

# HP Network Node Manager iSPI for MPLS Software

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

Software Version: 9.10

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## Deployment Guide

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# 1 Introducing the iSPI for MPLS

HP Network Node Manager i Software Smart Plug-in for MPLS (Multi Protocol Label Switching) (NNMi iSPI for MPLS) helps you to extend the capability of HP Network Node Manager i Software (NNMi) to monitor the overall health of the network.

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

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

## Preparing for Deployment

Before you start deploying the 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 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 iSPI for MPLS.

To install and configure the 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 iSPI for MPLS:

- *HP Network Node Manager i Software Installation Guide, 9.10*
- *HP Network Node Manager i Software Deployment Reference Guide, 9.10*
- *HP Network Node Manager i Software Release Notes, 9.10*
- *HP Network Node Manager i Software Support Matrix, 9.10*

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

- *HP Network Node Manager Smart Plug-in for MPLS Installation Guide, 9.10*
- *HP Network Node Manager Smart Plug-in for MPLS Release Notes, 9.10*
- *HP Network Node Manager Smart Plug-in for MPLS Support Matrix, 9.10*

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

## Environment Variables Used in the iSPI for MPLS Documents

The 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 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 iSPI for MPLS for the following scenarios:

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

### Deploy the iSPI for MPLS and NNMi Together

To deploy the 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 (Postgres Embedded or Oracle) as NNMi when you are installing the iSPI for MPLS.
- 3 Install the iSPI for MPLS, 9.10. For more information, see the *iSPI for MPLS Installation Guide*.
  - 4 Start the 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 the 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-enabled nodes are discovered along with NNMi nodes. For more information, see *NNMi Online Help*.
- 7 Log on to the NNMi console and verify that MPLS-enabled nodes are discovered. After the MPLS-enabled nodes are discovered, you can view the **MPLS** workspace and use it to launch inventory and form views for MPLS objects.

## Deploy the iSPI for MPLS in an NNMi Environment

To deploy the 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 (Postgres Embedded or Oracle) as NNMi when you are installing the iSPI for MPLS.

- 1 Install the 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 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 iSPI for MPLS, log on to the NNMi console, and then verify the availability of the MPLS workspace and MPLS views.

## Using Single Sign-On with NNM iSPI

By default Network Node Manager disables the Single Sign-On. To enable the Single Sign-On feature, follow these steps after installing NNM iSPI for MPLS.

- 1 Edit `/var/opt/OV/shared/nnm/conf/props/nms-ui.properties`:
  - a Set `com.hp.nms.ui.sso.isEnabled = true`
  - b Make a note of `initString`
  - c Run `nmssso.ovpl -reload`
- 2 Edit `/opt/OV/nonOV/mppls/jboss/server/nms/conf/lwssofmconf.xml`:

- a Change the value for `enableLWSSOFramework` from `'False'` to `'True'`
- b Make sure that the `initString` value is same for NNMi and iSPI for MPLS
- c Restart the iSPI for MPLS process

For more information, see *Using Single Sign-On with NNMi in NNMi 9.10 Deployment Reference*.

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

You must install NNMi 9.10, 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, iSPI for MPLS, and the iSPI Performance for Metrics/NPS on the same server.
- Installing the iSPI for MPLS and NNMi on one server and 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, 9.10.
- 2 Install the iSPI Performance for Metrics/NPS. 9.10. For information about the steps to install, see *HP NNMi iSPI Performance for Metrics/NPS Installation Guide*.
- 3 Install the iSPI for MPLS, 9.10.



Always install the iSPI Performance for Metrics/NPS and then install the iSPI for MPLS. If you have installed NNMi and iSPI for MPLS before installing NPS and 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

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

- 1 Install NNMi, 9.10 and iSPI for MPLS, 9.10 on the same management server.

- 2 Install the 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, iSPI for MPLS, and iSPI Performance for Metrics/NPS.



Always install the iSPI Performance for Metrics/NPS and then install the iSPI for MPLS. If you have installed NNMi and iSPI for MPLS before installing NPS and 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 iSPI for MPLS introduces the following extension packs on the NPS/ Metrics console:

<b>Extension Pack Name</b>	<b>Purpose</b>
MPLS LSR Node	Shows report based on the available metric definitions for an MPLS-enabled nodes.
MPLS LSR Interface	Shows report based on the available metric definitions for an MPLS-enabled interfaces.
L3_VPN_VRF	Shows report based on the available metric definitions for a VRF or an L3VPN.

The extension packs use data collected by the 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->Reporting-Report Menu**. The iSPI Performance for Metrics console appears with the MPLS metrics and you can generate the MPLS reports.

