

EXPRESSCLUSTER® X **for Linux SAP NetWeaver**

Configuration Example

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Preface

This document describes the creation of a cluster system described in the document “EXPRESSCLUSTER X for Linux SAP NetWeaver System Configuration Guide” and gives an example of settings how to operate.

Who Should Use This Guide

This manual is intended for administrators, who want to build a cluster system, system engineers who want to provide user support, and maintenance personnel.

This manual introduces software whose operation in an EXPRESSCLUSTER environment has been checked. The software and setup examples introduced here are for reference only. They are not meant to guarantee the operation of each software product.

The introduced software and the example of setting in this document are just reference information. There are not warranty of the each software's behavior.

EXPRESSCLUSTER X for Linux SAP NetWeaver Documentation Set

This guide includes the following two documents:

“EXPRESSCLUSTER X for Linux SAP NetWeaver System Configuration Guide”

“EXPRESSCLUSTER X for Linux SAP NetWeaver Configuration Example”

Conventions

In this guide, **Note**, **Important**, **Related Information** are used as follows:

Note:

Used when the information given is important, but not related to the data loss and damage to the system and machine

Important:

Used when the information given is necessary to avoid the data loss and damage to the system and machine.

Related Information:

Used to describe the location of the information given at the reference destination.

The following conventions are used in this guide.

Convention	Usage	Example
Bold	Indicates graphical objects, such as fields, list boxes, menu selections, buttons, labels, icons, etc.	In User Name , type your name. On the File menu, click Open Database .
Angled bracket within the command line	Indicates that the value specified inside of the angled bracket can be omitted.	<code>clpstat -s [-h <i>host_name</i>]</code>
#	Prompt to indicate that a Linux user has logged on as root user.	<code># clpcl -s -a</code>
Monospace (courier)	Indicates path names, commands, system output (message, prompt, etc), directory, file names, functions and parameters.	<code>/Linux/server/</code>
Monospace bold (courier)	Indicates the value that a user actually enters from a command line.	Enter the following: <code># clpcl -s -a</code>
<i>Monospace italic</i> (courier)	Indicates that users should replace italicized part with values that they are actually working with.	<code>clpstat -s [-h <i>host_name</i>]</code>

Related documents

EXPRESSCLUSTER X Documentation Set

The EXPRESSCLUSTER X manuals consist of the following four guides. The title and purpose of each guide is described below:

EXPRESSCLUSTER X Getting Started Guide

This guide is intended for all users. The guide covers topics such as product overview, system requirements, and known problems.

EXPRESSCLUSTER X Installation and Configuration Guide

This guide is intended for system engineers and administrators who want to build, operate, and maintain a cluster system. Instructions for designing, installing, and configuring a cluster system with EXPRESSCLUSTER are covered in this guide.

EXPRESSCLUSTER X Reference Guide

This guide is intended for system administrators. The guide covers topics such as how to operate EXPRESSCLUSTER, function of each module, maintenance-related information, and troubleshooting. The guide is supplement to the Installation and Configuration Guide.

EXPRESSCLUSTER X Integrated WebManager Administrator's Guide

This guide is intended for system administrators who manage cluster systems using EXPRESSCLUSTER with Integrated WebManager, and also intended for system engineers who introduce Integrated WebManager. This guide describes detailed issues necessary for introducing Integrated WebManager in the actual procedures.

SAP NetWeaver documents

For details of SAP NetWeaver please refer to the official SAP documentation available at

<http://service.sap.com/installnw74/>

<http://service.sap.com/installnw75/>

Make sure to check the "Master Guide" and the "Installation Guide" for NetWeaver according to the database you are installing on.

SAP NOTES

- #0171356: SAP software on Linux: General information
- #0784391: SAP support terms and 3rd-party Linux kernel drivers
- #2002167: Red Hat Enterprise Linux 7.x: Installation und Upgrade
- #0941735: SAP memory management system for 64-bit Linux systems
- #1382721: Linux: Interpreting the output of the command 'free'
- #0174911: Determining the hardware key (customer key)
- #0181543: License key for high availability environment
- #0870871: License key installation
- #1391070: Linux UUID solutions
- #0146003: Application servers cannot be started
- #1553301: 7.20 EXT Kernel - Usage
- #1768213: Support details for NEC EXPRESSCLUSTER
- #2182373: NEC EXPRESSCLUSTER X: Rolling Kernel Switch in HA environments

Note:

Related documents and URL in this guide are subject to change without notice.

Terminology in this guide

Provides information of terminology used in this guide.

Terminology	Description
This product	EXPRESSCLUSTER X for Linux SAP NetWeaver
Configuration Guide	EXPRESSCLUSTER X for Linux SAP NetWeaver System Configuration Guide
Configuration Example	EXPRESSCLUSTER X for Linux SAP NetWeaver Configuration Example
Connector for SAP	The connector which links with SAP included in this product.
SAP NW	SAP NetWeaver
ASCS	ABAP SAP Central Services Instance
ERS	Enqueue Replication Server
PAS	Primary Application Server
AAS	Additional Application Server
HANA	The SAP HANA database used for SAP NW
DA	Diagnostics Agent

Section I Configuration example

- Chapter 1 Exemplary settings of the environment for SAP NW
- Chapter 2 EXPRESSCLUSTER settings
- Chapter 3 Bundled scripts

Chapter 1 Exemplary settings of the environment for SAP NW

Terminology used in this chapter.

Terminology	Description
SID	SAP System ID
DASID	Diagnostics Agent SAP System ID
INO	Instance Number

The additional terminology used in a configuration consisting of one NFS server and a cluster configuration consisting of two NFS servers is described in the following sections:

“1.3.2 Static IP and floating IP for an NFS server”

“1.3.3 Network configuration”

1.1. HA Database for SAP NW

Since SAP NW can run on several database technologies, e.g. SAP HANA, SAP MaxDB, IBM DB2, Oracle, Microsoft SQLSERVER, this guide assumes there is already a high available database setup in place. If you need help how create an HA setup for your database scenario please follow related EXPRESSCLUSTER documents on <http://www.nec.com/en/global/prod/expresscluster/>.

Throughout this document the HA database setup will be referred to as "database".

1.2. Mount Points

The following shows an example of NFS server shares and according mount points for each node needed.

Mount Type	Node#1 / Node#2	NFS Server
fstab(NFS)	/usr/sap/trans /sapmnt/<SID>	/opt/nfsroot/saptrans /opt/nfsroot/sapmnt/<SID>
EXPRESSCLUSTER (NAS resource)	/usr/sap/<SID>/ASCS<INO>	/opt/nfsroot/sapascs

Before installing SAP NW, it is necessary to create a symbolic link from /usr/sap/<SID>/SYS of Node#1 and Node#2 to mount point /sapmnt/<SID>. For how to create a symbolic link, refer to the SAP NW document.

1.3. Static IP and floating IP

1.3.1. Static IP and floating IP for SAP NW

The following table shows the static IP and floating IP setting example for a SAP NW cluster consisting of an active node (Node#1) and standby node (Node#2).

	Node#1	Node#2
Host Name	<i>sap1</i>	<i>sap2</i>
Static IP(eth0)	<i>172.16.30.135/24</i>	<i>172.16.30.136/24</i>
Static IP(eth1)	<i>10.0.0.1/24</i>	<i>10.0.0.2/24</i>
Floating IP(eth0)	<i>managesv:172.16.30.137/24</i> <i>ascssv:172.16.30.138/24</i>	

1.3.2. Static IP and floating IP for an NFS server

The following table shows the static IP setting example for a configuration consisting of one NFS server (Node#3). In this configuration, no floating IP is required.

	Node#3
Host Name	<i>nassv</i>
Static IP(eth0)	<i>172.16.30.140/24</i>
Static IP(eth1)	<i>10.0.0.3/24</i>

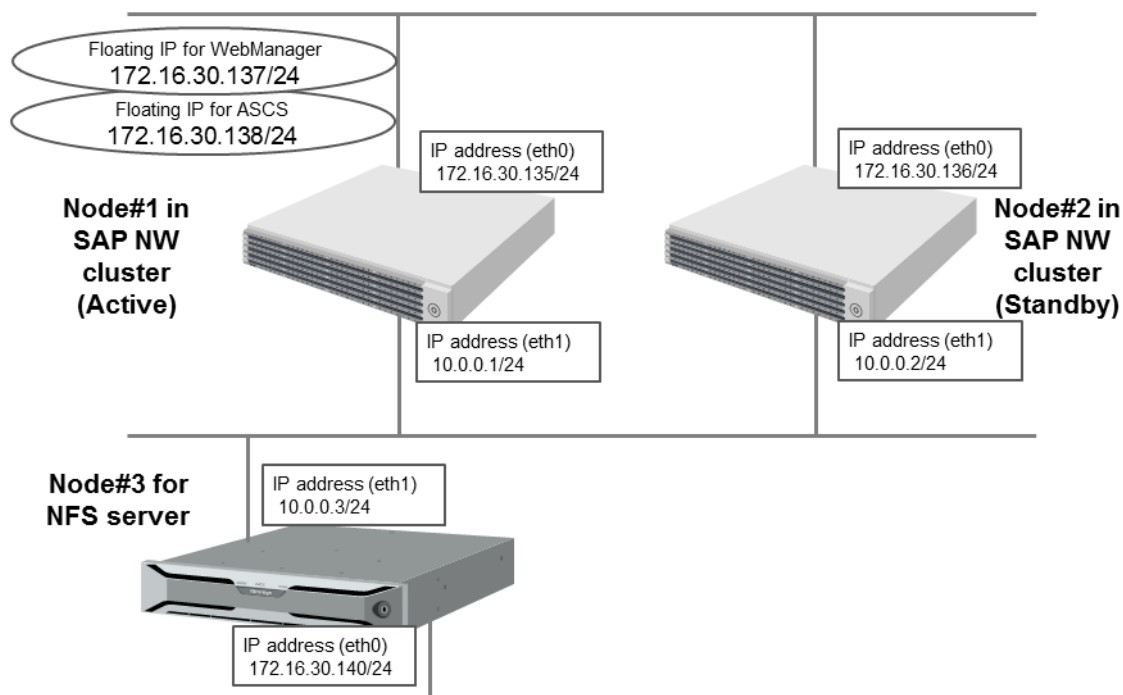
The following table shows the static IP and floating IP setting example for a unidirectional standby cluster configuration consisting of two nodes (Node#3 and Node#4) as an NFS server.

