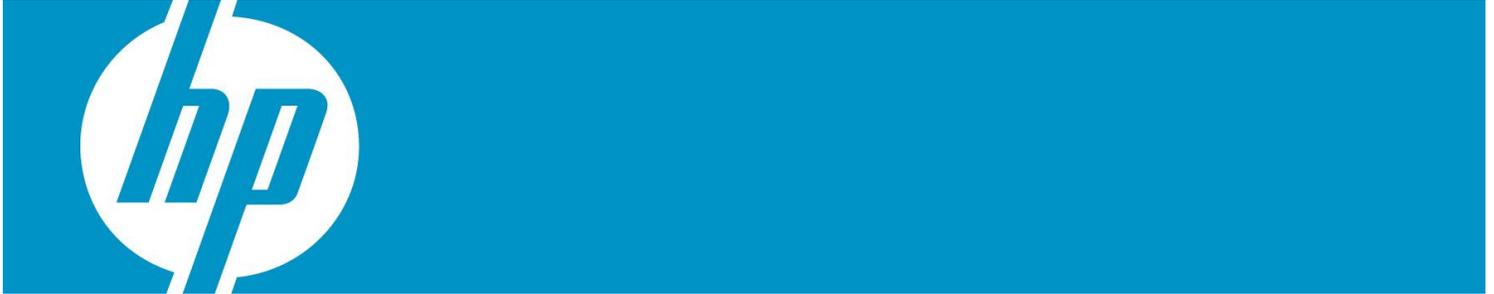


HP Business Service Management

for the Windows/Linux operating system

Software Version: 9.20

HP NNMi – HP BSM Topology Integration Best Practices



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Executive Summary

The purpose of this document is to provide details about topology integration between NNMi and BSM, beyond what is documented in the product manuals. This document focuses on BSM 9.10 and higher, and NNMi 9.10.

There are two ways to populate BSM with Layer 2 network topology from NNMi: the historical UCMDB Probe-based method, and the newer NNMi - BSM topology integration method. This best practices document compares these two methods, and then focuses on the HP preferred NNMi - BSM topology integration method, while addressing the following:

- How to configure the integration.
- The topology that NNMi creates in BSM.
- Configuring views to consume the network topology within BSM.
- How the CIs in BSM are maintained when NNMi objects are added, updated and removed.

NNMi Integration to BSM: Which Method to Use?

NNMi is the authoritative source for Layer 2 network topology. There are two methods for integrating NNMi topology into BSM/UCMDB:

- NNMi – BSM topology integration.
- NNMi – UCMDB integration.

HP recommends using the NNMi - BSM topology integration method. The other integration method which uses the Data Flow Probe (formerly called DDM Probe) is still supported, but it is used more for backward compatibility with older product versions (for example NNMi 8.11).

The NNMi - BSM topology integration method is documented in the *NNMi Deployment Reference*. The Probe-based method is documented in the *UCMDB Discovery and Integration Content Guide*.

Refer to the table in Appendix A for a comparison of these two methods.

Configuring the NNMi – BSM Topology Integration

This section summarises how to configure the NNMi – BSM topology integration and expands on some key points. Refer to the *NNMi 9.10 Deployment Reference* for details.

In the NNMi console, open the HP NNMi–HP BSM Topology Integration Configuration form (Integration Module Configuration > HP BSM Topology). Select the “Enable Integration” check box and complete the form.

When connecting NNMi to a multi-server BSM deployment, the “BSM Host” field needs to point to the BSM Gateway server.

Please note that although the fields in the form are labelled “BSM User” and “BSM Password”, these fields are actually the “RTSM User” and “RTSM Password”. RTSM users are different from BSM users; the RTSM user and password are used for RTSM integrations. By default, installing BSM 9.1x creates an RTSM user called admin, with the password set to admin.

To perform the NNMi – BSM topology integration, create and use a new RTSM user for better accountability and auditing. The CIs that are created or updated by this integration set the attributes “Created By” and “Updated By”. By using a different user for the integration, these attributes will be set to “UCMDB: User:<integration_user>” instead of the more generic “UCMDB: User:admin”, making it easier to discern the source responsible for the CI. The steps to create a new user are outlined in Appendix B, “Creating a new RTSM user”.

The *NNMi 9.10 Deployment Reference* suggests setting the Interface CI display label to prefer interface_name over mac_address. This results in a more user friendly display. To make this change, open the CI Type Manager in RTSM Administration, and select the Interface CI Type. Select the Default Label tab and set the format to:

```
interface_name | mac_address
```

Note that although the *NNMi 9.10 Deployment Reference* suggests changing the Node Name Resolution order to First Choice = Full DNS Name and Second Choice = Short DNS Name, this cannot be done in NNMi 9.10 (see QCCR1B90169). You can use the default Node Name Resolution order.

Figure 1. NNMi – BSM Topology Integration form

<http://wynand.rose.hp.com/> - HP NNMi-HP BSM Topology Integration Configuration

HP NNMi-HP BSM Topology Integration Configuration

Enable Integration: Help

NNMi SSL Enabled:

NNMi Host:

NNMi User:

NNMi Password:

BSM SSL Enabled:

BSM Host:

BSM Port:

BSM User:

BSM Password:

Topology Filter Node Group:

Additional Connections Node Group:

Topology Synchronization Interval (hrs):

BSM Topology Created by NNMi

The NNMi - BSM topology integration creates the following CIs:

- Node
- Interface
- IpAddress
- IpSubnet
- Layer2Connection
- HardwareBoard
- PhysicalPort

Devices such as switches, routers, and servers are all defined as Node CI Types. The device type is identified by the Node CI's NodeRole attribute. In NNMi 9.10, the NodeRole array attribute is set to one or more of these values: "hub", "load_balancer", "printer", "router", "server", "lan_switch", "voice_gateway" and/or "desktop". This is because it is possible for a network device to change its role (such as from a switch to a switch-router), and this method provides simple tracking via the CI's NodeRole attribute.

A single node can have multiple node roles. NNMi decides, based on the node's Device Category and the node's capabilities as discovered by NNMi, which NodeRole(s) to set. The following table shows the mapping of NNMi Device Category to NodeRole attribute.