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

# Deploy the iSPI for MPLS in a High Availability Cluster Environment

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

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

- Configuring NNMi and iSPI for MPLS together in an HA environment.
- Configuring the iSPI for MPLS in an NNMi environment.

## Configuring NNMi and iSPI for MPLS Together in an HA Cluster Environment

You can configure NNMi and iSPI for MPLS on the primary and secondary node in an HA environment. Make sure that the primary and secondary servers have different Fully Qualified Domain Names (FQDN) during the installation. See the *NNMi Installation Guide*. For more information about how to install NNMi on an HA environment, see *NNMi Deployment Reference*.

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

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

- 1 Install NNMi and then iSPI for MPLS. After you install the iSPI for MPLS, install the iSPI for MPLS licenses. For more information, see <https://webware.hp.com/welcome.asp>.
- 2 Configure NNMi in an HA cluster environment on the primary node. For information, see *NNMi Deployment Reference*.
- 3 Run the following command from the `$NNM_BIN` directory to find the virtual hostname:  
`<NnmInstallDir>/bin/ nnmofficialfqdn.ovpl`
- 4 Modify the following files from the `$NnmdataDir/shared/mpls/conf/or %NnmdataDir%\shared\mpls\conf` to show the Virtual FQDN instead of hostname:

File Name	Value
<code>nms-mpls.jvm.properties</code>	<code>-Dcom.hp.ov.nms.ssl.KEY_ALIAS= =&lt;Virtual FQDN&gt;.selfsigned</code>
<code>nms-mpls.jvm.properties</code>	<code>-Djava.rmi.server.hostname=&lt;V irtual FQDN&gt;</code>
<code>nms-mpls.address.properties</code>	<code>jboss.nnm.host=&lt;Virtual FQDN&gt;</code>
<code>nnm.extended.properties</code>	<code>com.hp.ov.nms.spi.mpls.spi.ho stname=&lt;Virtual FQDN&gt;</code>
<code>nnm.extended.properties</code>	<code>com.hp.ov.nms.spi.mpls.Nnm.ho stname=&lt;Virtual FQDN&gt;</code>

- 5 If you have modified any folders and files specified in `$NnmDataDir/shared/nnm/mplsdbdatareplicator.conf` file, then replicate them on each cluster member. In case of iSPI for MPLS, the `mplsdbdatareplicator.conf` contains the following folders:

```
$NnmInstallDir/nonOV/mpls/jboss/server/nms/conf|CM
$NnmDataDir/shared/mpls/conf/logging.properties|M
$NnmDataDir/shared/mpls/conf/publicASMapping|M
$NnmDataDir/shared/mpls/conf/privateASMapping|M
$NnmDataDir/shared/mpls/conf/interProviderVPNConfig|M
```

- 6 Start the NNMi HA resource group by the following command:

- For Windows:

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

- For UNIX:

```
$NnmInstallDir/misc/nnm/ha/nmhastartrg.ovpl NNM <resource_group>
```

For more information, see *NNMi Deployment Reference Guide*.

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

- 7 Configure the iSPI for MPLS by the following commands:

- For Windows:

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

- For UNIX:

```
$NnmInstallDir/misc/nnm/ha/nmhaconfigure.ovpl NNM -addon MPLS
```

## Configure the iSPI for MPLS on the Secondary Node

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

- 1 Configure NNMi on the secondary node. For information, see *Configuring NNMi on the Secondary Cluster Node*. After you install the iSPI for MPLS, install the iSPI for MPLS non production licenses. For more information, see <https://webware.hp.com/welcome.asp>.
- 2 Modify the following files from the `$NnmdataDir/shared/mpls/conf/` or `%NnmdataDir%\shared\mpls\conf` to show the Virtual FQDN instead of hostname:

File Name	Value
<code>nms-mpls.jvm.properties</code>	<code>-Dcom.hp.ov.nms.ssl.KEY_ALIAS=&lt;Virtual FQDN&gt;.selfsigned</code>
<code>nms-mpls.jvm.properties</code>	<code>-Djava.rmi.server.hostname=&lt;Virtual FQDN&gt;</code>
<code>nms-mpls.address.properties</code>	<code>jboss.nnm.host=&lt;Virtual FQDN&gt;</code>
<code>nnm.extended.properties</code>	<code>com.hp.ov.nms.spi.mpls.spi.hostname=&lt;Virtual FQDN&gt;</code>
<code>nnm.extended.properties</code>	<code>com.hp.ov.nms.spi.mpls.Nnm.hostname=&lt;Virtual FQDN&gt;</code>

