



# 5620 SAM Services Operations and Provisioning

## Exercise\_Questions

TOS36042\_V3.0-EQ Edition 1

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## **Welcome to 5620 SAM**

### **Services Operations and Provisioning**

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  1. Common Actions
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  1. VPLS
  2. VLL Epipe
  3. VLL Ipipe
  4. VLL Apipe
  5. VLL Cpipe
  6. IES
  7. VPRN
  8. Composite Service
  9. Service Mirror
4. OAM diagnostics
  1. VPLS OAM Test
  2. VLL OAM Test
5. Service and Network Tests
  1. Generated STM Test
  2. Service Throughput
  3. RCA Audit
6. Templates
  1. VPLS from Template
7. Service classification and Forwarding
  1. QoS



## 5620 SAM

### Services Operations and Provisioning

Upon completion of this course, you should be able to:

- Describe the Alcatel-Lucent service concept,
- Identify the roles and corresponding Alcatel-Lucent equipment in an IP/MPLS network,
- Describe the components of a service,
- Create service tunnels and configure service access ports
- Provision IP/MPLS services (VPLS, VLL, IES, and VPRN)
- Provision composite services, service mirrors, and dynamic services
- Perform OAM diagnostic tests
- Configure tests using the Service Test Manager to verify the services's operational state
- Create service throughput tests to verify SLAs
- Perform root cause analysis to identify configuration problems for services and physical links
- Create services using customer-defined templates
- Apply a QoS policy to a service

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## Section 1 Overview

# Module 1 Common Actions

TOS36042\_V3.0-EQ-English-Ed1 Module 1.1 Edition 1

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Edition	Date	Author	Remarks
3.0	2014-04-03	MCGRATH, John	TOS36042_V3.0 First edition – SAM 12.0 R1



Upon completion of this module, you should be able to:

- Identify and perform common actions related to the management of services and service tunnels

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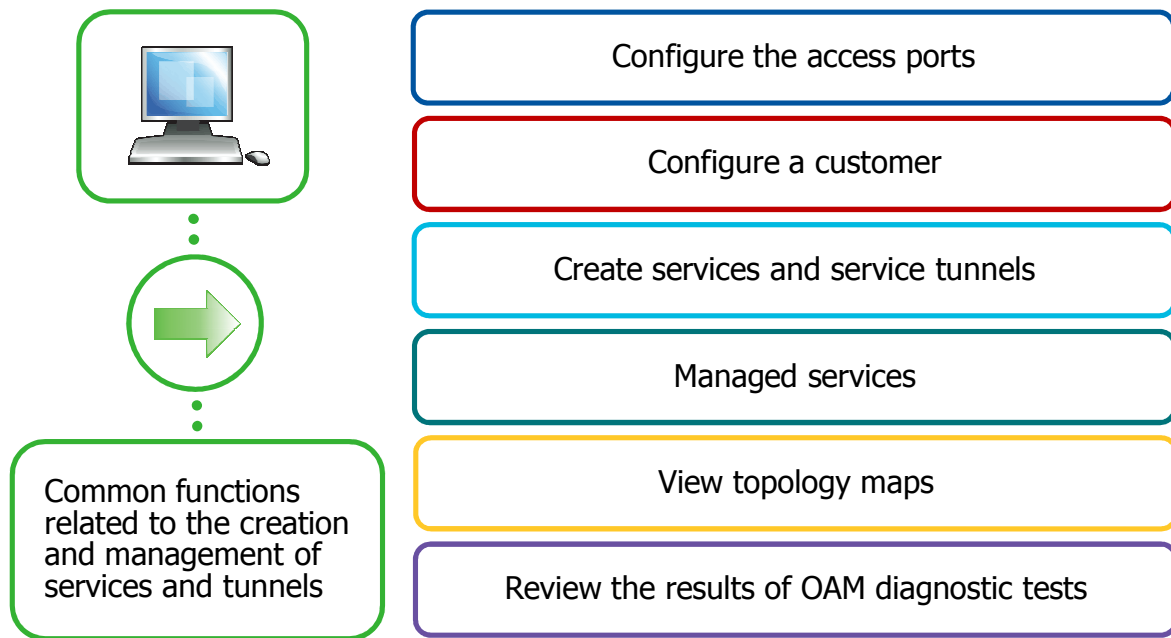


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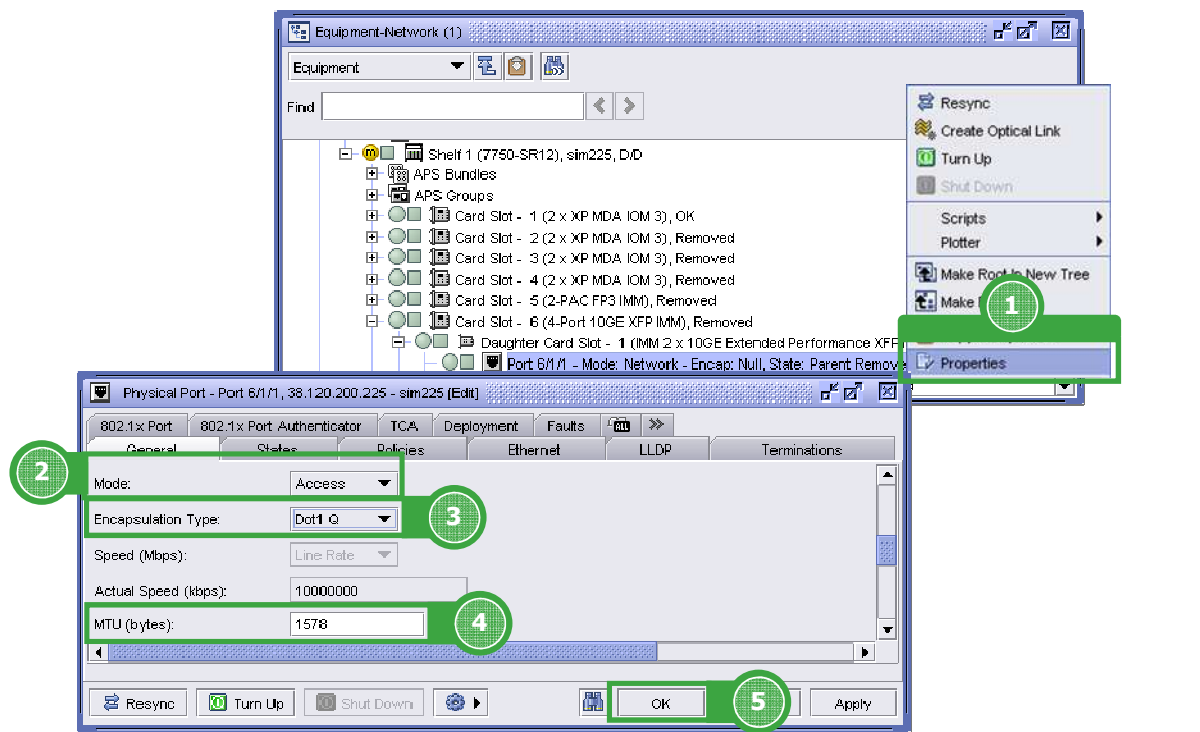
# 1 Common Service and Tunnel Management Functions

## 1.1 Lab overview



## 2 Configure the access ports

## 2.1 Configure Access Port



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Ports in a service that face the customer edge must be configured as Access mode.

1. Right-click on the appropriate port or ports and select the **Properties** command. It is possible to configure multiple ports at the same time by through the Shift - Click or Ctrl - Click method.
2. Configure the **Mode** parameter to **Access**.
3. Configure the **Encapsulation Type** parameter.
4. Configure the **MTU** parameter. The port MTU must be set to a value that supports the largest service MTU for the port.
5. Select **OK** to complete the configuration.



## 3 Configure a customer

## 3.1 Configure a customer

The screenshot shows the Alcatel-Lucent 5620 SAM interface. In the 'Manage' menu, 'Service' is expanded, and 'Customers' is selected (indicated by a green circle with the number 1). The 'Manage Customers' window is open, showing a table with columns for ID, Name, and Description. The 'Create...' button is highlighted (indicated by a green circle with the number 2). Below this, the 'Customer, (New Instance) [Create]' window is shown with the 'General' tab selected. The 'General' tab contains fields for ID, Name, Description, Address, Phone Number, Email, and Contact. A blue callout box states: 'The information in the General tab is used to create a database of customer information, including contact information, so that the customer can be contacted if there is a service or equipment problem.' The 'OK' button is highlighted (indicated by a green circle with the number 3).

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Services must be associated with a customer. Though a service may only have one customer, that customer may have more than one associated to them.

Each tab lists parameters you can view or modify, or functions that you can perform, related to customer management.

- The General tab lists the ID, the customer name, and contact information.
- The 5670 RAM Parameters lists the Apdex and MOS thresholds that can be set by the customer.
- The Services tab lists which services such as VPLS, VPRN, or VLL are associated with the customer.
- The Sites tab lists the PE devices used by the customer.
- The Aggregation tab lists aggregation schedulers defined for the customer.
- The Associated Templates tab lists service templates used to create services for the customer.
- The Spans tab lists the span of control over customers.

To create a Customer using the 5620 SAM:

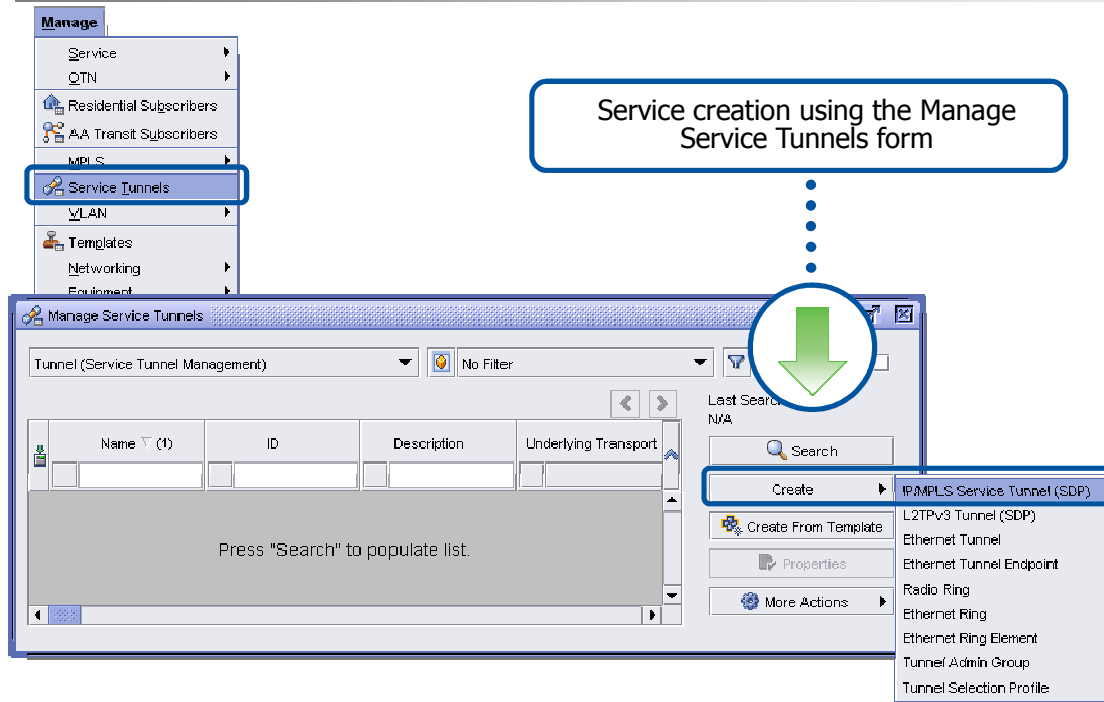
1. Select **Manage** → **Service** → **Customers** from the main menu.
2. Click on the **Create** button.
3. Configure the customer information and click on the **OK** button.

## 4 Create services and service tunnels



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## 4.2 Service tunnel creation



You can initiate the creation of 5620 SAM service tunnels using the Manage Service Tunnel form.

## 5 Manage services



## 5.1 Filter service list

The image shows two screenshots of the 'Manage Services' interface. The top screenshot shows the 'Epipe Service (EPIPE)' selected in the dropdown menu (1) and the 'Search' button (2). The bottom screenshot shows the search results table with 'course-epipe-1' selected (3). A context menu is also shown with options like Delete, Copy to Clipboard, and Properties.

Service ID	Default VC ID	Service Name	Description	Serv
4		course-epipe-1	N/A	3
5		Ro and Ro	N/A	3
6		N/A	N/A	3
34		EPIPE 34	N/A	3
10		EPIPE 10	N/A	3

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1. Select the service type from the drop-down menu in the Manage Services form.
2. Click on the Search button.
3. Select the service for which you want to view information or perform an action.

## 5.2 View existing service information

The screenshot shows the 'Edit' form for a service in the Alcatel-Lucent Service Manager. The form has tabs for 'General', 'Application Assurance', 'Sites', 'Endpoints', 'Interfaces', and 'Spoke SDP Bindings'. The 'General' tab is active, showing fields for 'Customer ID' (1) and 'Name' (Default customer). A red box highlights the 'Edit' button in the top right. A green arrow points from the 'Edit' button to the 'Edit' form. A blue callout box contains the following text:

You can view the components and configuration details for services used the edit form. The form allows you to modify the service, execute actions such as RCA Audit, and view the component details using the Navigation tree.

1. You must click on the OK or Apply buttons to save the service edits.

## 6 View topology maps

## 6.1 View the service on the topology map

**Service topology view initiated using the Manage Service form**

Service Name	Description	Service Tier	Service Priority
course-epipe-1	N/A	3	Low
R5 and R6	N/A	3	Low

**Service topology view initiated service edit form**

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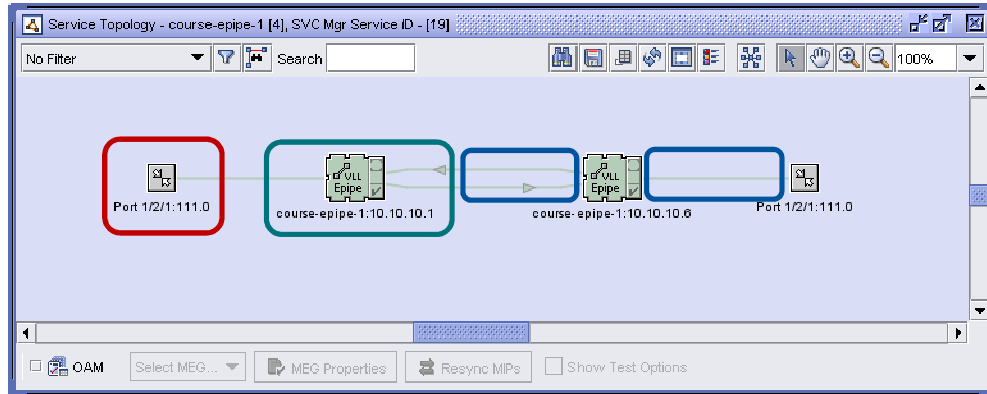
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You can initiate the service topology view using the Manage Services form or the service edit form.

## 6.2 View the service on the topology map

A line between two map objects represents a link or group of links. Links between device icons represent service circuits. Links between device icons and port icons represent the binding of an access port or interface to a service.



A port icon represents a managed access interface. A port label includes the port number and the inner and outer port encapsulation values.

Large NE icons represent managed devices (shown), small NE icons represent unmanaged devices (not shown). The label of an NE icon indicates the service name and the NE IP address.

## 6.3 View the service tunnel on the topology map

**Application**

- Navigation Tree
- Alarm Window
- Supervision Portal
- Physical Topology
- Service Tunnel Topology**
- Flat Maps
- EPS Path Topology
- Task Manager
- Text Message
- Clipboard
- Copy Property Form Identifier
- Go To Property Form
- User Preferences
- Manage Workspaces
- Customize Current Workspace
- Switch User
- Exit

Icons in the service path topology map represent devices. Link groups between devices represent service tunnels.

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1. Select Application→Service Tunnel Topology from the 5620 SAM main menu.

The color of the device icon represents the status of the device. Red means that the device is down. Green means that the device is up. Yellow means that the device is being synchronized. Purple means that the device is in a suspended management state.

When a link group is red, at least one tunnel in the link group is down.

For link groups between managed devices, right click on the link group icon to list and edit tunnels in the link group. For link groups between managed and unmanaged devices, right-click on the link group icon to open contextual menus and submenus which allow you to open additional information forms for the service tunnel, including the properties form.

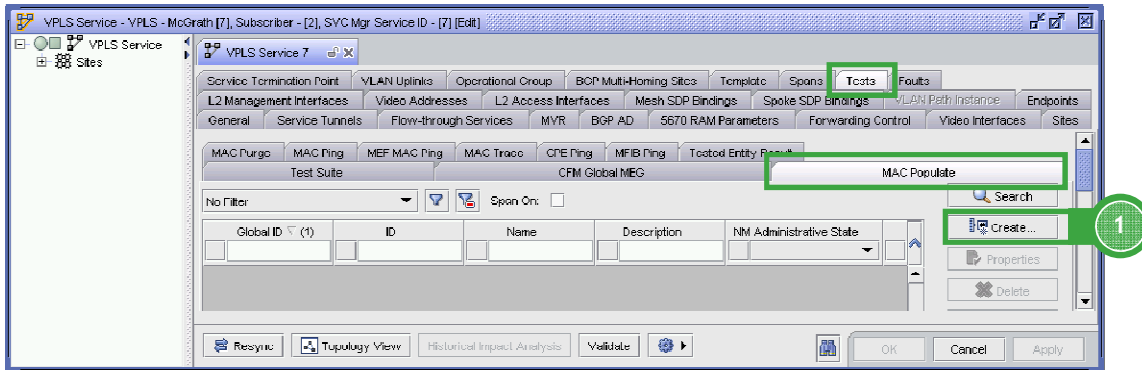


## 7 Review the results of OAM diagnostic tests

## 7.1 OAM diagnostic tests

The creation, execution, and review of OAM diagnostic test results are the same for all test types. The Tests tab on the service form lists the supported test types.

This lab shows a MAC populate test on a VPLS service as an example of the common functionality share by the OAM diagnostic tests.



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To configure the MAC Populate OAM test:

1. On the service edit form, click on the Test → MAC Ping tabs, and click on the **Create** button.

## 7.1 OAM diagnostic tests [cont.]

MAC Populate, mac populate Test [0] [Create]

General Results Configuration Deployed Tests NM Threshold Alarms Results

ID: 0 ☒ Auto-Assign ID

Name: mac populate

Description: mac populate

Administrative State: Enabled NE Persistent: ☐

Test Object

Target Type: VPLS Site

Target MAC Address: 22-11-11-11-11-11

Send via Control Plane: ☐

Flood: ☐

Force OAM: ☐

Age (seconds): 3600

Service

Service Name: claudio test

Service ID: 115

Site

Name: VPLS service-205 node150 (172.0.0.150)

System ID: 172.0.0.150

Operational State: Up

SAP

Reset OK Cancel **Apply** 2

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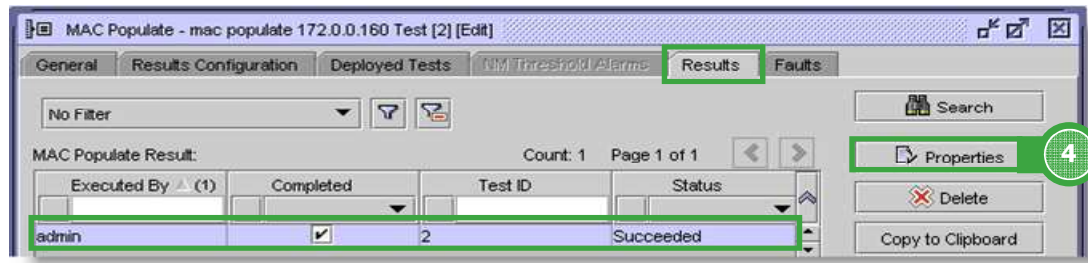
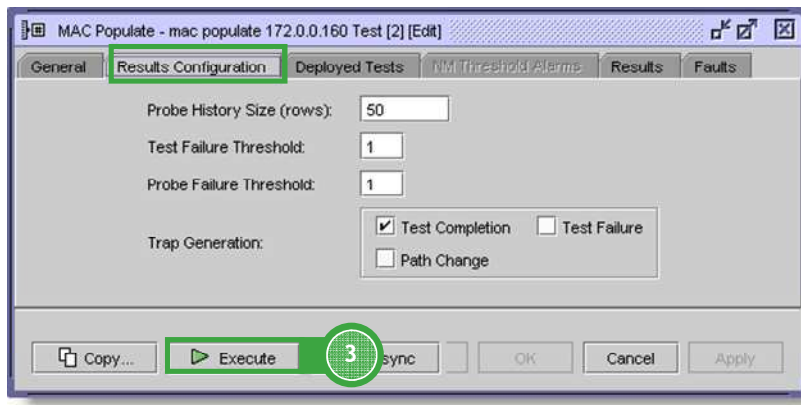
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2. Configure the test details and click on the **Apply** button.

## 7.1 OAM diagnostic tests [cont.]



3. Click on the **Execute** button that has appeared at the bottom of the window after the configuration has been saved;
4. Click on the **Results** tab, select the test result, and click on the **Properties** button.

## 7.1 OAM diagnostic tests [cont.]

The MAC Populate Result provides the test results within the one window. From this context, it is possible to determine a wide variety of information including; test status, the time the result was captured by the 5620 SAM, the event trigger mechanism, service tested and the MAC address that was used in this test.

The screenshot shows a window titled "MAC Populate Result - Result - [admin], Test - [2], [172.0.0.160] [Edit]". The window is divided into two main sections. The top section contains general test information, and the bottom section contains the test results.

**General Test Information:**

- Executed By: admin
- Completed: ☒
- Test ID: 2
- Time Captured: 2009/08/11 12:52:02 539 EDT
- From Node: 172.0.0.160
- Timed Out: ☐
- Status: Succeeded
- Reason: N/A
- Execution Trigger: SAM Triggered

**Test Result:**

- Test Execution Status: Completed
- Target MAC Address: 22-11-11-11-11-11
- Service ID: 16
- Send via Control Plane: ☐
- Flood: ☒
- Force OAM: ☐
- Age (seconds): 3600

At the bottom of the window, there are buttons for "View Test...", "View Tested Object...", "Reset", "OK", "Cancel", and "Apply".

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5. Review the general test information.
6. Review the test results.



## End of module Common Actions

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## Section 2 Overview

# Module 1 SDP

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3.0	2014-04-03	MCGRATH, John	TOS36042_V3.0 First edition – SAM 12.0 R1





Upon completion of this module, you should be able to:

- Create an IP/MPLS Service Tunnel
- Verify the tunnel connection

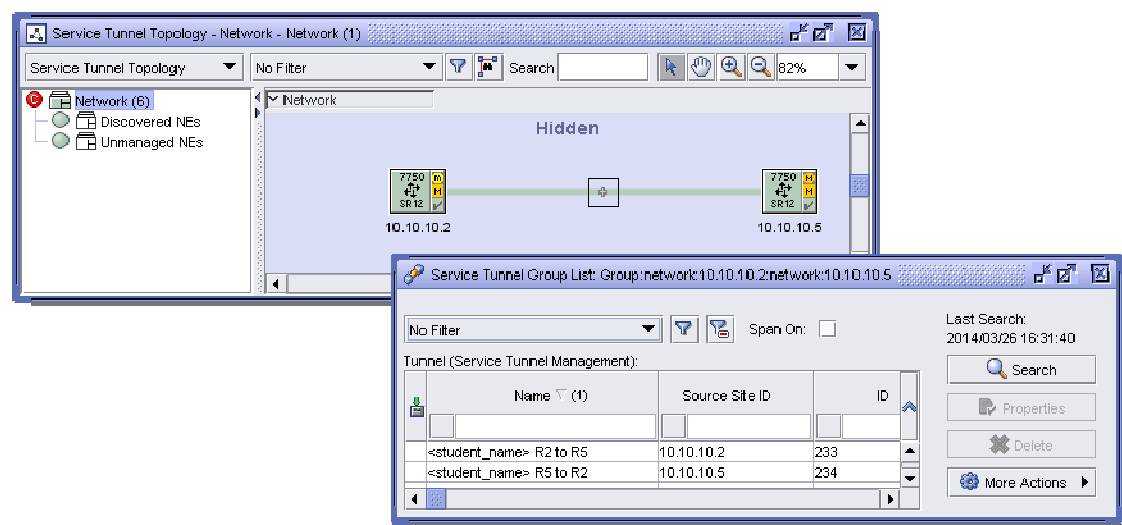
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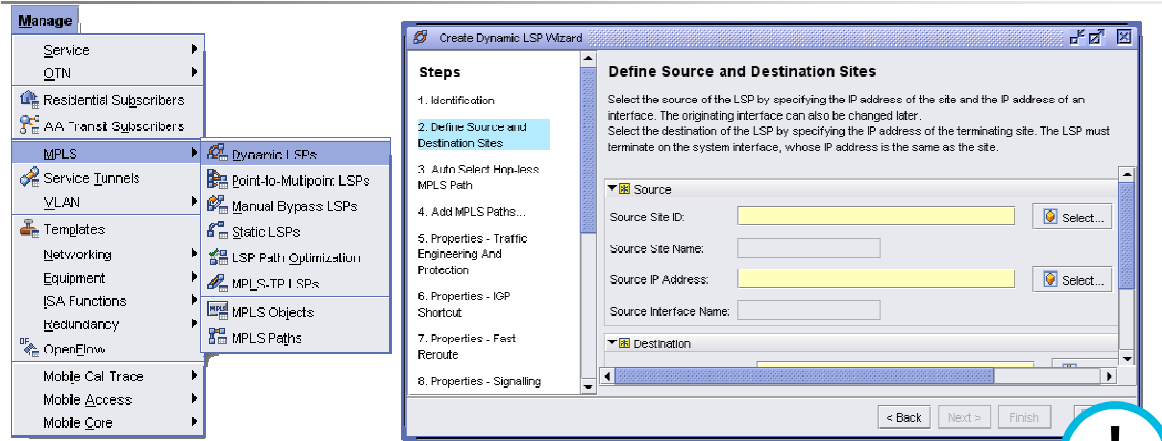
# 1 Service Tunnel Configuration



**This lab demonstrates how to configure an IP/MPLS service tunnel.**

## 2 Create an LSP

## 2.1 Create static or dynamic LSPs



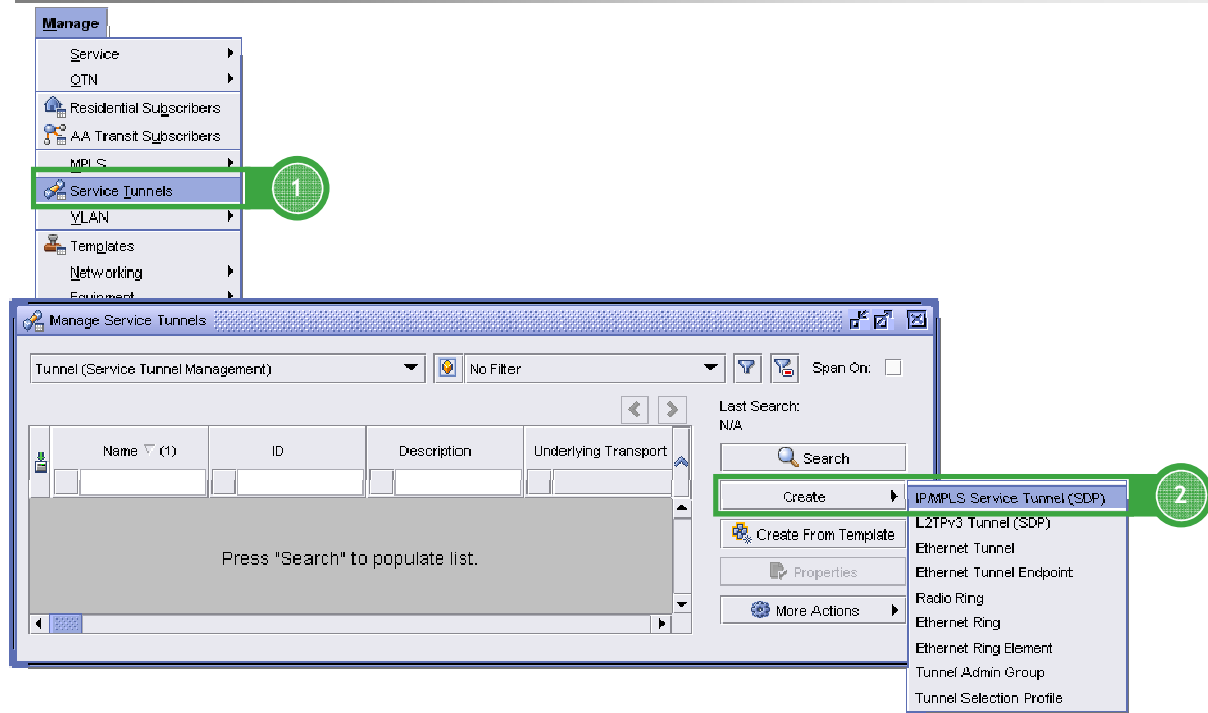
The first step in creating a service tunnel is to create a static or dynamic LSP. The 5620 SAM IP/MPLS course describes the details of LSP creation. **The LSP creation is outside the scope of this course, so your instructor created a full mesh of dynamic LSPs for the purpose of this lab.**

Remember, binding the SDP to the LSP creates the service tunnel, the actual mechanism through which customer traffic is transferred to the egress PE.



## 3 Create an IP/MPLS Service Tunnel

## 3.1 Create an IP/MPLS Service Tunnel



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1. Choose **Manage** → **Service Tunnels** from the main menu. The **Manage Service Tunnels** form opens.
2. Click on the **Create** button and choose **IP/MPLS Service Tunnel (SDP)**. The **IP/MPLS Service Tunnel (SDP)** form wizard opens.



### Note

*This is a multiple step process and is repeated for each Service Tunnel to be created. Complete each step of the wizard and click on the Next button to move to the next step. Once all mandatory fields (marked yellow) in the form are configured, the Finish button becomes active. By clicking on the Finish button at any point in the wizard, the default settings are applied to the tunnel for the remaining steps and the wizard closes.*

## 3.1 Create an IP/MPLS Service Tunnel [cont.]

The screenshot displays the 'IP/MPLS Service Tunnel (SDP)' configuration wizard. The main window is titled 'Name & Describe Service Tunnel (SDP)' and contains the following fields:

- Name:** <student\_name> R2 to R5 (highlighted with a green circle 3)
- Description:** (empty field)
- ID:** 0 (highlighted with a green circle 3)
- Auto-Assign ID:** ☒ (highlighted with a green circle 3)

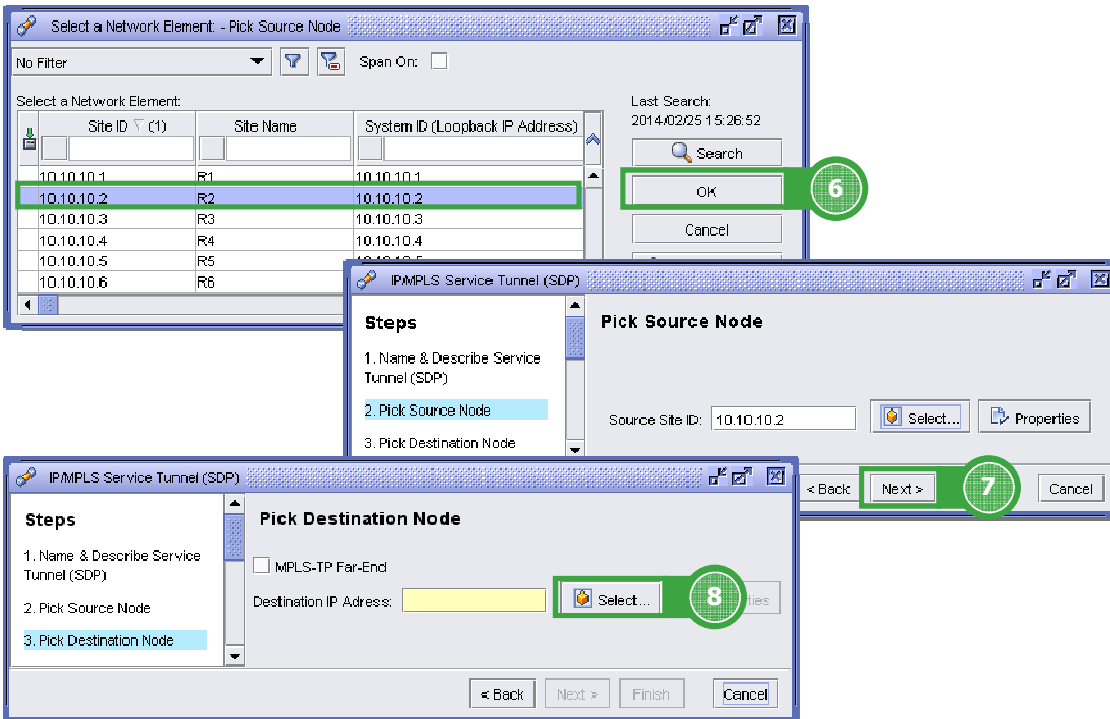
Below the main window, a smaller window titled 'Pick Source Node' is visible, showing the following steps:

1. Name & Describe Service Tunnel (SDP)
2. Pick Source Node (highlighted with a green circle 5)
3. Pick Destination Node

The 'Pick Source Node' window has a 'Source Site ID' field (highlighted with a green circle 5) and a 'Select...' button (highlighted with a green circle 5). At the bottom of the main window, the 'Next >' button is highlighted with a green circle 4.

