Guide to Migrating

from HP Serviceguard for Linux

to EXPRESSCLUSTER X for Linux

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First Edition

Revision History

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Who Should Use This Guide

The *Guide to Migrating from HP Serviceguard for Linux to EXPRESSCLUSTER X for Linux* is intended for system engineers considering migrating from HP Serviceguard for Linux to EXPRESSCLUSTER X for Linux, as well as for those who will manage maintenance and operation of the system after migration.

Terms Used in This Guide

Term	Meaning
Package	A *package* is a group of applications, services (individual Linux processes), and the resources, they depend on for a cluster set up using Serviceguard.
Group	A *group* is a collection of resources used to execute a single application in a cluster set up using EXPRESSCLUSTER X, and is also the failover unit.
HB	This is an abbreviation for *heartbeat*.

Table of Contents

Chapter 1 Introduction

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This chapter provides an overview and indicates the products covered by this guide.

1.1 Overview of This Guide

This guide describes the requirements for migrating from a Linux cluster system that uses HP Serviceguard for Linux (called *Serviceguard* below) to one that uses EXPRESSCLUSTER X for Linux (called *EXPRESSCLUSTER X* below).
The guide depicts the actual flow of migration work to describe the procedures for checking the operating environment, migrating parameters, and performing an inspection before starting operations.

Note that the following documents will be necessary while reading this guide, so make sure those are available.

- HP Serviceguard for Linux Version A.11.18 Release Notes
- HP Serviceguard for Linux Version A.11.19 Release Notes
- Managing HP Serviceguard for Linux
- EXPRESSCLUSTER X 2.1 for Linux Installation & Configuration Guide

In addition, for any queries regarding migrating to EXPRESSCLUSTER X, mail on below specified address.

Outside Japan: info@expresscluster.jp.nec.com

1.2 Products Covered by This Guide

The descriptions in this guide apply to the products below.

OS	Serviceguard	EXPRESSCLUSTER X for Linux
Red Hat Enterprise Linux AS/ES 4 (update 5 or later)	A.11.18	2.1
Red Hat Enterprise Linux 5.1 to 5.4	A.11.18, A.11.19	
Novell SUSE Linux Enterprise Server 10	A.11.18, A.11.19	

Chapter 2 Migration Procedure

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This chapter describes the items to be checked before the migration performing, as well as the migration work itself.

2.1 Migration Work Points

1. Parameter mapping

For the mapping of Serviceguard and EXPRESSCLUSTER X parameters, some parameters can be easily mapped, but rest of the parameters must be checked/verified in advance.

2. Packages and groups

As Serviceguard and EXPRESSCLUSTER X work differently, it is necessary to consider the resource startup order. For details, see *2.3.6 Notes*.

2.2 Migration Work Flow

The migration work flow is shown below.

| Step	Work Description	Sections to See in this Document
1	Checking parameters	2.3.3 Items common to Serviceguard and EXPRESSCLUSTER X
		2.3.4 Items that exist only in EXPRESSCLUSTER X
		2.3.5 Items that exist only in Serviceguard
2	Backing up the Serviceguard configuration file	2.4.1 Backing up the configuration file
3	Uninstalling Serviceguard	2.4.2 Uninstalling Serviceguard
4	Installing EXPRESSCLUSTER X	2.4.3 Installing EXPRESSCLUSTER X
5	Setting up EXPRESSCLUSTER X	2.4.4 Setting up EXPRESSCLUSTER X
6	Inspection work	Chapter 3 Inspection Work Before Starting Operations

2.3 Items to Check Before Migration

2.3.1 EXPRESSCLUSTER X software environment

EXPRESSCLUSTER X for Linux is made up of the three software products below.

