HP Network Node Manager i Software

Step-by-Step Guide to Using Security Groups

NNMi 9.1x Patch 1

This document discusses some Security Group concepts and provides an example of how to use Security Groups. This paper also provides an example of how to use Tenants and Security Groups in Global Network Management.

CONTENTS

Introduction

NNMi includes a security model that provides restrictions to object access based on group membership (similar to Access Control Lists (ACLs), though different in implementation). This document discusses some Security Group concepts and gives a specific example of using Security Groups. This paper also discusses another feature of NNMi, Multi-Tenancy, which is closely related to Security Groups.

Using Security Groups and Multi-Tenancy you can configure NNMi to enable different operators to view items specific to their assignments and privileges. This restriction applies to nodes (and indirectly, to all subcomponents like interfaces, addresses, cards controlled at the node level) as well as incidents, maps, lists, and other views.

Security Concepts

Consider two types of groups: User Groups and Security Groups. User Groups combine users (user accounts) into groups. Users can belong to multiple User Groups. For example, a user could be a member of two different regional Level1 Operator groups.

Security Groups control which User Groups can access nodes. Each node (for instance, a switch, router, load balancer, or server) is a member of only one Security Group. An example of a Security Group would be nodes in a specific region, such as a data center.

A User Group mapping maps users to User Groups.

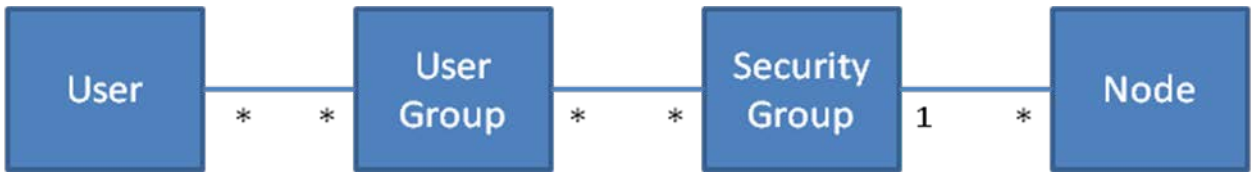
Security Group mapping establishes a relationship between User Groups and Security Groups, effectively granting permission for User Group members to access nodes in the Security Group. Security Group mapping also controls the level of action User Group members can perform on the nodes.

NNMi Administrator accounts can always access all nodes because Security Groups do not apply to NNMi Administrator accounts.

User interface access determines what actions and menu items are visible to User Group members while viewing the graphical user interface. This is achieved using predefined User Groups. In most cases, you make the Security Group access level match the user interface access level; although this is not required.

The following figure provides a graphical representation of the groups and their relationships. The asterisks indicate that one or more mappings are allowed. The only restriction is that nodes must be in only one Security Group.

Figure 1: Groups and their Relationships

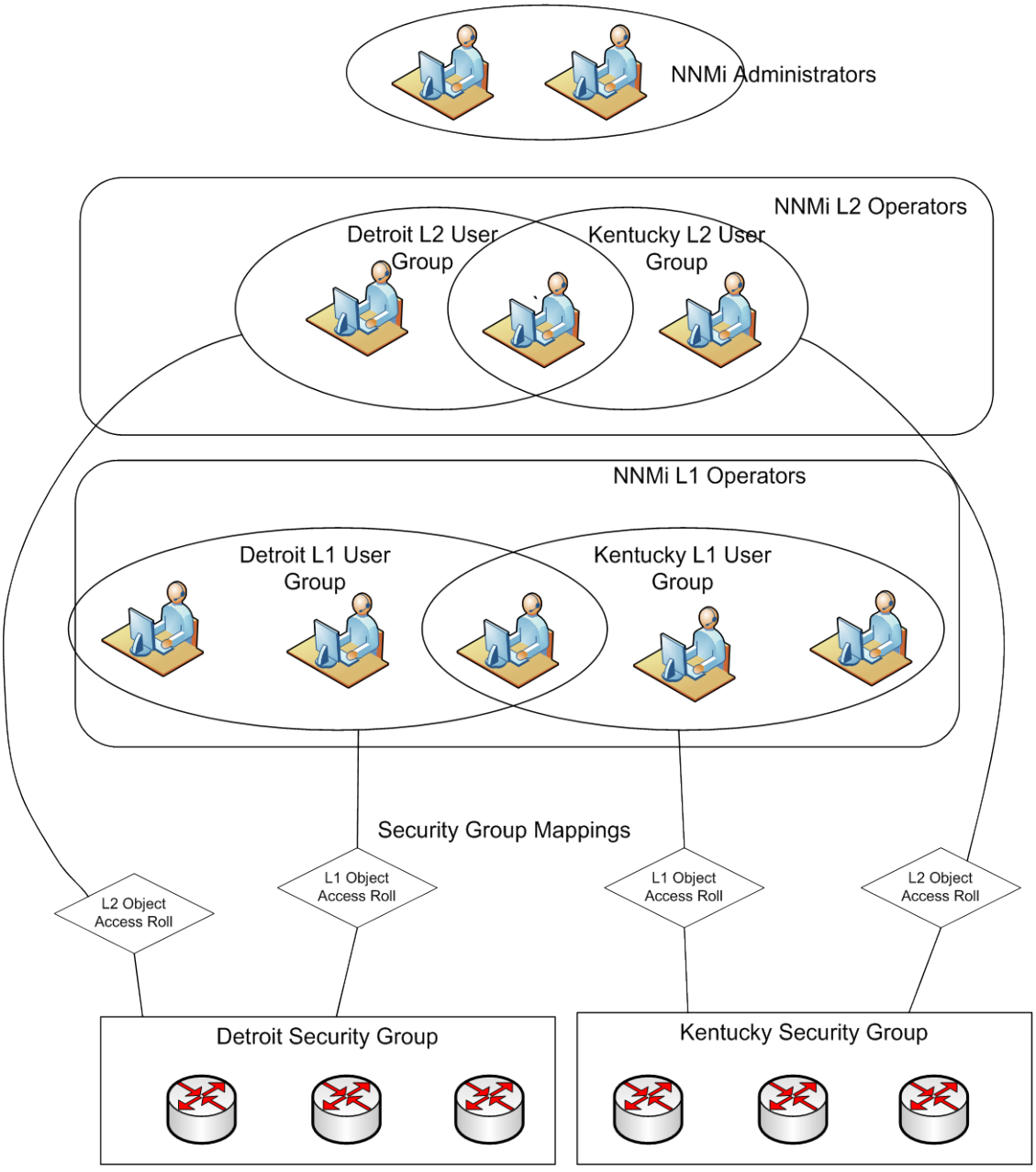


Security Groups Model

Consider the following scenario. Suppose you want to divide responsibility of your network monitoring based on geography. You have one set of operators that are in charge of monitoring nodes in the Kentucky region (a state with multiple cities). In addition, you have another set of operators in charge of monitoring nodes in the Detroit region (a large city). You also have one operator that needs to access nodes from both regions. You also have two NNMi administrators that maintain the NNMi system.

The following figure depicts the NNMi model of the scenario just described.

Figure 2: Security Groups Model



Security Groups Example

Consider the following example of the model previously discussed. In this implementation, there are the following users:

- a single NNMi administrator (Ringo)
- Level 1 and Level 2 operators (John, Paul, and George). One of the users, Paul, has access to both regions.

The following table shows the responsibilities of each user.

Tip: While it is possible for a user to be a Level 1 Operator for one set of nodes and a Level 2 Operator on another set of nodes within the security model, the graphical user interface does not have the same level of separation. Therefore, do not mix levels for individual operators (unless you want to give some users additional capabilities).

Geography	User	User Group	Security Role
All	Ringo	N/A	NNMi Administrator
Detroit	John	Detroit Oper1	Level 1 Operator
	Paul	Detroit Oper2	Level 2 Operator
Kentucky	George	Kentucky Oper1	Level 1 Operator
	Paul	Kentucky Oper2	Level 2 Operator

Table 1 Users and Roles

The following list is the summary of the steps in this example. This example uses the Security Wizard but you could also use the workspaces in the console.

1. Remove default User Group mappings
2. Create users
3. Create User Groups
    a. Kentucky Oper1
    b. Kentucky Oper2
    c. Detroit Oper1
    d. Detroit Oper2
4. Map Users to User Groups
5. Create Security Groups
    a. Kentucky Security Group
    b. Detroit Security Group
6. Map User Groups to Security Groups
7. Assign nodes to Security Groups

Note: In this example, two User Groups, NNMi L1 Operators and NNMi L2 Operators, have been predefined to access the user interface.

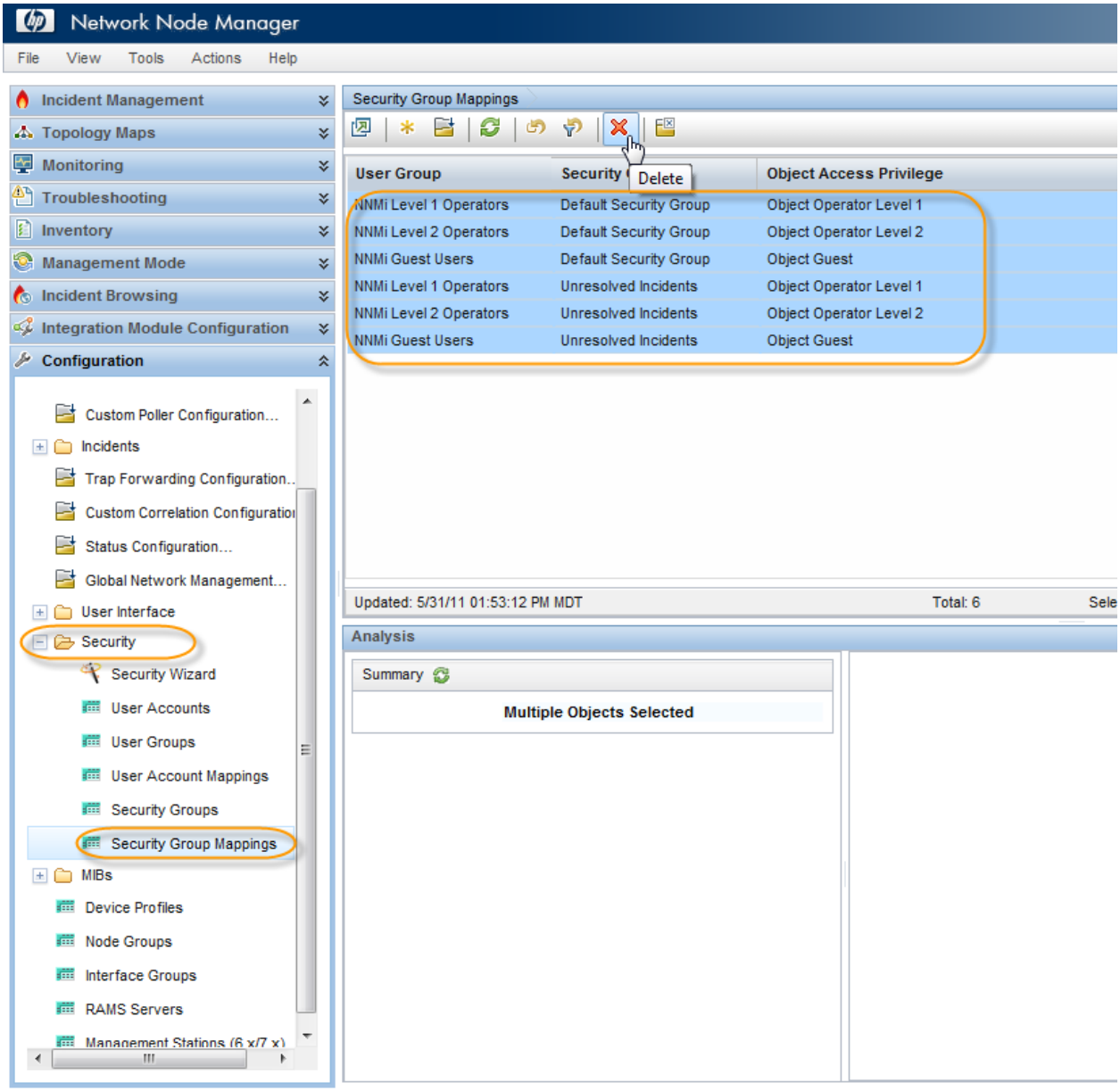
Remove Default User Group Mappings

Remove the default User Group mappings (provided for backwards compatibility) so that no operator sees any nodes initially:

1. From the workspace navigation panel, select the **Configuration** workspace.
2. Expand the **Security** folder.

3. Click **Security Group Mappings**.
4. Select all the current mappings and delete them.

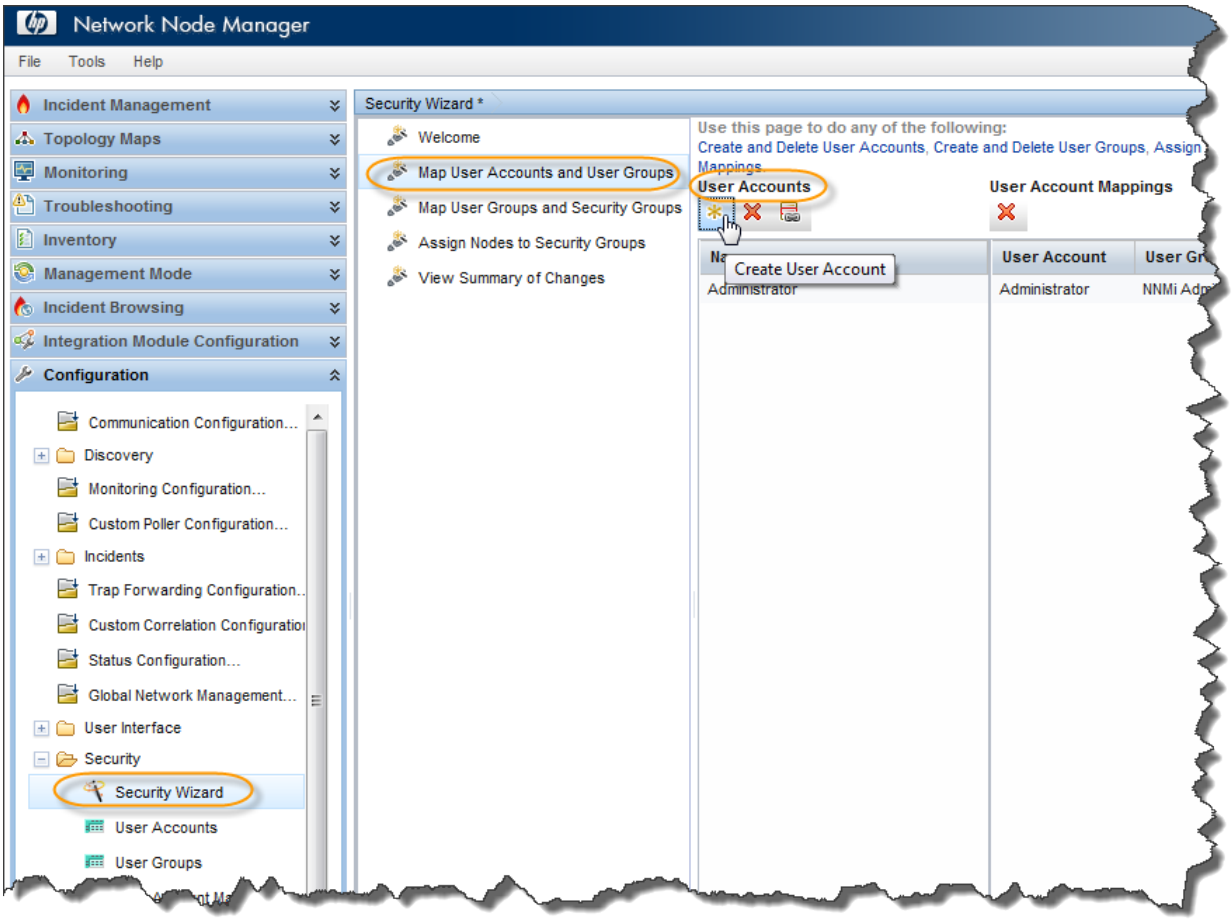
Figure 3: Security Group Mappings: Delete Default Mappings



Create Users

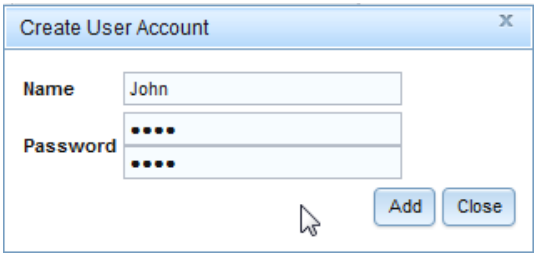
1. From the workspace navigation panel, select the **Configuration** workspace.
2. Expand the **Security** folder.
3. Click **Security Wizard**.
4. Click **Map User Accounts and User Groups**.
5. Click the **Create User Account** icon.

Figure 4: Security Wizard: Create User Account



6. Enter the **Name** and **Password** for each user.

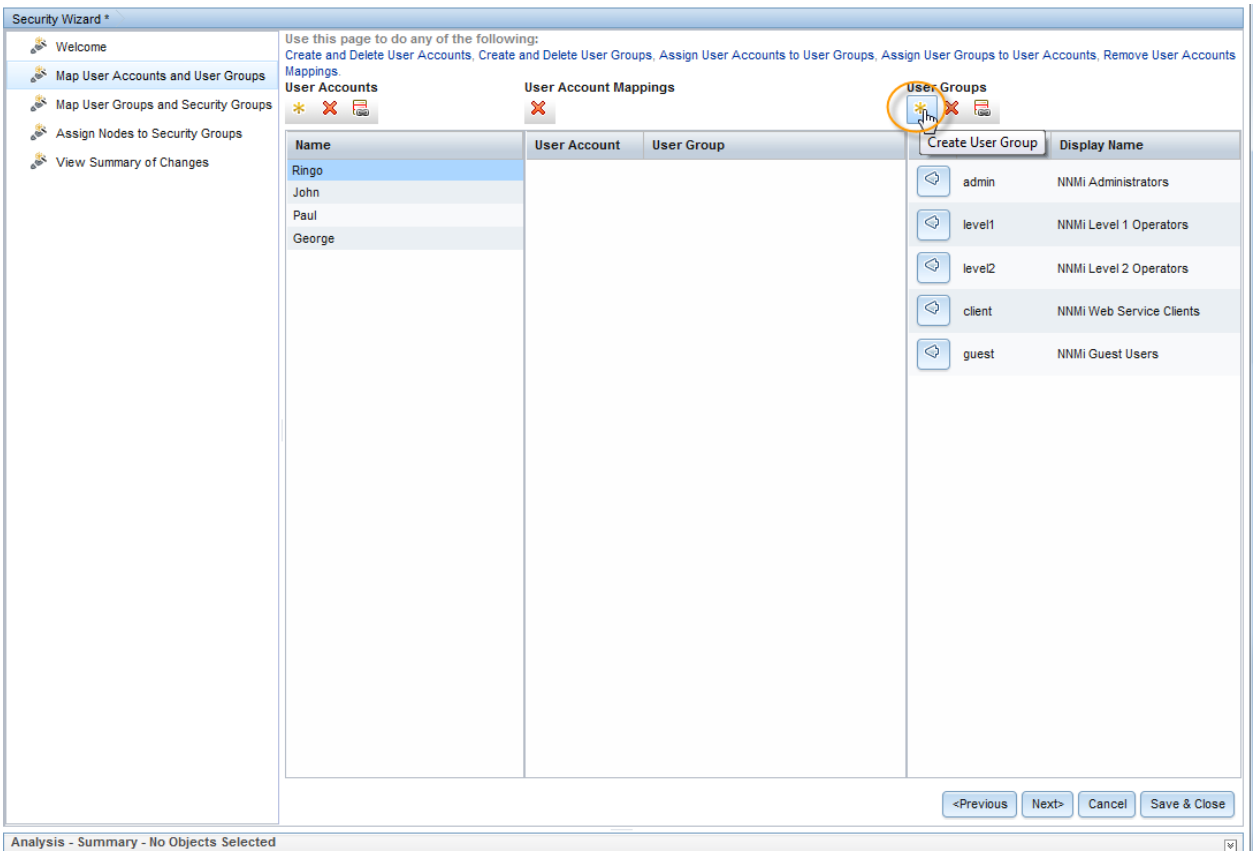
Figure 5: Create User Account Dialog Box



Create User Groups

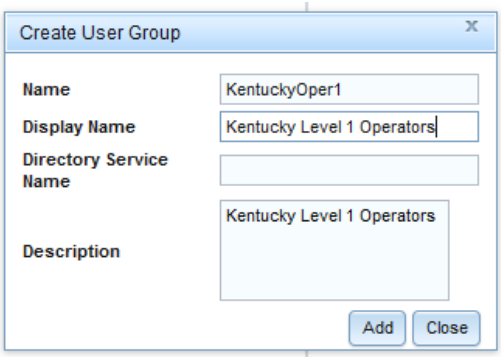
1. Click the ✱ **Create User Group** icon.

Figure 6: Security Wizard: Create User Group



2. Complete the **Create User Group** dialog box for each User Group.

Figure 7: Create User Group Dialog Box

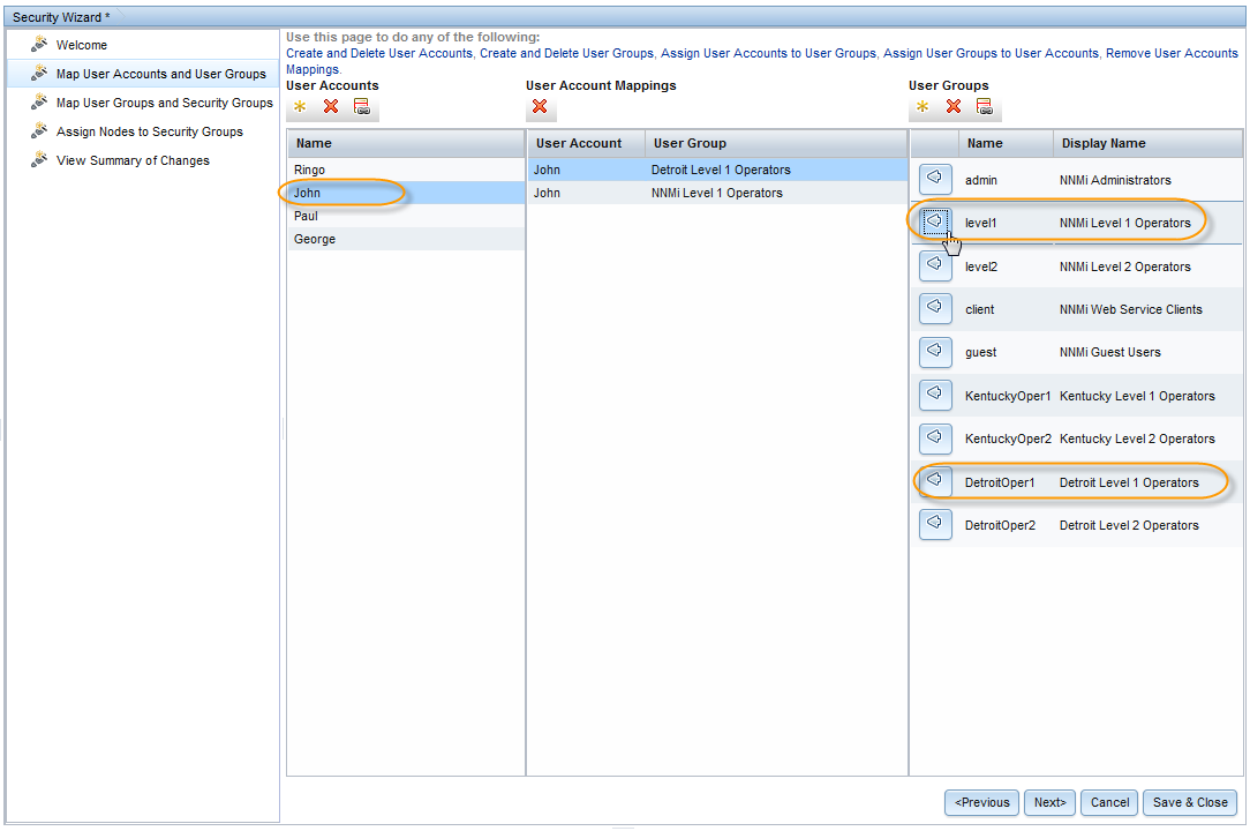


Map Users to User Groups

For each user, create a User Account Mapping as follows:

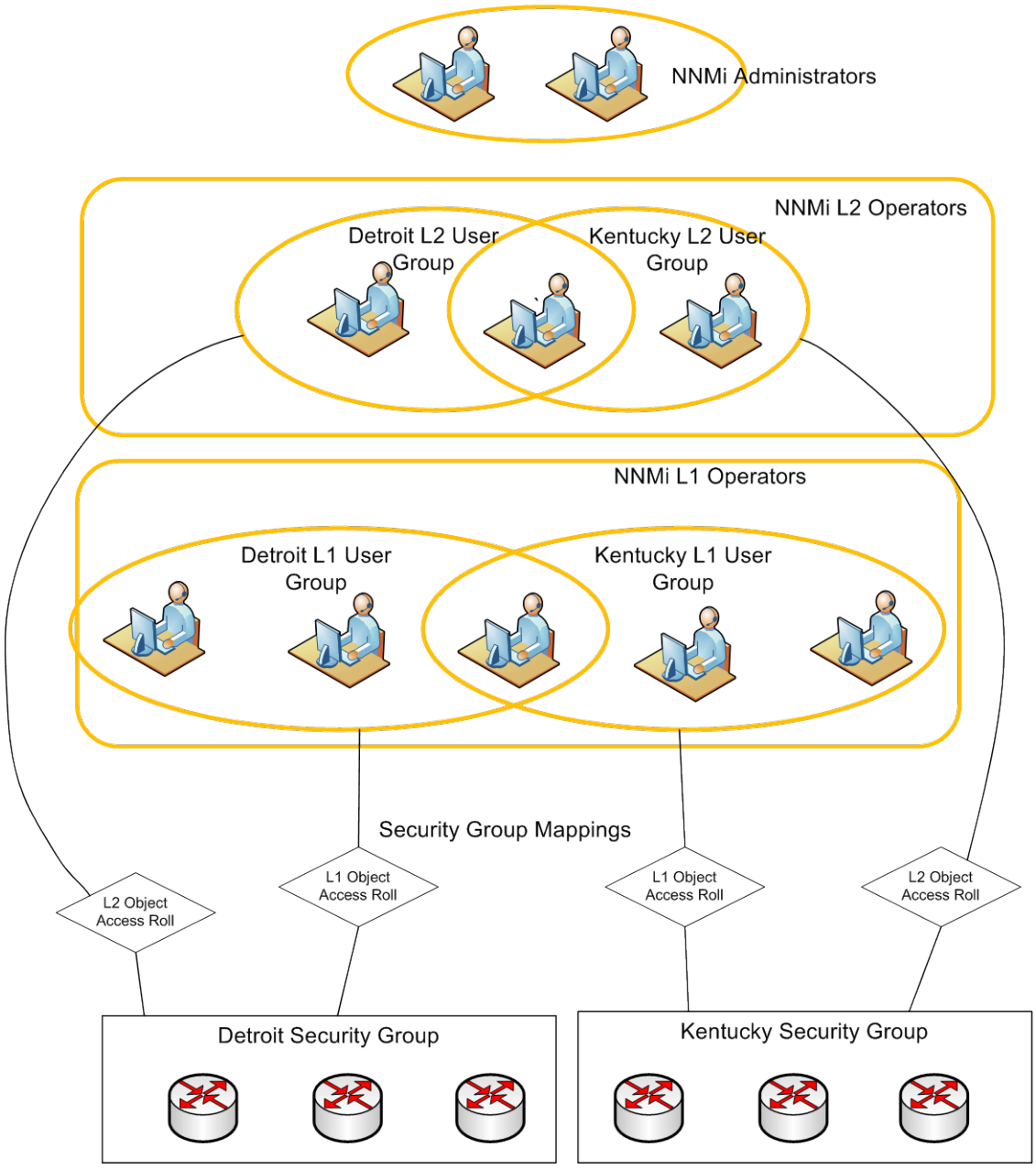
1. In the Security Wizard, click the user Name, the User Group, and then click the icon beside the desired level to define the mapping assignment. Be sure to include both the special NNMi User Group for the user interface (Level 1, Level 2) and the custom User Group (for example, Detroit Level 1 Operators).
2. After creating all the User Account Mappings, click the **Next** button.

Figure 8: Security Wizard: User Account Mappings



The following figure indicates the items completed to this point (shown in yellow):

Figure 9: Completed Items

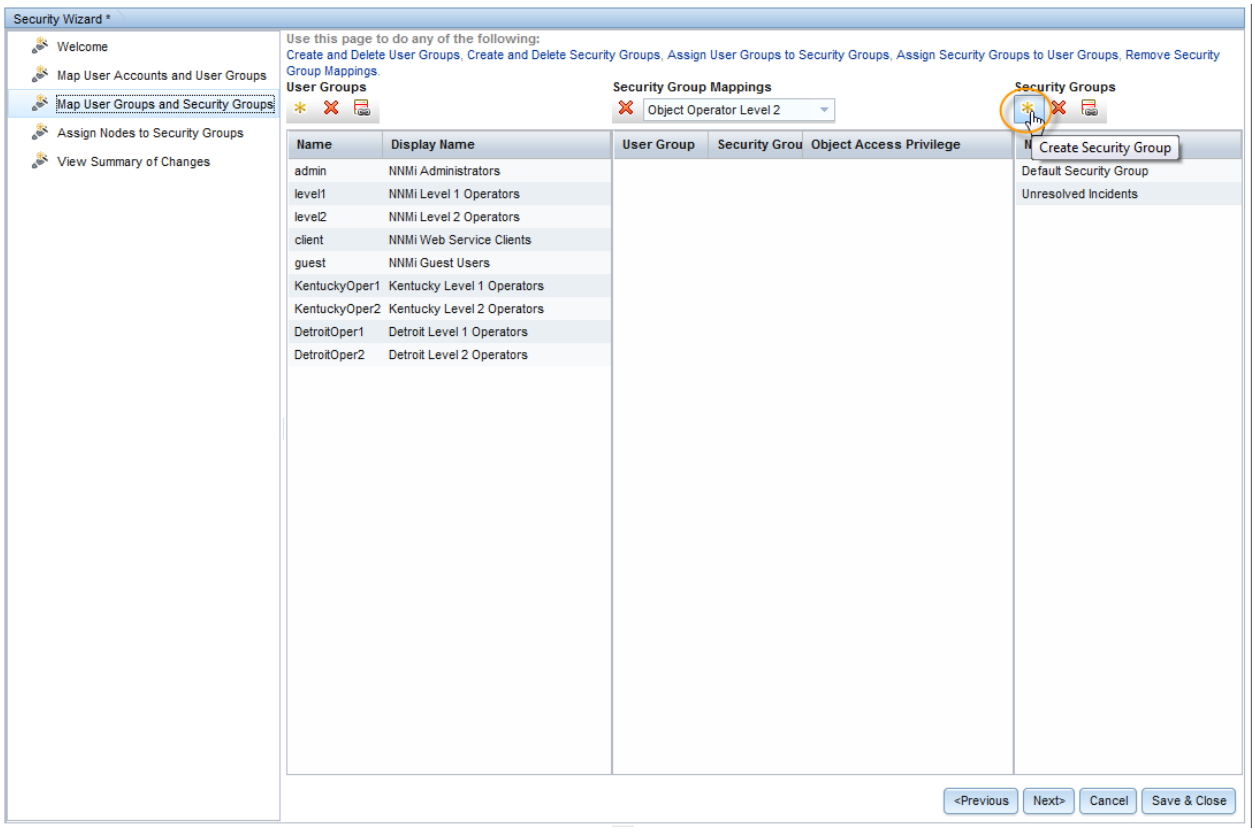


Create Security Groups

Create two Security Groups, one for Kentucky and one for Detroit:

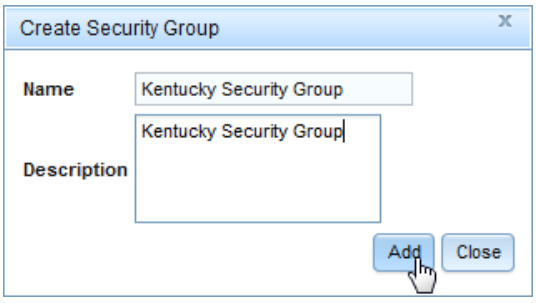
1. In the **Security Wizard**, click the **Create Security Group** icon.

Figure 10: Security Wizard: Create Security Group



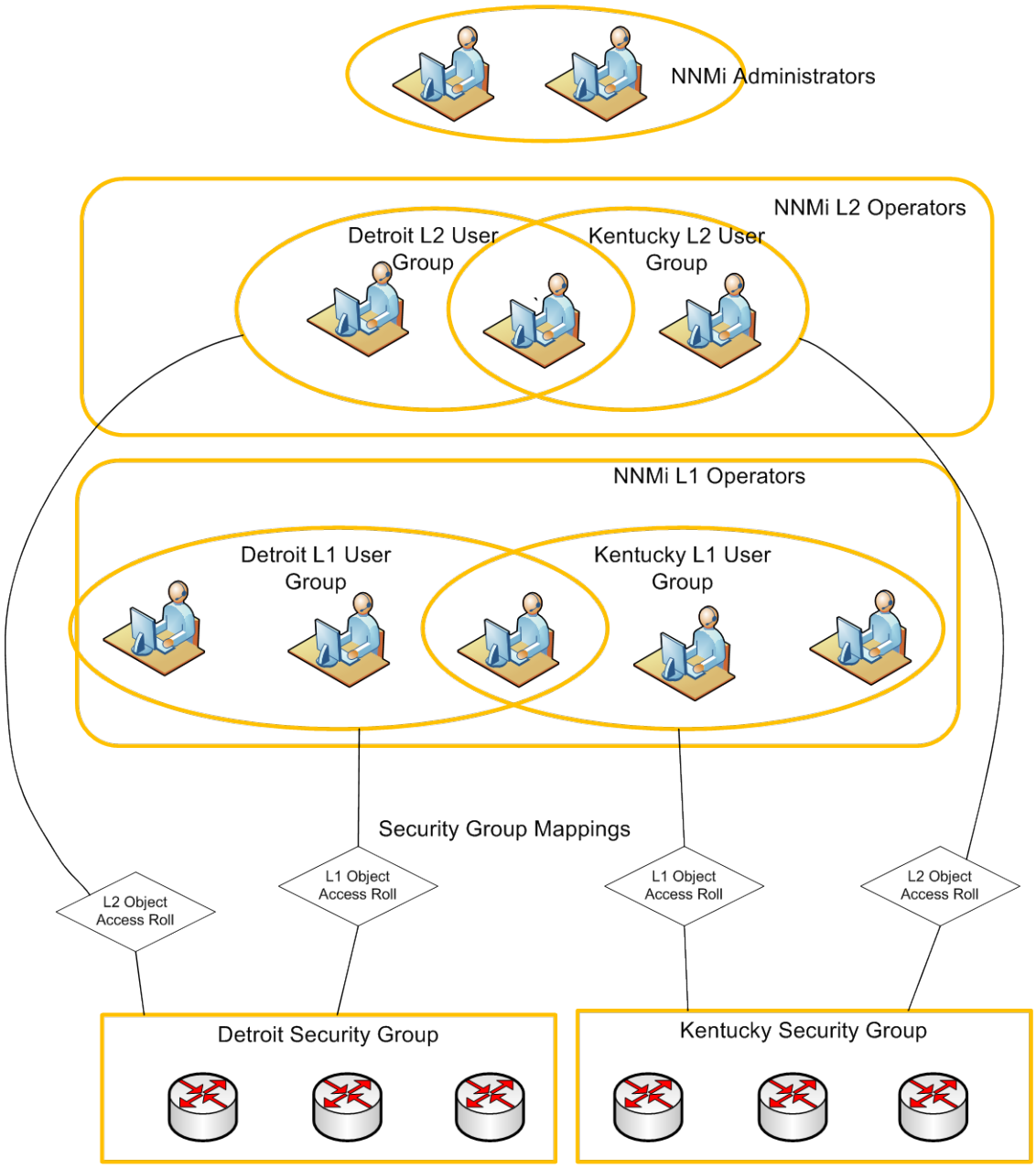
2. Enter the information for each Security Group in the **Create Security Group** dialog box.