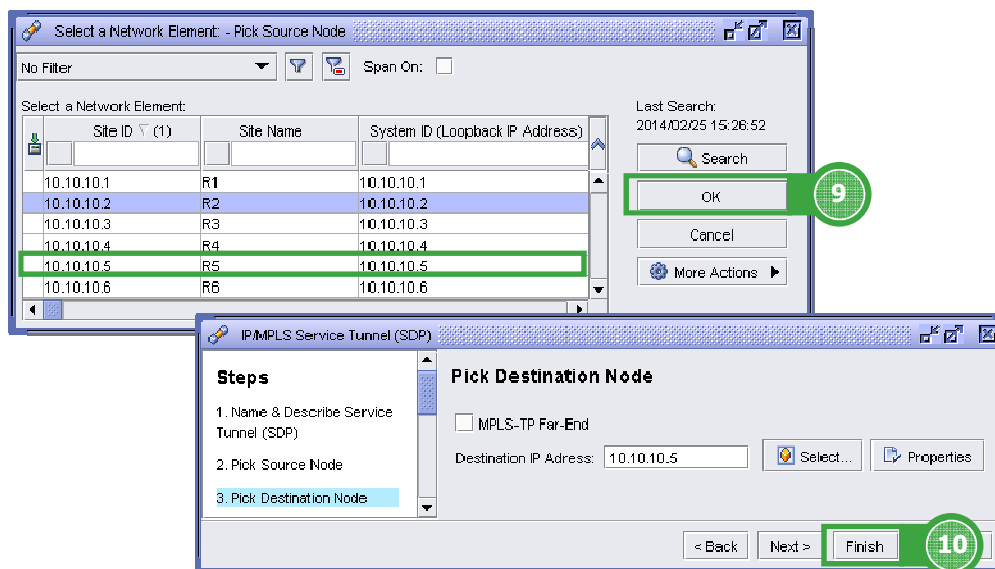
3. Configure service tunnel **Name** and **Description**. You can use the Auto-Assign ID parameter the SDP ID is fine as long as you use a Clear Tunnel Name.
4. Click on the **Next** button to continue
5. Click on the the **Select** Button to enter the source system address.

## 3.1 Create an IP/MPLS Service Tunnel [cont.]



6. Select the source network element and click on the **OK** button.
7. Click on the **Next** button.
8. Click on the the **Select** Button to enter the destination system address.

## 3.1 Create an IP/MPLS Service Tunnel [cont.]



9. Select the source network element and click on the **OK** button.
10. Click on the **Next** button.

## 3.1 Create an IP/MPLS Service Tunnel [cont.]

**IP/MPLS Service Tunnel (SDP)**

**Steps**

1. Name & Describe Service Tunnel (SDP)
2. Pick Source Node
3. Pick Destination Node
- 4. Specify Transport**
5. Specify Transport Destination Address
6. Specify Hello Parameters
7. Specify MTU Values
8. Specify Metric
9. VC Type Related Parameters
10. Specify Initial State
11. Associate Service
12. Admin Groups

**Specify Transport**

Specify Transport for This Service Tunnel

Underlying Transport: **MPLS**

Mixed LSP Mode: **false**

Enable LDP: **true**

Enable BGP-Tunnel: **false**

Signaling: **TLDP**

The transport options presented in the IP/MPLS SDP configuration wizard can vary for each device type and release. Also, the transport configuration can impact the steps presented for the remainder for the configuration wizard.

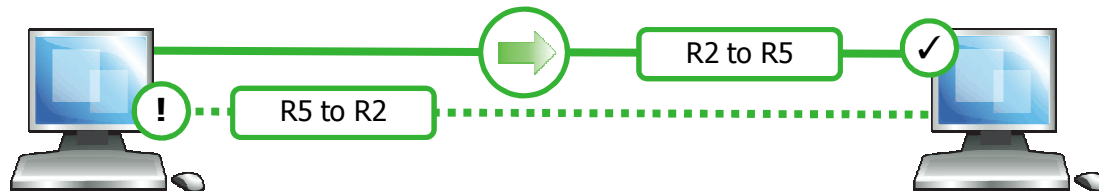
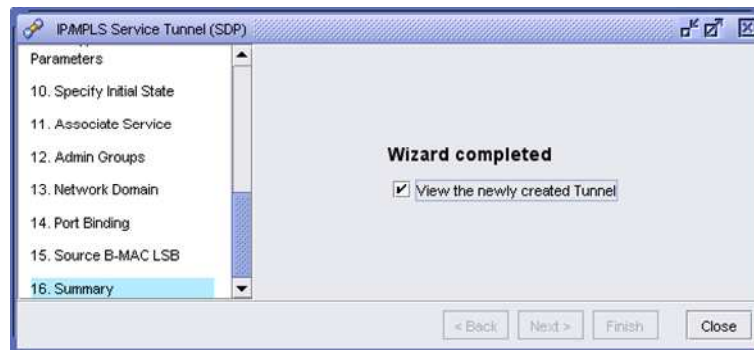
< Back Next > **Finish**

### 11. Configure the following parameters:

- Underlying Transport: MPLS
- LDP Enabled: True
- Signaling: TLDP

### 12. Unless otherwise indicated by your instructor, click on the **Finish** button to apply the default values for each parameter within the successive steps.

## 3.1 Create an IP/MPLS Service Tunnel [cont.]

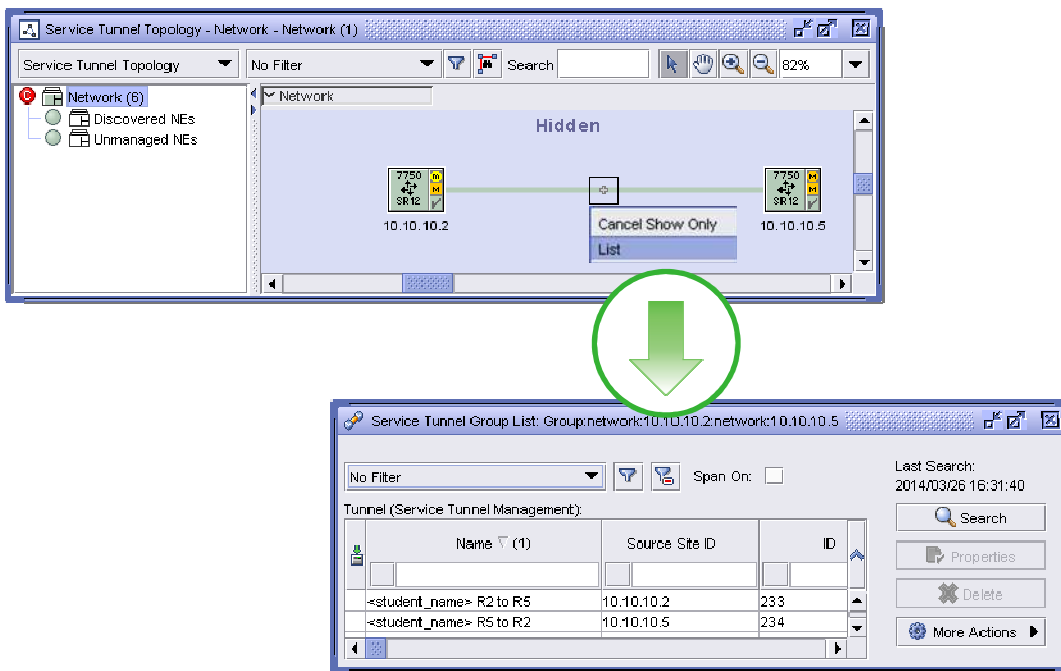


Service tunnels are **unidirectional**, so they are required in both directions between the source NE and the destination NE. Repeat the steps associated with the IP/MPLS Service Tunnel (SDP) configuration wizard to configure the return tunnel.

## 4 View the tunnel on the topology map



## 4.1 View the tunnel on the topology map



2 • 1 • 19

Overview - SDP  
5620 SAM - Services Operations and Provisioning

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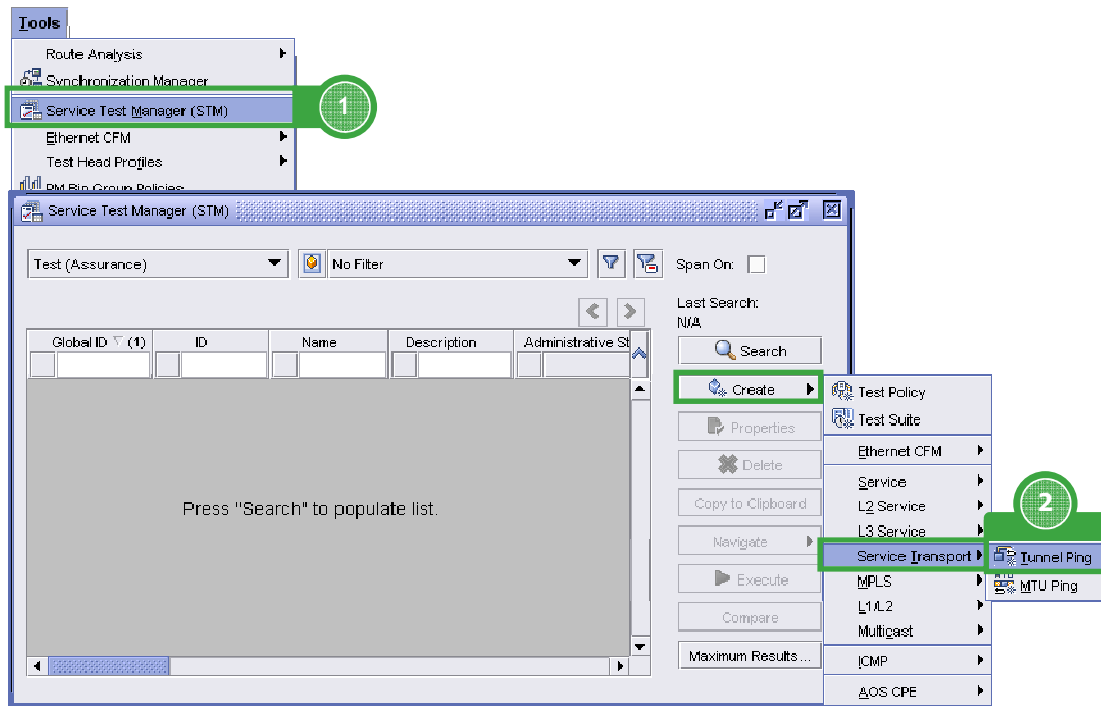
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The **Service Tunnel Topology** view map displays the SDP link you have created. In this example, the user requested that the 5620 SAM only show the newly created R2-R5 tunnel. You can limit the display of the tunnels in the topology map by right-clicking on the plus sign associated with the tunnel and selecting the Show Only Selected command from contextual menu.

Right click on the **plus** sign on a link in the map and choose **List** from the contextual menu, or double-click on the **plus** sign on a link in the map. The **Service Tunnel Group List** form opens with a list of service tunnels for the link.

## 5 Verify tunnel connection

## 5.1 Verify tunnel connection



2 · 1 · 21

Overview · SDP  
5620 SAM · Services Operations and Provisioning

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1. From the main menu select **Tools** → **Service Test Manager (STM)**. The Service Test Manager form opens.
2. Select **Create** → **Service Transport** → **Tunnel Ping**. The Tunnel Ping [Create] form opens with the general tab displayed.

## 5.1 Verify tunnel connection [cont.]

2 • 1 • 22

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3. On the **Tunnel Ping [Create]** form **General** tab configure the parameters:
  - a. Name the Tunnel Ping Test
  - b. Click on the **Select** button to specify the node at the start of the tunnel. You can optionally specify the Return Tunnel ID (SDP number).
4. Click on the **Apply** button. The **Tunnel Ping** form refreshes to show additional tabs
5. Open the **Results** tab and click on the **Execute** button to perform the test. The list will refresh to display the results for the test. To review the test results, double-click on an entry in the list or select an entry and click on the **Properties** button

**Note**

*It may be useful to create a MTU Ping using a similar series of steps.*

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End of module  
SDP

.....  
**2 · 1 · 24**

Overview - SDP  
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## Section 3 Service Types

# Module 1 VPLS

TOS36042\_V3.0-EQ-English-Ed1 Module 3.1 Edition 1

5620 SAM  
Services Operations and Provisioning  
TOS36042\_V3.0-EQ Edition 1

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Document History			
Edition	Date	Author	Remarks
1.0	2012-10-12	MCGRATH, John	TOS36042_V1.0 – SAM 10.0 R1
1.1	2012-11-16	MCGRATH, John	TOS36042_V1.1 – SAM 10.0 R5
2.0	2013-04-10	MCGRATH, John	TOS36042_V2.0 First edition – SAM 11.0 R1
2.1	2013-08-16	MCGRATH, John	TOS36042_V2.0 Second edition – SAM 11.0 R1 (update)
3.0	2014-04-03	MCGRATH, John	TOS36042_V3.0 First edition – SAM 12.0 R1





Upon completion of this module, you should be able to:

- Configure a Virtual Private LAN Service (VPLS)

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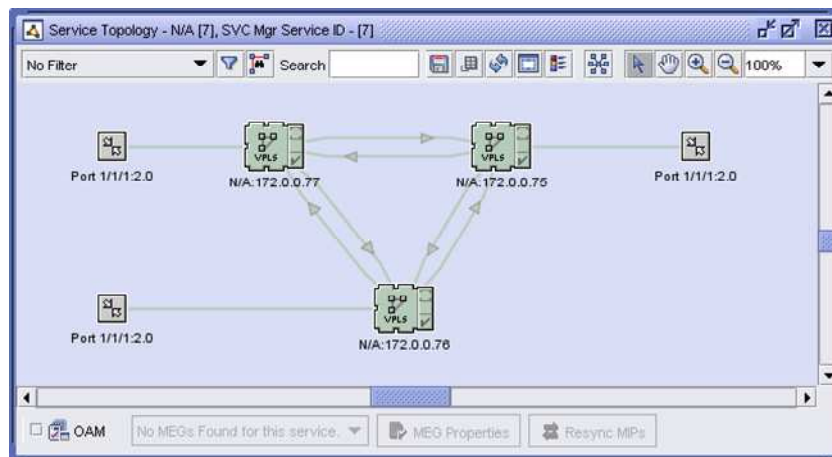


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2.1.1 Adding sites	21
2.1.2 Adding L2 Access interfaces	23
2.1.3 Create Mesh SDP Bindings	25

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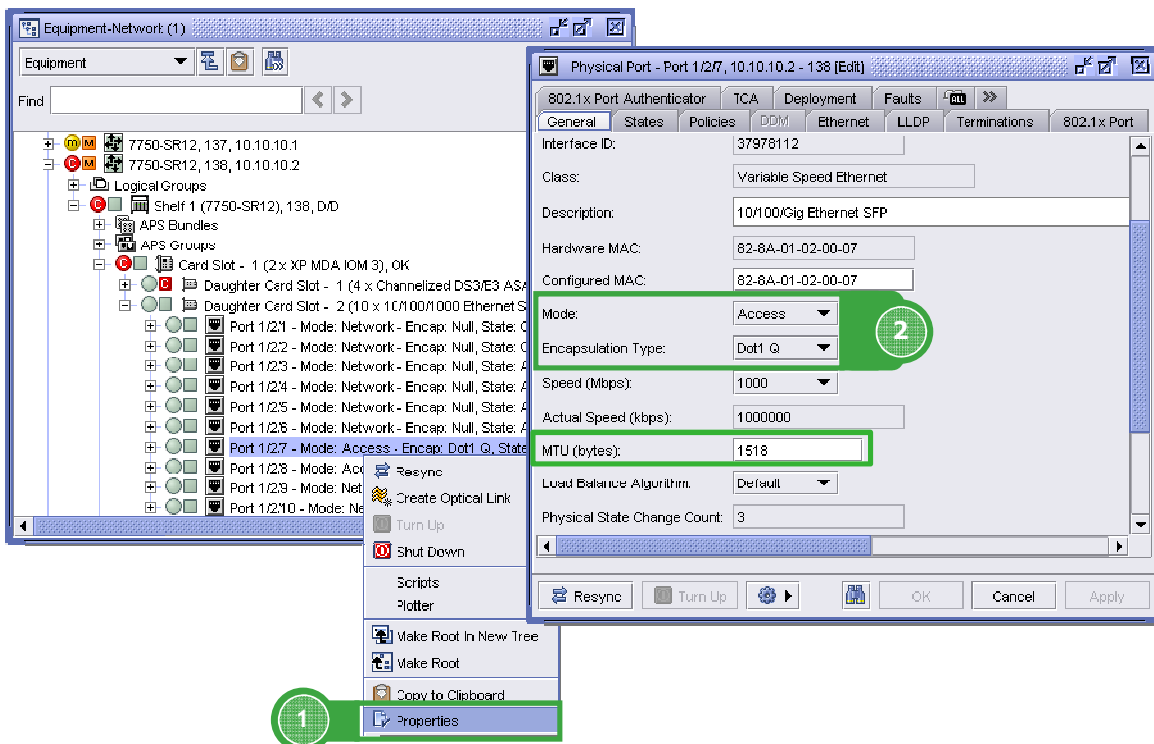
# 1 VPLS Configuration

# 1.1 Lab overview



**This lab demonstrates how to configure the core components of VPLS service using the form-based configuration method and the point-and-click provisioning method.**

## 1.2 Configure Access Port



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The following lab exercises will guide you through the steps necessary to configure a VPLS service in the lab's managed network.

1. Create a VPLS Service
2. Assign a Port to SAP
3. Assign SDPs



### Technical Reference

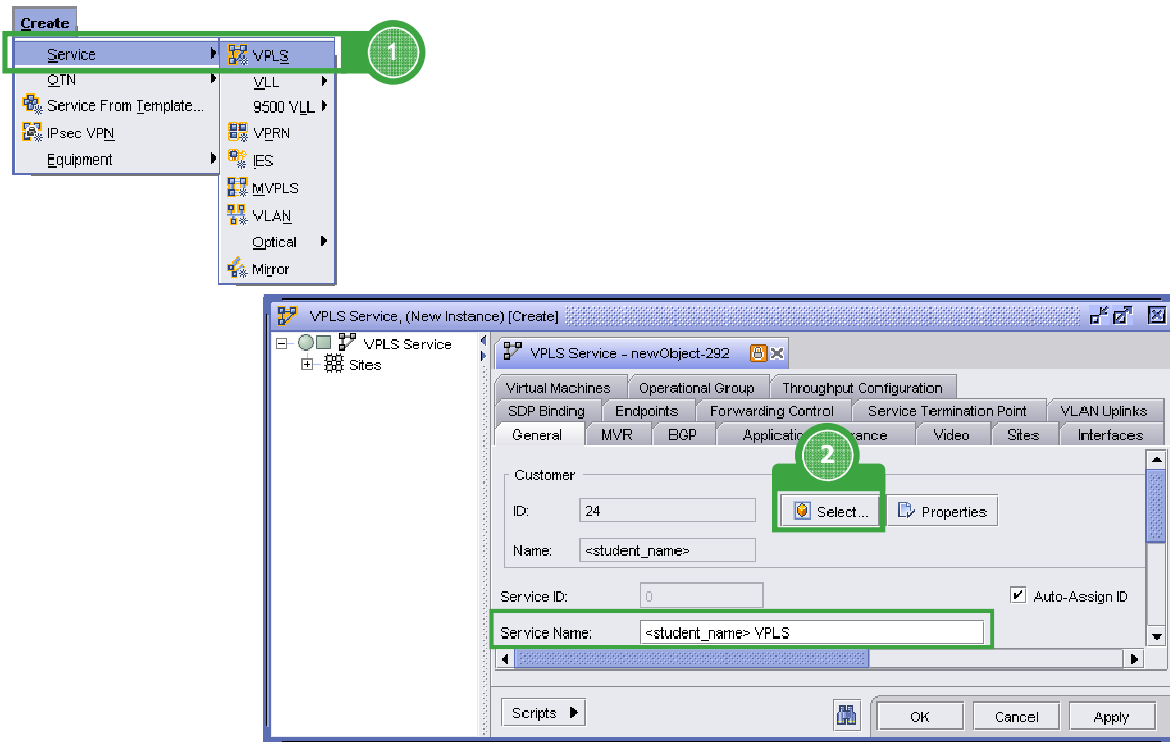
See the *Alcatel-Lucent 5620 SAM User Guide* for more details on the procedures to create VPLS services.

## Configure Access Port

1. From the **Equipment** tab. Right click the equipment facing port and select **Properties**.
2. Change the **Mode** to **Access**, and **Encap Type** to **Dot1Q**

Note: From the Port MTU will automatically increase from 1514 to 1518 when you select OK

## 1.3 Create a VPLS



3 • 1 • 10

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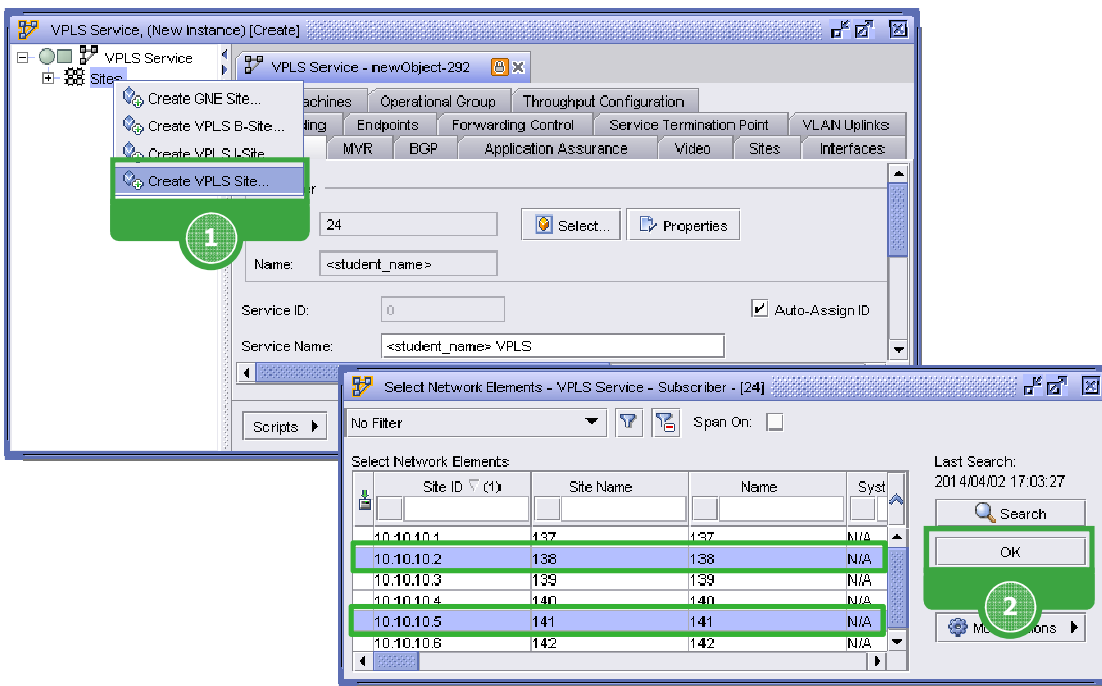
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1. Select **Create** → **Service** → **VPLS** from the Main Menu. The **VPLS Service [Create]** form opens with the **General** tab displayed.
2. From the **General** Tab, click the **Select** button to add the **Customer**.

It is not necessary to add a service name but a service name is very helpful to have to identify your service when performing searches. To specify a Service ID uncheck the box beside Auto-Assign ID parameter.



## 1.3.1 Adding Sites



3 • 1 • 11

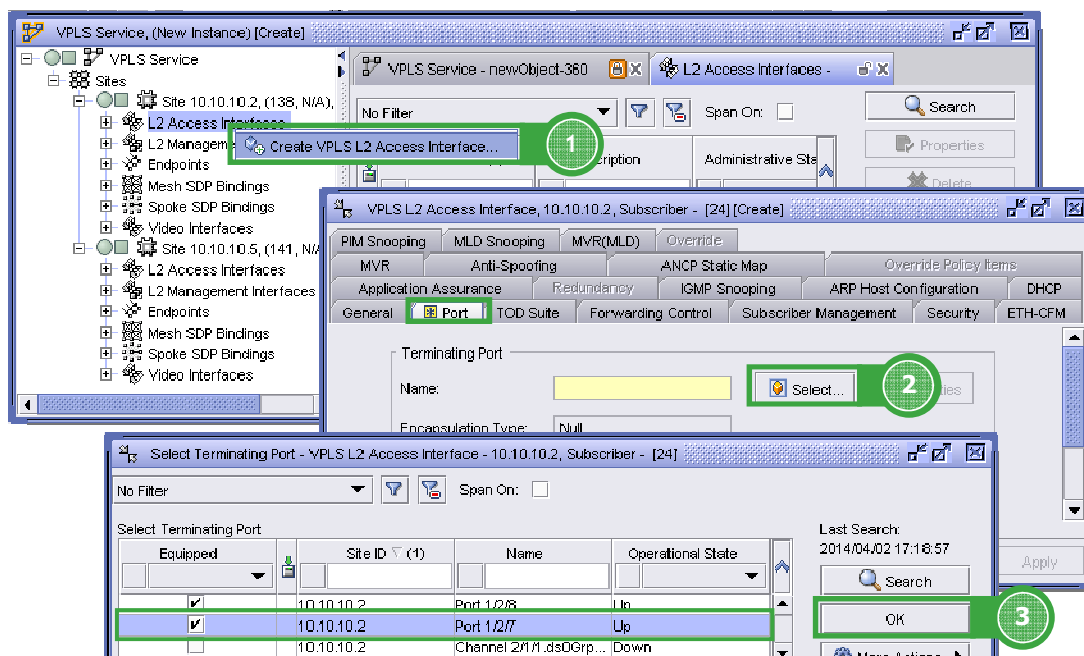
Service Types - VPLS  
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1. From the **VPLS Service [Create]** form's **Components Tree**, right-click on **Site**, select **Create VPLS Site**
2. Select the devices to be included within the VPLS service and click on the **OK** button.

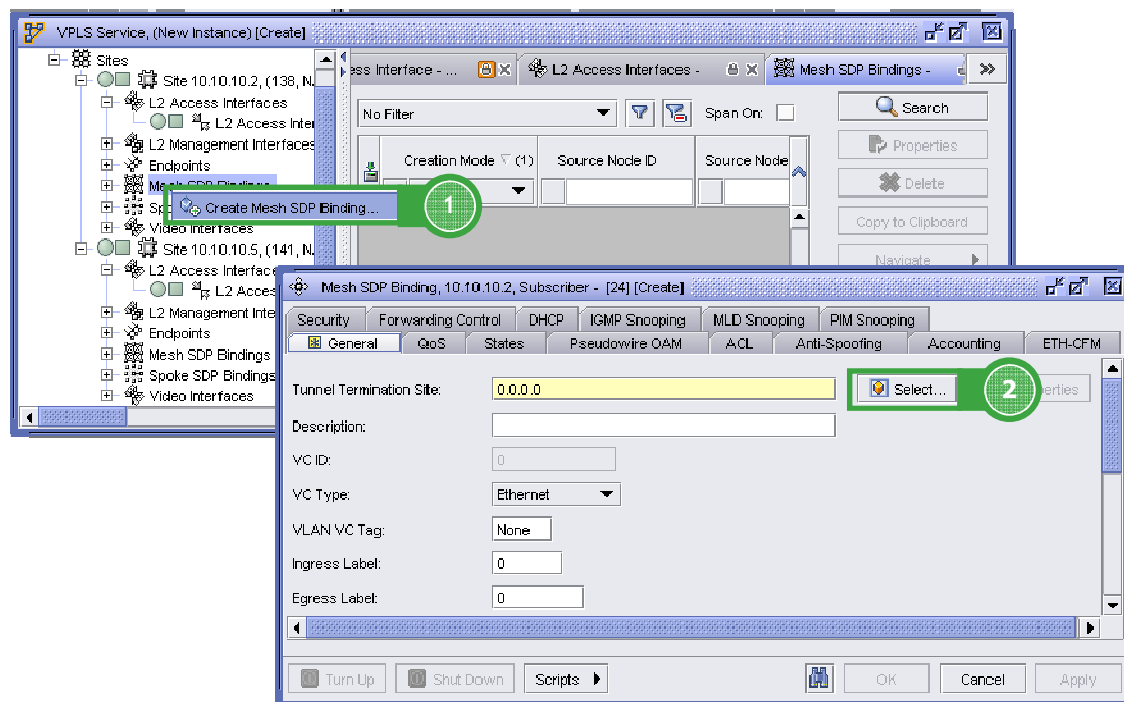
## 1.3.2 Adding an L2 Access Interface



**Repeat steps 1 to 3 to create access interfaces on the other VPLS site**

1. Right-click on the L2 Access Interface associated with each site and choose the **Create VPLS L2 Access Interface** command from the contextual menu.
2. Click on the Port tab and initiate the selection of a terminating port by clicking on the **Select** button.
3. Select the terminating port and click on the **OK** button.

## 1.3.3 Adding Mesh SDP Bindings



3 • 1 • 13

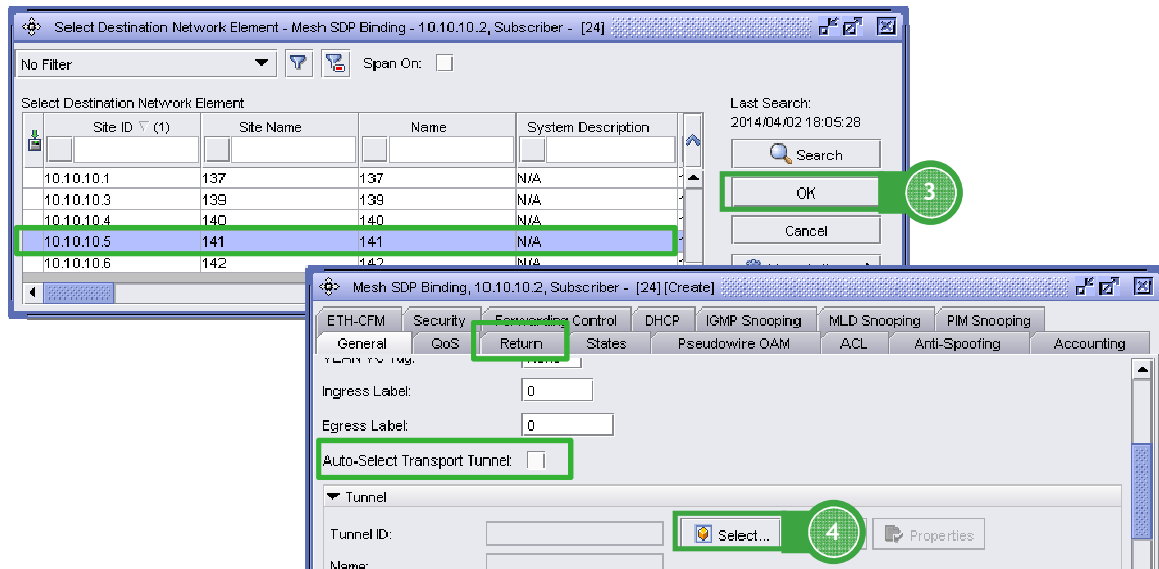
Service Types - VPLS  
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1. Right-click on the Mesh SDP Binding associated with each site and choose the **Create Mesh SDP Binding** command from the contextual menu.
2. Initiate the selection of a Tunnel Termination Site by clicking on the **Select** button.

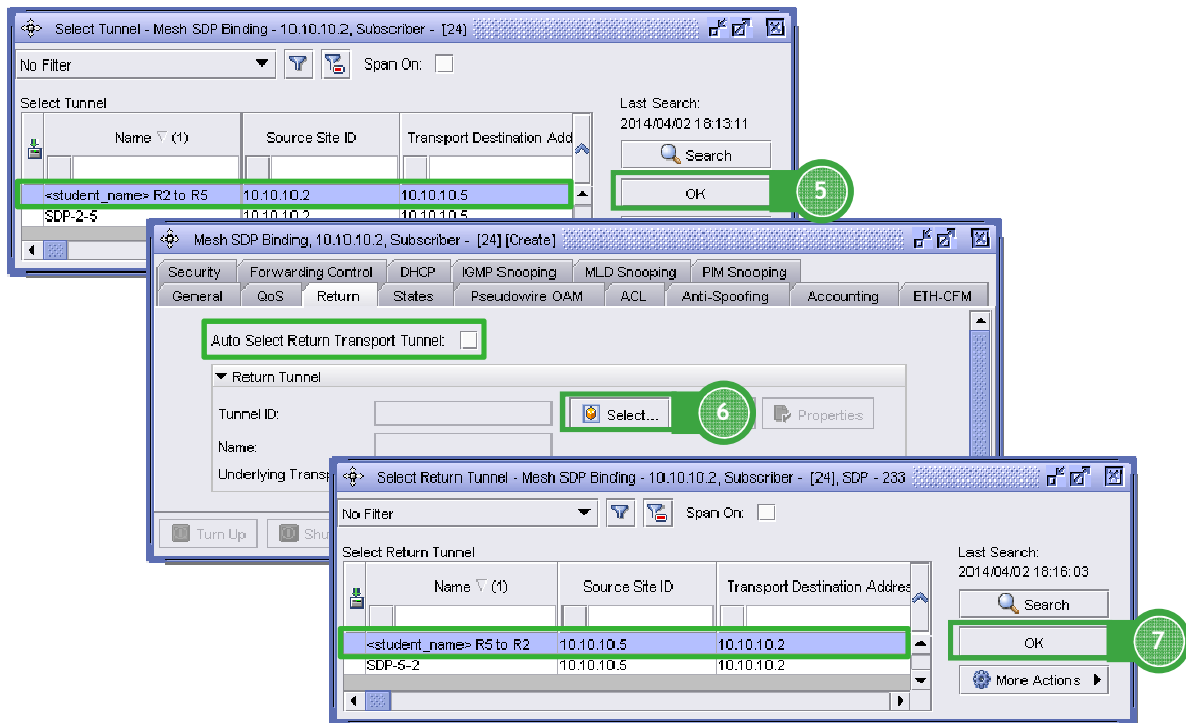
## 1.3.3 Adding Mesh SDP Bindings [cont.]



You can manually select the service transport tunnel, or enable the 5620 SAM to automatically select and available tunnel between the selected nodes. The manual selection process allows to to specify the return tunnel, as well.

3. Select the destination NE and click on the **OK** button.
4. Click on the **Select** button associated with the Tunnel ID parameter to manually specify the service tunnel.

