

ServerView Resource Orchestrator Cloud Edition V3.1.0



NS Option Instruction

Windows/Linux

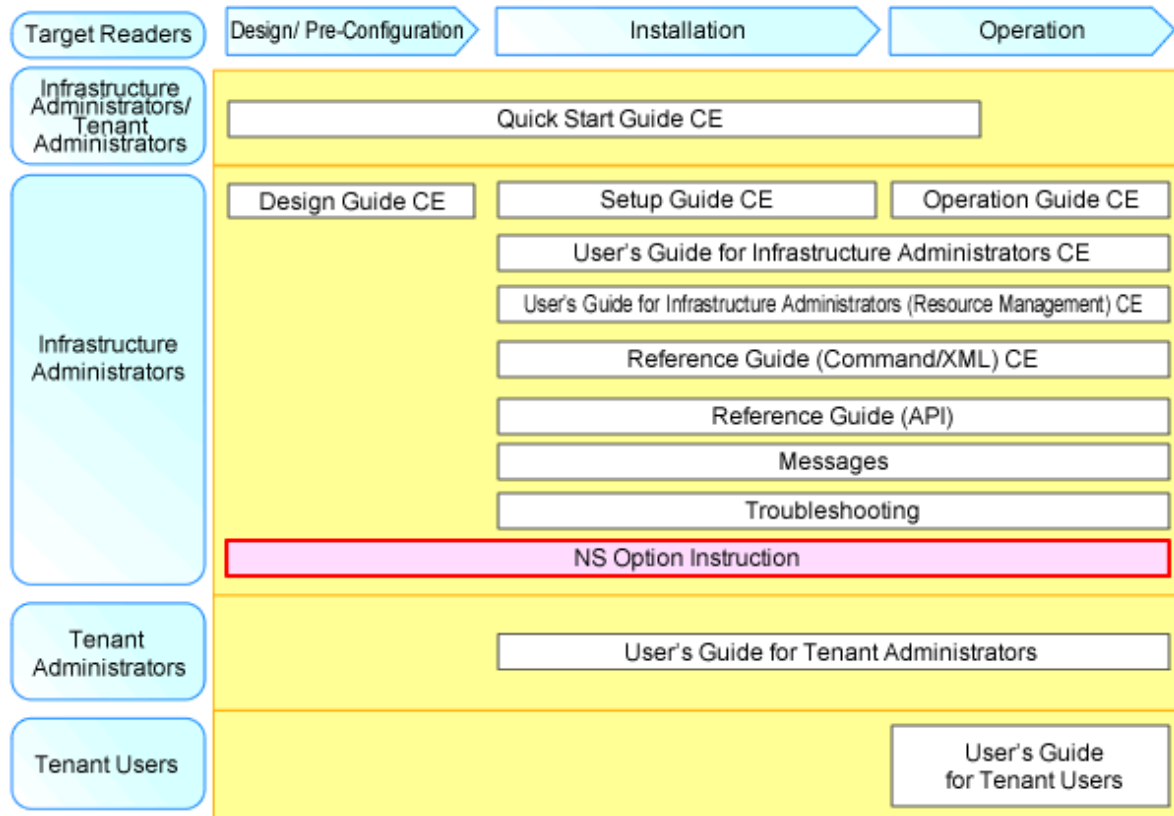
J2X1-7677-01ENZ0(00)
July 2012

Preface

Documentation Road Map

The following manuals are provided with Resource Orchestrator.

Documentation Road Map



For details on related manuals for Resource Orchestrator and how to use them, refer to "Chapter 1 Documentation Road Map" in the "Quick Start Guide CE".

Purpose

This manual explains the overview, setup, and operation of NS Option (*1), an optional product of ServerView Resource Orchestrator Cloud Edition (hereinafter ROR CE).

*1: NS is the abbreviation of Network Service.

This manual focuses on explaining how to set up NS Option and make it available for use on systems where ServerView Resource Orchestrator Cloud Edition will be installed. Therefore, for content that is explained in ServerView Resource Orchestrator Cloud Edition manuals, only items are listed in this manual.

Target Readers

This manual is written for system administrators who will use Resource Orchestrator to operate the infrastructure in private cloud or data center environments.

When using NS Option, it is assumed that readers have basic knowledge about ServerView Resource Orchestrator Cloud Edition.

Organization

This manual is composed as follows:

Title	Description
Chapter 1 Overview	Provides an overview of NS Option.
Chapter 2 Design and Preparations	Explains how to design and prepare for NS Option installation.
Chapter 3 Setup	Explains the setup necessary for using NS Option.
Chapter 4 Operation	Explains how to operate NS Option.
Appendix A Commands	Provides an overview of the commands available in NS Option. Please refer to it when necessary.
Appendix B Port List	Explains the ports used by Resource Orchestrator.

Notational Conventions

The notation in this manual conforms to the following conventions.

- When using NS Option and the operation differs depending on the basic software (OS) on which the manager of NS Option operates, it is indicated as follows:

[Windows]	Sections related to Windows
[Linux]	Sections related to Linux

- Unless specified otherwise, the blade servers mentioned in this manual refer to PRIMERGY BX servers.
- References and character strings or values requiring emphasis are indicated using double quotes (").
- Window names, dialog names, menu names, and tab names are shown enclosed by brackets ([]).
- Button names are shown enclosed by angle brackets (< >) or square brackets ([]).
- The order of selecting menus is indicated using []-[].
- Text to be entered by the user is indicated using bold text.
- Variables are indicated using italic text and underscores.
- Character strings or values requiring emphasis are indicated using double quotes (").
- The ellipses ("...") in menu names, indicating settings and operation window startup, are not shown.
- The ">" used in Windows is included in usage examples. When using Linux, read ">" as meaning "#".

Abbreviations

The following abbreviations are used in this manual:

Abbreviation	Products
Windows	Microsoft(R) Windows Server(R) 2008 Standard Microsoft(R) Windows Server(R) 2008 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Standard Microsoft(R) Windows Server(R) 2008 R2 Enterprise Microsoft(R) Windows Server(R) 2008 R2 Datacenter Microsoft(R) Windows Server(R) 2003 R2, Standard Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise Edition Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition Windows(R) 7 Professional Windows(R) 7 Ultimate Windows Vista(R) Business Windows Vista(R) Enterprise

Abbreviation	Products
	Windows Vista(R) Ultimate Microsoft(R) Windows(R) XP Professional operating system
Linux	Red Hat(R) Enterprise Linux(R) 5 (for x86) Red Hat(R) Enterprise Linux(R) 5 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.1 (for x86) Red Hat(R) Enterprise Linux(R) 5.1 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.2 (for x86) Red Hat(R) Enterprise Linux(R) 5.2 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.3 (for x86) Red Hat(R) Enterprise Linux(R) 5.3 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.4 (for x86) Red Hat(R) Enterprise Linux(R) 5.4 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.5 (for x86) Red Hat(R) Enterprise Linux(R) 5.5 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.6 (for x86) Red Hat(R) Enterprise Linux(R) 5.6 (for Intel64) Red Hat(R) Enterprise Linux(R) 5.7 (for x86) Red Hat(R) Enterprise Linux(R) 5.7 (for Intel64) Red Hat(R) Enterprise Linux(R) 6.2 (for x86) Red Hat(R) Enterprise Linux(R) 6.2 (for Intel64) SUSE(R) Linux Enterprise Server 11 for x86 SUSE(R) Linux Enterprise Server 11 for EM64T
ROR CE	ServerView Resource Orchestrator Cloud Edition

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Month/Year Issued, Edition	Manual Code
June 2012, First Edition	J2X1-7677-01ENZ0(00)

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Chapter 1 Overview

This chapter provides an overview of NS Option.

NS Option is a virtual appliance product which separates a multi-layer system into individual layers to ensure network security. Hereinafter this network security function is referred to as "NS Appliance".

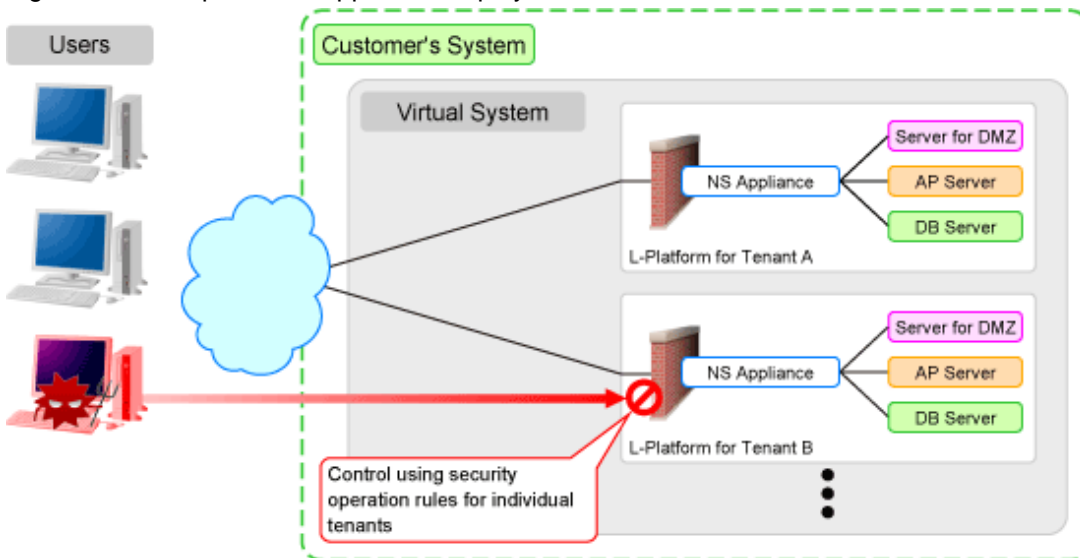
By using NS Appliance, security of each network segment on an L-Platform can be ensured easily and flexibly. In order to use NS Appliance, an NS Option license is required. Up to 10 NS Appliances can be created on a single physical server.

Figure 1.1 Image of Deployment on a Server



NS Appliances can be deployment targets as network devices in the same way as other firewall units, when selecting an L-Platform template which includes firewalls. When NS Appliance is deployed on an L-Platform, it controls communications with the server according to the operation rules configured for NS Appliance.

Figure 1.2 Example of NS Appliance Deployment Structure



Information

- A physical L-Server on which NS Appliance operates can be created using a cloning image for NS Option. The resulting L-Server will be the dedicated L-Server for NS Option, which includes NS Appliance and the program that controls NS Appliance.
- NS Appliance operates as a VM on a physical L-Server deployed using a cloning image for NS Option on a server. It can be registered with a manager and managed as a network device.
The same number of NS Appliances as NS Option licenses registered with the manager can be used.

1.1 Merits of Installation

Installing NS Option enables dynamic and flexible deployment of firewalls that were deployed in a static form, delivering the following merits:

Merit 1: Ensuring Network Security When Adding Tenants is Easy

The following work, which was necessary when adding tenants without NS Option, will be no longer necessary:

- Designing a network associated with installing hardware appliances
- Pre-setup networking activities such as cabling

Merit 2: Simultaneous Operation of Multiple Tenants is Easy

As it is possible to deploy an independent NS Appliance on each tenant, network security policies and logs can be separated on a tenant-by-tenant basis, simplifying operation.

Conventionally, when sharing a single firewall unit between multiple tenants for management, the administrator in charge of the entire data center had to adjust and configure the settings while taking requests from individual tenants into consideration, because requirements for policy changes and log managements differ for each tenant.

Installing NS Option enables deployment of an independent NS Appliance on each tenant, making the following operations possible:

- Each tenant administrator can change the policy of a firewall unit without affecting other tenants.
- As the log can be separated on a tenant-by-tenant basis, management is simplified.

1.2 Function Overview

This section explains the security functions provided by NS Appliance.

NS Appliance provides the following security functions:

- [Access Control Function](#)
- [Network Address Translation Function](#)
- [Anomaly-based IPS Function](#)

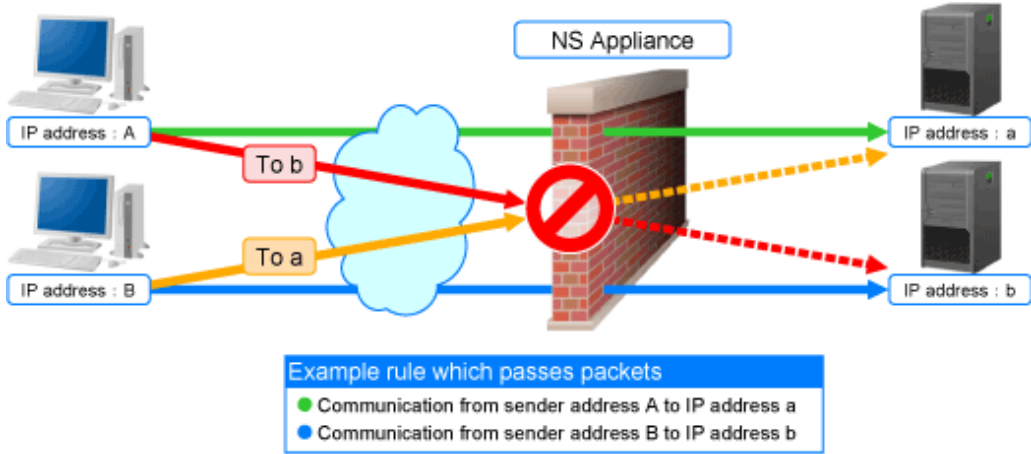
1.2.1 Access Control Function

The access control function controls traffic of communication packets by referring to the information of communication packets which attempt to pass through NS Appliance.

The conditions to allow communication packets to pass through can be freely determined by defining a rule on the NS Appliance.