	Node#3	Node#4
Host Name	<i>nas1</i>	<i>nas2</i>
Static IP(eth0)	<i>172.16.30.140/24</i>	<i>172.16.30.141/24</i>
Static IP(eth1)	<i>10.0.0.4/24</i>	<i>10.0.0.5/24</i>
Floating IP(eth1)	<i>nassv:10.0.0.3/24</i>	

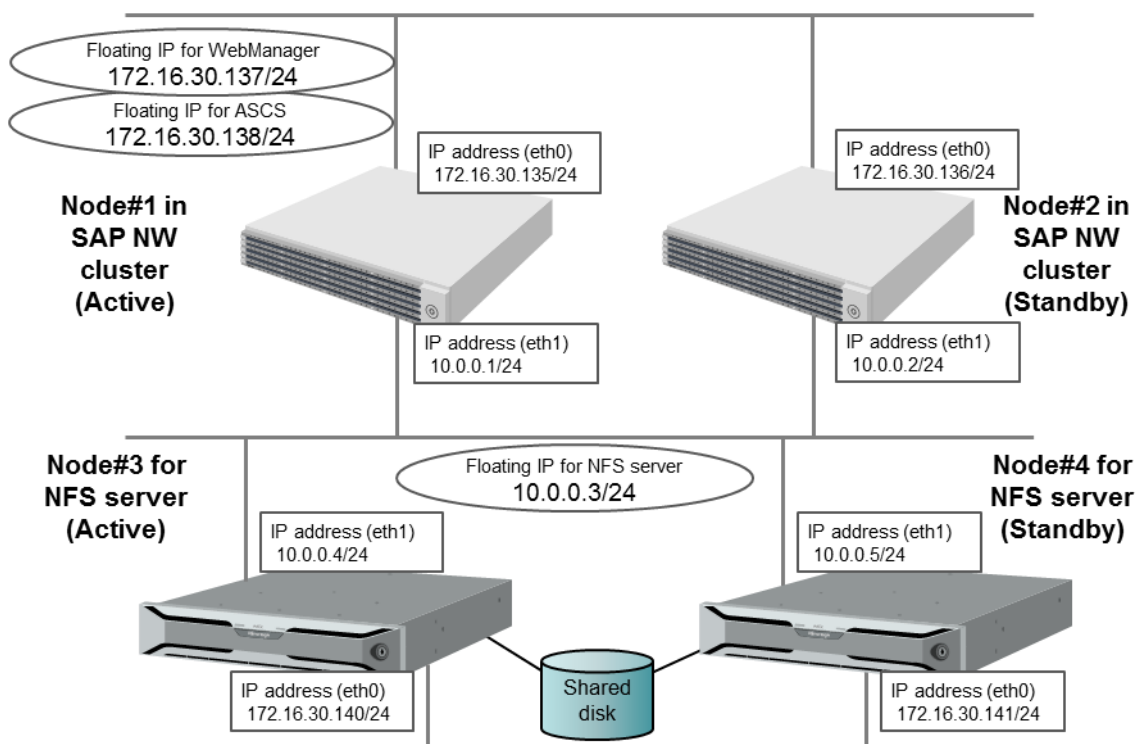
1.3.3. Network configuration

This section describes the network configurations between a SAP NW cluster and NFS servers used in this guide.

Network configuration consisting of one NFS server



Network configuration for a cluster configuration consisting of two NFS servers



1.4. An example of setting OS

An example of settings for Red Hat Enterprise Linux 7.x is shown below.

Setting of SELinux	<pre>Host Name Status sap1 Disabled sap2 Disabled</pre>
Installation and setting of indispensable software	<pre># yum groupinstall <Group Name> #Group Name base compat-libraries debugging directory-client hardware-monitoring large-systems network-file-system-client perl-runtime storage-client-multipath x11 # yum install uuid.x86_64 # systemctl start uuid # systemctl enable uuid</pre>
Adding nodes to /etc/hosts (or use DNS)	<pre># vi /etc/hosts 10.0.0.3 nassv 172.16.30.135 sap1 172.16.30.136 sap2 172.16.30.137 managesv 172.16.30.138 ascssv</pre>
Creating mount points	<pre># mkdir -p /sapmnt/<SID> # mkdir -p /usr/sap/<SID>/ASCS<INO> # mkdir -p /usr/sap/trans</pre>
Setting for NFS to be mounted at boot time	<pre># vi /etc/fstab nassv:/opt/nfsroot/sapmnt/<SID> /sapmnt/<SID> nfs defaults 0 0 nassv:/opt/nfsroot/saptrans /usr/sap/trans nfs defaults 0 0</pre>
Setting of kernel parameters	<pre># vi /etc/sysctl.d/sap.conf # SAP settings kernel.sem=1250 256000 100 1024 vm.max_map_count=2000000 Enter the following to apply the setting. # sysctl --system</pre>
Setting of limits.conf	<pre># vi /etc/security/limits.conf @sapsys hard nofile 32800 @sapsys soft nofile 32800</pre>

1.5. Sample settings for SAP NW

An overview of “hostname”, “instance name” and “instance number” of SAP NW used in this manual is shown below.

The overview of the instance number is based on the pattern 1 configuration. For the instance number configuration, refer to *System Configuration Guide* - “Section 1.1.4.”

Host Name	Floating IP Address	Note
<i>managesv</i>	<i>172.16.30.137</i>	For EXPRESSCLUSTER Management Group
<i>ascssv</i>	<i>172.16.30.138</i>	For ASCS

Instance	Parameter name	Value of the setting
SAP NW	SID	<i>NEC</i>
ASCS	The instance number	<i>10</i>
	The instance name	<i>ASCS10</i>
	Host name	<i>ascssv</i>
ERS1	The instance number	<i>20</i>
	The instance name	<i>ERS20</i>
ERS2	The instance number	<i>21</i>
	The instance name	<i>ERS21</i>
PAS	The instance number	<i>30</i>
	The instance name	<i>D30</i>
AAS	The instance number	<i>40</i>
	The instance name	<i>D40</i>
DA1	The instance number	<i>97</i>
	The instance name	<i>SMDA97</i>
DA2	The instance number	<i>96</i>
	The instance name	<i>SMDA96</i>

Chapter 2 EXPRESSCLUSTER settings

Terminology used in this chapter.

Terminology	Description
SID	SAP System ID

The additional terminology used in a configuration consisting of one NFS server and a cluster configuration consisting of two NFS servers is described in the following section:

“2.2 Sample configuration of EXPRESSCLUSTER in an NFS cluster”

2.1. Sample configuration of EXPRESSCLUSTER in a SAP NW cluster

The following table outlines the EXPRESSCLUSTER settings for creating a cluster environment for SAP NW.

For some parameters, the setting value changes depending on whether the instance number configuration is pattern 1 or pattern 2. For the instance number configuration, refer to *System Configuration Guide* - “Section 1.1.4.”

2.1.1. Configuration example for failover groups

	Parameter name	Value of the setting
Cluster configuration	Cluster name	cluster
	The number of servers	2
	The number of failover groups	11
	The number of monitor resources	21
Heartbeat	Lankhb	2
	Lanhb	2
Node#1 (Server of master)	Server name	sap1
	IP address of interconnect (Kernel Mode, Priority1)	172.16.30.135
	IP address of interconnect (Kernel Mode, Priority2)	10.0.0.1
	IP address of interconnect (User Mode, Priority3)	172.16.30.135
	IP address of interconnect (User Mode, Priority4)	10.0.0.1
Node#2	Server name	sap2
	IP address of interconnect (Kernel Mode, Priority1)	172.16.30.136
	IP address of interconnect (Kernel Mode, Priority2)	10.0.0.2
	IP address of interconnect (User Mode, Priority3)	172.16.30.136
	IP address of interconnect (User Mode, Priority4)	10.0.0.2
1st group (for WebManager)	Type	failover
	Group name	Management Group
	Server group of run	Failover is possible on all servers

	Parameter name	Value of the setting
1st group resource	The number of group resources	1
	Type	floating ip resource
	Group resource name	Management IP
	IP Address	172.16.30.137
2nd group (for ASCS)	Type	failover
	Group name	ASCS-Group
	Startup Server	Failover is possible on all servers
	Startup Attribute	Auto Startup
	Failover Attribute	Auto Failover Use the startup server settings
	Failback Attribute	Manual Failback
	Failover Exclusive Attribute	Normal exclusion
	Stop Dependent group	ERS1-Group PAS-Group ERS2-Group AAS-Group
		Wait the Dependent Groups when a Cluster Stops Wait the Dependent Groups when a Server Stops
	The number of group resources	4
1st group resource Depth 0	Type	floating ip resource
	Dependent Resources	Follow the default dependency
	Group resource name	fip-ascssv
	IP Address	172.16.30.138
2nd group resource Depth 1	Type	nas resource
	Group resource name	nas-ascs
	Dependent Resources	Follow the default dependency
	Recovery Operation at Activation Failure Detection	Retry Count 0
		Failover Threshold 1
		No operation (not activate next resource)
	Recovery Operation at Deactivation Failure Detection	Retry Count at Deactivation Failure 0
		Stop the cluster service and shutdown OS
	Server Name	nassv
	Shared Name	/opt/nfsroot/sapascs
	Mount Point	/usr/sap/NEC/ASCS10
	File System	nfs
3rd group resource Depth 2	Type	execute resource
	Group resource name	exec-ascs-SAP-instance_NEC_10
	Dependent Resources	fip-ascssv nas-ascs
	Recovery Operation at Activation Failure Detection	Retry Count 0
		Failover Threshold 1
		No operation (not activate next resource)

		Parameter name	Value of the setting	
		Recovery Operation at Deactivation Failure Detection	Retry Count at Deactivation Failure 0	
			Stop the cluster service and shutdown OS	
		Details	Script created with this product Start path : /root/sample/scripts/SAP-ASCS-instance/ascs_start.sh Stop path : /root/sample/scripts/SAP-ASCS-instance/ascs_stop.sh Refer to “3.1.1 Usage of the scripts” for how to specify scripts.	
	4rd group resource Depth 2	Type	execute resource	
		Group resource name	exec-ascs-SAP-service_NEC_10	
		Dependent Resources	fip-ascssv nas-ascs	
		Recovery Operation at Activation Failure Detection	Retry Count 0	
			Failover Threshold 1	
			No operation (not activate next resource)	
		Recovery Operation at Deactivation Failure Detection	Retry Count at Deactivation Failure 0	
			Stop the cluster service and shutdown OS	
		Details	Script created with this product Start script: start.sh Stop script: stop.sh	
	3rd group (for ERS1)	Type	failover	
		Group name	ERS1-Group	
		Startup Server	sap1	
		Startup Attribute	Pattern 1 configuration	Manual Startup
			Pattern 2 configuration	Auto Startup
		Failover Attribute	Auto Failover Use the startup server settings	
		Failback Attribute	Auto Failback	
		Failover Exclusive Attribute	Off	
		Start Dependent group	ASCS-Group	
		Stop Dependent group	-----	
		The number of group resources	2	
	1st group resource Depth 0	Type	execute resource	
		Group resource name	exec-ERS1-SAP-instance_NEC_20	
		Dependent Resources	Follow the default dependency	
		Recovery Operation at Activation Failure Detection	Retry Count 0	
			Failover Threshold 1	
			No operation (not activate next resource)	
		Recovery Operation at Deactivation Failure Detection	Retry Count at Deactivation Failure 0	
			Stop the cluster service and shutdown OS	

