

# HP Network Node Manager iSPI for MPLS Software

for the HP-UX, Linux, Solaris, and Windows® operating systems

Software Version: 9.20

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## Deployment Guide

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# 1 Introducing the NNM iSPI for MPLS

HP Network Node Manager for MPLS Software (NNMi iSPI for MPLS) helps you to extend the capability of HP Network Node Manager i Software (NNMi) to monitor MPLS services configured on the network.

You can plan the deployment of the NNM iSPI for MPLS based on how NNMi is deployed in the environment. While planning the deployment, consider the following areas to achieve an optimum performance of the system:

- Scale of MPLS objects
- Deployment of the NNM iSPI for MPLS in a High Availability (HA) environment.
- Deployment of the NNM iSPI for MPLS in an Application Failover environment
- Deployment of the NNM iSPI for MPLS along with other iSPIs (NNM iSPI for IP Multicast, NNM iSPI Performance for QA, RAMS, and NNM iSPI Performance for Metrics/ NPS).
- Deployment of the NNM iSPI for MPLS in a Global Network Manager (GNM) environment.

## Preparing for Deployment

Before you start deploying the NNM iSPI for MPLS, you must plan the installation based on your deployment requirements. You must identify the ideal deployment scenarios for the supported configuration and make sure that all the prerequisites are met before you begin the installation process.

Factors that impact the deployment of the NNM iSPI for MPLS include the type of database configured with NNMi and the size of the network that you want to monitor. In addition, make sure to install the latest NNMi patches before installing the NNM iSPI for MPLS.

To install and configure the NNM iSPI for MPLS in an HA and application failover environment, see the HA and Application Failover section of *NNMi Deployment Reference Guide*.

Read the following NNMi documents before you start installing and configuring the NNM iSPI for MPLS:

- *HP Network Node Manager i Software Installation Guide, 9.20*
- *HP Network Node Manager i Software Deployment Reference Guide, 9.20*
- *HP Network Node Manager i Software Release Notes, 9.20*
- *HP Network Node Manager i Software Support Matrix, 9.20*

In addition, read the following NNM iSPI for MPLS documents before you start deploying the NNM iSPI for MPLS:

- *HP Network Node Manager Smart Plug-in for MPLS Installation Guide, 9.20*

- *HP Network Node Manager Smart Plug-in for MPLS Release Notes, 9.20*
- *HP Network Node Manager Smart Plug-in for MPLS Support Matrix, 9.20*

For current versions of all documents listed here, go to: <http://h20230.www2.hp.com/selfsolve/manuals>.

## Environment Variables Used in the NNM iSPI for MPLS Documents

The NNM iSPI for MPLS documents use the following NNMi environment variables to refer to file and directory locations. The default values are listed here. Actual values depend upon the selections made during NNMi installation.

NNMi installation process creates the following system environment variables, so they are always available to all users:

- On Windows Server 2008,

- *%NnmInstallDir%*: <drive>\YourFolder\HP\HP BTO Software
- *%NnmDataDir%*: <drive>\Yourfolder\HP\HP BTO Software



By default, these variables are created in the program files folder on the c drive.

- On UNIX,

- *\$NnmInstallDir*: /opt/OV
- *\$NnmDataDir*: /var/opt/OV



## 2 Deploying the NNM iSPI for MPLS

The NNM iSPI for MPLS and NNMi must be installed on the same management server. To install and configure NNMi on a management server, see the *NNMi Installation Guide and Deployment Reference*.

You can deploy the NNM iSPI for MPLS for the following scenarios:

- Installing NNMi and NNM iSPI for MPLS together on a management server. NNMi and NNM iSPI for MPLS are both configured together.
- Installing the NNM iSPI for MPLS on the management server where NNMi is already installed and configured.
- Installing the NNM iSPI for MPLS in a Global Network Management environment.
- Installing NNMi, NNM iSPI Performance for Metrics/ NPS, and NNM iSPI for MPLS on the same management server.
- Installing NNMi and NNM iSPI for MPLS in a management server and the NNM iSPI Performance for Metrics/ NPS on a dedicated server.
- Installing the NNM iSPI for MPLS with NNM iSPI for IP Multicast, and NNM iSPI Performance for Quality Assurance.
- Integrated with Route Analytics Management Software (RAMS) Appliance.

### Deploy the NNM iSPI for MPLS and NNMi Together

To deploy the NNM iSPI for MPLS on a management server, follow these steps:

- 1 Install and Start the NNMi process.
- 2 Create a New User with the Web Service Client Role from the NNMi console.



Make sure to use the same database type (PostgreSQL Embedded or Oracle) as NNMi when you are installing the NNM iSPI for MPLS.

- 3 Install the NNM iSPI for MPLS, 9.20. For more information, see the *NNM iSPI for MPLS Installation Guide*.
- 4 Start the NNM iSPI for MPLS processes by using the command: `ovstart -c mplsjoboss`.
- 5 Log on with the administrative privileges to use the `MPLS Configuration workspace`. If you have the list of Route Targets (RTs) to be excluded in the network, you can add the RTs to be excluded from the `MPLS Configuration workspace`. Similarly, you can group the Pseudowires based on the attributes such as Id or encapsulation type to discover VPWS VPNs. These configurations help in discovering the L3VPNs and L2VPNs.



You can add the list of RTs to be excluded anytime after starting NNMi the NNM iSPI for MPLS processes.

- 6 Seed the MPLS nodes from the NNMi console. The NNMi discovery process starts after you seed the nodes and MPLS capabilities are discovered along with generic capabilities of a node. For more information, see *NNMi Online Help*.
- 7 Log on to the NNMi console and verify that MPLS-enabled nodes are discovered. You can do this using the **MPLS** workspace. This workspace is visible on the NNMi console after NNM iSPI for MPLS is successfully installed. You can use the MPLS workspace to launch inventory and form views for MPLS objects.

## Deploy the NNM iSPI for MPLS in an NNMi Environment

To deploy the NNM iSPI for MPLS on a management server where NNMi is already installed and running, follow these steps:



Make sure to use the same database type (PostgreSQL Embedded or Oracle) as NNMi when you are installing the NNM iSPI for MPLS.