By using this function, it is possible to allow only communication packets from authorized service users or specific communication packets. In this way it is possible to control which packets are allowed, according to the system requirements.

Figure 1.3 Access Control Function Overview



The following information of communication packets can be used for defining rules on NS Appliance:

Table 1.1 Information of Communication Packets that can be Defined as Conditions to Allow or Deny Communications

Definable Information		Remarks
IP address	IP address	Destination or sender IP address
	Destination IP address	-
	Sender IP address	-
Port number	Port number	Destination or sender port number
	Destination port number	-
	Sender port number	-
Interface	Incoming interface	-
ICMP session information	addr.mask	Address Mask Request/Address Mask Reply
	echo / ping	Echo/Echo Reply
	info	Information Request/Information Reply
	timestamp	Timestamp/Timestamp Reply
	any	All ICMP session information is the target.
IP protocol number	1(icmp)	Internet Control Message Protocol for IPv4
	2(igmp)	Internet Group Management Protocol
	6(tcp)	Transmission Control Protocol
	8(egp)	Exterior Gateway Protocol
	9(igp)	Interior Gateway Protocol
	17(udp)	User Datagram Protocol
	45(idrp)	Inter-Domain Routing Protocol
	46(rsvp)	Resource ReSerVation Protocol
	47(gre)	General Encapsulation Security Payload
	50(esp)	IP Encapsulating Security Payload (IPSec)
	50(ipsec)	Security Architecture for the Internet Protocol
	51(ah)	IP Authentication Header (IPSec)
	58(icmpv6)	Internet Control Message Protocol for IPv6

Definable Information		Remarks
	89(ospf)	Open Shortest Path First Protocol
	103(pim)	Protocol Independent Multicast
	108(ipcomp)	IP Payload Compression Protocol
	115(l2tp)	Layer Two Tunneling Protocol
	132(sctp)	Stream Control Transmission Protocol
	134(rsvp.e2e)	Aggregation of RSVP End-to-End
any		All communication packets are targets.

1.2.2 Network Address Translation Function

The network address translation function translates sender and destination information of communication packets that pass through the NS Appliance.

This function enables communication with external network while hiding information internal to the data center. As a result, it is possible to strengthen network security.

The network address translation function provides the following translation functions:

- Translation of sender IP addresses

Translates the sender IP address in the IP header of an outgoing packet which passes through the NS Appliance, according to a rule.

- Translation of sender IP addresses and sender port numbers

Translates the sender IP address in the IP header and the sender port number in the TCP or UDP header of an outgoing packet which passes through the NS Appliance, according to a rule.

- Translation of destination IP addresses

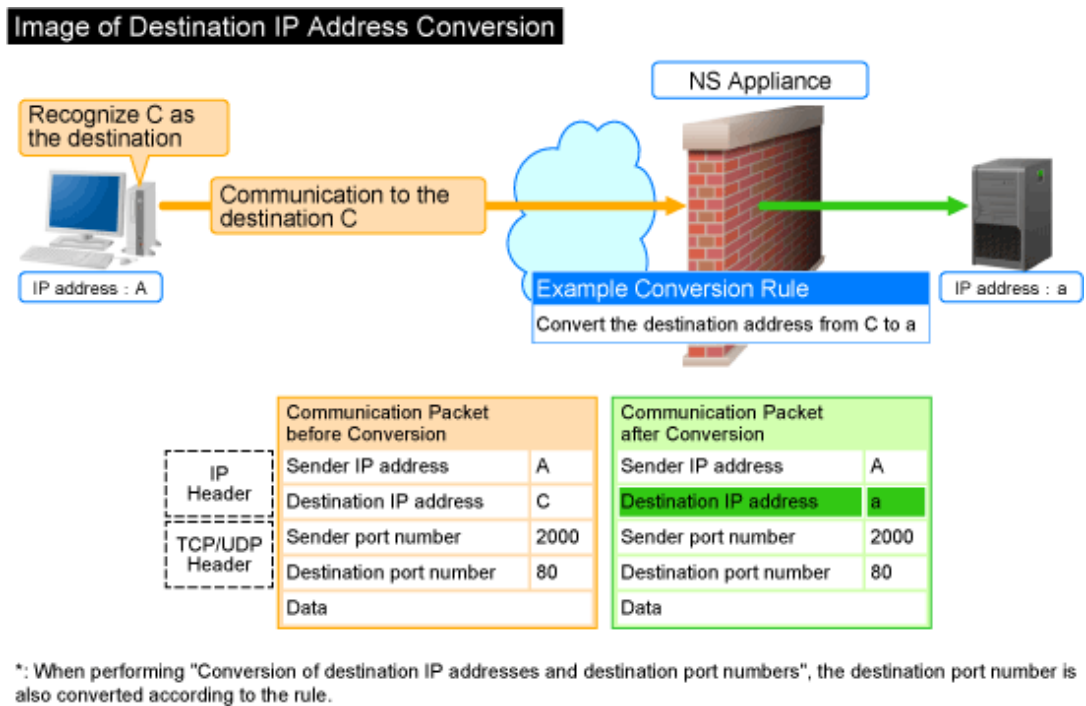
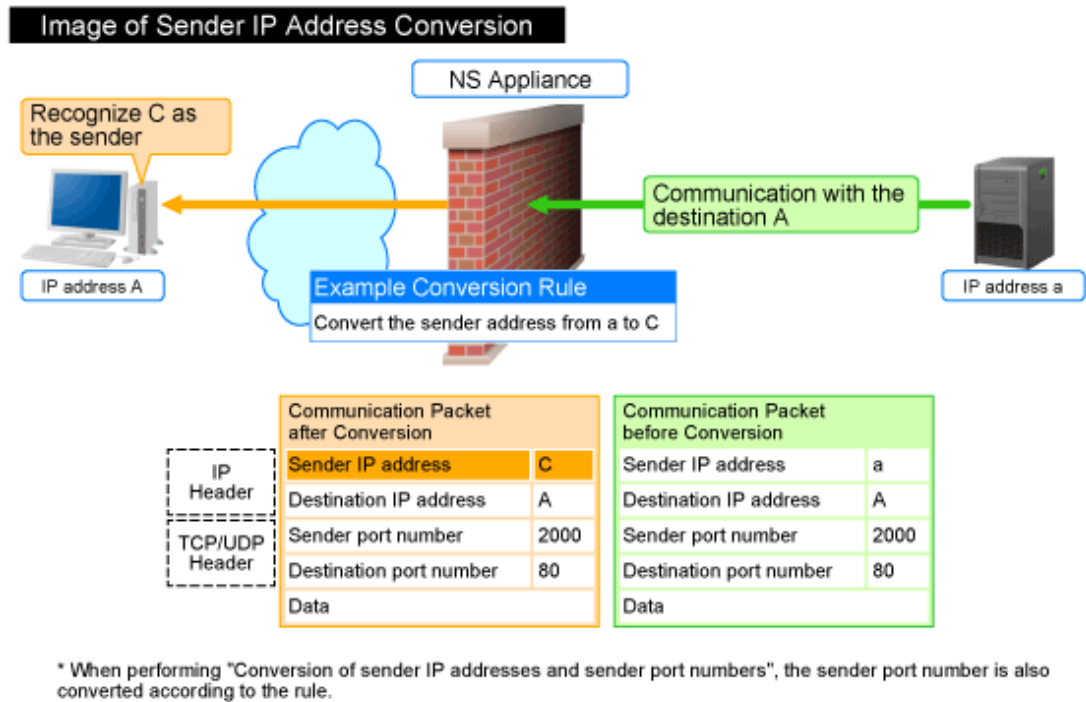
Translates the destination IP address in the IP header of an incoming packet which passes through the NS Appliance, according to a rule.

- Translation of destination IP addresses and destination port numbers

Translates the destination IP address in the IP header and the destination port number in the TCP or UDP header of an incoming packet which passes through the NS Appliance, according to a rule.

How communication packets that pass through the NS Appliance are translated can be freely determined by defining a rule on the NS Appliance.

Figure 1.4 Network Address Translation Function Overview



1.2.3 Anomaly-based IPS Function

Malicious users perform attacks (hereinafter "DoS attacks") to interrupt services provided by the target server. The anomaly-based IPS function defends a server against DoS attacks.

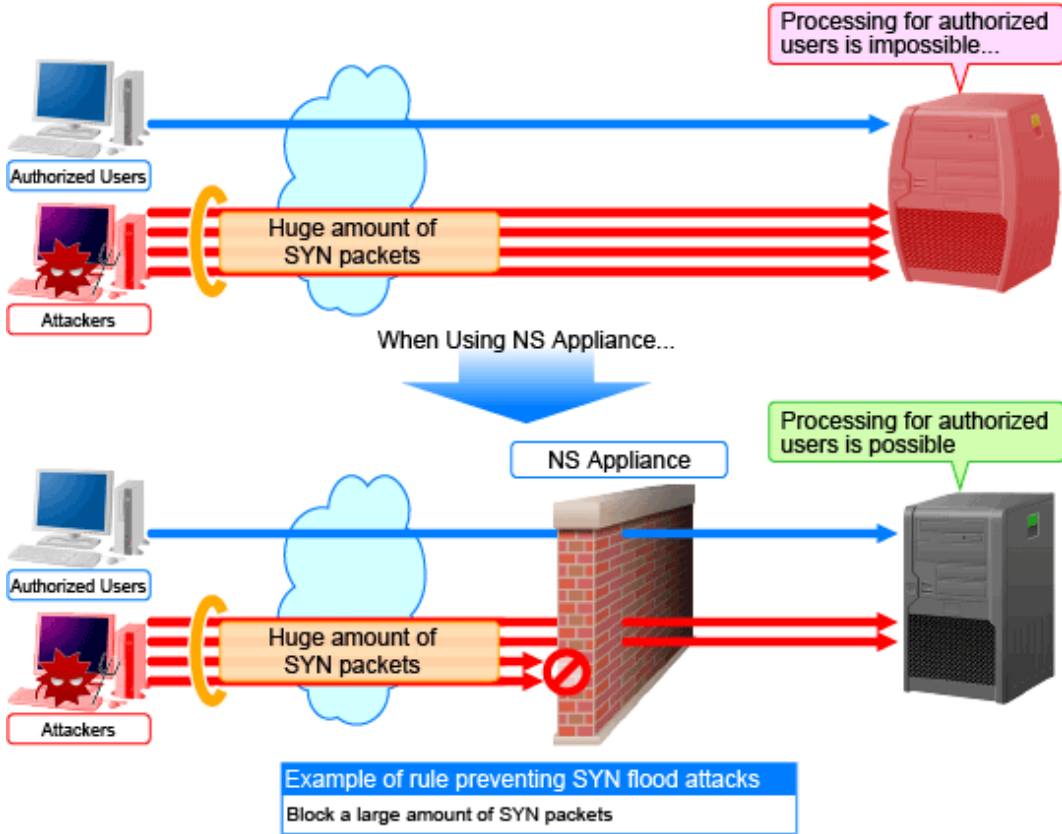
This function defends a server against DoS attacks performed by malicious users, enabling continuous services.

NS Appliance provides the following defensive functions:

Table 1.2 Defensive Functions Provided by NS Appliance

Defensive Functions		Action upon Detection
Anti SYN Flood attack		Follows the method set in the rule.
Anti UDP Flood attack		
Invalid IP packet	Invalid IP header length	Unconditionally drops the packet.
	Invalid IP data length	
	Invalid IP version number	
	Invalid sender IP address	
	Invalid destination IP address	
	Invalid IP checksum value	
Invalid TCP packet	Invalid TCP header length	
	Invalid TCP checksum value	
Invalid UDP packet	Invalid UDP header length	
	Invalid UDP checksum value	
Invalid ICMP packet	Invalid ICMP packet length	
	Invalid ICMP checksum value	
Invalid ARP packet	Invalid ARP packet length	
	Invalid ARP packet format	
Overlapped Fragment attack		
Ping of Death attack		
Land attack		

Figure 1.5 Anti SYN Flood Attack Function Overview



*: In UDP flood attacks, a huge amount of UDP packets are sent.

1.3 Software Environment

NS Option is composed of the following DVD-ROM.

- ServerView Resource Orchestrator NS Option

1.3.1 Software Organization

NS Option is composed of the following software.

Table 1.3 Software Organization

Software	Function Overview
ServerView Resource Orchestrator V3.1.0 NS Option	<ul style="list-style-type: none"> - Controls network security functions - Controls NS Appliance - Deploys the cloning image for NS Option on the admin server and allocates it to a particular managed server for operation

1.3.2 Software Requirements

This section explains the software requirements for installation of NS Option.

1.3.2.1 Basic Software

For the basic software required to use NS Option, refer to the manager section of "2.4.2.1 Basic Software" in the "Design Guide CE".

1.3.2.2 Required Software

When using NS Option, ServerView Resource Orchestrator Cloud Edition is required.

1.3.2.3 Exclusive Software

There is no software that cannot be used in combination with NS Option.

1.3.2.4 Disk Space for Cloning Images

When using NS Option, the following disk space is required for storing cloning images for NS Option in the image file storage folder of ROR CE Manager.

Table 1.4 Disk Space Required for Storing Cloning Images for NS Option

Software	Folder	Disk Space (Unit: MB)
NS Option [Windows]	<i>Image_file_storage_folder (*1)</i>	650
NS Option [Linux]	<i>Image_file_storage_folder (*1)</i>	650

*1: The name of the image file storage folder (directory) specified during installation of NS Option.

[Windows]

When Windows is installed on C:\, the default location is as follows:

C:\Fujitsu\ROR\SVROR\ScwPro\depot

[Linux]

The default location is as follows:

/var/opt/FJSVscw-deploysv/depot

1.4 Hardware Environment

This section explains hardware requirements that must be met when using NS Option.