- 3 Configure the iSPI for MPLS on the secondary node by the following commands:

- For Windows:

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

- For UNIX:

```
$NnmInstallDir/misc/nnm/ha/nnmhaconfigure.ovpl NNM -addon MPLS
```

## Configuring the iSPI for MPLS in an NNMi HA Cluster Environment

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

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

Before you start configuring the iSPI for MPLS, make sure that NNMi is running on the primary node in an HA cluster environment. In addition, update the NNMi in the maintenance mode to prevent failover. Follow the steps documented in the *NNMi Deployment Reference* to put NNMi into the maintenance mode. Make sure that NNMi (ovjboss) is running by the following command: `ovstatus -c`.

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

- 1 Install the iSPI for MPLS.
- 2 Remove NNMi from maintenance mode. For information, see *Removing an HA Resource Group from Maintenance Mode* from the *NNMi Deployment Reference*.
- 3 Start configuring the iSPI for MPLS by the following commands:

- For Windows:

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

- For UNIX:

```
$NnmInstallDir/misc/nnm/ha/nnmhaconfigure.ovpl NNM -addon MPLS
```

- 4 Switch the HA application group of NNMi & iSPI for MPLS to the secondary system.

### Configure the iSPI for MPLS on the Secondary Node

Before you start configuring the iSPI for MPLS, make sure that NNMi is running on the secondary node in an HA cluster environment. In addition, change NNMi into the maintenance mode to prevent failover. Follow the steps documented in the *NNMi Deployment Reference* to put NNMi into the maintenance mode. Make sure that NNMi (ovjboss) is running by the following command: `ovstatus -c`.

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

- 1 Start installing the iSPI for MPLS. While installing the iSPI for MPLS, the following errors appear:
  - Create Database User
  - Create Database

Ignore the error messages and click **OK**. The database is created on the primary node while installing the iSPI for MPLS and exists on the shared disk.

- 2 Remove NNMi from maintenance mode. For information, see *Removing an HA Resource Group from Maintenance Mode* from the *NNMi Deployment Reference*.
- 3 Start configuring the iSPI for MPLS by the following commands:
  - For Windows:
 

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

```
$NnmInstallDir/misc/nnm/ha/nnmhaconfigure.ovpl NNM -addon MPLS
```
- 4 Run the command `nnmhaclusterinfo.ovpl -config NNM -get NNM_ADD_ON_PRODUCTS`. HA is configured properly if the output shows the node names across the SPI name. For example, `MPLS[hasol1,hasol2]`:

- When the Primary system fails-over to Secondary standby system, the cluster software may bring down the NNMi on Primary unless it's a system failure. In such case, the `ovstop` on "mplsjboss" may not be successful. After the fail-over from one cluster member to other member, make sure that the NNMi and iSPI for MPLS are stopped successfully on failed system. Terminate the java process of iSPI for MPLS, `mplsjboss`. The corresponding java process for `mplsjboss` can be found using the "ps" command on Unix and Task Manager on Windows
- The timeout parameters on Cluster software need to be tuned during the HA deployment. The important timeout parameters for Veritas Cluster Software are `OfflineTimeout`, `OnlineTimeout` and `MonitorTimeout`. In case of Windows Cluster Manager software, consider tuning `Pending Timeout` and `Deadlock Timeout` parameters. These parameters are to be modified accordingly when two or more iSPI add-on products are installed as well
- The iSPI for MPLS log and trace files do not go into the appropriate folder on Mounted shared disk. It continues to go into the `$NnmDataDir/log/mpls` folder on both cluster member systems. This folder can be looked at if any log or trace file need to be sent to support for any reason

## Remove the iSPI for MPLS from an HA Cluster Environment

To remove the iSPI for MPLS from an HA cluster environment, first remove the iSPI for MPLS from the secondary node and then from the primary node.

To remove the iSPI for MPLS from an HA cluster environment, follow these steps:

- 1 Remove the iSPI for MPLS from an HA cluster environment by the following command:
  - Windows:
 

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

```
$NnmInstallDir/misc/nnm/ha/nnmhaunconfigure.ovpl NNM -addon MPLS
```
- 2 Remove NNMi from an HA cluster environment. For information, see *NNMi Deployment Reference Guide*.