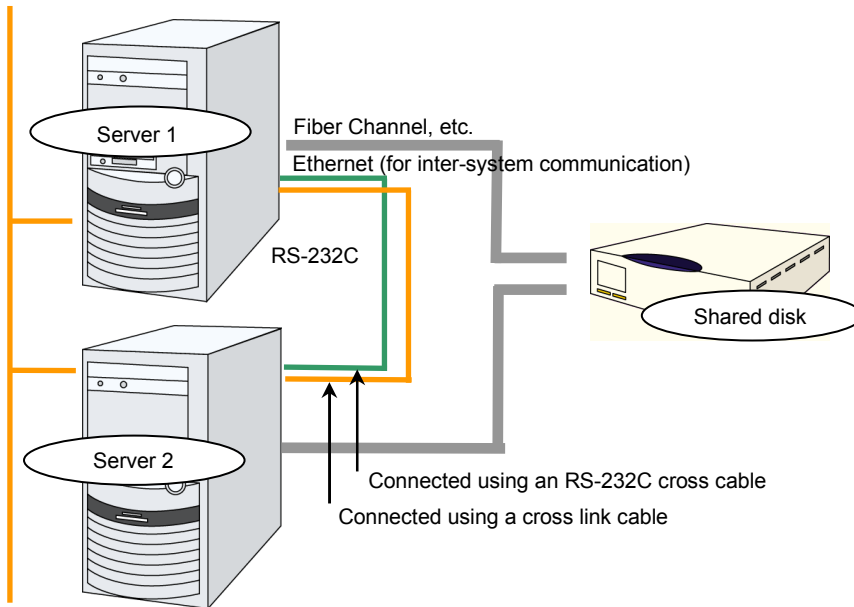| Name	Function
EXPRESSCLUSTER Server	This is installed and used on the server side and is the main cluster software module.
EXPRESSCLUSTER WebManager	This is a management tool used to manage the EXPRESSCLUSTER operation (and is called *WebManager* below).
EXPRESSCLUSTER Builder	This tool is used to create the EXPRESSCLUSTER configuration information (and is called *Builder* below).
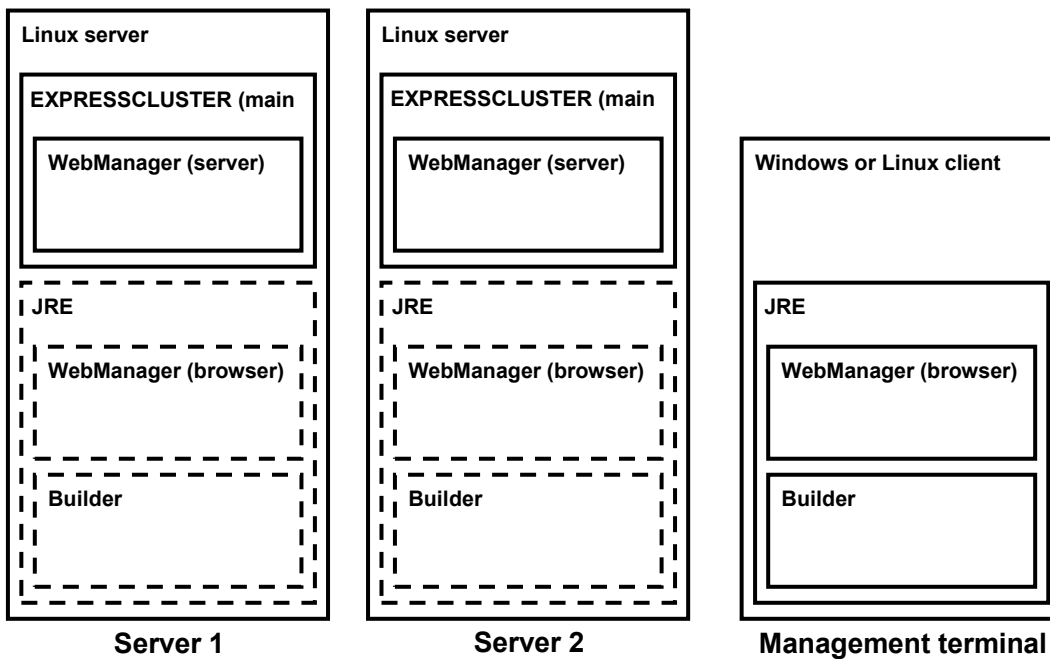
As Builder and WebManager are Java applets that run on a Java VM, they can be run in either Windows or Linux if a JRE (Java Runtime Environment) is installed on the computer.

Note A JRE (1.5.0_06 or later) is required.

2.3.2 Hardware environment

This document describes a cluster configuration that uses a shared disk.

Fiber Channel, etc.

Ethernet (for inter-system communication)

RS-232C

Server 1

Server 2

Shared disk

Connected using an RS-232C cross cable

Connected using a cross link cable

Recommendations

✓ It is recommended to prepare both an application LAN (a public LAN) and an EXPRESSCLUSTER X interconnect-dedicated LAN (an interconnect LAN).

✓ For a two-node configuration, it is recommended to connect the COM ports (RS-232C) by using a cross cable.

