as a dialog box window), or the name of a manual other than this one.	<i>"Setting" window</i> <i>"Installation Guide"</i>
[ ] square brackets in the command line	Indicates that the specification of the value in [ ] can be omitted.	add [/a] Gr1
Monospace font	Output from the command-line system (such as a message prompt)	Execute the following command: <code>replace Gr1</code>
Italicized monospace font	An item that should be replaced by users with a valid value  If the value contains a space, surround it with " " (double quotes).	add <i>GroupName</i> <code>InstallPath= "Install Path"</code>
Json example	Json examples are shown with breaks and indents added in order to improve the readability.	<pre>{   "ID": [     "45ed3512"   ],   "Manager": {     "ErrorMessage": "",     "Name": "localhost",     "Status": 200,     "StatusCode": 200   } }</pre>

## Glossary

This document uses the terms below.

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Term	Description
Service Governor	Name of this product Official name is MasterScope Service Governor
Installation directory	Refers to the destination to which MasterScope Service Governor is installed. The default value is C:\Program Files (x86)\NEC\UMF\Operations
Tomcat installation directory	Refers to the destination (included in the ServiceGovernor WebAPI Base Option package) to which Tomcat is installed. The default value is C:\Program Files (x86)\NEC\UMF\Operations\Tomcat
Manager	A server that runs the services of "MasterScope UMF Operations Manager_n".
EXPRESSCLUSTER X	An NEC product that can be used to switch running processes between nodes in a duplicated system. In this document, a host system included in a cluster is referred to as a node.

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# Chapter 1. Operating Environments/System Requirements

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This section describes the operating environment.

## 1.1 System Requirements

### 1.1.1 Hardware Requirements

Type	Hardware Requirements
CPU	At least Intel Compatible 2GHz 4 Core
Memory capacity	At least 4GB
Disk capacity	At least 4GB

### 1.1.2 Software Requirements

#### 1.1.2.1 List of Supported Platforms

This package runs on the following software:

OS
Windows Server 2008 Standard Edition (x86,x64)
Windows Server 2008 Standard Edition R2 (x64)
Windows Server 2008 Enterprise Edition (x86,x64)
Windows Server 2008 R2 Enterprise Edition (x64)
Windows Server 2012 Standard (x64)
Windows Server 2012 R2 Standard (x64)
Windows Server 2012 Datacenter (x64)
Windows Server 2012 R2 Datacenter (x64)
Windows Server 2016

#### 1.1.2.2 Bundled Applications

This product is bundled with the applications shown below.

Application	Supported version
Java	Java Runtime Environment 1.8.0_162
Tomcat	Apache Tomcat Version 8.5.24

#### **Caution**

For the verified latest versions, contact the NEC Customer Support Center.

# Chapter 2. Installing ServiceGovernor

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**⚠ Caution**

When constructing a cluster environment, refer to "[Chapter 4. Constructing a ServiceGovernor Cluster \(page 22\)](#)" before performing this procedure.

## 2.1 Installing ServiceGovernor

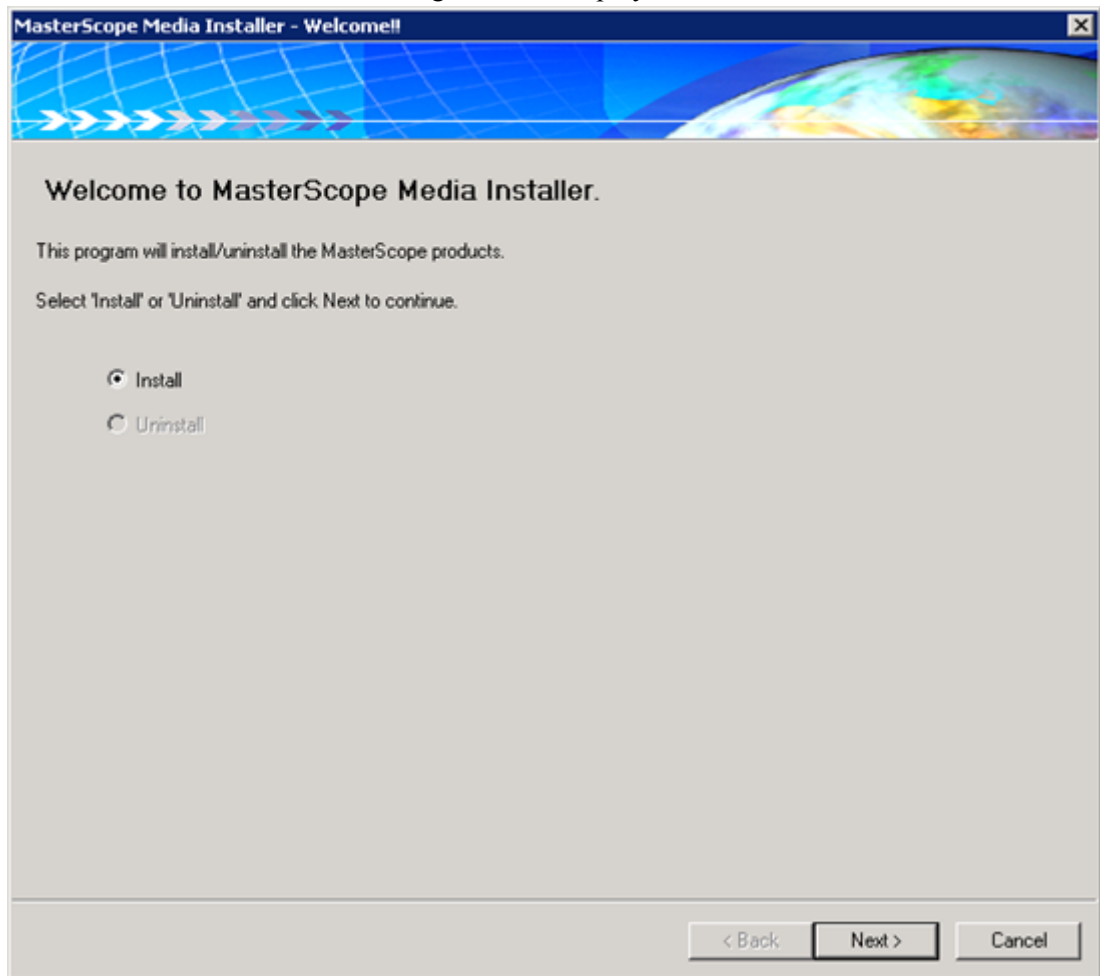
The following and subsequent pages describe the procedure for installing ServiceGovernor.

### 2.1.1 Installing ServiceGovernor from the Installer

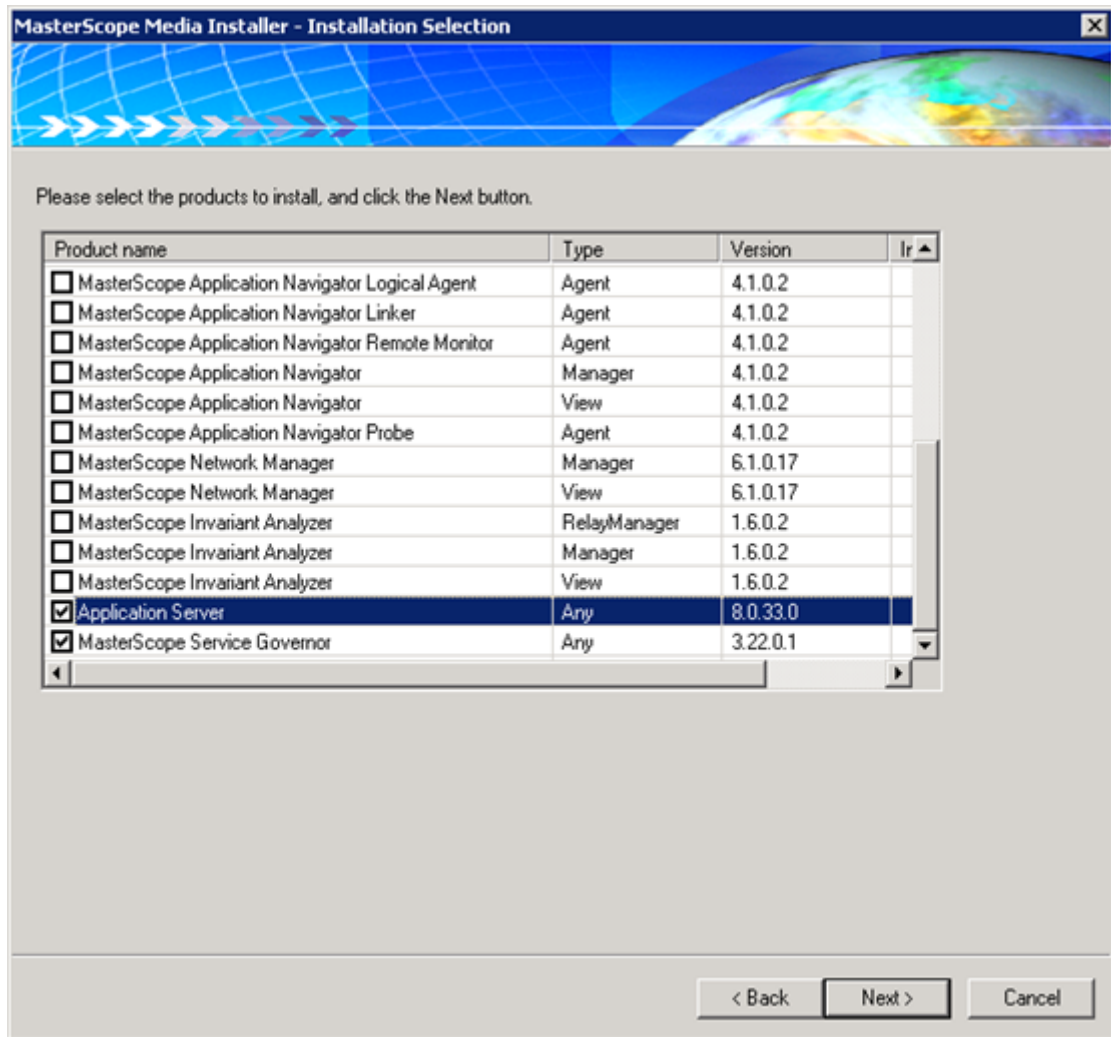
1. Insert the installation DVD into the DVD drive.
2. Execute the following command from the Explorer or command prompt to start the installer.

```
> <Install DVD>\Windows\Setup.exe
```

3. The installer starts, and the following screen is displayed.



4. Select [Install], and click [Next].
5. The [Installation Selection] screen is displayed.

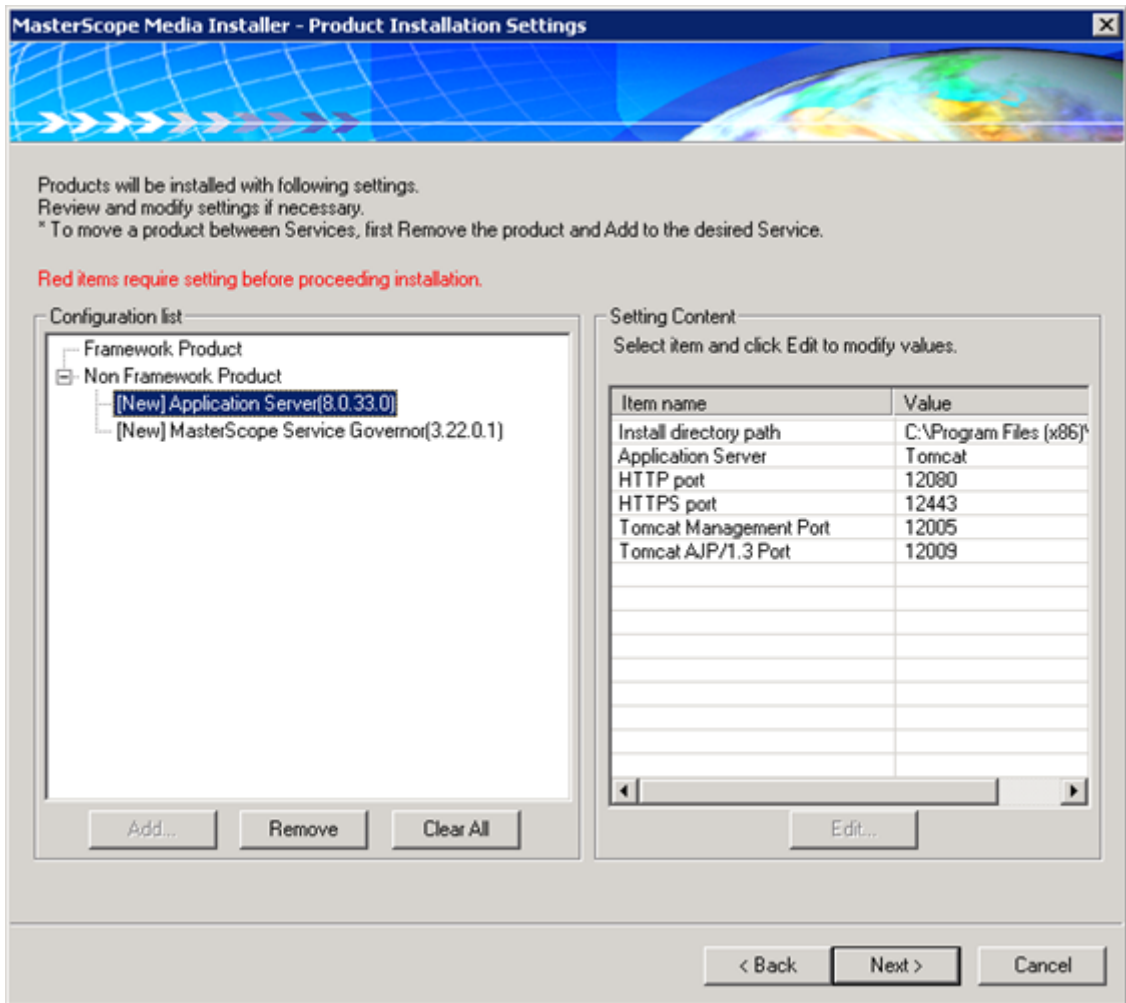


6. Check the boxes of the following product names.

- Application Server
- MasterScope Service Governor

7. Click [Next].

The [Product Installation Settings] dialog box is displayed.



8. Select [Configuration list] > [Application Server], and set the setting items in [Setting Content].

Click the setting item and click [Edit...], or double-click the setting item.

The setting screen for the selected setting item opens.

The details of parameters are as follows.

Field name	Setting value
Installation destination folder	Specify the installation destination folder. The default value is defined in " <a href="#">Glossary (page iii)</a> ". Specify the folder path, by using up to 55 characters.
Application Server	Specify Tomcat.
HTTP port	Specify the HTTP port number of ServiceGovernor . The default value is "12080".
HTTPS port	Specify the HTTPS port number of ServiceGovernor . The default value is "12443".
Tomcat management port number	Specify the Tomcat management port number. The default value is "12005".

Field name	Setting value
Tomcat AJP/1.3 port number	Specify the Tomcat AJP/1.3 port number. The default value is "12009".

### Caution

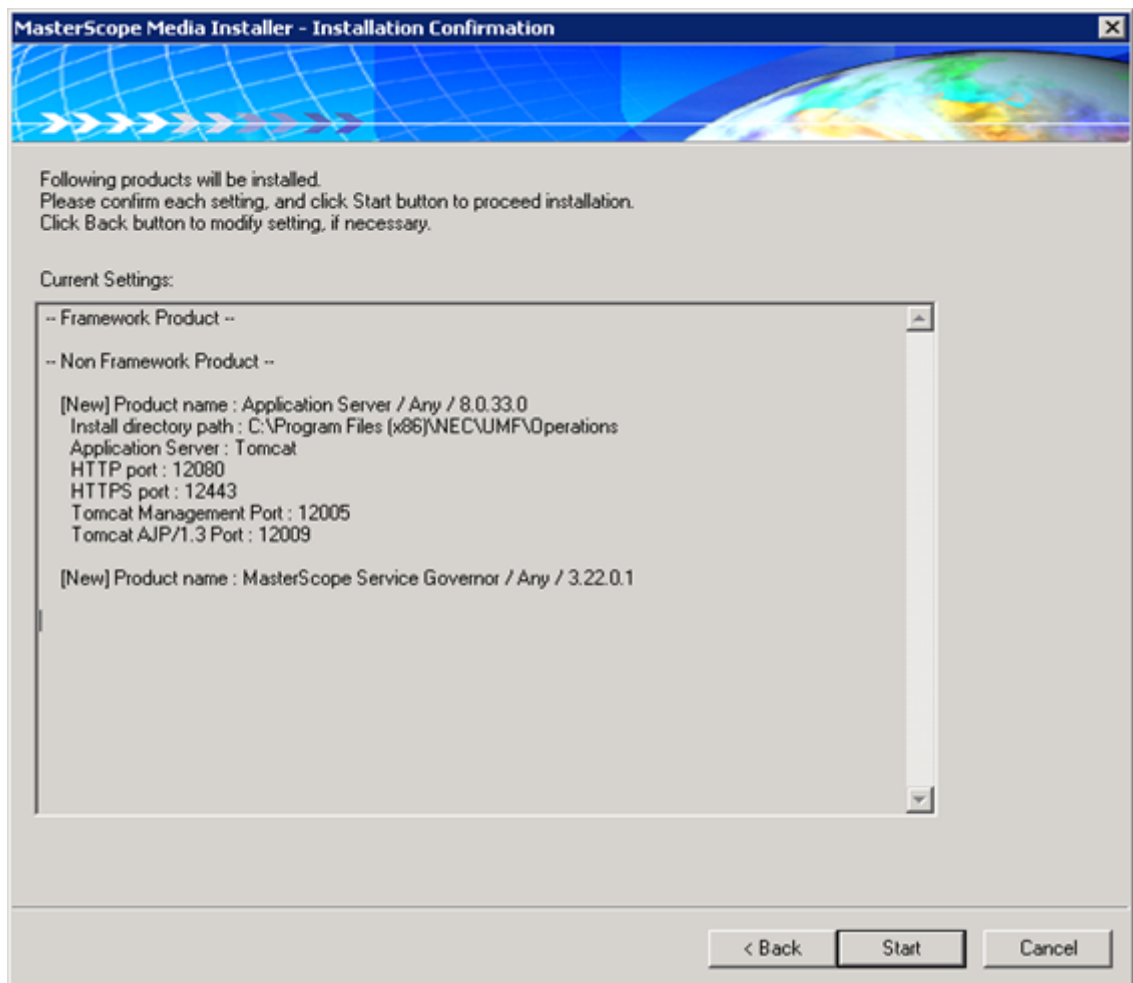
For the port number, specify a number that differs from those of the other products.  
Otherwise, the Tomcat service cannot be started up.