		Parameter name	Value of the setting
		Details	Script created with this product Start path : /root/sample/scripts/SAP-ERS-instance/ers_start.sh Stop path : /root/sample/scripts/SAP-ERS-instance/ers_stop.sh Refer to “3.1.1 Usage of the scripts” for how to specify scripts.
	2nd group resource Depth 0	Type	execute resource
		Group resource name	exec-ERS1-SAP-service_NEC_20
		Dependent Resources	Follow the default dependency
		Recovery Operation at Activation Failure Detection	Retry Count 0
			Failover Threshold 1
			No operation (not activate next resource)
		Recovery Operation at Deactivation Failure Detection	Retry Count at Deactivation Failure 0
			Stop the cluster service and shutdown OS
		Details	Script created with this product Start script: start.sh Stop script: stop.sh
	4th group (for PAS)	Type	failover
		Group name	PAS-Group
		Startup Server	sap1
		Startup Attribute	Auto Startup
		Failover Attribute	Auto Failover Use the startup server settings
		Failback Attribute	Auto Failback
		Failover Exclusive Attribute	Off
		Start Dependent group	ASCS-Group
		Stop Dependent group	-----
			Wait the Dependent Groups when a Cluster Stops
		The number of group resources	2
	1st group resource Depth 0	Type	execute resource
		Group resource name	exec-PAS-SAP-instance_NEC_30
		Dependent Resources	Follow the default dependency
		Recovery Operation at Activation Failure Detection	Retry Count 0
			Failover Threshold 1
			No operation (not activate next resource)
		Recovery Operation at Deactivation Failure Detection	Retry Count at Deactivation Failure 0
			Stop the cluster service and shutdown OS
		Details	Script created with this product Start script: start.sh Stop script: stop.sh
	2nd group resource Depth 0	Type	execute resource
		Group resource name	exec-PAS-SAP-service_NEC_30
		Dependent Resources	Follow the default dependency

		Parameter name	Value of the setting	
5th group (for ERS2)		Recovery Operation at Activation Failure Detection	Retry Count 0	
			Failover Threshold 1	
			No operation (not activate next resource)	
		Recovery Operation at Deactivation Failure Detection	Retry Count at Deactivation Failure 0	
			Stop the cluster service and shutdown OS	
		Details	Script created with this product Start script: start.sh Stop script: stop.sh	
		Type	failover	
		Group name	ERS2-Group	
		Startup Server	sap2	
		Startup Attribute	Pattern 1 configuration	Manual Startup
			Pattern 2 configuration	Auto Startup
		Failover Attribute	Auto Failover Use the startup server settings	
		Failback Attribute	Auto Failback	
		Failover Exclusive Attribute	Off	
		Start Dependent group	ASCS-Group	
		Stop Dependent group	-----	
			Wait the Dependent Groups when a Cluster Stops	
		The number of group resources	2	
1st group resource Depth 0		Type	execute resource	
		Group resource name	exec-ERS2-SAP-instance_NEC_21	
		Dependent Resources	Follow the default dependency	
		Recovery Operation at Activation Failure Detection	Retry Count 0	
			Failover Threshold 1	
			No operation (not activate next resource)	
		Recovery Operation at Deactivation Failure Detection	Retry Count at Deactivation Failure 0	
			Stop the cluster service and shutdown OS	
		Details	Script created with this product Start path : /root/sample/scripts/SAP-ERS-instance/ers_start.sh Stop path : /root/sample/scripts/SAP-ERS-instance/ers_stop.sh	
			Refer to “3.1.1 Usage of the scripts” for how to specify scripts.	
		Type	execute resource	
		Group resource name	exec-ERS2-SAP-service_NEC_21	
		Dependent Resources	Follow the default dependency	
		Recovery Operation at Activation Failure Detection	Retry Count 0	
			Failover Threshold 1	
			No operation (not Deactivate next resource)	
		Recovery Operation at Deactivation	Retry Count at Deactivation Failure 0	
2nd group resource Depth 0		Type	execute resource	
		Group resource name	exec-ERS2-SAP-service_NEC_21	
		Dependent Resources	Follow the default dependency	
		Recovery Operation at Activation Failure Detection	Retry Count 0	
			Failover Threshold 1	
			No operation (not Deactivate next resource)	
		Recovery Operation at Deactivation	Retry Count at Deactivation Failure 0	

		Parameter name	Value of the setting
		Failure Detection	Stop the cluster service and shutdown OS
		Details	Script created with this product Start script: start.sh Stop script: stop.sh
6th group (for AAS)		Type	failover
		Group name	AAS-Group
		Startup Server	sap2
		Startup Attribute	Auto Startup
		Failover Attribute	Auto Failover Use the startup server settings
		Failback Attribute	Auto Failback
		Failover Exclusive Attribute	Off
		Start Dependent group	ASCS-Group
		Stop Dependent group	----- Wait the Dependent Groups when a Cluster Stops
		The number of group resources	2
	1st group resource Depth 0	Type	execute resource
		Group resource name	exec-AAS-SAP-instance_NEC_40
		Dependent Resources	Follow the default dependency
		Recovery Operation at Activation Failure Detection	Retry Count 0
			Failover Threshold 1
			No operation (not activate next resource)
		Recovery Operation at Deactivation Failure Detection	Retry Count at Deactivation Failure 0
			Stop the cluster service and shutdown OS
		Details	Script created with this product Start script: start.sh Stop script: stop.sh
	2nd group resource Depth 0	Type	execute resource
		Group resource name	exec-AAS-SAP-service_NEC_40
		Dependent Resources	Follow the default dependency
		Recovery Operation at Activation Failure Detection	Retry Count 0
			Failover Threshold 1
			No operation (not activate next resource)
		Recovery Operation at Deactivation Failure Detection	Retry Count at Deactivation Failure 0
			Stop the cluster service and shutdown OS
		Details	Script created with this product Start script: start.sh Stop script: stop.sh
7th group (for DA1)		Type	failover
		Group name	DA1-Group
		Startup Server	sap1
		Startup Attribute	Auto Startup
		Failover Attribute	Auto Failover Use the startup server settings

	Parameter name	Value of the setting
	Failback Attribute	Auto Failback
	Failover Exclusive Attribute	Off
	Start Dependent group	-----
	Stop Dependent group	-----
		Wait the Dependent Groups when a Cluster Stops
	The number of group resources	2
	1st group resource Depth 0	Type
		Group resource name
		Dependent Resources
		Retry Count 0
		Failover Threshold 1
		No operation (not activate next resource)
		Retry Count at Deactivation Failure 0
		Stop the cluster service and shutdown OS
	2nd group resource Depth 0	Type
		Group resource name
		Dependent Resources
		Retry Count 0
		Failover Threshold 1
		No operation (not activate next resource)
		Retry Count at Deactivation Failure 0
		Stop the cluster service and shutdown OS
	8th group (for DA2)	Type
		Group name
		Startup Server
		Startup Attribute
		Failover Attribute
		Failback Attribute
		Failover Exclusive Attribute
		Start Dependent group

		Stop Dependent group

		Wait the Dependent Groups when a Cluster Stops
		The number of group resources
	1st group resource Depth 0	Type
		Group resource name

		Parameter name	Value of the setting
		Dependent Resources	Follow the default dependency
		Recovery Operation at Activation Failure Detection	Retry Count 0
			Failover Threshold 1
			No operation (not activate next resource)
		Recovery Operation at Deactivation Failure Detection	Retry Count at Deactivation Failure 0
			Stop the cluster service and shutdown OS
		Details	Script created with this product Start script: start.sh Stop script: stop.sh
	2nd group resource Depth 0	Type	execute resource
		Group resource name	exec-DA2-service_DAA_96
		Dependent Resources	Follow the default dependency
		Recovery Operation at Activation Failure Detection	Retry Count 0
			Failover Threshold 1
			No operation (not activate next resource)
		Recovery Operation at Deactivation Failure Detection	Retry Count at Deactivation Failure 0
			Stop the cluster service and shutdown OS
		Details	Script created with this product Start script: start.sh Stop script: stop.sh
	9th group (for hostexec1)	Type	failover
		Group name	hostexec1-Group
		Startup Server	sap1
		Startup Attribute	Auto Startup
		Failover Attribute	Auto Failover Use the startup server settings
		Failback Attribute	Auto Failback
		Failover Exclusive Attribute	Off
		Start Dependent group	-----
		Stop Dependent group	-----
			Wait the Dependent Groups when a Cluster Stops
		The number of group resources	1
	1st group resource Depth 0	Type	execute resource
		Group resource name	exec-hostexec1
		Dependent Resources	Follow the default dependency
		Recovery Operation at Activation Failure Detection	Retry Count 0
			Failover Threshold 1
			No operation (not activate next resource)
		Recovery Operation at Deactivation Failure Detection	Retry Count at Deactivation Failure 0
			Stop the cluster service and shutdown OS
		Details	Script created with this product Start script: start.sh Stop script: stop.sh

	Parameter name	Value of the setting
10th group (for hostexec2)	Type	failover
	Group name	hostexec2-Group
	Startup Server	sap2
	Startup Attribute	Auto Startup
	Failover Attribute	Auto Failover Use the startup server settings
	Failback Attribute	Auto Failback
	Failover Exclusive Attribute	Off
	Start Dependent group	-----
	Stop Dependent group	-----
		Wait the Dependent Groups when a Cluster Stops
	The number of group resources	1
1st group resource Depth 0	Type	execute resource
	Group resource name	exec-hostexec2
	Dependent Resources	Follow the default dependency
	Recovery Operation at Activation Failure Detection	Retry Count 0
		Failover Threshold 1
		No operation (not activate next resource)
	Recovery Operation at Deactivation Failure Detection	Retry Count at Deactivation Failure 0
		Stop the cluster service and shutdown OS
	Details	Script created with this product Start script: start.sh Stop script: stop.sh
11th group (For exclusive control of Node#1) Note: This group requires only the pattern 1 configuration. The pattern 2 configuration is not required.	Type	failover
	Group name	Exclusive-Group1
	Startup Server	sap1
	Startup Attribute	Auto Startup
	Failover Attribute	Auto Failover Use the startup server settings
	Failback Attribute	Auto Failback
	Failover Exclusive Attribute	Normal exclusion
	Start Dependent group	-----
	Stop Dependent group	-----
		Wait the Dependent Groups when a Cluster Stops
	The number of group resources	0
12th group (For exclusive control of Node#2) Note: This group requires only the pattern 1 configuration. The pattern 2 configuration is not required.	Type	failover
	Group name	Exclusive-Group2
	Startup Server	sap2
	Startup Attribute	Auto Startup
	Failover Attribute	Auto Failover Use the startup server settings
	Failback Attribute	Auto Failback

	Parameter name	Value of the setting
	Failover Exclusive Attribute	Normal exclusion
	Start Dependent group	-----
	Stop Dependent group	-----
		Wait the Dependent Groups when a Cluster Stops
	The number of group resources	0