- 1 Install the NNM iSPI for MPLS on a management server where NNMi is already installed, running, and nodes are discovered.
- 2 Start the MPLS processes. If you have the list of Route Targets (RTs) to be excluded in the network, you can add the RTs to be excluded from the *MPLS Configuration* workspace. Similarly, you can group the Pseudowires based on the attributes such as *Id* or encapsulation type to discover VPWS VPNs. These configurations help in discovering the L3VPNs and L2VPNs.
- 3 You can start the NNM iSPI for MPLS discovery process to discover the MPLS objects from the discovered NNMi nodes in any *one* of the following ways:
  - Run the following command to discover the MPLS objects from the discovered NNMi nodes:

```
$InstallDir/bin/nmsmplsdisco.ovpl -u <user> -p <password> [ -all | -node <node_name> ]
```
  - Select NNMi nodes from NNMi inventory and start the configuration poll. For more information, see *Help for NNMi, Launch the Actions: Configuration Poll Command*.
  - Wait for the next NNMi discovery cycle.
- 4 After installing the NNM iSPI for MPLS, log on to the NNMi console, and then verify the availability of the MPLS workspace and MPLS views.

## Inter-Provider VPN for NNM iSPI for MPLS

NNM iSPI for MPLS provides the following options to users for Inter-Provider VPN, they are:

- To Turn-on or Turn-off the Inter-Provider Feature.
- To Modify an AS Name

## To Turn-on or Turn-off the Inter-Provider Feature.

Inter-Provider VPN feature is *Disabled* by default in NNM iSPI for MPLS. To *Enable* the inter-provider VPN feature:

- Go to `nms-mpls.jvm.properties` and remove the comment for `Dcom.hp.ov.nms.spi.mpls.linkmgr.computeRemoteCEs=true`.
- modify `interProviderVPNConfig` file. This file is stored in the following path:

*For Windows:*

`%NnmDataDir%/shared/mpls/conf/interProviderVPNConfig`

*For Unix:*

`/var/opt/OV/shared/nnm/conf/interProviderVPNConfig`

`interProviderVPNConfig` has a global flag to enable or disable the inter-provider VPN feature, alongwith a list of inter-provider VPNs



You do not have to restart the `mpls jboss` after modifying `interProviderVPNConfig` file

## To Modify an AS Name

You can modify the Autonomous System name by modifying the `publicASMapping` file. This file is stored in the following path:

*For Windows:*

`%NnmDataDir%/shared/mpls/conf/publicASMapping`

*For Unix:*

`/var/opt/OV/shared/mpls/conf/publicASMapping`

## Using Single Sign-On with NNM iSPI

By default Single Sign-On is disabled. To enable the Single Sign-On feature, follow these steps after installing NNM iSPI for MPLS.

Edit `/var/opt/OV/shared/nnm/conf/props/nms-ui.properties`:

- a Set `com.hp.nms.ui.sso.isEnabled = true`
- b Run `nmssso.ovpl -reload`
- c Run `mplssoreload.ovpl`

For more information, see *Using Single Sign-On with NNMi* in *NNMi 9.20 Deployment Reference*.

## Deploy the NNM iSPI for MPLS with the NNM iSPI Performance for Metrics/NPS

You must install NNMi 9.20, iSPI of MPLS, NNM iSPI Performance for Metrics/ Network Performance Server (NPS) to view the MPLS reports. You can deploy these products for the following scenarios:

- Installing NNMi, NNM iSPI for MPLS, and the NNM iSPI Performance for Metrics/NPS on the same server.
- Installing the NNM iSPI for MPLS and NNMi on one server and NNM the iSPI Performance for Metrics/NPS on a dedicated server.

To deploy all the products on the same management server, follow these steps:

- 1 Install NNMi, 9.20.
- 2 Install the iSPI Performance for Metrics/NPS. 9.20. For information about the steps to install, see *HP NNMi iSPI Performance for Metrics/NPS Installation Guide*.
- 3 Install the NNM iSPI for MPLS, 9.20.



Always install the NNM iSPI Performance for Metrics/NPS and then install NNM the NNM iSPI for MPLS. If you have installed NNMi and NNM iSPI for MPLS before installing NPS and NNM iSPI Performance for Metrics, remove the <Extension Pack>.processed copy from the following location:

- On UNIX  
    <\$NNMDatadir>/ shared/ perfSpi/ datafiles/ extension/  
    final folder.
- On Windows  
    <%NNMDatadir%>\shared\perfSpi\datafiles\extension\fi  
    nal folder.

After removing the file, the following extension packs are installed automatically.

- MPLS\_LSR\_Node
- MPLS\_LSR\_Interface
- L3\_VPN\_VRF

To deploy NNMi and NNM iSPI for MPLS on the same management server and the NNM iSPI Performance for Metrics/NPS on a dedicated server, follow these steps:

- 1 Install NNMi, 9.20 and NNM iSPI for MPLS, 9.20 on the same management server.
- 2 Install the NNM iSPI Performance for Metrics/ NPS on the dedicated server. For information about the steps to install, see *HP NNMi iSPI Performance for Metrics/NPS Installation Guide*.

- 3 Complete the necessary configurations for NNMi, the NNM iSPI for MPLS, and iSPI Performance for Metrics/NPS.



Always install the iSPI Performance for Metrics/NPS and then install the NNM iSPI for MPLS. If you have installed NNMi and NNM iSPI for MPLS before installing NPS and NNM iSPI Performance for Metrics, remove the <Extension Pack>.processed copy from the following location:

- On UNIX -

<\$NNMDataDir>/ shared/ perfSpi/ datafiles/ extension/  
final folder.

On Windows -

<%NNMDataDir%>\shared\perfSpi\datafiles\extension\  
final folder.

After removing the file, the following extension packs are installed automatically.

- MPLS\_LSR\_Node
- MPLS\_LSR\_Interface
- L3\_VPN\_VRF

After you complete the installations, the NNM iSPI for MPLS introduces the following extension packs on the NPS/ Metrics console:

Extension Pack Name	Purpose
MPLS LSR Node	Shows report based on the available metric definitions for all MPLS-enabled nodes.
MPLS LSR Interface	Shows report based on the available metric definitions for all MPLS-enabled interfaces.
L3_VPN_VRF	Shows report based on the available metric definitions for all VRFs and L3VPNs.

The extension packs use data collected by the NNM iSPI for MPLS. Make sure that iSPI Performance for Metrics/NPS is up and running. To view the MPLS reports from the NNMi console, click **Actions-> HP NNM iSPI Performance -> Reporting-Report Menu**. The iSPI Performance for Metrics console appears with the MPLS metrics that enables you to generate the MPLS reports.