### Caution

Note that the installation destination folder name is not case-sensitive.  
The following characters cannot be used for an installation destination folder.  
 \ / : \* ? " > < | ; ' &

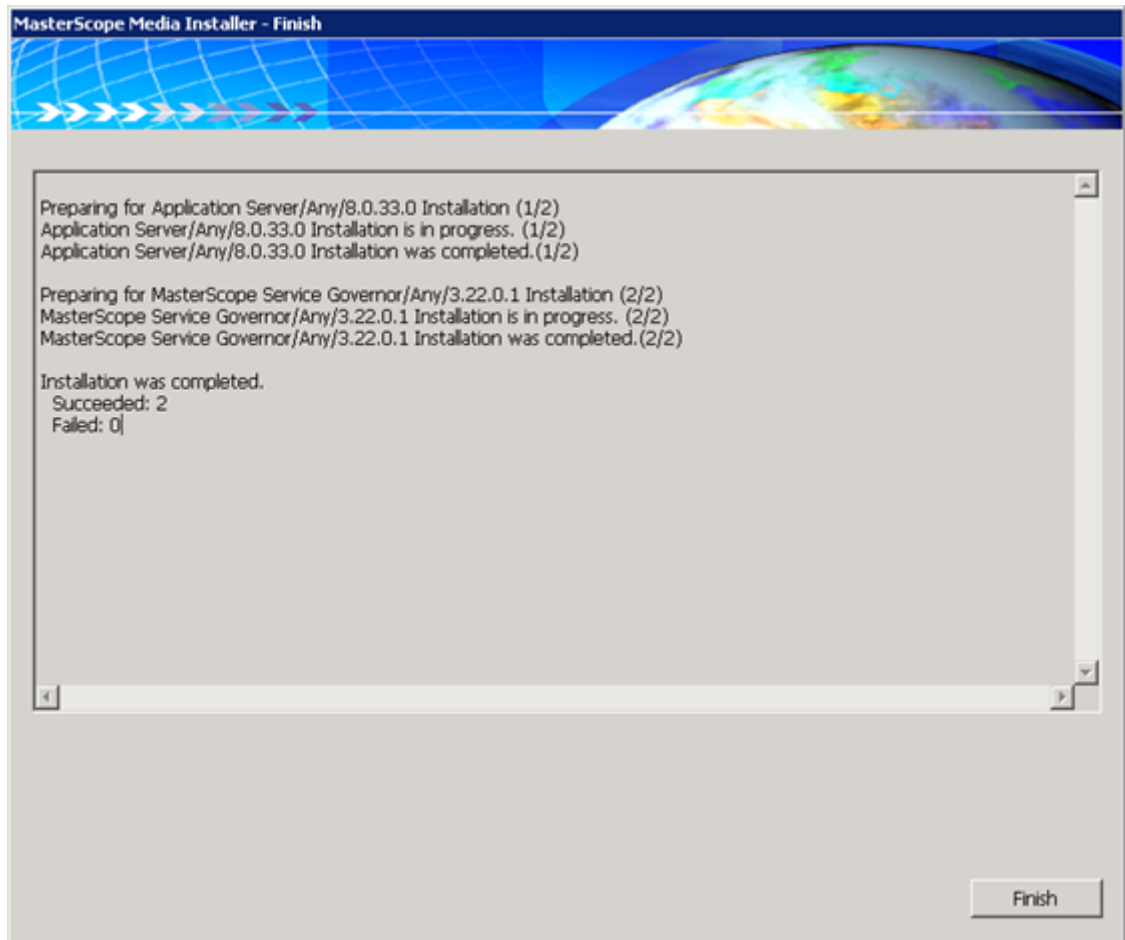
9. Click [Next].

The [Installation Confirmation] screen is displayed.



10. Check the details, and click [Start].

Installation starts. When the installation is complete, the [Finish] screen is displayed.



If the screen as above is displayed, the installation is complete.

11. Click [Finish].



# Chapter 3. Setting Up ServiceGovernor

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## 3.1 API Authentication Key

Create the authentication key for ServiceGovernor

1. Log into the manager under the Administrators privileges.
2. Open the Tools folder within the installation destination folder of the manager component.
3. Perform the following WebApiTool.bat command to create the access key.

```
> cd "<Installation directory>\Tools"
> WebApiTool.bat createkey <UserName> -description "<Description>"
```

\* Specify any value for <UserName> and <Description>.

### Caution

- An ASCII character or numeric value can be specified for <UserName>.
- The character string specified for <UserName> will be displayed as the user name of the [Audit Log] view on the manager's monitoring terminal.

Confirm that the following is displayed as a standard output.

```
NORMAL END.

command exit code:0
COMMAND SUCCEEDED.
```

4. Confirm the created access key.

Perform the following command to display the created access key.

```
> cd "<Installation directory>\Tools"
> WebApiTool.bat showkey <UserName>
```

Confirm that the following is displayed in a standard output.

```
-----
UserName : <UserName>
Description : <Description>
AccessKeyId : /TZfHsSFsdfsL3ghfE9hKyRYLW2ufSbcnYwf1m4RBVrw=
SecretAccessKey : rSQ2z2Yn/OgSHhL3R7j6IWuiErtM11CBMJQWtWpE5rXuU=
-----

NORMAL END.

command exit code:0
COMMAND SUCCEEDED.
```

5. Specify the displayed AccessKeyId and SecretAccessKey as the portal products.

Write down the values of the authentication access key (AccessKeyId) and authentication secret key (SecretAccessKey) and specify them to the portal products.

To use WebAPI of ServiceGovernor , it is necessary to include the assigned access key in the Http request header required to use WebAPI.

6. When the portal products use WebAPI, create the Http request header as follows.

Use the following Http request header for authentication.

HTTP header	Description
Date	Specifies in the WebAPI request date (RFC1123 format).
Authorization	Specifies the created access key and signature described later. Specify "SharedKeyLite" as the authentication method.

Use the following algorithm to create the Authorization header.

- Read the access key generated with the WebApiTool.bat command on the manager.

```
AccessKeyId : /TZfHsSFsdfsL3ghfE9hKyRYLW2ufSbcnYWf1m4RBVrw=
SecretAccessKey : rSQ2z2Yn/OgSHhL3R7j6IWuiErtM11CBMJQWtWpE5rXuU=
```

- Determine the request date.

```
Date = "Wed, 19 Dec 2012 08:01:10 GMT"
```

- Acquire the WebAPI path with the query character string ("?" or after) excluded.

```
CanonicalizedResource = "/umf/categories"
```

### Caution

If you need URLEncode, generate the target character string using the WebAPI path that results after encoding.

- Concatenate the request date and path by using a line feed character (CRLF) and create the character strings to be authenticated.

```
CRLF = "¥x0D¥x0A"
StringToSign = Date + CRLF + CanonicalizedResource
```

- Create the HMAC (SHA256) from the character strings to be authenticated and SecretAccessKey and encode it in Base64.

```
Signature = Base64(HmacSHA256(SecretAccessKey, StringToSign))
#=> "dSvqioC9hIUjnnDk7dhHcQ6oRCxJN1hc0Wdev393ZYc="
```

- Create the HTTP request header.

Example of Http request header:

```
Date: Wed, 19 Dec 2012 08:01:10 GMT
Authorization: SharedKeyLite /TZfHsSFsdfsL3ghfE9hKyRYLW2ufSbcnYWf1
m4RBVrw=:dSvqioC9hIUjnnDk7dhHcQ6oRCxJN1hc0Wdev393ZYc=
```

### Caution

This procedure is required to perform setup on the portal product that uses WebAPI of ServiceGovernor . If no signature is specified or the specified signature has a wrong value, WebAPI will fail to be executed.

7. To operate ServiceGovernor in a cluster configuration, copy the following files from the active server to the standby server.

```
<Installation directory>\Tomcat\vdCApiKey.jks
```

## 3.2 Setting up SSL/TLS for the manager

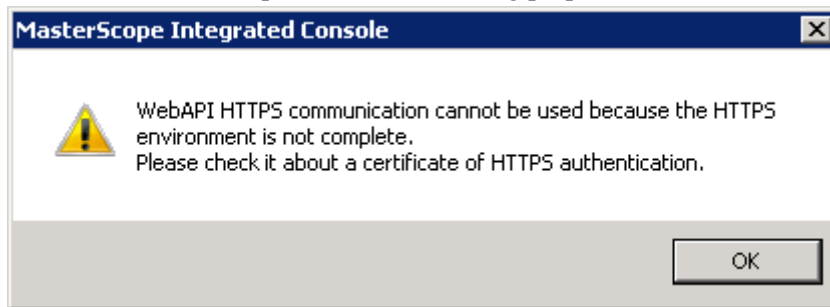
To connect ServiceGovernor and the manager via SSL/TLS, perform this procedure.

If an SSL/TLS connection is not used, this procedure is not necessary.

### 3.2.1 Setting a Manager

Check the [Use HTTPS cryptogram] box on the [Web Monitoring View] tab by referring to Setting up internal communication with ServiceGovernor.

If a warning as shown in the following figure was output during option setting or you want to modify the server certificate, perform the following preparation.



1. Stop the manager.
2. Check the file name settings of the server certificate and private key.  
If any of the files does not exist, create an empty file and add the setting.  
File name  
Windows:  
<installation destination folder>\Manager\sg\HttpServerMgr.ini  
  
Linux:  
<installation destination directory>/Manager/sg/HttpServerMgr.ini  
  
Contents specified

```
[ApiServer]
CertificateFile=server.crt
PrivateKeyFile=server.key
```

Parameter name	Description
CertificateFile	Specifies the server certificate file name. When the file name is omitted, server.crt is used as the default setting value.
PrivateKeyFile	Specify the private key file name. When the file name is omitted, server.key is used as the default setting value.

\* If you want to specify other parameters other than the default server certificate or private key, specify a file name that differs from the default file name.

3. Store the server certificate and private key to be used.  
Store in the following the server certificate and private key file names that have been set in "2. (page 12)".

Windows:

```
<installation destination folder>\Manager\sg\HttpServer\conf
```

Linux:

```
<installation destination directory>/Manager/sg/HttpServer/conf
```

4. Start the manager.

### Attention

- Only Windows or Linux manager supports the WebAPI function. No manager other than a Windows or Linux manager can use the WebAPI function.
- If you create a server certificate or private key, specify a file name that differs from the default file name.
- If you create a server certificate or private key, create the private key in RSA format without encryption or the server certificate in x509 format.

## 3.2.2 Setting Up ServiceGovernor

Change the {URL} protocol to https by reference to ["3.3.2 Setting Up the ServiceGovernor Property File \(page 14\)"](#).

### Caution

To operate ServiceGovernor in a cluster configuration, make a change on both the active and the standby servers.

## 3.3 Settings for Adding a Manager

The "manager" refers to a server that runs the service of "MasterScope UMF Operations Manager\_n".

When a manager having access to ServiceGovernor is added, perform the preparation using the following procedure and edit the ServiceGovernor configuration file.

### Caution

To operate ServiceGovernor in a cluster configuration, set the following ServiceGovernor settings on both the active and the standby servers.

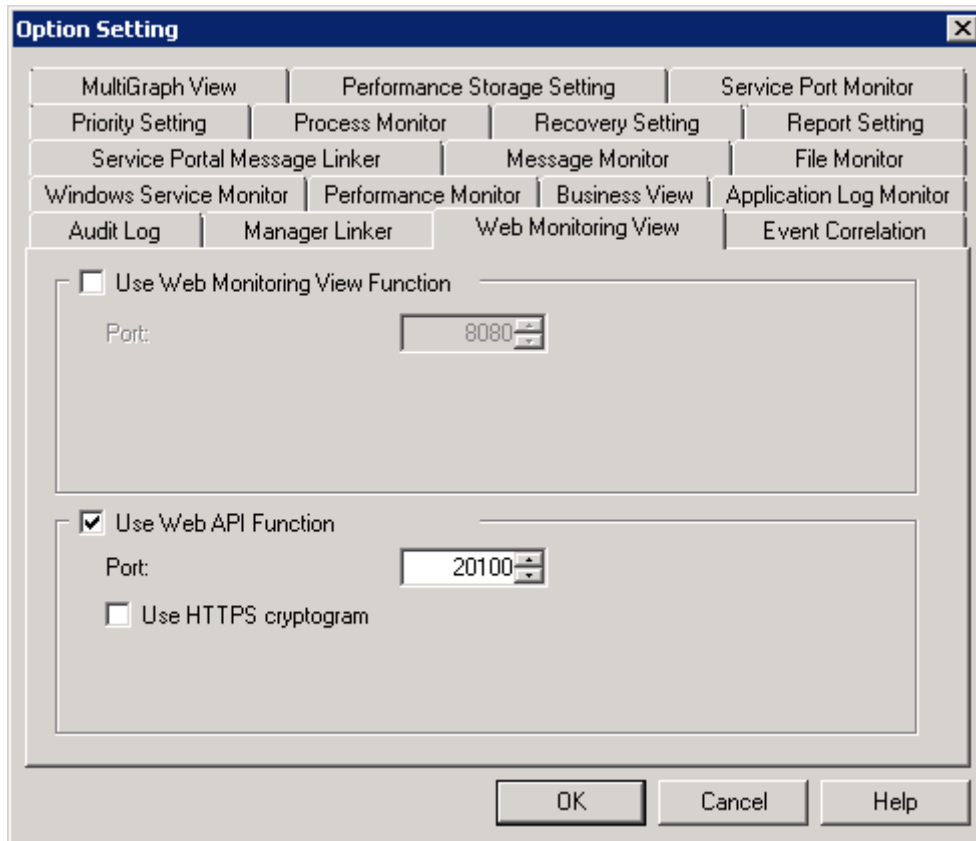
### 3.3.1 Preparation

1. Setting up internal communication with ServiceGovernor

Set up internal communication with ServiceGovernor for the manager.

For this setting, use the monitoring screen connected to the manager.

After changing to the definition mode, open the "Option Setting" screen by using [Option] in the [Setting] menu, and then select the [Web Monitoring View] tab.



Check the [Use Web API Function] box, and set [Port]. This port number will be used for the internal communication port specified in {URL} of "[3.3.2 Setting Up the ServiceGovernor Property File \(page 14\)](#)".

### 3.3.2 Setting Up the ServiceGovernor Property File

Set the properties for ServiceGovernor.

The configuration file of the properties is `\Tomcat\conf\fwapi.properties` in the installation folder.

A description of each parameter and a setting example are shown below.

#### ◆Parameter description

Parameter name	Description
<code>fw.manager{n}.host</code>	Specify the URL and port number of the manager. This parameter must be specified. In addition, name resolution must be possible with this parameter. The format of the parameter is as follows. <code>fw.manager{n}.host={URL},{SelfHost},{Manager Type}</code> The default value of port number is 20100.

#### ◆Format of the `fw.manager{n}.host` parameter

Enter a serial number starting with 1 in {n} of the `fw.manager{n}.host` key character string. When two managers are used, set the following.

```
fw.manager1.host={URL},{SelfHost},{Manager Type}
fw.manager2.host={URL},{SelfHost},{Manager Type}
```

Set the following elements to the setting values. Use a comma (,) as a separator.

Setting element	Setting value
{URL}	http://<manamer name>:<port number> In addition, name resolution must be possible with this parameter. The default value of port number is 20100.
{SelfHost}	Specify <manager name>. The manager name specified here must be the same as the HostName property in the [SelfNode] section set in the following file under the installation destination folder of the management server. In addition, name resolution must be possible with this parameter. Windows: <installation destination folder>\Manager\sg\SysMonMgr.ini  Linux: <installation destination directory>/Manager/sg/SysMonMgr.ini  [SelfNode] HostName=MOM01
{Manager Type}	If two or more managers are linked hierarchically, specify "MoM" for the entry of the high-level manager. Specify "RM" for the entry of the low-level manager. Omit this parameter unless two or more managers are linked.

#### ◆Setting example

Adding managers "mom03" and "mom04"

The following is a setting example where the original host name is registered for SysMonMgr.ini and the default value is set for a port number.

```
#fw.manager{n}.host={URL},{SelfHost},{Manager Type}
fw.manager1.host=http://mom03:20100,mom03
fw.manager2.host=http://mom04:20100,mom04
```

#### Caution

If you performed "3.2 Setting up SSL/TLS for the manager (page 12)", change protocol in {URL} to https.

On the machine on which ServiceGovernor has been installed, execute the following command to reflect the modified properties. After logging in with Administrators rights, execute the following WebApiTool.bat command to reflect the changed properties.

```
> cd "<Installation directory>\Tools"
> WebApiTool.bat properties reload fwapi
```

Confirm that the following is displayed as a standard output.

```
Normal End. PropertyFile(fwapi.properties) was reload.
-----
HTTP STATUS: 200
SUCCEEDED.
```

```
command exit code:0
COMMAND SUCCEEDED.
```

### **Caution**

If [ ServiceGovernor –HTTP Port] was changed in the procedure for installing ServiceGovernor , the following error message is output.

```
Abort Connection Error :IO error has happened. http response cord can't be received.
```

The specified port number must be identical to the port number within <installation folder>\Tools\env.bat.  
If the value has been changed from the default value (12080), change the following parameters in the env.bat file.  
For the SSL/TLS port, change [MANAGER\_PROTOCOL] to [https].

Setting example

```
set MANAGER_PROTOCOL=https
set MANAGER_PORT=12443
```

Execute the following command to check the loaded property values.

```
> cd "<Installation directory>\Tools"
> WebApiTool.bat properties show fwapi
```

Confirm that the following is displayed as a standard output.

```
fw.manager1.host=http://mom03:20100,mom03
fw.manager2.host=http://mom04:20100,mom04
```

## 3.4 Settings for Deleting a Manager

When a manager having access to ServiceGovernor is deleted, perform the preparation using the following procedure and edit the ServiceGovernor WebAPI configuration file.

### **Caution**

To operate ServiceGovernor in a cluster configuration, perform the following procedure on both the active and the standby servers.

### 3.4.1 Settings for Deleting a Manager

From the following files, delete the "fw.manager1.host=..." line, which specifies the target server to be deleted.  
¥Tomcat¥conf¥fwapi.properties

On the machine on which ServiceGovernor has been installed, execute the following command to reflect the modified properties. After logging in with Administrators rights, execute the following WebApiTool.bat command to reflect the changed properties.



```
> cd "<Installation directory>\Tools"
> WebApiTool.bat properties reload fwapi
```

Confirm that the following is displayed as a standard output.

```
Normal End. PropertyFile(fwapi.properties) was reload.
```

```
-----
HTTP STATUS: 200
SUCCEEDED.
```

```
command exit code:0
COMMAND SUCCEEDED.
```

### Caution

If [ ServiceGovernor –HTTP Port] was changed in the procedure for installing ServiceGovernor , the following error message is output.

```
Abort Connection Error :IO error has happened. http response cord can't be received.
```

The specified port number must be identical to the port number within <installation folder>\Tools\env.bat.

If the value has been changed from the default value (12080), change the following parameters in the env.bat file.

For the SSL/TLS port, change [MANAGER\_PROTOCOL] to [https].