2.1.2. Example of the configuration of the Monitor Resources

	Parameter name	Value of the setting
1st monitor resource (create of default)	Type	user mode monitor
	Monitor resource name	userw
2nd monitor resource	Type	NIC Link Up/Down monitor
	Monitor resource name	miiw-eth0
	Monitor Target	eth0
	Monitor Timing	Always
	Recovery Action	Executing failover to the recovery target
	Recovery Target	All Groups
3rd monitor resource	Type	NIC Link Up/Down monitor
	Monitor resource name	miiw-eth1
	Monitor Target	eth1
	Monitor Timing	Always
	Recovery Action	Executing failover to the recovery target
	Recovery Target	All Groups
4th monitor resource (for ASCS instance ENQ)	Type	custom monitor
	Monitor resource name	genw-ASCS-instance-ENQ
	Interval	30 sec
	Timeout	120 sec
	Retry Count	2 time
	Wait Time to Start Monitoring	30 sec
	Monitor Timing	Active exec-ascs-SAP-instance_NEC_10
	Script created with this product	genw.sh
	Monitor Type	Synchronous
	Log Output Path	/opt/nec/clusterpro/log/genw-ASCS-instance-ENQ.log
	Rotate Log	ON
	Rotation Size	1000000 byte
	Normal Return Value	0
	Recovery Action	Custom settings
	Recovery Target	ASCS-Group
	Recovery Script Execution Count	0 time
	Maximum Reactivation Count	0 time
	Maximum Failover Count	1 time
	Final Action	Stop the cluster service and shutdown OS
5th monitor resource (for ASCS instance MSG)	Type	custom monitor
	Monitor resource name	genw-ASCS-instance-MSG
	Interval	30 sec
	Timeout	120 sec
	Retry Count	2 time
	Wait Time to Start Monitoring	30 sec
	Monitor Timing	Active exec-ascs-SAP-instance_NEC_10
	Script created with this product	genw.sh
	Monitor Type	Synchronous
	Log Output Path	/opt/nec/clusterpro/log/genw-ASCS-instance-MSG.log

	Parameter name	Value of the setting	
	Rotate Log	ON	
	Rotation Size	1000000 byte	
	Normal Return Value	0	
	Recovery Action	Custom settings	
	Recovery Target	ASCS-Group	
	Recovery Script Execution Count	0 time	
	Maximum Reactivation Count	3 time	
	Maximum Failover Count	1 time	
	Final Action	No operation	
6th monitor resource (for ASCS service)	Type	custom monitor	
	Monitor resource name	genw-ASCS-service	
	Interval	15 sec	
	Timeout	60 sec	
	Retry Count	1 time	
	Wait Time to Start Monitoring	30 sec	
	Monitor Timing	Active exec-ascs-SAP-service_NEC_10	
	Script created with this product	genw.sh	
	Monitor Type	Synchronous	
	Log Output Path	/opt/nec/clusterpro/log/genw-ASCS-service.log	
	Rotate Log	ON	
	Rotation Size	1000000 byte	
	Normal Return Value	0	
	Recovery Action	Custom settings	
	Recovery Target	exec-ascs-SAP-service_NEC_10	
	Recovery Script Execution Count	0 time	
	Maximum Reactivation Count	3 time	
	Maximum Failover Count	1 time	
	Final Action	No operation	
7th monitor resource (for ERS1 instance)	Type	custom monitor	
	Monitor resource name	genw-ERS1-instance	
	Interval	30 sec	
	Timeout	120 sec	
	Retry Count	2 time	
	Wait Time to Start Monitoring	30 sec	
	Monitor Timing	Active exec-ERS1-SAP-instance_NEC_20	
	Script created with this product	genw.sh	
	Monitor Type	Synchronous	
	Log Output Path	/opt/nec/clusterpro/log/genw-ERS1-instance.log	
	Rotate Log	ON	
	Rotation Size	1000000 byte	
	Normal Return Value	0	
	Recovery Action	Custom settings	
	Recovery Target	exec-ERS1-SAP-instance_NEC_20	
	Recovery Script Execution Count	Pattern 1 configuration	1 time
		Pattern 2 configuration	0 time

	Parameter name	Value of the setting	
	Maximum Reactivation Count	Pattern 1 configuration	0 time
		Pattern 2 configuration	1 time
	Maximum Failover Count	0 time	
	Final Action	No operation	
	User Application [Recovery Script]	Pattern 1 configuration	/root/sample/genw/ers_mon_preaction_wrapper.sh Refer to “3.2.2 Usage of the recovery scripts (for pattern 1)” for how to specify recovery script.
		Pattern 2 configuration	Unnecessary to set
	Timeout [Recovery Script]	5 sec	
8th monitor resource (for ERS1 service)	Type	custom monitor	
	Monitor resource name	genw-ERS1-service	
	Interval	15 sec	
	Timeout	60 sec	
	Retry Count	1 time	
	Wait Time to Start Monitoring	30 sec	
	Monitor Timing	Active exec-ERS1-SAP-service_NEC_20	
	Script created with this product	genw.sh	
	Monitor Type	Synchronous	
	Log Output Path	/opt/nec/clusterpro/log/genw-ERS1-service.log	
	Rotate Log	ON	
	Rotation Size	1000000 byte	
	Normal Return Value	0	
	Recovery Action	Custom settings	
	Recovery Target	exec-ERS1-SAP-service_NEC_20	
	Recovery Script Execution Count	0 time	
	Maximum Reactivation Count	3 time	
	Maximum Failover Count	0 time	
	Final Action	No operation	
9th monitor resource (for ERS2 instance)	Type	custom monitor	
	Monitor resource name	genw-ERS2-instance	
	Interval	30 sec	
	Timeout	120 sec	
	Retry Count	2 time	
	Wait Time to Start Monitoring	30 sec	
	Monitor Timing	Active exec-ERS2-SAP-instance_NEC_21	
	Script created with this product	genw.sh	
	Monitor Type	Synchronous	
	Log Output Path	/opt/nec/clusterpro/log/genw-ERS2-instance.log	
	Rotate Log	ON	
	Rotation Size	1000000 byte	
	Normal Return Value	0	
	Recovery Action	Custom settings	

	Parameter name	Value of the setting	
	Recovery Target	exec-ERS2-SAP-instance_NEC_21	
	Recovery Script Execution Count	Pattern 1 configuration	1 time
		Pattern 2 configuration	0 time
	Maximum Reactivation Count	Pattern 1 configuration	0 time
		Pattern 2 configuration	1 time
	Maximum Failover Count	0 time	
	Final Action	No operation	
	User Application [Recovery Script]	Pattern 1 configuration	/root/sample/genw/ers_mon_preaction_wrapper.sh Refer to “3.2.2 Usage of the recovery scripts (for pattern 1)” for how to specify recovery script.
Pattern 2 configuration		Unnecessary to set	
Timeout [Recovery Script]	5 sec		
10th monitor resource (for ERS2 service)	Type	custom monitor	
	Monitor resource name	genw-ERS2-service	
	Interval	15 sec	
	Timeout	60 sec	
	Retry Count	1 time	
	Wait Time to Start Monitoring	30 sec	
	Monitor Timing	Active exec-ERS2-SAP-service_NEC_21	
	Script created with this product	genw.sh	
	Monitor Type	Synchronous	
	Log Output Path	/opt/nec/clusterpro/log/genw-ERS2-service.log	
	Rotate Log	ON	
	Rotation Size	1000000 byte	
	Normal Return Value	0	
	Recovery Action	Custom settings	
	Recovery Target	exec-ERS2-SAP-service_NEC_21	
	Recovery Script Execution Count	0 time	
	Maximum Reactivation Count	3 time	
	Maximum Failover Count	0 time	
Final Action	No operation		
11th monitor resource (for PAS instance)	Type	custom monitor	
	Monitor resource name	genw-PAS-instance	
	Interval	30 sec	
	Timeout	120 sec	
	Retry Count	2 time	
	Wait Time to Start Monitoring	30 sec	
	Monitor Timing	Active exec-PAS-SAP-instance_NEC_30	
	Script created with this product	genw.sh	
	Monitor Type	Synchronous	

	Parameter name	Value of the setting
	Log Output Path	/opt/nec/clusterpro/log/genw-PAS-instance.log
	Rotate Log	ON
	Rotation Size	1000000 byte
	Normal Return Value	0
	Recovery Action	Custom settings
	Recovery Target	exec-PAS-SAP-instance_NEC_30
	Recovery Script Execution Count	0 time
	Maximum Reactivation Count	3 time
	Maximum Failover Count	0 time
	Final Action	No operation
12th monitor resource (for PAS service)	Type	custom monitor
	Monitor resource name	genw-PAS-service
	Interval	15 sec
	Timeout	60 sec
	Retry Count	1 time
	Wait Time to Start Monitoring	30 sec
	Monitor Timing	Active exec-PAS-SAP-service_NEC_30
	Script created with this product	genw.sh
	Monitor Type	Synchronous
	Log Output Path	/opt/nec/clusterpro/log/genw-PAS-service.log
	Rotate Log	ON
	Rotation Size	1000000 byte
	Normal Return Value	0
	Recovery Action	Custom settings
	Recovery Target	exec-PAS-SAP-service_NEC_30
	Recovery Script Execution Count	0 time
	Maximum Reactivation Count	3 time
	Maximum Failover Count	0 time
	Final Action	No operation
13th monitor resource (for AAS instance)	Type	custom monitor
	Monitor resource name	genw-AAS-instance
	Interval	30 sec
	Timeout	120 sec
	Retry Count	2 time
	Wait Time to Start Monitoring	30 sec
	Monitor Timing	Active exec-AAS-SAP-instance_NEC_40
	Script created with this product	genw.sh
	Monitor Type	Synchronous
	Log Output Path	/opt/nec/clusterpro/log/genw-AAS-instance.log
	Rotate Log	ON
	Rotation Size	1000000 byte
	Normal Return Value	0
	Recovery Action	Custom settings
	Recovery Target	exec-AAS-SAP-instance_NEC_30
	Recovery Script Execution	0 time

	Parameter name	Value of the setting
	Count	
	Maximum Reactivation Count	3 time
	Maximum Failover Count	0 time
	Final Action	No operation
14th monitor resource (for AAS service)	Type	custom monitor
	Monitor resource name	genw-AAS-service
	Interval	15 sec
	Timeout	60sec
	Retry Count	1 time
	Wait Time to Start Monitoring	30 sec
	Monitor Timing	Active exec-AAS-SAP-service_NEC_40
	Script created with this product	genw.sh
	Monitor Type	Synchronous
	Log Output Path	/opt/nec/clusterpro/log/genw-AAS-service.log
	Rotate Log	ON
	Rotation Size	1000000 byte
	Normal Return Value	0
	Recovery Action	Custom settings
	Recovery Target	exec-AAS-SAP-service_NEC_40
	Recovery Script Execution Count	0 time
	Maximum Reactivation Count	3 time
	Maximum Failover Count	0 time
	Final Action	No operation
15th monitor resource (for DA1 instance)	Type	custom monitor
	Monitor resource name	genw-DA1-instance
	Interval	30 sec
	Timeout	120 sec
	Retry Count	2 time
	Wait Time to Start Monitoring	30 sec
	Monitor Timing	Active exec-DA1-instance_DAA_97
	Script created with this product	genw.sh
	Monitor Type	Synchronous
	Log Output Path	/opt/nec/clusterpro/log/genw-DA1-instance.log
	Rotate Log	ON
	Rotation Size	1000000 byte
	Normal Return Value	0
	Recovery Action	Custom settings
	Recovery Target	exec-DA1-instance_DAA_97
	Recovery Script Execution Count	0 time
	Maximum Reactivation Count	3 time
	Maximum Failover Count	0 time
	Final Action	No operation
16th monitor resource (for DA1 service)	Type	custom monitor
	Monitor resource name	genw-DA1-service
	Interval	15 sec