Table 1. Mapping of NNMi Device Category to Node CI's NodeRole attribute

NNMi Device Category	NodeRole Attribute
Hub	hub
Load Balancer	load_balancer
Printer	printer
Router	router
Server	server
Switch	lan_switch
Switch-Router	router, lan_switch
Voice Gateway	voice_gateway
Workstation	desktop

In addition to the Device Category mapping, if a node has IP forwarding capability (com.hp.nnm.capability.node.ipforwarding), the NodeRole "router" is applied. If a node has switching capability (com.hp.nnm.capability.node.lan_switching), the NodeRole "lan_switch" is applied.

The NNMi - BSM topology integration creates the following relationships:

- Membership: IpSubnet -> IpAddress
- Membership: Layer2Connection -> Interface
- Composition: Node -> Interface
- Containment: Node -> IpAddress
- Composition: Node -> HardwareBoard
- Composition: HardwareBoard -> HardwareBoard
- Composition: HardwareBoard -> PhysicalPort
- Realization: PhysicalPort -> Interface

Refer to Appendix C for the mapping of NNMi attributes to the equivalent CI attributes for each CI type.

Network Topology Views

The network topology views in BSM 9.1x are designed to work with the historical NNMi – UCMDB integration method. This is because the TQLs includes a Net Device CI type or a Computer CI type, whereas the NNMi - BSM topology integration creates nodes as Node CIs only, setting the NodeRole attribute to identify the device types as servers, switches, and so forth.

Until the views are updated in the product, you can easily modify them to work with the NNMi populated network topology. The following sections describe how to modify views to suit modelling with RTSM, Service Health and Operations Management (OMi).

Layer 2 Topology View

The **Layer 2 by NNMi** view in BSM 9.1x can be easily modified to work with the topology created by the BSM – NNMi topology integration. One way to do this is as follows:

- Open the **Layer 2 by NNMi** view and save it as **Layer 2 by NNMi 9.10**.
- Modify the **Layer 2 by NNMi 9.10** view as follows:
 - Delete the Net Device CI Type, and in its place add another Node CI Type.
 - Add a Composition relationship between this new Node CI and its Interface CI.
 - Re-establish the folding rule (fold Interface under Node).
 - For the Node CI, specify that the NodeRole attribute must contain “lan_switch” or “router” to restrict the results to network devices.
 - (Optional) You can further restrict the results by specifying the Node CI name(s) to match in order to view the equivalent of a **Layer 2 Neighbor** view.

The following two screenshots show the results, comparing an NNMi 9.10 **Layer 2 Neighbor View** with the equivalent **Layer 2 by NNMi 9.10** view in BSM. The third screenshot shows the **Layer 2 by NNMi** view in UCMDB using the historical NNMi – UCMDB integration method, to show that the results are equivalent.

Figure 2. NNMi Layer 2 Neighbor View

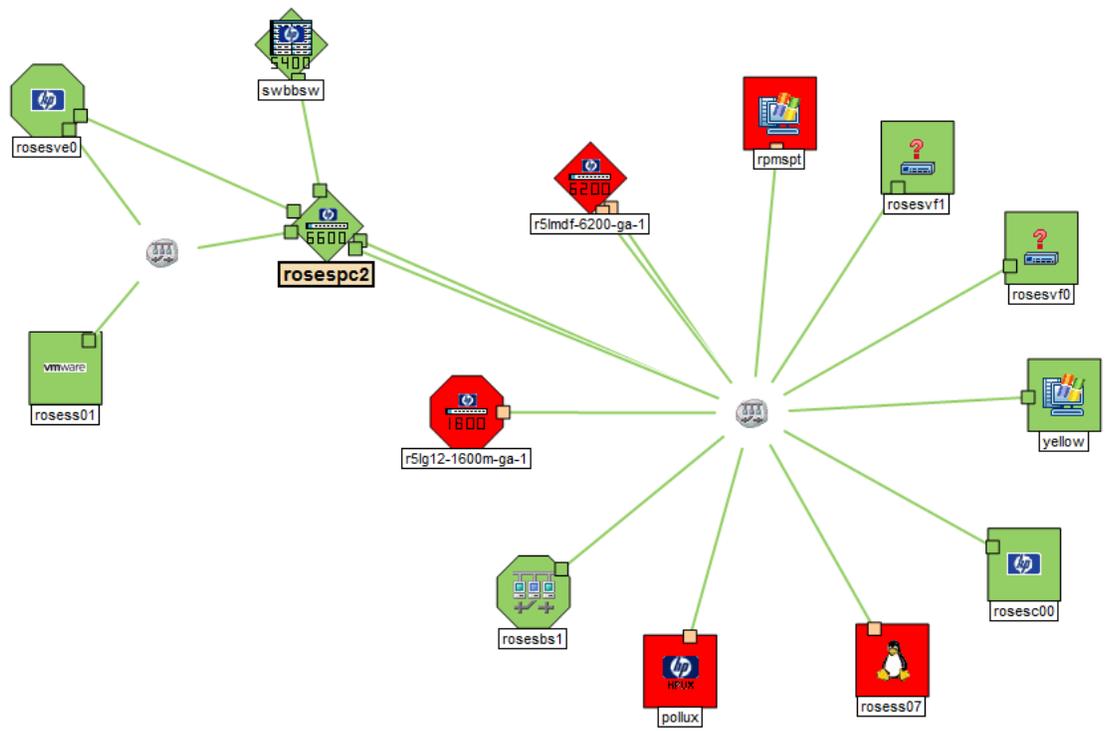
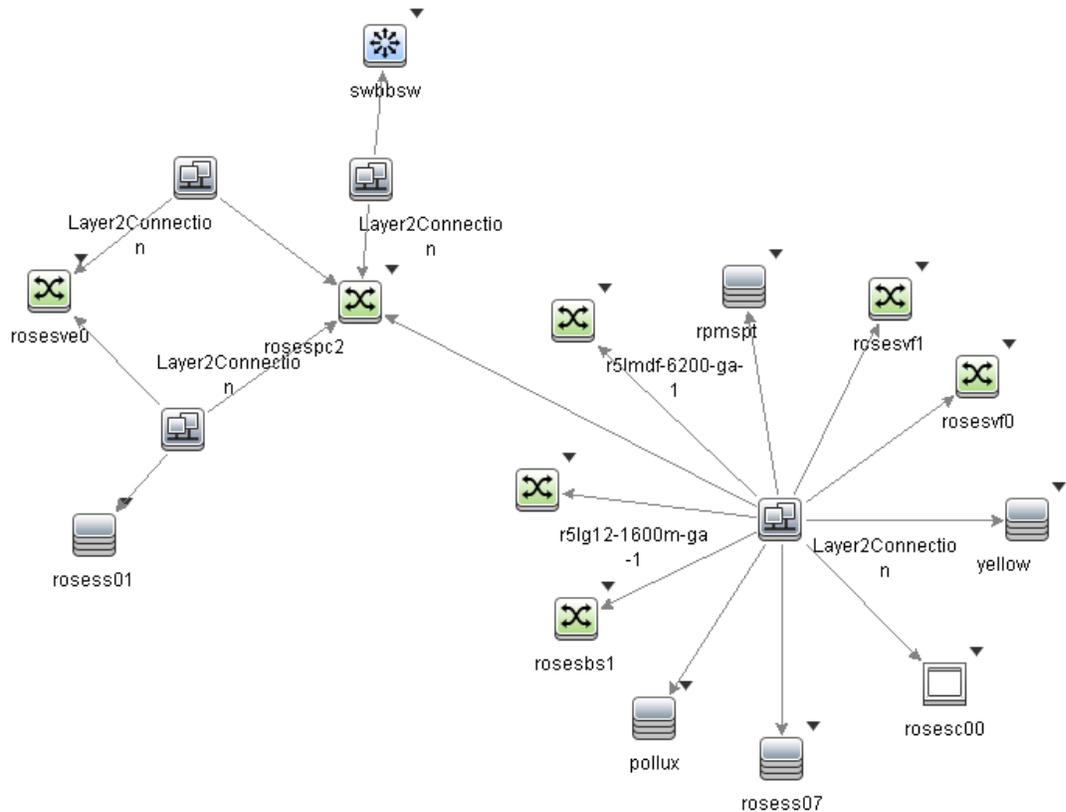