1.4.1 Hardware Environment

This section explains the devices on which NS Option operates.

Table 1.5 Required Hardware Conditions

Hardware		Remarks
Blade servers	PRIMERGY BX924 S2	Only On-board NICs can be used. (LAN expansion cards cannot be used.)
LAN switch blades	PY-SWB104(PG-SW109)	Mount this on CB1 and CB2.
Storage	ETERNUS DX90 S2 ETERNUS DX440 S2	FC connections will become single path.

1.4.2 Specifications Required for Servers with Physical L-Servers

Specifications required for the server on which a physical L-Server dedicated to the NS Appliance will be deployed are given below:

CPU

A dual core CPU or higher is required.

Memory Size

The required memory size is as follows:

Table 1.6 Required Memory Size

Item	Memory Size (Unit: MB)
Server	6,144 or larger

Estimate the memory size required for the server, using the following formula:

$\text{Required memory size for the server} = 4,096 + 2,048 * \text{the number of NS Appliances to be created} (*1)$
--

*1: Up to 10 instances of NS Appliance can be created on a single physical L-Server.

Disk Space

The disk space required for deploying a physical L-Server is shown below:

Table 1.7 Disk Space Required for Deploying a Physical L-Server

Item	Disk Space (Unit: GB)
Physical L-Servers	100 (*1)

*1: Static disk space required, regardless of the number of NS Appliances created on a physical L-Server.

1.5 High Availability

This section explains high availability of NS Appliance.

- High Availability as a Resource

- Physical L-Server redundancy

- When server recovery is specified during creation of a physical L-Server for NS Appliance, if an error is detected on the server where the physical L-Server is deployed, it is possible to switch to its spare server for automatic switchover.

- Server switchover when a chassis fails

- If a blade chassis in a configuration where ROR CE manages multiple blade chassis (PRIMERGY BX900) fails, operations can be re-started by starting the physical L-Server on a blade chassis that is not damaged.

- Switchover of operating or standby status of storage

- Realizes the switchover between operating or standby disks (system/data disks) in configurations in which replication of the operating storage volume used by a physical L-Server to a standby storage volume is configured.



See

.....
For details on high availability of managed resources, refer to "Chapter 17 High Availability of Managed Resources" in the "Operation Guide CE".
.....

- Disaster Recovery

- The same as for ROR CE.

- For details, refer to "Chapter 18 Disaster Recovery" in the "Operation Guide CE".

Chapter 2 Design and Preparations

This chapter explains the design and preparations necessary for using NS Option.

2.1 Design

In order to use NS Appliance provided by NS Option, it is necessary to design following items:

- [Number of Servers](#)

Estimate the number of servers required when using NS Appliance.

- [System Configuration](#)

Define which servers and storage are to be used from among the systems on which ROR CE is installed.

- [Network Configuration](#)

Design the network configuration for the environment using NS Appliance.

- [Resource Pools](#)

Define the usage method of resource pools associated with NS Appliance.

2.1.1 Number of Servers

Use the following procedure to estimate the number of servers required when using NS Appliance:

1. Determine the number of tenants that will use NS Appliances.
2. Based on the specifications of the servers on which physical L-Servers are to be created, determine how many NS Appliances will operate on each server, and then determine how many servers are required to operate the same number of NS Appliance as that of tenants calculated at 1.
Up to 10 NS Appliances can operate on a single physical server.

An example of estimating the required number of servers is given below:



Example

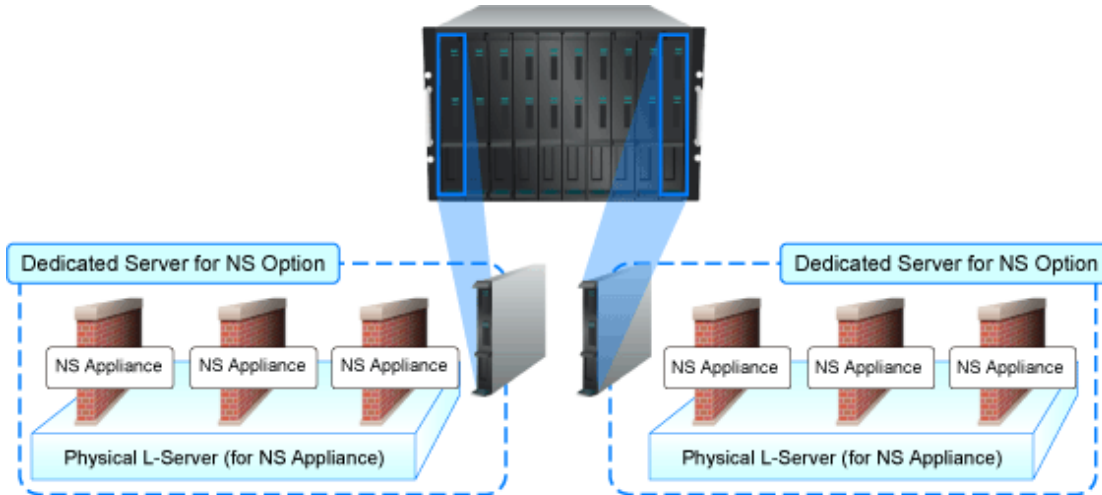
- The number of tenants that will use NS Appliances: 6
- Server specifications (common to all servers)
 - CPU: IntelR XeonR Processor L5609
 - Memory Size: 10 GB
 - Disk Space: 300 GB

The CPU and disk size meet the requirements for servers. Based on the memory size, up to three NS Appliances can be created on each server.

As six tenants will use NS Appliances, two servers are required for operating the NS Appliances for those tenants.

For details on specifications required for servers, refer to "[1.4.2 Specifications Required for Servers with Physical L-Servers](#)".

Figure 2.1 Example Estimate of Required Number of Servers



2.1.2 System Configuration

Define the servers and storage to be used from among the systems on which ROR CE is installed.

- How to Define Servers

Define the servers equivalent to the estimated number of servers to be used for NS Appliances.

- When installing NS Option at the same time as ROR CE

Define the system configuration for ROR CE, including the servers to be used for NS Option.

For details on required specifications for servers that can be used for NS Option, refer to "[1.4.2 Specifications Required for Servers with Physical L-Servers](#)".

- When installing NS Option on a system with ROR CE installed

Define the servers to be used for NS Option from the servers that meet the requirements described in "[1.4.2 Specifications Required for Servers with Physical L-Servers](#)".

- How to Define Storage

- When installing NS Option at the same time of installation of ROR CE

Define the system configuration for ROR CE, including the storage to be used for NS Option.

For details on the storage that can be used for NS Option, refer to "[1.4 Hardware Environment](#)".

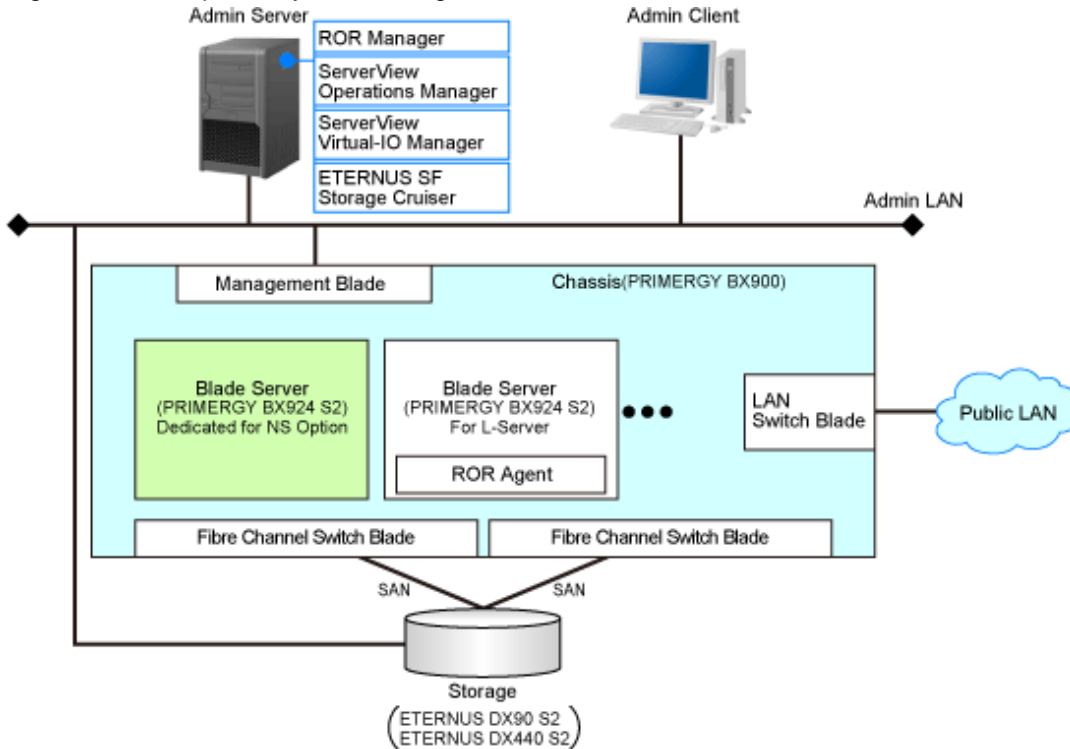
- When installing NS Option on the system with ROR CE installed

Define the storage to be used for NS Option from among the storage in the system that meets the requirements described in "[1.4 Hardware Environment](#)".

An example of system configuration when using NS Appliance is shown below:

For the configuration of an entire ROR CE system, refer to "2.6 System Configuration" in the "Design Guide CE".

Figure 2.2 Example of System Configuration



Blade Server (Dedicated to NS Option)

A dedicated server for NS Option, on which a physical L-Server is deployed using a cloning image for NS Option to operate NS Appliance.

Storage

Storage used as the disk necessary when deploying a physical L-Server on the blade server (dedicated to NS Option). It is managed by admin server.

2.1.3 Network Configuration

Define the information necessary to design the network configuration for the environment in which NS Appliance will be used.

- The information necessary for the admin LAN for the blade server (dedicated to NS Option)
 - The number and scope of VLAN IDs and the range of IP addresses for the admin LAN
In the "Figure 2.3 Example of Network Configuration in a Chassis", "100" is used for the VLAN ID.
 - The admin IP addresses for individual NS Appliances
 - Whether to use the same VLAN for the physical L-Server and NS Appliance
Use different VLANs in the following cases:
 - When using different admin LANs for NS Appliance on individual tenants
 - When there are not enough IP addresses on the admin LAN
- In the "Figure 2.3 Example of Network Configuration in a Chassis", the same VLAN is used.
- Admin LAN settings
 - When using the same VLAN for the physical L-Server and NS Appliance
For the admin LAN for NS Appliance, configure no VLAN.
 - When using different VLANs for the physical L-Server and NS Appliance
For the admin LAN for the NS Appliance, configure a VLAN.

- The communication route for the admin LAN
 - Presence of redundancy
 - NICs to be used

In the "Figure 2.3 Example of Network Configuration in a Chassis", a redundant configuration using on-board NICs is used.

- The information necessary for the public LAN for the blade server (dedicated to NS Option)
 - The number and scope of VLAN IDs and the range of IP addresses for the public LAN
(Including also the VLAN ID and the public LAN IP address used by the NS Appliance)

In the "Figure 2.3 Example of Network Configuration in a Chassis", "10" is used for the VLAN ID for connection to the external network, and "20", "30", and "40" are used for the VLAN IDs for connection to the L-Server.

- The communication route for the public LAN

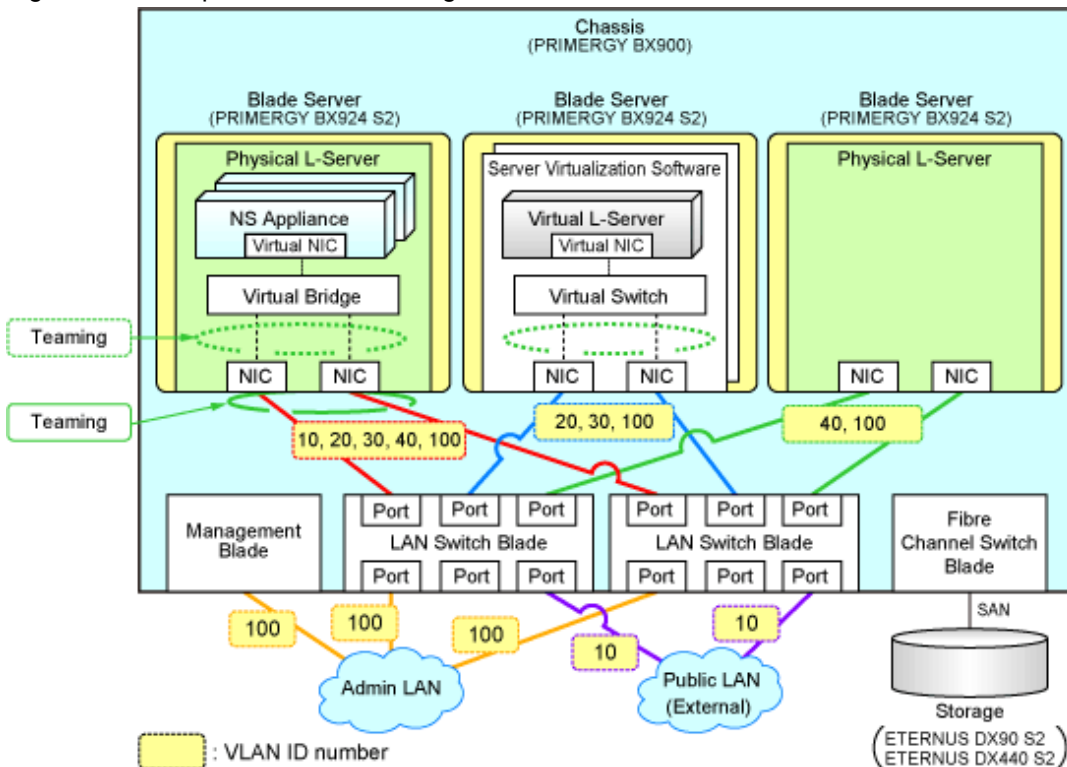
Information

For NICs used for the public LAN, two static NICs should be teamed with Active/Standby configuration.