After you uninstall the NNM iSPI for MPLS, the extension packs introduced by the NNM iSPI for MPLS are not removed. If the iSPI Performance for Metrics is running, the extension packs introduced by the NNM iSPI for MPLS, still appear. You must remove the extension packs manually before you start installing the NNM iSPI for MPLS again. For more information, see *Troubleshooting the NNM iSPI for MPLS* section from the *NNM iSPI for MPLS Installation Guide*.

# Deploy the NNM iSPI for MPLS in an Application Failover Environment

You can configure the NNM iSPI for MPLS in an application failover environment from the following scenarios:

## Deploy the NNM iSPI for MPLS in an Application Failover Environment with Oracle Database

Scenario 1: In this scenario, consider that you want to install the NNM iSPI for MPLS with NNMi and then configure application failover on NNMi:

- 1 Install NNMi in the primary server mode on server 1 and install NNMi in the secondary server mode on server 2.
- 2 Start NNMi on server 1.
- 3 Install the NNM iSPI for MPLS on server 1 with Oracle database by following the steps listed in the *HP Network Node Manager i Software Smart Plug-in for MPLS Installation Guide*.
- 4 Merge the keystores on one server and copy the keystores to both the primary and the secondary servers. For information, see the *NNMi Deployment Reference Guide* for instructions.
- 5 Install the NNM iSPI for MPLS license on server 1.
- 6 Stop NNMi on server 1.
- 7 Start NNMi on server 2.
- 8 Install the NNM iSPI for MPLS on server 2.
- 9 Configure NNM iSPI for MPLS on server 2 with the same database instance, user name, and password configured on server 1.
  - ▶ Ignore the warning messages displayed and click **OK**
- 10 After the installation of the NNM iSPI for MPLS, install the NNM iSPI for MPLS license on server 2.
- 11 Configure application failover server 1 and server 2 according to the instructions provided in the *NNMi Deployment Reference Guide*.

Scenario 2: In this scenario, consider that you want to install the NNM iSPI for MPLS after configuring NNMi in an application failover environment:

- 1 Remove configuration for application failover from the NNMi primary and secondary servers.
- 2 Restore the old keystore and truststore specific to the primary server and the secondary server.
- 3 Install the NNM iSPI for MPLS on both primary and secondary servers following the steps discussed in Scenario 1.
- 4 Install the licenses available for the NNM iSPI for MPLS installed on a server 1 and a server 2.
- 5 Configure the NNM iSPI for MPLS for an application failover.

- 6 Configure NNMi in the application failover mode. Follow instructions from the *NNMi Deployment Reference Guide* to configure NNMi in an application failover mode



Remove the iSPI for application failover by using the following steps:

- a Disable application failover for the NNM iSPI for MPLS following the steps discussed in the *Disabling NNMi for Application Failover* section in the *NNMi Deployment Reference Guide*.
- b Restore the keystore and the truststore for the systems that you backed up before configuring them for application failover.

## Deploy the NNM iSPI for MPLS in an Application Failover Environment with Embedded Database

Scenario 1: In this scenario, consider that you want to install the NNM iSPI for MPLS and NNMi in an application failover mode:

- 1 Install the NNM iSPI for MPLS and NNMi on the primary server and the secondary server.
- 2 After the installation of the NNM iSPI for MPLS, install the NNM iSPI for MPLS license on one server and non production licence on the other server.
- 3 Follow instructions documented in the *NNMi Deployment Reference Guide* to configure NNMi in application failover mode. After this, the NNM iSPI for MPLS automatically gets configured in the application failover mode.

Scenario 2: In this scenario, consider that you want to install the NNM iSPI for MPLS after configuring NNMi in the application failover mode:

- 1 Remove the NNMi application failover configuration from the primary and secondary nodes.
- 2 Restore the old keystore and truststore specific to the primary server and the secondary server configured. See the *NNMi Deployment Reference Guide* for instructions.
- 3 Install the NNM iSPI for MPLS on both the primary and the secondary servers.
- 4 Install the NNM iSPI for MPLS license on one server and non production licence on the other server.
- 5 Follow instructions documented in the *NNMi Deployment Reference Guide* to configure NNMi in application failover mode. After this, the NNM iSPI for MPLS automatically gets configured in the application failover mode.

## Deploy the NNM iSPI for MPLS with the NNM iSPI for IP Multicast

The NNM iSPI for MPLS helps you to monitor the Provider Edge (PE) routers discovered in a Multicast VPN (MVPN) topology. The PE routers are configured with the multicast-enabled VRF (MVRF) capabilities and use the multicast services to transmit data.

The iSPI for IP Multicast helps you to monitor the multicast services in the network. If the multicast services are used over an MPLS cloud, the integration of the NNM iSPI for MPLS and NNM IP Multicast provides the collaborative monitoring of MVPN topology.

Navigate from the NNM iSPI for MPLS to the NNM iSPI for IP Multicast to view the multicast tree used by multicast traffic in the core network (cloud between the PE routers). The multicast tree shows the default and data Multicast Distribution Tree (MDTs). For more information, see *NNM iSPI for MPLS Online Help, Overview of the Multicast VPN (MVPN) and MPLS view*.

For more information about launching the MPLS views, see NNM IP Multicast View from the *NNM iSPI for MPLS Online Help*.

To deploy the NNM iSPI for MPLS with the (HP) iSPI for IP Multicast, follow the steps:

- 1 Install NNMi 9.20.
- 2 Install the NNM iSPI for MPLS, 9.20.
- 3 Install the NNM iSPI for IP Multicast, 9.20.

There is no order to deploy the iSPIs (NNM iSPI for MPLS or NNM iSPI for IP Multicast) on a management server.

## Deploy the NNM iSPI for MPLS with the NNM iSPI Performance for Quality Assurance

The NNM iSPI for MPLS helps you to monitor the VRFs available on the network. The iSPI Performance for Quality Assurance measures the network traffic performance by configuring various tests on the VRFs. After installing the iSPI Performance for Quality Assurance, the NNM iSPI for MPLS uses the QA performance capabilities. You can view the tests configured for the selected VRF by navigating to the VRF form.

The integration of the NNM iSPI for MPLS and NNM iSPI Performance for QA enables you to do the following:

- View the tests configured on VRFs. Troubleshoot the connectivity for the selected VRFs on basis of the configured tests. For example, finding the quality of connectivity for the multiple sites.
- Troubleshoot the PE-PE, PE-CE, CE-CE connectivity.
- Generate the reports based on the QA metrics. For example, find out the delay for data packet to reach the destination or the packet loss.

For more information, see *Help for iSPI Performance for QA*.