Figure 4. UCMDB 9.03 Layer 2 by NNMi view



This type of view (**Layer 2 by NNMi 9.10**) is primarily useful as a basis for a TBEC rule, or to filter OMi events in View Selector. It is not optimal for use in Service Health; refer to the Service Health Views section for recommendations on creating views that include network devices. However, if you do want to display this view in Service Health, you need to modify the View Definition Properties and set the Bundles to Service_Health.

For a view that is used in the View Selector to filter OMi events, you might want to include all CIs that may have network events associated with them. NNMi events resolve to Node, Interface, Layer 2 Connection or IP Address CI Types; you therefore might add IP Address to the view. The following two screenshots show an example view containing the network elements associated with the "OBA1" business application.

Figure 5. Example of Layer 2 topology applied to a business application

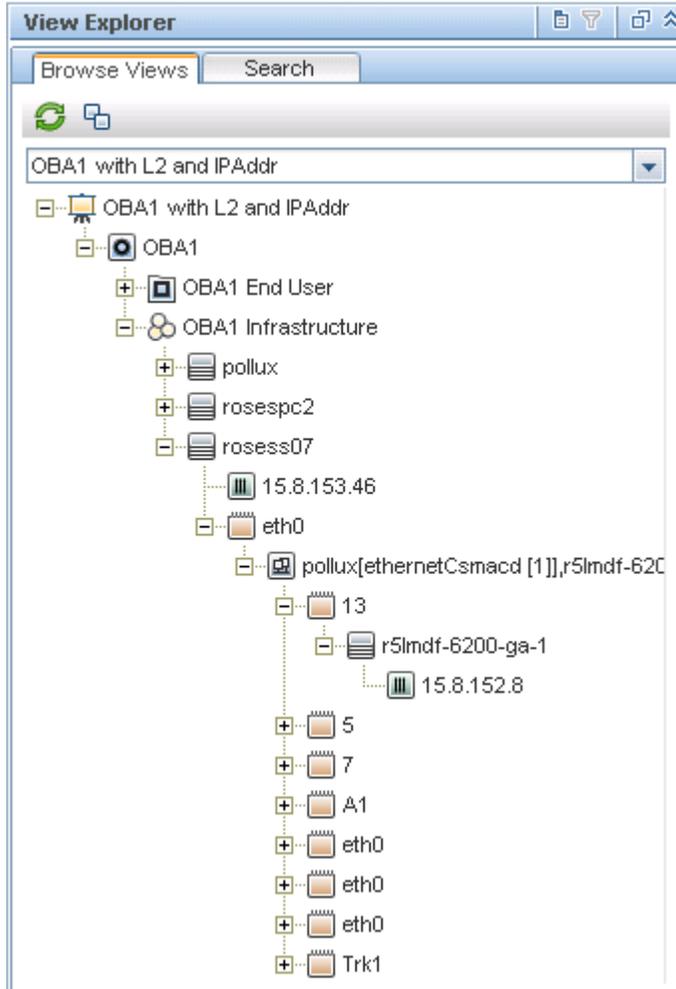
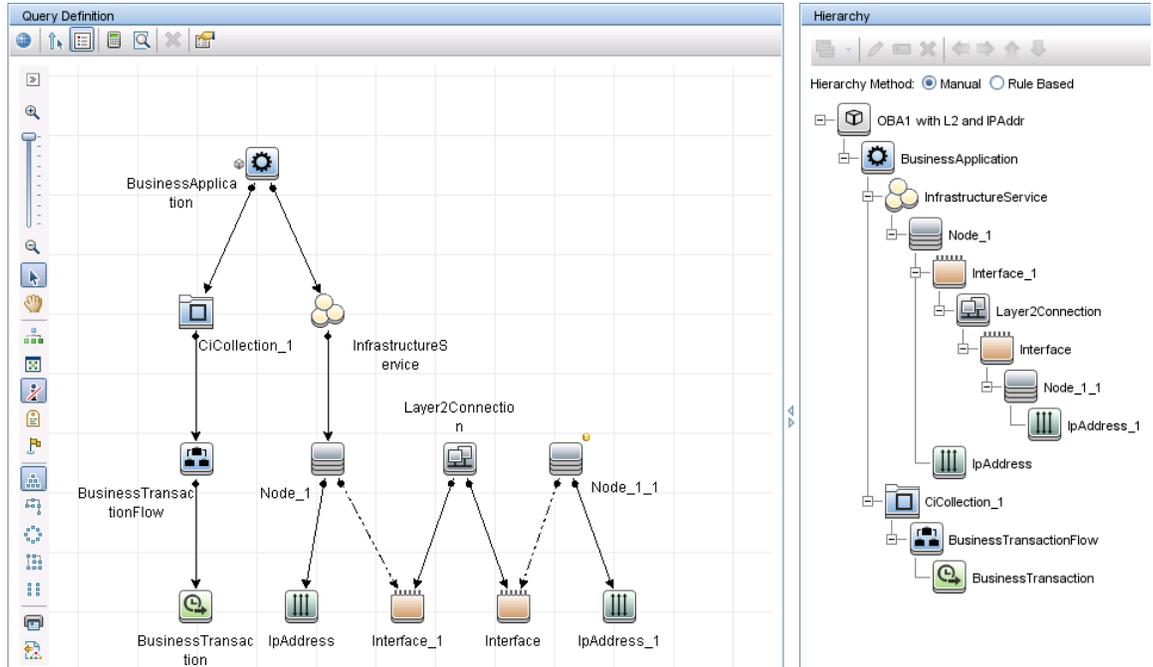