Setting example

```
set MANAGER_PROTOCOL=https
set MANAGER_PORT=12443
```

Execute the following command to check the loaded property values.

```
> cd "<Installation directory>\Tools"
> WebApiTool.bat properties show fwapi
```

Confirm that the following is displayed as a standard output.

```
fw.manager1.host=http://mom03:20100,mom03
fw.manager2.host=http://mom04:20100,mom04
```

## 3.5 Setting up SSL/TLS for Tomcat

To use ServiceGovernor over an SSL/TLS connection, perform this procedure.

The SSL/TLS connection of ServiceGovernor is established between [Application Server] and [Client System].

If an SSL/TLS connection is not used, this procedure is not necessary.

**⚠ Caution**

To operate ServiceGovernor in a cluster configuration, perform the following procedure for both active and standby nodes.

**⚠ Caution**

This procedure assumes the use of Tomcat and Java bundled with ServiceGovernor.

### 3.5.1 Importing the Certificate

Before performing this procedure, prepare the server certificate and import it to the key store file.

For how to set the server certificate, see ["10.1 About the Certificate for SSL/TLS Setting \(page 64\)"](#).

**⚠ Caution**

When ServiceGovernor is upgraded, the installation folder is replaced by the new directory.

If <key store file name> is created under <installation destination folder> \Tomcat

, it is recommended that it be placed under <installation destination folder> \Tomcat\conf

.

### 3.5.2 Modifying the Tomcat Settings

Modify the following file with a text editor.

```
<Installation folder>%Tomcat%conf%server.xml
```

\* <Installation folder> is the destination in which ServiceGovernor is installed.

Change the settings as follows if they are currently set to the default values.

```
<!-- ←1.Delete
    <Connector port="12443" protocol="org.apache.coyote.http11.Http11NioProtocol"
        maxThreads="150" SSLEnabled="true">
        <SSLHostConfig>
            2.Update if necessary → <Certificate certificateKeystoreFile="<Keystore File Name>"
            2.Update→          certificateKeystorePassword="<Keystore Password
            >"
                                type="RSA" />
        </SSLHostConfig>
    </Connector>
--> ←3.Delete
```

\* For <Keystore File Name> and <Keystore Password>, specify the <Keystore File Name> and <Keystore Password>, which you specified in ["3.5.1 Importing the Certificate \(page 18\)"](#).

Setting example (for Tomcat 8.5)

```
<Connector port="12443" protocol="org.apache.coyote.http11.Http11NioProtoco
l"
    maxThreads="150" SSLEnabled="true">
  <SSLHostConfig>
    Certificate certificateKeystoreFile="conf/localhost-rsa.jks"
    certificateKeystorePassword="changeit"
    type="RSA" />
  </SSLHostConfig>
</Connector>
```

### 3.5.3 Changing env.bat

When SSL/TLS for ServiceGovernor has been enabled, modify env.bat by referring to ["3.6 After the Tomcat Settings Are Monitored \(page 19\)"](#).

### 3.5.4 Restarting the Service

Restart the "Apache Tomcat 8.5 ServiceGovernor" service.

## 3.6 After the Tomcat Settings Are Monitored

### Caution

To operate ServiceGovernor in a cluster configuration, perform the following procedure on both the active and the standby servers.

If any of the following Tomcat server.xml settings was modified manually, you also need to modify the environment configuration file for ServiceGovernor tools.

- Enable/disable SSL/TLS
- HTTP port number

Target file:

```
<installation destination folder>\Tools\env.bat
```

The specified port number must be identical to the port number within <installation folder>\Tools\env.bat.

If the value has been changed from the default value (12080), change the following parameters in the env.bat file.

For the SSL/TLS port, change [MANAGER\_PROTOCOL] to [https].

Setting example

```
set MANAGER_PROTOCOL=https
set MANAGER_PORT=12443
```

## 3.7 About the Port Numbers Used

ServiceGovernor uses the following network port numbers by default.

If a firewall such as Windows Firewall is enabled in the system environment, open the following port.

For functions that are not used, set so that they will be closed.

Component	Item	Program name	Protocol	Connection destination port number	Connection source target	Connection source port number	Whether the port number can be changed or not
Application Server	* Apache Tomcat	<installation folder>\Tomcat\bin\tomcat8.exe  (The path varies according to the OS environment.)	TCP	12080	RESTFul API client * If http communication is used * If SSL/TLS is used, close the port.	Automatic	Yes
			TCP	12443	RESTFul API client * If https communication is used	Automatic	Yes
			TCP	12005	Tomcat management port number * Close the port.	Automatic	Yes
			TCP	12009	Tomcat AJP/1.3 port number * Close the port.	Automatic	Yes

## 3.8 Verifying Operation of ServiceGovernor

Verify that the installation and setup of ServiceGovernor have been completed successfully.

### 3.8.1 Enabling/Disabling the API Verification Screen

Enable or disable the API verification screen.

Change the setting for `fw.restconsole.check.enable` in the following file  
`\Tomcat\conf\fwapi.properties`

within the installation destination folder.

■When enabling:

Set `fw.restconsole.check.enable` to `true`.

Setting example:

```
fw.restconsole.check.enable=true
```

■When disabling:  
Set `fw.restconsole.check.enable` to `false`.

Setting example:

```
fw.restconsole.check.enable=false
```

After completing the change, execute the following command to update the setting.

```
> cd "<Installation directory>\Tools"  
> WebApiTool.bat properties reload fwapi
```

## 3.8.2 Operation Verification

1. Enable the API verification screen by referring to ["Enabling/Disabling the API Verification Screen \(page 20\)"](#).
2. Open the Web browser, and access the following URL.  
`http://localhost:12080/umf/APIConsoleService`

### Note

The scheme, host name, and port number to be specified for the URL must be changed according to your settings.

3. Enter the following on the displayed screen.

URI	<code>http://localhost:12080/umf/fw/topology/agent</code>
AccessKey	AccessKeyId generated in <a href="#">"3.1 API Authentication Key (page 10)"</a>
SecretKey	SecretAccessKey generated in <a href="#">"3.1 API Authentication Key (page 10)"</a>
Header	<code>Content-Type: application/json; charset=utf-8 X-FW-API-Version: 1.0</code>
RequestBody	(None)

4. Select GET with the radio button for Method.
5. Click the [submit] button.
6. If the following is displayed, ServiceGovernor is operating normally.

```
Response Status Code = 200  
  
{ "Topology": [{"TreeNode": {"NodeType": "root",  
:  
:  
:
```

7. Disable the API verification screen by referring to ["Enabling/Disabling the API Verification Screen \(page 20\)"](#).

# Chapter 4.

# Constructing a ServiceGovernor Cluster

---

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These procedures are available to operate ServiceGovernor in a cluster environment.

These procedures are unnecessary if you want to operate ServiceGovernor in a single configuration.

The procedures in this chapter assume that those in the subsequent sections must be performed in the order as described.

[Active] and [Standby] represent the systems in which to perform the procedures described in this section.

---

**⚠ Caution**

If you operate ServiceGovernor in a cluster configuration, the configuration file of ServiceGovernor and the log output by ServiceGovernor are managed separately on the active and standby servers.

Note that, for this reason, if the configuration file of ServiceGovernor is modified or the log is viewed, you need to perform the same process on both the active and the standby servers.

---

## 4.1 Preface

This document provides an example procedure for using EXPRESSCLUSTER X to set up a cluster configuration that has two nodes (for duplication). EXPRESSCLUSTER X is an NEC product that can be used to switch running processes between nodes in a duplicated system.

In this document, a host system included in a cluster is referred to as a node.

### 4.1.1 Supplemental Information

If the incorrect procedure is used to upgrade the OS on a cluster server, failovers might occur at unexpected times.

In the worst case, this might damage the system.

Be sure to upgrade the OS in accordance with the procedure on the setup card.

### 4.1.2 Target Products

This document covers the following products.

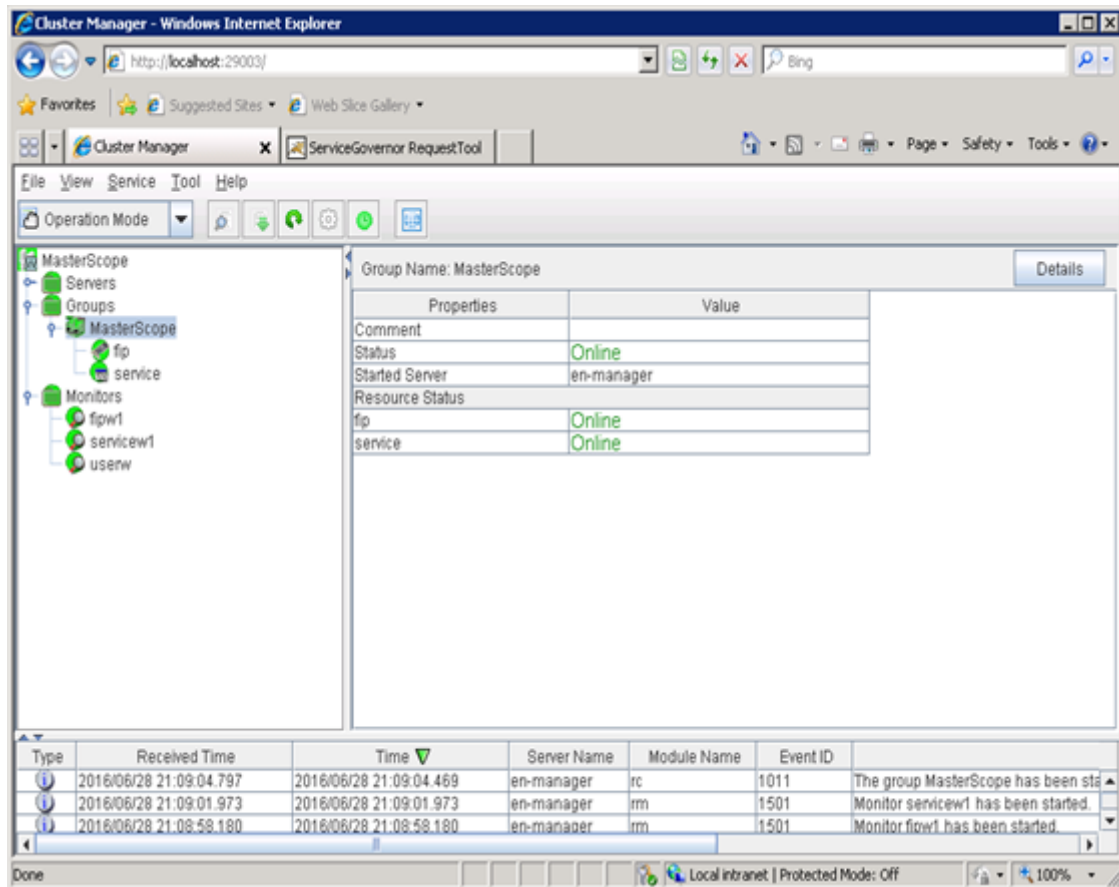
- EXPRESSCLUSTER X 3.1 for Windows
- EXPRESSCLUSTER X 3.2 for Windows
- EXPRESSCLUSTER X 3.3 for Windows

## 4.2 Creating a New Failover Group

For EXPRESSCLUSTERX, nodes connected to the cluster are managed using units called failover groups (hereinafter "groups").

For details of how to create groups, refer to Chapter 5 in the EXPRESSCLUSTER X document, "Installation and Creation Guide".

If another product supported by the MasterScope framework has been installed, the same group is available.



## 4.3 Setting Up Shared Resources (Floating IP)

The following describes how to set up shared resources for a failover group.

Here, the following shared resources are assumed:

Floating IP address: 192.168.1.10

Right-click the group, and then select [Add Resource] from the displayed pop-up menu. The [Resource Definition] screen is displayed.

Set up the floating IP address.

Right-click the group, select [Add Resource] from the displayed pop-up menu, select [floating ip resource] for [Type], and then enter the group name in the [Name] text box.



The screenshot shows the 'Resource Definition of Group(MasterScope)' dialog box in the 'Info' step. The 'Group Resource Definitions' section contains the following fields:

- Type: floating ip resource
- Name: fip
- Comment: (empty)

A 'Get Licence Info' button is located to the right of the Comment field. Below the input fields is a 'Description' section with the text: 'Select the type of group resource and enter its name.' At the bottom of the dialog are '< Back', 'Next >', and 'Cancel' buttons.

Specify the floating IP address in the [IP Address] text box.

The screenshot shows the 'Resource Definition of Group(MasterScope)' dialog box in the 'Details' step. The 'Common' tab is selected, showing the 'en-manager' and 'en-manager2' sub-tabs. The 'IP Address' field is empty. At the bottom right, there is a 'Tuning' button. At the bottom of the dialog are '< Back', 'Finish', and 'Cancel' buttons.

## 4.4 Setting Up ServiceGovernor

### Caution

- Perform the installation on the active server first and then on the standby server.

### 4.4.1 [Active] Installing ServiceGovernor

Install ServiceGovernor on the active server according to the procedure in "[Chapter 2. Installing ServiceGovernor \(page 3\)](#)".

### 4.4.2 [Active] Setting Up ServiceGovernor

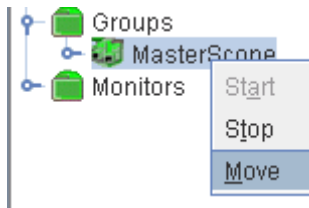
Set up ServiceGovernor according to the procedure in "[Chapter 3. Setting Up ServiceGovernor \(page 9\)](#)".

### 4.4.3 [Active] Setting Up the Tomcat Service

On the "Services" screen, open the properties of the [Apache Tomcat 8.5 ServiceGovernor] service, stop the service, and then change [Startup Type] to [Manual].

### 4.4.4 Moving to the Standby System

In the EXPRESSCLUSTER WebManager window, right-click the MasterScope group and select [Move] to move to the standby system.



### 4.4.5 [Standby] Installing ServiceGovernor

Install ServiceGovernor on the standby server according to the procedure in "[Chapter 2. Installing ServiceGovernor \(page 3\)](#)".

### Caution

All the input items, including the installation path and port number, must be identical to those of the active server.

### 4.4.6 [Standby] Setting Up ServiceGovernor

Set up ServiceGovernor according to the procedure in "[Chapter 3. Setting Up ServiceGovernor \(page 9\)](#)".

### Caution

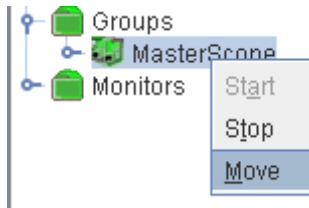
For "[3.1 API Authentication Key \(page 10\)](#)", execute only step "[7. \(page 11\)](#)".

### 4.4.7 [Standby] Setting Up the Tomcat Service

On the "Services" screen, open the properties of the [Apache Tomcat 8.5 ServiceGovernor] service, stop the service, and then change [Startup Type] to [Manual].

## 4.4.8 Moving to the Active System

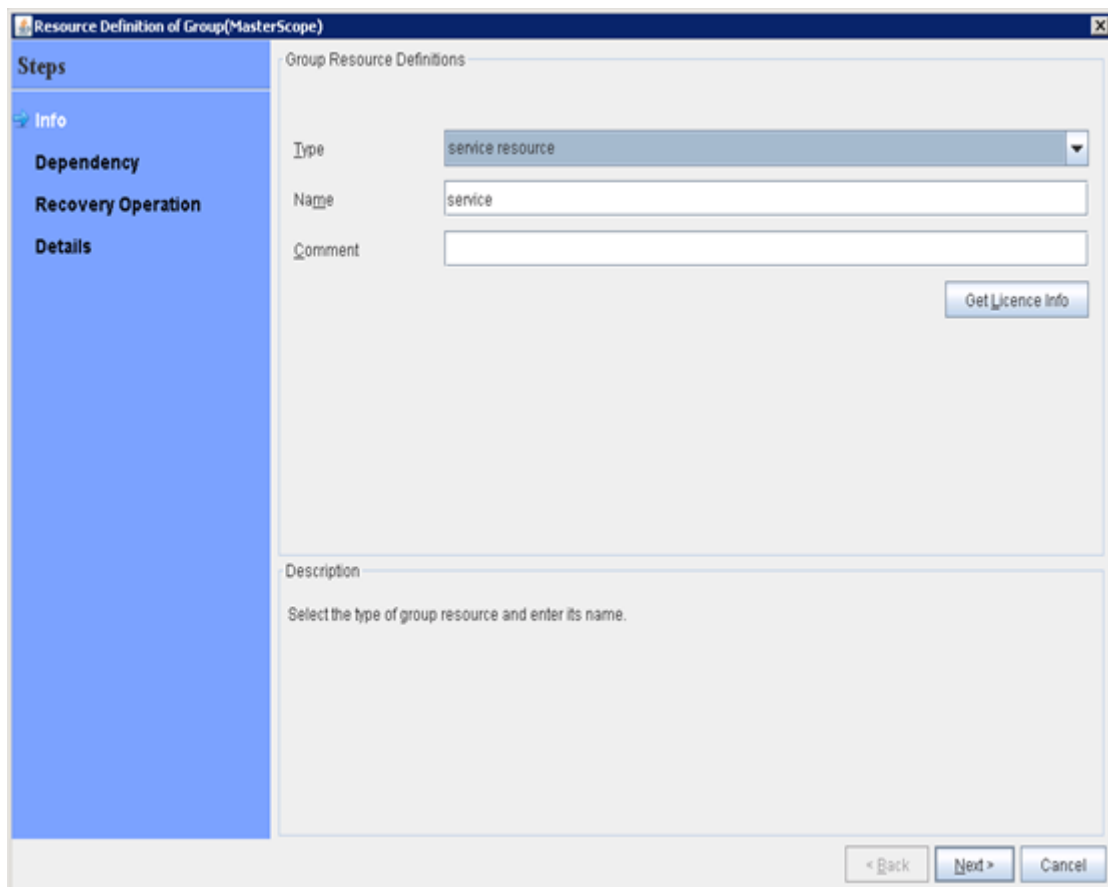
In the EXPRESSCLUSTER WebManager window, right-click the MasterScope group and select [Move] to move to the active system.



## 4.5 Adding Service Resources

Start up WebManager, and then select a failover group. (Here, select [MasterScope].)