Figure 11: Create Security Group Dialog Box



The following figure indicates the items now completed (shown in yellow).

Figure 12: Completed Items

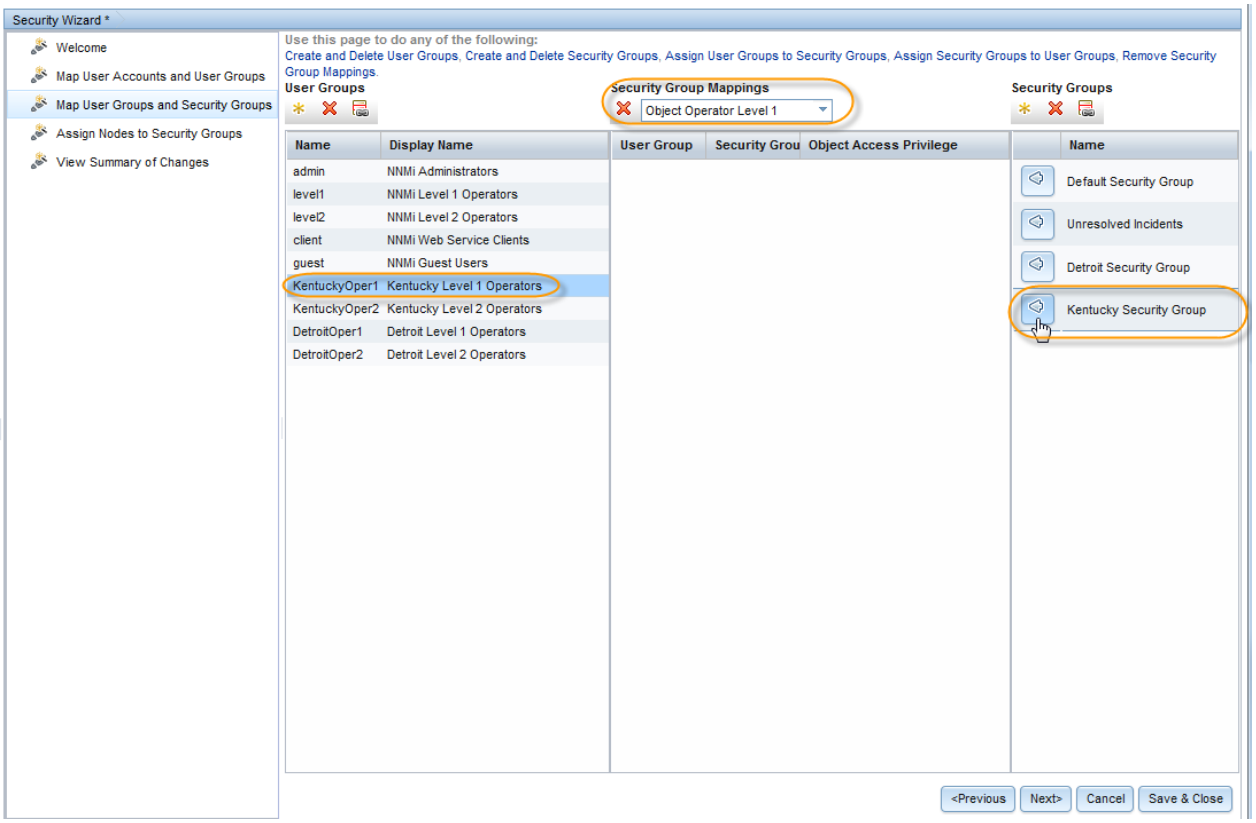


Map User Groups to Security Groups

For each User Group, do the following:

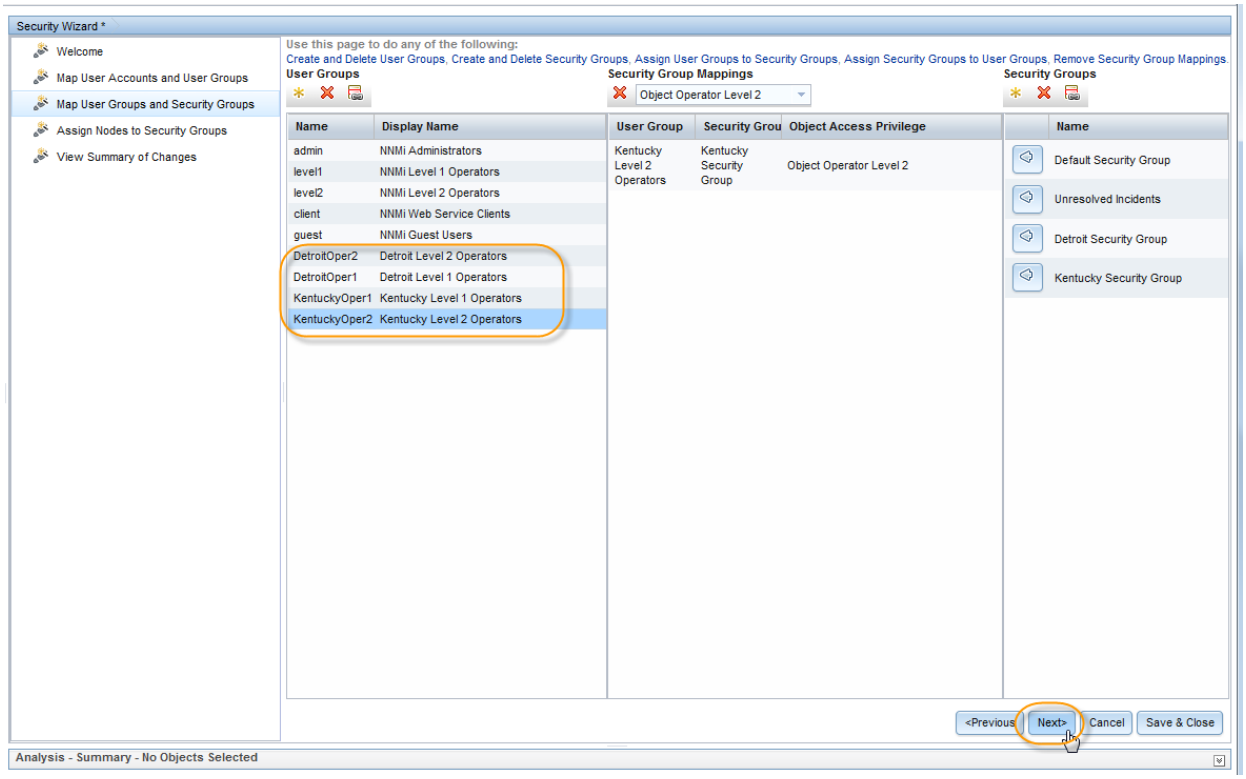
1. Click the User Group.
2. Click the appropriate object level in the **Security Group Mappings** pull-down list.
3. Click the icon beside the desired Security Group.

Figure 13: Security Wizard: Mapping Security Group



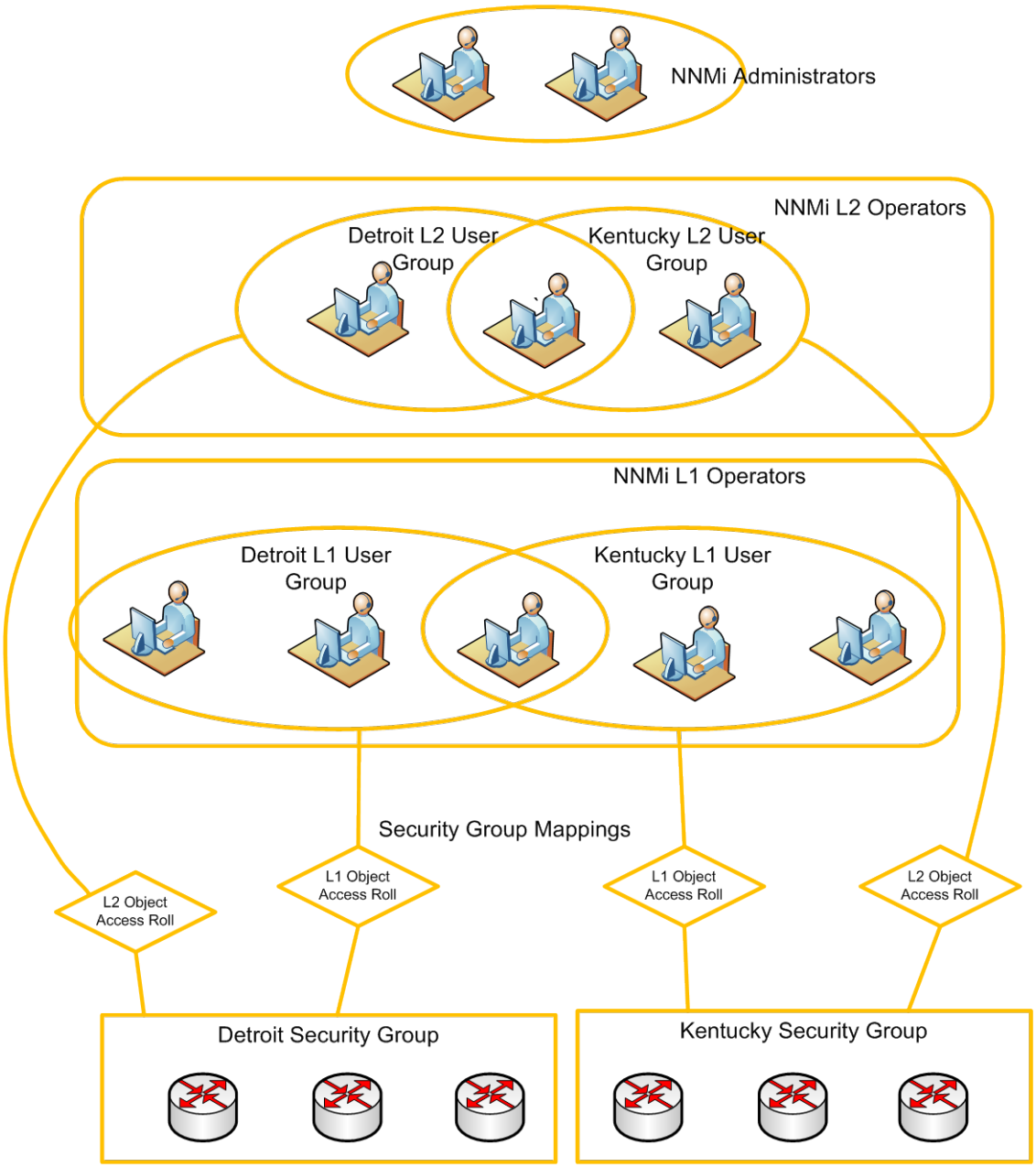
4. After you have defined all of the Security Group Mappings, click the **Next** button.