Figure 6. View definition

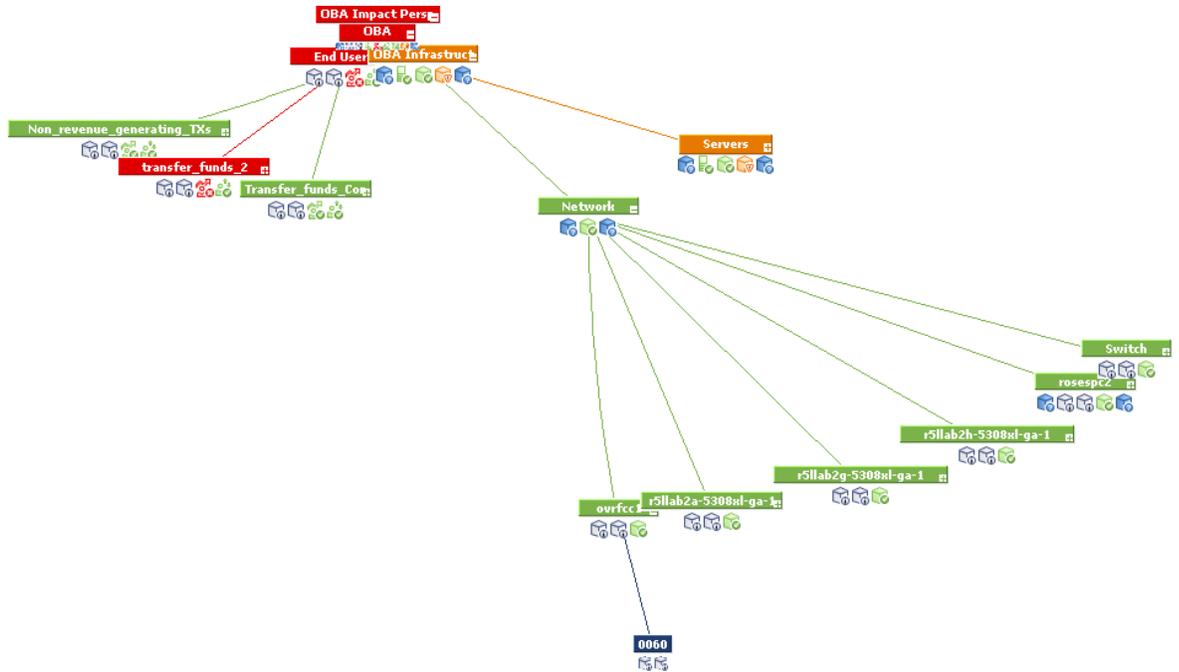


Service Health Views

It is difficult to display traditional network topology within Service Health. A relationship of "Node -> Interface -> Layer2Connection -> Interface -> Node" is meaningless, since (for example) there is no impact relationship (i.e. KPI status propagation) between Layer2Connection and Interface.

If you need to include network devices in a Service Health view, it is therefore best to show them in a flat structure rather than to attempt to reproduce a traditional network topology. Since there is an impact relationship between Interface and Node, one approach is to create a view that contains Node -> Interface, possibly grouped together as "Network"; refer to the screenshot below.

Figure 7. Top View



OMi Health Perspectives

In OMi Health Perspectives, the Health Top View displays a view based on the Related CI of the selected event. The default view is determined by View Mappings for the CIT.

The default View Mappings used in Health Perspectives do not work for the Node CIT and Interface CIT.

For the Node CIT, there is no default View Mapping. If you use OMi Health Perspectives, you may want to define such a view.

For the Interface CIT, the default View Mappings of NetworkInterface_Infrastructure and Systems_Infrastructure depend on a Computer CIT. Thus, for nodes that are populated from NNMI, these views will fail. You may want to modify the NetworkInterface_Infrastructure view to use Node CIT instead of Computer CIT.

CI Lifecycle

When NNMi objects (Node, Interface, IP Address, IP Subnet, Layer 2 Connection, Card and Port) are added or changed, they are dynamically updated in BSM. In addition, the full topology is re-synchronised periodically, as specified in the user-defined "Topology Synchronization Interval (hrs)" setting in the "HP NNMi - HP BSM Topology Integration Configuration" screen. NNMi ensures that the data is processed in manageable chunks, to avoid a negative impact on the performance of NNMi or BSM.

Periodic topology synchronization has the effect of updating the "Last Access Time" attribute for CIs that already exist in BSM, and prevents them from becoming candidates for deletion. If an object no longer exists in NNMi, the aging mechanism in BSM deletes the corresponding CI when its "Last Access Time" exceeds the time threshold (default is 40 days).

Note that the CI may also be monitored by another application such as HP SiteScope or HP Operations Manager, in which case "Last Access Time" may continue to be updated if the object remains monitored by another application.