An example of network configuration when using NS Appliance is shown below:

For the same content as the one applied for ROR CE, refer to "Chapter 9 Defining and Configuring the Network Environment" in the "Design Guide CE", as that content is omitted from this manual.

Figure 2.3 Example of Network Configuration in a Chassis



Information

When creating an L-Platform using the L-Platform template, deployment of NS Appliance or L-Servers triggers the automatic configuration function to perform the following network configuration:

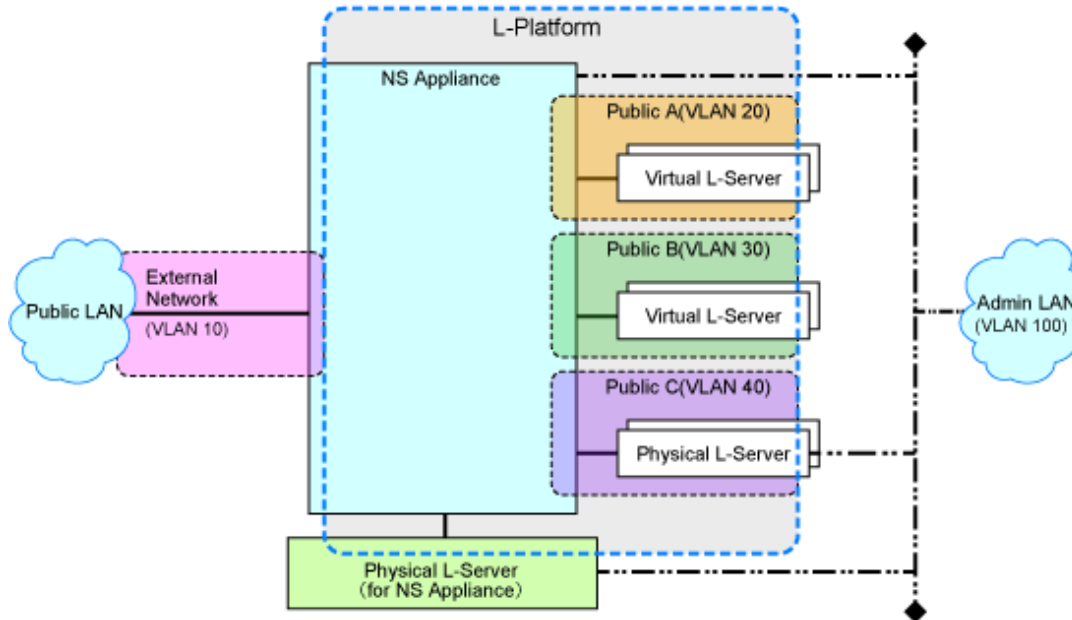
- Creation of Virtual NICs
- Creation of Virtual Bridges

- Creation of Virtual Switches
- VLAN Settings for LAN Switch Blades

The settings for internal connection ports of LAN switch blades, which are the network items to be protected by the security function of NS Appliance, need to be manually configured.

For details, refer to "[3.2.7 Configuring Settings for LAN Switch Blades](#)".

Figure 2.4 Example of Network Configuration for the L-Platform on which NS Appliance is Used



2.1.4 Resource Pools

Use resource pools in order to deploy the following two resources:

- The resources used by physical L-Servers for NS Appliances
- NS Appliances

Define the organization of the resource pools, according to the following guideline for creating resource pools.

- The resources used by physical L-Servers for NS Appliances
 - Image pool
Store the cloning images for NS Option in a dedicated image pool to make them inaccessible to anyone except infrastructure administrators, and isolate them from tenant administrators and tenant users.
 - Server, storage, network, and address pools
Although the resources can be deployed in any of these pools, it is recommended to place them in the dedicated pool accessible only by infrastructure administrators so that it will be easy to monitor the consumption of the resources in that pool.
- NS Appliances
 - Network pool
Register each NS Appliance as a network device and place it in the network pool for the tenant which will use it.

2.2 Preparations

This section explains the preparations necessary for setup of NS Appliance.

The necessary preparations are as follows:

- Preparations for admin servers, admin clients, managed servers, and storage

Use the same procedure as for ROR CE.

For details, refer to "9.2 Defining Configuration Settings for Devices" and "9.3 Pre-configuring Devices" in the "Design Guide CE".

- Preparations for the network

The preparation necessary for the network is explained in "[2.2.1 Preparations for the Network](#)".

2.2.1 Preparations for the Network

This section explains the preparations for setting up the network.

In order to use NS Appliance on a network, it is necessary to perform the following preparations:

- [Preparations for NS Appliance](#)
- [Preparations for LAN Switch Blades](#)

2.2.1.1 Preparations for NS Appliance

As preparation for NS Appliance, define the following network information:

The information defined here will be used when configuring the environment of NS Appliance and when registering network devices.

- Host name (equivalent to the device name for a network device)
- Admin IP address
- SNMP community
- Administrator information (user name, password, and privileged administrator password)
- Management method (PING, SNMP)



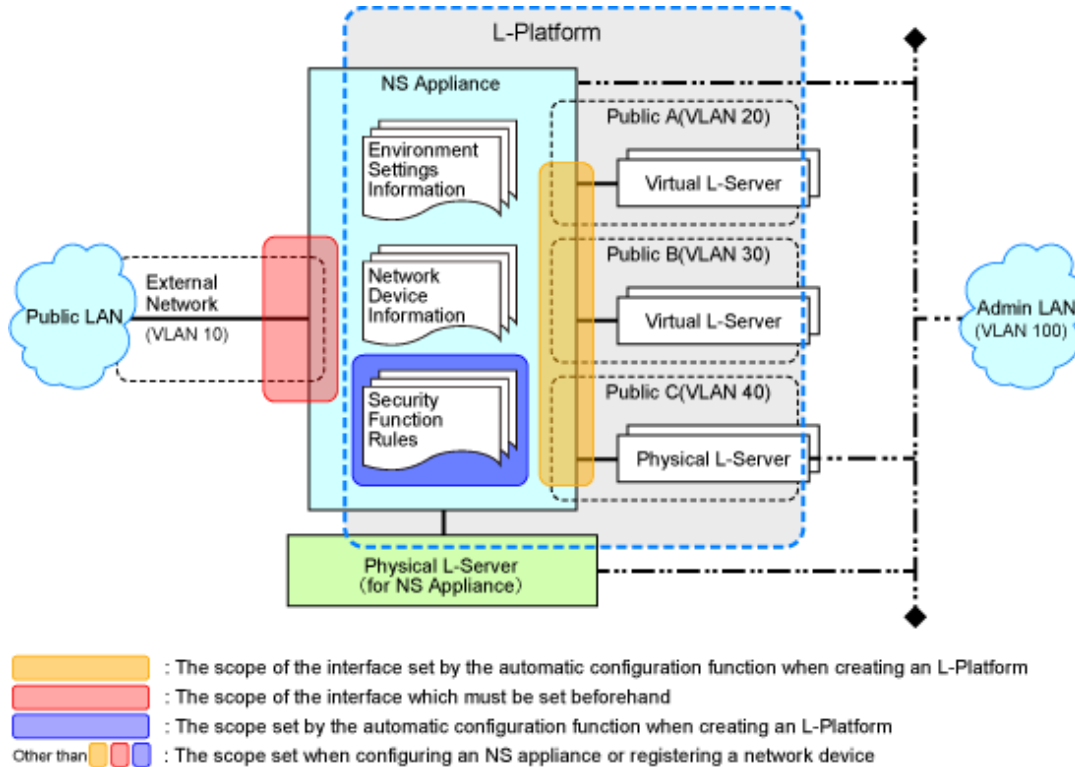
Information

The following items are automatically configured for the NS Appliance when creating an L-Platform using the network device automatic configuration function.

- The interface on the public LAN (L-Server side)

- Security function control rules

Figure 2.5 The Scope set by the Automatic Configuration Function



2.2.1.2 Preparations for LAN Switch Blades

For preparations for LAN switch blades (PY-SWB104(PG-SW109)), define and configure the following information:

- VLAN ID of the admin LAN used to communicate with the admin server

Point

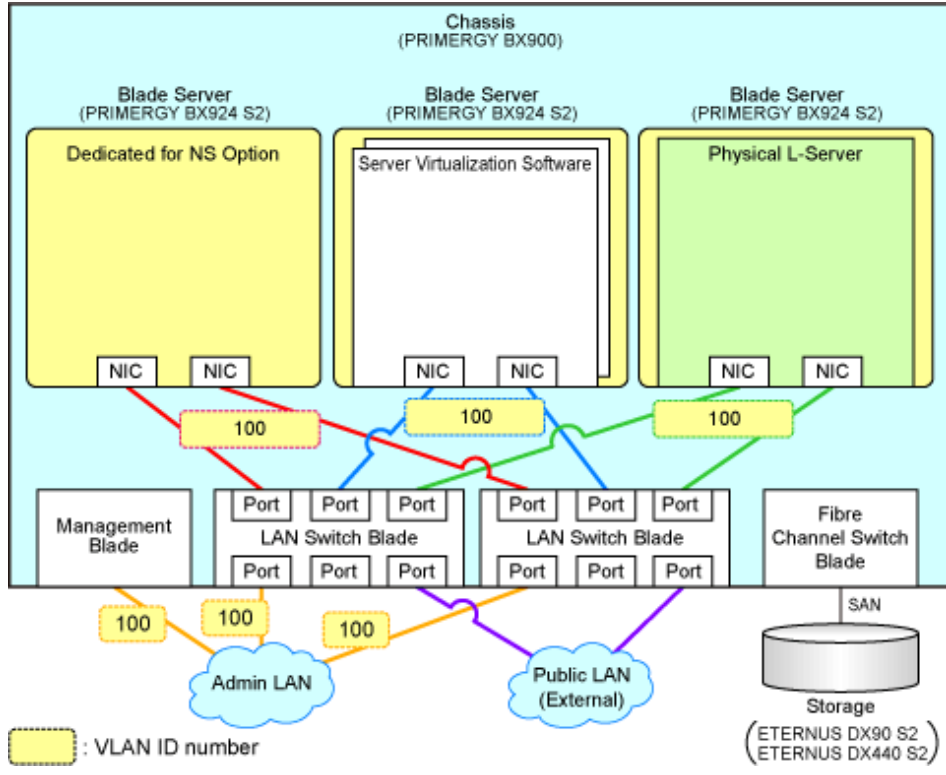
Configure the VLAN for the internal connection ports to connect to the physical L-Server for NS Appliances as follows:

- When using the same VLAN for the physical L-Server and NS Appliance
Configure an untagged VLAN for the internal connection ports.
- When using different VLANs for the physical L-Server and NS Appliance
Configure the following as the VLAN for the internal connection ports:
 - Untagged VLANs for the VLANs used by physical L-Servers
 - Tagged VLANs for the VLANs used by the appliances

- IP address of the managed network device for management
- SNMP community
- Administrator information (user name, password, and privileged administrator password)
- SNMP trap destination

For configuration information details and configuration instructions, refer to the manual for the LAN switch blade.

Figure 2.6 Example of Network Configuration after Completing Preparations for LAN Switch Blades



Chapter 3 Setup

This chapter explains the setup for using NS Appliance.

3.1 Preparations

Before setting up NS Appliance, the following preparations are required:

- [License Setup](#)
- [Registering Cloning Images for NS Option](#)
- [Creating Definition Files](#)
- [Creating an Environment for Network Device Automatic Configuration](#)

3.1.1 License Setup

Register the CE licenses and NS Option licenses necessary for using NS Appliance with the following procedure:

1. Register a CE license with the manager.
2. Restart the manager to reflect the registered CE license.
3. Confirm that the CE license has been registered with the manager.
4. Register an NS Option license with the manager.
5. Confirm that the NS Option license has been registered with the manager.

For details on how to register licenses with the manager, refer to "Chapter 5 License Setup and Confirmation" in the "Setup Guide CE".

3.1.2 Registering Cloning Images for NS Option

Register cloning images for NS Option using the following procedure:

1. Copy the entire Cloning folder on the media pack of ServerView Resource Orchestrator NS Option into the image file storage folder of the manager.
If the Cloning folder already exists in the image file storage folder of the manager, copy the folders and files in the Cloning folder on the media pack into the Cloning folder of the manager.
When using the default image file storage folder, copy the folders and files to the following location:
[Windows]
If Windows is installed on C:\:
C:\Fujitsu\ROR\SVROR\ScwPro\depot\Cloning
[Linux]
/var/opt/FJSVscw-deploysv/depot/CLONEIMG
If the location of the image file storage folder has been changed from the default, copy the folders and files to the Cloning" folder or the "CLONEIMG" directory at that location.
2. Restart the manager.

3.1.3 Creating Definition Files

Create the necessary definition files.

This section explains how to create the following definition files:

- Network configuration information files
Create the network configuration information file necessary for registering NS Appliance as a network device.

- Definition files combining ports of SAN storage
Create definition files combining ports of SAN storage.
For details, refer to "B.1 Creating Definition Files" in the "Setup Guide CE".