2.3.3 Items common to Serviceguard and EXPRESSCLUSTER X

This section describes the parameters in Serviceguard configuration file that can be directly migrated as Builder settings while creating the cluster configuration information in builder.

Serviceguard Parameter Name	Builder Setting
Cluster Configuration File	
CLUSTER_NAME	Cluster Generation Wizard initial window→[Name] **Note: If CLUSTER_NAME is 32 characters or more, change it so that it is 31 characters or less.**
NODE_NAME	Cluster Generation Wizard→[Server Definition] dialog box→[Name]
HEARTBEAT_IP	Server Properties→[Interconnect LAN I/F] tab→[IP Address] **Note: Both IPv4 and IPv6 can be specified. However, link-local addresses cannot be specified for IPv6.**
STATIONARY_IP	Server Properties→[Public LAN I/F] tab→[IP Address] **Note: Both IPv4 and IPv6 can be specified. However, link-local addresses cannot be specified for IPv6.**
MEMBER_TIMEOUT[*3] NODE_TIMEOUT[*4]	In the Cluster Properties, specify **(MEMBER_TIMEOUT ÷ 1,000,000) or (NODE_TIMEOUT) (rounded to the nearest whole number)** for [Timeout], which is on the [Timeout] tab under [Heartbeat]. **Note: As MEMBER_TIMEOUT and NODE_TIMEOUT are in microseconds, they must be converted to seconds.**
AUTO_START_TIMEOUT	In the Cluster Properties, specify **(AUTO_START_TIMEOUT ÷ 1,000,000) (rounded to the nearest whole number)** for [Server Sync Wait Time], which is on the [Timeout] tab. **Note: As AUTO_START_TIMEOUT is in microseconds, it must be converted to seconds.**

SUBNET[*3] POLLING_TARGET[*3] IP_MONITOR[*3]	If IP_MONITOR is set to ON, in the IP Monitor Resource Properties, specify the **POLLING_TARGET value** for [IP Address], which is found by selecting the [Parameter] tab and then the [Common] tab. **Note: The SUBNET parameter is used to indicate the subnet that includes the IP address subject to IP monitoring, and it does not have to be migrated.**
NETWORK_POLLING_INTERVAL	When performing NIC monitoring, in the NIC Link Up/Down Monitor Resource Properties, specify **(NETWORK_POLLING_INTERVAL ÷ 1,000,000) (rounded to the nearest whole number)** for [Interval], which is on the [Monitor] tab. **Note: As NETWORK_POLLING_INTERVAL is in microseconds, it must be converted to seconds.**
Package Configuration File/Package Control Script	
package_name	[Group Definition] dialog box→[Name] **Note: If package_name is 32 characters or more, change the group name so that it is 31 characters or less.**
package_type	Regardless of the package_type value, specify **[Failover]** for [Type], which is in the [Group Definition] dialog box. **Note: If package_type is multi_node, the same failover group must be created for each cluster node.**
package_description	[Group Definition] dialog box→[Comment]
node_name	Specify the **order specified for node_name** for [Order], which is in the [Group Definition] dialog box under [Servers that can run the Group].
auto_run	Specify one of the following values depending on the auto_run value, which is specified on the [Attribute] tab for [Startup Attribute] in the Group Properties: • **For yes: [Auto Startup]** • **For no: [Manual Startup]**

`node_fail_fast_enabled`	Specify one of the values below depending on the `node_fail_fast_enabled` values for the following two items in the Group Resource Properties on the [Settings] tab: • [Recovery Operation at Activation Failure Detection]→[Final Action] • [Recovery Operation at Deactivation Failure Detection]→[Final Action] • **For `yes`: [Stop the cluster daemon and reboot OS]** • **For `no`: [No operation (deactivate the next resource)]**
`failover_policy`	Specify the following two settings: • In the Group Properties, specify [Auto Failover] for [Failover Attribute], which is under [Attribute]. • Specify one of the following values depending on the `failover_policy` value, which is specified on the [Attribute] tab for [Failover Exclusive Attribute] in the Group Properties: • **For `configured_node`: [Off]** • **For `min_package_node`: [Normal exclusion]**
`failback_policy`	Specify one of the following values depending on the `failback_policy` value, which is specified on the [Attribute] tab for [Failback Attribute] in the Group Properties: • **For `manual`: [Manual Failback]** • **For `automatic`: [Auto Failback]**
`ip_address`[*1] `IP`[2]	Floating IP Resource Properties→[Details] tab→ [Common] tab→[IP Address]
`service_name`	Specify the same value for the following two items: • [Resource Definition] dialog box→[Name], which is used when setting up an EXEC resource • PID Monitor Resource Properties→[Monitor] tab →[Target Resource]
`service_cmd`	EXEC Resource Properties→[Details] tab→[Scripts]→ [Start Script]