## 1.3.3 Adding Mesh SDP Bindings [cont.]



3 • 1 • 15

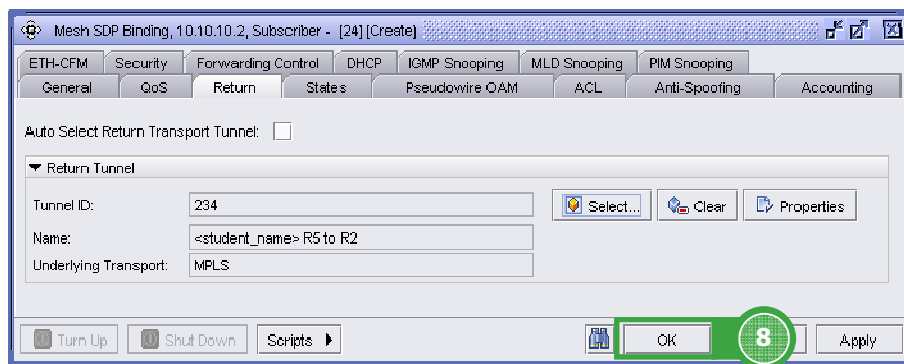
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5. Select the service tunnel and click on the **OK** button.
6. Click on the Return tab and click on the **Select** button associated with the Tunnel ID parameter to manually specify the return service tunnel.
7. Select the return service tunnel and click on the **OK** button.

## 1.3 Create VPLS [cont.]



Repeat steps 1 to 8 to create a Spoke SDP binding for the other VPLS site

3 • 1 • 16

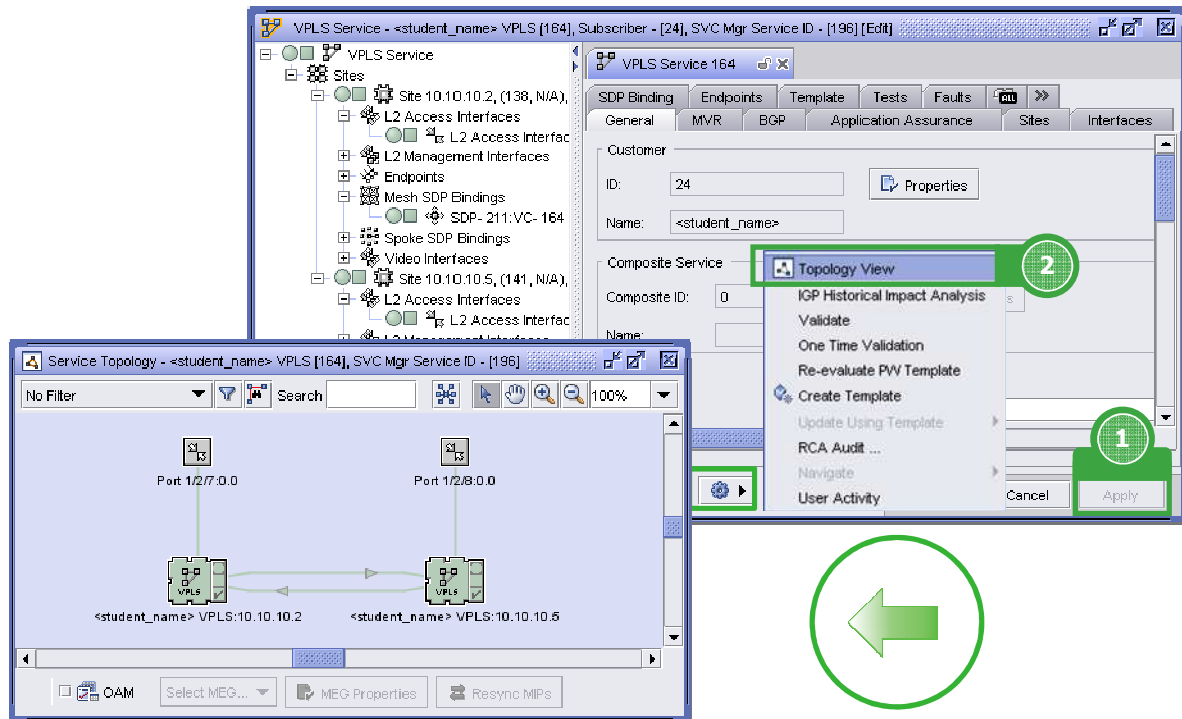
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8. Click on the OK button.

# 1.4 View Service Topology



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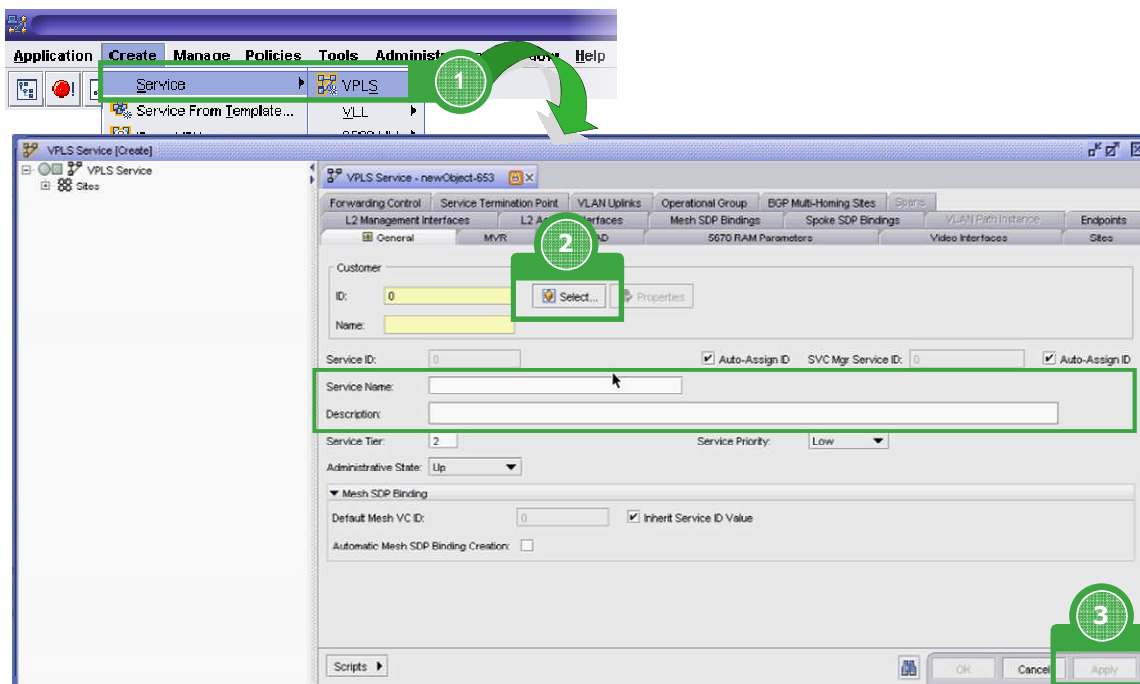
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1. Apply the configuration changes to the VPLS service.
2. Click on the Topology View button.

## 2 VPLS Point-and-Click Provisioning Method



## 2.1 Create VPLS



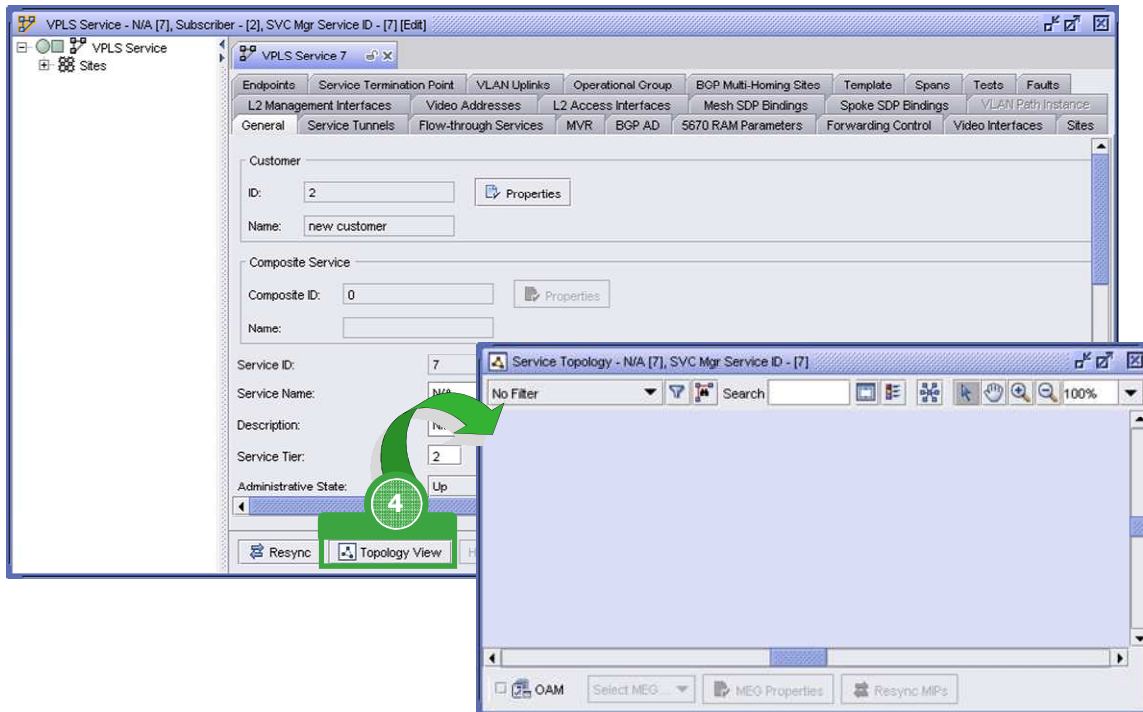
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## 2.1 Create VPLS [cont.]



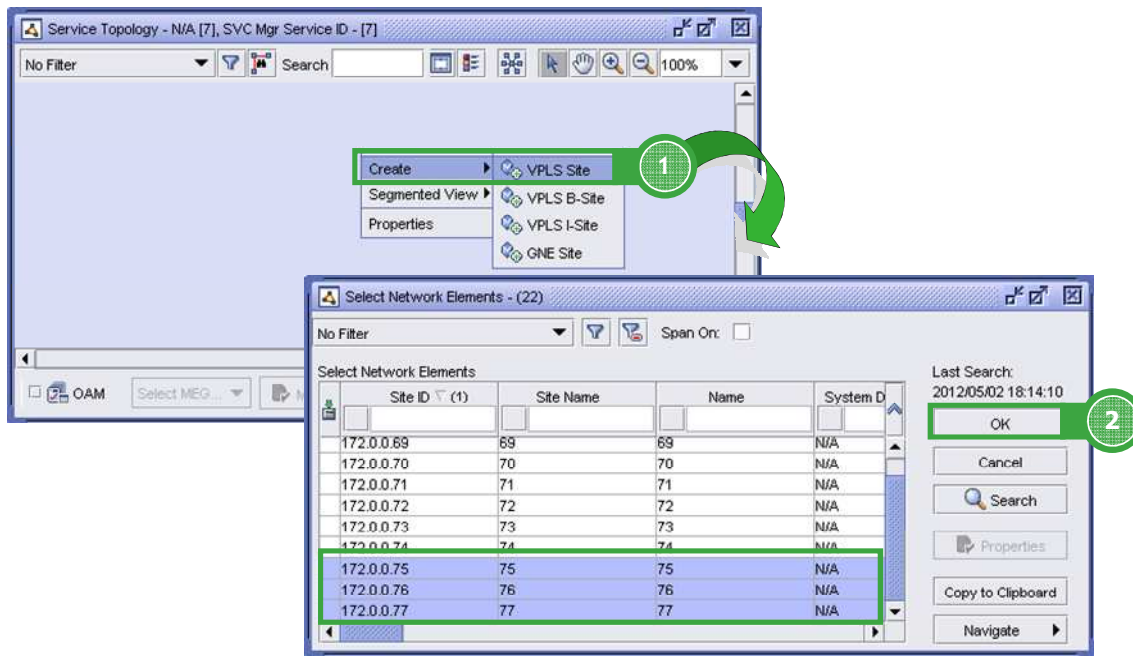
3 • 1 • 20

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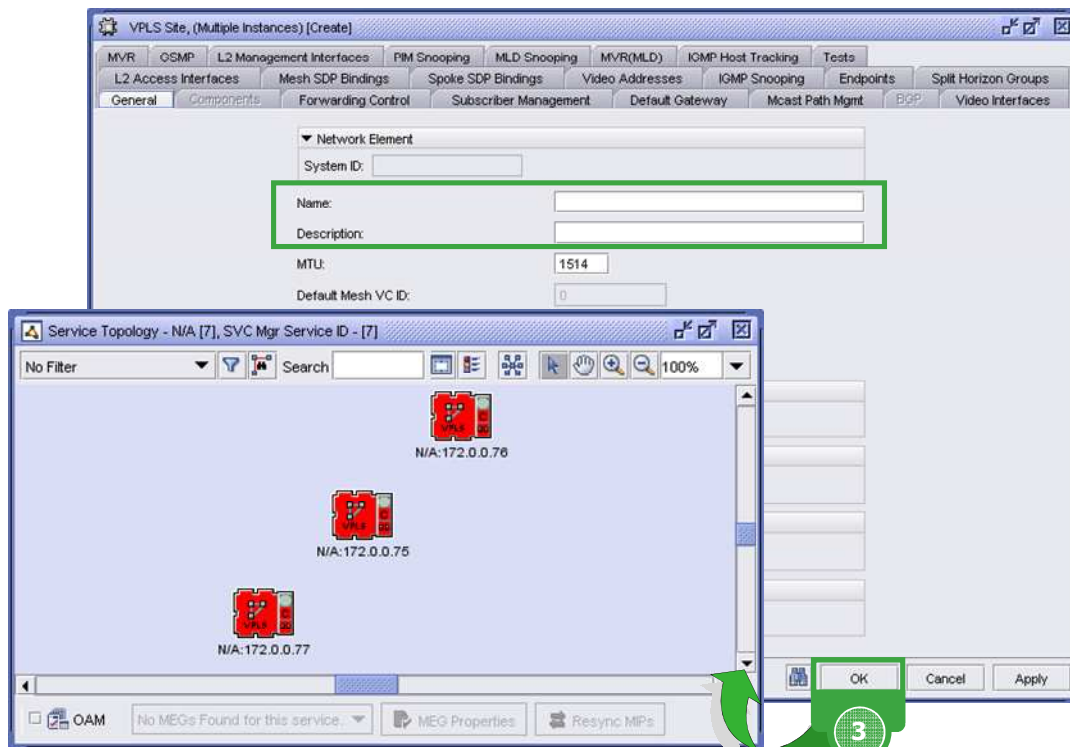
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## 2.1.1 Adding sites



## 2.1.1 Adding sites [cont.]



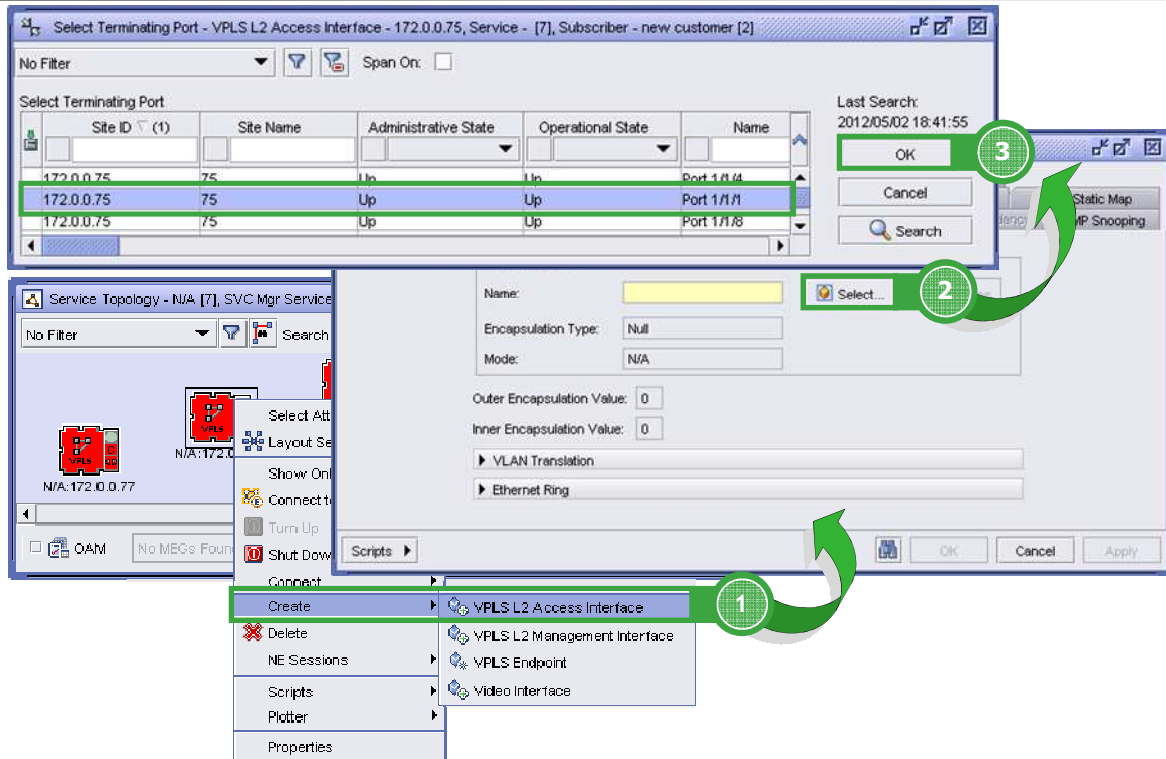
3 • 1 • 22

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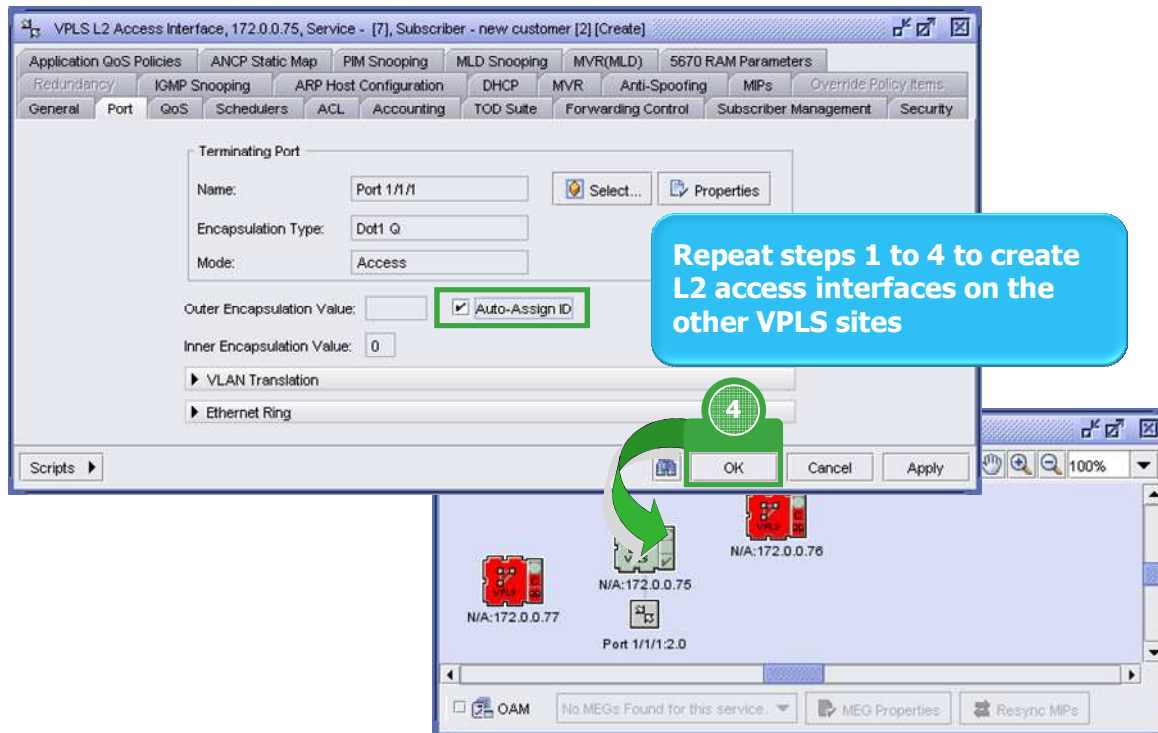
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## 2.1.2 Adding L2 Access interfaces



## 2.1.2 Adding L2 Access interfaces [cont.]



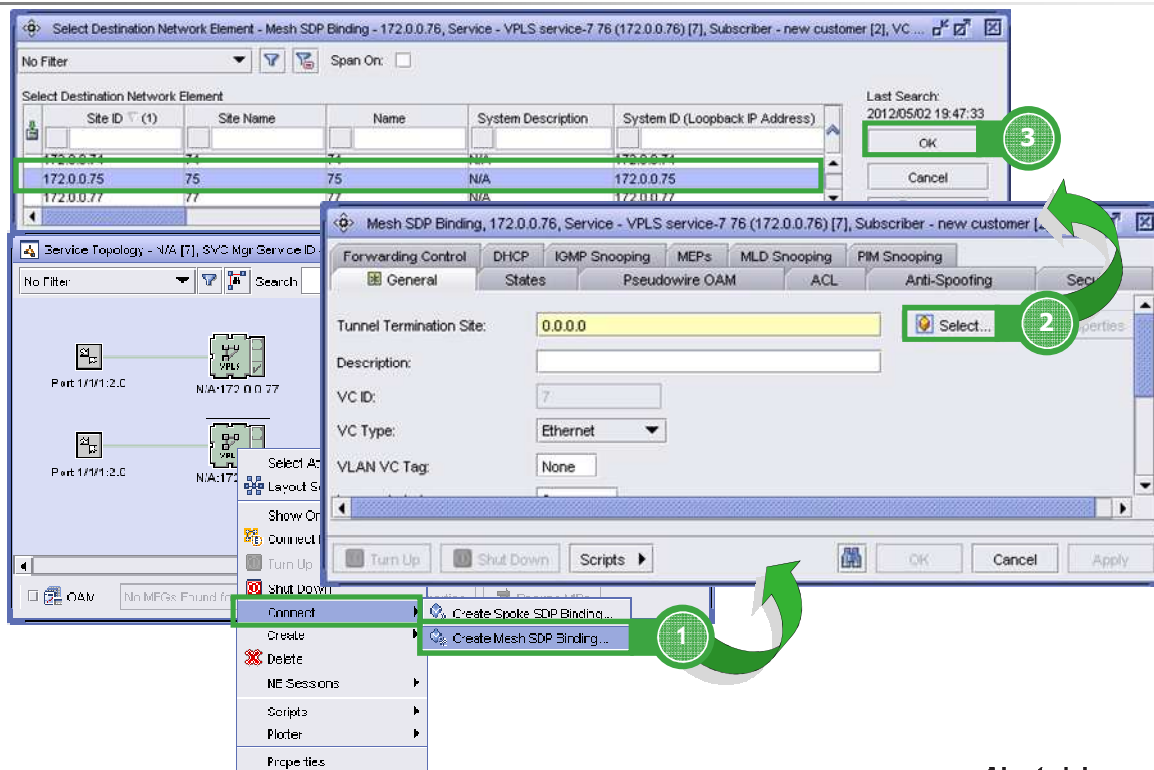
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## 2.1.3 Create Mesh SDP Bindings



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## 2.1.3 Create Mesh SDP Bindings [cont.]

The screenshot displays the 'Mesh SDP Binding' configuration window for the service 'VPLS service-7 76 (172.0.0.76)'. The 'General' tab is active, showing fields for Tunnel Termination Site (172.0.0.75), Description, VC ID (7), VC Type (Ethernet), VLAN VC Tag (None), Ingress Label (0), and Egress Label (0). The 'Auto-Select Transport Tunnel' checkbox is checked. In the 'Auto Tunnel Selection' section, the 'Hash Label' is set to 'MPLS LDP', which is highlighted with a green circle and the number '4'. A green arrow points from this circle to the 'Service Topology' window.

The 'Service Topology' window shows a network diagram with several VPLS nodes. A red arrow indicates a connection between the node 'N/A:172.0.0.76' and the node 'N/A:172.0.0.75'. The diagram also shows ports 'Port 1/1/1:2.0' connected to various VPLS nodes.

**Repeat steps 1 to 4 to create mesh SDP bindings on the other VPLS sites**

3 • 1 • 26

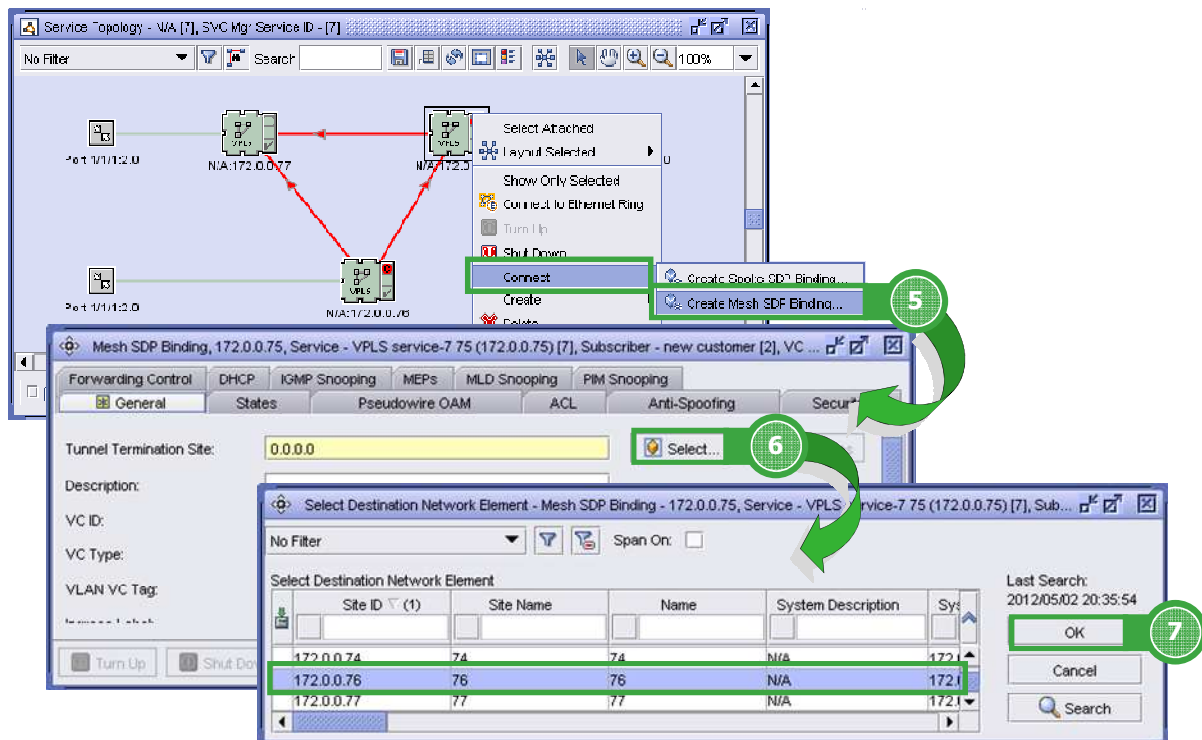
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## 2.1.3 Create Mesh SDP Bindings [cont.]

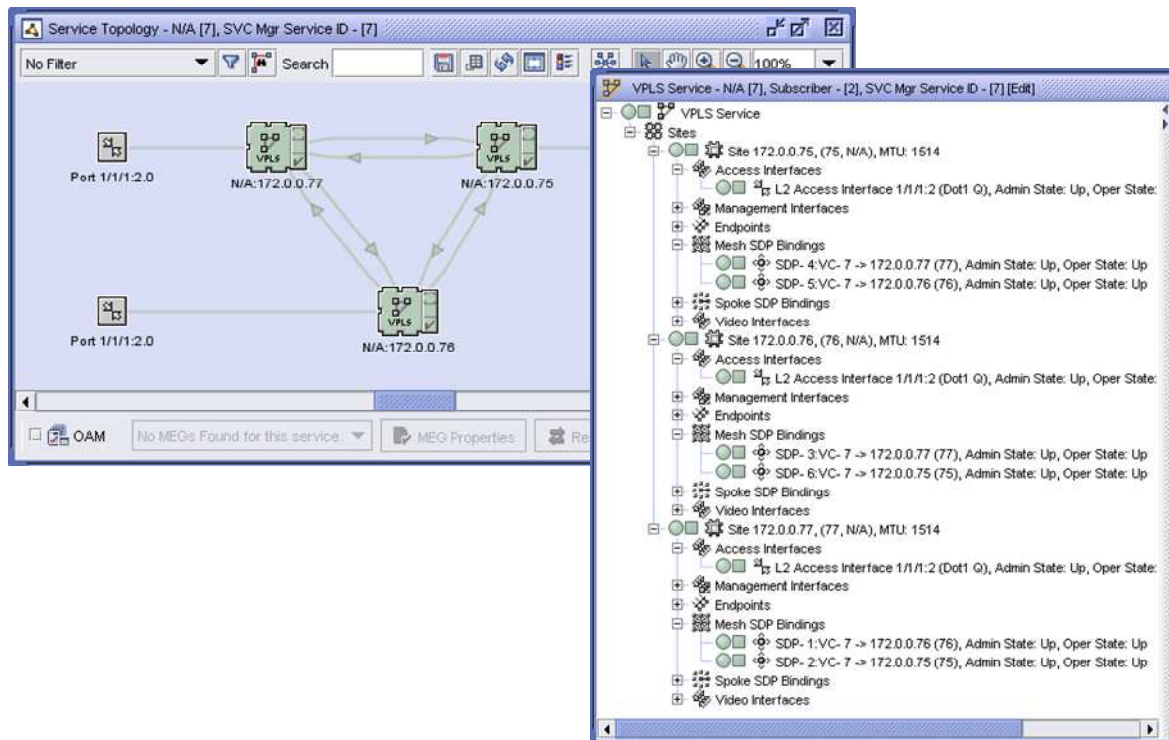


## 2.1.3 Create Mesh SDP Bindings [cont.]

The screenshot displays the 'Mesh SDP Binding' configuration window in the SAM interface. The 'General' tab is active, showing fields for Tunnel Termination Site (172.0.0.76), Description, VC ID (7), VC Type (Ethernet), VLAN VC Tag (None), Ingress Label (0), and Egress Label (0). The 'Auto-Select Transport Tunnel' checkbox is checked. Below this, the 'Auto Tunnel Selection' section shows 'Profile Name' and 'Tunnel Auto-Selection Transport Preference' set to 'MPLS.LDP'. A green circle with the number '8' and an arrow points to the 'MPLS.LDP' selection. A blue callout box with the text 'Repeat steps 5 to 8 to create return portion of the mesh SDP bindings on the other VPLS sites' is overlaid on the right. To the right of the configuration window is the 'Service Topology' window, showing a diagram with four VPLS nodes (N/A:172.0.0.77, N/A:172.0.0.75, N/A:172.0.0.76, and Port 1/1/1:2.0) connected in a mesh topology.

Repeat steps 5 to 8 to create return portion of the mesh SDP bindings on the other VPLS sites

## 2.1.3 Create Mesh SDP Bindings [cont.]



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## End of module VPLS

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## Section 3 Service Types

### Module 2 VLL Epipe

TOS36042\_V3.0-EQ-English-Ed1 Module 3.2 Edition 1

5620 SAM  
Services Operations and Provisioning  
TOS36042\_V3.0-EQ Edition 1

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Document History			
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1.1	2012-11-16	MCGRATH, John	TOS36042_V1.1 – SAM 10.0 R5
2.0	2013-04-10	MCGRATH, John	TOS36042_V2.0 First edition – SAM 11.0 R1
2.1	2013-08-16	MCGRATH, John	TOS36042_V2.0 Second edition – SAM 11.0 R1 (update)
3.0	2014-04-03	MCGRATH, John	TOS36042_V3.0 First edition – SAM 12.0 R1



Upon completion of this module, you should be able to:

- Create an Epipe
- Assign a Port to SAP
- Assign an LSP to SDP

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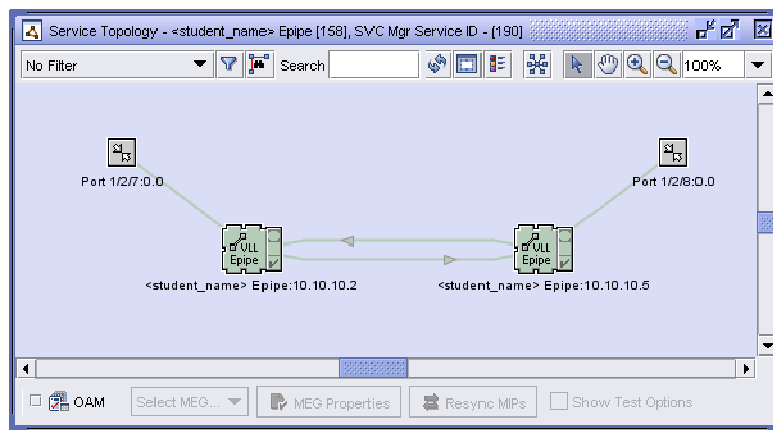


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2.1 Create Epipe Service	21
2.1.1 Create Epipe Sites	23
2.1.2 Create Access Interface	25
2.1.3 Create Spoke SDP Binding	27

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# 1 VLL Epipe Configuration

# 1.1 Lab overview



**This lab demonstrates how to configure the core components of a VLL Epipe service using the form-based configuration method and the point-and-click provisioning method.**

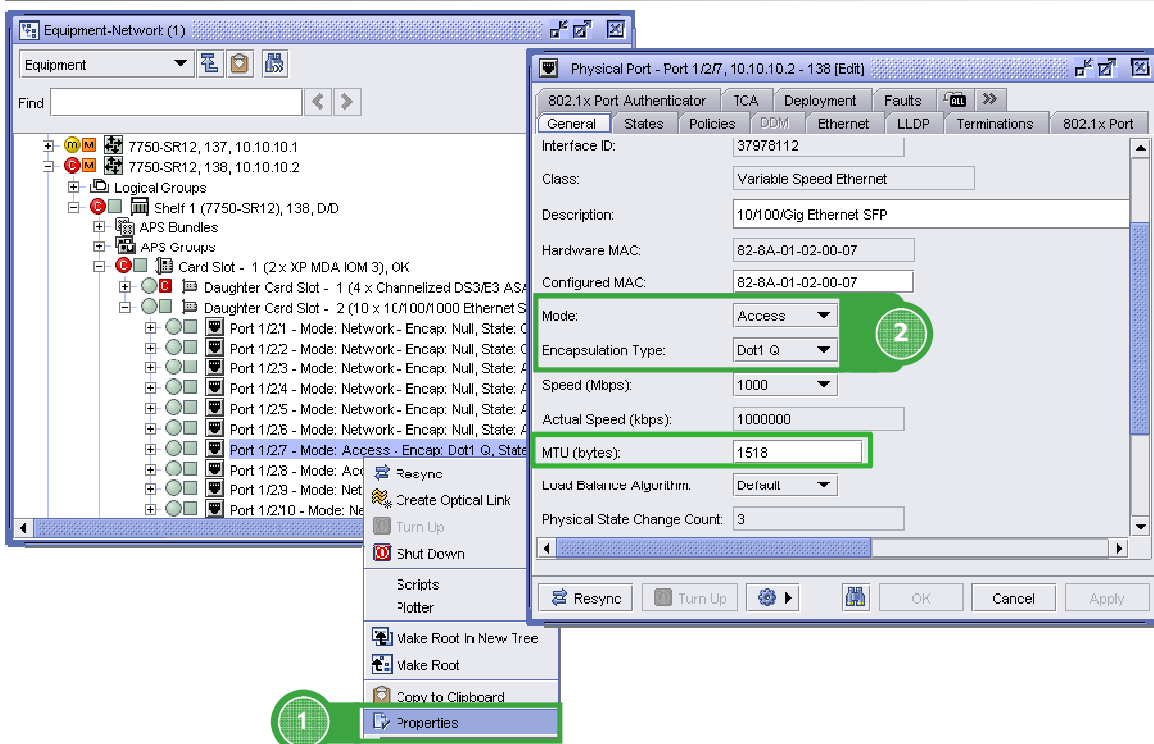
3 • 2 • 8

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## 1.2 Configure Access Port



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The following lab exercises will guide you through the steps necessary to configure an Epipe in the lab's managed network.