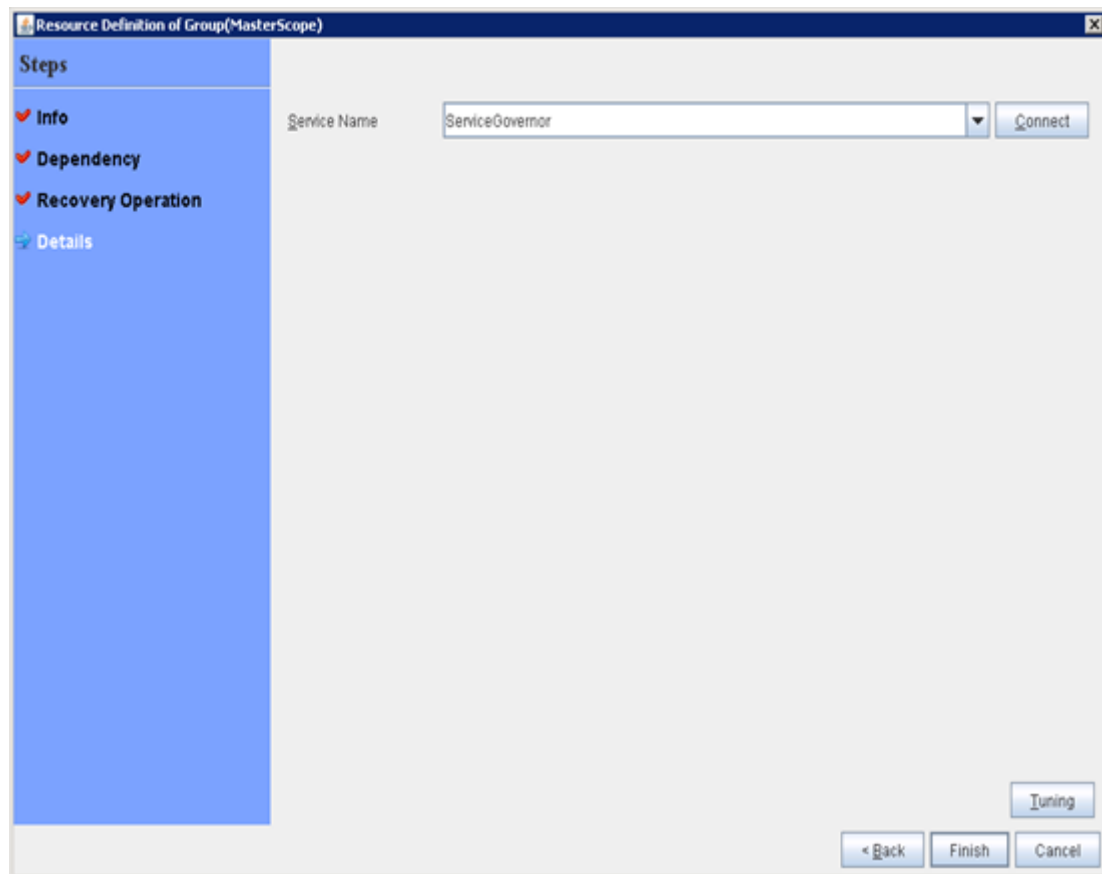
Right-click the group, select [Add Resource] from the displayed pop-up menu, select [service resource] for [Type], and then enter the group name in the [Name] text box.



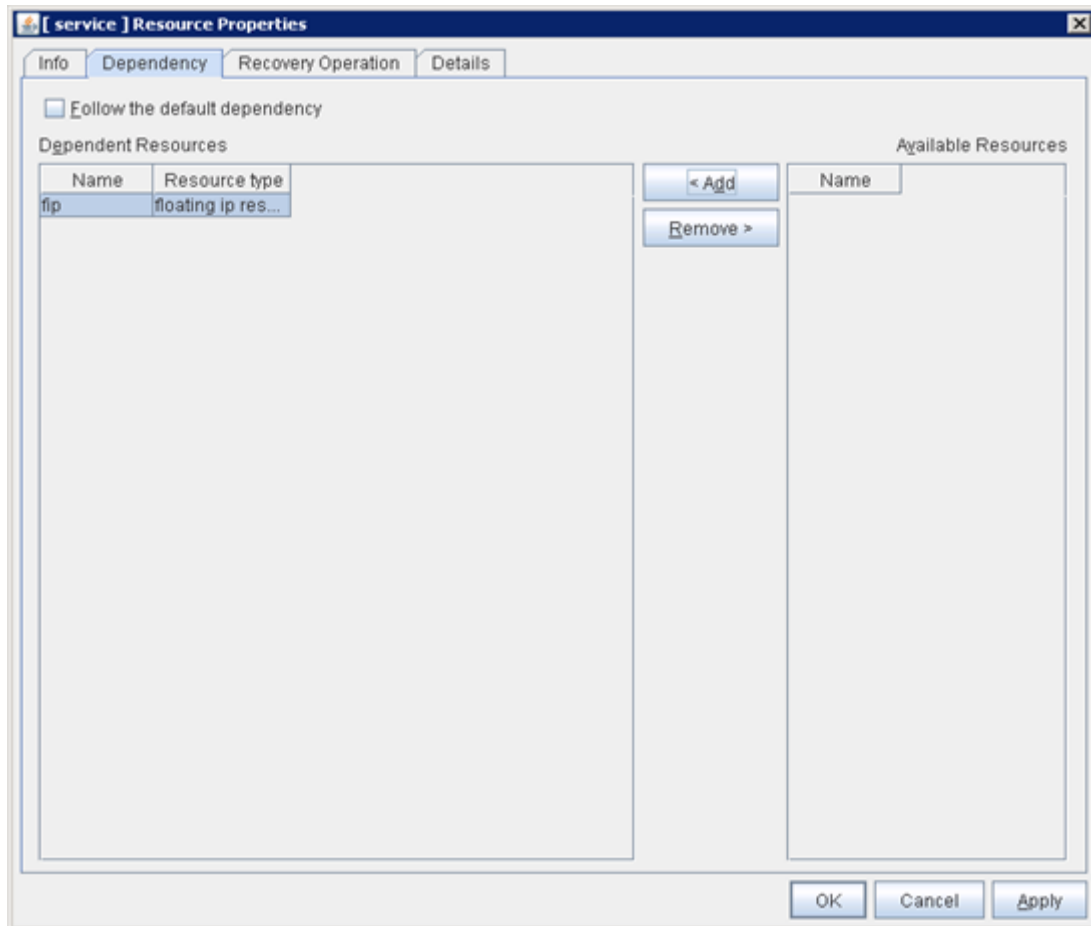
Specify the Windows service name for the product in the [Service Name] text box.

Enter the following service name.

ServiceGovernor



To set up the dependencies, clear the [Follow the default dependence] check box, and then add the floating IP address to the resources that are depended on.



After specifying the settings, return to the failover group properties, and then confirm that the settings have been applied.

# Chapter 5. Uninstalling ServiceGovernor

---

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## 5.1 Uninstalling ServiceGovernor

The following and subsequent sections describe the procedure for uninstalling the ServiceGovernor.

### Caution

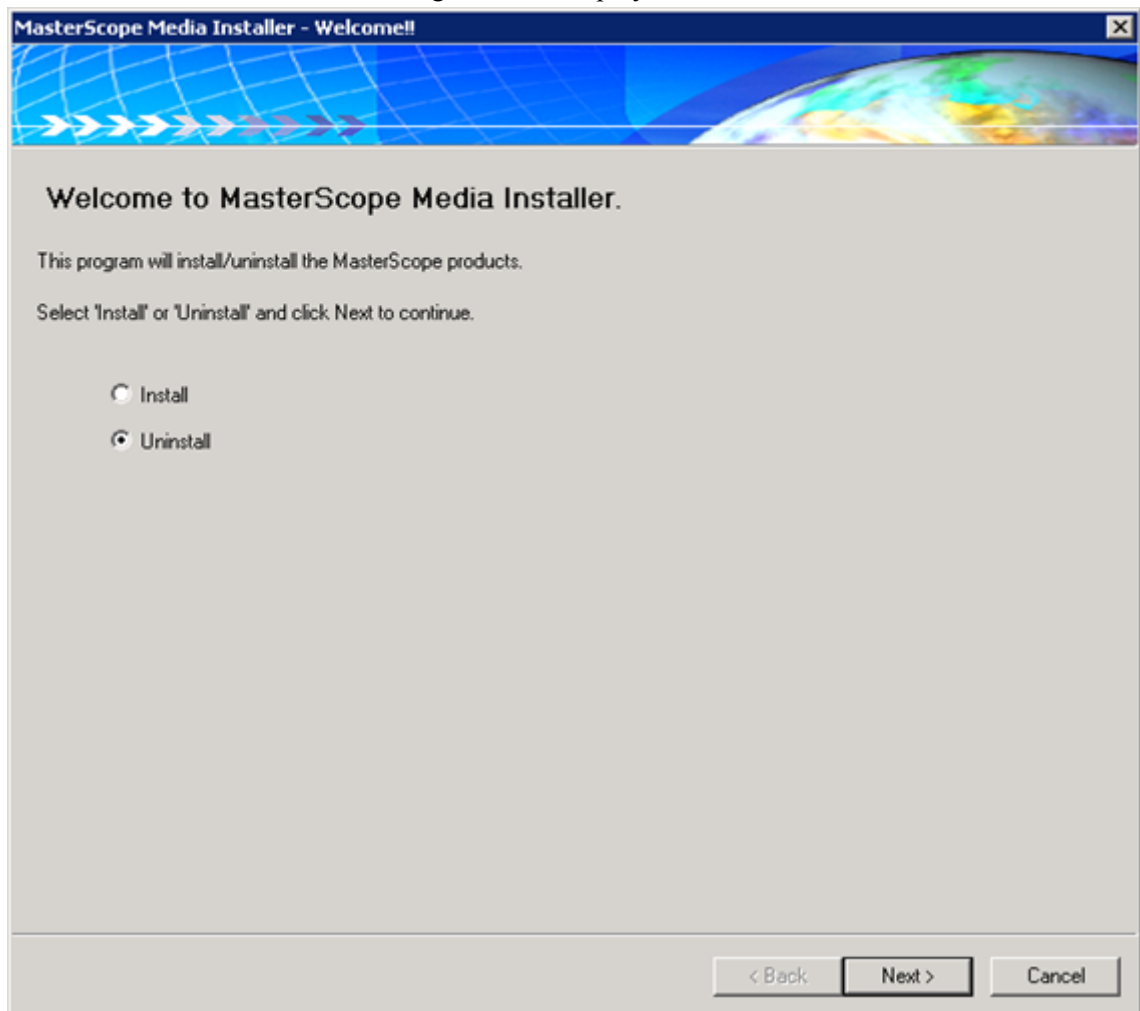
If ServiceGovernor is operating in a cluster environment, perform this procedure on both the active and the standby servers.

### 5.1.1 Uninstalling ServiceGovernor with Uninstaller

1. Insert the installation DVD into the DVD drive.
2. Execute the following command from the Explorer or command prompt to start the installer.

```
> <Install DVD>\Windows\Setup.exe
```

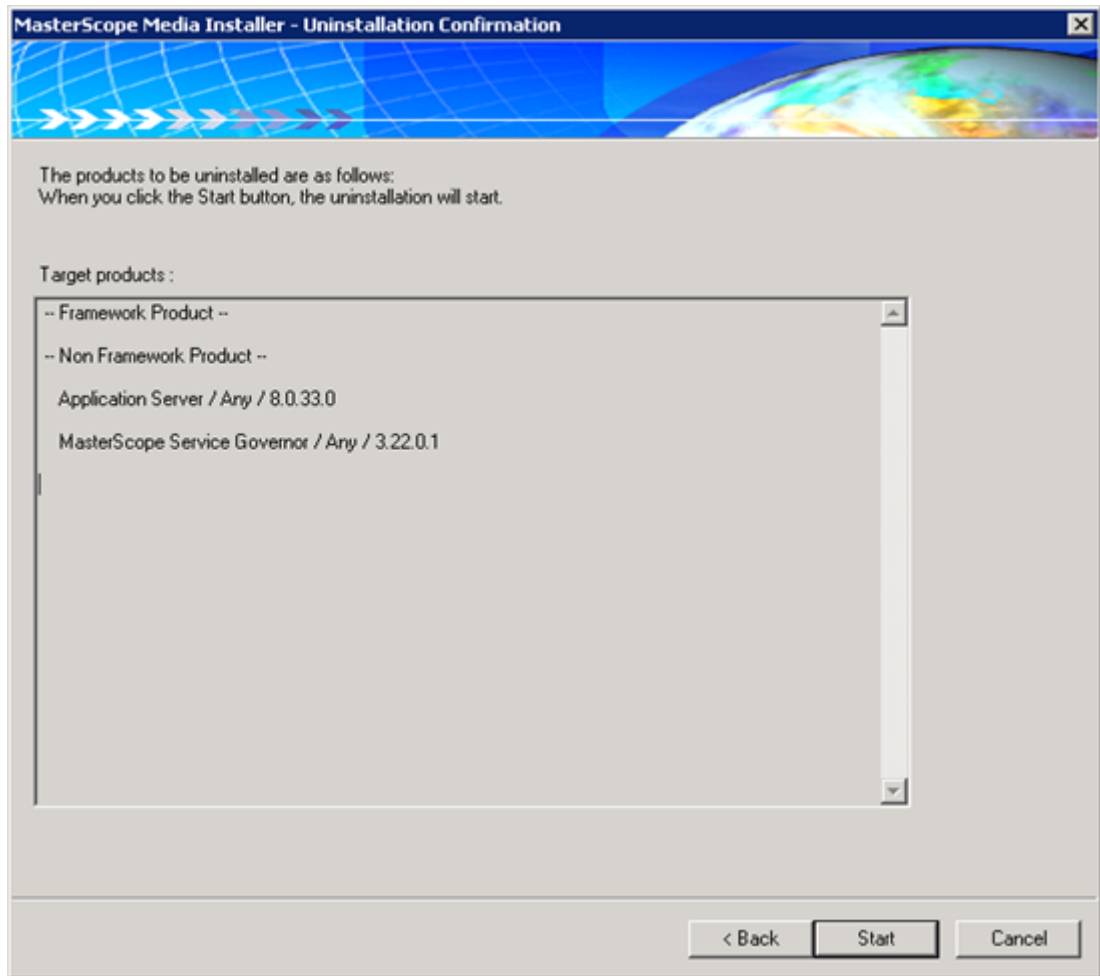
3. The installer starts, and the following screen is displayed.



4. Select [Uninstall], and click [Next].
5. The [Uninstallation Selection] screen is displayed.

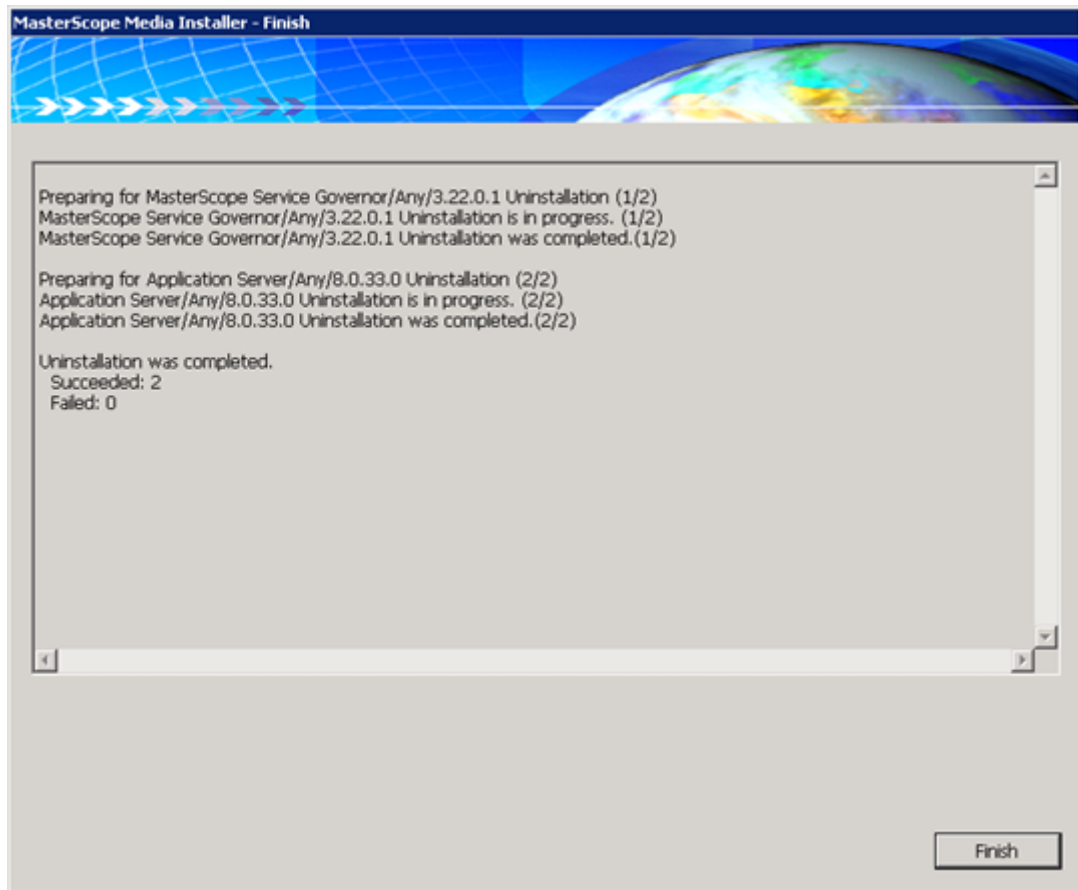






9. Check the details, and click [Start].

Uninstallation starts. When the Uninstallation is complete, the [Finish] screen is displayed.



If the screen as above is displayed, the installation is complete.

10. Click [Finish].

# Chapter 6. Upgrading

---

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---

You can individually upgrade ServiceGovernor itself and the application server on which ServiceGovernor operates.

The individual installation is described in the procedures below. However, like the installation procedure in "2.1.1 Installing ServiceGovernor from the Installer (page 4)", you can simultaneously upgrade the body of ServiceGovernor and the application server on which its ServiceGovernor operates.

## 6.1 Upgrading ServiceGovernor

Subsequent sections describe the procedure for upgrading ServiceGovernor.

### Caution

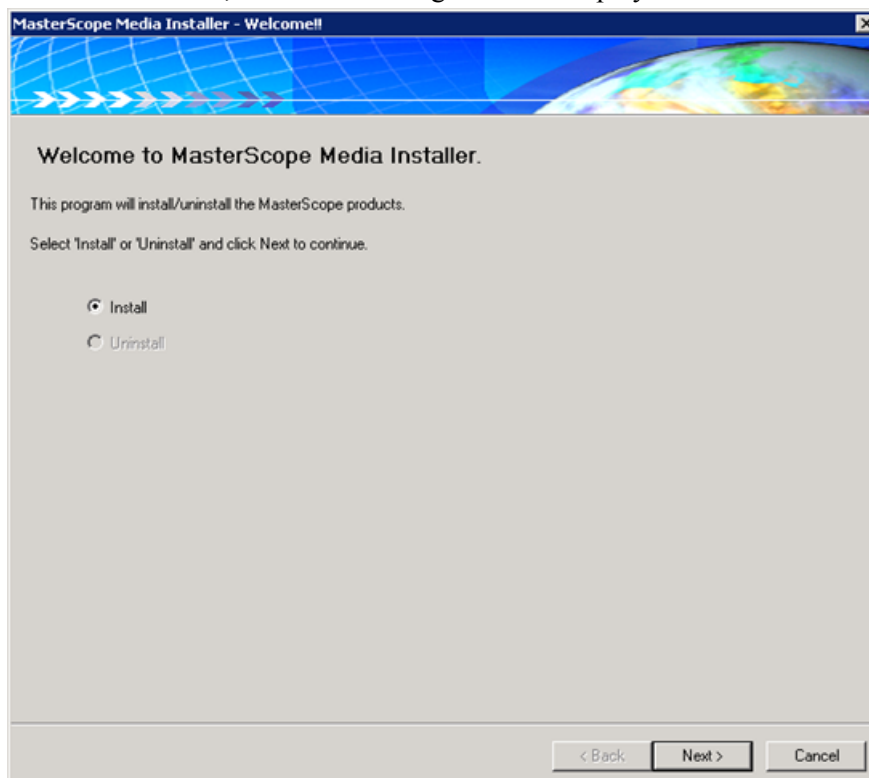
If ServiceGovernor is operating in a cluster environment, perform this procedure on both the active and the standby servers.