You must deploy NNM iSPI Performance for QA and NNM iSPI for MPLS on the same NNMi management server.



## Deploying the NNM iSPI for MPLS with Route Analytics Management System

HP Route Analytics Management System (RAMS) integrates with NNMi to provide the routing protocol path for the layer 3 topology. You can use the RAMS features and functionality to monitor the L3 VPNs that uses the mBGP protocol. In addition, you can use the RAMS capabilities to draw the MPLS path within MPLS cloud. After the integration with RAMS, you can monitor and view the SNMP traps from the RAMS appliance in the **RAMS** tab. The RAMS tab appears in the **L3 VPN** form. After RAMS is installed, you can push VPN name and RT list to RAMS system by using the `nmsmplsvpnandrtlist.ovpl` tool. For more information, see *NNM iSPI for MPLS 9.20 Online Help and NNM iSPI for MPLS 9.20 Reference Pages*.

## Deploy the NNM iSPI for MPLS in Global Network Management Environment

You can deploy the NNM iSPI for MPLS in a Global Network Management (GNM) environment. The NNM iSPI for MPLS uses the capabilities of NNMi Global Network Manager (NNMi GNM) and provides a centralized view to monitor the multiple sites. The NNM iSPI for MPLS allows you to configure the Regional Manager connections by using the **MPLS Configuration** workspace. After the connection is established, view and monitor the MPLS nodes from the NNM iSPI for MPLS inventory (GNM). For more information about how to configure the NNM iSPI for MPLS regional managers, see the *iSPI for MPLS Online Help*.

You can deploy NNMi and NNM iSPI for MPLS in a GNM environment for the following scenarios:

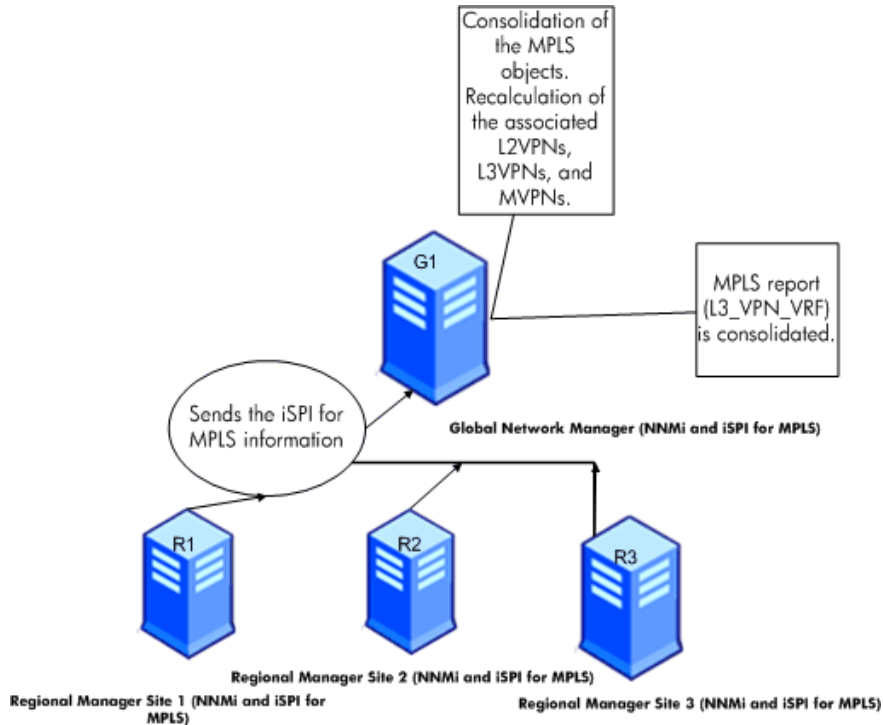
- Both NNMi and NNM iSPI for MPLS are configured on the Global Network Manager server and Regional Manager management servers.
- NNMi is configured on the Global Network Manager server and NNMi and NNM iSPI for MPLS are configured on the Regional Manager management servers.
- Both NNMi and NNM iSPI for MPLS are configured on the Global Network Manager server and NNMi is configured on the Regional Manager management server.

## Deploying NNMi and NNM iSPI for MPLS on the Global Network Manager and Regional Manager Management Server

You can install and configure NNMi and the NNM iSPI for MPLS on the Global Network Manager and Regional Managers. For information about the configuration steps, see *NNMi and NNM iSPI for MPLS Online Help*.

The following figure represents a deployment scenario, where NNMi and NNM iSPI for MPLS are configured on the Global Network Manager (G1) and Regional Managers (R1, R2, and R3):

In this deployment scenario, all the Regional Managers (R1, R2, and R3) send the MPLS information to the Global Network Manager (G1). You can view the following information from G1:



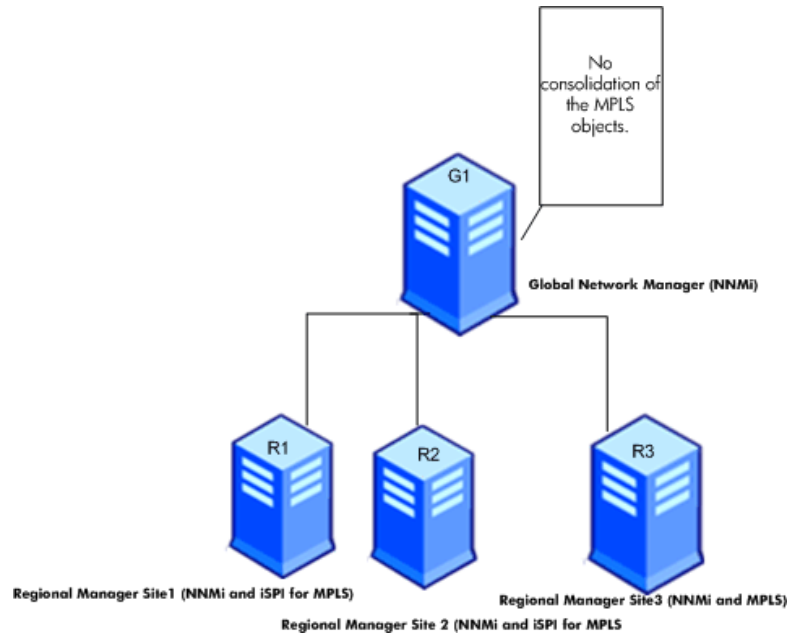
- Consolidated MPLS topology is available. The regional managers send the information about the MPLS objects such as VRFs, TE Tunnels, VC LSPs, and MVRFs to the Global Network Manager (G1). The GNM uses the MPLS object related information from the regional managers to regroup and form the L3 VPNs, L2VPNs, MVPNs, and PseudoWire VCs in the network. In the G1 inventory, the status is recalculated for the MPLS objects. In addition, the incidents are also generated for the MPLS topology in the GNM (G1). The incidents are not forwarded from the regional managers to GNM (G1) as the MPLS topology is derived again in the G1. The incidents are only generated for the MPLS objects available in the G1 inventory.
- Consolidated L3\_VPN\_VRF report is available. Other MPLS reports are available only for the local MPLS nodes in the G1.