	Parameter name	Value of the setting
	Timeout	60 sec
	Retry Count	1 time
	Wait Time to Start Monitoring	30 sec
	Monitor Timing	Active exec-DA1-service_DAA_97
	Script created with this product	genw.sh
	Monitor Type	Synchronous
	Log Output Path	/opt/nec/clusterpro/log/genw-DA1-service.log
	Rotate Log	ON
	Rotation Size	1000000 byte
	Normal Return Value	0
	Recovery Action	Custom settings
	Recovery Target	exec-DA1-service_DAA_97
	Recovery Script Execution Count	0 time
	Maximum Reactivation Count	3 time
	Maximum Failover Count	0 time
	Final Action	No operation
17th monitor resource (for DA2 instance)	Type	custom monitor
	Monitor resource name	genw-DA2-instance
	Interval	30 sec
	Timeout	120 sec
	Retry Count	2 time
	Wait Time to Start Monitoring	30 sec
	Monitor Timing	Active exec-DA2-instance_DAA_96
	Script created with this product	genw.sh
	Monitor Type	Synchronous
	Log Output Path	/opt/nec/clusterpro/log/genw-DA2-instance.log
	Rotate Log	ON
	Rotation Size	1000000 byte
	Normal Return Value	0
	Recovery Action	Custom settings
	Recovery Target	exec-DA2-instance_DAA_96
	Recovery Script Execution Count	0 time
	Maximum Reactivation Count	3 time
	Maximum Failover Count	0 time
	Final Action	No operation
18th monitor resource (for DA2 service)	Type	custom monitor
	Monitor resource name	genw-DA2-service
	Interval	15 sec
	Timeout	60 sec
	Retry Count	1 time
	Wait Time to Start Monitoring	30 sec
	Monitor Timing	Active exec-DA2-service_DAA_96
	Script created with this product	genw.sh
	Monitor Type	Synchronous

	Parameter name	Value of the setting
	Log Output Path	/opt/nec/clusterpro/log/genw-DA2-service.log
	Rotate Log	ON
	Rotation Size	1000000 byte
	Normal Return Value	0
	Recovery Action	Custom settings
	Recovery Target	exec-DA2-service_DAA_96
	Recovery Script Execution Count	0 time
	Maximum Reactivation Count	3 time
	Maximum Failover Count	0 time
	Final Action	No operation
19th monitor resource (for hostexec1)	Type	custom monitor
	Monitor resource name	genw-hostexec1
	Interval	30 sec
	Timeout	120 sec
	Retry Count	1 time
	Wait Time to Start Monitoring	30 sec
	Monitor Timing	Active exec-hostexec1
	Script created with this product	genw.sh
	Monitor Type	Synchronous
	Log Output Path	/opt/nec/clusterpro/log/genw-hostexec1.log
	Rotate Log	ON
	Rotation Size	1000000 byte
	Normal Return Value	0
	Recovery Action	Custom settings
	Recovery Target	exec-hostexec1
	Recovery Script Execution Count	0 time
	Maximum Reactivation Count	3 time
	Maximum Failover Count	0 time
	Final Action	No operation
20th monitor resource (for hostexec2)	Type	custom monitor
	Monitor resource name	genw-hostexec2
	Interval	30 sec
	Timeout	120 sec
	Retry Count	1 time
	Wait Time to Start Monitoring	30 sec
	Monitor Timing	Active exec-hostexec2
	Script created with this product	genw.sh
	Monitor Type	Synchronous
	Log Output Path	/opt/nec/clusterpro/log/genw-hostexec2.log
	Rotate Log	ON
	Rotation Size	1000000 byte
	Normal Return Value	0
	Recovery Action	Custom settings
	Recovery Target	exec-hostexec2
	Recovery Script Execution	0 time

	Parameter name	Value of the setting
	Count	
	Maximum Reactivation Count	3 time
	Maximum Failover Count	0 time
	Final Action	No operation
21th monitor resource	Type	disk monitor
	Monitor resource name	diskw-NFS
	Interval	15 sec
	Timeout	30 sec
	Retry Count	0 time
	Wait Time to Start Monitoring	0 sec
	Monitor Timing	Always
	Method	READ(O_DIRECT)
	Monitor Target	/sapmnt/<SID>/nfscheck
	Recovery Action	Final action only
	Final Action	No operation

Note:

The /sapmnt/<SID>/nfscheck file to be set to **Monitor Target** of the disk monitor resource must be created in advance.

2.2. Sample configuration of EXPRESSCLUSTER in an NFS cluster (for pattern1)

The following table outlines the EXPRESSCLUSTER settings for creating a NFS server cluster environment. The following settings are not necessary when using one node as an NFS server.

2.2.1. Configuration example for failover groups

	Parameter name	Value of the setting
Cluster configuration	Cluster name	Cluster-nfs
	The number of servers	2
	The number of failover groups	1
	The number of monitor resources	1
Heartbeat	Lankhb	2
	Lanhb	2
Node#3 (Server of master)	Server name	nas1
	IP address of interconnect (Kernel Mode, Priority 1)	10.0.0.4
	IP address of interconnect (Kernel Mode, Priority 2)	172.16.30.140
	IP address of interconnect (User Mode, Priority 3)	10.0.0.4
	IP address of interconnect (User Mode, Priority 4)	172.16.30.140
Node#4	Server name	nas2
	IP address of interconnect (Kernel mode, priority 1)	10.0.0.5
	IP address of interconnect (Kernel mode, priority 2)	172.16.30.141

		Parameter name	Value of the setting
		IP address of interconnect (User mode, priority 3)	10.0.0.5
		IP address of interconnect (User mode, priority 4)	172.16.30.141
1st group (for NFS server)		Type	failover
		Group name	NFS-Group
		Startup Server	Failover is possible on all servers
		Startup Attribute	Auto Startup
		Failover Attribute	Auto Failover Use the startup server settings
		Failback Attribute	Manual Failback
		Failover Exclusive Attribute	Off
		The number of group resources	3
1st group resource Depth 0		Type	floating ip resource
		Group resource name	fip-nfs
		Dependent Resources	Follow the default dependency
		IP Address	10.0.0.3
2nd group resource Depth 1		Type	disk resource
		Group resource name	disk-nfs
		Dependent Resources	Follow the default dependency
	Recovery Operation at Activation Failure Detection		Retry Count 0
			Failover Threshold 1
			No operation (not activate next resource)
	Recovery Operation at Deactivation Failure Detection		Retry Count at Deactivation Failure 0
			Stop the cluster service and shutdown OS
		Disk Type	disk
		File System	ext4
		Device Name	/dev/sda2
		Mount Point	/opt/nfsroot
3rd group resource Depth 2		Type	execute resource
		Group resource name	exec-nfs
		Dependent Resources	disk-nfs
	Recovery Operation at Activation Failure Detection		Retry Count 0
			Failover Threshold 1
			No operation (not activate next resource)
	Recovery Operation at Deactivation Failure Detection		Retry Count at Deactivation Failure 0
			Stop the cluster service and shutdown OS
		Details	Script created with this product Start script: start.sh Stop script: stop.sh

2.2.2. Example of the configuration of the monitor resources

	Parameter name	Value of the setting
1st monitor resource (create of default)	Type	user mode monitor
	Monitor resource name	userw
2nd monitor resource	Type	nfs monitor
	Monitor resource name	nfsw
	Interval	30 sec
	Timeout	60 sec
	Retry Count	1 time
	Wait Time to Start Monitoring	0 sec
	Monitor Timing	Active exec-nfs
	Share Directory	/opt/nfsroot
	NFS Server	127.0.0.1
	NFS Version	v4

Chapter 3 Bundled scripts

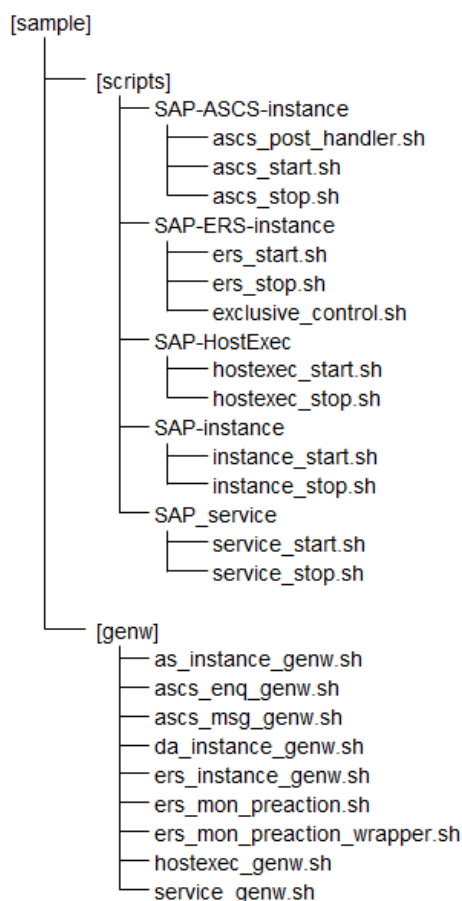
Terminology used in this chapter.

Terminology	Description
SID	SAP System ID
DASID	Diagnostics Agent SAP System ID
INO	Instance Number
start.sh	Default script for starting exec resource
stop.sh	Default script for stopping exec resource
genw.sh	Default script for custom monitor

The bundled scripts on the media are stored in the following directory.

`media/Linux/<Version of EXPRESSCLUSTER>/common/sample`

The structure of this directory is shown below.



Note(for EXPRESSCLUSTER X 3.3):

If the “as_instance_genw.sh”, “da_instance_genw.sh”, “ers_instance_genw.sh” and “check_monitor_status.sh.sh” are not bundled on the media, you can download them from the support portal (Content ID: 9510100151).

3.1. Exec resources

Set the following bundled scripts in a media as exec resources.

Bundled scripts are listed below.

Folder name	File name	Use
SAP-ASCS-instance	ascs_post_handler.sh	For exclusive control of ASCS/ERS instance
	ascs_start.sh	For starting ASCS instance
	ascs_stop.sh	For stopping ASCS instance
SAP-ERS-instance	ers_start.sh	For exclusive control of ASCS/ERS instance
	ers_stop.sh	For starting ERS instance
	exclusive_control.sh	For stopping ERS instance
SAP-HostExec	hostexec_start.sh	For starting SapHostExec
	hostexec_stop.sh	For stopping SapHostExec
SAP-Instance	instance_start.sh	For starting instance
	instance_stop.sh	For stopping instance
SAP-service	service_start.sh	For starting service
	service_stop.sh	For stopping service

Modify SAP user (SAPUSER), SAP System ID (SID), Diagnostics Agent SAP System ID (DASID) and Instance Number (INO) written in the bundled scripts according to the values setting of your installation of SAP NW.