`service_restart`	PID Monitor Resource Properties→[Monitor] tab→ [Retry Count]
`service_fail_fast_enabled`	Specify one of the following values depending on the `service_fail_fast_enabled` value, which is specified on the [Error Detection] tab for [Final Action] in the PID Monitor Resource Properties. • **For `yes`: [Stop the cluster daemon and reboot OS]** • **For `no`: [Stop group]**
`service_halt_timeout`	PID Monitor Resource Properties→[Monitor] tab→ [Timeout]
`fs_mount_retry_count`	Disk Resource Properties→[Details] tab→[Common] tab →[Tuning]→[Mount] tab→[Retry Count]
`fs_umount_retry_count`[*1] `FS_UMOUNT_COUNT`[*2]	Disk Resource Properties→[Details] tab→[Common] tab →[Tuning]→[Unmount] tab→[Retry Count]
`fs_name`[*1] `LV`[2]	In the Disk Resource Properties, specify the actual device that makes up the LVM volume for [Device name], which is found by selecting the [Details] tab and then the [Common] tab. **Note: Before mounting a disk resource, it is necessary to register the script that performs VG activation as an EXEC resource.**
`fs_directory`[*1] `FS`[2]	Disk Resource Properties→[Details] tab→[Common] tab →[Mount point]
`fs_type`	Disk Resource Properties→[Details] tab→[Common] tab →[File system]
`fs_mount_opt`	Disk Resource Properties→[Details] tab→[Common] tab →[Tuning]→[Mount] tab→[Mount Option]
`fs_fsck_opt`	Disk Resource Properties→[Details] tab→[Common] tab →[Tuning]→[fsck] tab→[fsck Option]
`external_pre_script`	EXEC Resource Properties→[Details] tab→[Scripts]
`external_script`	EXEC Resource Properties→[Details] tab→[Scripts]

*1: Parameter name for the modular package

*2: Parameter name for the conventional package

*3: Parameter for only Serviceguard 11.19

*4: Parameter for only Serviceguard 11.18

2.3.4 Items that exist only in EXPRESSCLUSTER X

This section describes the new settings that are required when setting up EXPRESSCLUSTER X.

EXPRESSCLUSTER X Parameter Name	Setting Policy
Cluster Configuration File	
Device name for the disk HB	For EXPRESSCLUSTER X, one partition (approximately 10 MB) of the shared disk is used as the HB path. The partition device must be specified for this. It is strongly recommended to specify this setting to protect the disk.
Device name for the COM HB	If using the COM HB for EXPRESSCLUSTER X, the COM port device name is required.
Shutdown monitoring timeout	In the Cluster Properties, specify [Set Timeout] for [Timeout], which under [Shutdown Monitor] on the [Monitor] tab, and specify **a longer time than the OS shutdown time**. (The default value is 90 seconds.)

2.3.5 Items that exist only in Serviceguard

Parameters that cannot be directly migrated while migrating to EXPRESSCLUSTER X from HP Serviceguard.

Serviceguard Parameter Name	Setting Policy
Cluster Configuration File	
HOSTNAME_ADDRESS_FAMILY[3]	As EXPRESSCLUSTER X supports both IPv4 and IPv6, migrating this parameter is not required.

QS_HOST QS_ADDR[3] QS_POLLING_INTERVAL QS_TIMEOUT_EXTENSION	If using a network partition resolution resource, specify the following setting. In the Builder Server Properties, specify the following addresses for [IP Address] on the [Ping I/F] tab: • **The server IP address specified for QS_HOST** • **The IP address specified for QS_ADDR**
NETWORK_INTERFACE	If performing NIC monitoring, specify the NETWORK_INTERFACE value for [Monitor Target], which is in the NIC Link Up/Down Monitor Resource Properties on the [Parameter] tab.
CAPACITY_NAME[3] CAPACITY_VALUE[3]	If it is necessary to control the failover group startup node, set [Failover Exclusive Attribute], which is in the Group Properties on the [Attribute] tab. For details about this setting, see the failover_policy parameter.
CLUSTER_LOCK_LUN	If using the disk HB, see *Device name for the disk HB* in *2.3.4 Items that exist only in EXPRESSCLUSTER X*.
WEIGHT_NAME[3] WEIGHT_DEFAULT[3]	If it is necessary to control the failover group startup node, set [Failover Exclusive Attribute], which is in the Group Properties on the [Attribute] tab. For details about this setting, see the failover_policy parameter.
USER_NAME USER_HOST USER_ROLE	If it is necessary to limit connections or operations for a cluster, specify the following items in the Cluster Properties on the [WebManager] tab: • **[Control connection by using password]** • **[Control connection by using client IP address]**