### 6.1.1 Upgrading ServiceGovernor from the Installer

1. Insert the installation DVD into the DVD drive.
2. Execute the following command from the Explorer or command prompt to start the installer.

```
> <Install DVD>\Windows\Setup.exe
```

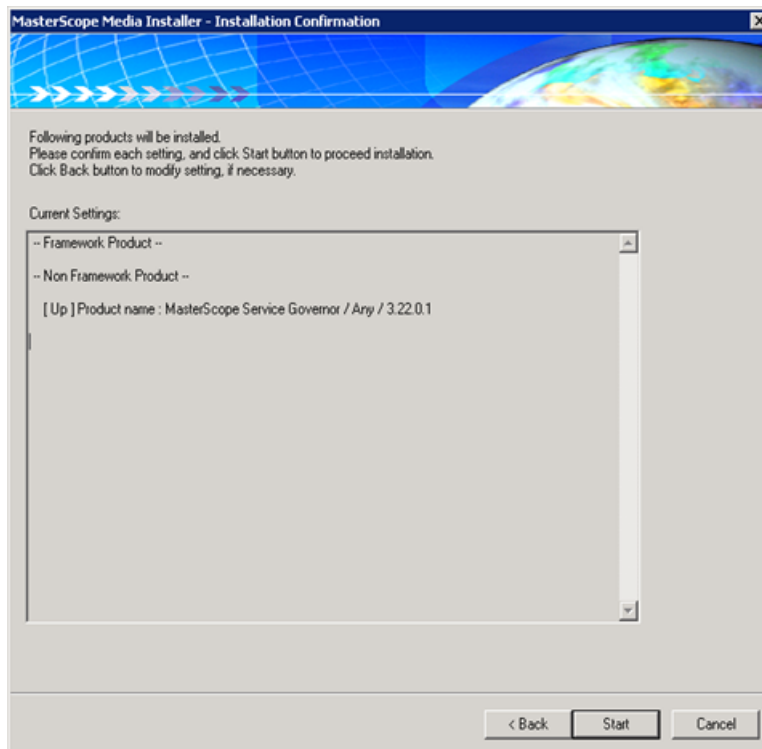
3. The installer starts, and the following screen is displayed.



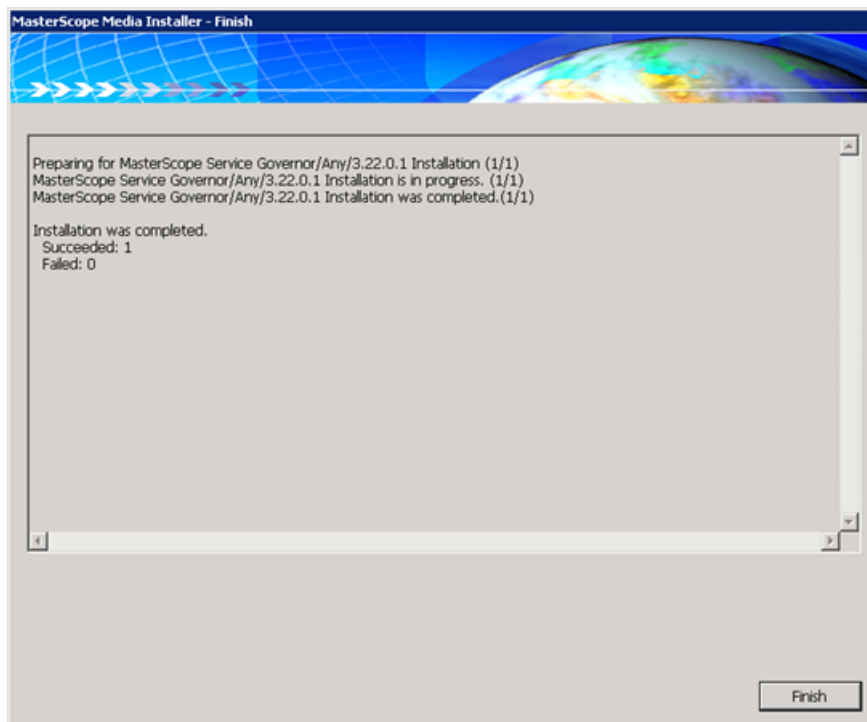
4. Select [Install], and click [Next].
5. The [Installation Selection] screen is displayed.



10. The [Installation Confirmation] screen is displayed.



11. Check the details, and click [Start].
12. Installation starts. When the installation is complete, the [Finish] screen is displayed.



13. If the screen as above is displayed, the installation is complete.
14. Click [Finish].

## 6.1.2 Reversion after Upgrade of ServiceGovernor

If a problem occurs after upgrade of ServiceGovernor, you can restore it to the previous version by using the backup acquired before the installation. The backup is saved automatically.

The backup contains the following files. The file settings can be restored by the restoring procedure.

- <installation folder>\Tools\env.bat  
Tomcat port number, protocol (http/https), JDK version used, etc.
- Jar files including the plug-ins operating on ServiceGovernor  
Restore the plug-ins used to implement the API The plug-ins for the old version are restored.

### Caution

Delete unnecessary backup files manually. For the backup directory folder, see the following procedure.

Perform the following procedure.

1. Using the following command, stop the ServiceGovernor service.

```
net stop ServiceGovernor
```

2. Copy backup files from the following backup folder to the folder storing the ServiceGovernor plug-in (jar file).

ServiceGovernor plug-in storage folder

```
<Installation directory>\Tomcat\FrameworkPlugins
```

ServiceGovernor plug-in backup folder

```
<Installation directory>\Tomcat_BackUp\FrameworkPlugins_BackUp\FrameworkPlugins_<Date>
```

<Date> indicates the date when ServiceGovernor was upgraded.

3. Copy backup files from the following backup folder to the folder storing the ServiceGovernor tools.

ServiceGovernor tool storage folder

```
<Installation directory>\Tools
```

ServiceGovernor tool backup folder

```
<Installation directory>\Tomcat_BackUp\Tools_BackUp\Tools_<Date>
```

<Date> is the date when ServiceGovernor was upgraded.

4. Delete the application file of ServiceGovernor and the folder to which they are deployed.

File path of the ServiceGovernor application to be deleted

```
<Installation directory>\Tomcat\webapps\umf.war
```

Folder to which the ServiceGovernor application file to be deleted is deployed

```
<Installation directory>\Tomcat\webapps\umf
```

- Copy the application file of ServiceGovernor from the following backup folder to the storage folder. Then, rename the file to "umf.war".

File path of ServiceGovernor application

```
<Installation directory>\Tomcat\webapps\umf.war
```

Backup file path of ServiceGovernor application

```
<Installation directory>\Tomcat_BackUp\umfwar\umf.war.<Date>
```

<Date> is the date when ServiceGovernor was upgraded.

- Using the following command, start the ServiceGovernor WebAPI service.

```
net start ServiceGovernor
```

The reverting procedure is now complete.

### Caution

- The setting files under the following folder are not upgraded automatically. If the settings have been changed after upgrading, restore them to the settings preceding the upgrade.

ServiceGovernor setting file storage folder

```
<Installation directory>\Tomcat\conf
```

## 6.2 Upgrading the Application Server

The following sections describe the procedure for upgrading the application server.

### Caution

- When you are operating the application server in a cluster environment, perform this procedure for both active and standby servers.
- When you are operating the application server in a cluster environment, reconfigure the service settings as instructed in ["4.4.3 \[Active\] Setting Up the Tomcat Service \(page 26\)"](#) and ["4.4.7 \[Standby\] Setting Up the Tomcat Service \(page 26\)"](#) after performing ["6.2.1 Upgrading the Application Server from the Installer \(page 41\)"](#).
- When you install the upgraded version, you cannot change the port number and other parameters that you set when initially installing the server.
- The files under <installation folder>\Tomcat\conf are not upgraded. The items that you need to set when upgrading Tomcat, such as server.xml, should be changed after the upgrade. In case you upgrade the files under conf individually, Tomcat is stored in the following file path of the installation media: DVD drive:\Windows\Product\CloudProviderAPI\Tomcat\_X64 (or Tomcat\_X86) . Uncompress Tomcat in a desired folder and refer to the conf folder.
- Upgrading the application server initializes the registries of Tomcat and Java. If you have changed any of these registries before the upgrade, set the changed registry again.
- The upgrade changes the Tomcat startup user to local system. If you have changed the Tomcat startup user after the installation, set the startup user again as instructed in ["9.2.2 Starting ServiceGovernor as a User with Non-Administrator Privileges \(page 57\)"](#).
- Upgrading the application server may fail. If the upgrade fails, recover the application server as described in ["10.4 Recovering an Application Server \(page 68\)"](#).

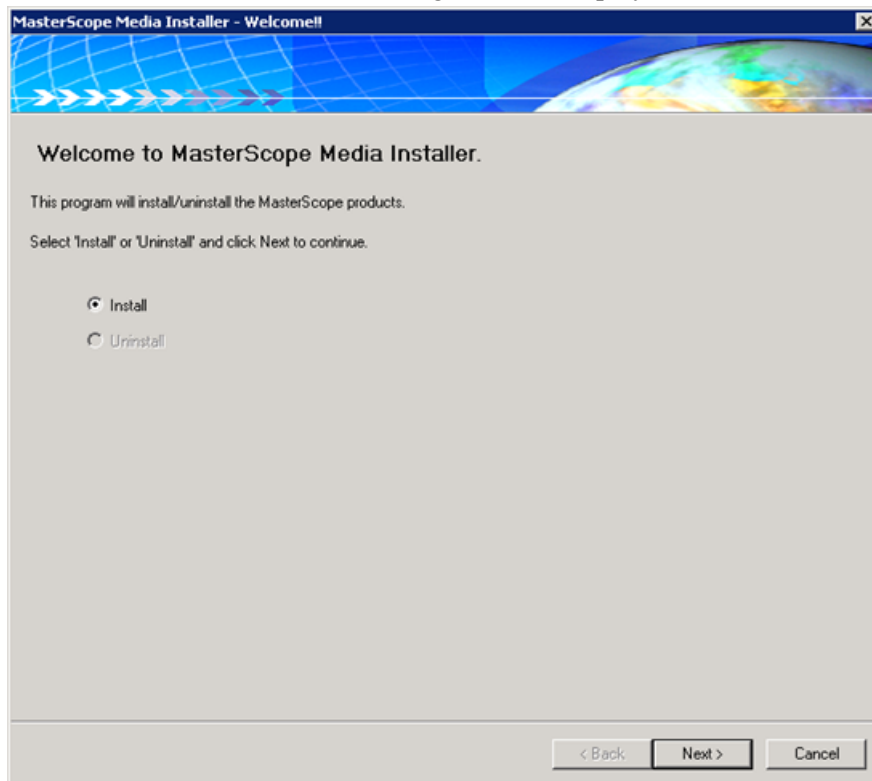


## 6.2.1 Upgrading the Application Server from the Installer

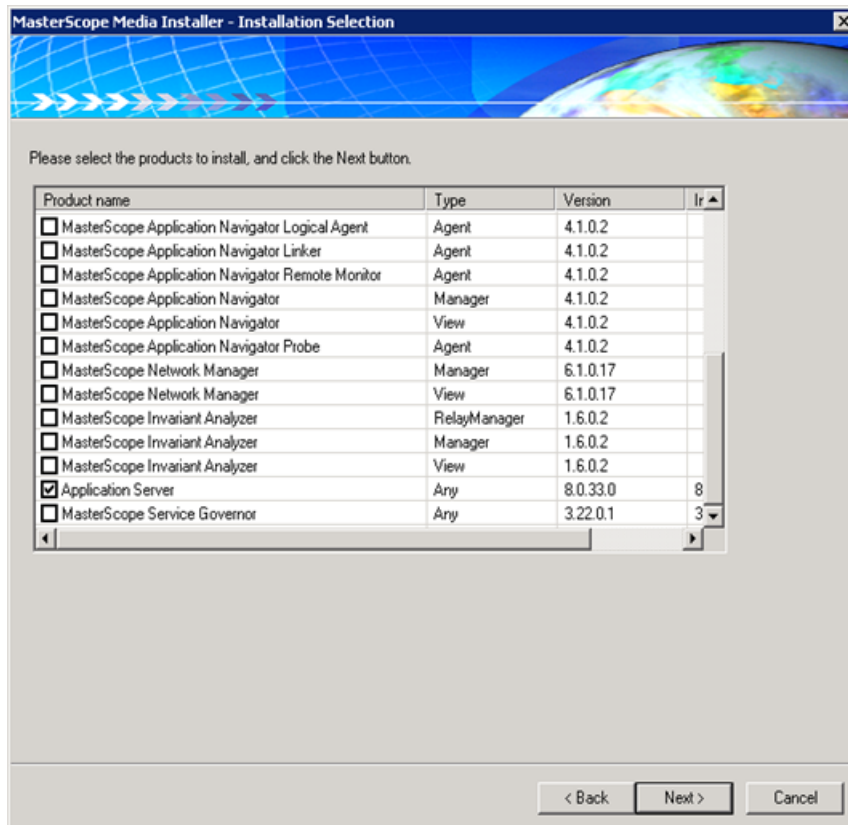
1. Insert the installation DVD into the DVD drive.
2. Execute the following command from the Explorer or command prompt to start the installer.

```
> <Install DVD>\Windows\Setup.exe
```

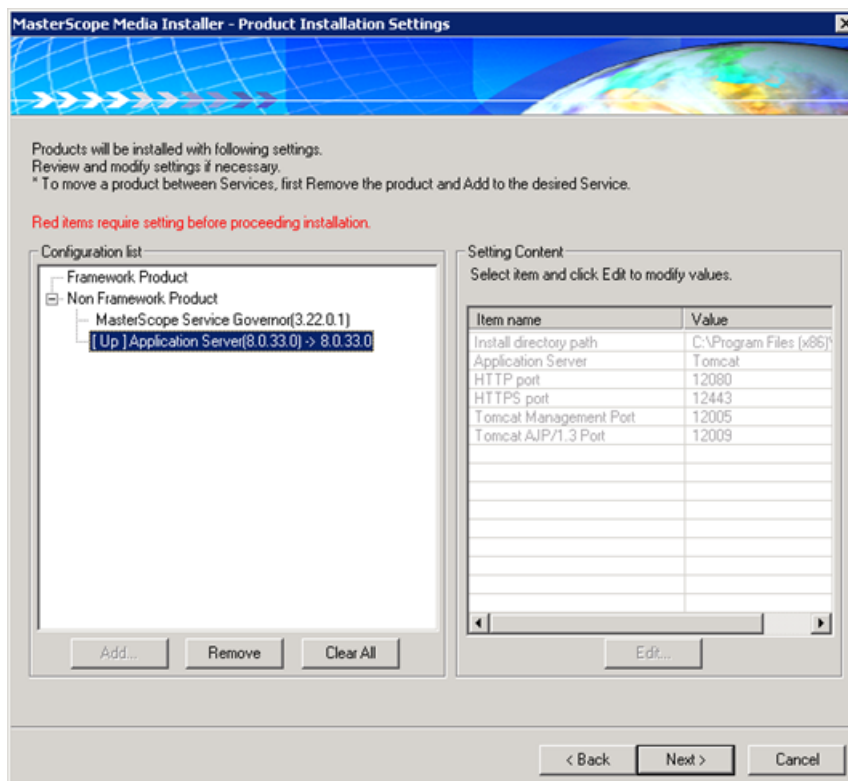
3. The installer starts, and the following screen is displayed.



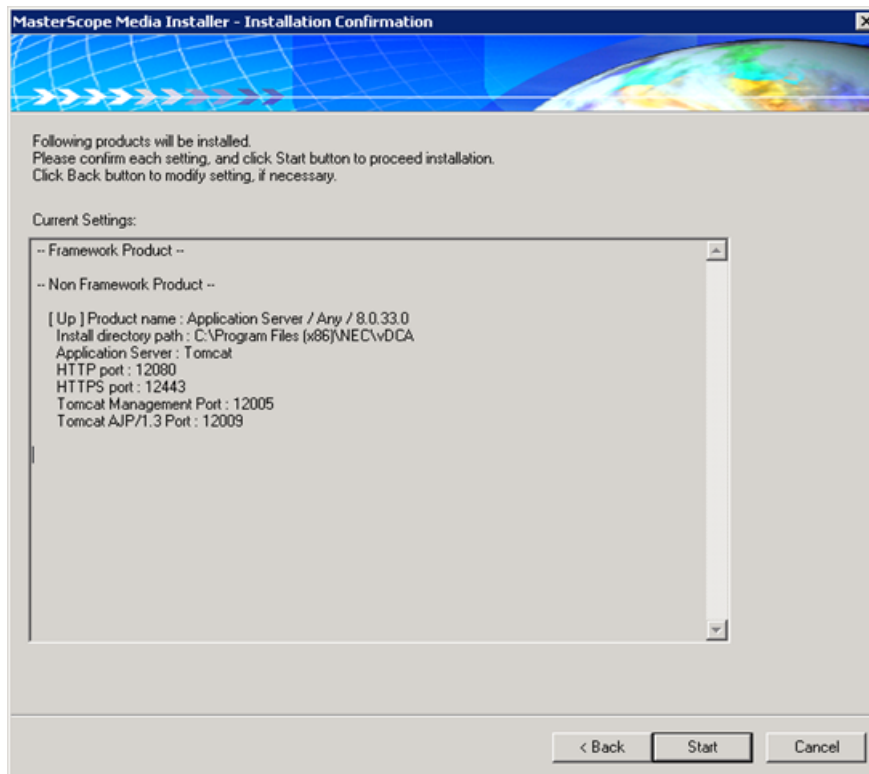
4. Select [Install], and click [Next].
5. The [Installation Selection] screen is displayed.