During SAP NW installation instance profiles are automatically created for each instance in the global directory /sapmnt/<SID>/profile as well as in the /usr/sap/<DASID>/profile directory on both nodes.

The default naming convention is <SID>_<Instance Name>_<Host Name>.

An example of profile path of each instance is listed below.

Instance	Profile path
Example	/sapmnt/<SID>/profile/<SID>_<Instance Name>_<Host Name>
ASCS	/sapmnt/NEC/profile/NEC_ASCS10_ascssv
ERS1	/sapmnt/NEC/profile/NEC_ERS20_sap1
ERS2	/sapmnt/NEC/profile/NEC_ERS21_sap2
PAS	/sapmnt/NEC/profile/NEC_D30_sap1
AAS	/sapmnt/NEC/profile/NEC_D40_sap2
DA1	/usr/sap/DAA/SYS/profile/DAA_SMDA97_sap1
DA2	/usr/sap/NEC/SYS/profile/DAA_SMDA96_sap2

For some scripts, the usage changes depending on whether the instance number configuration is pattern 1 or pattern 2. For these scripts, refer to either of the following sections depending on the selected configuration.

- Pattern 1 configuration
Section 3.1.1.1 **Usage of the scripts (for pattern 1)**
- Pattern 2 configuration
Section, 3.1.1.2 **Usage of the scripts (for pattern 2)**

For the instance number configuration, refer to *System Configuration Guide* - “Section 1.1.4.”

3.1.1. Usage of the scripts

The structure of the table is as follows.

Failover group name
Exec resource name
Description

ASCS-Group	
exec-ascs-SAP-service_NEC_10	Copy the contents of “service_start.sh” and “service_stop.sh” to start.sh and stop.sh respectively. Modify <code><instance name></code> to the “file name of SAP profile” of ASCS. Example in this manual NEC_ASCS10_ascssv Modify <code><CLUSTER_instance_resource_name></code> to the exec resource name setting in 7.1.1 in the supplied <i>System Configuration Guide</i> document. Example in this manual exec-ascs-SAP-instance_NEC_10 Modify "TIMEOUT" of service_stop.sh to the time in seconds until ASCS instance stops. Example in this manual 300 The stop script confirms whether the instance has stopped or not every "DELAY" seconds of service_stop.sh until the elapsed time reaches "TIMEOUT". Example in this manual 10 Note: To estimate the necessary time to stop the group resource of ASCS instance, stop the group resource with "DELAY=1", and then check alerts using the WebManager.
ERS1-Group	
exec-ERS1-SAP-service_NEC_20	Copy the contents of “service_start.sh” and “service_stop.sh” to start.sh and stop.sh respectively. Modify <code><instance name></code> to the “file name of SAP profile” of ERS1. Example in this manual NEC_ERS20_sap1 Modify <code><CLUSTER_instance_resource_name></code> to the exec resource name setting in 7.1.2 in the supplied <i>System Configuration Guide</i> document. Example in this manual exec-ERS1-SAP-instance_NEC_20 Modify "TIMEOUT" of service_stop.sh to the time in seconds until ERS1 instance stops. Example in this manual 300 The stop script confirms whether the instance has stopped or not every "DELAY" seconds of

	<code>service_stop.sh</code> until the elapsed time reaches "TIMEOUT". Example in this manual 10 Note: To estimate the necessary time to stop the group resource of ERS1 instance, stop the group resource with "DELAY=1", and then check alerts using the WebManager.
ERS2-Group	
	<code>exec-ERS2-SAP-service_NEC_21</code> Copy the contents of "<code>service_start.sh</code>" and "<code>service_stop.sh</code>" to <code>start.sh</code> and <code>stop.sh</code> respectively. Modify <code><instance name></code> to the "file name of SAP profile" of ERS2. Example in this manual NEC_ERS21_sap2 Modify <code><CLUSTER_instance_resource_name></code> to the exec resource name setting in 7.1.3 in the supplied <i>System Configuration Guide</i> document. Example in this manual <code>exec-ERS2-SAP-instance_NEC_20</code> Modify "TIMEOUT" of <code>service_stop.sh</code> to the time in seconds until ERS2 instance stops. Example in this manual 300 The stop script confirms whether the instance has stopped or not every "DELAY" seconds of <code>service_stop.sh</code> until the elapsed time reaches "TIMEOUT". Example in this manual 10 Note: To estimate the necessary time to stop the group resource of ERS2 instance, stop the group resource with "DELAY=1", and then check alerts using the WebManager.
PAS-Group	
	<code>exec-PAS-SAP-instance_NEC_30</code> Copy the contents of "<code>instance_start.sh</code>" and "<code>instance_stop.sh</code>" to <code>start.sh</code> and <code>stop.sh</code> respectively. Modify <code><instance name></code> to the "file name of SAP profile" of PAS. Example in this manual NEC_D30_sap1
	<code>exec-PAS-SAP-service_NEC_30</code> Copy the contents of "<code>service_start.sh</code>" and "<code>service_stop.sh</code>" to <code>start.sh</code> and <code>stop.sh</code> respectively. Modify <code><instance name></code> to the "file name of SAP profile" of PAS. Example in this manual NEC_D30_sap1 Modify <code><CLUSTER_instance_resource_name></code> to the exec resource name setting in 7.1.4 in the supplied <i>System Configuration Guide</i> document.

	Example in this manual exec-PAS-SAP-instance_NEC_30 Modify "TIMEOUT" of <code>service_stop.sh</code> to the time in seconds until PAS instance stops. Example in this manual 300 The stop script confirms whether the instance has stopped or not every "DELAY" seconds of <code>service_stop.sh</code> until the elapsed time reaches "TIMEOUT". Example in this manual 10 Note: To estimate the necessary time to stop the group resource of PAS instance, stop the group resource with "DELAY=1", and then check alerts using the WebManager.
AAS-Group	
	exec-AAS-SAP-instance_NEC_40 Copy the contents of "instance_start.sh" and "instance_stop.sh" to <code>start.sh</code> and <code>stop.sh</code> respectively. Modify <code><instance name></code> to the "file name of SAP profile" of AAS. Example in this manual NEC_D40_sap2
exec-AAS-SAP-service_NEC_40	
	Copy the contents of "service_start.sh" and "service_stop.sh" to <code>start.sh</code> and <code>stop.sh</code> respectively. Modify <code><instance name></code> to the "file name of SAP profile" of AAS. Example in this manual NEC_D40_sap2 Modify <code><CLUSTER_instance_resource_name></code> to the exec resource name setting in 7.1.5 in the supplied <i>System Configuration Guide</i> document. Example in this manual exec-AAS-SAP-instance_NEC_40 Modify "TIMEOUT" of <code>service_stop.sh</code> to the time in seconds until AAS instance stops. Example in this manual 300 The stop script confirms whether the instance has stopped or not every "DELAY" seconds of <code>service_stop.sh</code> until the elapsed time reaches "TIMEOUT". Example in this manual 10 Note: To estimate the necessary time to stop the group resource of AAS instance, stop the group resource with "DELAY=1", and then check alerts using the WebManager.
DA1-Group	

	exec-DA1-instance_NEC_97 Copy the contents of “instance_start.sh” and “instance_stop.sh” to start.sh and stop.sh respectively. Modify <instance name> to the “file name of SAP profile” of DA1. Example in this manual DAA_SMDA97_sap1
	exec-DA1-service_NEC_97 Copy the contents of “service_start.sh” and “service_stop.sh” to start.sh and stop.sh respectively. Modify <instance name> to “file name of SAP profile” of DA1. Example in this manual DAA_SMDA97_sap1 Modify <CLUSTER_instance_resource_name> to the exec resource name setting in 7.1.6 in the supplied <i>System Configuration Guide</i> document. Example in this manual exec-DA1-instance_DAA_97 Modify "TIMEOUT" of service_stop.sh to the time in seconds until DA1 instance stops. Example in this manual 300 The stop script confirms whether the instance has stopped or not every "DELAY" seconds of service_stop.sh until the elapsed time reaches "TIMEOUT". Example in this manual 10 Note: To estimate the necessary time to stop the group resource of DA1 instance, stop the group resource with "DELAY=1", and then check alerts using the WebManager.
	DA2-Group exec-DA2-instance_NEC_96 Copy the contents of “instance_start.sh” and “instance_stop.sh” to start.sh and stop.sh respectively. Modify <instance name> to the “file name of SAP profile” of DA1. Example in this manual DAA_SMDA96_sap2 exec-DA2-service_NEC_96 Copy the contents of “service_start.sh” and “service_stop.sh” to start.sh and stop.sh respectively. Modify <instance name> to the “file name of SAP profile” of DA1. Example in this manual DAA_SMDA96_sap2 Modify <CLUSTER_instance_resource_name> to the exec resource name setting in 7.1.7 in the supplied <i>System Configuration Guide</i> document. Example in this manual exec-DA2-instance_DAA_96

	Modify "TIMEOUT" of <code>service_stop.sh</code> to the time in seconds until DA2 instance stops. Example in this manual 300 The stop script confirms whether the instance has stopped or not every "DELAY" seconds of <code>service_stop.sh</code> until the elapsed time reaches "TIMEOUT". Example in this manual 10 Note: To estimate the necessary time to stop the group resource of DA2 instance, stop the group resource with "DELAY=1", and then check alerts using the WebManager.
	hostexec1-Group exec-hostexec1 Copy the contents of "hostexec_start.sh" and "hostexec_stop.sh" to <code>start.sh</code> and <code>stop.sh</code> respectively. Use the default path of SAP NW for SAPHOSTEXEC and PROFILE. Note: In SAP NW 7.5 or later environment, activation of the exec-hostexec1 may be failed. In that case, add " -restart" to the end of the line "\${SAPHOSTEXEC} pf=\${PROFILE}" in the <code>start.sh</code>.
	hostexec2-Group exec-hostexec2 Setting like the above exec-hostexec1. Note: In SAP NW 7.5 or later environment, activation of the exec-hostexec2 may be failed. In that case, add " -restart" to the end of the line "\${SAPHOSTEXEC} pf=\${PROFILE}" in the <code>start.sh</code>.

3.1.1.1. Usage of the scripts (for pattern 1)

	ASCS-Group exec-ascs-SAP-instance_NEC_10 Copy the files of SAP-ASCS-instance directory to any directory. Example in this manual /root/sample/scripts/SAP-ASCS-instance Assign the execute permission to <code>ascs_post_handler.sh</code>, <code>ascs_start.sh</code> and <code>ascs_stop.sh</code>. Example in this manual # chmod 700 /root/sample/scripts/SAP-ASCS-instance/ascs_post_handler.sh # chmod 700 /root/sample/scripts/SAP-ASCS-instance/ascs_start.sh # chmod 700 /root/sample/scripts/SAP-ASCS-instance/ascs_stop.sh Modify <ASCS_instance_name> of <code>ascs_start.sh</code> and <code>ascs_stop.sh</code> to the "file name of SAP profile" of ASCS. Example in this manual NEC_ASCS10_ascssv Modify <directory_path_of_ascs_post_handler.sh> of <code>ascs_start.sh</code> to the absolute
--	---

path of the directory where `ascs_post_handler.sh` is placed.