3.1.3.1 Network Configuration Information Files

In the network configuration information file, specify the information defined during "[2.2.1.1 Preparations for NS Appliance](#)".

When creating network configuration information files for NS Appliance, be sure to specify the following elements:

- Admin IP address (Netdevice ip)
Specify an IPv4 address.
- Netdevice subnetmask (Netdevice subnetmask)
Specify in the IPv4 format.
- Device name (name) (Netdevice name)
Specify a character string containing up to 32 alphanumeric characters, periods ("."), and hyphens ("-").
- Community name (ReadCommunity)
Specify a character string containing up to 32 alphanumeric characters, underscores ("_"), and hyphens ("-").
- Account (User)
Specify a character string containing up to 32 alphanumeric characters, underscores ("_"), and hyphens ("-").
- Password (Password)
Specify a character string containing between 6 and 32 alphanumeric characters, underscores ("_"), and hyphens ("-").
- Administrator password (PrivilegedPassword)
Specify a character string containing between 6 and 32 alphanumeric characters, underscores ("_"), and hyphens ("-").

For details, refer to "9.4.8 When Registering Network Devices as Resources" in the "Design Guide CE".



See

A tool for creating network configuration information files in the XML file format is available on the ServerView Resource Orchestrator Web site. This tool makes it easy to create network configuration information files.



Point

Points to note when creating network configuration information files for NS Appliance are as follow:

- Select "NS Appliance" for "Record Type", and then perform the following configuration:
 - Change "netdevice subnetmask" according to the network configuration.
 - Change "netdevice vlanid" according to the network configuration.
 - For "ApplianceType", "virtual" is automatically configured.
 - For "Type", "Firewall" is automatically configured.
 - For "Vendor", "Fujitsu" is automatically configured.
 - When "ProductName" is omitted, "NSAppliance" is automatically configured.
 - For "ModelName", "NSAppliance" is automatically configured.
 - For "group_id", "" (blank) is automatically configured.

- For "LoginInfo protocol", "telnet" is automatically configured.
- For "MgmtURL", "" (blank) is automatically configured.
- It is not necessary to enter values in the "CableLinkChart" sheet.

3.1.4 Creating an Environment for Network Device Automatic Configuration

Create an environment for performing auto-configuration of network devices.

Creating a Folder for Registering Rulesets

The network device automatic configuration function realizes automatic configuration by executing the script for NS Appliance prepared by the infrastructure administrator beforehand.

To configure different settings for individual services being provided, register each pattern as a rule for management.

This management unit is referred to as the ruleset.

Create a folder for registering scripts, etc. for each ruleset.

[Windows Manager]

Installation_folder\Manager\etc\scripts\Fujitsu\NSAppliance\rulesets*ruleset_name*\

[Linux Manager]

/etc/opt/FJSVrcvmr/scripts/Fujitsu/NSAppliance/rulesets/*ruleset_name*/



Information

- Specify the folder name of "ruleset name" using up to 32 characters, including alphanumeric characters, underscores ("_"), and hyphens ("-"). This name should start with an alphabetical character.
Set a unique name for the folder name of "ruleset name", excluding the following folders in which sample scripts are registered.

[Windows Manager]

Installation_folder\Manager\etc\scripts\

[Linux Manager]

/etc/opt/FJSVrcvmr/scripts/

- When using the sample scripts provided by NS Option, the following operations will be performed during the operations explained in "[3.2.6 Registering NS Appliances as Resources](#)".
 - Creation of a folder for registering rulesets
 - Copying of sample scripts into rulesets

However, it is necessary to create the following files according to the system configuration to be used:

- Parameter File (For Scripts)

For details on parameter files (for scripts), refer to "13.14 Parameter Files (for Scripts)" in the "Reference Guide (Command/XML)".

- Network Device Interface Configuration File

For details on interface configuration for network devices, refer to "13.15 Network Device Interface Configuration File" in the "Reference Guide (Command/XML)".

3.2 Setup

In order to use NS Appliance, the following setup operations must be performed:

- [Confirming Resource Registration States](#)

- [Registering Resources to Resource Pools](#)
- [Creating Physical L-Servers for NS Appliance](#)
- [Creating NS Appliances](#)
- [Environment Setup for NS Appliance](#)
- [Registering NS Appliances as Resources](#)
- [Configuring Settings for LAN Switch Blades](#)
- [Registering NS Appliances to a Network Pool](#)

3.2.1 Confirming Resource Registration States

On the ROR console, confirm that the following resources associated with NS Appliance have been registered:

- VIOM
- Storage (ETERNUS DX90 S2 or ETERNUS DX440)
- Managed Servers
 - Chassis (PRIMERGY BX900)
 - Server Blade (PRIMERGY BX924 S2)
 - LAN Switch Blade (PY-SWB104(PG-SW109))

If these resources have not been registered, register them.

For details on how to register resources, refer to "Chapter 5 Registering Resources" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

If there are any mistakes in the settings of the registered resources, modify the resources.

For details on how to change resources, refer to "Chapter 7 Changing Resources" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

3.2.2 Registering Resources to Resource Pools

If the resources necessary for the system on which NS Appliances are to be deployed have not been registered in resource pools, register them in the resource pools. Registration destinations are those defined in "[2.1.4 Resource Pools](#)".

Registering Server Resources

Register the servers to which physical L-Servers (for NS Appliance) are deployed to in the server pool.

Registering Storage Resources

Register the storage to which physical L-Servers (for NS Appliance) are deployed to in a storage pool.

Creating and Registering Network Resources

Create the network resources necessary for the admin LAN and public LAN that were defined when performing "[2.1.3 Network Configuration](#)" and register them to a network pool.

Configure the admin IP address to be used by NS Appliance as an IP address excluded from the network resources of the admin LAN.

Configure an untagged VLAN for the admin LAN of the physical L-Server for NS Appliance.

Creating and Registering Address Set Resources

Create the address set resources necessary for the admin LAN and public LAN that were defined when performing "2.1.3 Network Configuration" and register them to an address pool.

Registering Image Resources

Register the cloning images for NS Option which were registered in the image storage folder of the manager during "3.1.2 Registering Cloning Images for NS Option" to the image pool as image resources.

Information

Cloning images for NS Option can be confirmed in the cloning image list on the [Image List] tab of the ROR console.

The cloning image list is displayed as follow:

Table 3.1 Cloning Image List

Item	Value	Example
Cloning Image Name	NS_OPTION_ <i>model</i> _ <i>version</i> _ <i>release</i> <i>model</i> : Target model <i>version</i> : Image version (001 - 999) <i>release</i> : Release number of the image (001 - 999)	NS_OPTION_BX924S2_001_001
Version	1	1
Collection Date	<i>YYYY-MM-DD HH.MM.SS</i> <i>YYYY-MM-DD</i> : Year-Month-Date <i>HH.MM.SS</i> : Hours:Minutes:Seconds	2012-04-01 10:05:17
OS	Linux	Linux
Comment	NS Option (virtual appliance: <i>version</i>) <i>version</i> : The version of NS Appliance	NS Option (virtual appliance: E20L12NF0001)

See

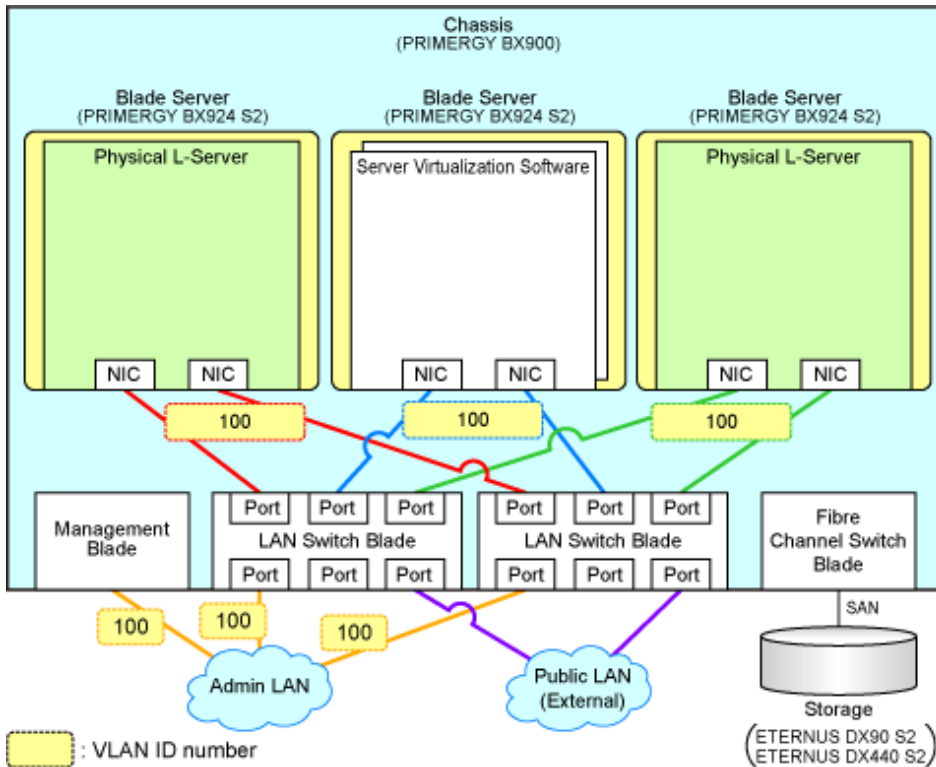
For details on how to register a resource in a resource pool, refer to "Chapter 14 Registering Resources in Resource Pools" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

3.2.3 Creating Physical L-Servers for NS Appliance

Create a physical L-Server for NS Appliance on the server dedicated for NS Option.

If there are multiple servers dedicated to the NS Option, create the same number of physical L-Servers as those servers.

Figure 3.1 Example of Network Configuration after Creation of Physical L-Servers for NS Appliance



- From the GUI:

Create using the ROR console.

The values to specify when creating the physical L-Server for NS Appliance are explained below:

For the items not explained here, specify arbitrary values.

Table 3.2 Specified Values on the [General] Tab

Item	Specified Value
Template	Specify "None".
Server type	Specify "Physical".
Image	Specify "Cloning image for NS Option".
Resource allocation	Uncheck the checkbox.
Network (NIC)	Select only the admin LAN. Use NIC1 and NIC2 for redundancy.

Table 3.3 Specified Values on the [Server] Tab

Item	Specified Value
Server Specification Methods	Select "Model" and specify "PRIMERGY BX924 S2".
Resource release	Uncheck the checkbox.
FC path	Specify "Single path mode".
Boot Mode	Specify "Default".

Table 3.4 Specified Values on the [Disk] Tab

Item	Specified Value
Disk type	Specify "SAN".

Item	Specified Value
Disk	Specify "100G*1".

Table 3.5 Specified Values on the [Network] Tab

Item	Specified Value
NIC/Network	Select only the admin LAN. Use NIC1 and NIC2 for redundancy.
IP address (Optional)	Specify the IP address for the admin LAN.

For details on specified items and how to create physical L-Servers, refer to "16.2 Creation of Physical L-Servers Using Parameters" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

- From the Command-line:

Create a physical L-Server for NS Appliance using the rcxnetworkservice lserver command.

For details on this command, refer to "A.1 rcxnetworkservice".

3.2.4 Creating NS Appliances

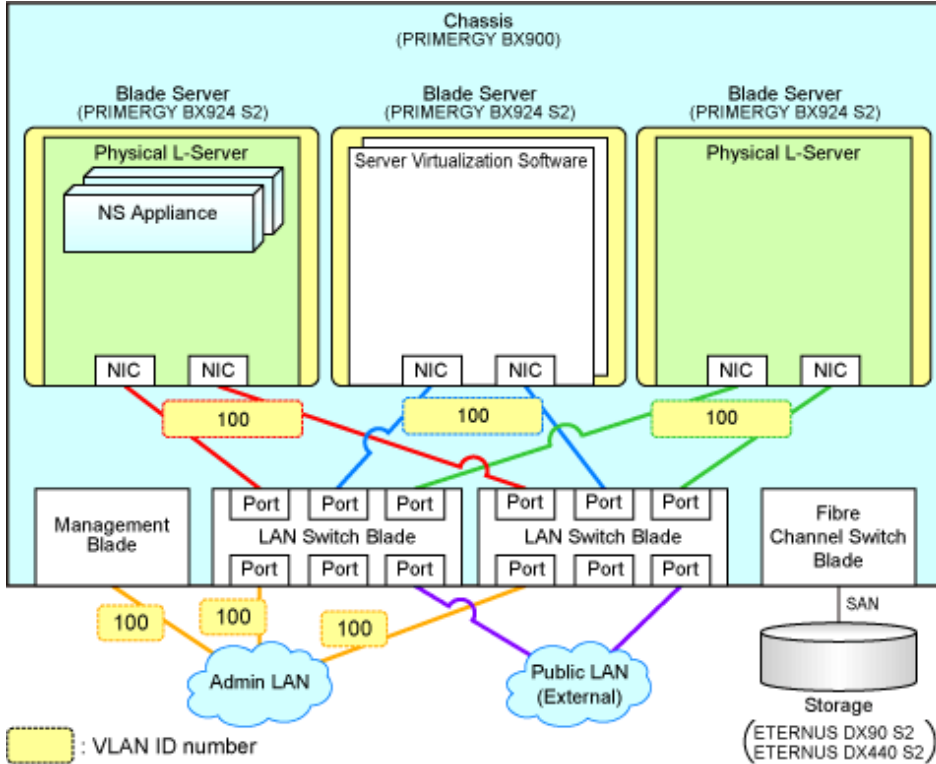
Create an NS Appliance on a physical L-Server using the rcxnetworkservice create command.

When creating an NS Appliance, specify the XML file created as instructed in "3.1.3.1 Network Configuration Information Files".