Figure 14: Security Wizard: Define Security Group Mappings



The following figure indicates the items now completed (shown in yellow).

Figure 15: Completed Items



Assign Nodes to Security Groups

You can assign previously discovered nodes to Security Groups either in the **Security Wizard**, the **Node** form, or with the `nnmsecurity.ovpl` tool. If you want to automatically assign nodes to a Security Group as they are discovered, use a "seeded discovery" along with the Tenant feature (discussed later in the *Tenants* section of this document).

This example includes the following assumptions:

1. The nodes have already been discovered.
2. You have created a Node Group that corresponds to each Security Group (Kentucky Nodes and Detroit Nodes).

Assign nodes to Security Groups as follows:

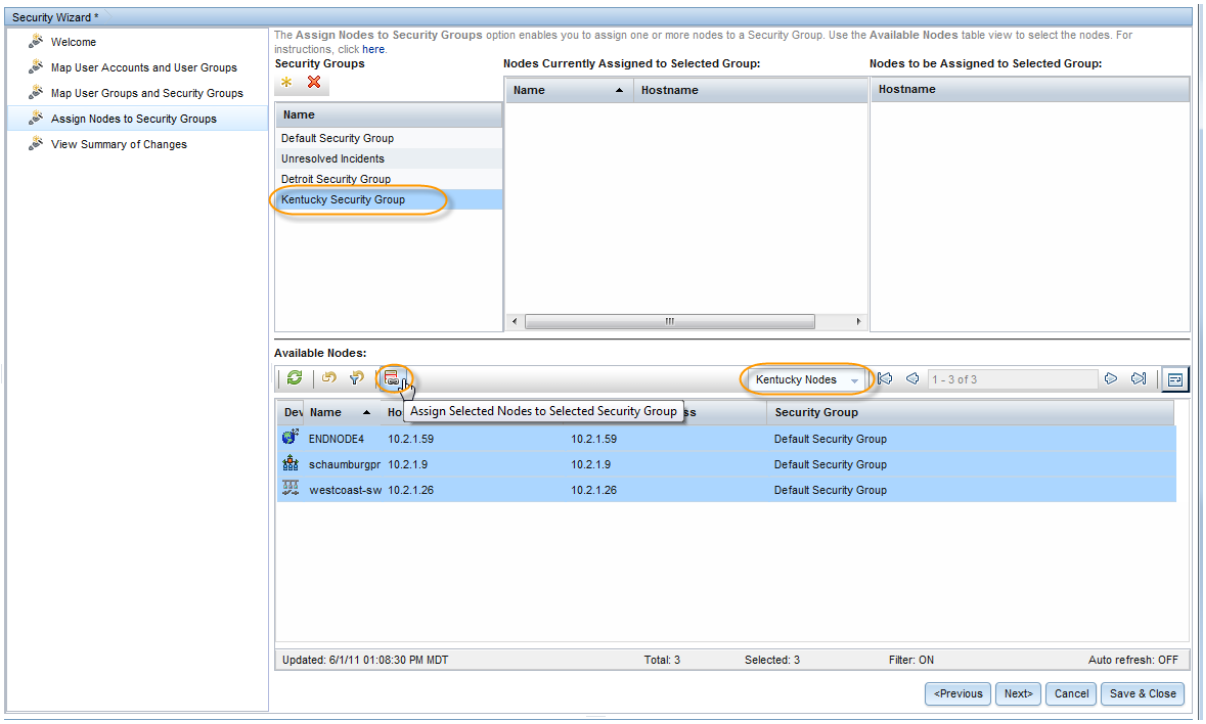
1. Click the Security Group to which you want to assign nodes (Kentucky Security Group in this example).
2. Click the nodes you want assigned to the Security Group in the bottom portion of the wizard.

Tip: To facilitate the process of assigning nodes, you can use the Node Group Filter pull-down list (**Kentucky Nodes** in the example below).

Tip: If there are many nodes in the Node Group, use the **CTRL**+**A** shortcut to select all of the nodes in the group.

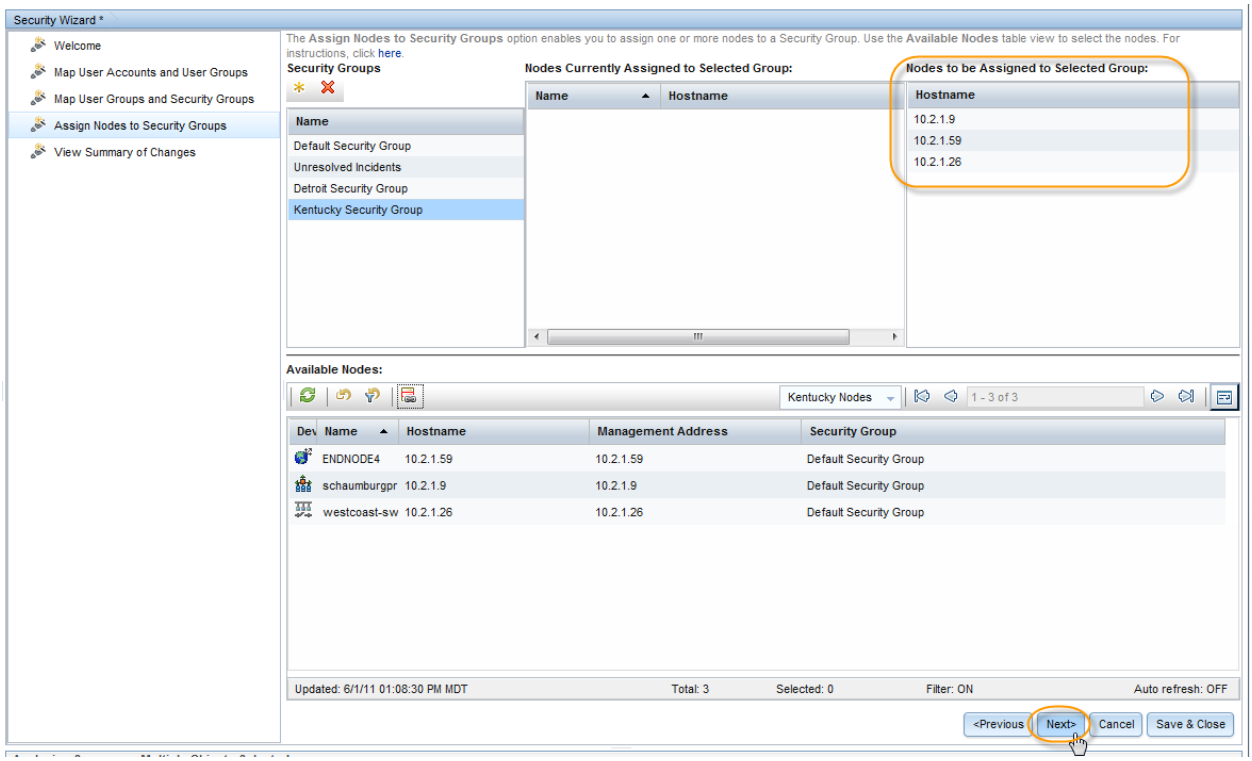
3. Click the **Assign Selected Nodes to Selected Security Group** icon.

Figure 16: Security Wizard: Assign Nodes to Security Group



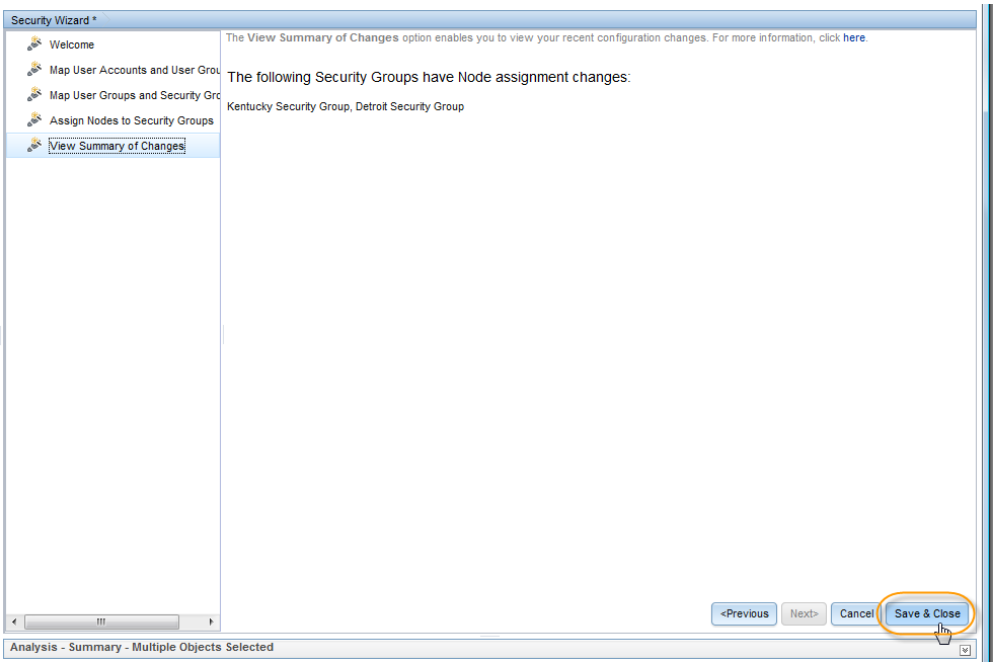
4. After you have assigned all the nodes, check to see that they are marked to be assigned, and then click **Next**.