# Deploy the iSPI for MPLS in an Application Failover Environment

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

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

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

- 1 Install NNMi in the primary server mode server 1 and install NNMi in the secondary server mode on server 2.
- 2 Start NNMi on server 1.
- 3 Install the 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 iSPI for MPLS license on server 1.
- 6 Stop NNMi on server 1.
- 7 Start NNMi on server 2.
- 8 Install the iSPI for MPLS on server 2.
- 9 Configure iSPI for MPLS on server 2 with the same database instance, user name, and password configured on server 1.
- 10 After the installation of the iSPI for MPLS, install the 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 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 Remove the iSPI for application failover by using the following steps:
  - a Disable application failover for the 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.
- 4 Install the iSPI for MPLS on both primary and secondary servers following the steps discussed in Scenario 1.
- 5 Install the licenses available for the iSPI for MPLS installed on a server 1 and a server 2.
- 6 Configure the iSPI for MPLS for an application failover.

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

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

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

Scenario 2: In this scenario, consider that you want to install the 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 iSPI for MPLS on both the primary and the secondary servers.
- 4 Install the iSPI for MPLS non production license on both the servers.
- 5 Configure the iSPI for MPLS in the application failover mode.
- 6 Configure NNMi in the application failover mode. Follow instructions from the *NNMi Deployment Reference Guide* to configure NNMi in an application failover mode.

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

The 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 iSPI for MPLS and IP Multicast provides the collaborative monitoring of an MVPN topology.

Navigate from the iSPI for MPLS to the 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 *iSPI for MPLS Online Help, Overview of the Multicast VPN (MVPN) and MPLS view*.

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

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

- 1 Install NNMi 9.10.
- 2 Install the iSPI for MPLS, 9.10.
- 3 Install the iSPI for IP Multicast, 9.10.

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

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

The 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 iSPI for MPLS uses the QA performance capabilities. You can view the tests configured for the selected VRF by using the VRF form.

The integration of the 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 connectivities.
- 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 iSPI for MPLS on the same NNMi management server.

## Deploying the 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 9.10 Online Help and NNM iSPI for MPLS 9.10 Reference Pages*.

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

You can deploy the iSPI for MPLS in a Global Network Management (GNM) environment. The iSPI for MPLS uses the capabilities of NNMi Global Network Manager (NNMi GNM) and provides a centralized view to monitor the multiple sites. The 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 iSPI for MPLS inventory (GNM). For more information about how to configure the iSPI for MPLS regional managers, see the *iSPI for MPLS Online Help*.

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

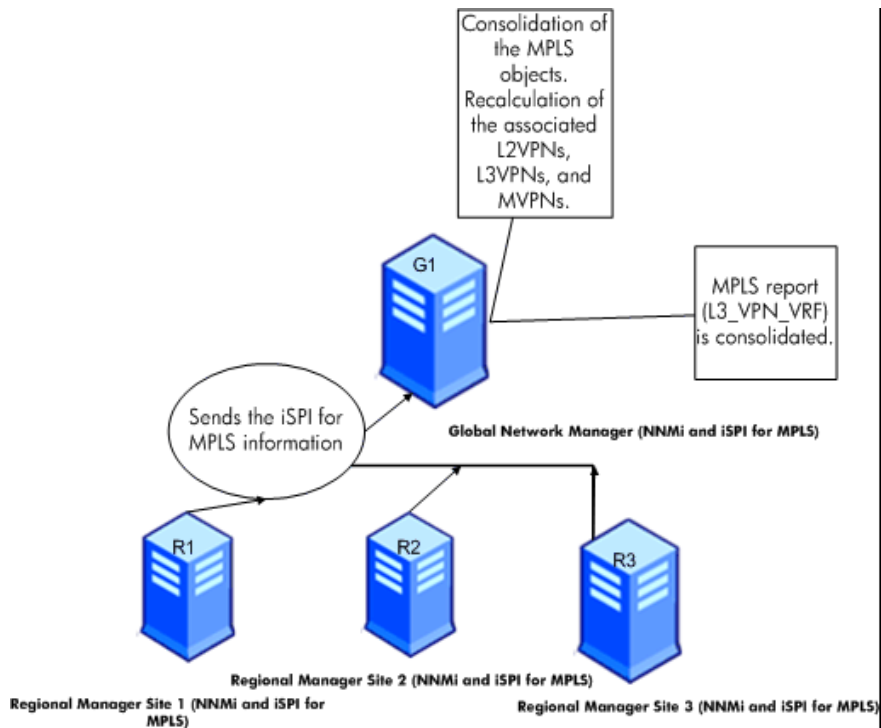
- Both NNMi and iSPI for MPLS are configured on the Global Network Manager server and Regional Manager management servers.
- NNMi is configured on the Global Network Manager server and NNMi and iSPI for MPLS are configured on the Regional Manager management servers.
- Both NNMi and iSPI for MPLS are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