Appendix A: Comparing Methods of Integrating NNMi with BSM/UCMDB

The following table provides a summary comparison of the two methods.

Table 2. NNMi – BSM Topology integration vs. “Layer 2 by NNM” discovery job

NNMi BSM Topology Integration	“Layer 2 by NNM” Discovery Job (Probe-based)
Can filter objects to sync from NNMi to BSM based on NNMi Node Group.	Currently no ability to filter NNMi objects to sync into BSM.
Performs incremental discovery and scheduled full topology sync.	Performs full topology sync only.
Creates all NNMi nodes as Node CIs *.	Creates NNMi nodes as various CI types (Router, Switch, Switch Router, Chassis, Computer, ATM Switch, Firewall, Load Balancer, and Printer).
Creates these other CIs: Interface, IpAddress, IpSubnet, Layer2Connection, HardwareBoard, and PhysicalPort.	Creates these other CIs: Interface, IpAddress, IpSubnet, Layer2Connection, HardwareBoard ⁺ , PhysicalPort ⁺ , and VLAN ⁺ .
Node CI attributes populated by BSM but not by Probe method:	Node CI attributes populated by Probe but not by BSM method:
<ul style="list-style-type: none"> • Host is Route. • Host is Virtual. • NodeModel. • PrimaryDnsName. 	<ul style="list-style-type: none"> • Description (populated from Device Profile Description)
	Node CI attributes with different values from BSM method:
Layer 2 Connection CI attribute Display Label is set to the Layer 2 Connection Name as shown in NNMi.	<ul style="list-style-type: none"> • DiscoveredVendor (more user-friendly format in BSM method; for example “Hewlett-Packard” rather than “hewlettpackard”). • NodeFamily (more user-friendly format in BSM method). • Host NNM UID. • Host Key.
	Layer 2 Connection CI attribute Display Label is hard-coded to “Layer2Connection”.
	Other CIs with different attributes when populated by Probe:
	<ul style="list-style-type: none"> • HardwareBoard CI includes SoftwareVersion attribute. • PhysicalPort CI includes DuplexSetting and Port Name (same value as Name) attributes.
Can easily adapt the out-of-the-box Layer 2 Network view.	Out-of-the-box Layer 2 Network view.

⁺ NNMi 9 is required for these CIs to be created.

* Nodes are identified by the NodeRole attribute.

Note: UCMDB Content Pack 9 enhances NNMi integration support of large NNMi environments, allowing you to control the number of Layer2Connections, VLANs and Nodes to get from NNMi per query.

Appendix B: Creating a New RTSM User

The following steps show how to create a new RTSM user for the NNMi – BSM topology integration.

1. Log in to the RTSM:

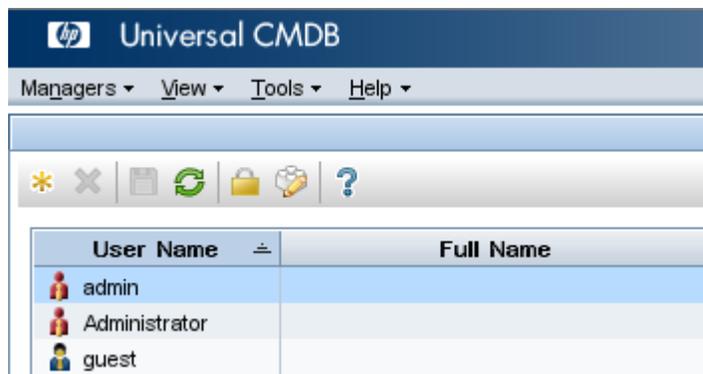
http://<BSM Data Processing Server>:21212/ucmdb

Username: admin

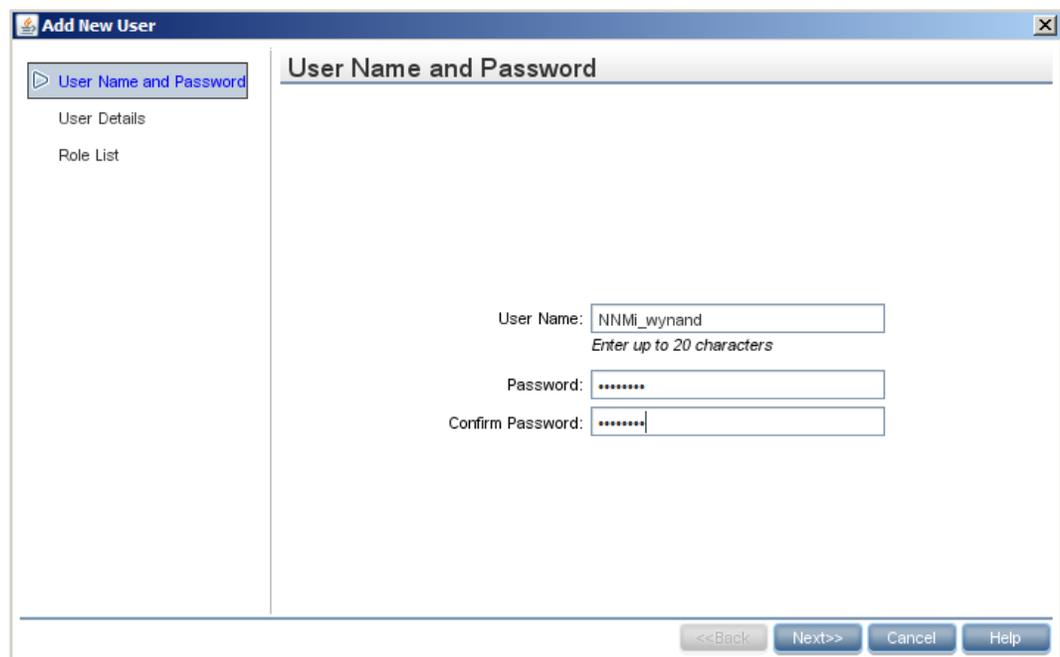
Password: admin (default password)

2. From the menu, select Managers > Administration > Users and Roles.

Note: Although this screen says Universal CMDB, you are actually using the RTSM user interface.