Figure 17: Security Wizard: Verify Nodes are Assigned to Security Group



5. Finally, review the summary of changes. After verifying changes, click **Save and Close**.

Figure 18: Security Wizard: Final Summary



Verify Example

Verify the previous example as follows:

1. Sign in to NNMi as George. You should see only Kentucky nodes as well as incidents on Kentucky nodes.

Figure 19: Nodes: Sign in as George

2. Sign in to NNMi as John. You should see only Detroit nodes and incidents.

Figure 20: Nodes: Sign in as John

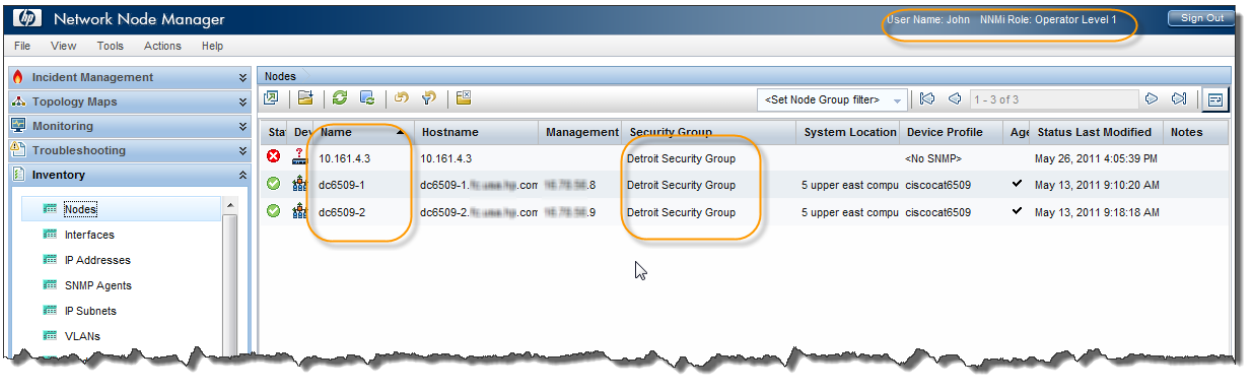
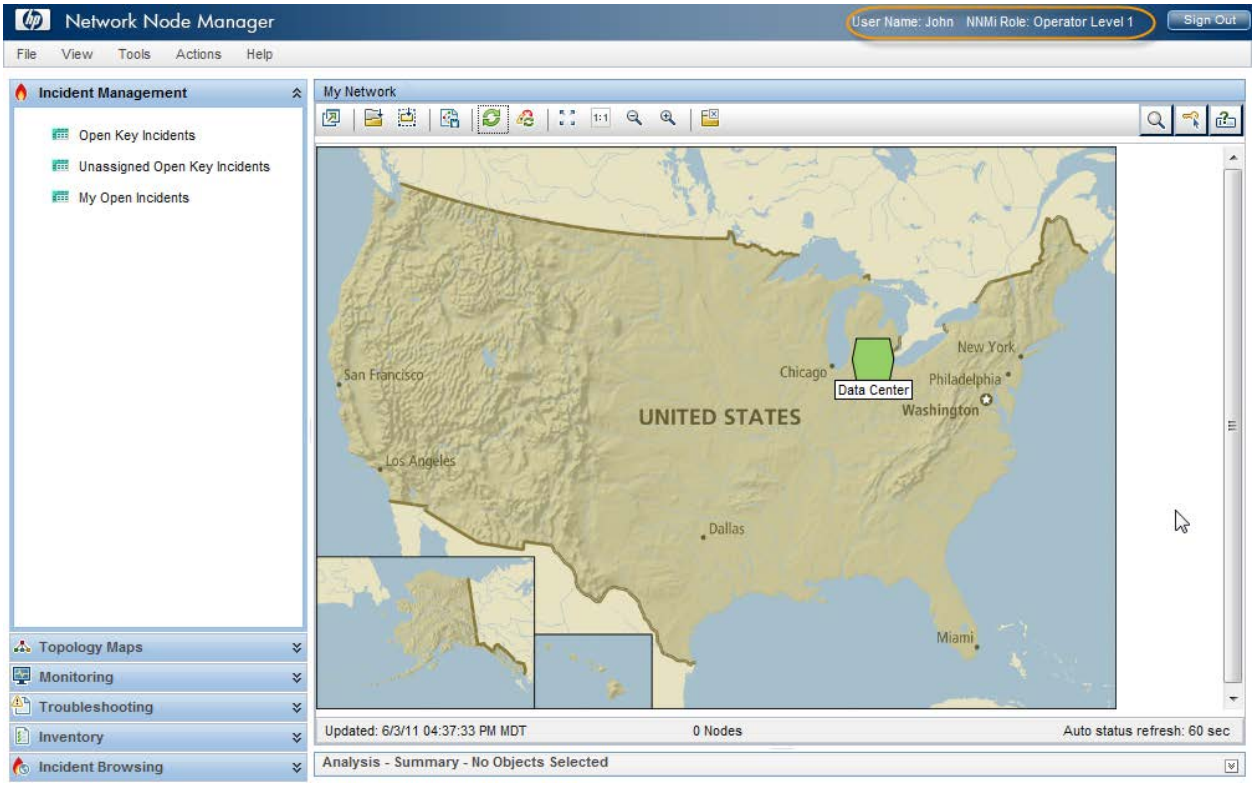


Figure 21: Incident Management: John's Network



3. Sign in to NNMi as Paul. You should see the nodes and incidents from both Detroit and Kentucky.

Figure 22: Nodes: Sign in as Paul

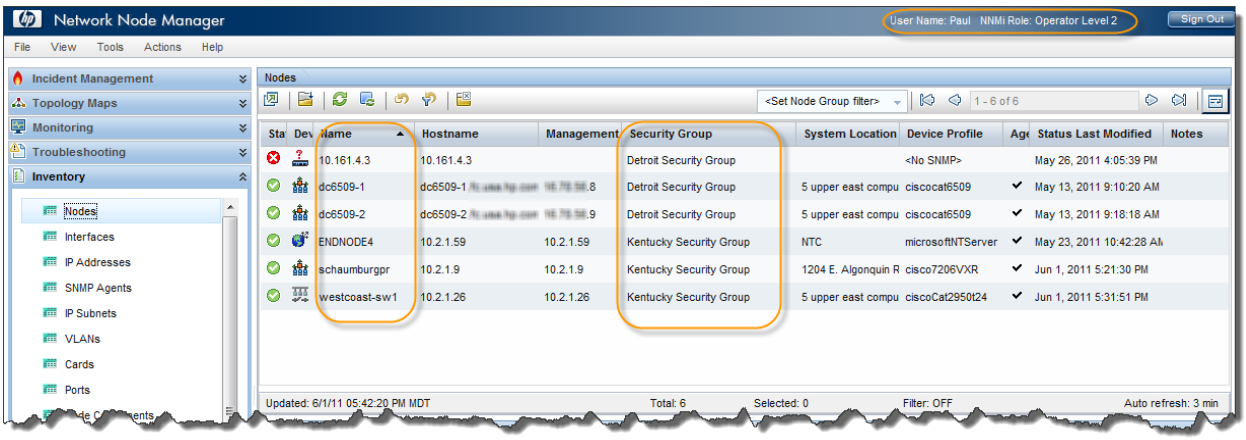
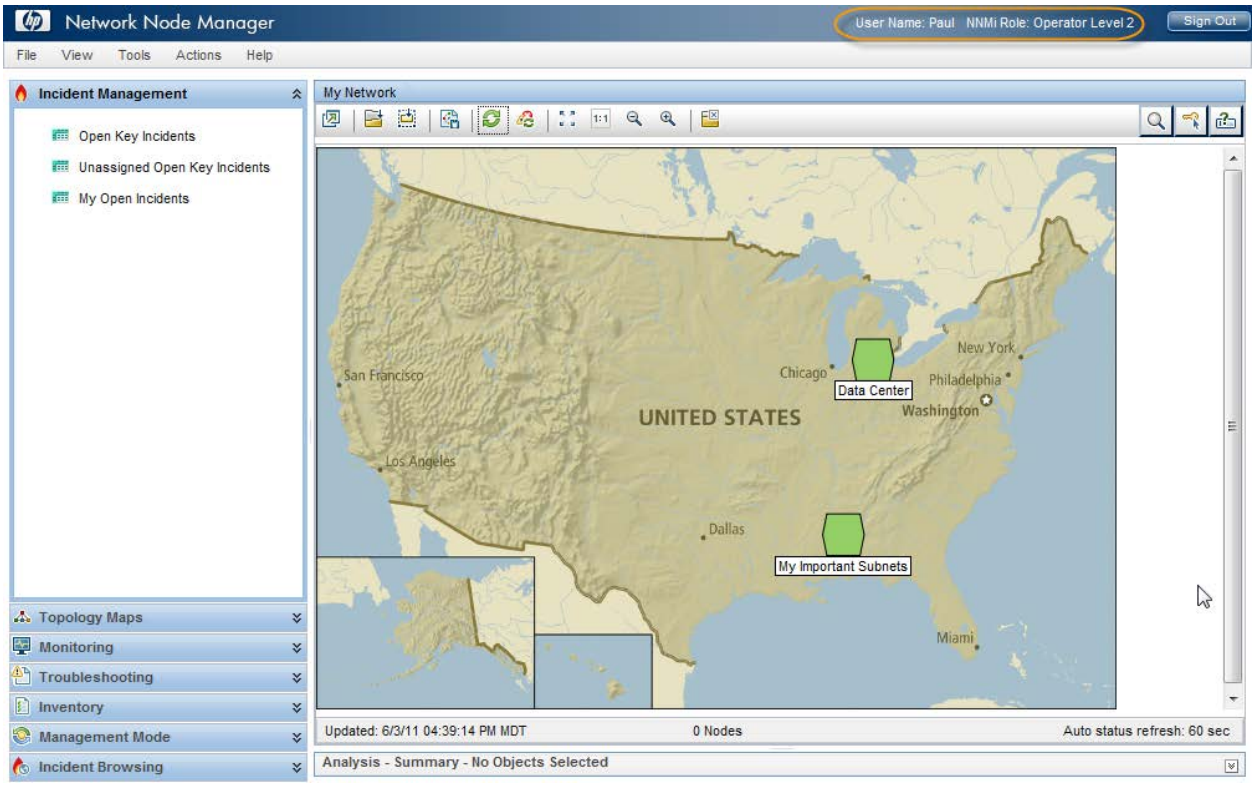
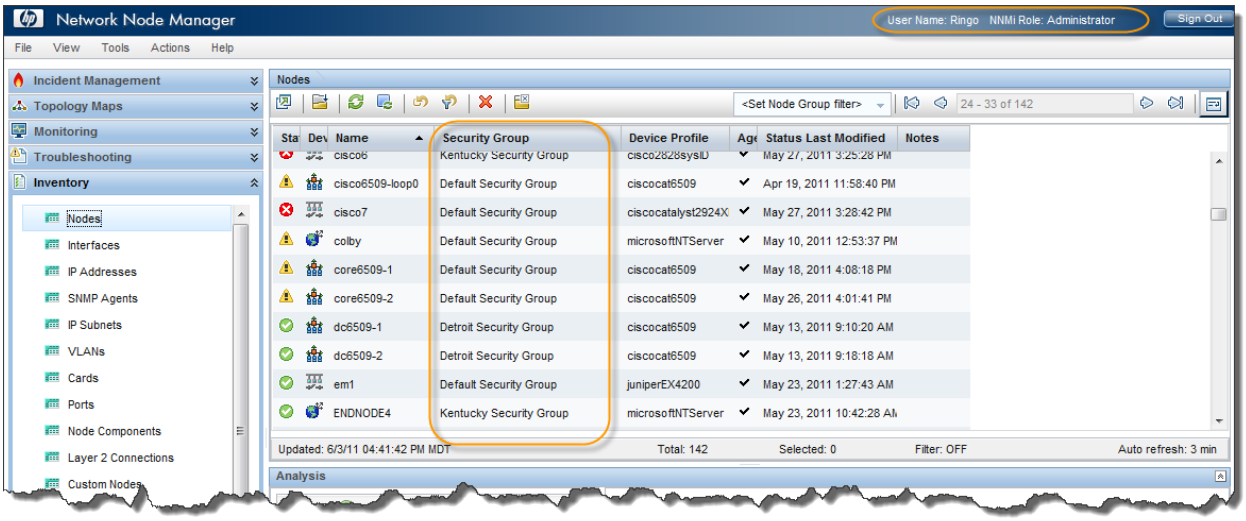


Figure 23: Incident Management: Paul's Network



4. Sign in to NNMi as Ringo. You should see all nodes (including nodes that are in the Default Security Group) because you are an administrator.

Figure 24: Nodes: Sign in as Ringo



Tenants

NNMi includes a feature called a Tenant (which may also be referred to as a customer or an organization). Each node is allowed one and only one Tenant assignment. Tenants are not Security Groups but they can be used in conjunction with Security Groups. The Tenant model is designed to be used with a "seeded

discovery". A Tenant can have an Initial Discovery Security Group assigned to it. When discovering a node into NNMi using a seed, you can specify the Tenant assignment. This means that if a node is discovered with a Tenant assigned, it can automatically be assigned into a Security Group. Thus, there is never a risk of accidentally having nodes visible to operators that are not supposed to see those nodes.