Example in this manual

```
/root/sample/scripts/SAP-ASCS-instance
```

Modify the “SAP_ERS_INO” of `ascs_start.sh` to the sequence of ERS1 instance INO and ERS2 instance INO set in *System Configuration Guide* - "Section 6.2." and - “Section 6.4.” Use a space for delimiter.

Example in this manual

```
20 21
```

Open the **Properties** window of EXEC resource and select the **Details** tab.

Click **User Application** in the **Details** tab.

Enter the absolute path of `ascs_start.sh` in **Start**.

Enter the absolute path of `ascs_stop.sh` in **Stop**.

Example in this manual

```
Start path : /root/sample/scripts/SAP-ASCS-instance/ascs_start.sh
```

```
Stop path : /root/sample/scripts/SAP-ASCS-instance/ascs_stop.sh
```

Note : If any failover group of the ERS instance is not working, the failover group of ERS instance is started automatically when administrator starts or moves ASCS instance manually. For disabling auto startup of the failover group of the ERS instance change the value of "ENABLED" of `ascs_start.sh` to "0", and start or move ASCS instance by manual.

ERS1-Group

exec-ERS1-SAP-instance_NEC_20

Copy the files of SAP- ERS-instance directory to any directory.

Example in this manual

```
/root/sample/scripts/SAP-ERS-instance
```

Assign the execute permission to `ers_start.sh`, `ers_stop.sh` and `exclusive_control.sh`.

Example in this manual

```
# chmod 700 /root/sample/scripts/SAP-ERS-instance/ers_start.sh
```

```
# chmod 700 /root/sample/scripts/SAP-ERS-instance/ers_stop.sh
```

```
# chmod 700 /root/sample/scripts/SAP-ERS-instance/exclusive_control.sh
```

Modify `<ERS_instance_name>` of `ers_start.sh` and `ers_stop.sh` to the “file name of SAP profile” of ERS.

Example in this manual

```
NEC_ERS20_sap1
```

Modify `<directory_path_of_exclusive_control.sh>` of `ers_start.sh` and `ers_stop.sh` to the absolute path of the directory where `exclusive_control.sh` is placed.

Example in this manual

```
/root/sample/scripts/SAP-ERS-instance
```

Modify the “SAP_ERS_INO” of `ers_start.sh` and `ers_stop.sh` to the sequence of ERS1 instance INO and ERS2 instance INO set in *System Configuration Guide* - "Section 6.2." and - “Section 6.4.” Use a space for delimiter.

Example in this manual

```
20 21
```

	Modify the "EXCLUSIVE_GROUP" of <code>ers_start.sh</code> and <code>ers_stop.sh</code> to the common failover group name for exclusive control set in <i>System Configuration Guide</i> - "Section 5.4." Open the Properties window of EXEC resource and select the Details tab. Click User Application in the Details tab. Enter the absolute path of <code>ers_start.sh</code> in Start. Enter the absolute path of <code>ers_stop.sh</code> in Stop. Example in this manual Start path : <code>/root/sample/scripts/SAP-ERS-instance/ers_start.sh</code> Stop path : <code>/root/sample/scripts/SAP-ERS-instance/ers_stop.sh</code>
ERS2-Group	exec-ERS2-SAP-instance_NEC_21
	Copy the files of SAP- ERS-instance directory to any directory. Example in this manual <code>/root/sample/scripts/SAP-ERS-instance</code> Assign the execute permission to <code>ers_start.sh</code>, <code>ers_stop.sh</code> and <code>exclusive_control.sh</code>. Example in this manual <pre># chmod 700 /root/sample/scripts/SAP-ERS-instance/ers_start.sh # chmod 700 /root/sample/scripts/SAP-ERS-instance/ers_stop.sh # chmod 700 /root/sample/scripts/SAP-ERS-instance/exclusive_control.sh</pre> Modify <code><ERS_instance_name></code> of <code>ers_start.sh</code> and <code>ers_stop.sh</code> to the "file name of SAP profile" of ERS. Example in this manual <code>NEC_ERS21_sap2</code> Modify <code><directory_path_of_exclusive_control.sh></code> of <code>ers_start.sh</code> and <code>ers_stop.sh</code> to the absolute path of the directory where <code>exclusive_control.sh</code> is placed. Example in this manual <code>/root/sample/scripts/SAP-ERS-instance</code> Modify the "SAP_ERS_INO" of <code>ascs_start.sh</code> to the sequence of ERS1 instance INO and ERS2 instance INO set in <i>System Configuration Guide</i> - "Section 6.2." and - "Section 6.4." Use a space for delimiter. Example in this manual <code>20 21</code> Modify the "EXCLUSIVE_GROUP" of <code>ers_start.sh</code> and <code>ers_stop.sh</code> to the common failover group name for exclusive control set in <i>System Configuration Guide</i> - "Section 5.4.1." Open the Properties window of EXEC resource and select the Details tab. Click User Application in the Details tab. Enter the absolute path of <code>ers_start.sh</code> in Start. Enter the absolute path of <code>ers_stop.sh</code> in Stop. Example in this manual Start path : <code>/root/sample/scripts/SAP-ERS-instance/ers_start.sh</code> Stop path : <code>/root/sample/scripts/SAP-ERS-instance/ers_stop.sh</code>

3.1.1.2. Usage of the scripts (for pattern 2)

ASCS-Group	
exec-ascs-SAP-instance_NEC_10	Copy the files of SAP-ASCS-instance directory to any directory. Example in this manual /root/sample/scripts/SAP-ASCS-instance Assign the execute permission to ascs_start.sh and ascs_stop.sh. Example in this manual # chmod 700 /root/sample/scripts/SAP-ASCS-instance/ascs_start.sh # chmod 700 /root/sample/scripts/SAP-ASCS-instance/ascs_stop.sh Modify <ASCS_instance_name> of ascs_start.sh and ascs_stop.sh to the “file name of SAP profile” of ASCS. Example in this manual NEC_ASCS10_ascssv Change the value of ENABLED of ascs_start.sh to 0. Example in this manual ENABLED="0" Open the Properties window of EXEC resource and select the Details tab. Click User Application in the Details tab. Enter the absolute path of ascs_start.sh in Start. Enter the absolute path of ascs_stop.sh in Stop. Example in this manual Start path : /root/sample/scripts/SAP-ASCS-instance/ascs_start.sh Stop path : /root/sample/scripts/SAP-ASCS-instance/ascs_stop.sh
ERS1-Group	exec-ERS1-SAP-instance_NEC_20 Copy the files of SAP- ERS-instance directory to any directory. Example in this manual /root/sample/scripts/SAP-ERS-instance Assign the execute permission to ers_start.sh, ers_stop.sh. Example in this manual # chmod 700 /root/sample/scripts/SAP-ERS-instance/ers_start.sh # chmod 700 /root/sample/scripts/SAP-ERS-instance/ers_stop.sh Modify <ERS_instance_name> of ers_start.sh and ers_stop.sh to the “file name of SAP profile” of ERS. Example in this manual NEC_ERS20_sap1 Delete or comment out the following part of ers_start.sh.

	<pre> export SID export SAP_ERS_INO export EXCLUSIVE_GROUP if [! -e \${DIR_PATH}/exclusive_control.sh] then \${CLPLOGCMD} -m "\${DIR_PATH}/exclusive_control.sh does not exist." -l warn exit 0 fi echo "exclusive_control.sh start" \${DIR_PATH}/exclusive_control.sh start if [\$? -ne 0] then \${CLPLOGCMD} "exclusive_control.sh failed." -l err # Exit 0 because sapcontrol command succeeded. fi </pre> Delete or comment out the following part of ers_stop.sh. <pre> export SID export SAP_ERS_INO export EXCLUSIVE_GROUP if [! -e \${DIR_PATH}/exclusive_control.sh] then \${CLPLOGCMD} -m "\${DIR_PATH}/exclusive_control.sh does not exist." -l warn exit 0 fi echo "exclusive_control.sh stop" \${DIR_PATH}/exclusive_control.sh stop if [\$? -ne 0] then \${CLPLOGCMD} "exclusive_control.sh failed." -l err # Exit 0 because sapcontrol command succeeded. fi </pre> Open the Properties window of EXEC resource and select the Details tab. Click User Application in the Details tab. Enter the absolute path of ers_start.sh in Start. Enter the absolute path of ers_stop.sh in Stop. Example in this manual Start path : /root/sample/scripts/SAP-ERS-instance/ers_start.sh Stop path : /root/sample/scripts/SAP-ERS-instance/ers_stop.sh
	ERS2-Group exec-ERS2-SAP-instance_NEC_21 Copy the files of SAP- ERS-instance directory to any directory. Example in this manual /root/sample/scripts/SAP-ERS-instance Assign the execute permission to ers_start.sh, ers_stop.sh. Example in this manual # chmod 700 /root/sample/scripts/SAP-ERS-instance/ers_start.sh # chmod 700 /root/sample/scripts/SAP-ERS-instance/ers_stop.sh Modify <ERS_instance_name> of ers_start.sh and ers_stop.sh to the “file name of SAP profile” of ERS.

Example in this manual
NEC_ERS21_sap2

Delete or comment out the following part of `ers_start.sh`.

```
export SID
export SAP_ERS_INO
export EXCLUSIVE_GROUP

if [ ! -e ${DIR_PATH}/exclusive_control.sh ]
then
    ${CLPLOGCMD} -m "${DIR_PATH}/exclusive_control.sh does not exist." -l warn
    exit 0
fi

echo "exclusive_control.sh start"
${DIR_PATH}/exclusive_control.sh start
if [ $? -ne 0 ]
then
    ${CLPLOGCMD} "exclusive_control.sh failed." -l err
    # Exit 0 because sapcontrol command succeeded.
fi
```

Delete or comment out the following part of `ers_stop.sh`.

```
export SID
export SAP_ERS_INO
export EXCLUSIVE_GROUP

if [ ! -e ${DIR_PATH}/exclusive_control.sh ]
then
    ${CLPLOGCMD} -m "${DIR_PATH}/exclusive_control.sh does not exist." -l warn
    exit 0
fi

echo "exclusive_control.sh stop"
${DIR_PATH}/exclusive_control.sh stop
if [ $? -ne 0 ]
then
    ${CLPLOGCMD} "exclusive_control.sh failed." -l err
    # Exit 0 because sapcontrol command succeeded.
fi
```

Open the **Properties** window of EXEC resource and select the **Details** tab.

Click **User Application** in the **Details** tab.

Enter the absolute path of `ers_start.sh` in **Start**.

Enter the absolute path of `ers_stop.sh` in **Stop**.