3. Click on the "*" button to add a new user. Enter the new user's name and password. Click Next.



The screenshot shows the "Add New User" dialog box. The title bar reads "Add New User". On the left side, there is a sidebar with a "User Name and Password" button (which is highlighted) and two other buttons: "User Details" and "Role List". The main area of the dialog is titled "User Name and Password" and contains three input fields: "User Name" with the value "NNMi_wynand" and a note "Enter up to 20 characters", "Password" with a masked field of seven asterisks, and "Confirm Password" with a masked field of seven asterisks. At the bottom right, there are four buttons: "<<Back", "Next>>", "Cancel", and "Help".

4. Enter the user's details (optional). Click Next.

The screenshot shows the 'Add New User' dialog box with the 'User Details' tab selected. The left sidebar contains 'User Name and Password', 'User Details', and 'Role List'. The main area is titled 'User Details' and contains the following fields:

- First Name: [Text Box]
- Last Name: [Text Box]
- Department: [Text Box]
- Location: [Text Box]
- E-mail: [Text Box]
- Business Tel.: [Text Box]
- Mobile: [Text Box]

At the bottom right, there are four buttons: '<<Back', 'Next>>', 'Cancel', and 'Help'.

5. Select the three CmdbOpenApi related roles for this user, as shown in the following screen shot. Click Finish.

The screenshot shows the 'Add New User' dialog box with the 'Role List' tab selected. The left sidebar contains 'User Name and Password', 'User Details', and 'Role List'. The main area is titled 'Role List' and contains the text 'Select roles for <NNMi_wynand>'. Below this is a table with the following data:

	Name	Description
<input type="checkbox"/>	Admin	Admins have complete and unrestricted access to the whole s...
<input type="checkbox"/>	CmdbOpenApiClassModel	Has permission to use Classmodel operations at the ucldb s...
<input checked="" type="checkbox"/>	CmdbOpenApiImpact	Has permission to use Impact operations at the ucldb soap api
<input checked="" type="checkbox"/>	CmdbOpenApiQuery	Has permission to query the cmdb soap api
<input checked="" type="checkbox"/>	CmdbOpenApiUpdate	Has permission to update the cmdb soap api
<input type="checkbox"/>	Guests	For guest access to the schema

At the bottom right, there are four buttons: '<<Back', 'Finish', 'Cancel', and 'Help'.

Appendix C: NNMi – CI Attribute Mapping

The following diagrams show the mapping of NNMi object attributes to the equivalent CI attributes in BSM. Note that the Monitored By attribute is set to include NNM for each of the CI types.

Figure 7. NNMi Node – Node CI Attribute Mapping

The image displays a screenshot of the NNMi Node configuration interface, illustrating the mapping between Node CI attributes and Device Profile attributes. The interface is divided into several panes:

- Nodes Node (Top Left):** Shows the basic information for the node `r5llab2g-5308xl-ga-1`. The Hostname is `r5llab2g-5308xl-ga-1.rose.hp.com`. The Node Management Mode is set to `Managed`. The Device Profile is `hpProCurve5308xl`.
- SNMP Values (Top Middle):** Lists system information such as System Name (`r5llab2g-5308xl-ga-1`), System Contact (`Help Desk 1-877-785-2155`), System Location (`R5L Lab2 row G`), System Object ID (`.1.3.6.1.4.1.11.2.3.7.11.17`), and System Description (`HP J4819A ProCurve Switch 5308xl revision E.10.52 ROM F.05.04 //sw/code/build/albmo/m3`).
- Capabilities (Top Right):** Lists capabilities with their Unique Keys, such as `com.hp.nnm.capability.card.ietf.entity` and `com.hp.nnm.capability.node.lanswitching`.
- Registration (Far Right):** Shows registration details including Created date (`January 10, 2010 1:26:57 PM PST`), Last Modified date (`May 31, 2011 11:10:38 AM PDT`), and Object Identifiers like `4294987978` and `717d99a8-29b0-4843-902b-cc7d1debbffe`.
- Configuration Item Properties (Bottom Left):** Shows properties for the Configuration Item `r5llab2g-5308xl-ga-1`. Key attributes include `Actual Deletion Period` (40), `Allow CI Update` (True), `BiosAssetTag`, `BiosSerialNumber`, `BiosUuid`, `CalculatedLocation`, `Create Time` (Mon, 30 May 2011 17:05 PDT), `Created By` (UCMDB: User:admin), `DefaultGatewayIpAddress`, `DefaultGatewayIpAddressType` (IPv4), `Deletion Candidate Period` (20), `Description`, `DiscoveredContact` (Help Desk 1-877-785-2155), `DiscoveredDescription` (HP J4819A ProCurve Switch 5308xl, revision E.10.52, RO...), `DiscoveredLocation` (R5L Lab2 row G), `DiscoveredModel` (hpProCurve5308xl), `DiscoveredOsName`, `DiscoveredOsVendor`, `DiscoveredOsVersion` (Hewlett-Packard), `Display Label` (r5llab2g-5308xl-ga-1), `DomainName`, `Enable Aging` (True), `Global Id` (1cbcd2372e3a07e0739ef140aacb237e), `Host Boot Time`, `Host Is Complete` (False), `Host Is Route` (False), and `Host Is Virtual` (False).
- Host Key Properties (Bottom Middle):** Lists various host key attributes such as `Host Key` (717d99a8-29b0-4843-902b-cc7d1debbffe), `Host NNM UID` (717d99a8-29b0-4843-902b-cc7d1debbffe), `Host Operating System Installation type`, `Host Operating System Release`, `Host Operating System accuracy`, `Host Server Type`, `Host is Desktop`, `Is Candidate For Deletion` (False), `Last Access Time` (Tue, 31 May 2011 11:30 PDT), `LastModifiedTime` (Mon, 30 May 2011 17:47 PDT), `MemorySize`, `Monitored By` ([NNMi]), `Name` (r5llab2g-5308xl-ga-1), `NetBiosName`, `NodeFamily` (HP ProCurve 5300xl Modular Switch), `NodeModel` (hpProCurve5308xl), `NodeRole` (router_lan_switch), `Note`, `Origin`, `OsDescription`, `OsFamily`, `OsVendor`, `PrimaryOsName` (r5llab2g-5308xl-ga-1.rose.hp.com), `SerialNumber`, `NmSysName` (r5llab2g-5308xl-ga-1), `SwapMemorySize`, `SystemObjectID` (.1.3.6.1.4.1.11.2.3.7.11.17), `Updated By` (UCMDB: User:admin), `User Label`, `Vendor`, `classification` (infrastructure), and `layer` (infrastructure).
- Device Profile (Bottom Right):** Shows the configuration for the `hpProCurve5308xl` device profile. Key attributes include `Device Model` (hpProCurve5308xl), `SNMP Object ID` (.1.3.6.1.4.1.11.2.3.7.11.17), `Description` (HP ProCurve 5308xl Switch (J4819A)), `Device Family` (HP ProCurve 5300xl Modular Switche), `Device Vendor` (Hewlett-Packard), and `Device Category` (Network Router).