NNMi provides a helpful command line tool, `nnmsecurity.ovpl`. (See the *nnmsecurity.ovpl* reference page, or the UNIX manpage for more information.) The following example uses the graphical user interface for most actions but be aware that all of these same actions are available using the command line. Consider using the command line tool for large deployments with many Tenants.

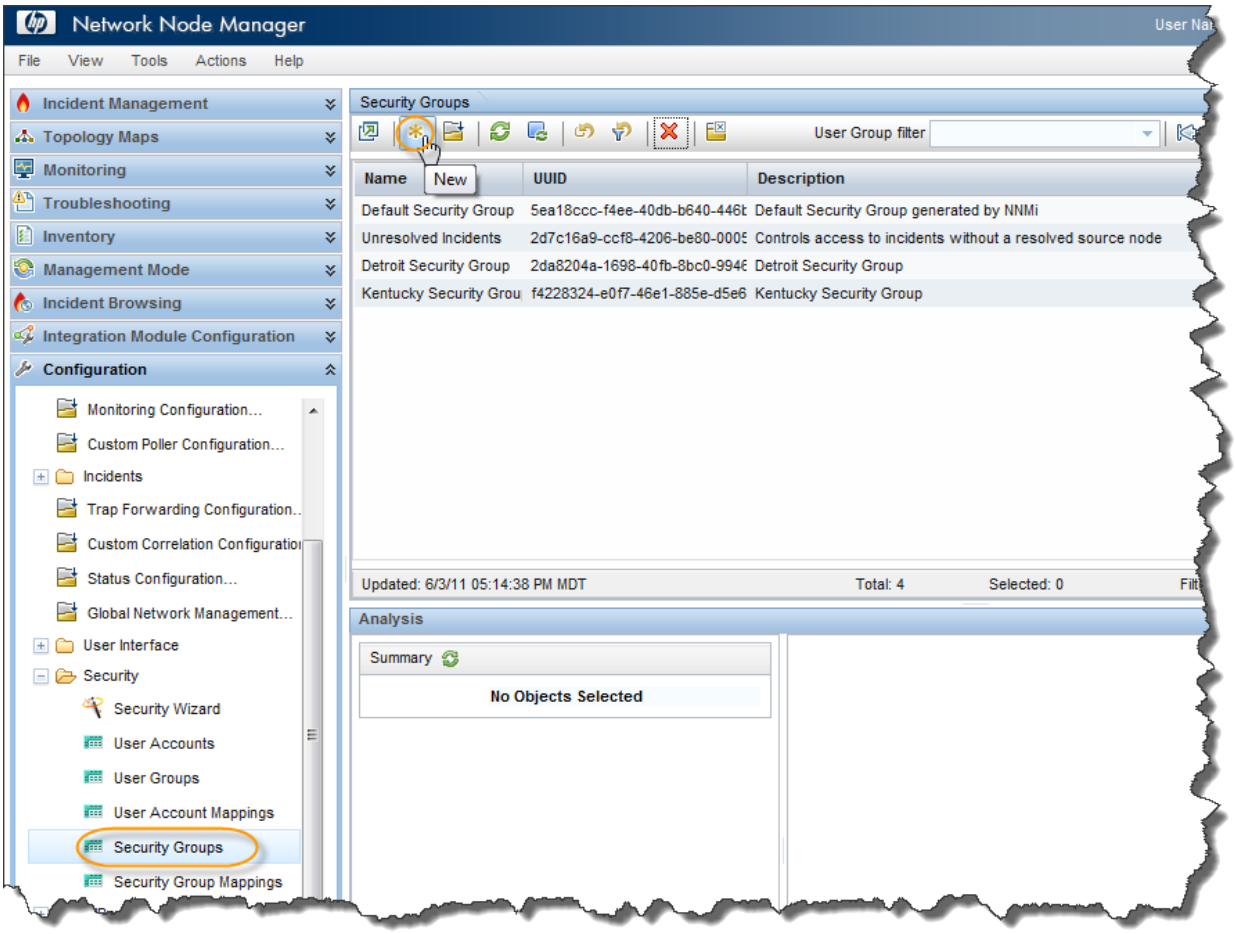
Tenant Example

Consider the following example. Begin by creating a Security Group for the Tenant.

Note: This example does not build on any of the previous examples.

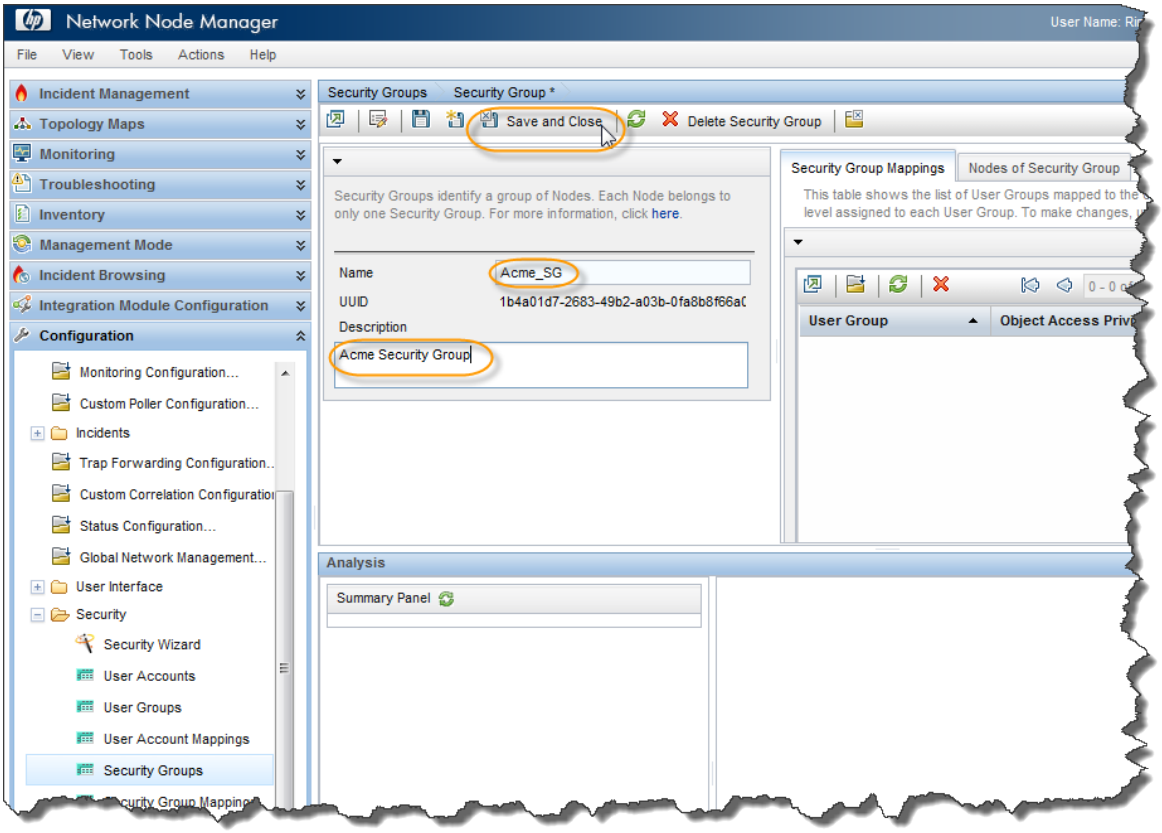
1. From the workspace navigation panel, select the **Configuration** workspace.
2. Expand the **Security** folder.
3. Click **Security Groups**.
4. Click the **New** icon.

Figure 25: Security Groups: Create a Security Group for the Tenant



5. Complete the form and save the Security Group.

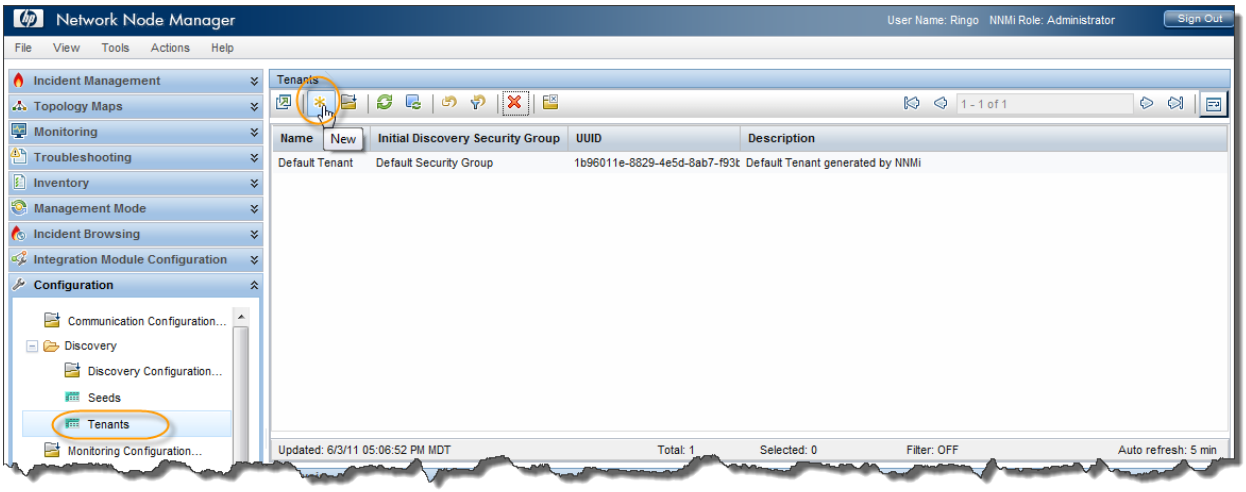
Figure 26: Security Group: Save and Close



Next, create a Tenant as follows:

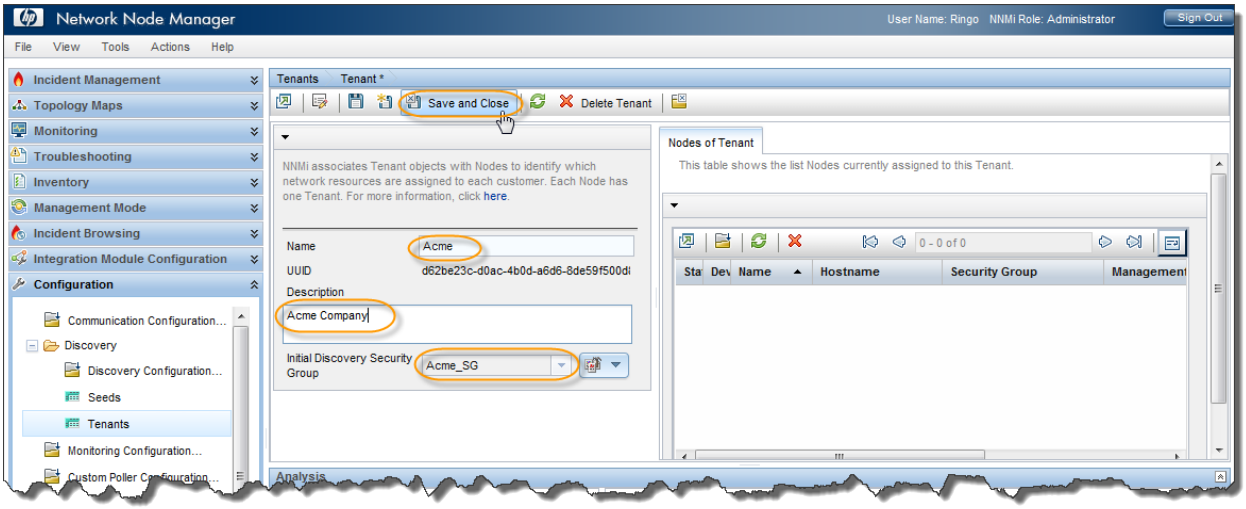
1. From the workspace navigation panel, select the **Configuration** workspace.
2. Expand the **Discovery** folder.
3. Click **Tenants**.
4. Click the **New** icon.