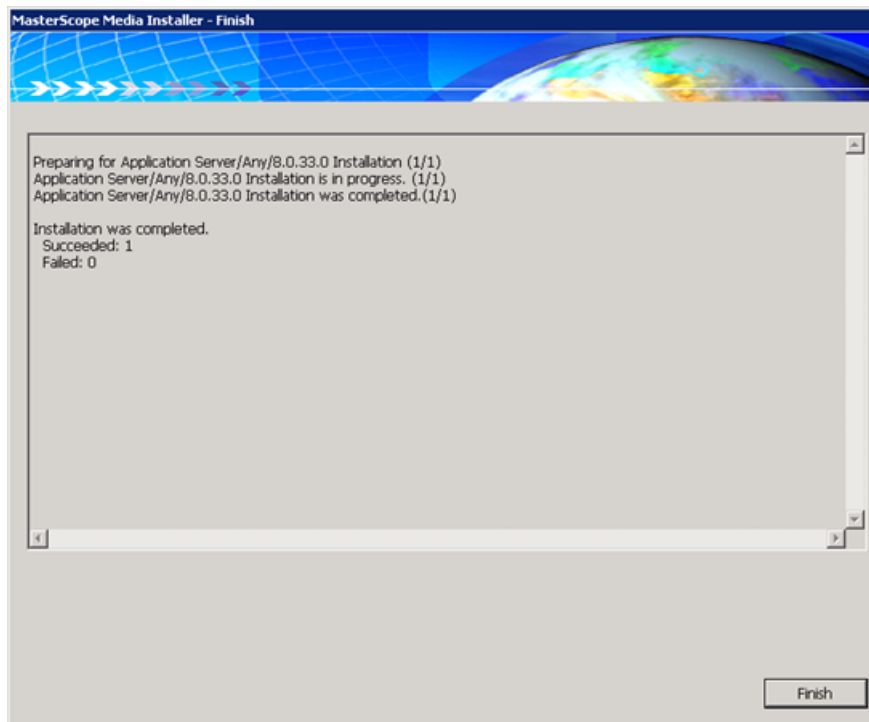
6. Check the boxes of the following product names.
  - Application Server
7. Click [Next].
8. The [Product Installation Settings] dialog box is displayed.



- No setting values can be changed.
- Click [Next].
  - The [Installation Confirmation] screen is displayed.



- Check the details, and click [Start].
- Installation starts. When the installation is complete, the [Finish] screen is displayed.



- If the screen as above is displayed, the installation is complete.

14. Click [Finish].

## 6.2.2 Reversion after Upgrade of the Application Server

If a problem occurs after upgrade of the application server, you can restore it to the previous version by using the backup acquired before the installation. The backup is saved automatically.

The backup contains the following files. The file settings can be restored by the restoring procedure.

- `<installation folder>\Tomcat\conf\server.xml`  
Tomcat port number, SSL/TLS settings, etc.
- `<installation folder>\Tomcat\conf\fwapi.properties`  
Manager settings, connection timeout value, and other settings managed by ServiceGovernor
- `<installation folder>\Tomcat\vDCApiKey.jks`  
User settings for user authentication that is performed during access to ServiceGovernor, as well as access key settings
- Other user-specified files stored under Tomcat (e.g., SSL/TLS certificate)

### Caution

Delete unnecessary backup files manually. For the backup directory folder, see the following procedure.

Perform the following procedure.

1. Using the following command, stop the ServiceGovernor service.

```
net stop ServiceGovernor
```

2. Copy the backup files from the following backup folder to the application server installation folder.

Application server installation folder

```
<Installation directory>\Tomcat
```

Application server backup folder

```
<Installation directory>\Tomcat_BackUp\Tomcat_<Date>
```

The date is the date when the application server was upgraded.

3. Using the following command, start the ServiceGovernor service.

```
net start ServiceGovernor
```

The reverting procedure is now complete.

### Caution

- The setting files under the following folder are not upgraded automatically. If the settings have been changed after upgrading, restore them to the settings preceding the upgrade.  
ServiceGovernor setting file storage folder

```
<Installation directory>\Tomcat\conf
```

---

# Chapter 7.

## Backing Up the Files

The following describes the procedure to follow to back up ServiceGovernor and its application server settings. <installation directory> in the procedure below is defined in "[Glossary \(page iii\)](#)". \* Replace it according to your environment.

1. Back up the following files in the desired folder.
  - <installation folder>\Tomcat\conf\fwapi.properties
  - <installation folder>\Tomcat\conf\fwbaselog.properties
  - <installation folder>\Tomcat\conf\responseheader.properties
  - <installation folder>\Tomcat\conf\server.xml
  - <installation folder>\Tomcat\conf\logging.properties
  - All files under <installation folder>\Tomcat\conf\FrameworkPlugins
  - Other user-specified files stored under the <installation folder>\Tomcat\conf (e.g., SSL/TLS certificate)
  - <installation folder>\Tomcat\vDCApiKey.jks
  - <installation folder>\Tools\env.bat
  - <installation folder>\Tools\WebApiTool.bat
  - <installation folder>\Tools\evidence\conf\apikeylog.properties

# Chapter 8.

## Restoring the Backed Up Files

The following describes the procedure to follow to restore the ServiceGovernor settings and its application server settings. The default value of <installation directory> in the procedure below is defined in "[Glossary \(page iii\)](#)". \* Replace it in accordance with your environment.

1. Using the following command, stop the ServiceGovernor service.

```
net stop ServiceGovernor
```

2. Overwrite the following files, which were backed up with the backup procedure.

- <installation folder>\Tomcat\conf\fwapi.properties
- <installation folder>\Tomcat\conf\fwbaselog.properties
- <installation folder>\Tomcat\conf\responseheader.properties
- <installation folder>\Tomcat\conf\server.xml
- <installation folder>\Tomcat\conf\logging.properties
- Other user-specified files stored under the <installation folder>\Tomcat\conf (e.g., SSL/TLS certificate)
- <installation folder>\Tomcat\vDCApiKey.jks
- <installation folder>\Tools\env.bat
- <installation folder>\Tools\WebApiTool.bat
- <installation folder>\Tools\evidence\conf\apikeylog.properties

For the following folder, delete all the files once from the folder before overwrite saving.

- All files under <installation folder>\Tomcat\conf\FrameworkPlugins

3. Start the ServiceGovernor WebAPI service by using the following command.

```
net start ServiceGovernor
```

# Chapter 9. Precautions

---

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---



## 9.1 Precautions on Products

- The port number specified for installation of ServiceGovernor must differ from those for the other services.
- In order to modify any of the files under <installation folder>\Tomcat\conf in an environment where ServiceGovernor is operated in a cluster configuration, be sure to make the same modifications to both the active and the standby servers.
- To perform the Tomcat SSL/TLS setting procedure, you need to use the Tomcat and Java software included in the ServiceGovernor package.
- To use ServiceGovernor, you need to perform the procedure shown in "3.1 API Authentication Key (page 10)". If no signature is specified or the specified signature is invalid, WebAPI will fail to be executed.
- Then the application server is upgraded, the startup user returns to the local system. If "9.2.2 Starting ServiceGovernor as a User with Non-Administrator Privileges (page 57)" has been executed, perform the procedure again after upgrading.

## 9.2 Precautions on Operation

### 9.2.1 About Bloating of the Tomcat Log

Unless the Tomcat log data is deleted periodically, the Tomcat log folder will bloat because of file accumulation.

The following describes the procedure for deleting the log folder periodically.

If you follow the setting of this procedure, the default value for deleting the log is as follows.

Retention period	If the last date of update is earlier than the specified period, the log data is retained; all the files before that date are deleted. Default value: 7
Files to be deleted	Default setting: catalina.*.log commons-daemon.*.log host-manager.*.log localhost.*.log localhost_access_log.*.txt manager.*.log servicegovernor-stderr.*.log servicegovernor-stdout.*.log

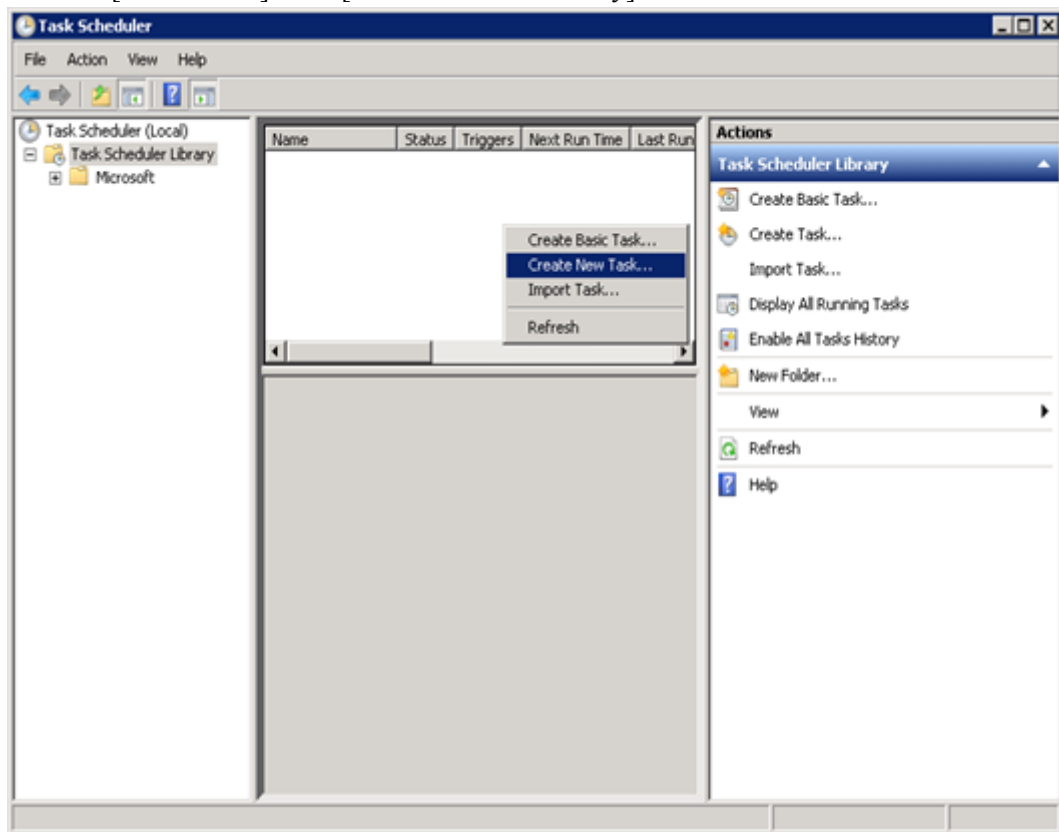
#### Caution

If ServiceGovernor is operating in a cluster environment, perform this procedure on both the active and the standby servers.

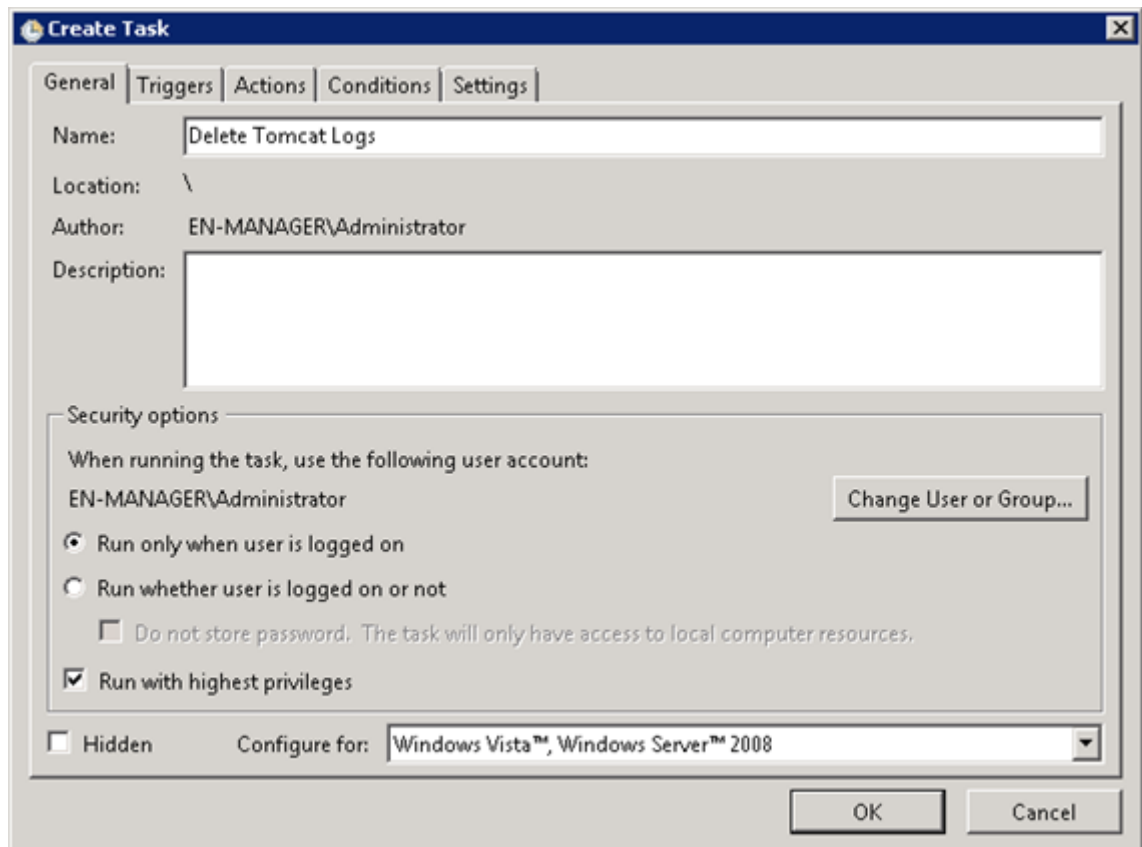
1. Open the following batch file used for deletion of Tomcat log using a text editor, and check the names of the log files to delete, the log file paths to delete, and the deletion period. Modify them if necessary.  
Make modifications according to your environment. If you modify a process, perform it on your own responsibility.

```
<Installation directory>\Tools\TomcatLogDel.bat
```

2. Save the files.
3. Start up the task scheduler.  
For Windows Server 2008, the scheduler starts up by selecting the following.  
[Start Menu] > [Administrative Tools] > [Task Scheduler]
4. Perform [Create Task] from [Task Scheduler Library].



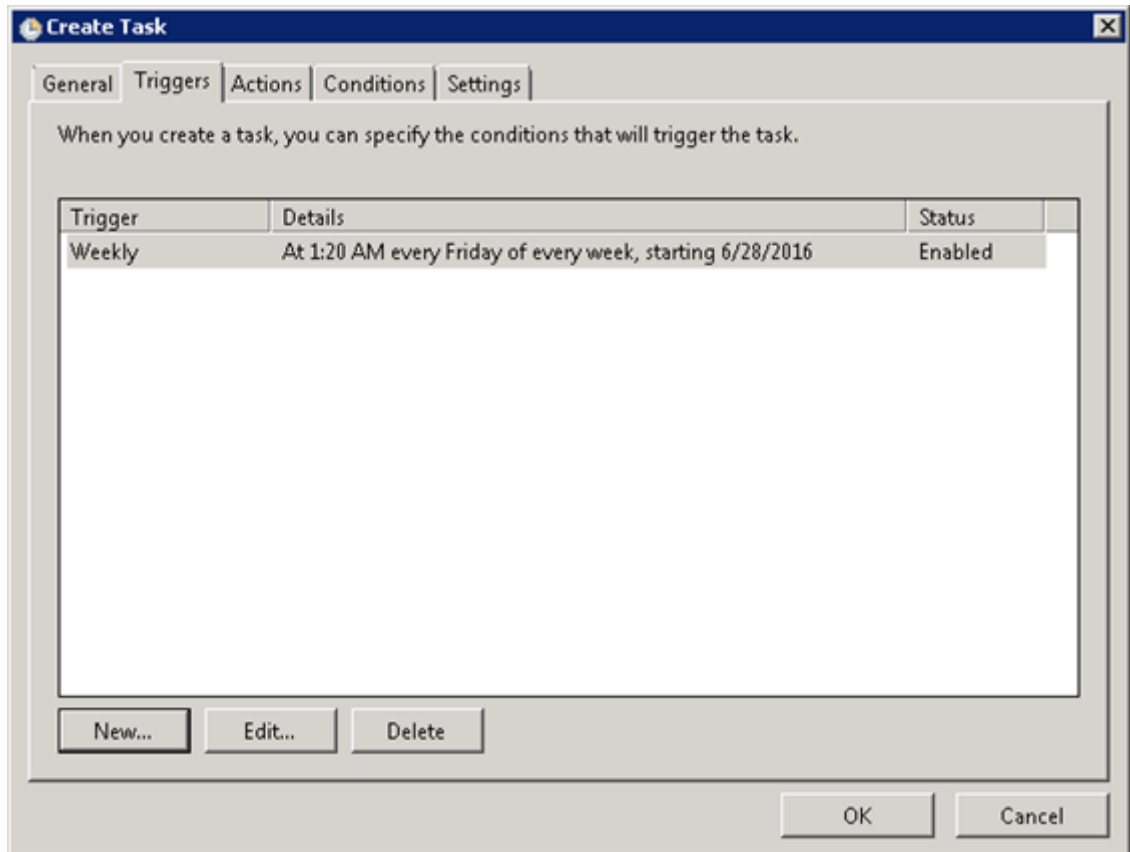
5. Set up the task.  
Perform the settings below on each tab on the [Properties] screen.
6. Configure [General] tab.



#### Setting parameter examples

Parameter	Value
When running the task, use the . . .	System
Run with highest privileges	Enabled
Configuration	Windows Server 2008
Hidden	Disabled

- Configure [Trigger] tag.  
Select the [Trigger] tab and press the [New...] button.  
Set and add the parameters. The trigger settings are listed as shown below.



After pressing the [New...] button, set the following on the displayed [Edit Trigger] screen.