➤ This possible only after integrating with NNM iSPI Performance for Metrics.

## Deploying NNMi on the Global Network Manager and NNMi and NNM iSPI for MPLS on the Regional Manager Management Server

You can install and configure NNMi on the Global Network Manager and both NNMi and NNM iSPI for MPLS on the Regional Managers. For information about the configuration steps, see the *NNMi and NNM iSPI for MPLS Online Help*.

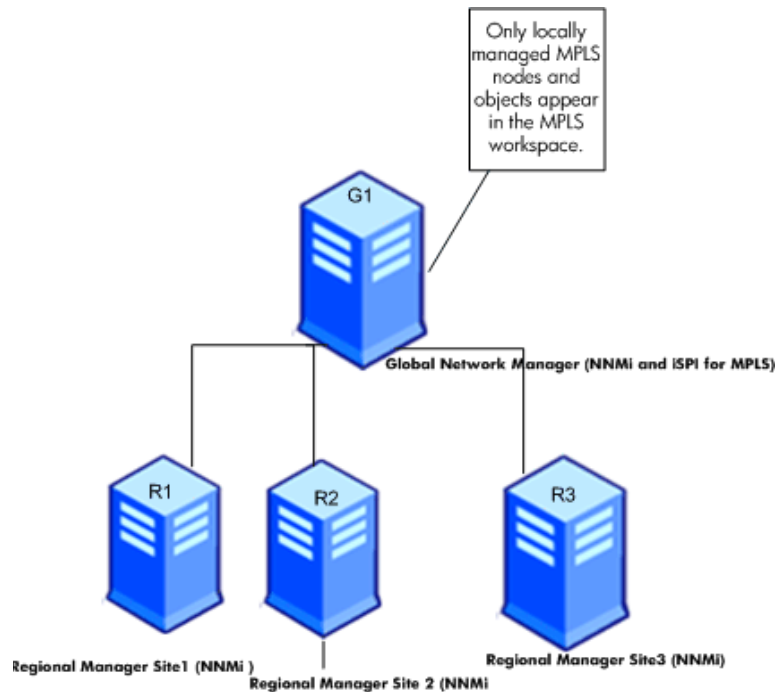
The following figure represents a deployment scenario, where NNMi is configured on the Global Network Manager (G1). NNMi and the iSPI for MPLS are configured on the Regional Managers (R1, R2, and R3):



In this deployment scenario, all the Regional Managers (R1, R2, and R3) discover the MPLS nodes and objects such as VRFs, TE Tunnels, VC LSPs, and MVRFs. The NNM iSPI for MPLS is not available on G1 so there is no communication established between G1 and regional managers for the NNM iSPI for MPLS. Thus, the MPLS nodes and objects from the Regional Managers are not available in the G1 inventory. In addition, no aggregated MPLS reports are available in the MPLS (GNM) inventory.

## Deploying NNMi and NNM iSPI for MPLS on the Global Network Manager and NNMi on the Regional Manager Management Server

You can install and configure NNMi and the NNM iSPI for MPLS on the Global Network Manager and only NNMi on the Regional Managers. For information about the configuration steps, see in the *NNMi and NNM iSPI for MPLS Online Help*. The following figure represents a deployment scenario, where NNMi and NNM iSPI for MPLS is configured on the Global Network Manager (G1) and NNMi on the Regional Managers (R1, R2, and R3):



In this deployment scenario, only the locally managed MPLS nodes and objects such as L3 VPNs, L2VPNs, MVPNs, and PseudoWire VCs are available in the MPLS inventory (G1).

## Deploying the Regional Manager in the Application Failover Environment

When the NNM iSPI for MPLS Regional Manager is in the Application failover environment, use the **ORDER** parameter to decide the priority to establish the connection.

To use the regional manager in an application failover environment, follow these steps:

- 1 Configure the Regional Manager connection using MPLS configuration workspace.
- 2 Add the two regional manager connections and provide the two hostnames.
- 3 Use the **ORDER** parameter to give different values to the two regional managers.

Whenever there is an application fail-over available on the regional manager, the GNM will always use the lowest order value to establish the next connection.

You can configure the regional manager in the application failover environment by using the steps documented in the [Deploy the NNM iSPI for MPLS in an Application Failover Environment with Oracle Database](#) on page 14 and [Deploy the NNM iSPI for MPLS in an Application Failover Environment with Embedded Database](#) on page 15.





# 3 Installing and Upgrading the NNM iSPI for MPLS in an HA Cluster

You can install NNMi and NNM iSPI for MPLS in a High Availability (HA) environment to achieve redundancy in your monitoring setup. The prerequisites to configure the NNM iSPI for MPLS in an HA environment is similar to NNMi. For information, see *NNMi Deployment Reference* guide.

## Installing the NNM iSPI for MPLS

You can configure the NNM iSPI for MPLS for the following scenarios:

- Install NNMi and the NNM iSPI for MPLS in your environment before configuring NNMi to run under HA. See [Configuring an HA Cluster on a Set of Systems with NNMi and iSPI](#) on page 23.
- Install and configure the NNM iSPI for MPLS in an existing NNMi HA cluster environment. See [Installing the NNM iSPI for MPLS in an Existing NNMi HA Cluster Environment](#) on page 25.

## Configuring an HA Cluster on a Set of Systems with NNMi and iSPI

If you have NNMi and the NNM iSPI for MPLS installed on at least two systems, you can create an HA cluster and configure NNMi and the iSPI to run under HA.

You can configure NNMi and NNM iSPI for MPLS on the primary node and secondary node in an HA environment. For more information on how to install NNMi in an HA environment, see *NNMi Deployment Reference*.