When the NS Appliance is created, it is displayed in the NS Appliance list with the status "running".

The NS Appliance list can be displayed using the rcxnetworkservice list command. For details on the rcxnetworkservice command, refer to "A.1 rcxnetworkservice".

Figure 3.2 Example of Network Configuration after Creation of NS Appliance



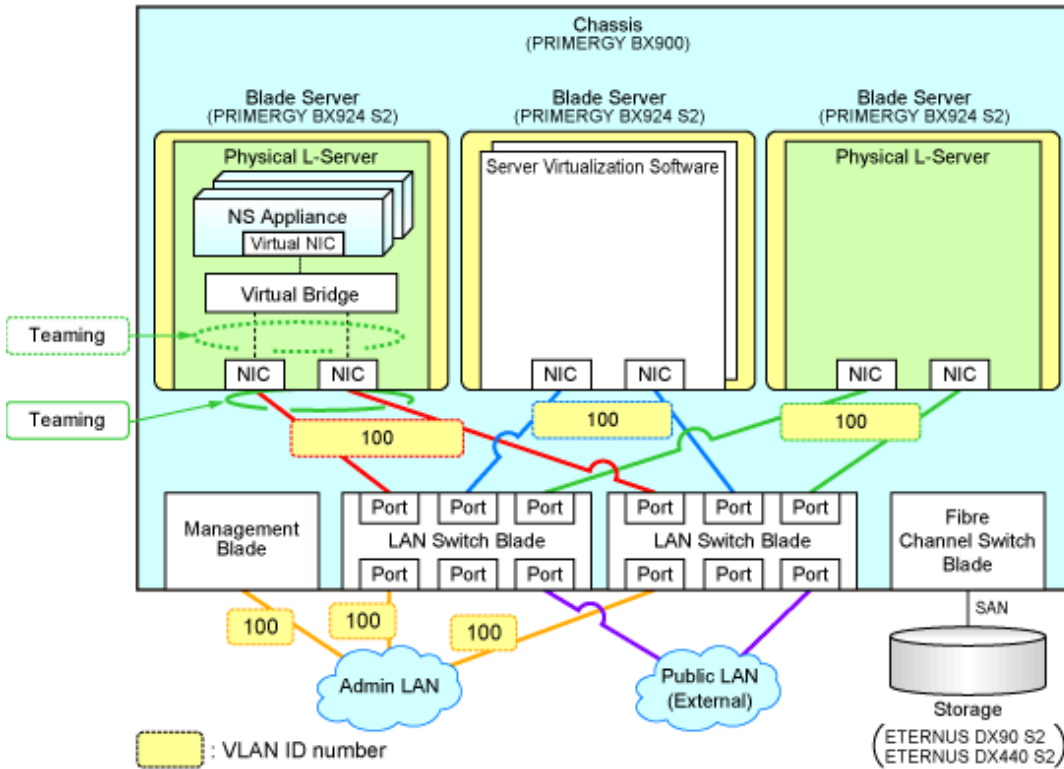
3.2.5 Environment Setup for NS Appliance

Set up the environment for the created NS Appliance using the rcxnetworkservice setup command.

When setting up the environment, specify the information that was defined when performing "2.2.1.1 Preparations for NS Appliance".

For details on the rcxnetworkservice command, refer to "A.1 rcxnetworkservice".

Figure 3.3 Example of Network Configuration after Environment Setup for NS Appliance



3.2.6 Registering NS Appliances as Resources

Register the NS Appliance for which environment setup has been completed as a network device, using the rcxnetworkservice register command.

When registering NS Appliance, specify the XML file created as instructed in "3.1.3.1 Network Configuration Information Files".

When an NS Appliance is recognized as a network device, it is displayed in the network device tree on the ROR console.

For details on the rcxnetworkservice command, refer to "A.1 rcxnetworkservice".

Information

When the rcxnetworkservice register command is successfully executed, the following folders for registering rulesets are created and the sample scripts provided by NS Option are copied.

- For a 3-Tier Model System (without External Firewall)

[Windows Manager]

Installation_folder\Manager\etc\scripts\original\Fujitsu\NSAppliance\rulesets\FW_of_3Tier_sys-NSAppliance2\

[Linux Manager]

/etc/opt/FJSVrcvmr/scripts/original/Fujitsu/NSAppliance/rulesets/FW_of_3Tier_sys-NSAppliance2/

- For a 3-Tier Model System (with External Firewall)

[Windows Manager]

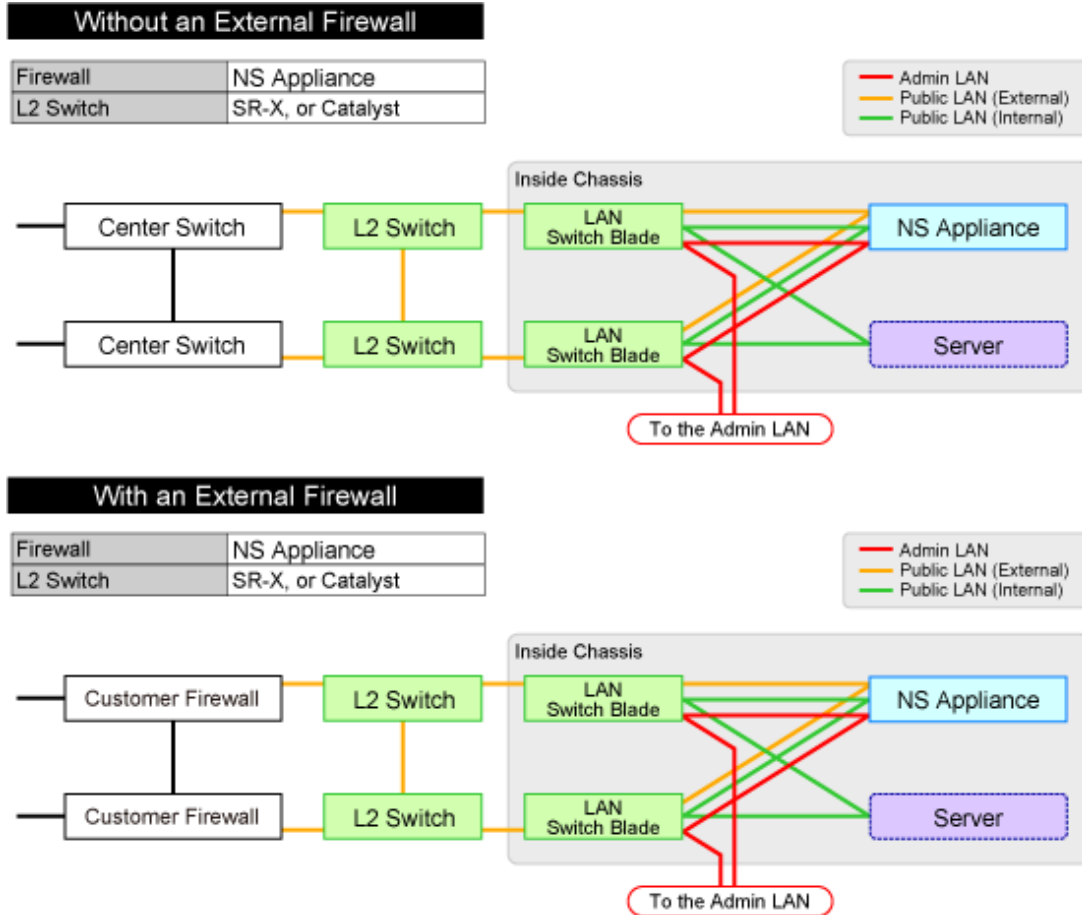
Installation_folder\Manager\etc\scripts\original\Fujitsu\NSAppliance\rulesets\FW_of_3Tier_sys--NSAppliance1\

[Linux Manager]

/etc/opt/FJSVrcvmr/scripts/original/Fujitsu/NSAppliance/rulesets/FW_of_3Tier_sys--NSAppliance1/

The default model configuration for a sample script is shown below:

Figure 3.4 Default Model Configuration for a Sample Script



3.2.7 Configuring Settings for LAN Switch Blades

Set the VLAN IDs of all network resources used on the L-Platform on the internal connection ports of the LAN switch blade connected to the NIC of the physical L-Server.

1. Right-click the server with the physical L-Server for NS Appliance from the ROR console server resource tree.
2. In the displayed menu, select [Modify]-[Network Settings].
3. In the displayed [Network Settings] window, configure the VLAN IDs to use.

For details, refer to "5.4.6 Configuring VLANs on Internal Connection Ports" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

Information

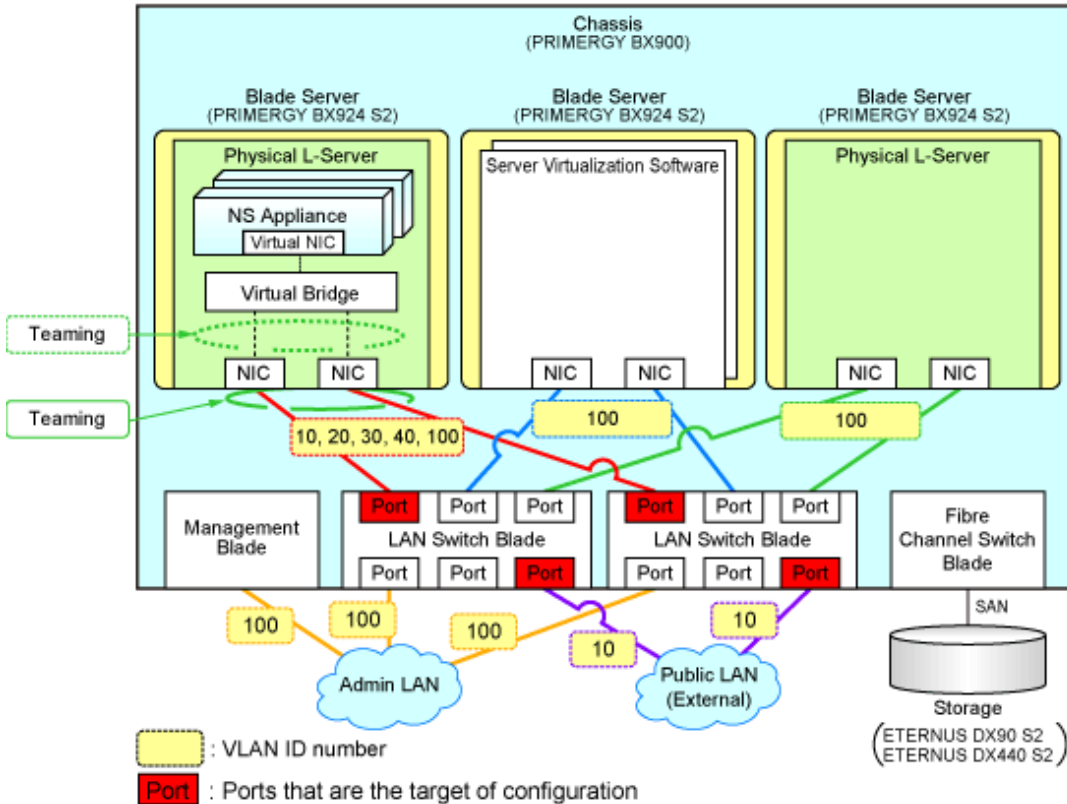
It is necessary to configure LAN switch blades for each individual physical L-Server for NS Appliance.

When sharing NS Appliance among multiple L-Platforms, it is necessary to set the VLAN IDs of all network resources used by each L-Platform.

Also set the VLAN IDs for the external connection ports of LAN switch blades connected to the external network as the public LAN.

For details, refer to "5.4.5 Configuring VLANs on External Connection Ports" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

Figure 3.5 Example of LAN Switch Blade Configuration Targets and Resulting Network Configuration



3.2.8 Registering NS Appliances to a Network Pool

Register an NS Appliance registered as a network device to a network pool for the destination tenant.

For details on how to register network devices, refer to "14.4 Network Devices" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

3.3 Creating L-Platform Templates

NS Appliances are treated as network devices in the same way as firewall units. Therefore, when creating L-Platform templates, NS Appliance should be treated in the same way as firewall units.

For details on how to create L-Platforms, refer to "Chapter 16 Creating L-Platform Templates" in the "Setup Guide CE".

Chapter 4 Operation

This chapter explains how to operate NS Appliances.

4.1 Operation

This chapter explains how to operate NS Appliances from the manager.

Table 4.1 List of Operations

Operation	Description
Starting NS Appliances	The operation for starting NS Appliances.
Stopping NS Appliances	The operation for stopping NS Appliances.
Restarting NS Appliances	The operation for restarting NS Appliances.
Batch Starting of L-Servers	The operation for starting all of the L-Servers in the resource folder at the same time.
Batch Stopping of L-Servers	The operation for stopping all of the L-Servers in the resource folder at the same time.
Batch Restarting of L-Servers	The operation for restarting all of the L-Servers in the resource folder at the same time.
Modifying Basic Information	The operation for changing the basic information of physical L-Servers on which NS Appliance operates.
Deleting NS Appliances	The operation for deleting NS Appliances.
Cloning Image Operations	The operations for cloning images for NS Option.
Adding NS Appliances	The operation for adding NS Appliances.
Deleting NS Appliances	The operation for deleting NS Appliances.

4.1.1 Starting NS Appliances

This section explains how to start an NS Appliance.

NS Appliances can be started using the `rcxnetworkservice start` command.

NS Appliances already created on a physical L-Server automatically start after the physical L-Server is started.

4.1.2 Stopping NS Appliances

This section explains how to stop an NS Appliance.

NS Appliance can be stopped using the `rcxnetworkservice stop` command.