Example in this manual

Start path : `/root/sample/scripts/SAP-ERS-instance/ers_start.sh`
Stop path : `/root/sample/scripts/SAP-ERS-instance/ers_stop.sh`

3.2. Custom monitor

Use the following bundled scripts as custom monitor resources.

Bundled scripts are listed below.

File name	Use
as_instance_genw.sh	For monitoring the PAS/AAS instance
ascs_enq_genw.sh	For monitoring ASCS enqueue server
ascs_msg_genw.sh	For monitoring ASCS message server
check_monitor_status.sh	Script to check whether access to files in /sapmnt/<SID> is available before each custom monitor starts monitoring
da_instance_genw.sh	For monitoring the DA instance
ers_instance_genw.sh	For monitoring the ERS instance
ers_mon_preaction.sh	Recovery script for monitoring the ERS instance
ers_mon_preaction_wrapper.sh	Recovery script for monitoring the ERS instance
service_genw.sh	For monitoring instance service
hostexec_genw.sh	For monitoring Saphostexec

Note(for EXPRESSCLUSTER X 3.3):

If the “as_instance_genw.sh”, “da_instance_genw.sh”, “ers_instance_genw.sh” and “check_monitor_status.sh.sh” are not bundled on the media, you can download them from the support portal (Content ID: 9510100151).

In the same way as in chapter 3.1, modify SAPUSER, SID (SAP System ID), DASID (Diagnostics agent SAP System ID) and INO (Instance Number) used in the bundled scripts according to the values used during the installation of SAP NW.

3.2.1. Usage of the scripts

The structure of the table is as follows.

Custom monitor name
Description

An example of setting: modifying contents included in <>.

genw-ASCS-instance-ENQ
Copy the contents of “ascs_enq_genw.sh” to genw.sh. Modify <instance name> to the “file name of SAP profile” of ASCS. Example in this manual NEC_ASCS10_ascssv Modify <DISKW> of genw.sh to the name of the disk monitor added the SAP NW cluster. Example in this manual diskw-NFS Modify <directory_path_of_check_monitor_status.sh> of genw.sh to the absolute path of the directory where check_monitor_status.sh is placed.

Example in this manual /root/sample/genw For details of <code>check_monitor_status.sh</code>, refer to “3.2.3 Usage of <code>check_monitor_status.sh</code>.”
genw-ASCS-instance-MSG Copy the contents of “<code>ascs_msg_genw.sh</code>” to <code>genw.sh</code>. Modify <code><instance name></code> to the “file name of SAP profile” of ASCS. Example in this manual NEC_ASCS10_ascssv Modify <code><DISKW></code> of <code>genw.sh</code> to the name of the disk monitor added the SAP NW cluster. Example in this manual diskw-NFS Modify <code><directory_path_of_check_monitor_status.sh></code> of <code>genw.sh</code> to the absolute path of the directory where <code>check_monitor_status.sh</code> is placed. Example in this manual /root/sample/genw For details of <code>check_monitor_status.sh</code>, refer to “3.2.3 Usage of <code>check_monitor_status.sh</code>.”
genw-ERS1-instance genw-ERS2-instance Copy the contents of “<code>ers_instance_genw.sh</code>” to <code>genw.sh</code>. Modify <code><instance name></code> to the “file name of SAP profile” which corresponds to each instance. Example in this manual NEC_ERS20_sap1 NEC_ERS21_sap2 Modify <code><DISKW></code> of <code>genw.sh</code> to the name of the disk monitor added the SAP NW cluster. Example in this manual diskw-NFS Modify <code><directory_path_of_check_monitor_status.sh></code> of <code>genw.sh</code> to the absolute path of the directory where <code>check_monitor_status.sh</code> is placed. Example in this manual /root/sample/genw For details of <code>check_monitor_status.sh</code>, refer to “3.2.3 Usage of <code>check_monitor_status.sh</code>.”
genw-PAS-instance genw-AAS-instance Copy the contents of “<code>as_instance_genw.sh</code>” to <code>genw.sh</code>. Modify <code><instance name></code> to the “file name of SAP profile” which corresponds to each instance. Example in this manual NEC_D30_sap1 NEC_D40_sap2 Modify <code><DISKW></code> of <code>genw.sh</code> to the name of the disk monitor added the SAP NW cluster. Example in this manual diskw-NFS Modify <code><directory_path_of_check_monitor_status.sh></code> of <code>genw.sh</code> to the absolute path of the

	directory where <code>check_monitor_status.sh</code> is placed. Example in this manual <code>/root/sample/genw</code> For details of <code>check_monitor_status.sh</code>, refer to “3.2.3 Usage of <code>check_monitor_status.sh</code>.”
	genw-DA1-instance genw-DA2-instance Copy the contents of “<code>da_instance_genw.sh</code>” to <code>genw.sh</code>. Modify <code><instance name></code> to the “file name of SAP profile” which corresponds to each instance. Example in this manual <code>DAA_SMDA97_sap1</code> <code>DAA_SMDA96_sap2</code> Modify <code><DISKW></code> of <code>genw.sh</code> to the name of the disk monitor added the SAP NW cluster. Example in this manual <code>diskw-NFS</code> Modify <code><directory_path_of_check_monitor_status.sh></code> of <code>genw.sh</code> to the absolute path of the directory where <code>check_monitor_status.sh</code> is placed. Example in this manual <code>/root/sample/genw</code> For details of <code>check_monitor_status.sh</code>, refer to “3.2.3 Usage of <code>check_monitor_status.sh</code>.”
	genw-ASCS-service genw-ERS1-service genw-ERS2-service genw-PAS-service genw-AAS-service genw-DA1-service genw-DA2-service Copy the contents of “<code>instance_genw.sh</code>” to <code>genw.sh</code>. Modify <code><instance name></code> to the “file name of SAP profile” which corresponds to each instance. Example in this manual <code>NEC_ASCS10_ascssv</code> <code>NEC_ERS20_sap1</code> <code>NEC_ERS21_sap2</code> <code>NEC_D30_sap1</code> <code>NEC_D40_sap2</code> <code>DAA_SMDA97_sap1</code> <code>DAA_SMDA96_sap2</code> Modify <code><DISKW></code> of <code>genw.sh</code> to the name of the disk monitor added the SAP NW cluster. Example in this manual <code>diskw-NFS</code> Modify <code><directory_path_of_check_monitor_status.sh></code> of <code>genw.sh</code> to the absolute path of the directory where <code>check_monitor_status.sh</code> is placed. Example in this manual <code>/root/sample/genw</code> For details of <code>check_monitor_status.sh</code>, refer to “3.2.3 Usage of <code>check_monitor_status.sh</code>.”
	genw-hostexec1

genw-hostexec2	
	Copy the contents of “hostexec_genw.sh” to genw.sh and modify the following part. For SAPHOSTEXEC, use the default path of SAP NW.

3.2.2. Usage of the recovery scripts (for pattern 1)

The structure of the table is as follows.

Custom monitor name
Description

It is necessary for the pattern 1 configuration to configure the following recovery script. Since the pattern 2 configuration does not require a recovery script, go to the next section.

genw-ERS1-instance
Copy <code>ers_mon_preaction.sh</code> and <code>ers_mon_preaction_wrapper.sh</code> in any directory. Example in this manual <code>/root/sample/genw</code> Assign the execute permission to <code>ers_mon_preaction.sh</code> and <code>ers_mon_preaction_wrapper.sh</code>. Example in this manual # <code>chmod 700 /root/sample/genw/ers_mon_preaction.sh</code> # <code>chmod 700 /root/sample/genw/ers_mon_preaction_wrapper.sh</code> Modify <code><directory_path_of_ers_mon_preaction.sh></code> of <code>ers_mon_preaction_wrapper.sh</code> to the absolute path of the directory where <code>ers_mon_preaction.sh</code> is placed. Example in this manual <code>/root/sample/genw</code> Modify <code><SID></code> of <code>ers_mon_preaction_wrapper.sh</code> to the SID set in <i>System Configuration Guide</i>-“Section 6.2”. Example in this manual NEC Modify the “SAP_ASCS_INO” of <code>ers_mon_preaction_wrapper.sh</code> to the ASCS instance INO set in <i>System Configuration Guide</i> - “Section 6.2” Example in this manual 10 Modify the “SAP_ERS_INO” of <code>ers_mon_preaction_wrapper.sh</code> to the sequence of ERS1 instance INO and ERS2 instance INO set in <i>System Configuration Guide</i> - “Section 6.2.” and - “Section 6.4.” Use a space for delimiter. Example in this manual 20 21 Open the Properties window of custom monitoring resource and select the Recovery Action tab. Click Script Settings to display the Edit Script dialog box. Click User Application in the Edit Script dialog box. Enter the absolute path of <code>ers_mon_preaction_wrapper.sh</code> in File. Example in this manual <code>/root/sample/genw/ers_mon_preaction_wrapper.sh</code>
genw-ERS2-instance

Copy `ers_mon_preaction.sh` and `ers_mon_preaction_wrapper.sh` in any directory.

Example in this manual
`/root/sample/genw`

Assign the execute permission to `ers_mon_preaction.sh` and `ers_mon_preaction_wrapper.sh`.

Example in this manual

```
# chmod 700 /root/sample/genw/ers_mon_preaction.sh
# chmod 700 /root/sample/genw/ers_mon_preaction_wrapper.sh
```

Modify `<directory_path_of_ers_mon_preaction.sh>` of `ers_mon_preaction_wrapper.sh` to the absolute path of the directory where `ers_mon_preaction.sh` is placed.

Example in this manual
`/root/sample/genw`

Modify `<SID>` of `ers_mon_preaction_wrapper.sh` to the SID set in *System Configuration Guide* - “Section 6.2”.

Example in this manual
`NEC`

Modify the “`SAP_ASCS_INO`” of `ers_mon_preaction_wrapper.sh` to the ASCS instance INO set in *System Configuration Guide* - “Section 6.2”

Example in this manual
`10`

Modify the “`SAP_ERS_INO`” of `ers_mon_preaction_wrapper.sh` to the sequence of ERS1 instance INO and ERS2 instance INO set in *System Configuration Guide* - “Section 6.2.” and - “Section 6.4.” Use a space for delimiter.

Example in this manual
`20 21`

Open the **Properties** window of custom monitoring resource and select the **Recovery Action** tab.
Click **Script Settings** to display the **Edit Script** dialog box.
Click **User Application** in the **Edit Script** dialog box.
Enter the absolute path of `ers_mon_preaction_wrapper.sh` in **File**.

Example in this manual
`/root/sample/genw/ers_mon_preaction_wrapper.sh`

3.2.3. Usage of `check_monitor_status.sh`

Copy `check_monitor_status.sh` in any directory.

Example in this manual
`/root/sample/genw`

Assign the execute permission to `check_monitor_status.sh`.

Example in this manual

```
# chmod 700 /root/sample/genw/check_monitor_status.sh
```

Note(for EXPRESSCLUSTER X 3.3):

If the "check_monitor_status.sh.sh" is not bundled on the media, you can download it from the support portal (Content ID: 9510100151).