Red lines indicate the mapping between the `Discovered` attributes in the Configuration Item Properties pane and the corresponding attributes in the Device Profile pane. Blue lines show the mapping between the `Host Key` properties and the `Host Key` properties in the Host Key Properties pane. Yellow lines highlight specific capabilities and their unique keys.

Figure 8. NNMi Interface – Interface CI Attribute Mapping

The image illustrates the mapping of interface attributes from a node configuration window to a Configuration Item Properties window. The node configuration window shows the following details for 'ethernet_9':

- Name: ethernet_9
- Status: No Status
- Management Mode: Managed
- Direct Management Mode: Inherited
- Hosted On Node: ovresx4-ilo
- Physical Address: 0010182477D6

The 'SNMP Values' section in the node configuration window lists the following attributes:

- ifName: ethernet_9
- ifAlias: Local Area Connection 2
- ifDescr: Broadcom NetXtreme Gigabit Ethernet #2
- ifIndex: 12
- ifSpeed: 0 bps
- ifType: ethernetCsmacd

The 'Configuration Item Properties' window shows the following attributes for 'ethernet_9':

Attribute	Value
Actual Deletion Period	40
AdminStatus	
Allow CI Update	True
Create Time	Mon, 30 May 2011 17:12 PDT
Created By	UCMDB: User:admin
Deletion Candidate Period	20
Description	
Display Label	ethernet_9
Enable Aging	True
GlobalId	376c7da443bac3348fe899e69959f1aa
InterfaceAlias	Local Area Connection 2
InterfaceDescription	Broadcom NetXtreme Gigabit Ethernet #2
InterfaceIndex	12
InterfaceName	ethernet_9
InterfaceRole	
InterfaceSpeed	0
InterfaceType	ethernetCsmacd
Is Candidate For Deletion	False
Is Pseudo Interface	False
Is Virtual	False
Last Access Time	Tue, 31 May 2011 11:35 PDT
LastModifiedTime	Mon, 30 May 2011 17:51 PDT
MacAddress	0010182477D6
Monitored By	[NNM]
Name	
Note	
OperationalStatus	
Origin	
SerialNumber	
Updated By	UCMDB: User:admin
User Label	
classification	infrastructure
layer	infrastructure

Figure 9. NNMi IP Address – IpAddress CI Attribute Mapping

The image displays two windows side-by-side, illustrating the mapping between NNMi IP Address CI attributes and Configuration Item Properties.

Left Window: IP Addresses

- Address:** 15.8.153.12
- Prefix Length:** 21
- Status:** No Status
- Management Mode:** Managed
- Direct Management Mode:** Inherited
- IP Address State:**
 - State:** Not Polled
 - State Last Modified:** January 10, 2010 1:26:16 PM PST
- In Interface:** DEFAULT_VLAN
- Hosted On Node:** r3-ga-hpsw-05
- In Subnet:** 15.8.152.0/21

Right Window: Configuration Item Properties

Name: 15.8.153.12 **ID:** dc19fec2c3ef3438c202d49c5261af9f **CI Type:** IpAddress

Actual Deletion Period	40
Allow CI Update	True
AuthoritativeDnsName	
Create Time	Mon, 30 May 2011 17:13 PDT
Created By	UCMDB: User:admin
Deletion Candidate Period	20
Description	
Display Label	15.8.153.12
Enable Aging	True
Global Id	dc19fec2c3ef3438c202d49c5261af9f
IP Address	15.8.153.12
IP DHCP Domain Name	
IP Is Broadcast	
IP Network Address	
IP Network Class	
IP Network Mask	
IP Network Type	
IP Probe Name	
IpAddressProperty	
IpAddressType	IPv4
IpAddressValue	0000:0000:0000:0000:0000:ffff:0f08:990c
Is Candidate For Deletion	False
Is Managed	True
Is Virtual	False
Last Access Time	Tue, 31 May 2011 11:44 PDT
LastModifiedTime	Mon, 30 May 2011 17:52 PDT
Monitored By	[NNM]
Name	15.8.153.12
Note	
Origin	
RoutingDomain	DefaultDomain
Updated By	UCMDB: User:admin
User Label	
classification	network
layer	infrastructure

Buttons: OK, Cancel, Apply, Reset, Help

Figure 10. NNMi IP Subnet – IpSubnet CI Attribute Mapping

The image shows two windows illustrating attribute mapping for an IP Subnet Configuration Item (CI).

IP Subnets - IP Subnet (Summary Table):

Basics	
Name	15.8.152.0/21
Prefix	15.8.152.0
Prefix Length	21

Configuration Item Properties (Detailed Table):

Name: 15.8.152.0 ID: 7c749bf738c16748213cca96f7c5762f CI Type: IpSubnet

Actual Deletion Period	40
Allow CI Update	True
Create Time	Mon, 30 May 2011 16:56 PDT
Created By	UCMDB: User:admin
Deletion Candidate Period	20
Description	
Display Label	15.8.152.0
Enable Aging	True
Global Id	7c749bf738c16748213cca96f7c5762f
IpAddressType	IPv4
IpAddressValue	0000:0000:0000:0000:0000:ffff:0f08:9800
IpPrefixLength	21
Is Candidate For Deletion	False
Is Managed	True
Is Virtual	False
Last Access Time	Tue, 31 May 2011 11:27 PDT
LastModifiedTime	Tue, 31 May 2011 11:27 PDT
Monitored By	[NNM]
Name	15.8.152.0
Network Broadcast Address	
Network Class	
Network Count	
Network Managed	
Network Mask	255.255.248.0
Network Probe Name	FRANCON
Network Type	
Note	
Origin	
RoutingDomain	DefaultDomain
Updated By	UCMDB: User:admin
User Label	
classification	network
layer	infrastructure

Arrows indicate the mapping from the summary table to the detailed properties table:

- Summary Name (15.8.152.0/21) maps to Detailed Name (15.8.152.0).
- Summary Prefix (15.8.152.0) maps to Detailed IpAddressValue (0000:0000:0000:0000:0000:ffff:0f08:9800).
- Summary Prefix Length (21) maps to Detailed IpPrefixLength (21).