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

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

The following figure represents a deployment scenario, where NNMi and 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

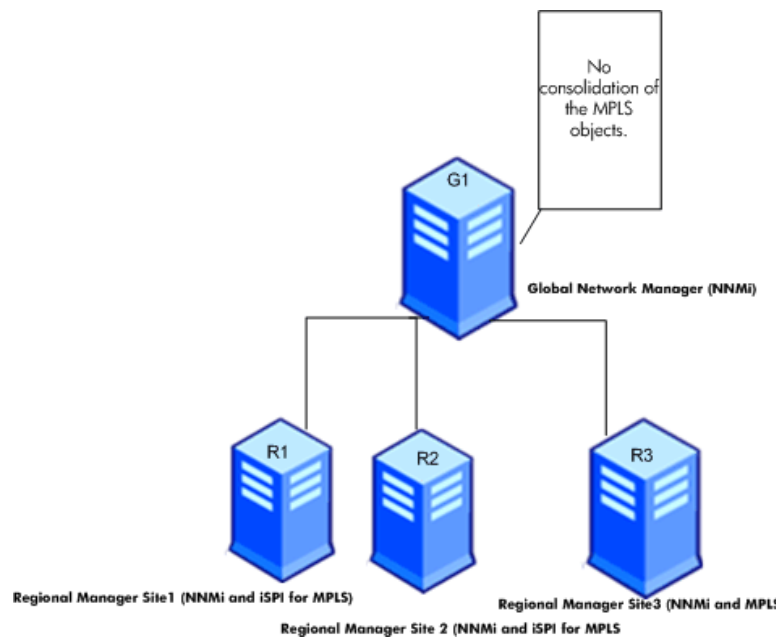
incidents are not forwarded from the regional managers to GNM (G1) as the MPLS topology is derived again in the G1. The incidents are only generated for the MPLS objects available in the G1 inventory.

- Consolidated L3\_VPN\_VRF report is available. Other MPLS reports are available only for the local MPLS nodes in the G1.

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

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

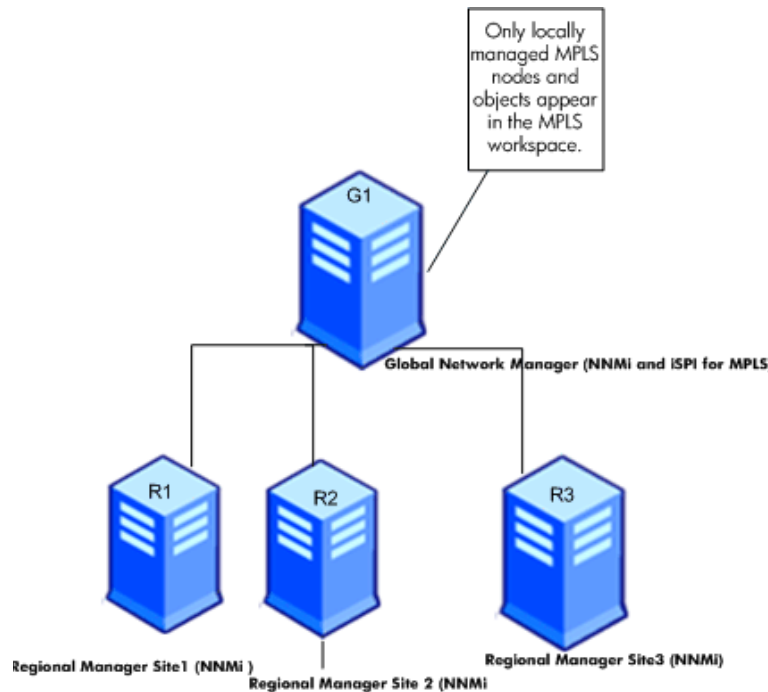
The following figure represents a deployment scenario, where NNMi is configured on the Global Network Manager (G1). NNMi and the iSPI for MPLS are configured on the Regional Managers (R1, R2, and R3):



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 iSPI for MPLS is not available on G1 so there is no communication established between G1 and regional managers for the 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 iSPI for MPLS on the Global Network Manager and NNMi on the Regional Manager Management Server

You can install and configure NNMi and the 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 iSPI for MPLS Online Help*. The following figure represents a deployment scenario, where NNMi and 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 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 iSPI for MPLS in an Application Failover Environment with Oracle Database](#) on page 17 and [Deploy the iSPI for MPLS in an Application Failover Environment with Embedded Database](#) on page 18.







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