Figure 27: Tenants: Create New Tenant



5. Complete the **Tenant** form. (Remember to assign an Initial Discovery Security Group.)
6. Click the **Save and Close** button.

Figure 28: Tenant Form: Save and Close

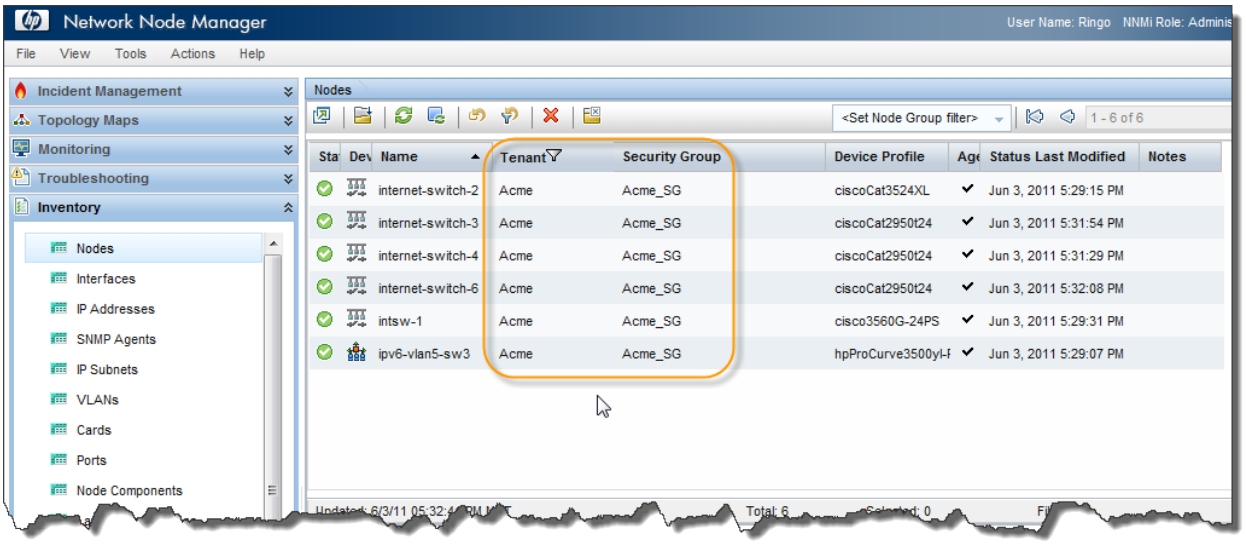


Finally, use the `nnmloadseeds.ovpl` command line tool to load seeds into NNMi. (For this example, there is a seed file, `acme_nodes.txt`, already created for the nodes to be loaded.) Use the `-t` option to assign the Tenant for the nodes, as shown in the following example:

```
nnmloadseeds.ovpl -t Acme -f acme_nodes.txt
```

The nodes are assigned a Tenant and a Security Group as they are discovered. Now the normal Security Group restrictions apply as previously discussed in this document.

Figure 29: Nodes Form: Tenant and Security Group



Tip: You can use Tenants as filter criteria for Node Groups.

Tenants and Security Groups in Global Network Management (GNM)

Tenants and Security Groups are uniquely identified by their Universally Unique Identifier (UUID). When using Tenants (Multi-Tenancy) and Security Groups in a GNM environment, you must keep the Tenant UUIDs identical between the Global NNMi station and the Regional NNMi station; the same is true for Security Groups if you want to share the security restrictions between the servers.

Tenants and Security Groups in GNM Example

Consider the following example.

Note: This example does not build on any of the previous examples.

1. Use the command line to create a Security Group and Tenant at the Global NNMi station for Customer2.

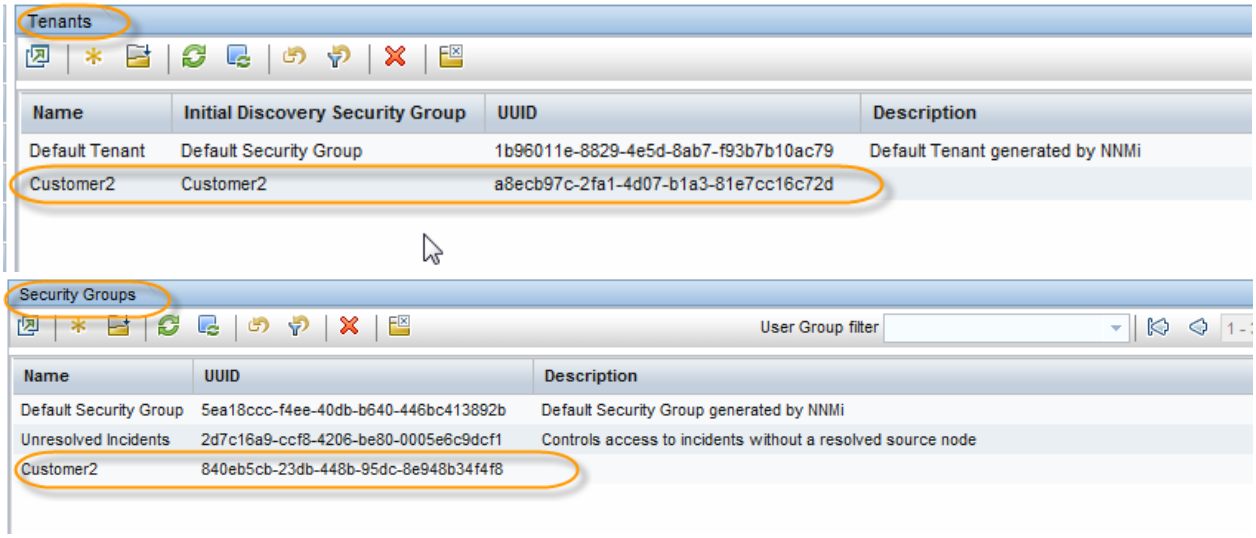
   Tip: When you create a Tenant from the command line using `nnmsecurity.ovpl`, as a convenience, if you do not specify a default Security Group, the tool creates a matching Security Group of the same name.

   The first UUID in the output is the Tenant UUID and the second UUID is the Security Group UUID. The return values in the following example are highlighted in different colors to show how the values are used at the Regional NNMi station.

   ```
   nnmsecurity.ovpl -createTenant Customer2
   a8ecb97c-2fa1-4d07-b1a3-81e7cc16c72d : 840eb5cb-23db-448b-95dc-8e948b34f4f8 :
   Customer2 :
   ```

   In the following figure, notice that the Global NNMi has created a Tenant and a Security Group with corresponding UUIDs.

Figure 30: Tenants Form: Tenant and Security Group for Customer2 at Global NNMi



2. Now, at the Regional NNMi station, use the `nnmsecurity.ovpl` command line tool to create a Tenant and Security Group (include the return values from the command output when the script was previously run at the Global NNMi station). Specifying the UUIDs causes NNMi to create a Tenant and a Security Group with these same UUIDs, allowing for proper synchronization.

   See the following sample command line:

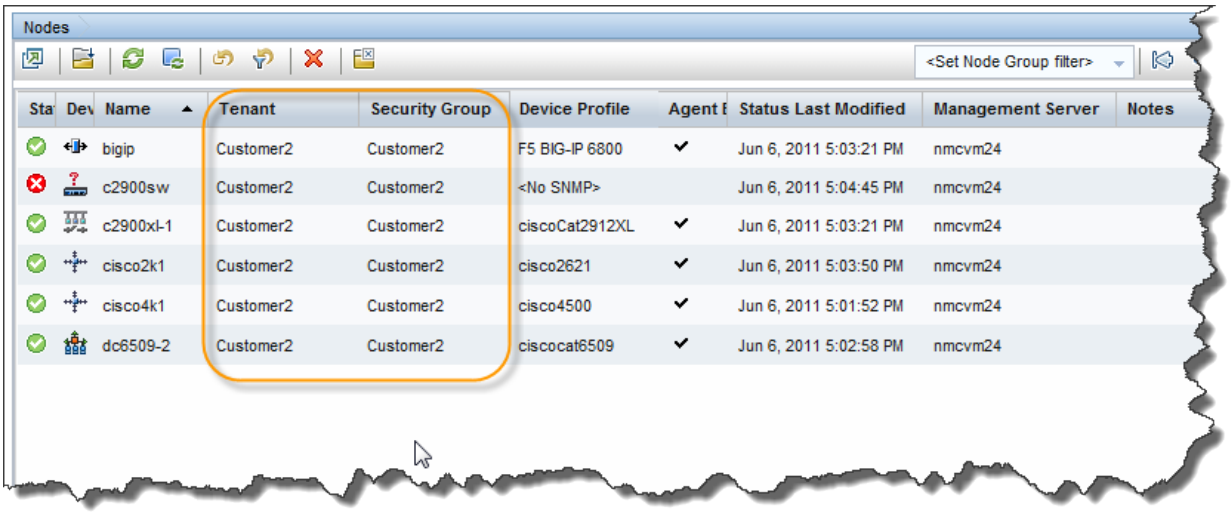
   ```
   nnmsecurity.ovpl -createTenant Customer2 -tenantUuid a8ecb97c-2fa1-4d07-b1a3-
   81e7cc16c72d -securityGroupUuid 840eb5cb-23db-448b-95dc-8e948b34f4f8
   a8ecb97c-2fa1-4d07-b1a3-81e7cc16c72d : 840eb5cb-23db-448b-95dc-8e948b34f4f8 :
   Customer2 :
   ```

3. Now you can load seeds at the Regional NNMi with the Tenant specified using the following command line syntax:

   ```
   nnmloadseeds.ovpl -t Customer2 –f <seedfile>
   ```

   All of these seeds are created on the Regional NNMi with the Tenant as Customer2 and the associated Security Group as Customer2. These nodes are synchronized to the Global NNMi station using the same Tenant and Security Group UUID, as shown in the following figure.

Figure 31: Nodes Form: Customer2 Tenant and Security Group at Global NNMi



4. At the Global NNMi station (and at the Regional NNMi station, as necessary), create users and User Groups, and then map the User Groups to the Security Groups. You do not need to do this at the Regional NNMi station if your users are signing into the Global NNMi station only. Users and User Groups are private to each NNMi system and are not synchronized.

Conclusion

This paper has shown a sample implementation of the security model by providing examples of Users Accounts, User Groups, Security Groups, mappings and Tenants. An example using the GNM feature was also shown.

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This product includes software developed by the Apache Software Foundation.

(http://www.apache.org)

This product includes software developed by the Indiana University Extreme! Lab.

(http://www.extreme.indiana.edu)

Support

Visit the HP Software Support web site at:

www.hp.com/go/hpsoftwaresupport

This web site provides contact information and details about the products, services, and support that HP Software offers.

HP Software online support provides customer self-solve capabilities. It provides a fast and efficient way to access interactive technical support tools needed to manage your business. As a valued support customer, you can benefit by using the support web site to:

- Search for knowledge documents of interest
- Submit and track support cases and enhancement requests
- Download software patches
- Manage support contracts
- Look up HP support contacts
- Review information about available services
- Enter into discussions with other software customers
- Research and register for software training

Most of the support areas require that you register as an HP Passport user and sign in. Many also require a support contract. To register for an HP Passport ID, go to:

http://h20229.www2.hp.com/passport-registration.html

To find more information about access levels, go to:

http://h20230.www2.hp.com/new_access_levels.jsp