### Configure the NNM iSPI for MPLS on the Primary Node

To configure the NNM iSPI for MPLS on the primary node, follow these steps:

- 1 Install NNMi and NNM iSPI for MPLS on each system. See the *NNMi Installation Guide* and the *NNM iSPI for MPLS Installation* guide for more information.
- 2 Configure the HA software on the systems and configure NNMi to run under HA. See the *NNMi Deployment Reference* for information on configuring NNMi to run under HA. Do not start the resource group while configuring NNMi to run under the HA (do not run the `nnmhastartrg.ovpl` command).
- 3 Configure the NNM iSPI for MPLS on the primary (active) node:
  - α Run the following command to find the virtual hostname:  
`nnmofficialfqdn.ovpl`

- b Modify the following files from the `$NnmdataDir/shared/mpls/conf` or `%NnmdataDir%\shared\mpls\conf` to replace the host name with the virtual FQDN for the following parameters:

File Name	Variable Name
<code>nms-mpls.jvm.properties</code>	<code>-Dnmsas.server.security.keystore.alias</code>
<code>nnm.extended.properties</code>	<code>com.hp.ov.nms.spi.mpls.Nnm.hostname</code>
<code>nnm.extended.properties</code>	<code>com.hp.ov.nms.spi.mpls.spi.hostname</code>

- c Modify the `server.properties` file from the `%nnmdatadir%\nmsas\mpls` or `/var/opt/OV/nmsas/mpls` directory to reflect the virtual FQDN of the NNMI management server for the `java.rmi.server.hostname` and `nmsas.server.net.hostname.private` parameters).
- d Modify the `login-config.xml` file from the `%nnminstalldir%\mpls\server\conf` or `/opt/OV/mpls/server/conf` directory to reflect the virtual FQDN of the NNMI management server (for the `module-option` element).
- e Run the following command to start the NNMI HA resource group:

— For Windows:

```
%NnmInstallDir%\misc\nnm\ha\nnmhastartrg.ovpl NNM
<resource_group>
```

— For UNIX:

```
/opt/OV/misc/nnm/ha/nnmhastartrg.ovpl NNM <resource_group>
```

For more information, see *NNMI Deployment Reference* guide.

The NNM iSPI for MPLS and NNMI must start after this step. If NNMI or the NNM iSPI for MPLS does not start, see *Troubleshooting the HA Configuration* from *NNMI Deployment Reference*.

- f Run the following command to configure the NNM iSPI for MPLS to run under the HA cluster:

— For Windows:

```
%NnmInstallDir%\misc\nnm\ha\nnmhaconfigure.ovpl NNM -addon MPLS
```

— For UNIX:

```
/opt/OV/misc/nnm/ha/nnmhaconfigure.ovpl NNM -addon MPLS
```

- 4 Configure the NNM iSPI for MPLS on the secondary (passive) node:

- a Install NNMI with NNM iSPI for MPLS on the secondary node. Make sure the secondary node has a separate Fully Qualified Domain Names (FQDN) during the installation. See the *NNMI Installation Guide* and the *HP Network Node Manager iSPI Performance for MPLS Software Installation* guide for more information.
- a Run the following command to find the virtual hostname:

```
nnmofficialfqdn.ovpl
```



- b Modify the following files from the `$NnmdataDir/shared/mpls/conf` or `%NnmdataDir%\shared\mpls\conf` to replace the host name with the virtual FQDN for the following parameters:

File Name	Variable Name
<code>nms-mpls.jvm.properties</code>	<code>-Dnmsas.server.security.keystore.alias</code>
<code>nnm.extended.properties</code>	<code>com.hp.ov.nms.spi.mpls.Nnm.hostname</code>
<code>nnm.extended.properties</code>	<code>com.hp.ov.nms.spi.mpls.spi.hostname</code>

- c Modify the `server.properties` file from the `%nnmdatadir%\nmsas\mpls` or `/var/opt/OV/nmsas/mpls` directory to reflect the virtual FQDN of the NNMI management server for the `java.rmi.server.hostname` and `nmsas.server.net.hostname.private` parameters).
- d Modify the `login-config.xml` file from the `%nnminstalldir%\mpls\server\conf` or `/opt/OV/mpls/server/conf` directory to reflect the virtual FQDN of the NNMI management server (for the `module-option` element).
- e Run the following commands to configure the NNMI iSPI for MPLS on the secondary node to run under the HA cluster:
  - For Windows:
 

```
%NnmInstallDir%\misc\nnm\ha\nnmhaconfigure.ovpl NNM -addon MPLS
```
  - For UNIX:
 

```
/opt/OV/misc/nnm/ha/nnmhaconfigure.ovpl NNM -addon MPLS
```

- 5 Repeat [step 4](#) on page 24 if you have additional passive nodes in the HA cluster.

## Installing the NNMI iSPI for MPLS in an Existing NNMI HA Cluster Environment

You can configure the NNMI iSPI for MPLS on the primary node and secondary node in an NNMI HA cluster environment. For more information on how to install NNMI in an HA environment, see *NNMI Deployment Reference* guide.

- 1 Make sure that NNMI is running on the primary server.
- 2 Put the NNMI resource group to the HA maintenance mode by placing the maintenance file under the following directory:
 

```
%nnmdatadir%\hacluster\<resource_group_name>
$NnmDataDir/hacluster/<resource_group_name>
```
- 3 Run `ovstatus -c ovjboss` to make sure that `ovjboss` is running.
- 4 Install the NNMI iSPI for MPLS on the primary (active) node in the cluster, but do *not* start the iSPI.

- 5 Modify the following files from the `$NnmdataDir/shared/mpls/conf` or `%NnmdataDir%\shared\mpls\conf` to replace the host name with the virtual FQDN for the following parameters :

File Name	Variable Name
<code>nms-mpls.jvm.properties</code>	<code>-Dnmsas.server.security.keystore.alias</code>
<code>nnm.extended.properties</code>	<code>com.hp.ov.nms.spi.mpls.Nnm.hostname</code>
<code>nnm.extended.properties</code>	<code>com.hp.ov.nms.spi.mpls.spi.hostname</code>

- f Modify the `server.properties` file from the `%nnmdatadir%\nmsas\mpls` or `/var/opt/OV/nmsas/mpls` directory to reflect the virtual FQDN of the NNMI management server for the `java.rmi.server.hostname` and `nmsas.server.net.hostname.private` parameters).
- g Modify the `login-config.xml` file from the `%nnminstallldir%\mpls\server\conf` or `/opt/OV/mpls/server/conf` directory to reflect the virtual FQDN of the NNMI management server (for the `module-option` element).
- h If you have modified any folders and files specified in `mplsdbdatareplicator.conf` file, then replicate them on each cluster member. In case of NNMI iSPI for MPLS, the `mplsdbdatareplicator.conf` contains the following:

*For UNIX:*

```
/var/opt/OV/mpls/server/conf/login-config.xml|I
/var/opt/OV/mpls/server/conf/logging.properties|M
/var/opt/OV/mpls/server/deploy/jboss-logging.xml|M
/var/opt/OV/mpls/server/conf|CM
/var/opt/OV/shared/mpls/conf/publicASMapping|M
/var/opt/OV/shared/mpls/conf/privateASMapping|M
/var/opt/OV/shared/mpls/conf/interProviderVPNConfig|M
/var/opt/OV/shared/mpls/conf/ParserConfig.xml|M
/var/opt/OV/shared/mpls/conf/.keyFile|CM
```

*For Windows:*

```
%NnmInstallDir%\mpls\server\conf\login-config.xml|I
%NnmDataDir%\mpls\server\conf\logging.properties|M
%NnmDataDir%\mpls\server\conf\jboss-logging.xml|M
%NnmDataDir%\mpls\server\conf|CM
%NnmDataDir%\shared\mpls\conf\publicASMapping|M
%NnmDataDir%\shared\mpls\conf\privateASMapping|M
%NnmDataDir%\shared\mpls\conf\interProviderVPNConfig|M
%NnmDataDir%\shared\mpls\conf\ParserConfig.xml|M
%NnmDataDir%\shared\mpls\conf\.keyFile|CM
```

- 6 Remove the maintenance file that you added in [step 2](#) on page 25.

7 Initiate a failover to a secondary (passive) node in the cluster where you want to install the NNM iSPI for MPLS. Make sure that NNMi fails over and runs on the secondary server successfully.

8 On this system, follow these steps:


a Put the NNMi resource group to the HA maintenance mode by placing the maintenance file under the following directory:

```
%nnmdatadir%\hacluster\<resource_group_name>
```

```
$NnmDataDir/hacluster/<resource_group_name>
```

b Run `ovstatus -c ovjboss` to make sure that ovjboss is running.

c Install the NNM iSPI for MPLS on this server., but do *not* start the iSPI.

 The NNM iSPI for MPLS displays two error messages: create db user and create DB. Ignore these errors and continue with the installation.

d Modify the following files from the `/var/opt/OV/shared/mpls/conf` or `%NnmDataDir%\shared\mpls\conf` to replace the host name with the virtual FQDN for the following parameters :

File Name	Variable Name
nms-mpls.jvm.properties	-Dnmsas.server.security.keystore.alias
nnm.extended.properties	com.hp.ov.nms.spi.mpls.Nnm.hostname
nnm.extended.properties	com.hp.ov.nms.spi.mpls.spi.hostname

e Modify the `server.properties` file from the `%nnmdatadir%\nmsas\mpls` or `/var/opt/OV/nmsas/mpls` directory to reflect the virtual FQDN of the NNMi management server for the `java.rmi.server.hostname` and `nmsas.server.net.hostname.private` parameters).

f Modify the `login-config.xml` file from the `%nnminstalldir%\mpls\server\conf` or `/opt/OV/mpls/server/conf` directory to reflect the virtual FQDN of the NNMi management server (for the `module-option` element).

g If you have modified any folders and files specified in `mplsdbdatareplicator.conf` file, then replicate them on each cluster member. In case of NNM iSPI for MPLS, the `mplsdbdatareplicator.conf` contains the following:

*For UNIX:*

```
/var/opt/OV/mpls/server/conf/login-config.xml|I  
/var/opt/OV/mpls/server/conf/logging.properties|M  
/var/opt/OV/mpls/server/deploy/jboss-logging.xml|M  
/var/opt/OV/mpls/server/conf|CM  
/var/opt/OV/shared/mpls/conf/publicASMapping|M  
/var/opt/OV/shared/mpls/conf/privateASMapping|M  
/var/opt/OV/shared/mpls/conf/interProviderVPNConfig|M  
/var/opt/OV/shared/mpls/conf/ParserConfig.xml|M  
/var/opt/OV/shared/mpls/conf/.keyFile|CM
```

*For Windows:*

```

%NnmInstallDir%\mpls\server\conf\login-config.xml|I
%NnmDataDir%\mpls\server\conf\logging.properties|M
%NnmDataDir%\mpls\server\conf\jboss-logging.xml|M
%NnmDataDir%\mpls\server\conf|CM
%NnmDataDir%\shared\mpls\conf\publicASMapping|M
%NnmDataDir%\shared\mpls\conf\privateASMapping|M
%NnmDataDir%\shared\mpls\conf\interProviderVPNConfig|M
%NnmDataDir%\shared\mpls\conf\ParserConfig.xml|M
%NnmDataDir%\shared\mpls\conf\.keyFile|CM

```

- h Remove the maintenance file that you added in [step a](#) on page 27.
- 9 If you have multiple nodes in the cluster, fail over to another passive server, and then repeat [step a](#) on page 27 through [step h](#) on page 28.
- 10 Run the following command on the active server first, and then on all passive servers:
  - For Windows:
 

```
%NnmInstallDir%\misc\nnm\ha\nnmhaconfigure.ovpl NNM -addon MPLS
```
  - For UNIX:
 

```
/opt/OV/misc/nnm/ha/nnmhaconfigure.ovpl NNM -addon MPLS
```
- 11 Verify that the NNM iSPI for MPLS is successfully registered by running the following command:
  - On Windows:
 

```
%nnminstalldir%\misc\nnm\ha\nnmhaclusterinfo.ovpl -config NNM -get NNM_ADD_ON_PRODUCTS
```
  - On UNIX/Linux:
 

```
/opt/OV/misc/nnm/ha/nnmhaclusterinfo.ovpl -config NNM -get NNM_ADD_ON_PRODUCTS
```

## Licensing

You require two licenses to run the NNM iSPI for MPLS in an HA cluster:

- One production license tied to the IP address of one of the physical cluster nodes
- One non-production license tied to the virtual IP address of the NNMi HA resource group

After obtaining these licenses for the NNM iSPI for MPLS, follow the procedure in the *Licensing NNMi in an HA Cluster* section in the *NNMi Deployment Reference*.