**Edit Trigger**

Begin the task: **On a schedule**

**Settings**

One time  
 Daily  
 Weekly  
 Monthly

Start: 6/28/2016 1:20:41 AM  Synchronize across time zones

Recur every: 1 weeks on:

Sunday  Monday  Tuesday  Wednesday  
 Thursday  Friday  Saturday

**Advanced settings**

Delay task for up to (random delay): 1 hour  
 Repeat task every: 1 hour for a duration of: 1 day  
 Stop all running tasks at end of repetition duration  
 Stop task if it runs longer than: 3 days  
 Expire: 6/28/2017 1:21:14 AM  Synchronize across time zones  
 Enabled

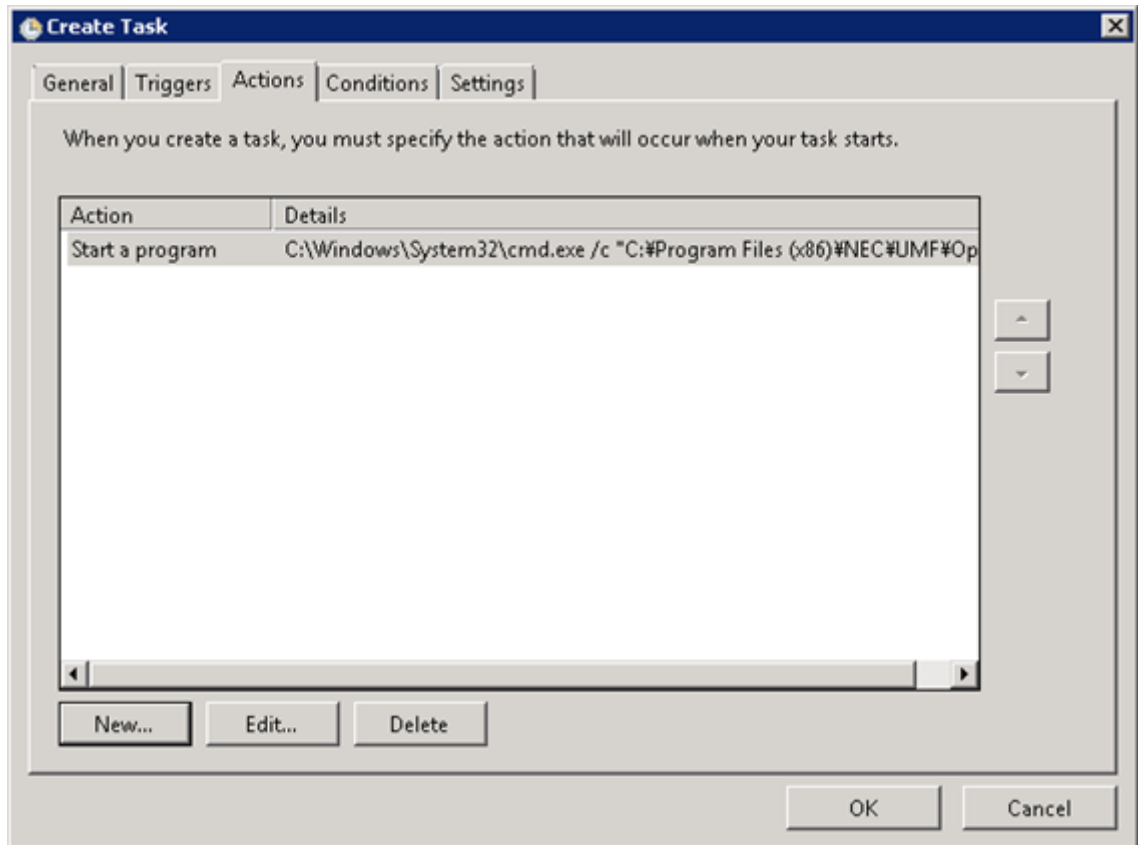
OK Cancel

## Setting parameter examples

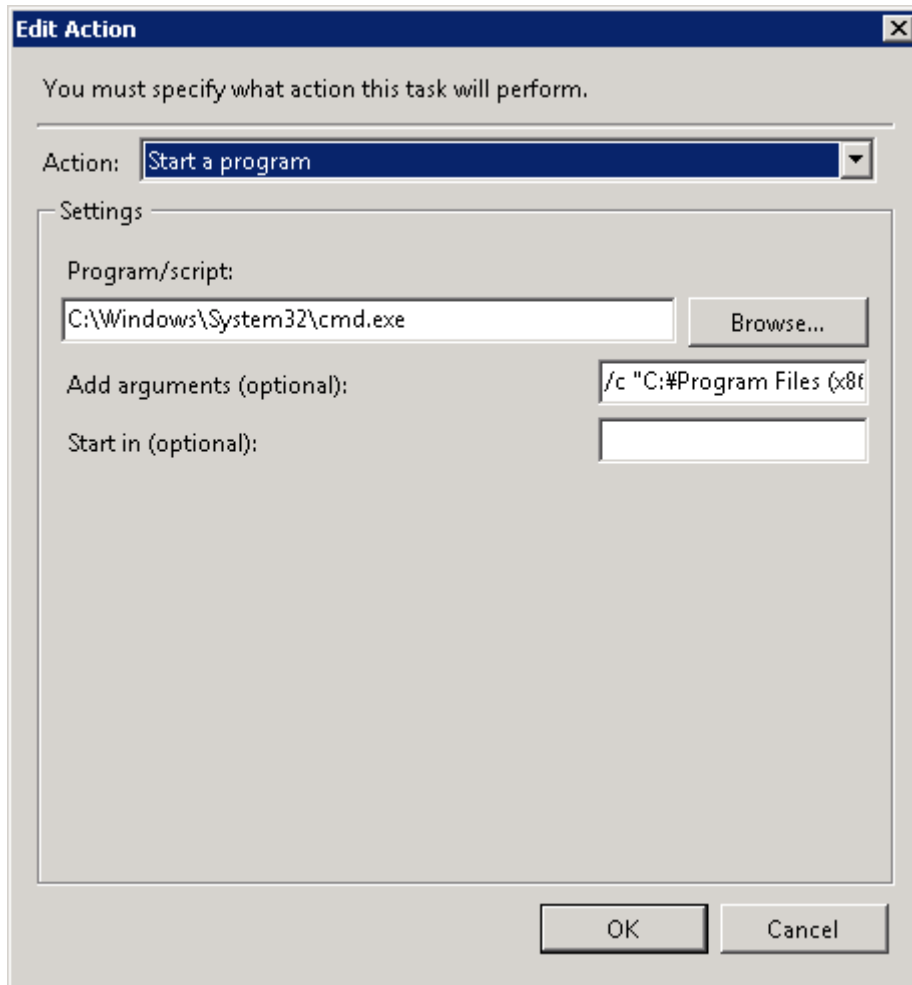
This example deletes by executing a deletion script at 0:00 every Friday.

Parameter	Value
Begin the task	On a schedule
Settings	Weekly
Start	12:00 AM
Recur Every	1 week
Friday	Enabled
Delay task for:	Disabled
Stop all running tasks at end of repetition duration	Disabled
Stop task if it runs longer than:	Disabled
Expires on	Disabled
Enabled	Enabled

- Configure [Actions] tag.  
Select the [Actions] tab and press the [New...] button.  
Set and add the parameters. The operation settings are listed as below.



After pressing the [New...] button, set the following on the displayed [Edit Action] screen.



#### Setting parameter examples

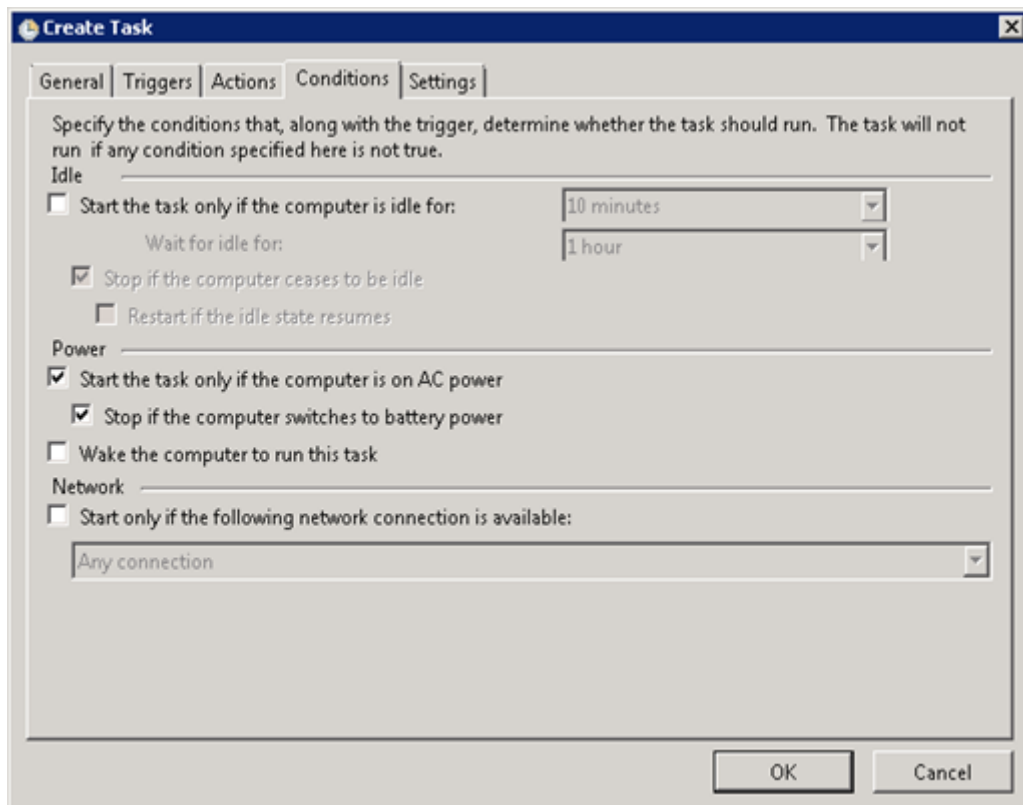
Parameter	Value
Action	Start the program
Program	C:\Windows\System32\cmd.exe
Add arguments	/c "C:\Program Files (x86)\NEC\UMF\Operations\Tools\TomcatLogDel.bat"
Hide	Disabled

If the Tomcat log deletion batch is executed without any option like the above parameter example, the following default parameter values will be used for execution.

Parameter	Value
-path	C:\Program Files (x86)\NEC\UMF\Operations\Tomcat\logs
-day	7

By specifying the path and day, you can set the target period of deletion.

9. Configure [Conditions] tag.

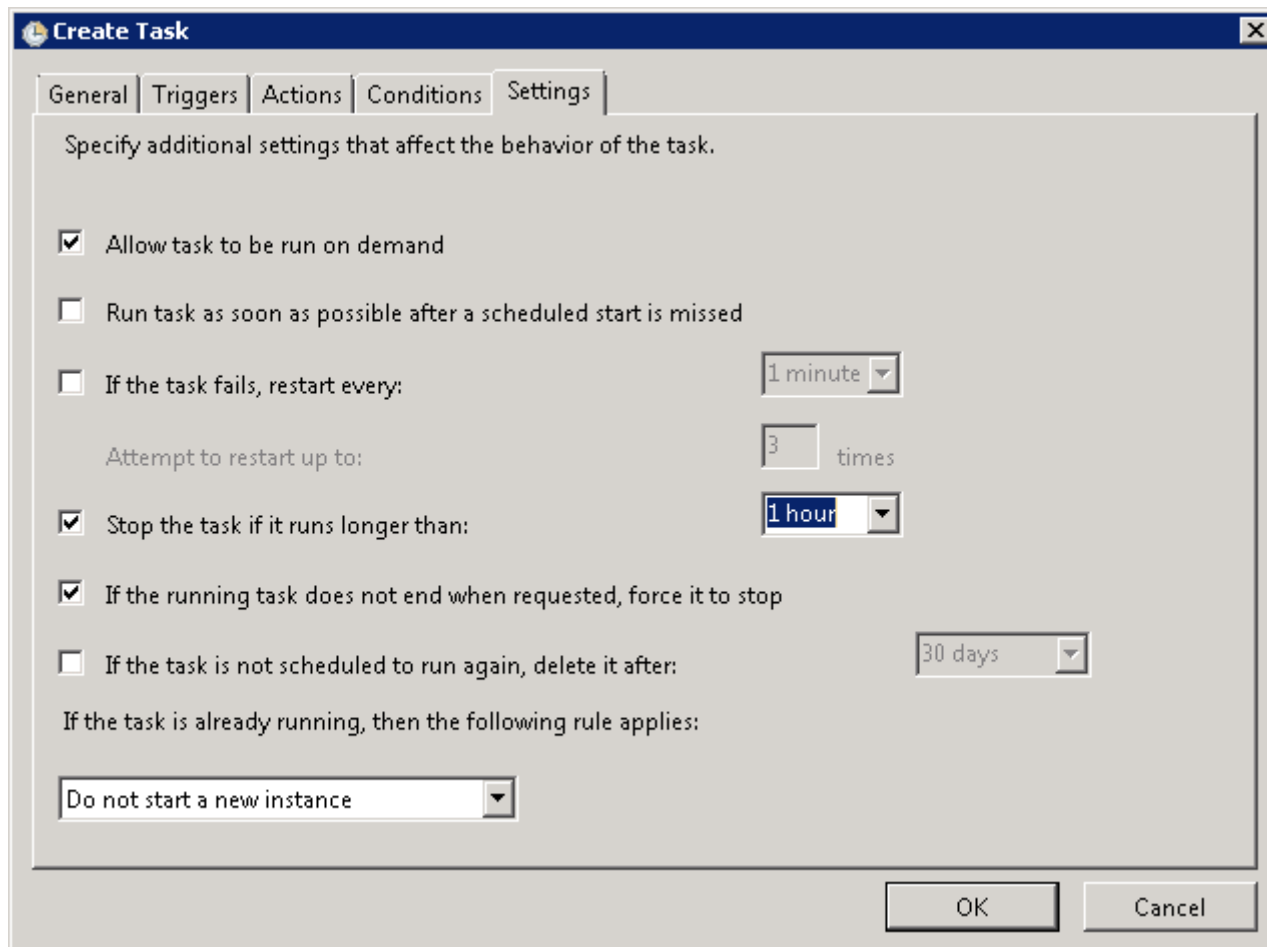


Set the parameters as follows.

Parameter	Value
Start the task only if the computer is on AC power	Enabled
Stop if the computer switches to battery power	Enabled
Wake the computer to run this task	Disabled
Start only if the following network connection is available:	Disabled

10. Configure [Setting] tag.





Set the parameters as follows.

Parameter	Value
Allow task to be run on demand	Enabled
Run task as soon as possible after a scheduled start is missed	Disabled
If the task fails, restart every:	Disabled
Stop the task if it runs longer than:	Enabled 1 hour
If the running task does not end when requested, force it to stop	Enabled
If the task is not scheduled to run again, delete it after:	Disabled
If the task is already running, then the following rule applies:	Do not start a new instance

- By selecting and right-clicking the created task and selecting [Run], you can check whether the task is executed normally. Check the messages output to the schedule log (e.g., start, stop). In addition, check that the log saved for the specified period was deleted at the specified date/time.

## 9.2.2 Starting ServiceGovernor as a User with Non-Administrator Privileges

You can use the local system account to start up the Tomcat software installed during installation of ServiceGovernor.

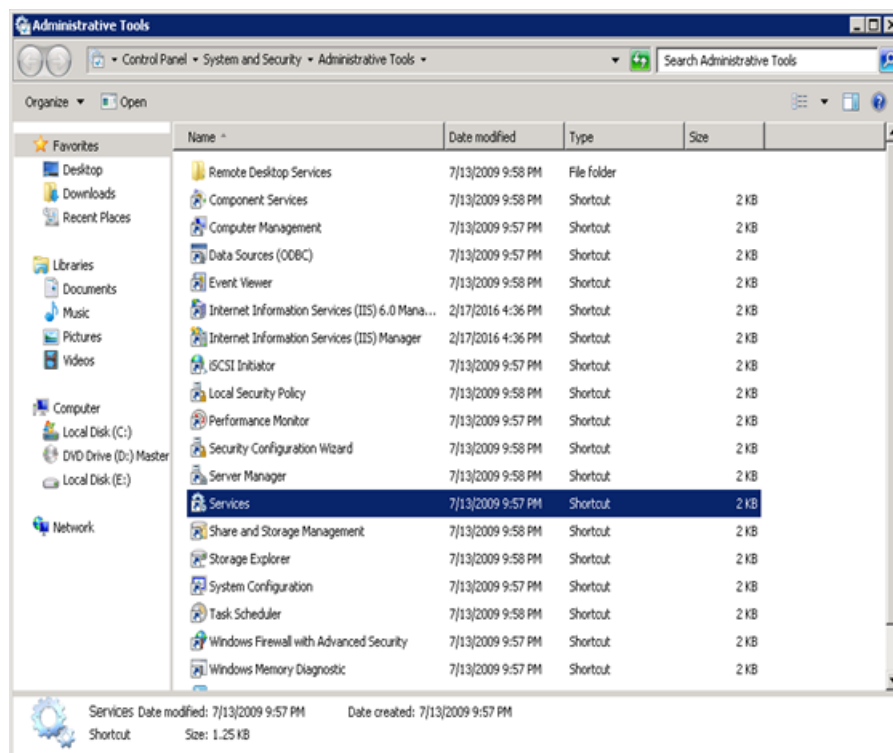
If there is a buffer overflow in the application server or other servers when Tomcat is executed with a local system account, an arbitrary application could be executed under root privileges.

If necessary, consider starting Tomcat under privileges other than the local system account by using the following procedure, for example.

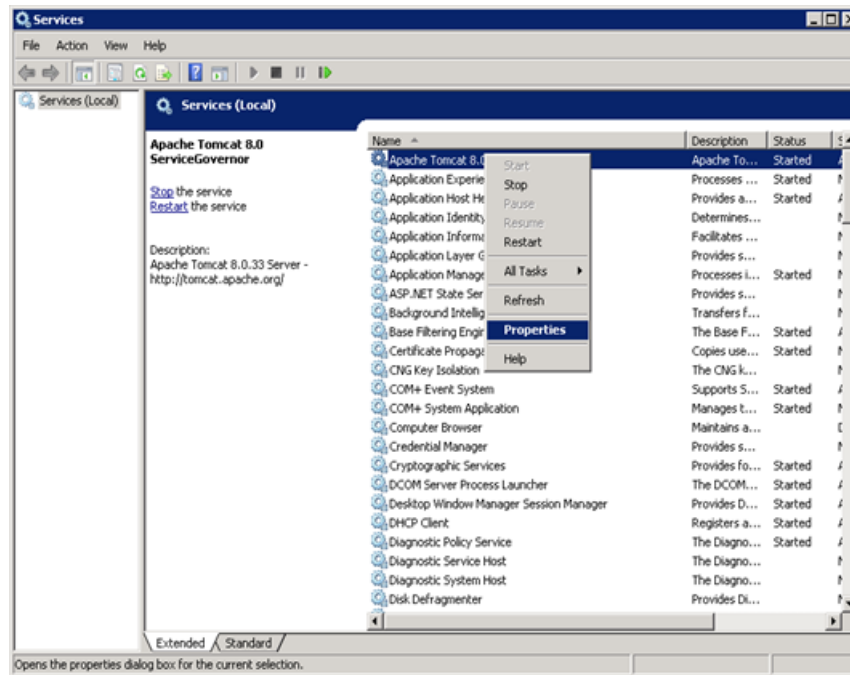
1. Creating a user  
Create the user used to start up Tomcat
2. Changing the privileges of the Tomcat installation directory  
Change to the user for which the privileges of full control of the Tomcat installation directory were created.
3. Changing the user who starts Tomcat  
Change to the user for which the log on setting was created under [Control Panel] > [Administrative Tools] > [Services > [Apache Tomcat 8.5 ServiceGovernor]].

The following explains the procedure for changing the user. The procedure below is an explanation for Windows Server 2012 R2. Replace it accordingly based on your environment.