To also stop the physical L-Server for NS Appliance, first stop all NS Appliances running on the physical L-Server and then stop the physical L-Server.

Stopping a physical L-Server also stops any NS Appliances on it, disabling communications using those NS Appliances.

4.1.3 Restarting NS Appliances

This section explains how to restart an NS Appliance.

NS Appliance can be restarted using the `rcxnetworkservice restart` command.

To also restart the physical L-Server for NS Appliance, first stop all NS Appliances running on the physical L-Server and then restart the physical L-Server.

After a physical L-Server is restarted, any already created NS Appliances on it will automatically restart.

Restarting a physical L-Server also restarts any NS Appliances on it, temporarily disabling communications using those NS Appliances.

4.1.4 Batch Starting of L-Servers

This section explains how to perform batch starting of physical L-Servers when multiple physical L-Servers for NS Appliances are deployed in a resource folder. When performing batch starting of physical L-Servers, any existing NS Appliances on those physical L-Servers are also started.

- From the GUI:

1. From the orchestration tree on the ROR console, select the resource folder in which the target L-Servers are registered.
2. Right-click the resource folder to invoke the context menu for the folder.
3. Select "ON" from the [Power] menu.
4. In the displayed [Power On L-Servers] dialog, click <OK>.

- From the Command-line:

Execute the rcxadm folder start command.

4.1.5 Batch Stopping of L-Servers

This section explains how to perform batch stopping of physical L-Servers when multiple physical L-Servers for NS Appliances are deployed in a resource folder.

1. Stop all NS Appliances running on the physical L-Server in a resource folder using the rcxnetworkservice stop command.
2. Stop all L-Servers in a resource folder.

- From the GUI:

- a. From the orchestration tree on the ROR console, select the resource folder in which the target physical L-Servers are registered.
- b. Right-click the resource folder to invoke the context menu for the folder.
- c. Select "OFF" from the [Power] menu.
- d. In the displayed [Power OFF L-Servers] dialog, click <OK>.

- From the Command-line:

Execute the rcxadm folder stop command.

Stopping a physical L-Server also stops any NS Appliances on it, disabling communications using those NS Appliances.

4.1.6 Batch Restarting of L-Servers

This section explains how to perform batch restart of physical L-Servers when multiple physical L-Servers for NS Appliances are deployed in a resource folder. When performing batch restarting of physical L-Servers, any existing NS Appliances on those physical L-Servers are also started.

1. Stop all NS Appliances running on the physical L-Server in a resource folder using the rcxnetworkservice stop command.
2. Restart all L-Servers in a resource folder.

- From the GUI:

- a. From the orchestration tree on the ROR console, select the resource folder in which the target physical L-Servers are registered.
- b. Right-click the resource folder to invoke the context menu for the folder.
- c. Select "Reboot" from the [Power] menu.
- d. In the displayed [Reboot L-Servers] dialog, click <OK>.

- From the Command-line:

Execute the rcxadm folder restart command.

Restarting a physical L-Server also restarts any NS Appliances on it, temporarily disabling communications using those NS Appliances.

4.1.7 Modifying Basic Information

This section explains the operation for changing the basic information of physical L-Servers on which NS Appliances operate.

Basic Information that can be Modified

It is possible to modify the following information for physical L-Servers on which NS Appliances operate:

- L-Server Name
- Label
- Comment



Do not modify any basic information other than the above.

If other information is modified, proper operation cannot be guaranteed.

Procedure for Modifying Basic Information

Use the following procedure to modify the basic information.

- From the GUI:
 1. In the orchestration tree on the ROR console, right-click the target L-Server.
 2. In the displayed menu, select [Modify]-[Registration Settings].
 3. In the displayed [Resource Change Setting] dialog, modify the desired settings.
 4. Click <OK>.
- From the Command-line:

Modify the basic information using the `rcxadm lserver modify` command.

4.1.8 Deleting NS Appliances

This section explains how to delete an NS Appliance.

1. Confirm that the NS Appliance to be deleted is not being used on the L-Platform.

Execute the `rcxadm netdevice show` command. If the line for "AllocatedResources[XXX]:" is blank, the corresponding NS Appliance is not being used on the L-Platform.
For details on the `rcxadm netdevice show` command, refer to "3.8 rcxadm netdevice" in the "Reference Guide (Command/XML) CE".
2. Unregister the network device resource for the NS Appliance from the network pool.
3. Unregister the network device resource for NS Appliance from a resource pool using the `rcxnetworkservice unregister` command.
4. Stop the NS Appliance using the `rcxnetworkservice stop` command.
5. Delete the NS Appliance using the `rcxnetworkservice delete` command.
6. When also deleting the physical L-Server for the NS Appliance, first delete all NS Appliances running on the physical L-Server. Then, execute the `rcxadm lserver delete` command to delete the physical L-Server.

4.1.9 Cloning Image Operations

This section explains operations for the cloning images for NS Option.

The following operations can be performed on the cloning images for NS Option.

- Viewing a Cloning Image
- Unregistering a Cloning Image
- Deleting a Cloning Image

The procedures are the same as those for ROR CE.

For the details, refer to "Chapter 17 Cloning [Physical Servers]" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".

4.1.10 Adding NS Appliances

This section explains how to add an NS Appliance.

1. Confirm that the required license has been registered with the manager.
For details on how to confirm registered licenses, refer to "Chapter 5 License Setup and Confirmation" in the "Setup Guide CE".
2. Create a network configuration information file.
For details, refer to "[3.1.3.1 Network Configuration Information Files](#)".
3. Confirm resource registration states.
For details, refer to "[3.2.1 Confirming Resource Registration States](#)".
4. Register resources in a resource pool.
Perform this operation only when the resources necessary for creating additional NS Appliances have not been registered in the resource pools (for example, when there are no available server resources in the server pool) during creation of a new physical L-Server for NS Appliance.
For details, refer to "[3.2.2 Registering Resources to Resource Pools](#)".
5. Create a physical L-Server for NS Appliance.
Perform this operation only when adding an NS Appliance to a physical L-Server.
For details, refer to "[3.2.3 Creating Physical L-Servers for NS Appliance](#)".
6. Create an NS Appliance.
Create an NS Appliance on a physical L-Server using the `rcxnetworkservice create` command.
For details, refer to "[3.2.4 Creating NS Appliances](#)".
7. Set up the environment for the newly created NS Appliance.
Set up the environment for the newly created NS Appliance using the `rcxnetworkservice setup` command.
For details, refer to "[3.2.5 Environment Setup for NS Appliance](#)".
8. Register the new NS Appliance as a resource.
Execute the `rcxnetworkservice register` command to register the new NS Appliance with the manager as a network device.
For details, refer to "[3.2.6 Registering NS Appliances as Resources](#)".
9. Configure settings for LAN switch blades.
Perform this operation only when adding an NS Appliance to the newly created physical L-Server.
For details, refer to "[3.2.7 Configuring Settings for LAN Switch Blades](#)".
10. Register the new NS Appliance in the network pool.
Register the NS Appliance which was registered as a network device resource in 8. in the network pool for the tenant to which it is to be deployed.
For details on how to register network devices, refer to "14.4 Network Devices" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

4.1.11 Deleting NS Appliances

This section explains how to delete an NS Appliance.

1. Delete the L-Platform on which the target NS Appliance is being used.
2. Unregister the network device resource for the NS Appliance from the network pool.

3. Unregister the network device resource for NS Appliance from a resource pool using the `rcxnetworkservice unregister` command.
4. Stop the NS Appliance using the `rcxnetworkservice stop` command.
5. Delete the NS Appliance using the `rcxnetworkservice delete` command.
6. When also deleting the physical L-Server for the NS Appliance, first delete all NS Appliances running on the physical L-Server. Then, execute the `rcxadm lserver delete` command to delete the physical L-Server.

Information

Deleting an L-Platform is completed when the tenant administrator or tenant user requests release of the L-Platform and the infrastructure administrator approves the request.

See

- For details on the `rcxnetworkservice` command, refer to "A.1 `rcxnetworkservice`".
- For details on the operations for physical L-Servers, refer to "Chapter 17 L-Server Operations" of the "User's Guide for Infrastructure Administrators (Resource Management) CE".
- For details on the `rcxadm folder` command, refer to "3.5 `rcxadm folder`" in the "Reference Guide (Command/XML) CE".
- For details on the `rcxadm lserver` command, refer to "3.6 `rcxadm lserver`" in the "Reference Guide (Command/XML) CE".
- For details on how to unregister network devices for NS Appliances from a network pool, refer to "19.4 Unregistration" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

4.2 Monitoring Operations

This section explains monitoring operations of NS Appliance.

4.2.1 Confirming Server Status

This section explains how to confirm the status of the servers on which physical L-Servers for NS Appliance are deployed.

1. Select the target server in the server tree on the ROR console.
2. Select the [Resource Details] tab of the Main Panel.
3. In the [General] area, check the value in [Status].

When the displayed status is something other than "normal", an error may have been detected as a result of device monitoring. In that case, troubleshooting of the server is necessary.

For details, refer to "Chapter 11 Monitoring Resources" of the "Operation Guide CE".

Information

For details on the information displayed on the main panel, refer to "A.6.3 Physical OS, VM Host, and VM Guest Attributes" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

For the following items, fixed values are displayed.

- General Area

For "Type", "Physical OS" is displayed.

4.2.2 Confirming Network Device Status

This chapter explains how to confirm the status of network devices for NS Appliances.

1. Select a target network device in the network device tree on the ROR console.
2. Select the [Resource Details] tab of the Main Panel.
3. In the [General] area, check the value in [Device status].

When the displayed status is something other than "normal", an error may have been detected as a result of network device monitoring. In that case, troubleshooting of the NS Appliance is necessary.

A status other than "normal" may be also displayed when there are problems with physical L-Servers or LAN switch blades. So also check the statuses of physical L-Servers and LAN switch blades.

For details, refer to "Chapter 11 Monitoring Resources" of the "Operation Guide CE".

Information

For details on the information displayed on the main panel, refer to "A.6.4 Network Device Attributes" in the "User's Guide for Infrastructure Administrators (Resource Management) CE".

The content displayed for the following items varies depending on whether the selected network device is an NS Appliance or another network device.

- Items with Fixed Information
 - General Area
 - For "Device name (Product name)", "NSAppliance" is displayed.
 - For "Model", "NSAppliance" is displayed.
 - For "Vendor", "Fujitsu" is displayed.
 - For "Serial number", "-" is displayed.
 - For "Type", "Firewall(virtual)" is displayed.
 - Port Properties Area
 - For "Port Number", "0", "1", "2", and "3" are displayed.
 - For "Port Number", "LAN0.0", "LAN0.1", "LAN0.2", and "LAN0.3" are displayed.
 - For "Member Port", "-" is displayed.
 - For "Link Status", "up" or "down" is only displayed.
 - For "Speed/DuplexMode", only "1G" or "0" is displayed.

Port information displayed here is not linked to the statuses of NICs for physical L-Servers.

- Items with No Information
 - Redundant Configuration
 - Hardware Details Area
 - Link Data Area

4.3 Disaster Recovery Operations

Use the same procedure as for ROR CE.

However, note the following points:

- As was done for the other network devices, create an NS Appliance at the backup site and register it as a network device beforehand. For details on how to create an NS Appliance, refer to "[Chapter 3 Setup](#)".
- "backup of configurations" and "copying of configurations", both of which are performed for firewall units, are not necessary.

For details, refer to "Chapter 18 Disaster Recovery" in the "Operation Guide CE".

Appendix A Commands

This appendix explains the commands used to operate NS Appliances.

A.1 rcxnetworkservice

Name

[Windows Manager]

Installation_folder\Manager\bin\rcxnetworkservice - NS Appliance Operations

[Linux Manager]

/opt/FJSVrcvmr/bin/rcxnetworkservice - NS Appliance Operations

Format

```
rcxnetworkservice create -ip ipaddress -user user -passwd password -file file.xml [-name name] [-mgrnet network/mask {-gw gateway | -gw name=gateway[, name=gateway]...}]
rcxnetworkservice delete -ip ipaddress -user user -passwd password -file file.xml [-name name]
rcxnetworkservice setup -ip ipaddress -user user -passwd password -file file.xml [-name name]
rcxnetworkservice register -file file.xml
rcxnetworkservice unregister -file file.xml
rcxnetworkservice update -ip ipaddress -user user -passwd password -file file.xml -image image [-name name] [-mgrnet network/mask {-gw gateway | -gw name=gateway[, name=gateway]...}]
rcxnetworkservice list -ip ipaddress -user user -passwd password
rcxnetworkservice start -ip ipaddress -user user -passwd password -file file.xml [-name name]
rcxnetworkservice stop -ip ipaddress -user user -passwd password -file file.xml [-name name] [-force]
rcxnetworkservice restart -ip ipaddress -user user -passwd password -file file.xml [-name name] [-force]
rcxnetworkservice lserver -file file
```

Description

rcxnetworkservice is the command used to operate NS Appliances.

Subcommands

create

Creates an NS Appliance on a dedicated physical L-Server for NS Appliance, as a VM guest.

delete

Deletes an NS Appliance.

When the delete subcommand is executed, NS Appliance is deleted even if it is running. For this reason, confirm that the NS Appliance is not being used before executing the delete subcommand.

When executing the rcxadm netdevice show command, if nothing is displayed in the line of "AllocatedResources[XXX]:", the corresponding NS Appliance is not being used on the L-Platform.

For details on the rcxadm netdevice show command, refer to "rcxadm netdevice" in the "Reference Guide (Command/XML) CE".

setup

Sets up an NS Appliance.