MAX_CONFIUGRED_PACKAGE	As there is no item that specifies the maximum number of groups (and the maximum number of groups that can be processed by EXPRESSCLUSTER X is fixed to 64), migrating this parameter is not required.

Package Configuration File/Package Control Script	
`module_name`[*1] `module_version`[*1]	The parameters that must be migrated are determined according to the parameter value (module name) specified for `module_name`. For details about the parameters for each module, see *Table 6-1 Base Modules* and *Table 6-2 Optional Modules* in *Managing HP Serviceguard for Linux*.

`run_script_timeout`
`halt_script_timeout`
`successor_halt_timeout`
	As there is no parameter for setting up the group startup/stop timeout, these parameters cannot be migrated as it is. Instead, control the group operation by specifying a timeout value in the group resource settings.

`script_log_file`	If the standard output and standard error output are available as user application and script log output destinations, specify the following setting: Builder EXEC Resource Properties→ [Details] tab→[Tuning]→[Maintenance] tab→ [Log Output Path] **Note: Group log data is output to the alert log.**
`log_level`[*1]	The EXEC resource does not have an item for specifying the message output level of the standard output and standard error output of user applications and scripts. Therefore, to adjust the message output level, incorporate the processing into the user application or script.
`priority`	As there are no dependencies between groups, this parameter cannot be migrated as it is. However, as it is possible to specify dependencies between group resources for each group, specify this parameter as necessary.

`dependency_name`
`dependency_condition`
`dependency_location`
	As there is no item for specifying dependencies between groups, these parameters cannot be migrated as it is. However, as it is possible to specify dependencies between group resources for each group, specify these parameters as necessary.

`weight_name`[3] `weight_value`[3]	If it is necessary to control the failover group startup node, set [Failover Exclusive Attribute], which is in the Group Properties on the [Attribute] tab. For details about this setting, refer the `failover_policy` parameter.
`monitored_subnet, ip_subnet`[1] `SUBNET`[2]	If performing subnet monitoring, specify the IP addresses of at least two non-cluster nodes included in the subnet specified by `monitored_subnet`, `ip_subnet`, and `SUBNET` for each IP monitor resource. Note that, when specifying a floating IP resource, it is necessary to specify an IP address included in the subnet specified by `monitored_subnet`, `ip_subnet`, and `SUBNET`.
`monitored_subnet_access`[3], `ip_subnet_node`[3]	If a cluster that extends across multiple subnets linked by a router is set up, it is necessary to specify an IP address included in the subnet specified by `monitored_subnet_access` for the virtual IP resource.
`vgchange_cmd`[1] `VGCHANGE`[2]	If monitoring an LVM logical volume by using a disk monitor resource, use "READ" or "WRITE(File)" as the monitoring type of the disk monitor resource.
`vg`	If monitoring an LVM logical volume by using a disk monitor resource, use "READ" or "WRITE(File)" as the monitoring type of the disk monitor resource.

`concurrent_fsck_operations`	As the `fsck` command is executed at the same time according to the EXPRESSCLUSTER X specifications, migrating this parameter is not required. **However, if simultaneous `fsck` execution is prohibited, specify dependencies between disk resources.**
`concurrent_mount_and_umount_operations`	As simultaneous execution of the `mount`/`umount` command is prohibited by the EXPRESSCLUSTER X specifications, migrating this parameter is not required.
`fs_umount_opt`	As there is no item for specifying the `umount` command option, migrating this parameter is not required.
`pv`[*3]	As the `pv` parameter is used exclusively by the HP partner, migrating this parameter is not required.
`pev_`	Include all the path information necessary when executing a user application or script specified for an EXEC resource in the user application or script.

`user_name`
`user_host`
`user_role`
	If it is necessary to limit connections or operations for a cluster, specify the following items in the Cluster Properties on the [WebManager] tab:
	• **[Control connection by using password]**
	• **[Control connection by using client IP address]**

`PATH`[*2]	Include all the path information necessary when executing a user application or script specified for an EXEC resource in the user application or script.