1. Create an Epipe
2. Assign a Port to SAP
3. Assign SDPs



### Technical Reference

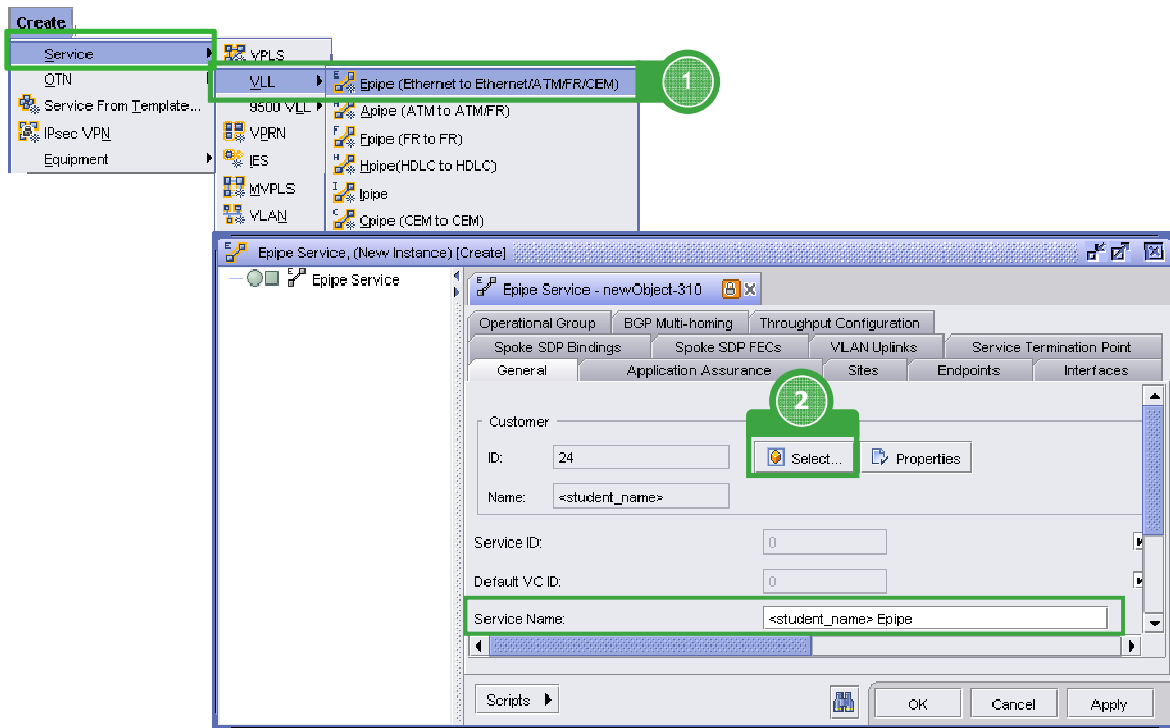
For more details on the procedures to create an Epipe see the **Alcatel-Lucent 5620 SAM User Guide**.

## Configure Access Port

1. From the **Equipment** tab. Right click the equipment facing port and select **Properties**.
2. Change the **Mode** to **Access**, and **Encap Type** to **Dot1Q**

Note: From the Port MTU will automatically increase from 1514 to 1518 when you select OK

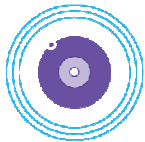
## 1.3 Create an Epipe Service



3 - 2 - 10

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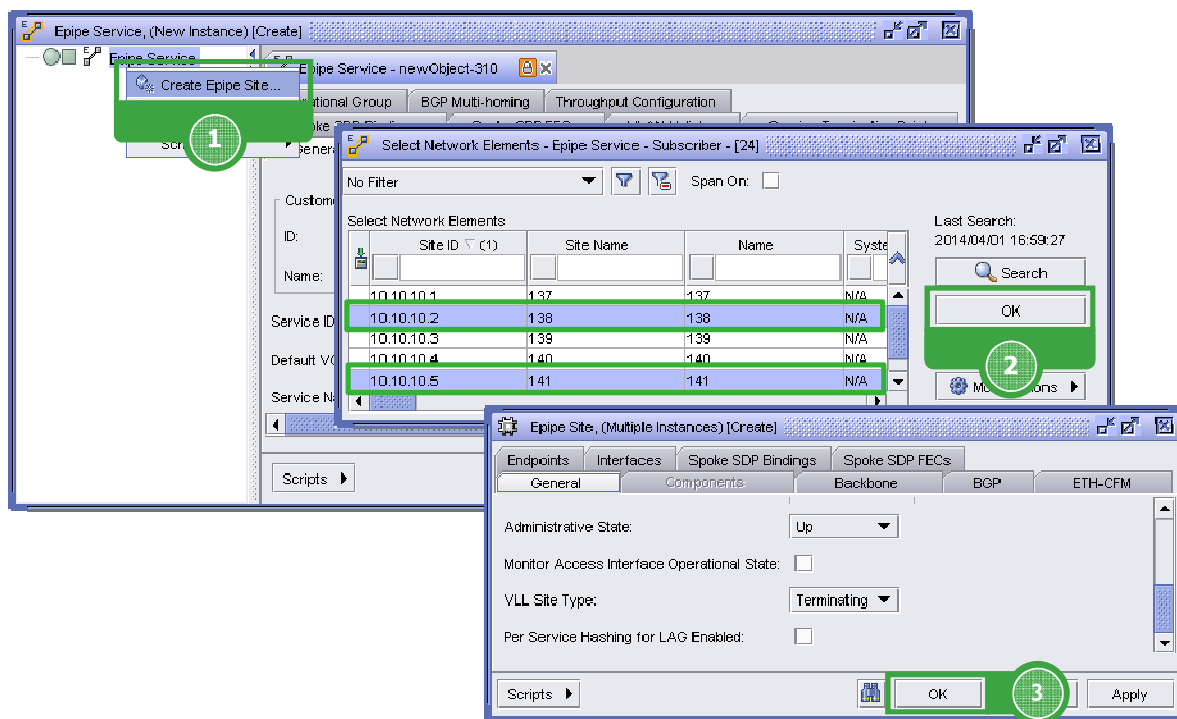
### Technical Reference

For more details on the procedure to create an Epipe, see the Alcatel-Lucent 5620 SAM User Guide.

The following lines and the images above summarize the steps recommended to create a Epipe for this lab:

1. Choose **Create** → **Service** → **VLL** → **Epipe** from the main menu. The **Epipe Service [Create]** form opens with the **General** tab displayed
2. In the **Customer** panel, click the **Select** button to add the customer. Specify a **Service Name** and **Description**.

## 1.3.1 Adding Sites



3 - 2 - 11

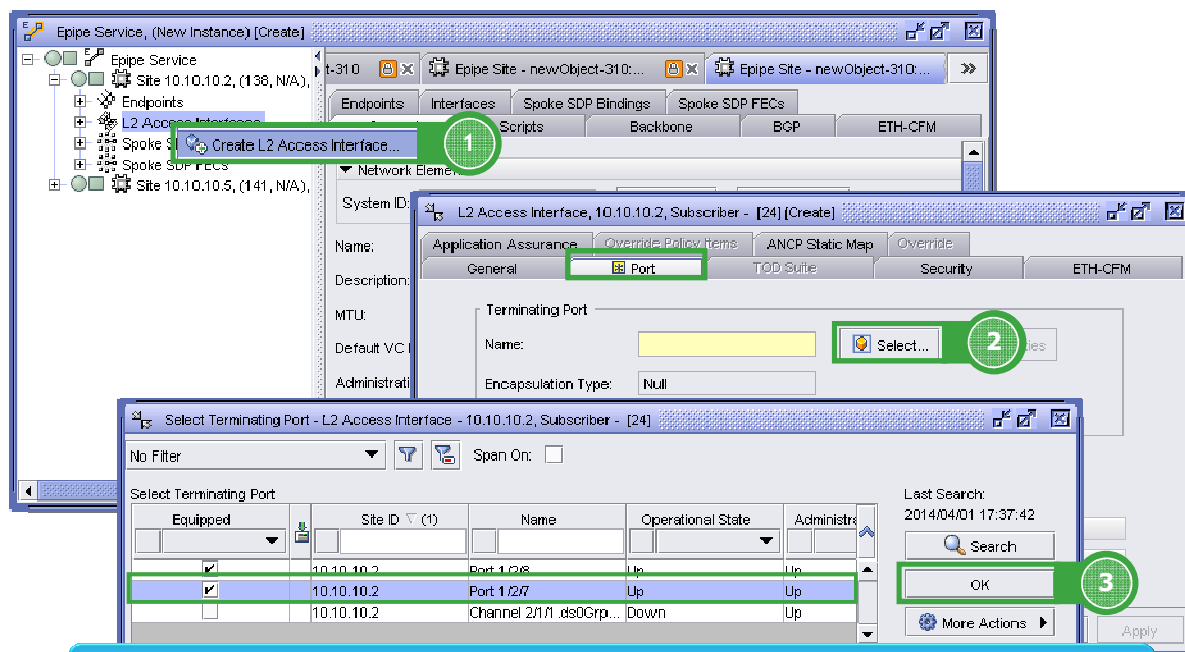
Service Types - VLL Epipe  
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1. From the **Components Tree**, right-click on **Epipe Service** and choose **Create Site**.
2. Select both nodes that will be included in the Epipe Service and click on the **OK** button.
3. Configure each site in the service, if required, and click on the **OK** button.

## 1.3.2 Adding an L2 Access Interface



Repeat steps 1 to 3 to create access interfaces on the other Epipe site

3 - 2 - 12

Service Types - VLL Epipe  
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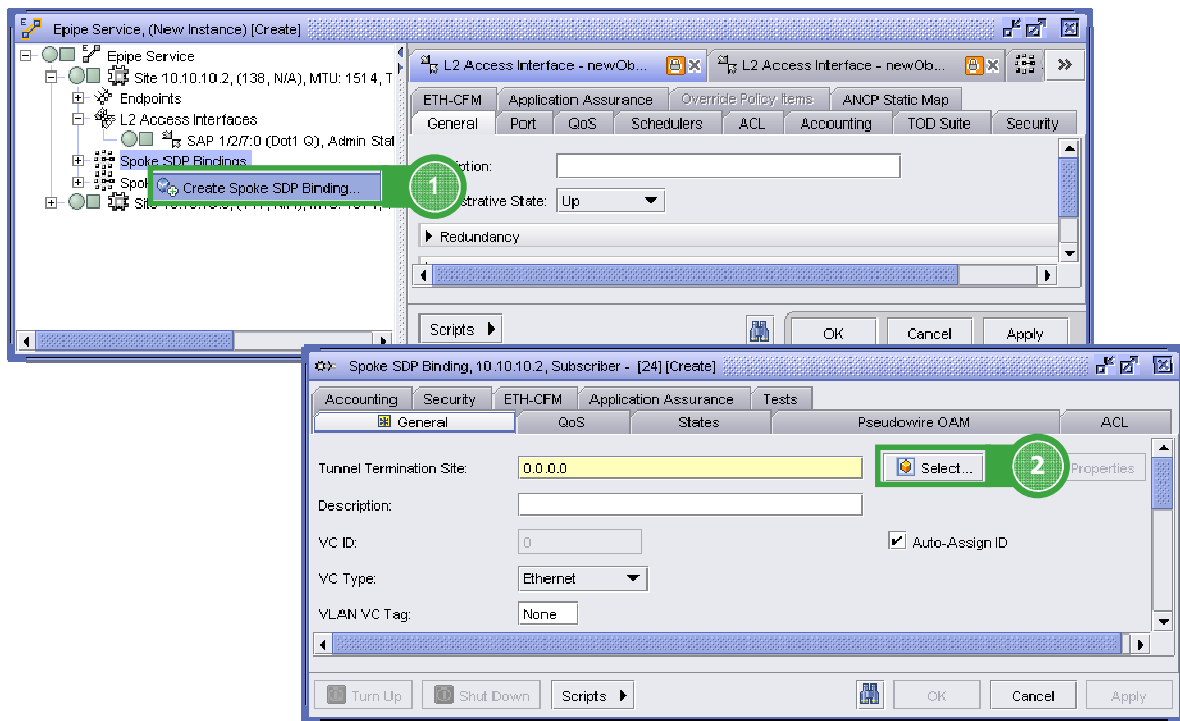
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1. Right-click on the L2 Access Interface associated with each site and choose the **Create EPipe L2 Access Interface** command from the contextual menu.
2. Click on the Port tab and initiate the selection of a terminating port by clicking on the **Select** button.
3. Select the terminating port and click on the **OK** button.



## 1.3.3 Adding Spoke SDP Bindings



3 • 2 • 13

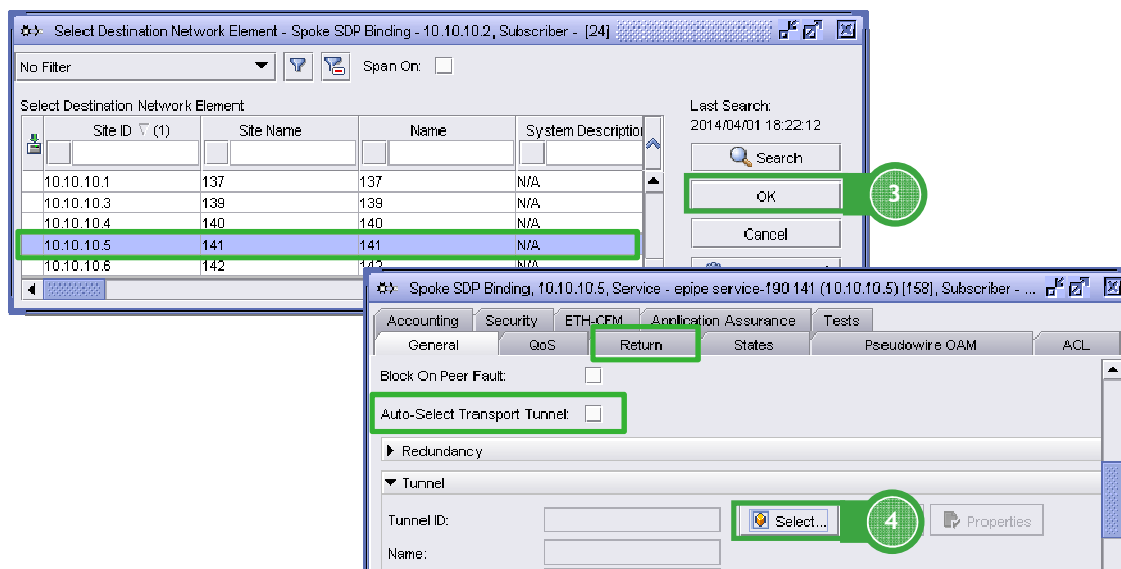
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1. Right-click on the Spoke SDP Binding associated with each site and choose the **Create Spoke SDP Binding** command from the contextual menu.
2. Initiate the selection of a Tunnel Termination Site by clicking on the **Select** button.

## 1.3.3 Adding Spoke SDP Bindings [cont.]



You can manually select the service transport tunnel, or enable the 5620 SAM to automatically select and available tunnel between the selected nodes. The manual selection process allows to specify the return tunnel, as well.

3 · 2 · 14

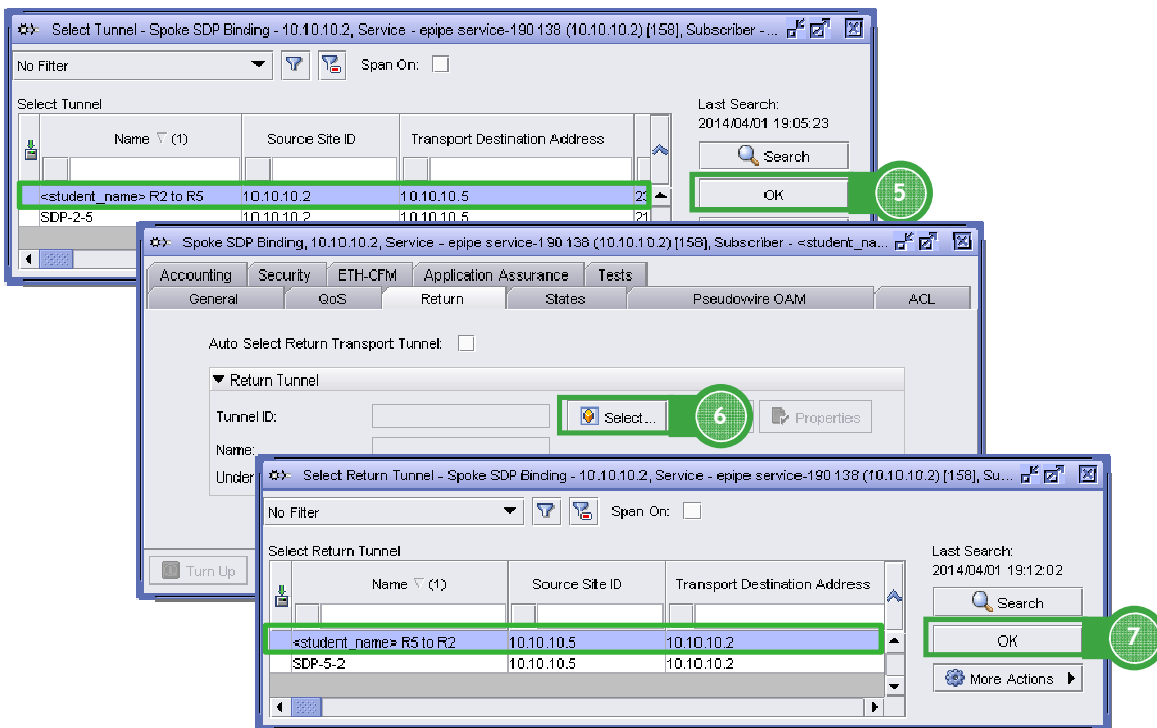
Service Types - VLL Epipe  
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3. Select the destination NE and click on the **OK** button.
4. Click on the **Select** button associated with the Tunnel ID parameter to manually specify the service tunnel.

## 1.3.3 Adding Spoke SDP Bindings [cont.]



3 - 2 - 15

Service Types - VLL Epipe  
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5. Select the service tunnel and click on the **OK** button.
6. Click on the Return tab and click on the **Select** button associated with the Tunnel ID parameter to manually specify the return service tunnel.
7. Select the return service tunnel and click on the **OK** button.

## 1.3.3 Adding Spoke SDP Bindings [cont.]

Spoke SDP Binding, 10.10.10.5, Service - epipe.service-190.141 (10.10.10.5) [158], Subscriber - <student\_name> [24] [Create]

General QoS Return States Pseudowire OAM ACL Accounting Security ETH-CFM Application Assurance Tests

Auto Select Return Transport Tunnel: ☐

Return Tunnel

Tunnel ID: 233 [Select... Clear Properties]

Name: <student\_name> R2 to R5

Underlying Transport: MPLS

Return SDP Binding Endpoint

Return Endpoint: [Select... Clear]

Set Return ICB: ☐

Turn Up Shut Down Scripts OK Apply

**Repeat steps 1 to 8 to create a Spoke SDP binding for the other Epipe site**

3 • 2 • 16

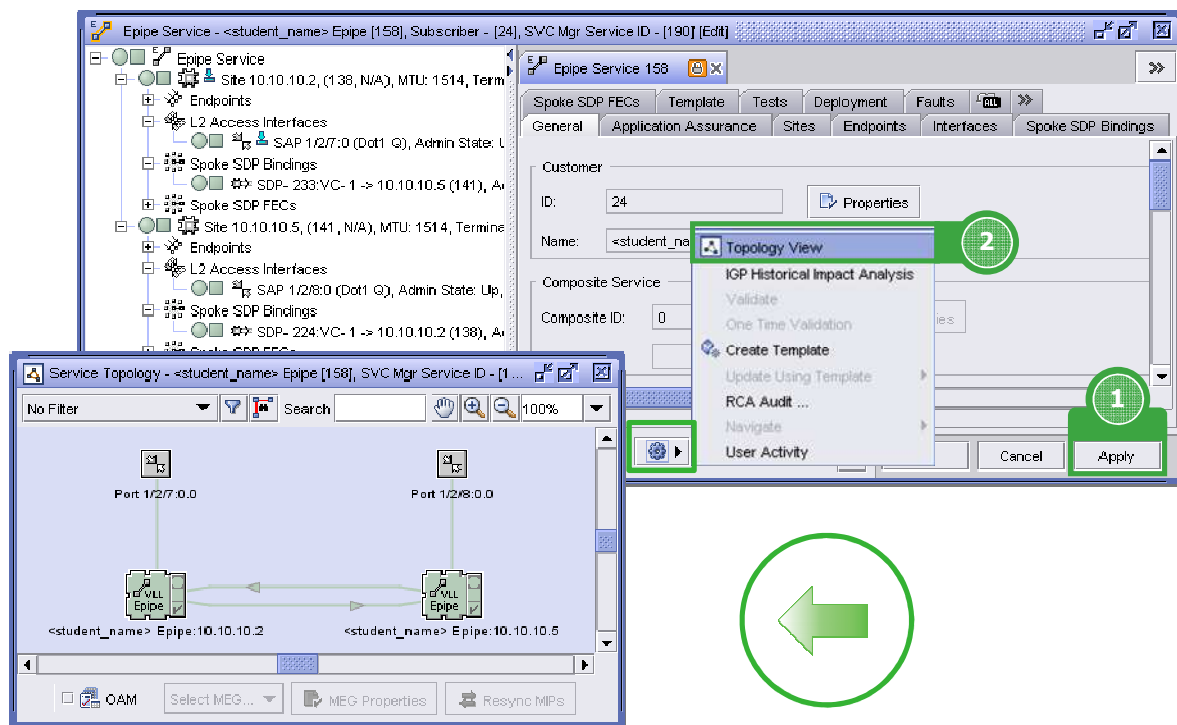
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8. Click on the **OK** button.

# 1.4 View Service Topology



3 - 2 - 17

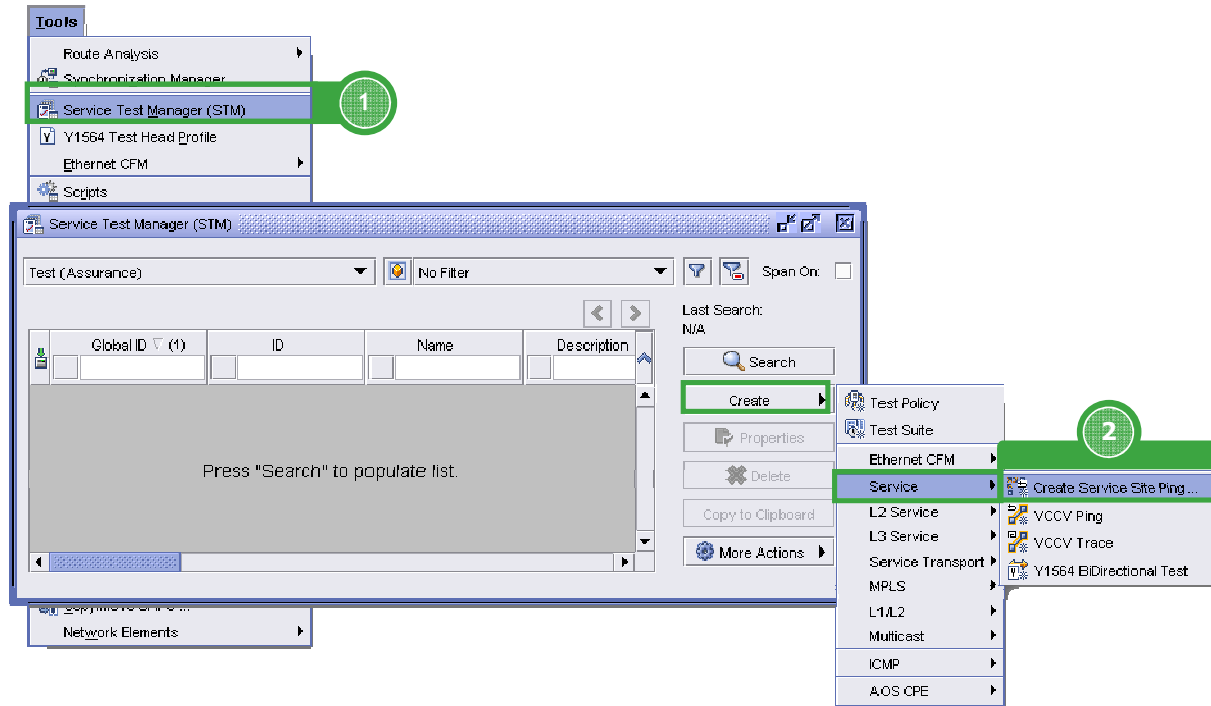
Service Types - VLL Epipe  
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1. Apply the configuration changes to the Epipe service.
2. Click on the Topology View button.

# 1.5 Verify Operational State



3 - 2 - 18

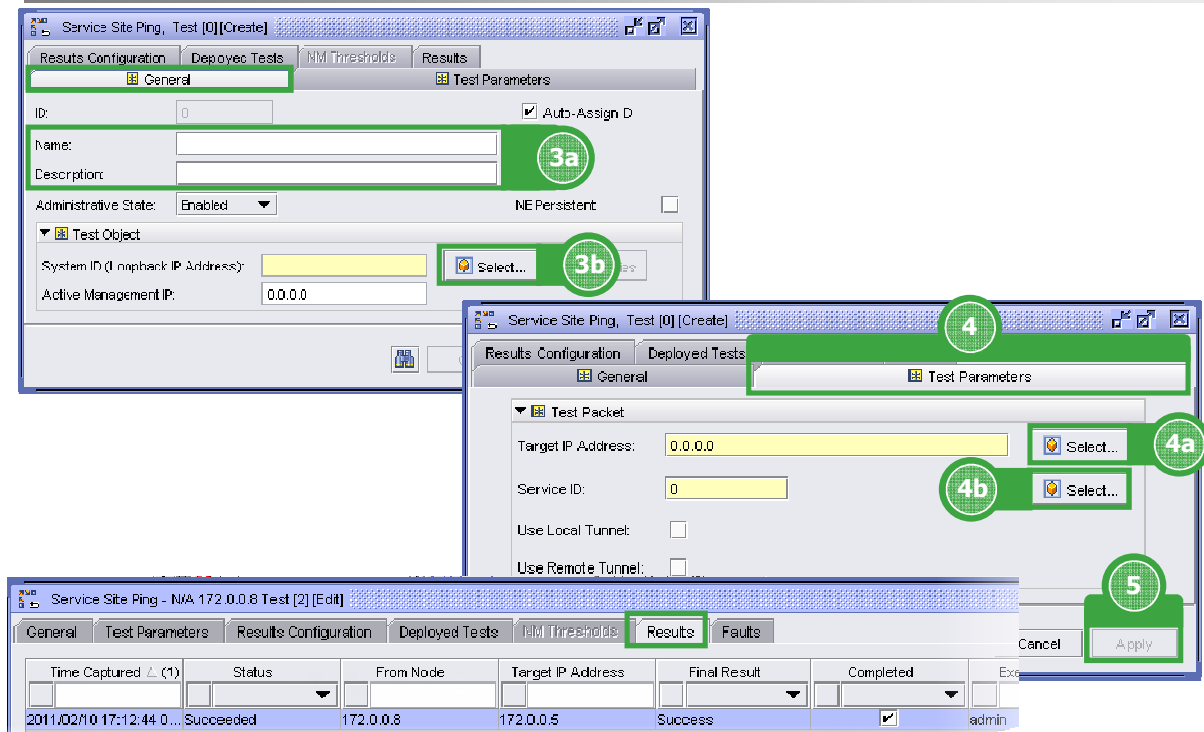
Service Types - VLL Epipe  
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1. From the **Tools Menu** select **Service Test Manager (STM)**. The **Service Test Manager** form opens.
2. Select **Create** → **Service** → **Service Site Ping**. The **Service Site Ping [Create]** form opens with the **General** tab displayed.

## 1.5 Verify Operational State [cont.]



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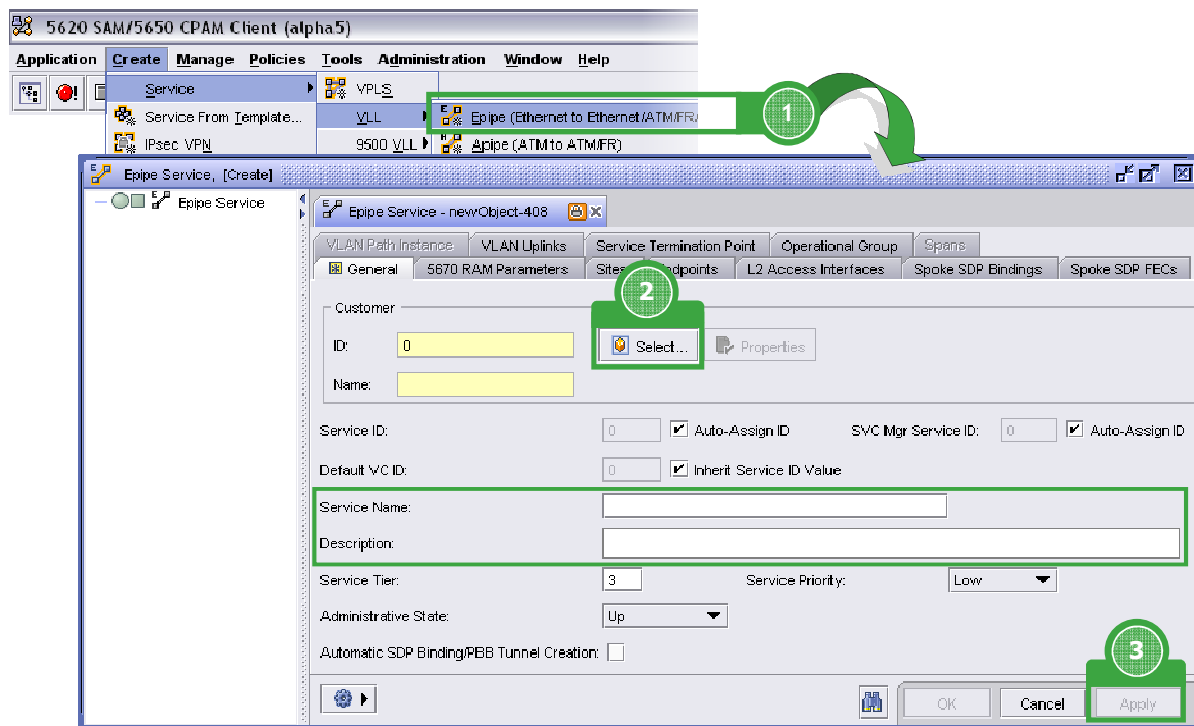
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3. On the **Service Site Ping [Create]** form **General** tab configure the parameters:
  - a. **Name** and **Description** to name the Service Site Ping Test
  - b. **System ID (Loopback IP Address)** Click the **Select** button and specify the node the ping will originate from
4. Open the **Test Parameters** tab and configure the parameters:
  - a. **Target IP Address.** Click the **Select** button and specify the “Target IP Address”
  - b. **Service ID.** Click the **Select** button and choose the service to be tested
5. Click on the **Apply** button. You can execute the test and view the test results under the Results tab.