Specify the following information:

Item Name	Description
Host name	Host name of the NS Appliance

Item Name	Description
	Specify the name attribute value of the Netdevice element in the network configuration information file (XML definition).
SNMP community name	The community name of the SNMP agent for the NS Appliance Specify the value of the ReadCommunity element in the network configuration information file (XML definition).
Account	The account for accessing the NS Appliance Specify the value of the User element in the network configuration information file (XML definition).
Password	The password for the access account of the NS Appliance Specify the value of the Password element in the network configuration information file (XML definition).
Administrator password	The administrator password for the access account of the NS Appliance Specify the value of the PrivilegedPassword element in the network configuration information file (XML definition).
Session log collection level	Collection level of NS Appliance session log. Specify INFO level.
telnet idle timeout	Monitors timeout of telnet sessions of NS Appliance Set 5 minutes for the interval of idle timeout.
Application identification	Identifies applications used for NS Appliance <ul style="list-style-type: none"> - DNS 53/udp - FTP 21/tcp - HTTP 80-82/tcp - HTTP 8080-8083/tcp - HTTPS 443/tcp

When executing the setup subcommand on multiple NS Appliances at the same time, setup of some of the NS Appliances may fail. In that case, specify the -name option, and execute the -setup subcommand on the NS Appliances on which setup failed.

register

Registers an NS Appliance with the manager as a network device.
If the ruleset folder does not exist, it will be automatically created.



Information

.....
If there is hardware device information in the specified network configuration information file (XML definition), hardware devices will be also registered.
.....

unregister

Unregisters an NS Appliance from the manager.

Any hardware devices configured in the specified network configuration information file (XML definition) will be also unregistered. The ruleset folder will not be deleted. Manually delete it if necessary.

To unregister particular network devices only, use the rcxadm netdevice delete command.

For details on the rcxadm netdevice command, refer to "3.8 rcxadm netdevice" in the "Reference Guide (Command/XML) CE".

update

Performs software update of NS Appliance.

When the update subcommand is executed, software update is performed on the NS Appliance even if it is running.

For this reason, stop the NS Appliance before executing the update subcommand.

Information

New NS Appliances created using the create subcommand on a physical L-Server where NS Appliances for which software update has been performed exist, will be created with the same software update applied.

list

Displays a list of the NS Appliances on a Physical L-Server.

The following information is displayed:

Table A.1 Information on the NS Appliance List

Item Name	Description
NAME	Name of the NS Appliance IP address of the network device.
STATUS	Status of the NS Appliance One of the following is displayed: - running Displayed when the NS Appliance is running - stop Displayed when the NS Appliance has been stopped

start

Starts an NS Appliance.

stop

Stops an NS Appliance.

When executing the stop subcommand for the NS Appliance which has not been set up using the rcxnetworkservice setup command, specify the -force option.

If the stop subcommand is executed without the -force option specified, an error will occur.

restart

Restarts an NS Appliance.

The restart subcommand cannot be used on an NS Appliance which has not been set up using the rcxnetworkservice setup command. Stop the NS Appliance using the -force option of the stop subcommand, and then start it using the start subcommand.

lserver

Creates a physical L-Server for NS Appliance.

Information

The XML file specified when creating the physical L-Server is saved using the following filename in the same folder as the specified file:

NS_XML_filename.xml



Example

Specified file: /root/ns_server

File to be saved: /root/NS_ns_server.xml

Options

-ip *ipaddress*

In *ipaddress*, specify an IP address to use to access the physical L-Server on which the NS Appliance is to be created.

-user *user*

In *user*, specify a user ID to use to access the physical L-Server on which the NS Appliance is to be created.

-passwd *password*

In *password*, specify the password for the user ID to use to access the physical L-Server on which the NS Appliance is to be created.

-file *file.xml*

In *file.xml*, specify the network configuration information file (XML definition).

When using a network configuration information file (XML definition) in which batch creation of multiple network devices is defined, the operation will be performed on all defined NS Appliances.

Up to 10 NS Appliances can be created on a single physical L-Server. Up to 10 different pieces of information can be specified for NS Appliances in the network configuration information file (XML definition) specified for NS Appliance operations.

To specify more than 10 different pieces of information for NS Appliances, divide them into multiple network configuration information files (XML definitions).

-name *name*

In *name*, specify the device name of the target NS Appliance.

The operation will be only performed on NS Appliances with device names specified in the network configuration information file (XML definition).

-mgrnet *network/mask*

In *network/mask*, specify the network address and mask value of the admin LAN of the manager.

In *network*, specify the address in the IPv4 address format.

In *mask*, specify a number between 1 and 32.



Example

When the admin LAN network address is 192.168.1.0 with a 24-bit mask

```
-mgrnet 192.168.1.0/24
```

-gw *gateway*

In *gateway*, specify the IP address of the gateway used by the NS Appliance to access the admin LAN of the manager, in the IPv4 address format.

When multiple NS Appliances are defined in the network configuration information file (XML definition) specified using the **-file** option, the gateway for all NS Appliances to be created will have the IP address specified in *gateway*. To configure different gateways for individual NS Appliances, specify the **-gw** option using the *name=gateway* format.

Example

When setting 192.168.1.1 for the gateway of the NS Appliance

```
-gw 192.168.1.1
```

-gw *name=gateway*[, *name=gateway*]...

In *name*, specify the device name (the name attribute value of the Netdevice element) defined in the network configuration information (XML definition) specified using the -file option.

In *gateway*, specify the IP address of the gateway used by the NS Appliance specified for *name* to access the admin LAN of the manager, in the IPv4 address format.

When multiple NS Appliances are defined in the network configuration information file (XML definition) specified using the -file option, specify the gateways for individual NS Appliances, separating them using commas (",").

Example

When creating NS Appliances (NS1 and NS2) and setting 192.168.1.1 and 192.168.2.1 for the gateways of NS1 and NS2, respectively

```
-gw NS1=192.168.1.1,NS2=192.168.2.1
```

-force

Forcibly stops or restarts an NS Appliance.

This option can be specified when using the "stop" or "restart" subcommand.

-image *image*

In *image*, specify the update image of the NS Appliance.

-file *file*

Specify the configuration file for creating physical L-Servers. In the configuration file, enter each value using the following format:

"item name" = value

The following items can be specified:

Item Name	Description	Expected Values
FOLDER	Destination resource folder	The folder to which the L-Server will be deployed To specify the level, use the following format: Resource_folder_name/Resource_folder_name Tenant_folder_name/Resource_folder_name Resource_folder_name/Tenant_folder_name
LSERVER	L-Server name	The name of the L-Server to be deployed
IMAGE	Image	A cloning image for NS Option to use for deployment
FC_CONNECTION	FC connection pattern (optional)	Specify the name of the pattern file for FC connections, excluding the file extension. For details on FC connection pattern files, refer to "B.1 Creating Definition Files" in the "Setup Guide CE".
DISK_NAME	Disk name of the existing LUN	Disk name of the LUN which was created in advance using storage management software, for allocation to the L-Server
VSTORAGE_NAME	Virtual storage resource	The resource name of an existing virtual storage

Item Name	Description	Expected Values
	(Optional, when specifying the storage pool)	
STORAGE_POOL	Storage pool (Optional, when specifying a virtual storage resource)	The resource name of an existing storage pool If there are storage pools with the same name on different levels, the level must also be specified to enable identification. Resource_folder_name/Resource_pool_name
NETWORK_NAME	Network	Name of the network resource that the L-Server connects to Specify an admin LAN resource.
IP_AUTO	IP address automatic configuration	For automatic configuration of the IP address to be assigned to the L-Server, specify one of the following: - true Automatically assigns an IP address from the address range set for the network resource. - false Specify the address directly.
IP_ADDRESS	IP address (Specify when specifying "false" for IP address automatic configuration)	IP address
MAC_[index]_AUTO (*1)	MAC address automatic configuration	Determines whether to perform automatic configuration of the MAC address to be assigned to a NIC. Specify one of the following: - true Automatically assigns the MAC address. - false Specify the address directly.
MAC_[index]_ADDRESS (*1)	MAC address (Specify when specifying "false" for MAC address automatic configuration)	MAC address Enter a string delimited by hyphens ("-") or colons (":").
MAC_[index]_RESOURCE (*1)	MAC address set resource (Specify when specifying "true" for MAC address automatic configuration Not usable when specifying a MAC address pool)	Address set resource from which the MAC address is assigned
MAC_[index]_POOL (*1)	MAC address pool (Specify when specifying "true" for MAC address automatic configuration Not usable, when specifying a MAC address set resource)	Address pool from which the MAC address is assigned
HBA	HBA count	The number of HBAs to allocate to the L-Server

Item Name	Description	Expected Values
WWN_[index]_AUTO (*1)	WWN automatic configuration (Specify the same number as the HBA count)	Determines whether to allocate a WWN automatically. Specify one of the following: - true Automatic configuration - false Manual configuration
WWN_[index] (*1)	WWN (Specify when specifying "false" for WWN automatic configuration)	WWN Specify the WWN in colon (":") delimited form.
WWN_[index]_RESOURCE (*1)	WWN address set resource (Specify when specifying "true" for WWN automatic configuration Not usable, when specifying a WWN address pool)	Address set resource from which the WWN is assigned
WWN_[index]_POOL (*1)	WWN address pool (Specify when specifying "true" for WWN automatic configuration Not usable, when specifying a WWN address set resource)	Address pool from which the WWN is assigned
ADDRESS_POOL	Address pool	Address pool to allocate to the L-Server If there are storage pools with the same name on different levels, the level must also be specified to enable identification. To specify the level, use the following format: Resource_folder_name/Resource_pool_name
REDUNDANCY	Redundancy	Specify the server redundancy to be assigned to the L-Server. Specify one of the following: - HA Specify when performing redundancy - None Specify when not performing redundancy
PHYSICAL_SERVER	Physical server (Optional, when specifying the server pool)	Physical server to allocate to the L-Server
SERVER_POOL	Server pool (Optional, when specifying a physical server)	Resource pool that comprises the physical servers allocated to L-Servers If there are storage pools with the same name on different levels, the level must also be specified to enable identification. To specify the level, use the following format: Resource_folder_name/Resource_pool_name
RESERVE_SERVER_POOL	Server pool for reserve settings	Server pool for reserve settings

Item Name	Description	Expected Values
	(Specify when specifying "HA" for Redundancy)	

*1: In index, specify 0 and 1.

This option can be specified when using the subcommand is lserver.

Example

```
FOLDER=NSAPP
LSERVER=NSApp
IMAGE=NS_OPTION_BX924S2_001_001
DISK_NAME=NS
STORAGE_POOL=NS_Storage_Pool
NETWORK_NAME=AdminLAN
IP_AUTO=true
MAC_0_AUTO=true
MAC_1_AUTO=false
MAC_1_ADDRESS="XX:XX:XX:XX:XX:X1"
MAC_0_POOL=NS_Pool
HBA=1
WWN_0_AUTO=true
WWN_0_POOL=NS_Pool
ADDRESS_POOL=NS_pool
REDUNDANCY=HA
PHYSICAL_SERVER=BX924
RESERVE_SERVER_POOL=NS_Server_Pool
```

Example

- When displaying the list of NS Appliances on a physical L-Server

```
>rcxnetworkservice list -ip 192.168.1.1 -user USER1 -passwd PASSWORD
NAME          STATUS
----          -
192.168.1.10  running
192.168.1.11  stop
```

Appendix B Port List

This appendix explains the ports used by NS Option.

The following figure shows the connection configuration of NS Option components.

Figure B.1 Connection Configuration



The following tables show the port numbers used by NS Option. Communications should be allowed for each of these ports in order for NS Option to operate properly.

Table B.1 Admin Server

Function Overview	Source				Destination				Protocol
	Server	Service	Port	Modification	Server	Service	Port	Modification	
Monitoring and controlling resources	Admin server	-	Variab le value	Not possible	Physical L-Server for NS Appliance	ssh	22	Not possible	tcp
		-	Variab le value	Not possible		rpcbind	111	Not possible	tcp
		-	Variab le value	Not possible		NFS	993	Not possible	tcp
		-	Variab le value	Not possible		-(*1)	3172	Not possible	tcp
		-	Variab le value	Not possible		teradataordbms	8002	Not possible	tcp
		-	Variab le value	Not possible		nfagentrcvat (*2)	23458	Not possible	tcp
		-	Variab le value	Not possible		rpcbind	111	Not possible	udp
		-	Variab le value	Not possible		ntp	123	Not possible	udp
		-	Variab le value	Not possible		snmp	161	Not possible	udp
		-	Variab le value	Not possible		avahi	5353	Not possible	udp

Function Overview	Source				Destination				Protocol
	Server	Service	Port	Modification	Server	Service	Port	Modification	
		-	Variable value	Not possible		avahi	40985	Not possible	udp
		-	Variable value	Not possible		rpc.statd	987	Not possible	udp
		-	Variable value	Not possible		rpc.statd	990	Not possible	udp
		-	Variable value	Not possible		ServerView Resource Coordinator VE Agent	4973	Not possible	udp
	-	Variable value	Not possible	NS Appliance	ssh	22	Not possible	tcp	
	-	Variable value	Not possible		telnet	23	Not possible	tcp	
	-	Variable value	Not possible		snmp	161	Not possible	udp	

*1: ServerView Remote Connector Service. This is necessary when using VIOM coordination or when running VMware ESXi on managed servers.

*2: Required for SPARC Enterprise servers.

Table B.2 Admin Client

Function Overview	Source				Destination				Protocol
	Server	Service	Port	Modification	Server	Service	Port	Modification	
Creation and Operation of NS Appliances	Admin Client	-	Variable value	Not possible	NS Appliance	ssh	22	Not possible	tcp
		-	Variable value	Not possible		telnet	23	Not possible	tcp

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