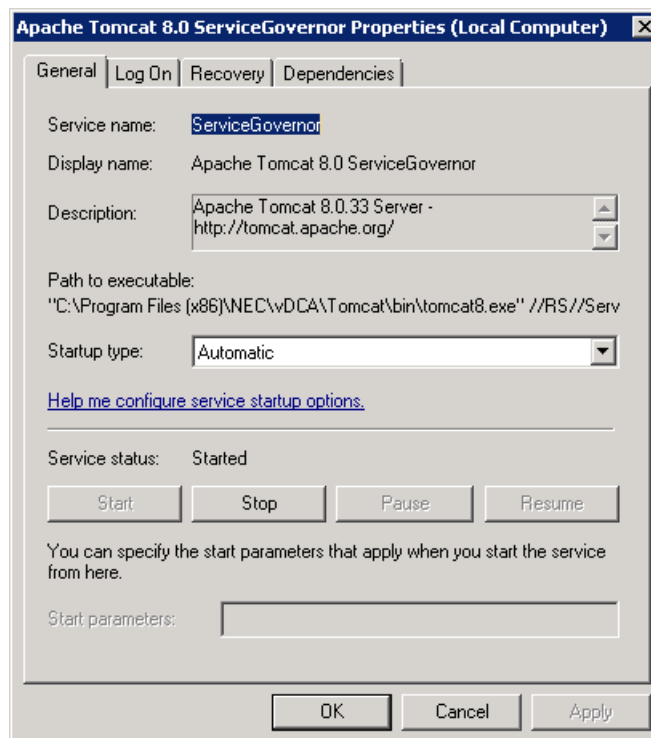
- a. Click [Administrative Tools] > [Services] to start "Service".



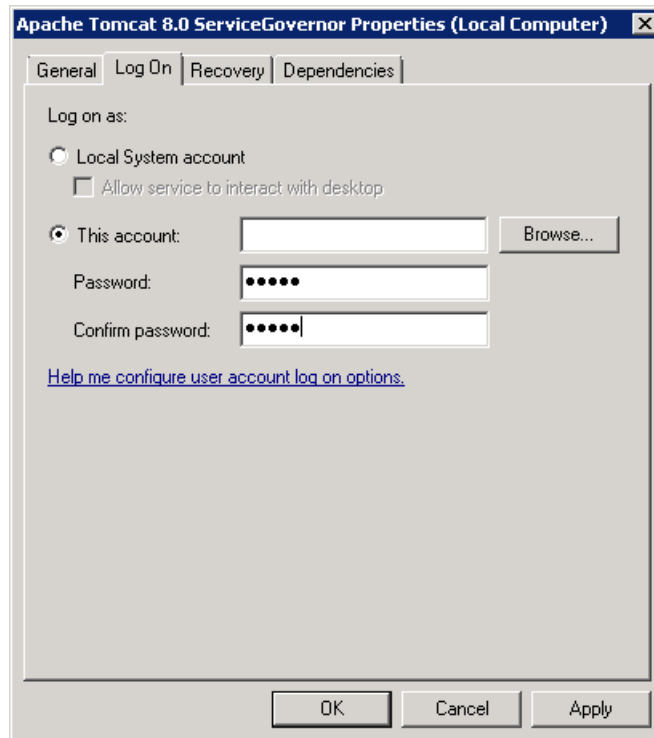
- b. Right-click [Apache Tomcat 8.5 ServiceGovernor], and select [Properties].



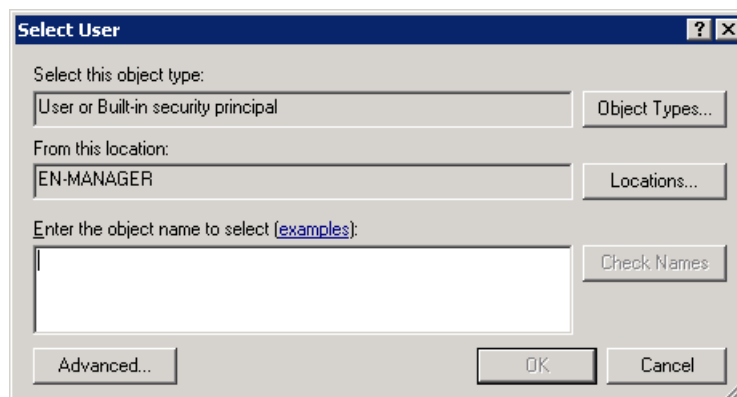
- c. Select the [LogOn] tab from the “Properties” screen.



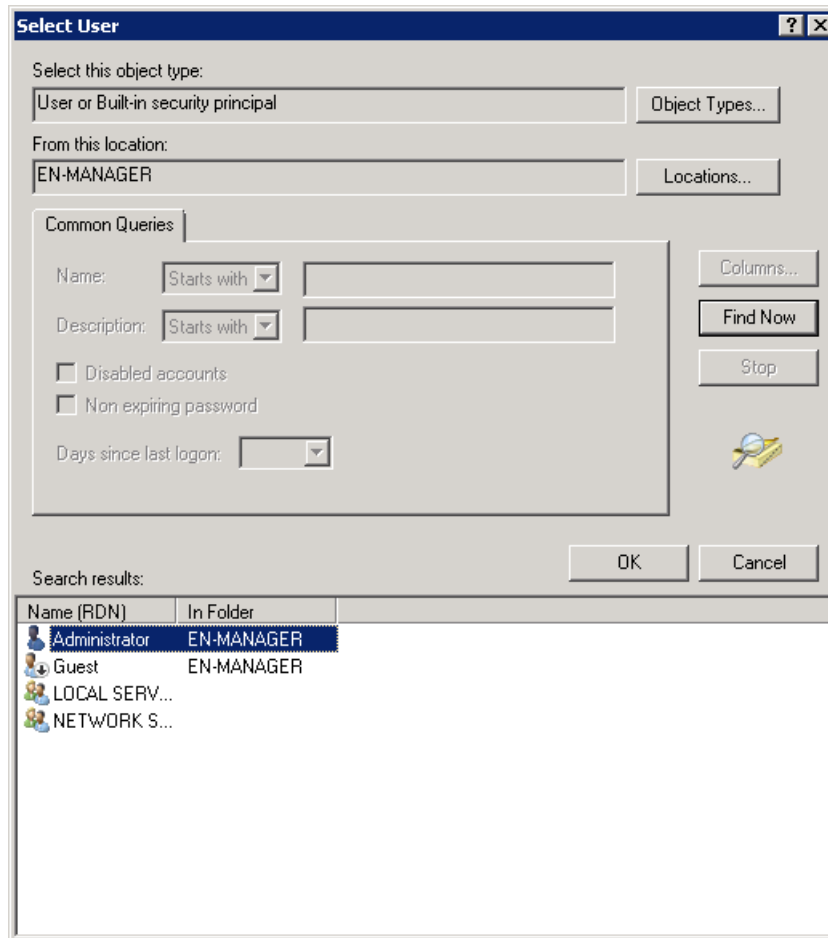
- d. Check the [This account] box, and press the [Browse...] button.



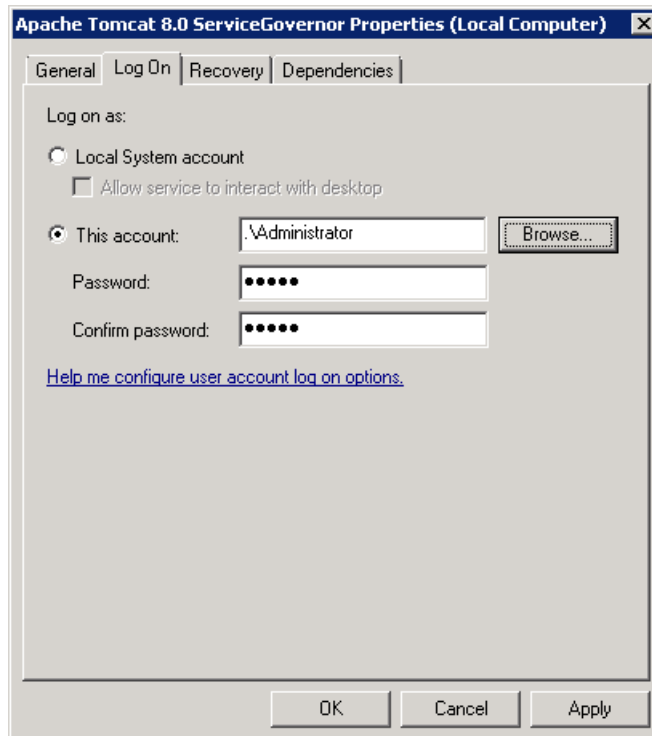
- e. On the [Select User] screen, press the [Advanced...] button to start up the screen available for user search.



- f. Press the [Find Now] button, and select from the search result the user created for the target OS. Then, press the [OK] button.



- g. Check that the selected user has been set on the [Log On] tab on the "Properties" screen. Then, enter the password that the user uses or log in, and press the [OK] button.



- h. On the [Services] screen, check that the [Apache Tomcat 8.5 ServiceGovernor] service has been started by the specified user.

Name ^	Description	Status	Startup Type	Log On As
Apache Tomcat 8.0 ServiceGovernor	Apache To...	Started	Automatic	.\Administrator
Application Experience	Processes ...	Started	Manual	Local System
Application Host Helper Service	Provides a...	Started	Automatic	Local System

The entire procedure is now complete.

### 9.2.3 About Tomcat Shutdown Port

Immediately after installation of ApplicationServer, the shutdown port is running.

Consider the following measures for vulnerability.

- Change the shutdown character string.

Modify the following file with a text editor.

server.xml

```
<Server port="8005" shutdown="SHUTDOWN">
```

- Restrict access to the shutdown port.  
Limit access to the shutdown port (8005) by installing firewall equipment, setting iptables or software such as Windows Firewall.

# Chapter 10. Appendix

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---

## 10.1 About the Certificate for SSL/TLS Setting

### Introduction

There are two ways of creating a server certificate.

One is to create a server certificate using a public certificate authority.

The other is to create a self-issued, self-signed certificate.

The latter should generally be used when access from many unspecified users is not permitted.

The way of setting the SSL/TLS setting varies according to the type of certificate you want to use; an example for each of both procedures is shown below.

### Caution

Note that the procedures, extensions, and other information in this document are shown just as examples for reference purposes and we do not guarantee their contents.

### Caution

Tomcat accepts key store files of JKS (default) or PKCS #12 format. In this document, the key store file format is JKS (default of Tomcat) unless otherwise noted.

### 10.1.1 Status Certificate Created Using a Public Certificate Authority

1. Create a secret key in the key store.

```
> keytool.exe -genkey -alias <Alias> -keyalg RSA -keystore <Keystore File Name> -storepass changeit
```

Set any value for each item to be input after execution of a command. For the password of the key, specify changeit.

### Caution

If you want to change the password of the key from changeit, set the same password as that of the key store.

### Caution

For CN, specify the host name or IP address that is used for access from the client.

2. Create a request to issue the server certificate.

```
> keytool.exe -certreq -alias <Alias> -keystore <Keystore File Name> -file <certreq_file>.csr -storepass changeit
```

3. Have a public certificate authority issue the server certificate.

Contact your provider for how to request the authority to issue the server certificate.

4. Install the certificate of the intermediate certificate authority (CA).



```
> keytool.exe -import -noprompt -trustcacerts -alias <Alias> -file <Intermediate certificate authority (CA)>.pem -keystore <Keystore File Name> -storepass changeit
```

5. Import the server certificate.

```
> keytool.exe -import -v -trustcacerts -alias <Alias> -file <Server certificate>.cert -keystore <Keystore File Name> -storepass changeit
```

## 10.1.2 Self-Issued, Self-Signed Certificate

The following illustrates the way of creating a self-issued, self-signed certificate using openssl.

1. Create a secret key.

```
> openssl genrsa -aes128 1024 > <Secret key>.key
```

2. Create a request to issue the server certificate.

```
> openssl req -new -key <Secret key>.key > <Request Certificate>.csr
```

### Caution

If you want to change the password of the key from changeit, set the same password as that of the key store.

### Caution

For Common Name, specify the host name or IP address that is used for access from the client.

3. Create the server certificate.

```
> openssl x509 -in <Request Certificate>.csr -days 365 -req -signkey <Secret key>.key > <Certificate>.cert
```

### Caution

This example assumes that the validity period of the certificate is 365 days.  
To change the validity period, change the value following the ?days option.

4. Convert the certificate to pkcs12 format.

```
> openssl pkcs12 -export -in <Certificate>.cert -inkey <Secret key>.key -out <Certificate>.p12 -name <Alias>
```

5. Import the server certificate.

```
> keytool.exe -importkeystore -srckeystore <Certificate>.p12 -destkeystore <Keystore File Name> -srcstoretype pkcs12 -deststoretype JKS
```

## 10.2 Upgrading Java used by ServiceGovernor

Java used by ServiceGovernor may need to be upgraded individually due to its vulnerabilities or for some other reason.

In that case, upgrade Java by performing the procedure described below.

### Caution

- In a cluster environment, perform the procedure for both active and standby systems.
- For the verified latest versions, contact the NEC Customer Support Center.

1. From the Java download website, download the latest or other desired version of Java.  
When downloading Java, make sure that the extension of the file you download is tar.gz.
2. Stop the ServiceGovernor service by using the following command.

```
> net stop ServiceGovernor
```

3. To save the folder that stores Java used by ServiceGovernor, change the name of the following folder to a desired one.

```
<installation folder>%Tomcat%\JRE\JavaHome
```

4. Create the following folder to store the new Java software.

```
<installation folder>%Tomcat%\JRE\JavaHome
```

5. Uncompress the downloaded Java file in the following folder.

```
<installation folder>%Tomcat%\JRE\JavaHome
```

### Caution

Uncompress the file so that you have the following configuration after uncompressing.

```
<installation folder>%Tomcat%\JRE\JavaHome\bin
<installation folder>%Tomcat%\JRE\JavaHome\lib
```

6. Run the following command at the command prompt to register the ServiceGovernor service again.

```
> set JRE_HOME=<installation folder>%Tomcat%\JRE\JavaHome
> cd "<installation folder>%Tomcat%"
> attrib -R -S -H "<installation folder>%Tomcat%" /S /D
> attrib -R -S -H "<installation folder>%Tomcat%*" /S /D
> cd "<installation folder>%Tomcat%\bin"
> service.bat remove ServiceGovernor
> service.bat install ServiceGovernor
```

7. Start the ServiceGovernor service by using the following command.

```
> net start ServiceGovernor
```

8. Delete the Java storage folder you saved.

This completes the Java upgrading procedure.

## 10.3 Upgrading Tomcat used by ServiceGovernor

Tomcat used by ServiceGovernor may need to be upgraded individually due to its vulnerabilities or for some other reason.

In that case, upgrade Tomcat by performing the procedure described below.

### Caution

- In a cluster environment, perform the procedure for both active and standby systems.
- For the verified latest versions, contact the NEC Customer Support Center.

1. From the Tomcat download website, download a desired version of Tomcat.

When downloading Tomcat, make sure that the extension of the file you download is zip.

2. Uncompress the downloaded Tomcat file in a desired folder. Then, compress the bin and other folders under apache-tomcat-x.x.x in the uncompressed folder into zip format.

Example: When you have a configuration shown below after uncompressing the downloaded file, compress the bin, conf, and all other folders under apache-tomcat-x.x.x into a single file.

```
<uncompressed folder>/apache-tomcat-x.x.x/bin
<uncompressed folder>/apache-tomcat-x.x.x/conf<uncompressed folder>/
apache-tomcat-x.x.x/lib
<uncompressed folder>/apache-tomcat-x.x.x/logs
<uncompressed folder>/apache-tomcat-x.x.x/temp
<uncompressed folder>/apache-tomcat-x.x.x/webapps
<uncompressed folder>/apache-tomcat-x.x.x/work
<uncompressed folder>/apache-tomcat-x.x.x/LICENSE
<uncompressed folder>/apache-tomcat-x.x.x/NOTICE
<uncompressed folder>/apache-tomcat-x.x.x/RELEASE-NOTES
<uncompressed folder>/apache-tomcat-x.x.x/RUNNING.txt
```

3. Stop the ServiceGovernor service by using the following command:

```
> net stop ServiceGovernor
```

4. From the installation media, copy the files for installing ServiceGovernor to the Temporary folder. From the installation media, copy the following files to a desired folder.
  - <installation DVD>\Windows
  - <installation DVD>\tools
5. Change the name of the downloaded Tomcat file to apache-tomcat-windows-x64.zip, and save it to the following folder.
  - <copy destination folder>\Windows\Product\CloudProviderAPI\APServer\Tomcat\_X64

### Caution

When you use a 32-bit machine, replace apache-tomcat-windows-x64.zip with apache-tomcat-windows-x86.zip.

When you use a 32-bit machine, replace Tomcat\_X64 with Tomcat\_X86.

6. The points to note when upgrading Tomcat are the same as those for the ordinary upgrading procedure. See the following procedure.
 

["6.2 Upgrading the Application Server \(page 40\)"](#)

For upgrading, replace <installation DVD> with <copy destination folder> in the following procedure.

#### "6.2.1 Upgrading the Application Server from the Installer (page 41)"

7. Start the ServiceGovernor service by using the following command.

```
> net start ServiceGovernor
```

8. Delete the copy destination folder in Temporary to which you copied the installation media files.

This completes the Tomcat upgrading procedure.

## 10.4 Recovering an Application Server

Upgrading an application server may fail.

If the upgrade fails, recover the application server by performing the procedure described below.

1. Move the following backup folder of the application server to <Installation folder>, respectively.

```
<Installation folder>%Tomcat_BackUp%Tomcat_<Date>
```

The <date> refers to the date on which the upgrade was performed on the application server.

After moving the backup folder, rename them as follows.

```
<Installation folder>%Tomcat
```

2. When the registration of the "Apache Tomcat 8.5 ServiceGovernor" service has been canceled, register the ServiceGovernor service by executing the following command from the command prompt.

```
> set JRE_HOME=<Installation folder>%Tomcat%JRE%JavaHome
> cd "<Installation folder>%Tomcat%bin"
> service.bat install ServiceGovernor
```

3. Start the ServiceGovernor service by using the following command.

```
> net start ServiceGovernor
```

The recovery of the application server is now complete.

# Chapter 11.

## Open Source Software License

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## 11.1 About commons-codec-1.7

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### ■Target file

commons-codec-1.7.jar

### ■Copyright information

Apache Commons Codec  
Copyright 2002-2012 The Apache Software Foundation

This product includes software developed by  
The Apache Software Foundation (<http://www.apache.org/>).

-----  
-----  
src/test/org/apache/commons/codec/language/DoubleMetaphoneTest.java  
contains  
test data from <http://aspell.sourceforge.net/test/batch0.tab>.

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- javaee\_web\_services\_client\_1\_2.xsd
- javaee\_6.xsd
- javaee\_web\_services\_1\_3.xsd
- javaee\_web\_services\_client\_1\_3.xsd
- jsp\_2\_2.xsd
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- web-fragment\_3\_0.xsd

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**MasterScope Service Governor3.26.0  
Installation Guide  
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**March, 2018 1st Edition**

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