## Upgrading the NNM iSPI for MPLS in an HA Cluster

To upgrade the NNM iSPI for MPLS to the version 9.20 in an HA cluster, follow these steps:

- 1 On the primary (active) node in the cluster, follow these steps:
  - a Put the NNMi resource group to the HA maintenance mode by placing the maintenance file under the following directory:

```
%nnmdatadir%\hacluster\<resource_group_name>  
$NnmDataDir/hacluster/<resource_group_name>
```

- b** Upgrade NNMi to the version 9.20.
- c** Run **ovstart -c ovjboss** to make sure that ovjboss is running.
- d** Upgrade the NNM iSPI for MPLS to the version 9.20,
- e** Stop all NNMi and iSPI processes.
- f** Make sure that the following files from the `/var/opt/OV/shared/mpls/conf` or `%NnmDataDir%\shared\mpls\conf` contain the virtual FQDN for the following parameters :

File Name	Variable Name
nms-mpls.jvm.properties	-Dnmsas.server.security.keystore.alias
nnm.extended.properties	com.hp.ov.nms.spi.mpls.Nnm.hostname
nnm.extended.properties	com.hp.ov.nms.spi.mpls.spi.hostname

- g** Make sure that the `server.properties` file from the `%nnmdatadir%\nmsas\mpls` or `/var/opt/OV/nmsas/mpls` directory contains the virtual FQDN of the NNMi management server for the `java.rmi.server.hostname` and `nmsas.server.net.hostname.private` parameters).
- h** Make sure that the `login-config.xml` file from the `%nnminstalldir%\qa\server\conf` or `/opt/OV/mpls/server/conf` directory contains the virtual FQDN of the NNMi management server (for the `module-option` element).
- i** If you have modified any folders and files specified in `mplsdbdatareplicator.conf` file, then replicate them on each cluster member. In case of NNM iSPI for MPLS, the `mplsdbdatareplicator.conf` contains the following:

*For UNIX:*

```
/var/opt/OV/mpls/server/conf/login-config.xml|I  
/var/opt/OV/mpls/server/conf/logging.properties|M  
/var/opt/OV/mpls/server/deploy/jboss-logging.xml|M  
/var/opt/OV/mpls/server/conf|CM  
/var/opt/OV/shared/mpls/conf/publicASMapping|M  
/var/opt/OV/shared/mpls/conf/privateASMapping|M  
/var/opt/OV/shared/mpls/conf/interProviderVPNConfig|M  
/var/opt/OV/shared/mpls/conf/ParserConfig.xml|M  
/var/opt/OV/shared/mpls/conf/.keyFile|CM
```

*For Windows:*

```
%NnmInstallDir%\mpls\server\conf\login-config.xml|I  
%NnmDataDir%\mpls\server\conf\logging.properties|M  
%NnmDataDir%\mpls\server\conf\jboss-logging.xml|M  
%NnmDataDir%\mpls\server\conf|CM  
%NnmDataDir%\shared\mpls\conf\publicASMapping|M
```

```

%NnmDataDir%\shared\mpls\conf\privateASMapping|M
%NnmDataDir%\shared\mpls\conf\interProviderVPNConfig|M
%NnmDataDir%\shared\mpls\conf\ParserConfig.xml|M
%NnmDataDir%\shared\mpls\conf\.keyFile|CM

```

- 2 On the secondary (passive) node in the cluster, follow these steps:
- a Put the NNMi resource group to the HA maintenance mode by placing the maintenance file under the following directory:

```

%nnmdatadir%\hacluster\<resource_group_name>
$NnmDataDir/hacluster/<resource_group_name>

```

- b Upgrade NNMi to the version 9.20.
- c Upgrade the NNM iSPI for MPLS to the version 9.20,
- d Make sure that the following files from the `/var/opt/OV/shared/mpls/conf` or `%NnmdataDir%\shared\mpls\conf` contain the virtual FQDN for the following parameters :

File Name	Variable Name
nms-mpls.jvm.properties	-Dnmsas.server.security.keystore.alias
nnm.extended.properties	com.hp.ov.nms.spi.mpls.Nnm.hostname
nnm.extended.properties	com.hp.ov.nms.spi.mpls.spi.hostname

- e Make sure that the `server.properties` file from the `%nnmdatadir%\nmsas\mpls` or `/var/opt/OV/nmsas/mpls` directory contains the virtual FQDN of the NNMi management server for the `java.rmi.server.hostname` and `nmsas.server.net.hostname.private` parameters).
- f Make sure that the `login-config.xml` file from the `%nnminstallldir%\mpls\server\conf` or `/opt/OV/mpls/server/conf` directory contains the virtual FQDN of the NNMi management server (for the `module-option` element).
- g If you have modified any folders and files specified in `mplsdbdatareplicator.conf` file, then replicate them on each cluster member. In case of NNM iSPI for MPLS, the `mplsdbdatareplicator.conf` contains the following:

*For UNIX:*


```

/var/opt/OV/mpls/server/conf/login-config.xml|I
/var/opt/OV/mpls/server/conf/logging.properties|M
/var/opt/OV/mpls/server/deploy/jboss-logging.xml|M
/var/opt/OV/mpls/server/conf|CM
/var/opt/OV/shared/mpls/conf/publicASMapping|M
/var/opt/OV/shared/mpls/conf/privateASMapping|M
/var/opt/OV/shared/mpls/conf/interProviderVPNConfig|M
/var/opt/OV/shared/mpls/conf/ParserConfig.xml|M
/var/opt/OV/shared/mpls/conf/.keyFile|CM

```

*For Windows:*

```
%NnmInstallDir%\mpls\server\conf\login-config.xml|I
%NnmDataDir%\mpls\server\conf\logging.properties|M
%NnmDataDir%\mpls\server\conf\jboss-logging.xml|M
%NnmDataDir%\mpls\server\conf|CM
%NnmDataDir%\shared\mpls\conf\publicASMapping|M
%NnmDataDir%\shared\mpls\conf\privateASMapping|M
%NnmDataDir%\shared\mpls\conf\interProviderVPNConfig|M
%NnmDataDir%\shared\mpls\conf\ParserConfig.xml|M
%NnmDataDir%\shared\mpls\conf\.keyFile|CM
```

- 3 Repeat [step 2](#) on page 30 on each passive node.
- 4 Remove the maintenance file from all passive nodes in the cluster.
- 5 Stop all the processes on the primary server by running **ovstop -c**
  -  You have to run **ovstop** because ovjboss starts on primary server
- 6 Execute the command **Nnmhastartrg.ovpl** on primary server. After the resource-group is online and all the processes are running, remove the maintenance file from primary server





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**Product name and version:** NNM iSPI for MPLS 9.20

**Document title:** Deployment Guide

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