Figure 11. NNMi Card – HardwareBoard CI Attribute Mapping

The screenshot illustrates the mapping of attributes from a HardwareBoard Configuration Item (CI) to the main NNMi interface. The main window shows the 'Basics' tab with fields for Name, Hosted On Node, Status, Management Mode, Direct Management Mode, Hosted On Card, and Redundant Group. The 'Card State' section shows the Administrative State as 'Up'. The 'Configuration Item Properties' dialog box displays the following attributes and values:

Attribute	Value
Actual Deletion Period	40
Allow CI Update	True
BoardIndex	C
Create Time	Mon, 30 May 2011 17:41 PDT
Created By	UCMDB: User:admin
Deletion Candidate Period	20
Description	
Display Label	C
Enable Aging	True
FirmwareVersion	K.11.12
Global Id	0afb09afe12d8605e7ff7495cfb03479
HardwareBoardIndex	
HardwareVersion	1
Is Candidate For Deletion	False
Is Virtual	False
Last Access Time	Tue, 31 May 2011 11:28 PDT
LastModifiedTime	Tue, 31 May 2011 11:28 PDT
Monitored By	INNM1
Name	C
Note	
Origin	
SerialNumber	SG915AT0WH
SoftwareVersion	
Updated By	UCMDB: User:admin
User Label	
classification	infrastructure
layer	infrastructure

The mapping shows the following connections:

- Name:** C (Main window Name field)
- Hosted On Node:** swbbaw (Main window Hosted On Node field)
- Status:** Normal (Main window Status field)
- Management Mode:** Managed (Main window Management Mode field)
- Direct Management Mode:** Inherited (Main window Direct Management Mode field)
- Hosted On Card:** (Main window Hosted On Card field)
- Redundant Group:** (Main window Redundant Group field)
- Administrative State:** Up (Main window Card State Administrative State field)
- Serial Number:** SG915AT0WH (Main window Serial Number field)
- Firmware Version:** K.11.12 (Main window Firmware Version field)
- Hardware Version:** 1 (Main window Hardware Version field)
- Index:** C (Main window Index field)

Figure 12. NNMi Port – PhysicalPort CI Attribute Mapping

The image displays two windows illustrating the mapping of Configuration Item (CI) attributes for a PhysicalPort. On the left is the 'Basics' tab of a configuration window, and on the right is the 'Configuration Item Properties' dialog.

Basics Tab Fields:

- Name: C10
- Hosted On Node: swbbsw
- Card: C
- Type: gigabitEthernetT
- Speed: AUTO
- Configured Duplex Setting: Auto
- Associated Interface: C10
- ifAlias
- Port Index: 10

Configuration Item Properties Dialog:

Name: C10 ID: f64cdd077665e934df273001a05a47ab CI Type: PhysicalPort

Actual Deletion Period	40
Allow CI Update	True
Create Time	Mon, 30 May 2011 17:41 PDT
Created By	UCMDB: User:admin
Deletion Candidate Period	20
Description	
Display Label	C10
DuplexSetting	
Enable Aging	True
Global Id	f64cdd077665e934df273001a05a47ab
Is Candidate For Deletion	False
Is Virtual	False
Last Access Time	Tue, 31 May 2011 11:28 PDT
LastModifiedTime	Tue, 31 May 2011 11:28 PDT
Monitored By	[NNM]
Name	C10
Note	
Origin	
Port Hosting Bridge	
Port Interface Index	
Port Last Run	
Port Name	
Port Next MAC	
Port Number	
Port Remote Bridge	
Port Remote ID	
Port Slot	
Port Type	
Port VLAN	
PortIndex	10
SerialNumber	
Updated By	UCMDB: User:admin
User Label	
classification	infrastructure
layer	infrastructure

Buttons: OK, Cancel, Apply, Reset, Help

Figure 13. NNMi Layer 2 Connection – Layer2Connection CI Attribute Mapping

The image shows two windows from the NNMi interface. On the left is the 'Layer 2 Connections' window, and on the right is the 'Configuration Item Properties' dialog.

Layer 2 Connections Window:

- Tab: Layer 2 Connection
- Buttons: Save and Close, Refresh, Close
- Section: Basics
 - Name: Switch[ethernetCsmacd [1]],r5lab2b32-2848-ga-1[18]
 - Status: No Status
 - Topology Source: FDB

Configuration Item Properties Dialog:

Name: Switch[ethernetCsmacd [1]],r5lab2b32-28 ID: ac02d144534a669deeca110a486 CI Type: Layer2Connecti

Actual Deletion Period	40
Allow CI Update	True
Create Time	Mon, 30 May 2011 17:27 PDT
Created By	UCMDB: User:admin
Deletion Candidate Period	20
Description	
Display Label	Switch[ethernetCsmacd [1]],r5lab2b32-2848-ga-1[18]
Enable Aging	True
Global Id	ac02d144534a669deeca110a486fa4d2
Is Candidate For Deletion	False
Is Virtual	False
Last Access Time	Wed, 1 Jun 2011 11:02 PDT
LastModifiedTime	Mon, 30 May 2011 18:01 PDT
Monitored By	[NNM]
Name	Switch[ethernetCsmacd [1]],r5lab2b32-2848-ga-1[18]
Note	
Origin	
Updated By	UCMDB: User:admin
User Label	
classification	network
layer	infrastructure

Buttons: OK, Cancel, Apply, Reset, Help

For More Information

<http://support.openview.hp.com/selfsolve/manuals>

HP Network Node Manager i Software: Deployment Reference

HP Universal CMDB: Discovery and Integration Content Guide

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