## 2 Epipe Point-and-Click Provisioning Method



## 2.1 Create Epipe Service



3 • 2 • 21

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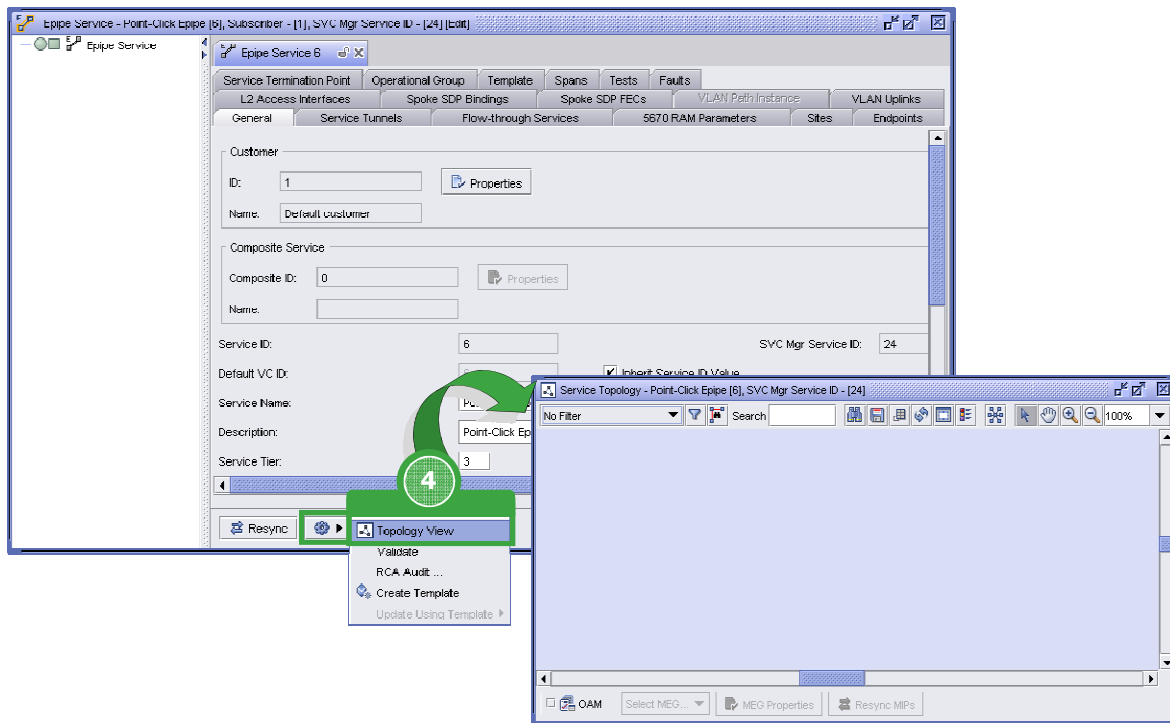
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The following lines and the images above summarize the steps recommended to create an Epipe using the point-and-click provisioning method for this lab:

1. Choose **Create** → **Service** → **VLL** → **Epipe** from the main menu. The **Epipe Service [Create]** form opens with the **General** tab displayed
2. In the **Customer** panel, click the **Select** button to add the customer. Specify a **Service Name** and **Description**.
3. Click on the **Apply** button. The form refreshes into the **Epipe Service - Name [Create]** form opens displaying additional tabs and with the **General** tab displayed.

## 2.1 Create Epipe Service [cont.]



3 • 2 • 22

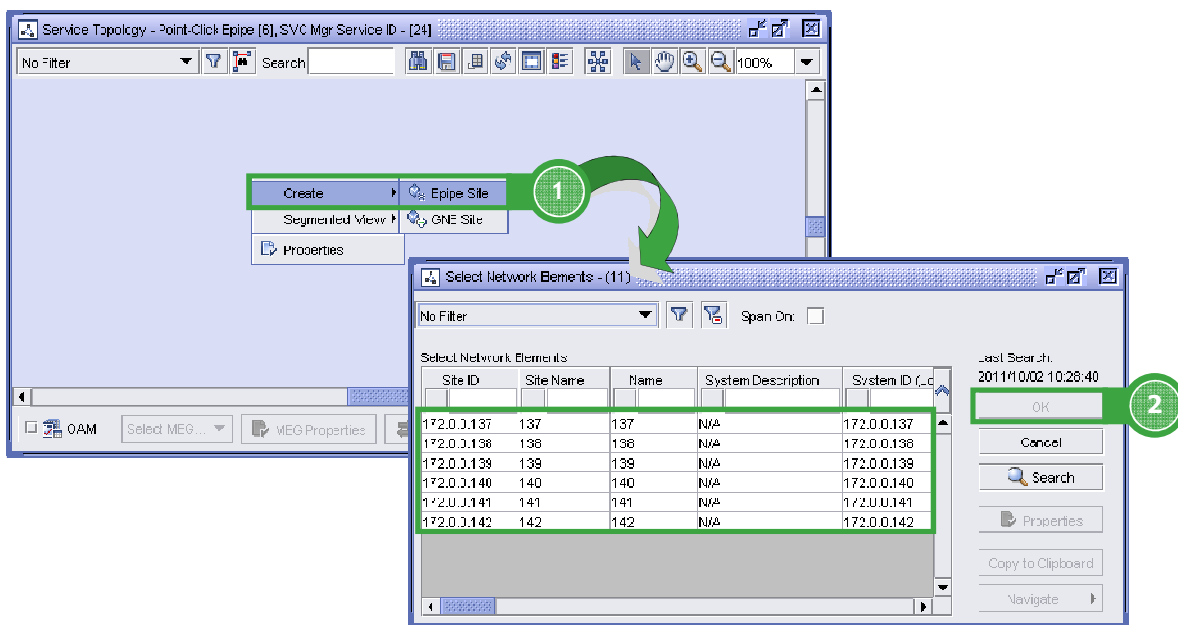
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4. On the **Epipe Service - Name [Create]** form, click on the **More Actions** and choose **Topology View** from the contextual menu. The **Service Topology** map opens.

## 2.1.1 Create Epipe Sites



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Service Types - VLL Epipe  
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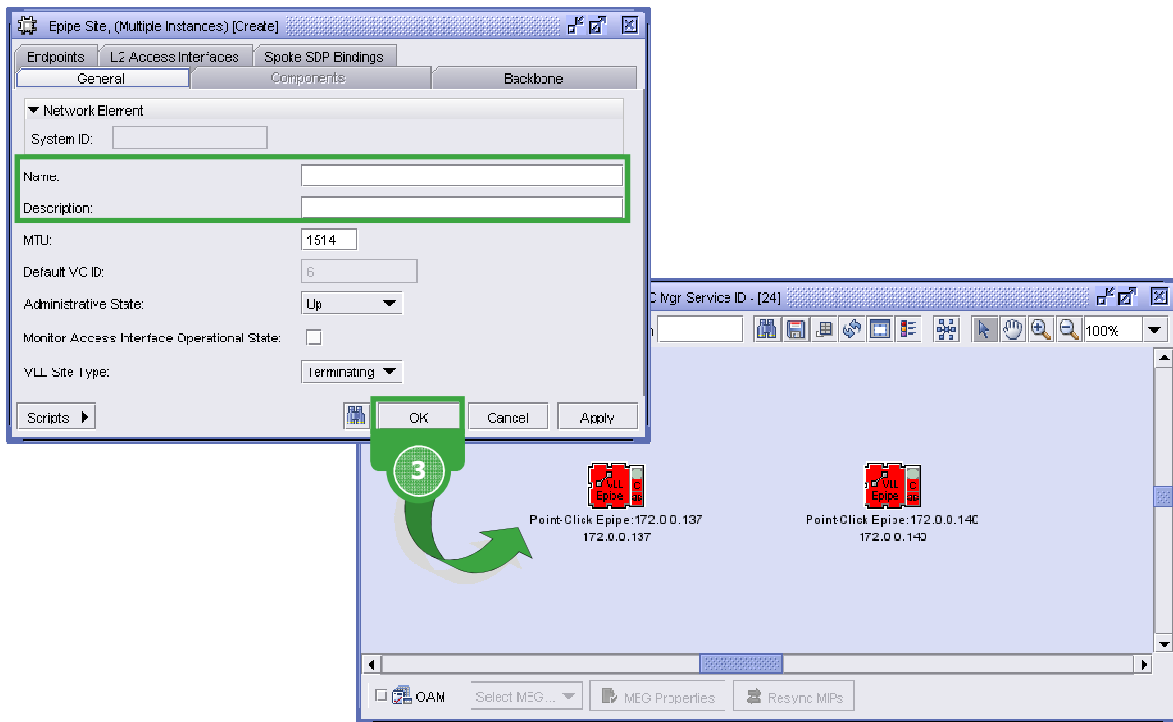
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The following lines and the images above summarize the steps recommended to create Epipe sites using the point-and-click provisioning method for this lab:

1. Click on an empty portion of the **Service Topology** map. Choose **Create**→**Epipe Site** from the contextual menu. The **Select Network Elements** form opens with a list of available sites.
2. Choose a site or multiple sites and click on the **OK** button. The **Site (Create)** form opens with the **General** tab displayed.

## 2.1.1 Create Epipe Sites [cont.]



3 - 2 - 24

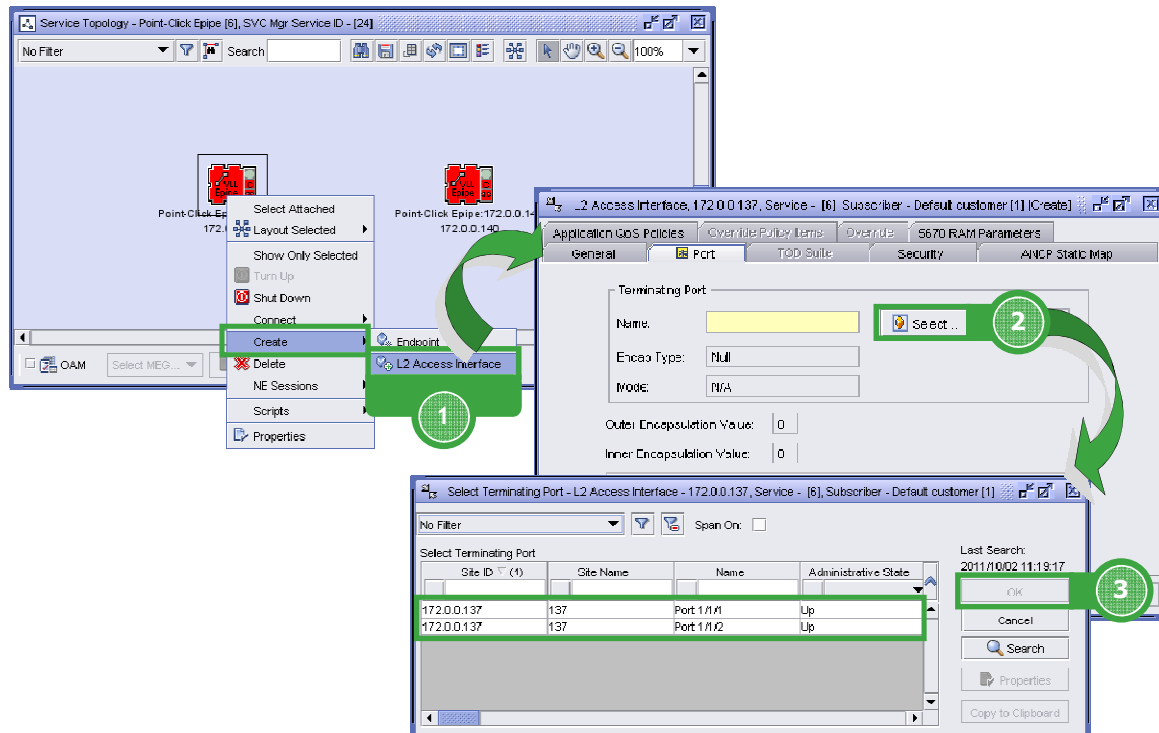
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- On the **Epipe Site (Create)** form assign a Name and Description. Click on the **OK** button. The **Epipe Site (Create)** form closes and the **Service Topology** map refreshes displaying the created Epipe sites.

## 2.1.2 Create Access Interface



3 - 2 - 25

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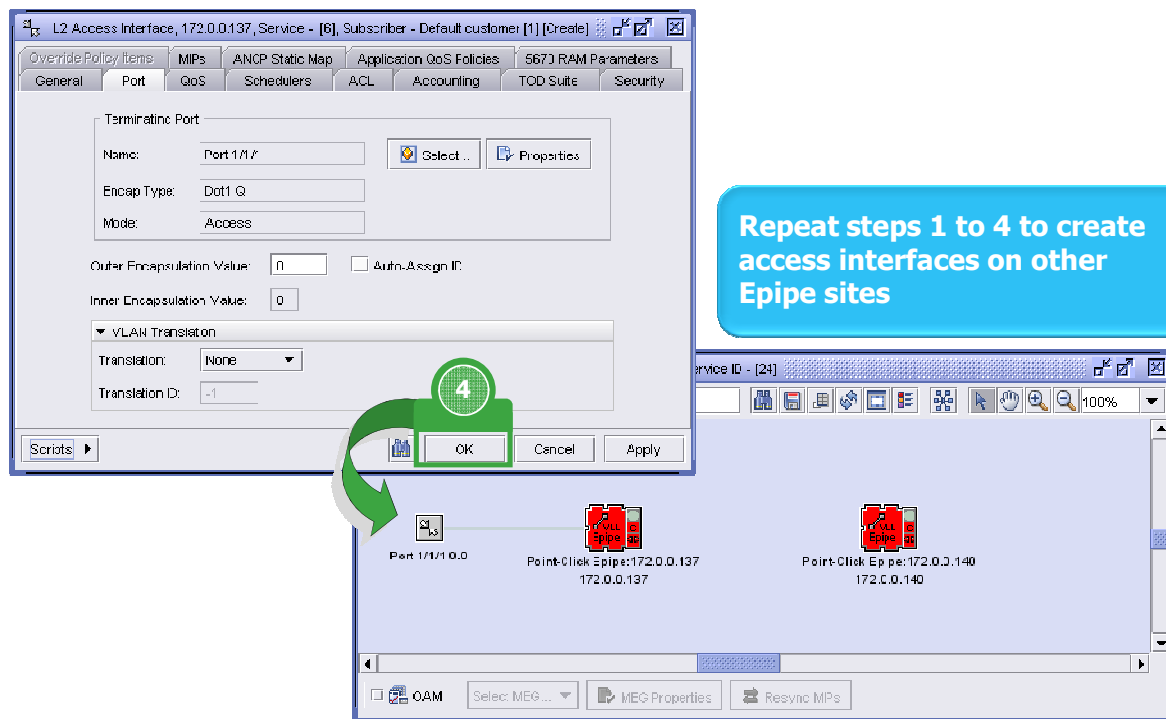
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The following lines and the images above summarize the steps recommended to create access interfaces using the point-and-click provisioning method for this lab:

1. On **Service Topology** map, right-click on an Epipe site and choose **Create→L2 Access Interface** from the contextual menu. The **L2 Access Interface [Create]** form opens with the **General** tab displayed
2. Click on the **Port** tab button and click on the **Select** button in the **Terminating Port** panel. The **Select Terminating Port** form opens with a list of available access ports.
3. Choose a port from the list and click on the **OK** button. The **Select Terminating Port** form and the **L2 Access Interface [Create]** form refreshes with selected port name is displayed in the **Terminating Port** panel.

## 2.1.2 Create Access Interface [cont.]



3 - 2 - 26

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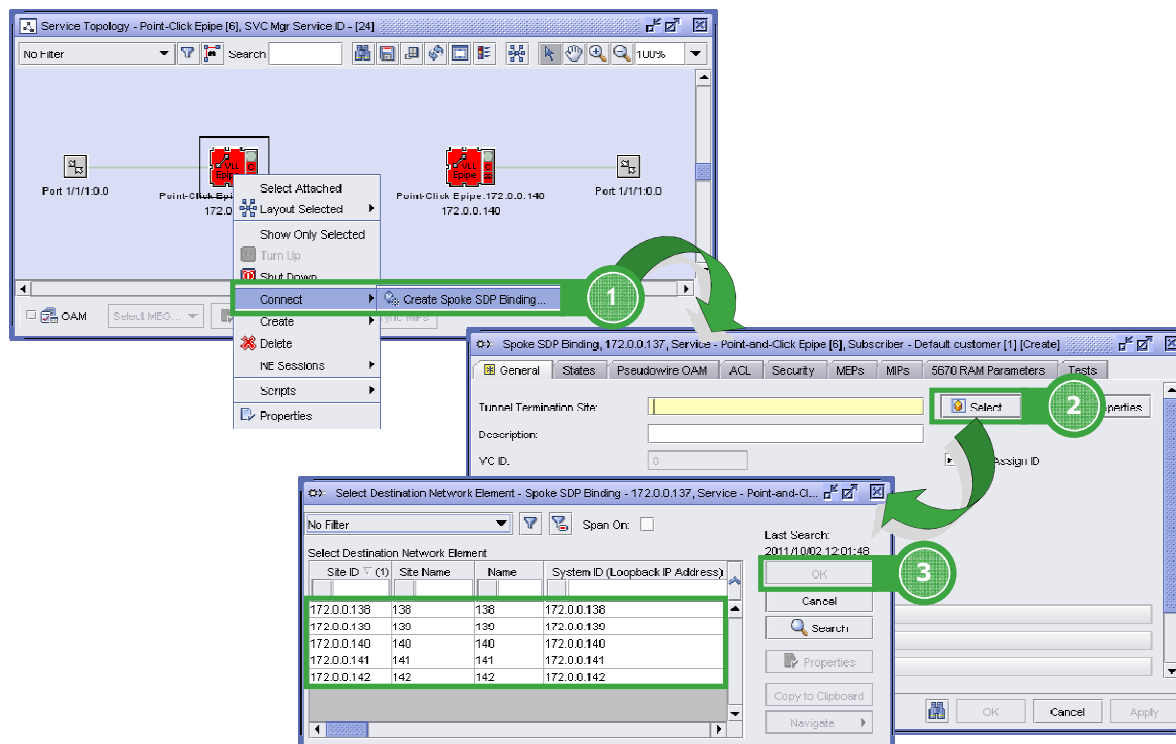
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4. Click on the **OK** button. The **L2 Access Interface [Create]** form closes and the **Service Topology** map refreshes displaying the created access interfaces.

Repeat these steps as required to create access interfaces on other Epipe sites.

## 2.1.3 Create Spoke SDP Binding



3 - 2 - 27

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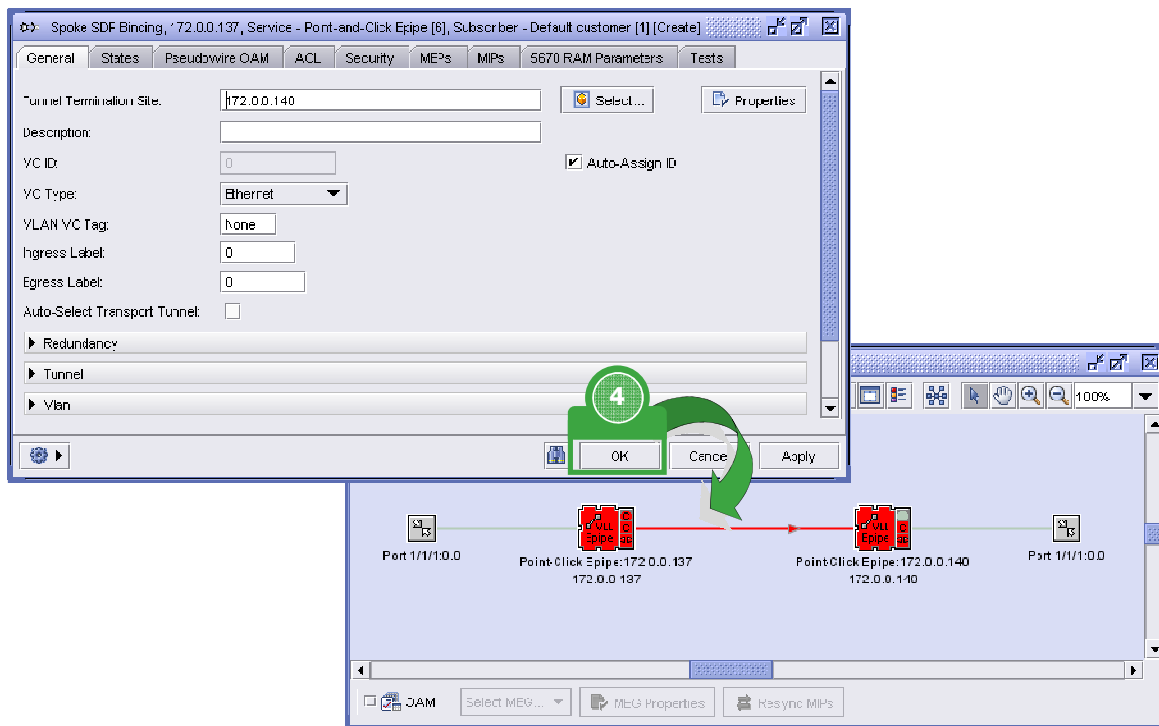
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The following lines and the images above summarize the steps recommended to create a Spoke SDP binding connection using the point-and-click provisioning method for this lab:

1. On **Service Topology** map, right-click on an Epipe site and choose **Connect**→**Create Spoke SDP Binding** from the contextual menu. The **Spoke SDP Binding [Create]** form opens with the **General** tab displayed
2. Click on the **Select** button to choose a **Tunnel Termination Site**. The **Select Destination Network Element** form opens with a list of available tunnel termination sites.
3. Choose a tunnel destination site from the list and click on the **OK** button. The **Select Destination Network Element** form and the **Spoke SDP Binding [Create]** form refreshes with the selected tunnel destination site is displayed.

## 2.1.3 Create Spoke SDP Binding [cont.]



3 - 2 - 28

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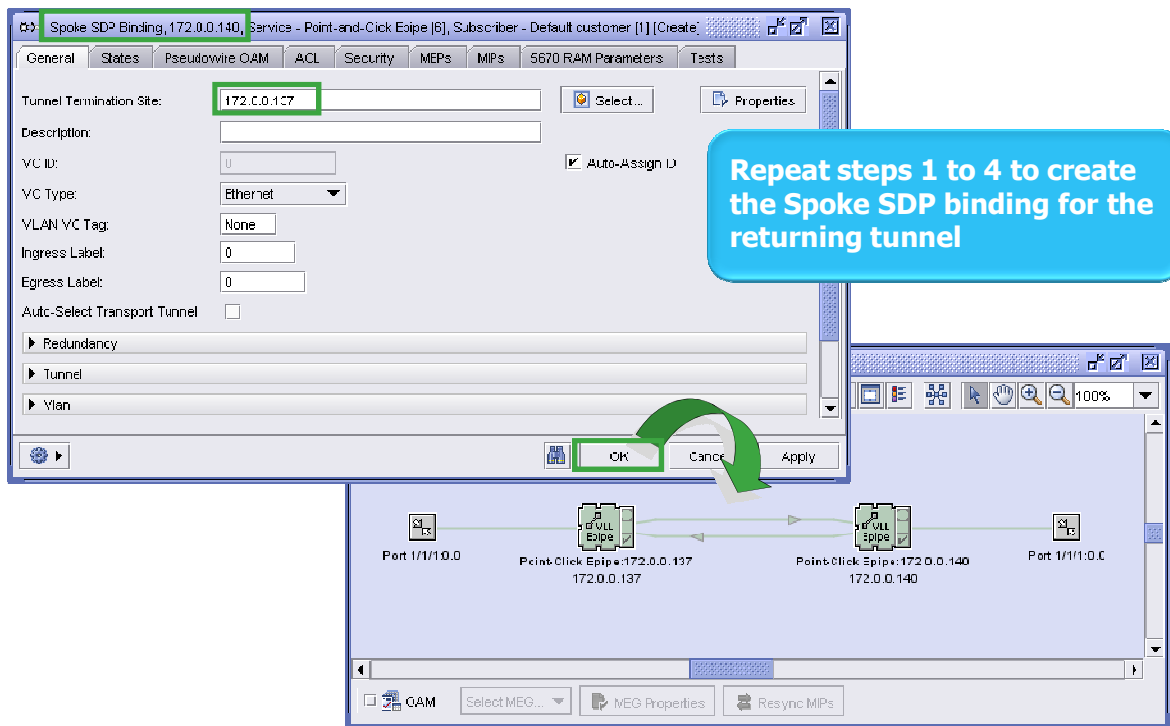
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4. Click on the **OK** button. The **Spoke SDP Binding [Create]** form closes and the **Service Topology** map refreshes displaying the created spoke SDP binding.



## 2.1.3 Create Spoke SDP Binding [cont.]



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Repeat steps 1 to 4 to create on the other Epipe site the Spoke SDP binding for the returning tunnel.



End of module  
VLL Epipe

.....  
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## Section 3 Service Types

# Module 3 VLL Ipipe

TOS36042\_V3.0-EQ-English-Ed1 Module 3.3 Edition 1

5620 SAM  
Services Operations and Provisioning  
TOS36042\_V3.0-EQ Edition 1

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Document History			
Edition	Date	Author	Remarks
1.0	2012-10-12	MCGRATH, John	TOS36042_V1.0 – SAM 10.0 R1
1.1	2012-11-16	MCGRATH, John	TOS36042_V1.1 – SAM 10.0 R5
2.0	2013-04-10	MCGRATH, John	TOS36042_V2.0 First edition – SAM 11.0 R1
2.1	2013-08-16	MCGRATH, John	TOS36042_V2.0 Second edition – SAM 11.0 R1 (update)
3.0	2014-04-03	MCGRATH, John	TOS36042_V3.0 First edition – SAM 12.0 R1



Upon completion of this module, you should be able to:

- Configure Ports
- Configure DS3, DS1, and DS0 channels
- Create an Ipipe
- Assign a Port to SAP
- Assign an LSP to SDP

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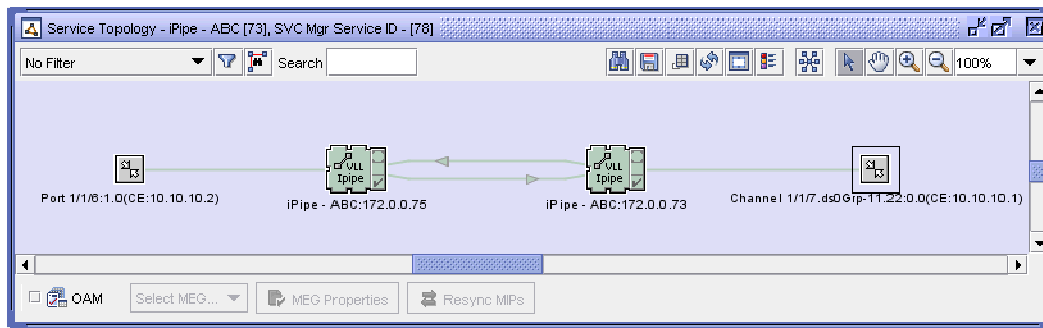
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<b>1 VLL Ipipe Provisioning</b>	<b>7</b>
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# 1 VLL Ipipe Provisioning

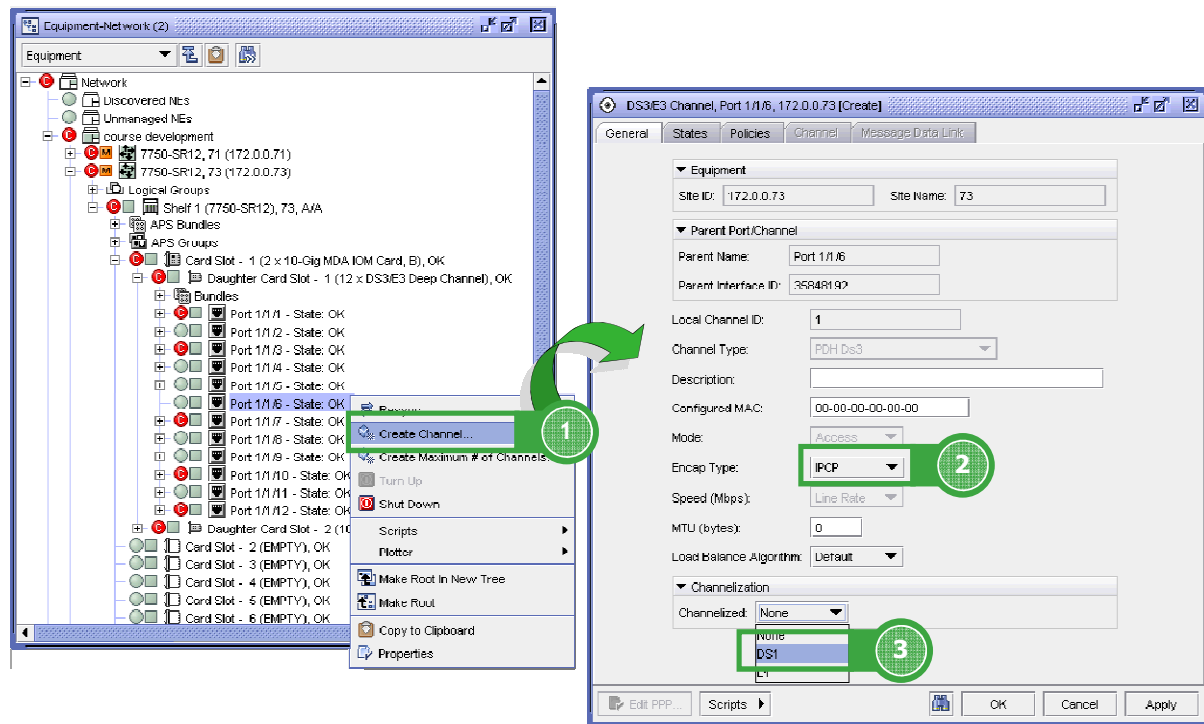
## 1.1 Lab overview



**This lab demonstrates how to configure the core components of a VLL Ipipe service using the form-based configuration method and the point-and-click provisioning method.**

## 2 Configure channels

## 2.1 Create a DS3 channel



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The following lab exercises will guide you through the steps necessary to configure an Ipipe in the lab's managed network.

- Configure Ports
- Configure DS3, DS1, and DS0 channels
- Create an Ipipe
- Assign a Port to SAP
- Assign an LSP to SDP



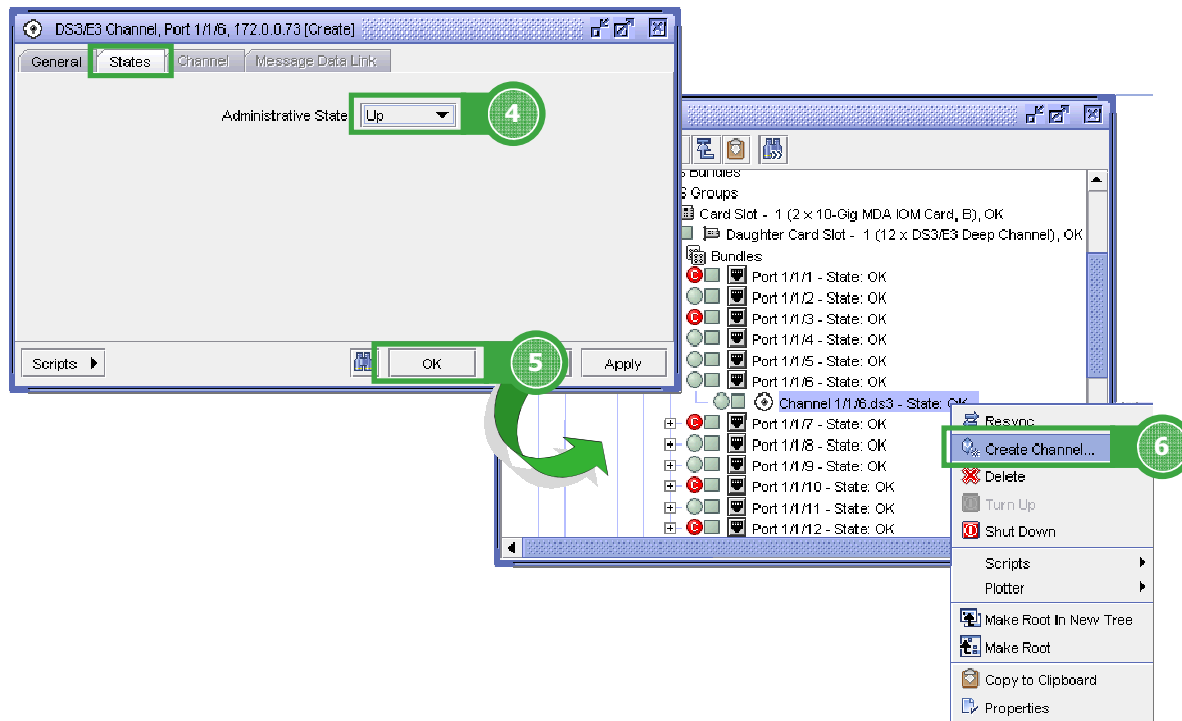
### Technical Reference

See the **Alcatel-Lucent 5620 SAM User** for more details on the procedures to create an Epipe service.

## Create DS3 channel

1. Right-click on an equipment-facing port in the Equipment view and choose Create Channel from the contextual menu.
2. Set the Encap Type parameter to IPCP.
3. Set the Channelized parameter to DS1.

## 2.2 Create a DS3 channel [cont.]



3 • 3 • 11

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4. Click on the States tab and set the Administrative State parameter to Up.
5. Click on the OK button.
6. Right-click on the newly created DS3 channel in the Equipment view and choose Create Channel from the contextual menu.