`RUN_SCRIPT`[2] `HALT_SCRIPT`[2]	Specify the processing performed by the script specified for `RUN_SCRIPT` in the EXEC resource startup script, and specify the processing performed by the script specified for `HALT_SCRIPT` in the EXEC resource completion script.

*1: Parameter name for the modular package

*2: Parameter name for the conventional package

*3: Parameter for only Serviceguard 11.19

*4: Parameter for only Serviceguard 11.18

2.3.6 Notes

1. For EXPRESSCLUSTER X, as the maximum length for cluster and group names is 31 characters, if the values of the `CLUSTER_NAME` and `package_name` parameters are 32 characters or more, set them to values that are 31 characters or less during parameter migration.

2. Because EXPRESSCLUSTER X can only process up to 64 groups, if there are 65 or more Serviceguard packages, reduce the number of groups to 64 groups or less.

3. When migrating `service_cmd`, `external_pre_script`, and `external_script`, define each as a separate EXEC resource.

4. Specify the group resource dependencies such that the activation order is as follows:
   1. EXEC resources (processing executed by `external_pre_script`) (only for a modular package)
   2. Floating IP resources
   3. Disk resources
   4. EXEC resources (processing executed by `external_script`)
   5. EXEC resources (processing executed by `service_cmd`)

5. If monitoring an LVM logical volume by using EXPRESSCLUSTER X, use the READ or WRITE (File) method. In addition, when performing an LVM `import` or `export` operation, use an EXEC resource.

2.4 Installation and Setup

2.4.1 Backing up the configuration file
Back up the Serviceguard configuration file by executing one of the commands below.

- Red Hat Enterprise Linux execution example (when using the default path)

```
# /bin/cp -pr /usr/local/cmcluster/conf /tmp/SGCONF
```

- SUSE LINUX Enterprise Server execution example (when using the default path)

```
# /bin/cp -pr /opt/cmcluster/conf /tmp/SGCONF
```

Note The path using which the Serviceguard configuration file is saved is defined for the
SGCONF parameter in the /etc/cmcluster.conf file (and the default is
/usr/local/cmcluster/conf). If the SFCONF parameter has been changed,
specify the source path to be copied as same value as defined in SFCONF when
executing the cp command.

2.4.2 Uninstalling Serviceguard
For details about the Serviceguard uninstallation procedure, refer *Uninstalling Serviceguard for Linux* in the *HP Serviceguard for Linux Release Notes*.

If .rhosts has been used to specify the root access setting for cluster nodes in a
Serviceguard cluster configuration, delete the .rhosts file after uninstalling Serviceguard.
In addition, if ports used by Serviceguard have been opened due to a setting such as
/etc/services or iptables, close these ports after uninstalling Serviceguard.

2.4.3 Installing EXPRESSCLUSTER X

For details about the EXPRESSCLUSTER X installation procedure, refer *Configuring a cluster system*, *Installing EXPRESSCLUSTER*, and *Registering the license* in the *EXPRESSCLUSTER X 2.1 for Linux Installation & Configuration Guide*.

2.4.4 Setting up EXPRESSCLUSTER X

For details about the EXPRESSCLUSTER X setup procedure, refer *Creating the cluster configuration data* in the *EXPRESSCLUSTER X 2.1 for Linux Installation & Configuration Guide*.

Chapter 3 Inspection Work Before Starting Operations

This chapter describes the evaluation work required before starting EXPRESSCLUSTER X operations. In particular, this involves checking the operation of the configured system.

3.1 Checking the Operation

For details about how to check the EXPRESSCLUSTER X operation, refer *Verifying the operation* in the *EXPRESSCLUSTER X 2.1 for Linux Installation & Configuration Guide*.

Additional Notes

Correspondences Between Important Control Commands

Purpose	HP Serviceguard for Linux	EXPRESSCLUSTER X
Starting a cluster	`cmruncl`	`clpcl -s`
Stopping a cluster	`cmhaltcl`	`clpcl -t`
Starting a package	`cmrunpkg`	`clpgrp -s [`*`group_name`*`]`
Stopping a package	`cmhaltpkg`	`clpgrp -t [`*`group_name`*`]`
Checking the cluster status	`cmviewcl`	`clpstat`

For details about EXPRESSCLUSTER X commands, refer *Chapter 4 EXPRESSCLUSTER command reference* in the *EXPRESSCLUSTER X 2.1 for Linux Reference Guide*.