## 2.3 Create a DS1 channel

DS1/E1 Channel, Channel 1/1/6.ds3, 172.0.0.73 [Create]

General States SubChannels Channel

Equipment

Site ID: 172.0.0.73 Site Name: 73

Parent Port/Channel

Parent Name: Channel 1/1/6.ds3

Parent Interface ID: 572718110

Local Channel ID: 11

Channel Type: PDH Ds1

Scripts ▶

DS1/E1 Channel, Channel 1/1/6.ds3, 172.0.0.73 [Create]

General States SubChannels Channel

Administrative State: Up

Scripts ▶ OK Apply

3 • 3 • 12

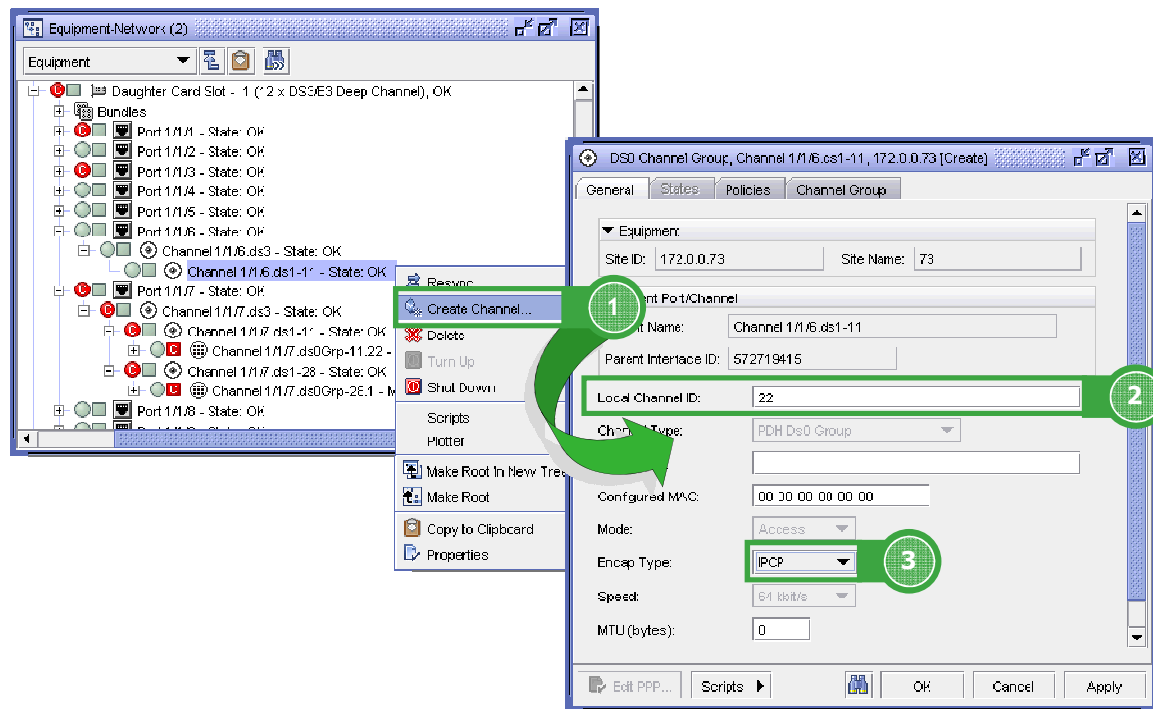
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1. Configure the Local Channel ID parameter.
2. Click on the States tab and set the Administrative State parameter to Up.
3. Click on the OK button.

## 2.4 Create a DS0 channel



3 • 3 • 13

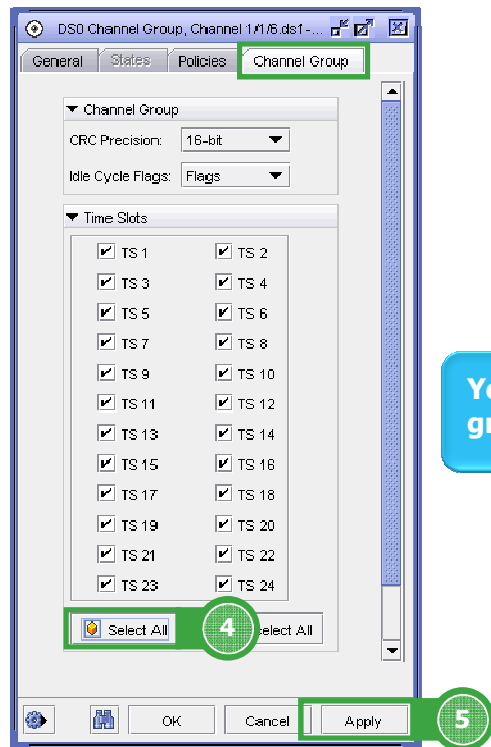
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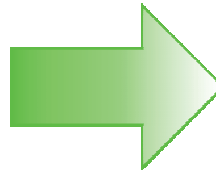
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1. Right-click on the newly created DS1 channel in the Equipment view and choose Create Channel from the contextual menu.
2. Configure the Local Channel ID parameter.
3. Set the Encap Type parameter to IPCP.

## 2.4 Create a DS0 channel [cont.]



You cannot apply the change to the channel group if the admin state is up.



3 • 3 • 14

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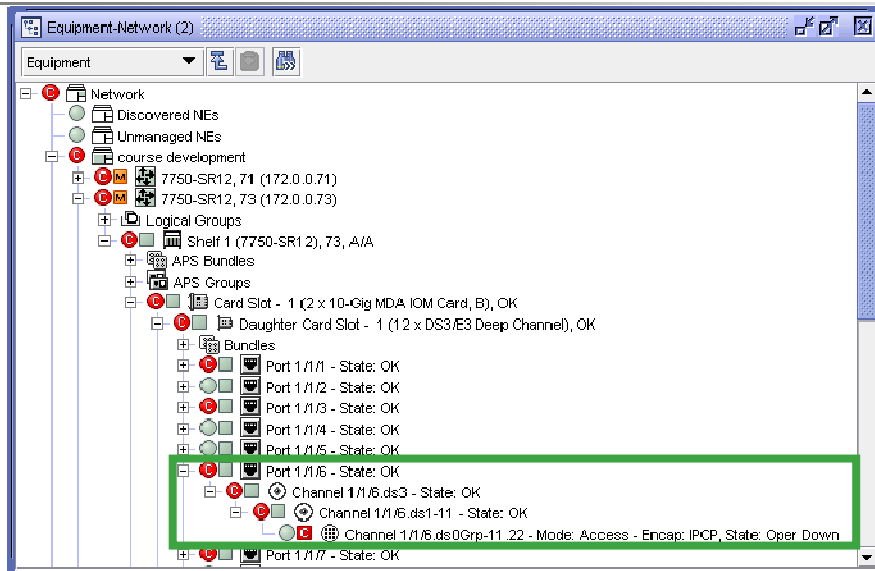
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4. Click on the Channel Group tab and click on the Select All button.
5. Click on the Apply button.
6. Turn up the channel administrative state.



## 2.4 Create a DS0 channel [cont.]



The DS0 channel group will be in an object alarm state until the signaling is configured for the entire VLL Ipipe service.

3 • 3 • 15

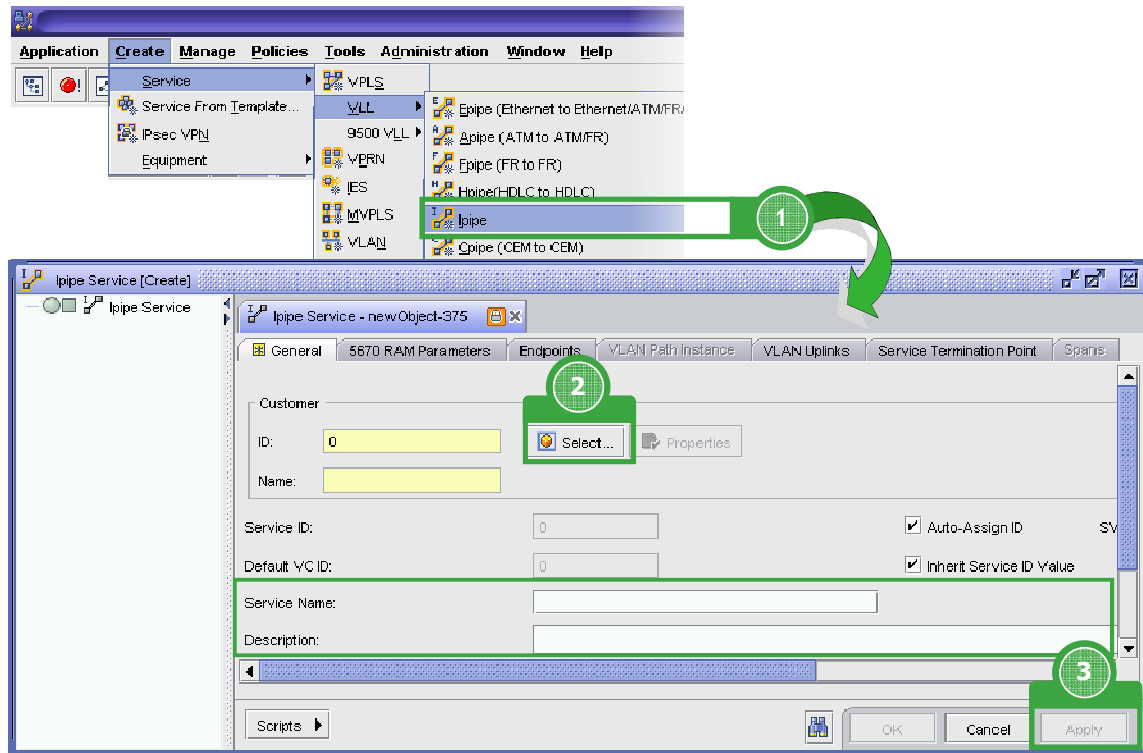
Service Types - VLL Ipipe  
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## 3 Create a Cpipe Service

## 3.1 Create Ipipe Service



3 • 3 • 17

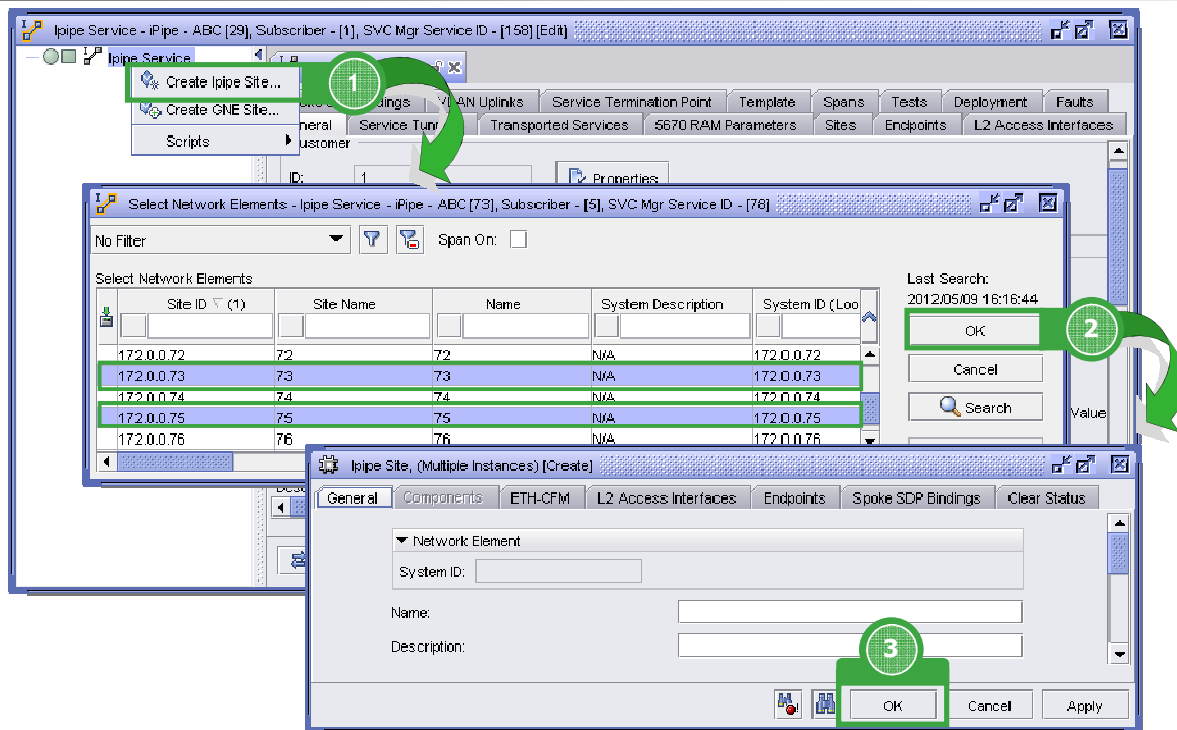
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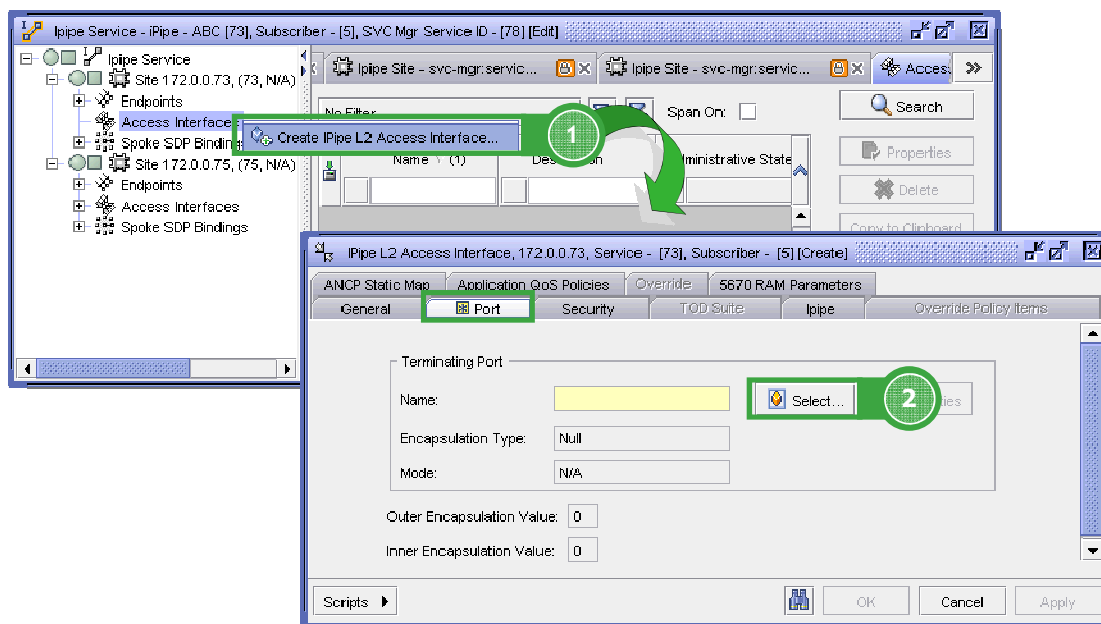
1. Choose **Create** → **Service** → **VLL** → **Ipipe** from the main menu. The **Ipipe Service [Create]** form opens with the **General** tab displayed
2. In the **Customer** panel, click the **Select** button to add the customer. Specify a **Service Name** and **Description**.
3. Click on the **Apply** button.

## 3.1.1 Adding Sites



1. Right-click on the Ipipe service in the navigation pane and choose Create Ipipe Site from the contextual menu.
2. Select the sites for the service and click on the OK button.
3. Configure each site in the service and click on the OK button.

## 3.1.2 Adding an L2 Access Interface



3 • 3 • 19

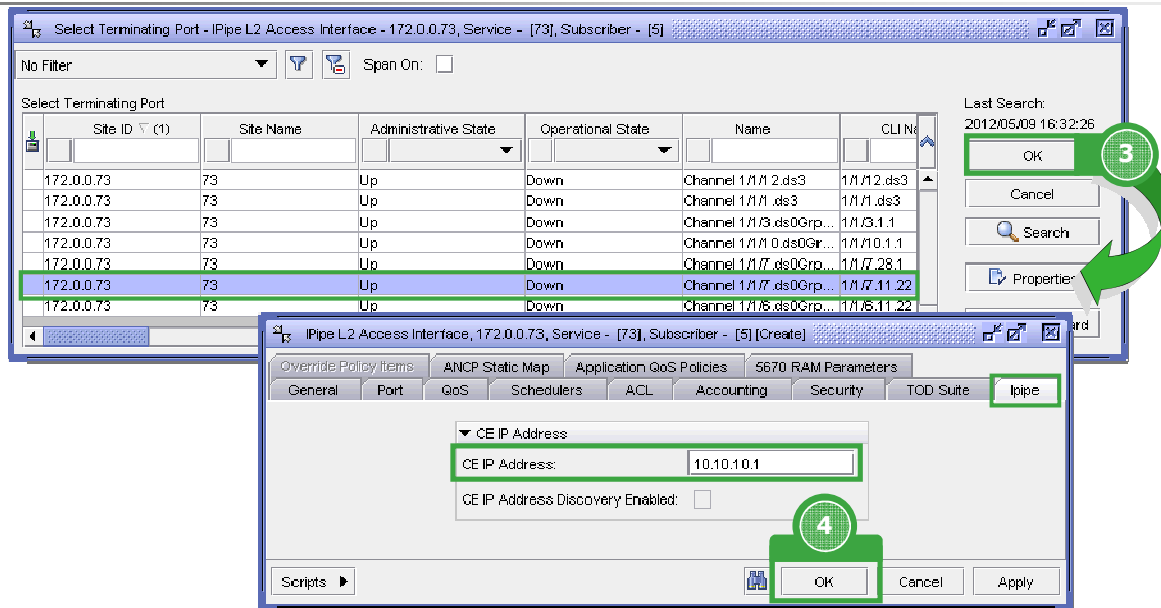
Service Types - VLL Ipip  
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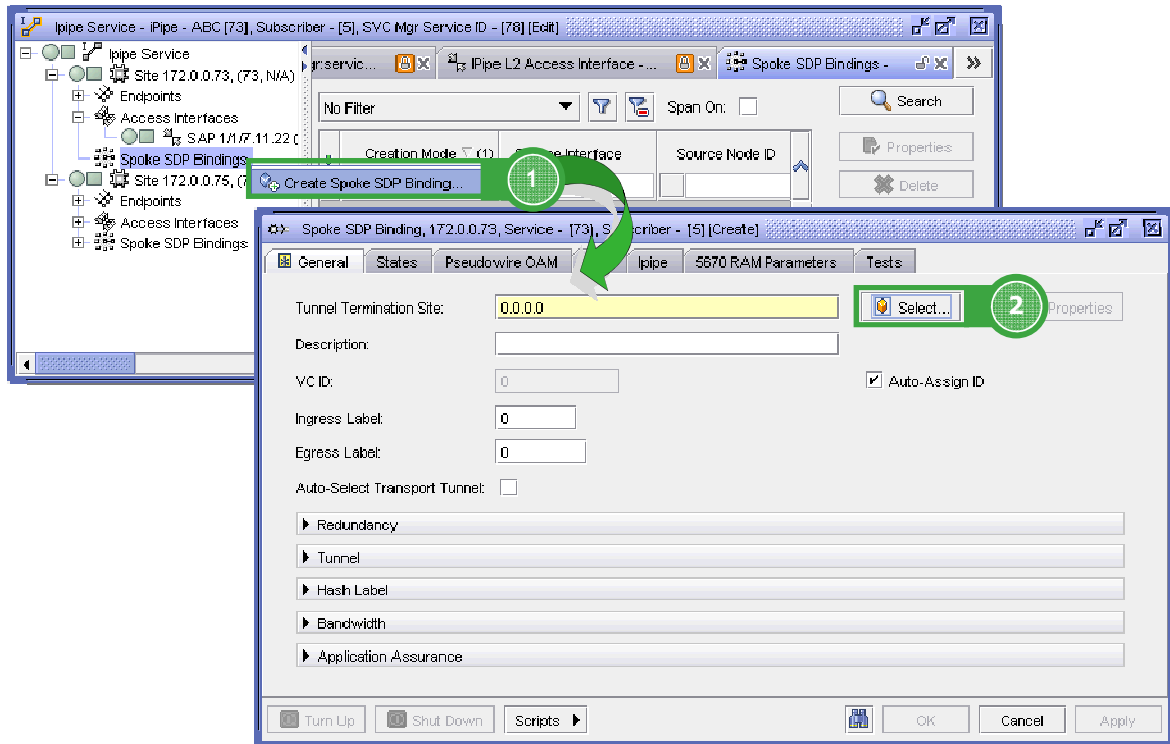
1. Right-click on the Access Interface associated with each site and choose Create IPipe L2 Access Interface from the contextual menu.
2. Click on the Port tab and initiate the selection of a terminating port by clicking on the Select button.

## 3.1.2 Adding an L2 Access Interface [cont.]



3. Select the terminating port and click on the OK button.
4. Click on the Ipipe tab, define the CE IP Address, and click on the OK button.

### 3.1.3 Adding Spoke SDP Bindings



3 • 3 • 21

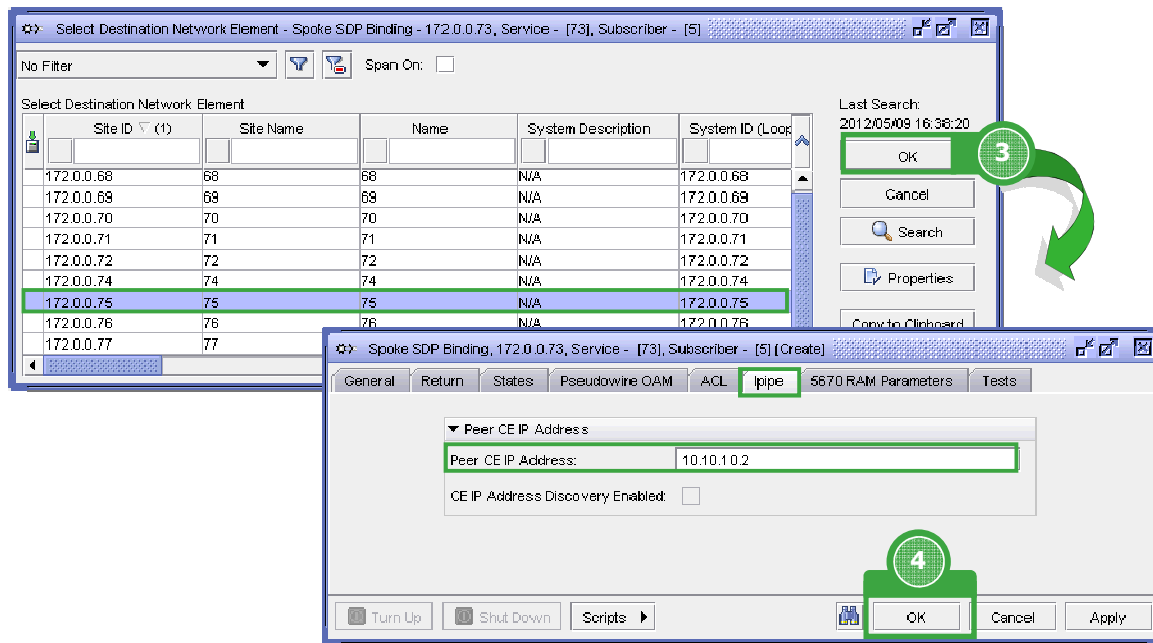
Service Types - VLL Ipipe  
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1. Right-click on the Spoke SDP Binding associated with each site and choose Create Spoke SDP binding from the contextual menu.
2. Initiate the selection of a Tunnel Termination Site by clicking on the Select button.

### 3.1.3 Adding Spoke SDP Bindings [cont.]



3 • 3 • 22

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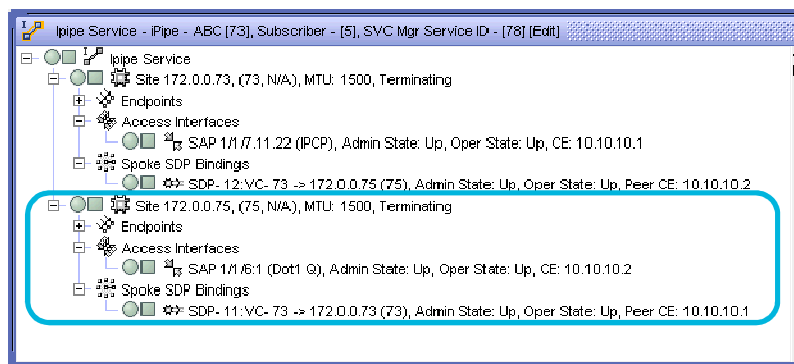
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3. Select the destination NE and click on the OK button.
4. Click on the lpipe tab, define the Peer CE IP Address, and click on the OK button.



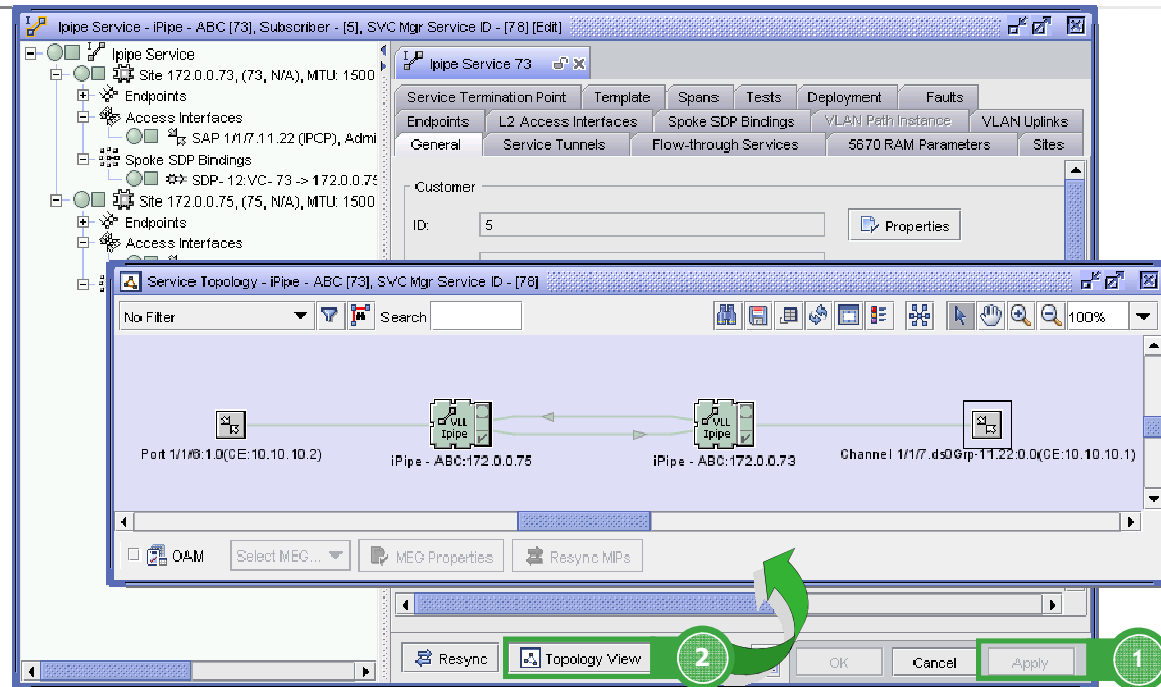
## 3.1.4 Second site configuration



**Repeat the steps to create the L2 access interface and SDP binding on the other site in the Ipipe service.**

**In this example, node 172.0.0.75 uses 10.10.10.2 for the access interface and 10.10.10.1 for the spoke SDP binding.**

## 3.1.5 Topology View



3 • 3 • 24

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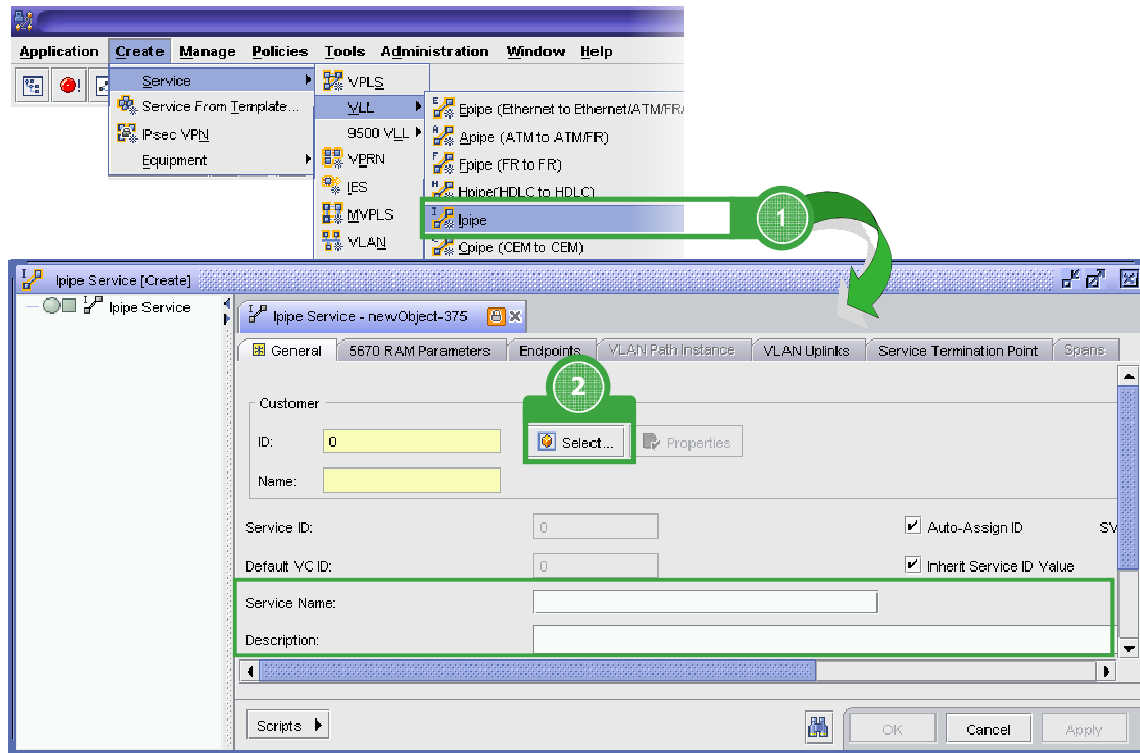
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1. Apply the configuration changes to the Ipipe service.
2. Click on the Topology View button.

## 4 Ipipe Point-and-Click Provisioning Method

## 4.1 Create Ipipe Service



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The following lines and the images above summarize the steps recommended to create an Ipipe using the point-and-click provisioning method for this lab:

1. Choose **Create** → **Service** → **VLL** → **Ipipe** from the main menu. The **Epipe Service [Create]** form opens with the **General** tab displayed
2. In the **Customer** panel, click the **Select** button to add the customer. Specify a **Service Name** and **Description**.

## 4.1 Create Ip Pipe Service [cont.]

The screenshot shows the 'Ip Pipe Service [Create]' window with the following configuration details:

- Customer:** ID: 2, Name: new\_customer
- Service ID:** 0, ☒ Auto-Assign ID
- Default VC ID:** 0, ☒ Inherit Service ID Value
- Service Name:** (empty field)
- Description:** (empty field)
- Service Tier:** 3, **Service Priority:** (empty field)
- Administrative State:** Up
- Automatic SDP Binding/PBB Tunnel Creation:** ☒ (Step 3)
- Auto Tunnel Selection:**
  - Profile Name:** (empty field)
  - Transport Type:** MPLS:LDP (Step 5)
- Buttons:** OK (Step 4), Apply (Step 6)

3 • 3 • 27

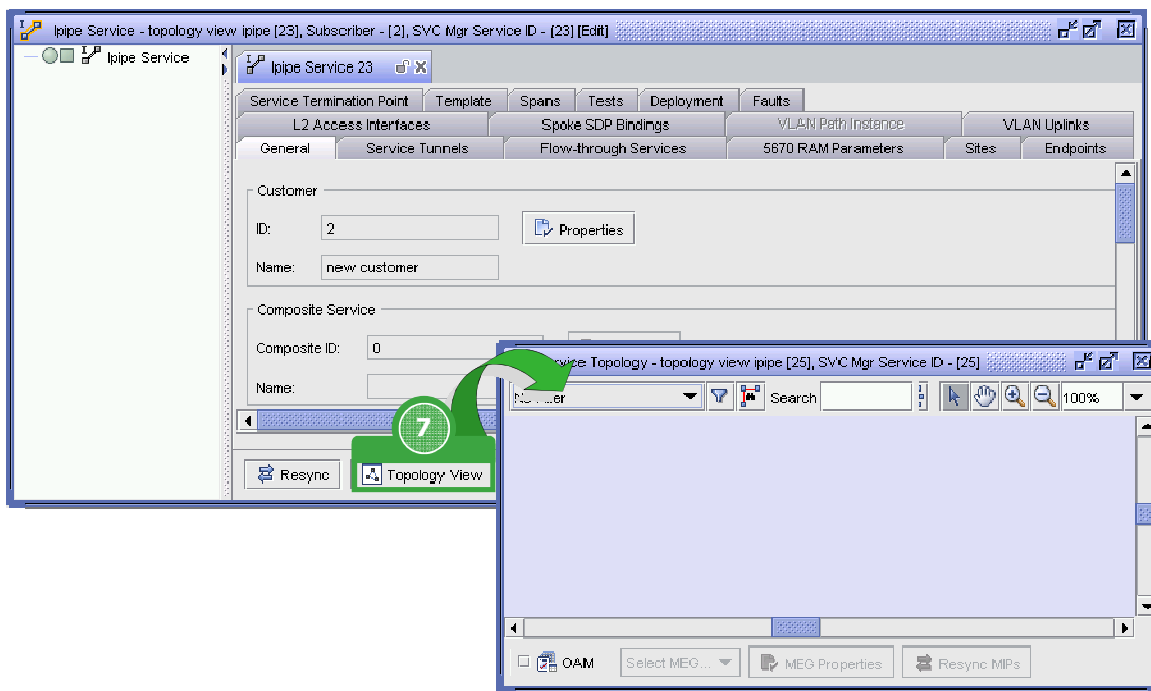
Service Types - VLL Ip Pipe  
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3. Enable the Automatic SDP Binding/Tunnel Creation parameter.
4. Click on the Apply button. The form refreshes and displays additional parameters.
5. Set the Transport Type parameter to MPLS:LDP.
6. Click on the Apply button.

## 4.1 Create Ipipe Service [cont.]



3 • 3 • 28

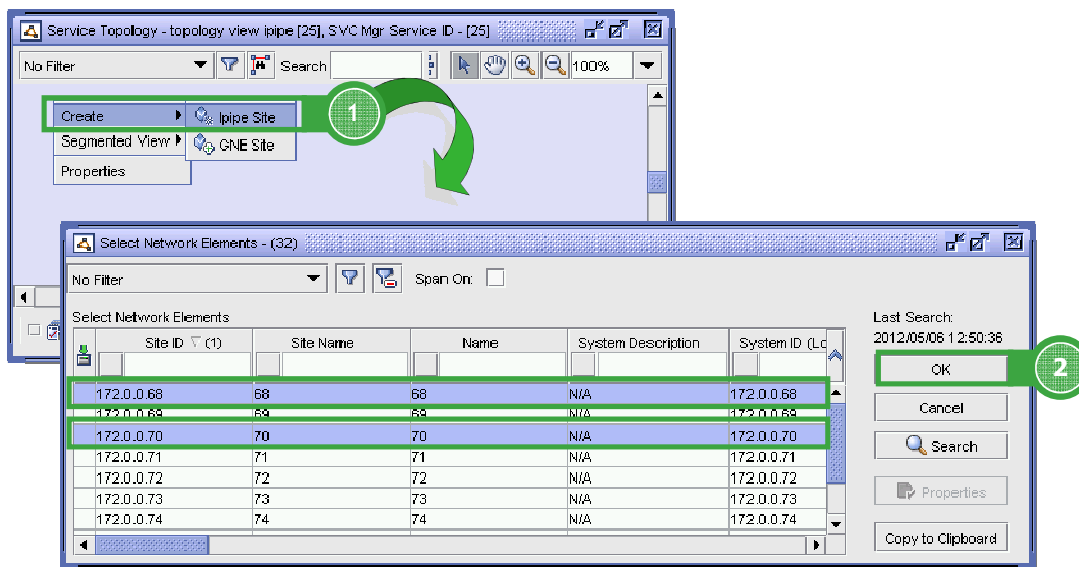
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7. Click on the Topology View button. The Service Topology map opens.

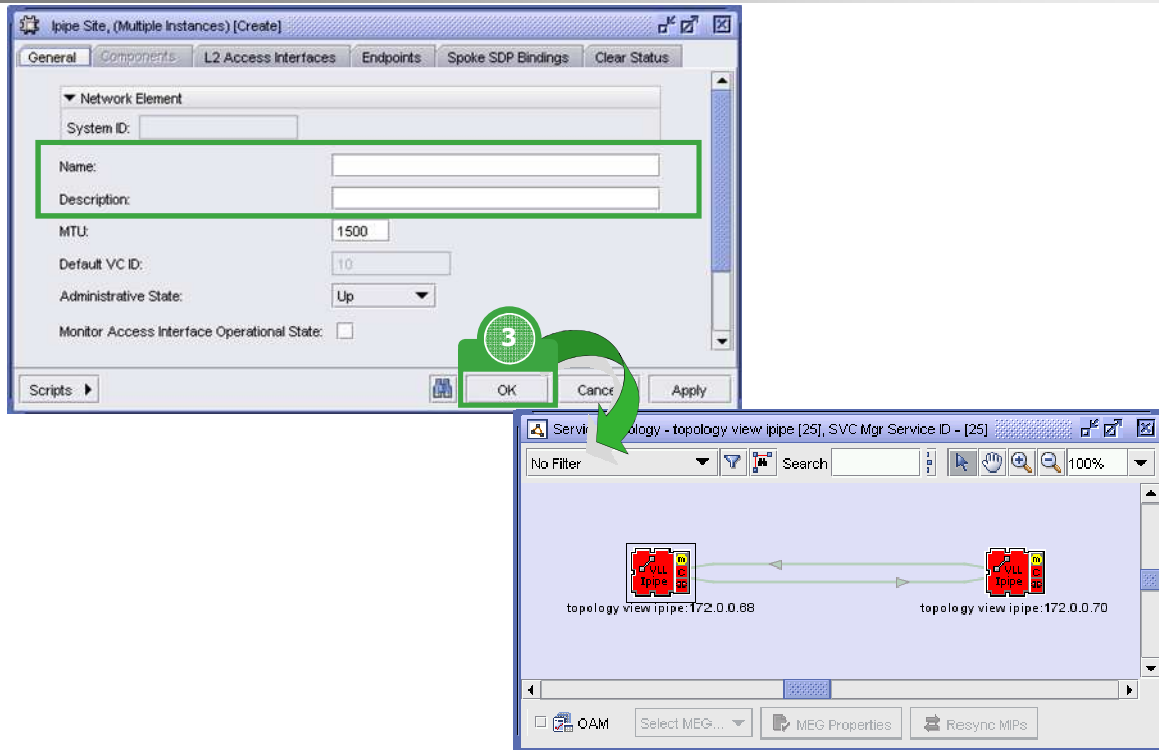
## 4.1.1 Create Ipipe Sites



The following lines and the images above summarize the steps recommended to create Ipipe sites using the point-and-click provisioning method for this lab:

1. Click on an empty portion of the **Service Topology** map. Choose **Create**→**Ipipe Site** from the contextual menu. The **Select Network Elements** form opens with a list of available sites.
2. Choose a site or multiple sites and click on the **OK** button. The **Site (Create)** form opens with the **General** tab displayed.

## 4.1.1 Create Ipipe Sites [cont.]



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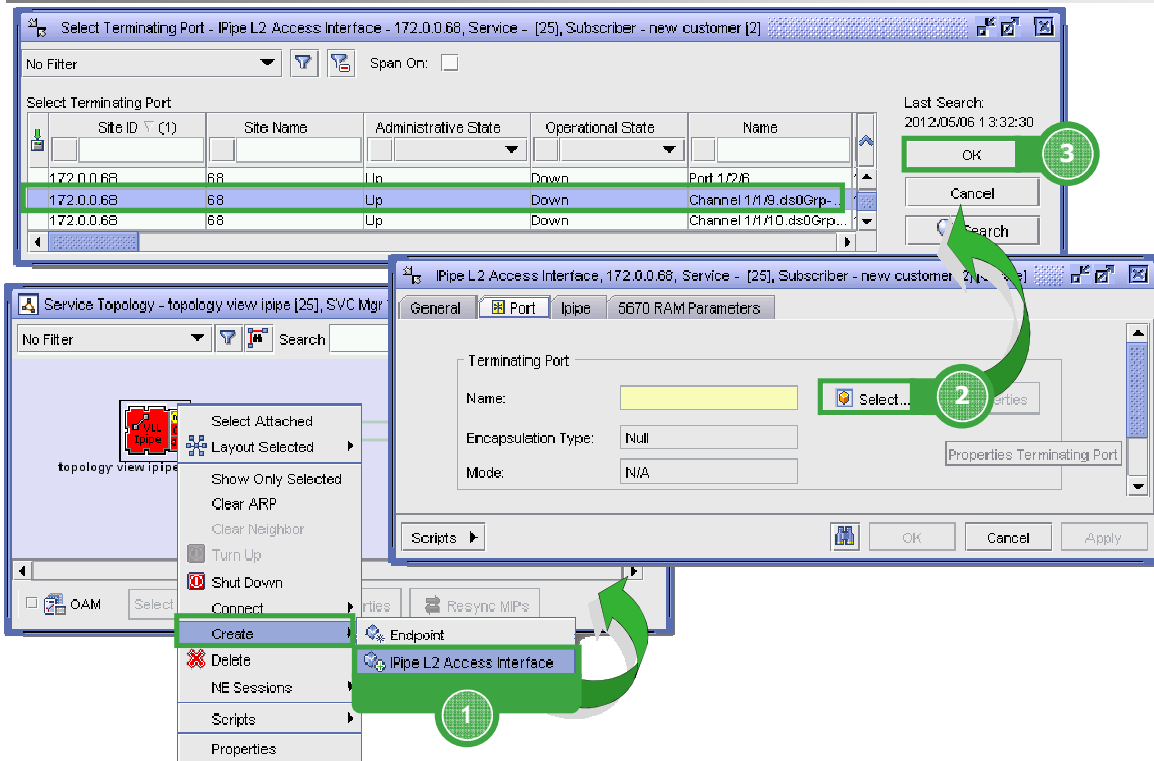
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- On the **Ipipe Site (Create)** form assign a Name and Description. Click on the **OK** button. The **Ipipe Site (Create)** form closes and the **Service Topology** map refreshes displaying the created Epipe sites.



## 4.1.2 Create L2 Access Interface



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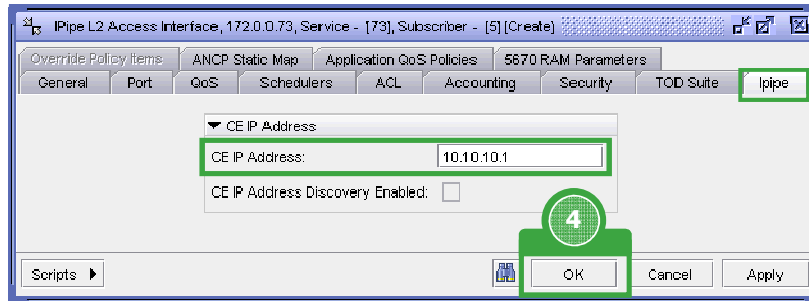
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The following lines and the images above summarize the steps recommended to create an access interface sites using the point-and-click provisioning method for this lab:

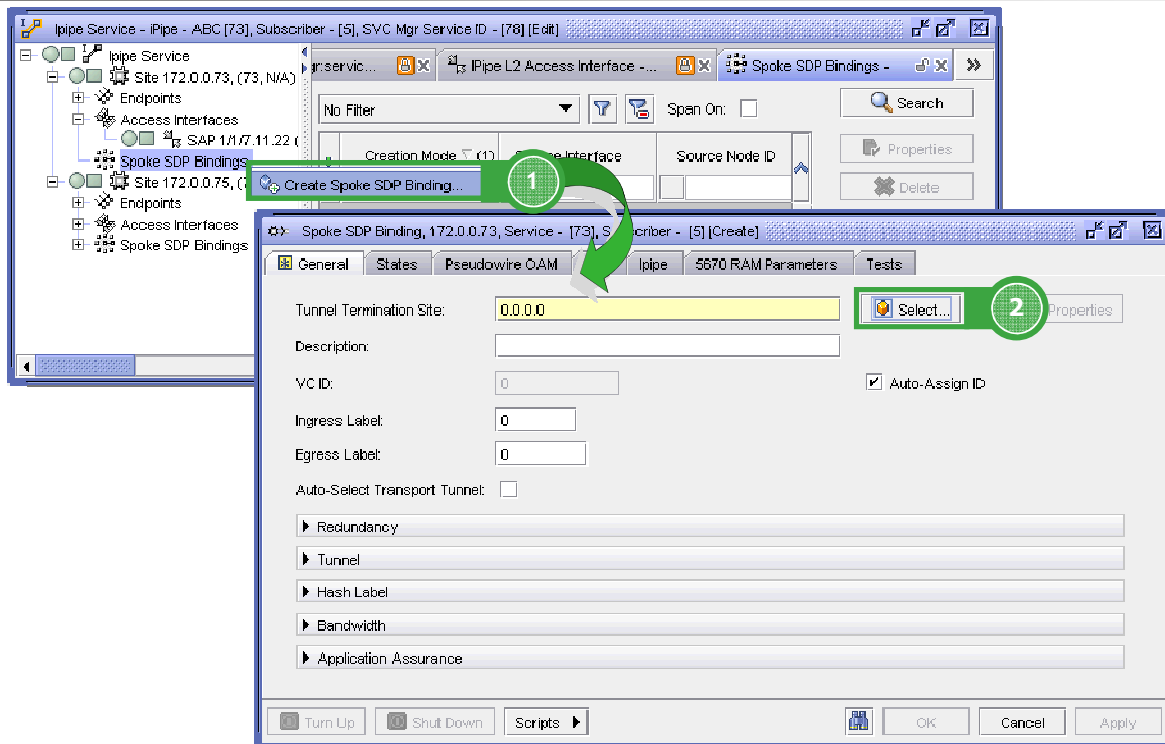
1. On **Service Topology** map, right-click on an Epipe site and choose **Create**→**IPipe L2 Access Interface** from the contextual menu. The **IPipe L2 Access Interface [Create]** form opens with the **General** tab displayed
2. Click on the **Port** tab button and click on the **Select** button in the **Terminating Port** panel. The **Select Terminating Port** form opens with a list of available access ports.
3. Choose a port from the list and click on the **OK** button. The **Select Terminating Port** form and the **IPipe L2 Access Interface [Create]** form refreshes with selected port name is displayed in the **Terminating Port** panel.

## 4.1.2 Create L2 Access Interface [cont.]



4. Click on the Ipipe tab, define the Peer CE IP Address, and click on the OK button.

## 4.1.3 Adding spoke SDP bindings



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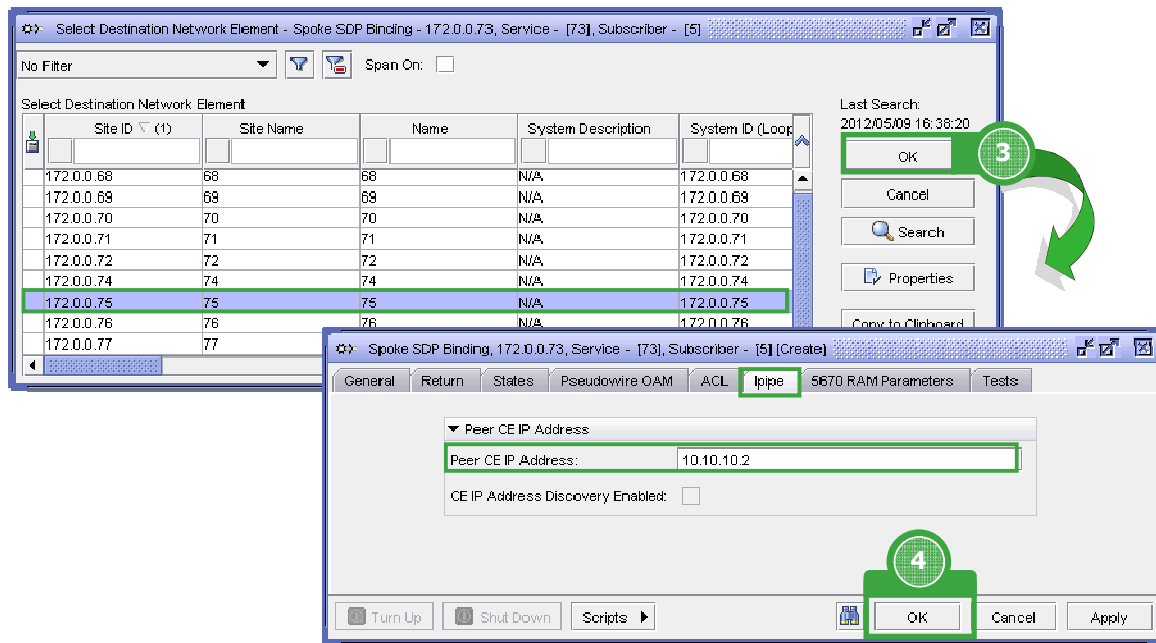
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1. Right-click on the Spoke SDP Binding associated with each site and choose Create Spoke SDP binding from the contextual menu.
2. Initiate the selection of a Tunnel Termination Site by clicking on the Select button.

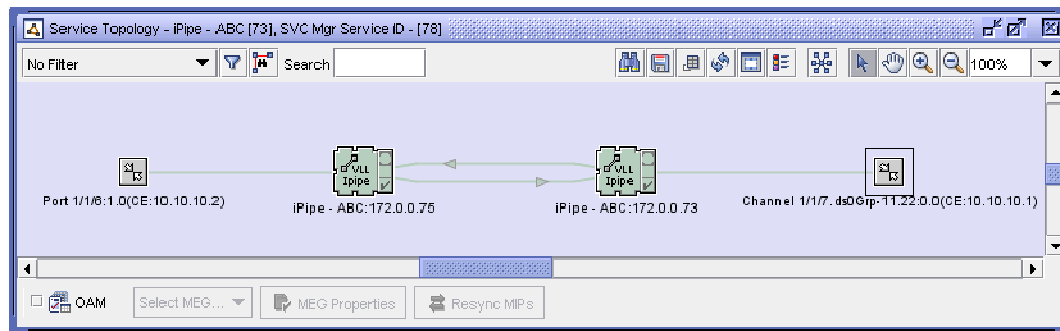
## 4.1.3 Adding spoke SDP bindings [cont.]



3. Select the destination NE and click on the OK button.
4. Click on the Ipipe tab, define the Peer CE IP Address, and click on the OK button.

## 4.1.3 Adding spoke SDP bindings [cont.]

Repeat the steps to create the L2 access interface and SDP binding on the other site in the Ipipe service.





End of module  
VLL Ipipe

.....  
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Section 3  
Service Types

**Module 4**  
**VLL Apipe**

TOS36042\_V3.0-EQ-English-Ed1 Module 3.4 Edition 1

5620 SAM  
Services Operations and Provisioning  
TOS36042\_V3.0-EQ Edition 1

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Document History			
Edition	Date	Author	Remarks
1.0	2012-10-12	MCGRATH, John	TOS36042_V1.0 – SAM 10.0 R1
1.1	2012-11-16	MCGRATH, John	TOS36042_V1.1 – SAM 10.0 R5
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2.1	2013-08-16	MCGRATH, John	TOS36042_V2.0 Second edition – SAM 11.0 R1 (update)
3.0	2014-04-03	MCGRATH, John	TOS36042_V3.0 First edition – SAM 12.0 R1





Upon completion of this module, you should be able to:

- Create an Apipe Service
- Assign a Port to SAP
- Create Service Distribution Path (SDP) Bindings

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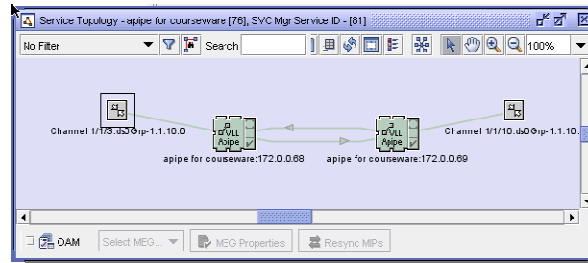


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# 1 VLL Apipe Configuration

## 1.1 Lab overview



**This lab demonstrates how to configure the core components of a VLL Apipe service using the form-based configuration method and the point-and-click provisioning method.**

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## 2 Configure the Access Port

## 2 Configure the Access Port

### 2.1 Create the Channel

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The following lab exercises will guide you through the steps necessary to configure an Apipe in the lab's managed network.

1. Create an Apipe service
2. Assign a Port to SAP
3. Create the Spoke SDP Bindings.



#### Technical Reference

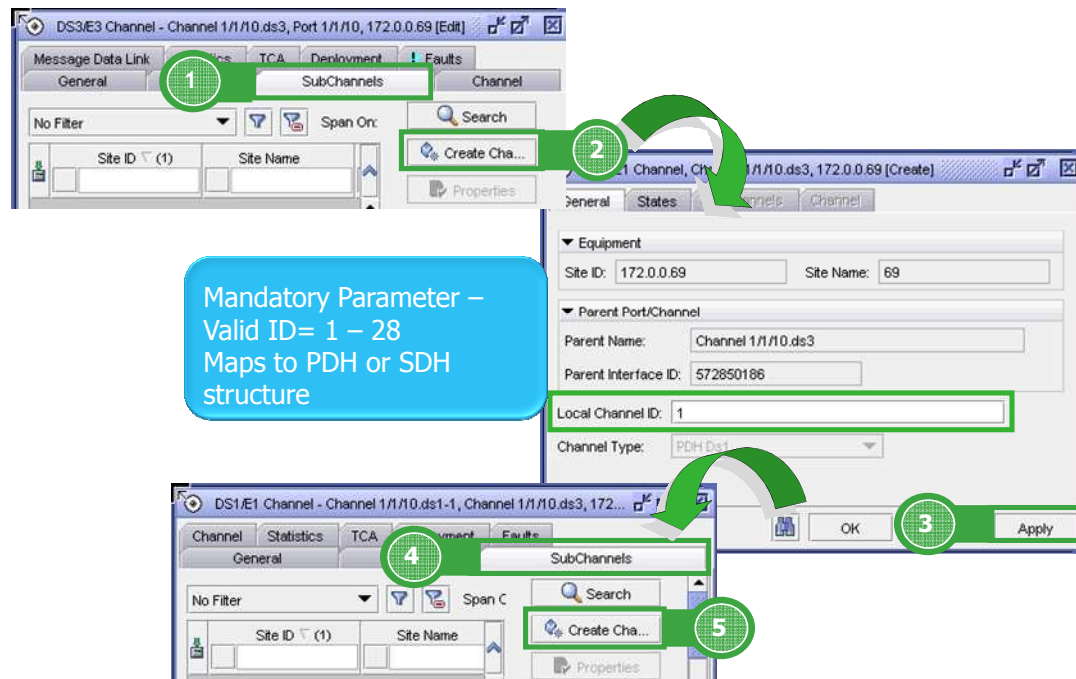
See the *Alcatel-Lucent 5620 SAM User Guide* for more details on the procedures to create an Apipe service.

### Configure Access Port

1. From the **Equipment** tab, select the appropriate port from the navigation tree, right click and select **Create Channel**.
2. Note that the port **Mode** is set to **Access** by default in this example. If it is set to **Network**, click on the down arrow and select **Access** from the dropdown. Set the **Encap Type** to **ATM** from the dropdown menu provided by click on the down arrowhead next to the parameter.
3. Click on the down arrow next to the **Channelized** parameter setting and choose the appropriate value from the list; **DS1** in this example. As such, the port will support 28 T1 sub-channels within the same physical port.
4. Click on the **Apply** button to save the changes. Note that the **SubChannel** tab appears at the top of the window.



## 2.2 Create the SubChannel



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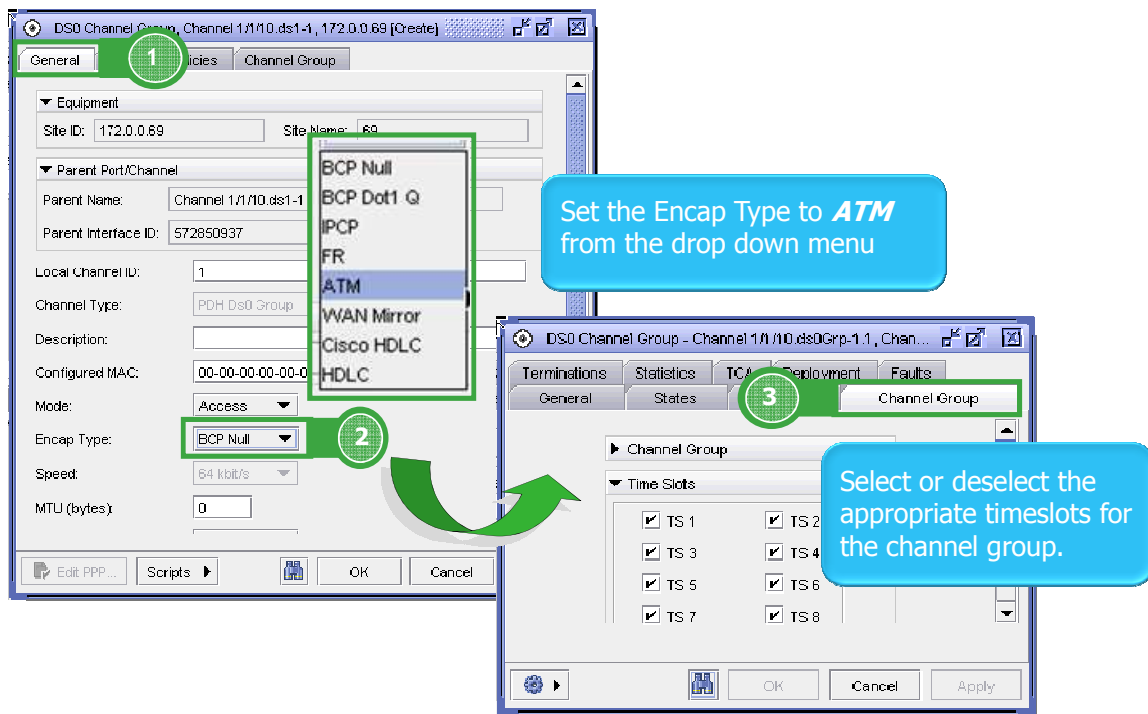
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### Configure the Sub Channel

1. Open the **SubChannels** tab at the top of the window.
2. Click the **Create Channel** button at the right side of the window. Note that the SubChannel **Create** window opens. Note that the Local Channel ID requires a mandatory input; valid inputs being numbers 1 through 28. This value maps to the PDH or SDH structure of a TDM framed DS3/ E3. In this example, the number 1 is used which would map to the first T1 in the first DS2 of the TDM framed DS3. This would also apply within the SDH format.
3. Click on the **Apply** button at the bottom of the window. Note that another **SubChannel** tab becomes available. This tab will be used to define the structure of the T1 link.
4. Click on the **SubChannels** tab and note that there are no entries listed.
5. Click on the **Create Channel** button at the right side of the window.

## 2.3 Configure the Channel Group



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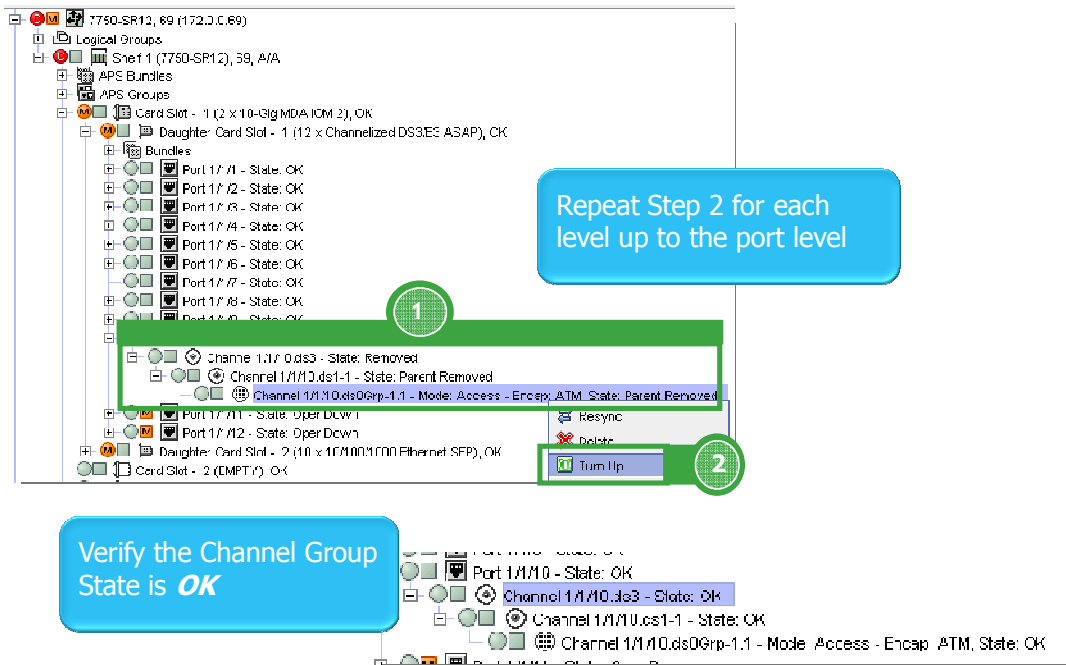
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### Configure the Channel Group

- Under the **General** tab of the new window, note that the Parent Port/ Channel **Mode** is set to **Access**. If it is set to Network, click on the down arrow and select Access from the dropdown.
- Set the **Encap Type** to **ATM** from the dropdown menu provided by click on the down arrowhead next to the parameter.
- Open the **Channel Group** tab. Note that automatically including all timeslots in the channel group is the default action for this port. Uncheck the appropriate timeslots to support the service and click on the **OK** button at the bottom of the window to save the changes. Each T1 can support up to 24 channel groups whereas an E1 can support up to 30.
- Click on the **Apply** button to save the changes. Note that the **SubChannel** tab appears at the top of the window.

## 2.4 Enable the Channel Group



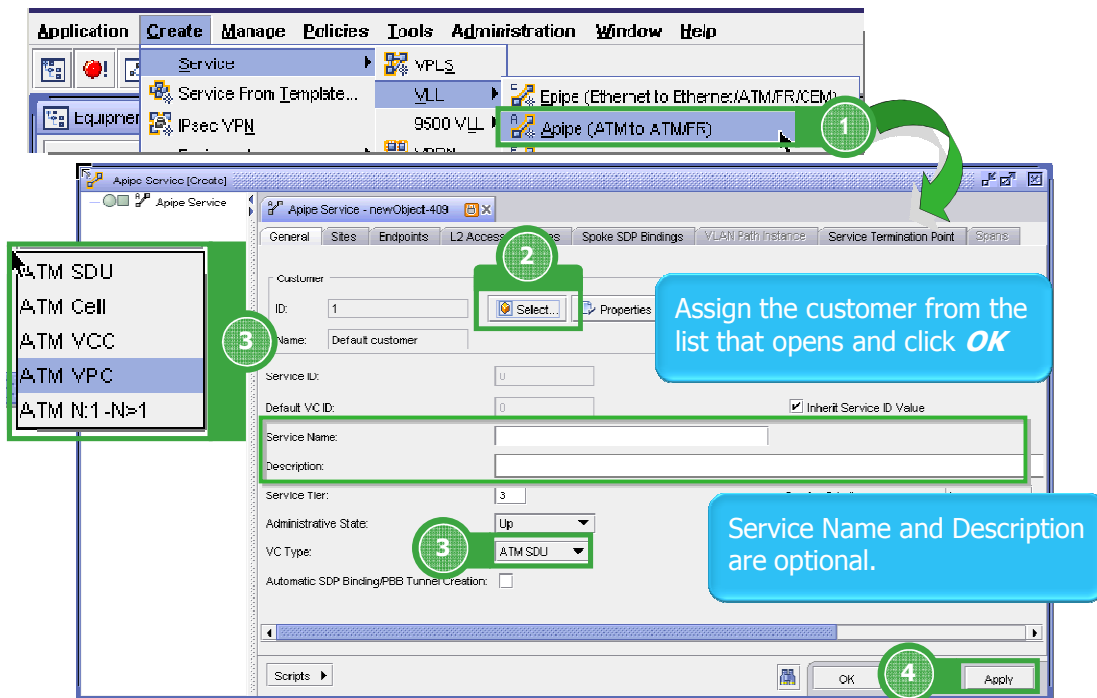
### Enable the Channel Group

From within the **Equipment** tab under the Navigation Tree, select the newly created channel group and view its operational state.

1. Where the operational **State** reads **Parent Removed**, first ensure that the object is set to **Admin Up**. To do so, select the object in the list, as illustrated above, and right click to access the contextual menu. Select **Turn Up**, and monitor the operational state. Repeat this step for each of the higher level objects in the hierarchical tree.
2. Note that the channel group **State** changes to **OK** when everything is properly configured. The port is now ready to support a SAP.

## 3 Create the Apipe Service

## 3.1 Create an Apipe Service



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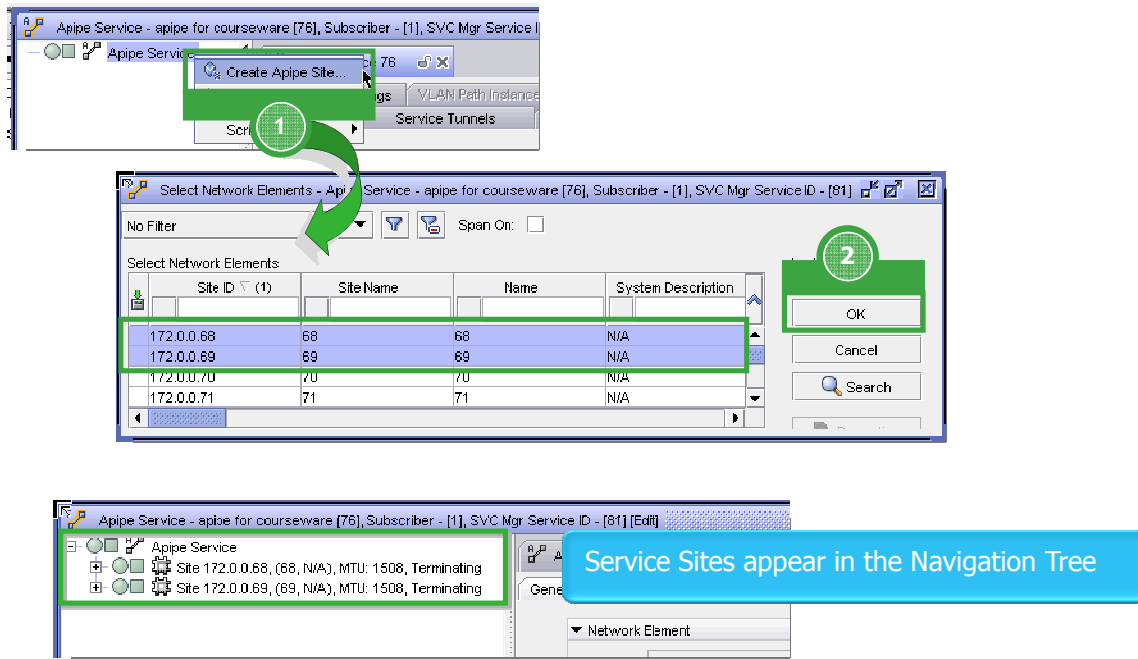
### Add the Service Sites

The following lines and the images above summarize the steps recommended to create an Apipe for this lab:

1. Choose **Create** → **Service** → **VLL** → **Apipe** from the main menu. The **Apipe Service [Create]** form opens with the **General** tab displayed
2. In the **Customer** panel, click the **Select** button to select the appropriate customer from the list and click on the OK button at the right side of the window. Though not mandatory to create the service, set the **Service Name** and **Description** as per corporate policy.
3. Set the **VC Type** from the dropdown menu as indicated by the down arrow. The definition for each of the parameters has been discussed earlier in the training session. For the purposes of this lab, select **ATM VPC**.
4. Click on the **Apply** button at the bottom of the window to save the changes. Note that the service sites appear in the Components tree at the left side of the configuration window.

## 4 Add the Service Sites

## 4.1 Add the Apipe Service Sites



### Create the Service Sites

1. From the **Components Tree**, right-click on **Apipe Service** and choose **Create Site**.
2. From the **Select Network Elements** list, select the sites to be included in the Apipe service. Click on **OK** at the right side of the window. Note that the sites appear in the **Navigation Tree** of the **Components View**.

## 5 Add the L2 Access Interface (SAP)



## 5.1 Add the Apipe Access Interfaces

Perform steps 1 – 4 for each SAP to be added to the service

- Click on the **Select** button
- Choose the port from the list
- Click on the **OK** button

Set the Encapsulation value dependant upon the port Encap Type

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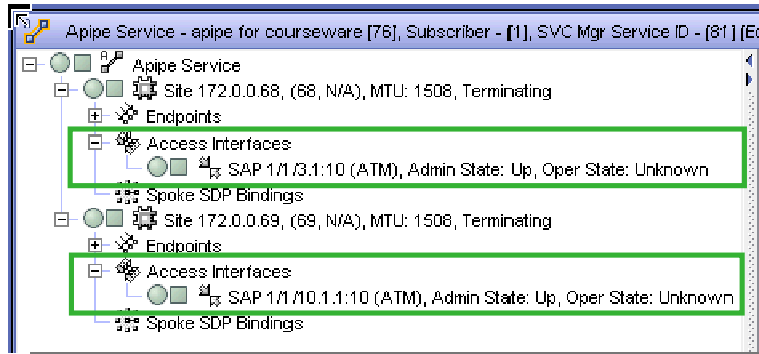
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### Create the Service Access Points

1. Expand the hierarchical tree by clicking on the + sign next to the service site entry. Select **Create L2 Access Interface** by right-clicking on the **Access Interface** entry.
2. Open the Port tab of the **L2 Access Interface [Create]** window
3. Click on the **Select** button and choose the appropriate channel group from the list. Click on the **OK** button at the right side of the window.
4. Set the Encapsulation Value (VPI) to map to the VPI from the CE device.
5. Click on the OK button at the bottom right of the window. Repeat Steps 1 through 5 for the other Access interface.

## 5.2 Verify SAP Status



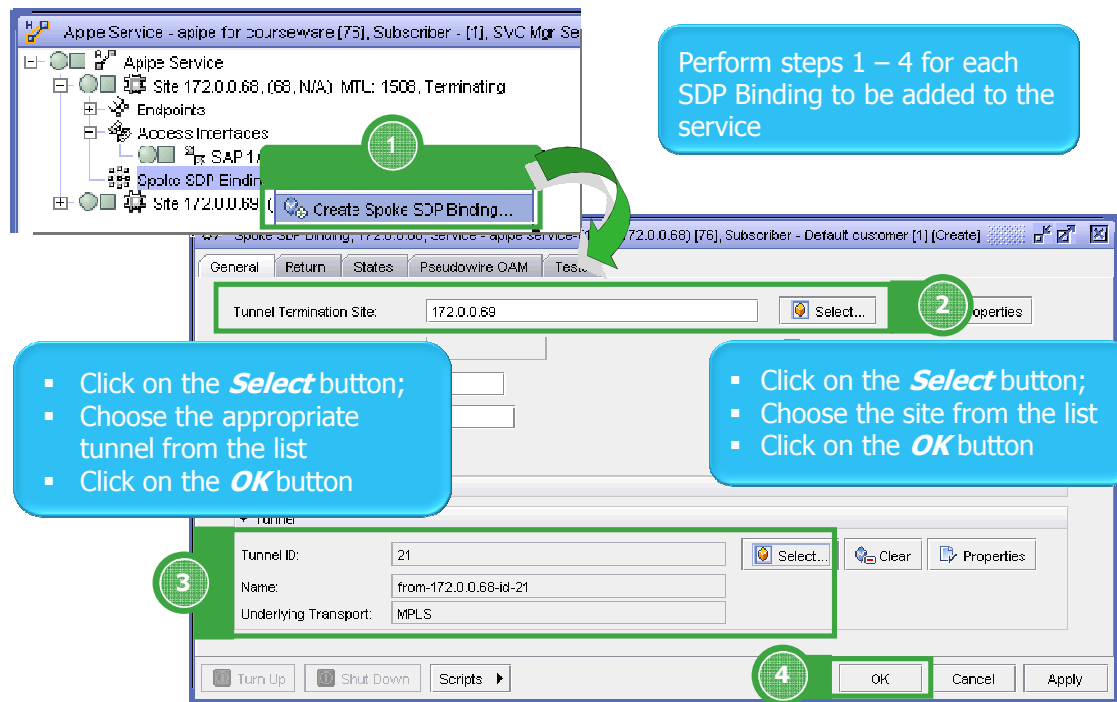
- **Oper State: Unknown** – indicates that the configuration changes have not been sent to the node
- OK and Apply buttons are bolded

To verify the status of the Access Interfaces from within the Components View for the service, expand the tree under the Access Interface entry. The newly configured access interface will be listed. Note that the Operational State is currently Unknown which is an indication that the changes have not been processed by the 5620 SAM server and therefore do not exist on the nodes or in the database.

To save the change, click on the Apply button at the bottom right of the service configuration window. The changes will be applied to the appropriate nodes and the 5620 SAM server will update the GUI with the results.

## 6 Create the SDP Bindings

## 6.1 Create the SDP Bindings



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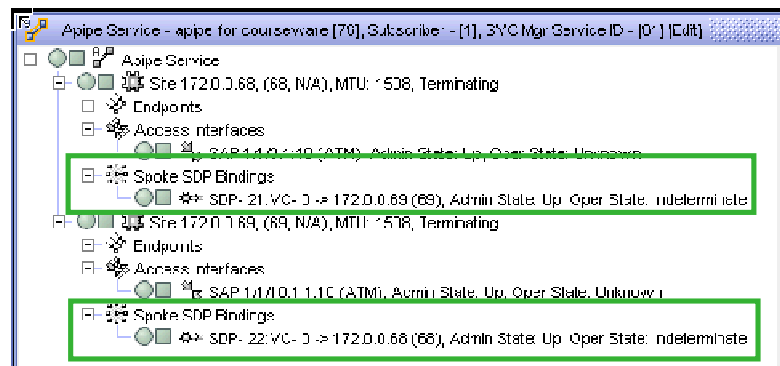
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SDP Bindings are required to connect the two service sites and allow traffic to pass between the two endpoints. To create the Spoke SDP Bindings;

1. Select **Create SDP Spoke Bindings** from the contextual menu by right-clicking on the **Spoke SDP Binding** entry below the Service Site entry from within the Components view.
2. Specify the **Termination Site** (mandatory) by clicking on the **Select** button and selecting the appropriate entry from the list.
3. Scroll down to the **Tunnel** header and click on the Select button next to the Tunnel ID parameter. Choose the appropriate tunnel from the list and click on the **OK** button that the right side of the window.
4. Click on the **Apply** button at the bottom right of the configuration window. Repeat steps 1 through 4 to configure the return SDP Binding from the other service site.

## 6.2 Verify Spoke SDP Binding Status



- Oper State: Indeterminate – indicates that the configuration changes have not been sent to the node
- Click on the Apply button to save the changes

To verify the status of the Spoke SDP Bindings, expand the navigation tree from within the Components view at the left side of the configuration window.

Note that the operational state indicates Indeterminate which indicates that the changes have not been sent to the node via the 5620 SAM. To save the change, click on the Apply button at the bottom right of the service configuration window. The changes will be applied to the appropriate nodes and the 5620 SAM server will update the GUI with the results.

## 7 View Service Configuration and Status

## 7.1 View Service Configuration and Status

**Navigation Tree**

- lists components based upon hierarchy
- selecting an item in the list changes the tabs presented in window
- each tab provides object specific information

**Topology View; graphical representation with color coded status indicators**

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The 5620 SAM GUI provides the capability to verify the status of the Apipe service and its components via tabular form (through a navigation tree) and a graphical representation referred to as the Topology View.

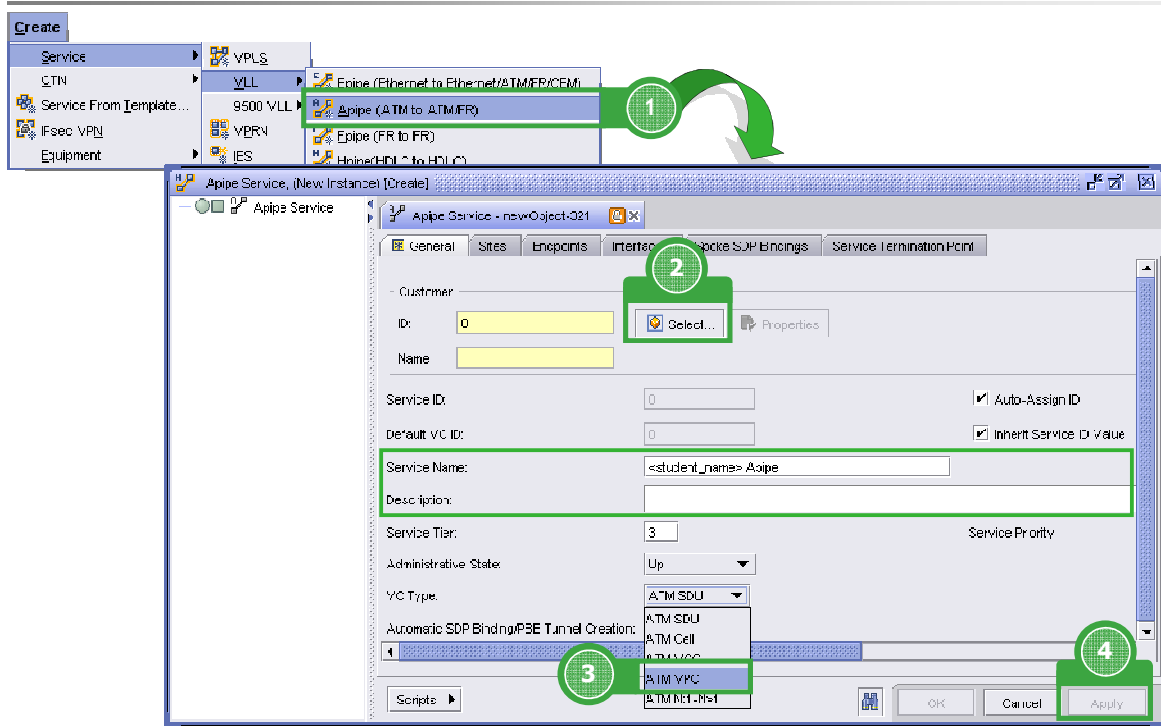
Determining status from within the tabular form is a matter of expanding the entries under each service site by clicking in the + sign next to each component. The status is set as the Admin and State parameters for the SAP and SDP. Color coding is also used; the legend is provided by clicking on the color bar icon at the top right of the service window.

To access the graphical representation, click on the Topology View button at the bottom of the window. The service topology opens in a new window and uses color coding to identify the operational state of each component. Again, the coding is identified under the Legend icon.

## 8 Apipe Point-and-Click Provisioning Method



## 8.1 Create Apipe Service in Topology View



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The following lines and the images above summarize the steps recommended to create an Apipe using the point-and-click provisioning method for this lab:

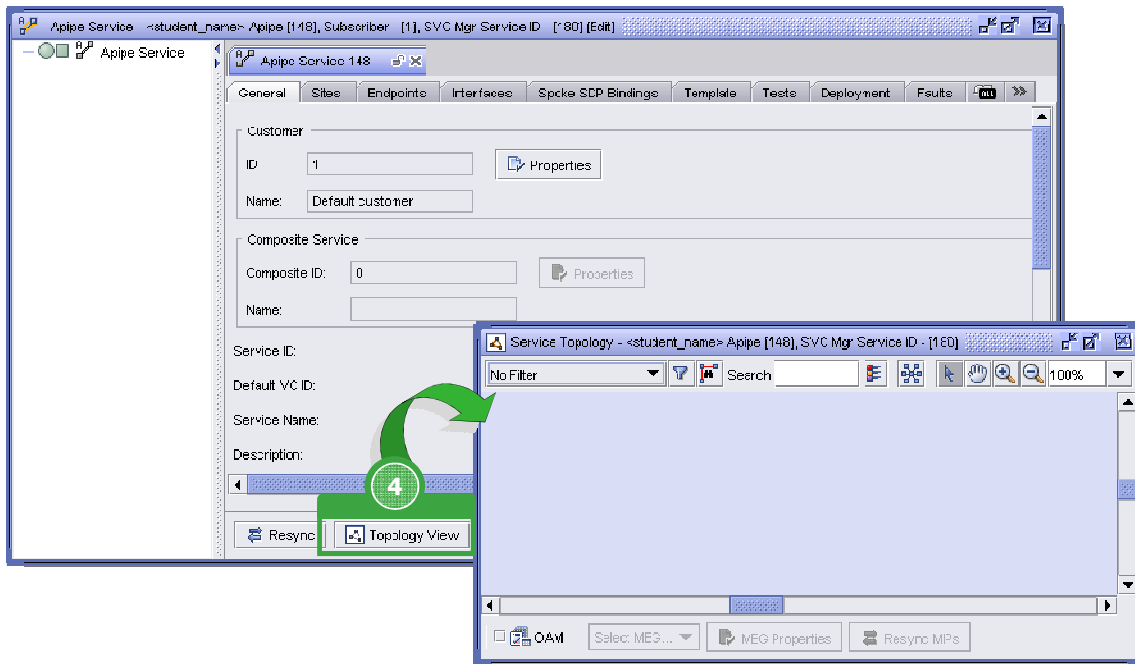
1. Choose **Create** → **Service** → **VLL** → **Apipe** from the main menu. The **Apipe Service [Create]** form opens with the **General** tab displayed
2. In the **Customer** panel, click the **Select** button to select the appropriate customer from the list and click on the OK button at the right side of the window. Though not mandatory to create the service, set the **Service Name** and **Description** as per corporate policy.
3. Set the **VC Type** from the dropdown menu as indicated by the down arrow. The definition for each of the parameters has been discussed earlier in the training session. For the purposes of this lab, select **ATM VPC**.
4. Click on the **Apply** button at the bottom of the window to save the changes. Note that the service sites appear in the Components tree at the left side of the configuration window.



### Note

*The point-and-click provisioning method demonstrates how to use the 5620 SAM topology map to create and Apipe service. You must configure the channel, sub channel, and channel group using the navigation tree and forms shown in the initial part of the Apipe lab.*

## 8.1 Create Apipe Service in Topology View [cont.]



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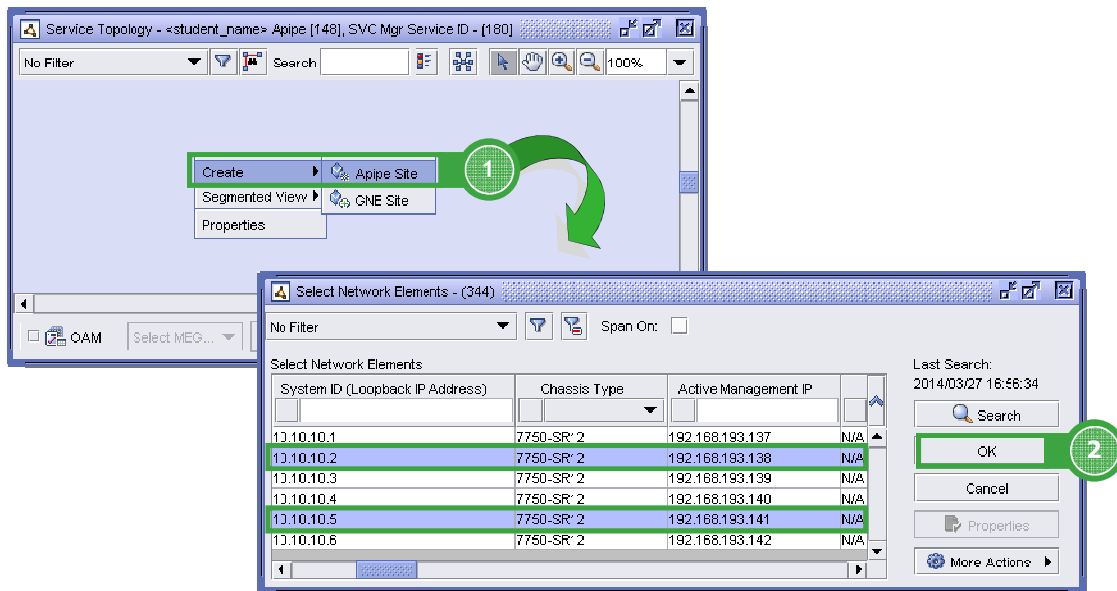
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4. On the **Apipe Service - Name [Create]** form, click on the **Topology View** button. The **Service Topology** map opens.

## 8.1 Create Apipe Service in Topology View

### 8.1.1 Create Service Sites



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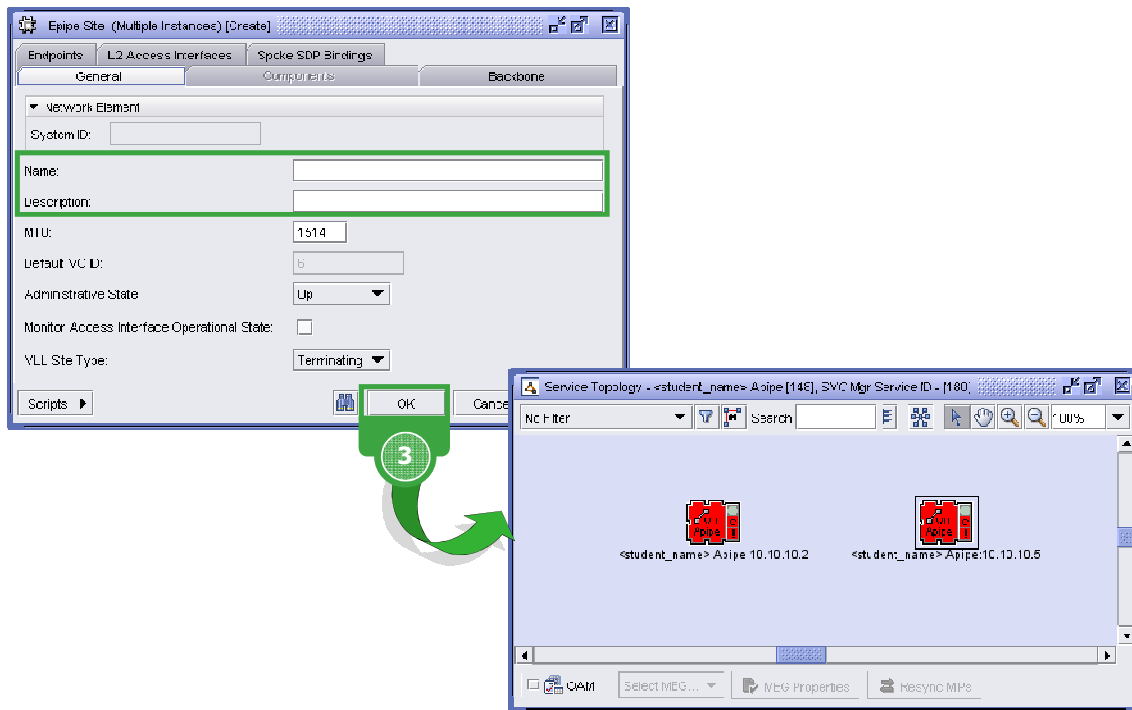
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The following lines and the images above summarize the steps recommended to create Apipe sites using the point-and-click provisioning method for this lab:

1. Click on an empty portion of the **Service Topology** map. Choose **Create**→**Apipe Site** from the contextual menu. The **Select Network Elements** form opens with a list of available sites.
2. Choose a site or multiple sites and click on the **OK** button. The **Site (Create)** form opens with the **General** tab displayed.

## 8.1.1 Create Service Sites [cont.]



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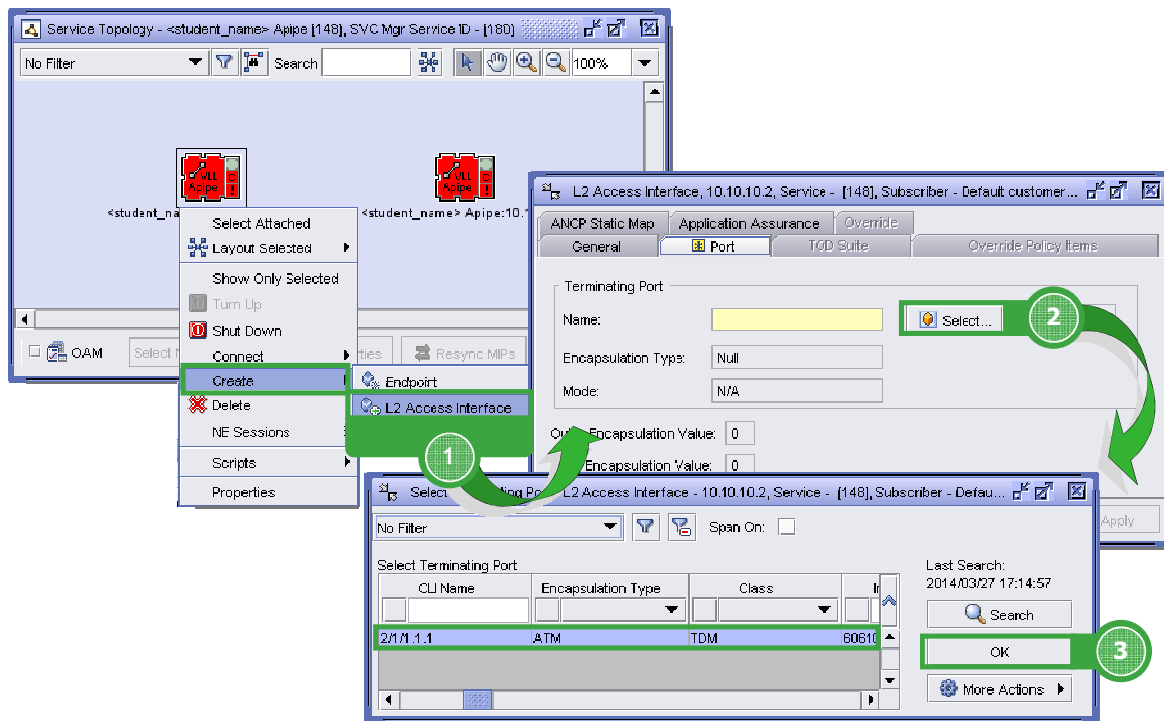
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- On the **Apipe Site (Create)** form assign a Name and Description. Click on the **OK** button. The **Apipe Site (Create)** form closes and the **Service Topology** map refreshes displaying the created Apipe sites.

## 8.1.2 Create Access Interface



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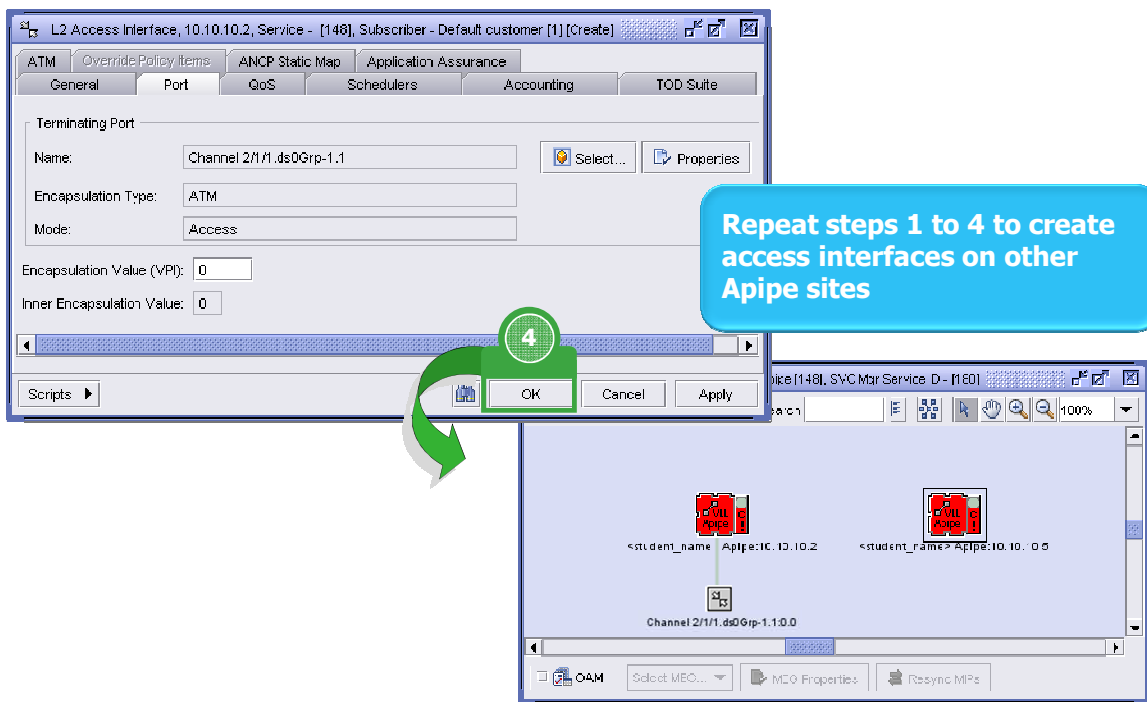
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The following lines and the images above summarize the steps recommended to create an access interface sites using the point-and-click provisioning method for this lab:

1. On **Service Topology** map, right-click on an Apipe site and choose **Create**→**L2 Access Interface** from the contextual menu. The **L2 Access Interface [Create]** form opens with the **General** tab displayed
2. Click on the **Port** tab button and click on the **Select** button in the **Terminating Port** panel. The **Select Terminating Port** form opens with a list of available access ports.
3. Choose a port from the list and click on the **OK** button. The **Select Terminating Port** form and the **L2 Access Interface [Create]** form refreshes with selected port name is displayed in the **Terminating Port** panel.

## 8.1.2 Create Access Interface [cont.]



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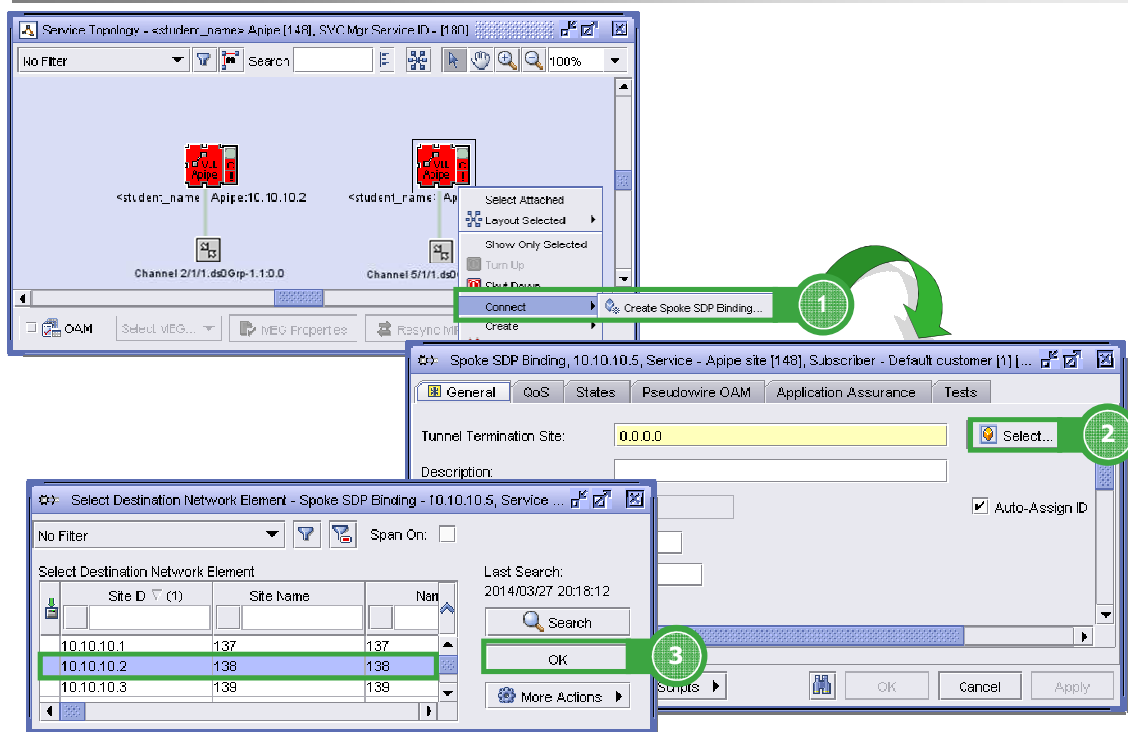
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4. Click on the **OK** button. The **L2 Access Interface [Create]** form closes and the **Service Topology** map refreshes displaying the created access interfaces.

Repeat these steps as required to create access interfaces on other Apipe sites.

## 8.1.3 Create Spoke SDP Bindings



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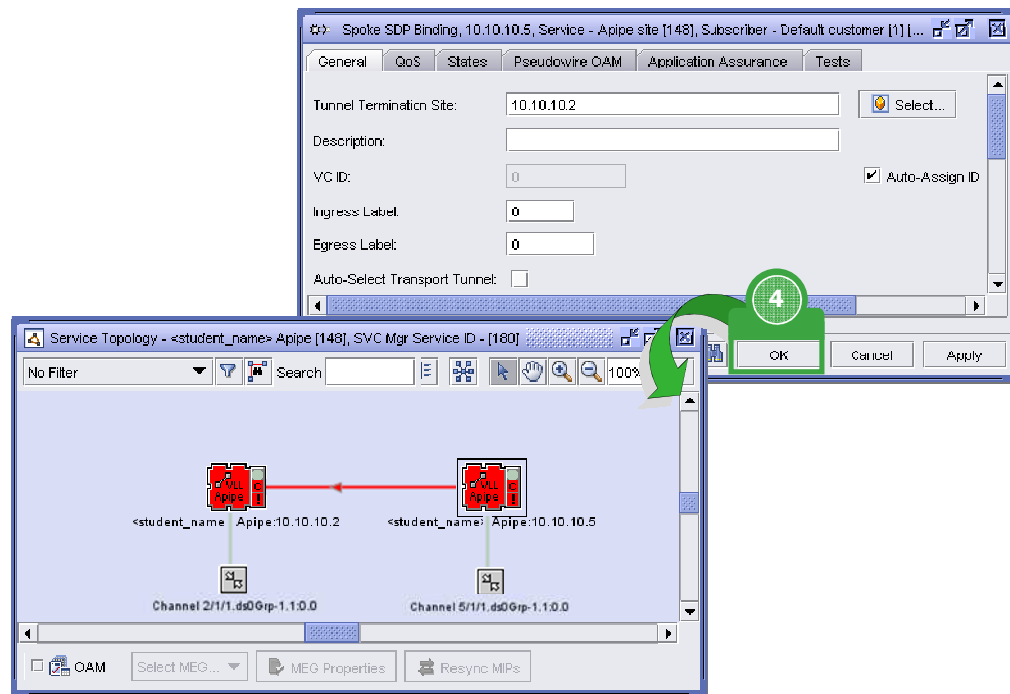
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The following lines and the images above summarize the steps recommended to create a Spoke SDP binding connection using the point-and-click provisioning method for this lab:

1. On **Service Topology** map, right-click on an Apipe site and choose **Connect**→**Create Spoke SDP Binding** from the contextual menu. The **Spoke SDP Binding [Create]** form opens with the **General** tab displayed
2. Click on the **Select** button to choose a **Tunnel Termination Site**. The **Select Destination Network Element** form opens with a list of available tunnel termination sites.
3. Choose a tunnel destination site from the list and click on the **OK** button. The **Select Destination Network Element** form and the **Spoke SDP Binding [Create]** form refreshes with the selected tunnel destination site is displayed.

## 8.1.3 Create Spoke SDP Bindings [cont.]



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4. Click on the **OK** button. The **Spoke SDP Binding [Create]** form closes and the **Service Topology** map refreshes displaying the created spoke SDP binding.



## 8.1.3 Create Spoke SDP Bindings [cont.]

The image shows two screenshots from the Alcatel-Lucent network management interface. The top screenshot is the 'Spoke SDP Binding' configuration window for the tunnel termination site 10.10.10.5. It includes fields for Description, VC ID, Ingress Label, Egress Label, and Auto-Assign ID. A blue callout box with white text says: 'Repeat steps 1 to 4 to create the Spoke SDP binding for the returning tunnel'. The bottom screenshot shows the 'Service Topology' view, displaying two VLL Apipe nodes connected by a bidirectional arrow. Below each node is a channel (Channel 2/1/1.ds06rp-1.1.0.0 and Channel 5/1/1.ds06rp-1.1.0.0).

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Repeat steps 1 to 4 to create on the other Apipe site the Spoke SDP binding for the returning tunnel.



End of module  
VLL Apipe

.....  
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## Section 3 Service Types

# Module 5 VLL Cpipe

TOS36042\_V3.0-EQ-English-Ed1 Module 3.5 Edition 1

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Services Operations and Provisioning  
TOS36042\_V3.0-EQ Edition 1

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2.0	2013-04-10	MCGRATH, John	TOS36042_V2.0 First edition – SAM 11.0 R1
2.1	2013-08-16	MCGRATH, John	TOS36042_V2.0 Second edition – SAM 11.0 R1 (update)
3.0	2014-04-03	MCGRATH, John	TOS36042_V3.0 First edition – SAM 12.0 R1



Upon completion of this module, you will be able to:

- Describe the process to create a Cpipe service
- Create a Cpipe service through the Topology View
- Quickly determine the service status and that of its associated components

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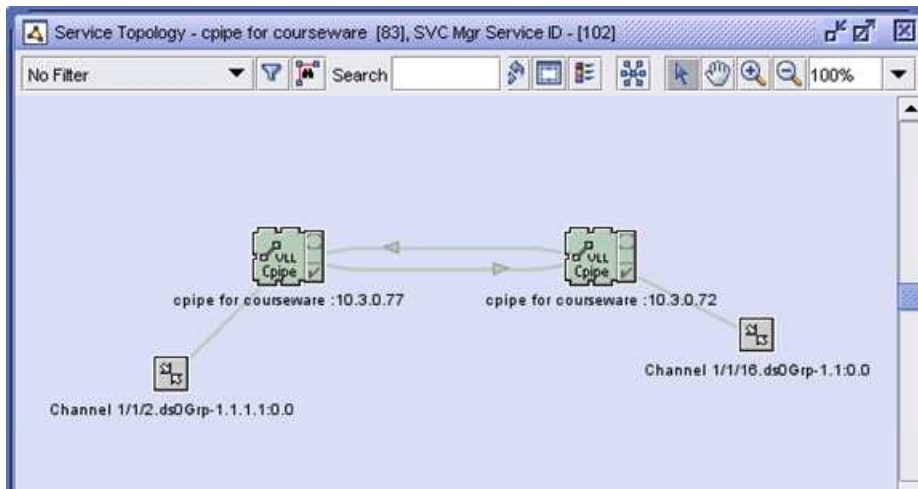
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# 1 VLL Cpipe Configuration

## 1.1 Lab overview



**This lab demonstrates how to configure the core components of a VLL Cpipe service using the form-based configuration method and the point-and-click provisioning method.**

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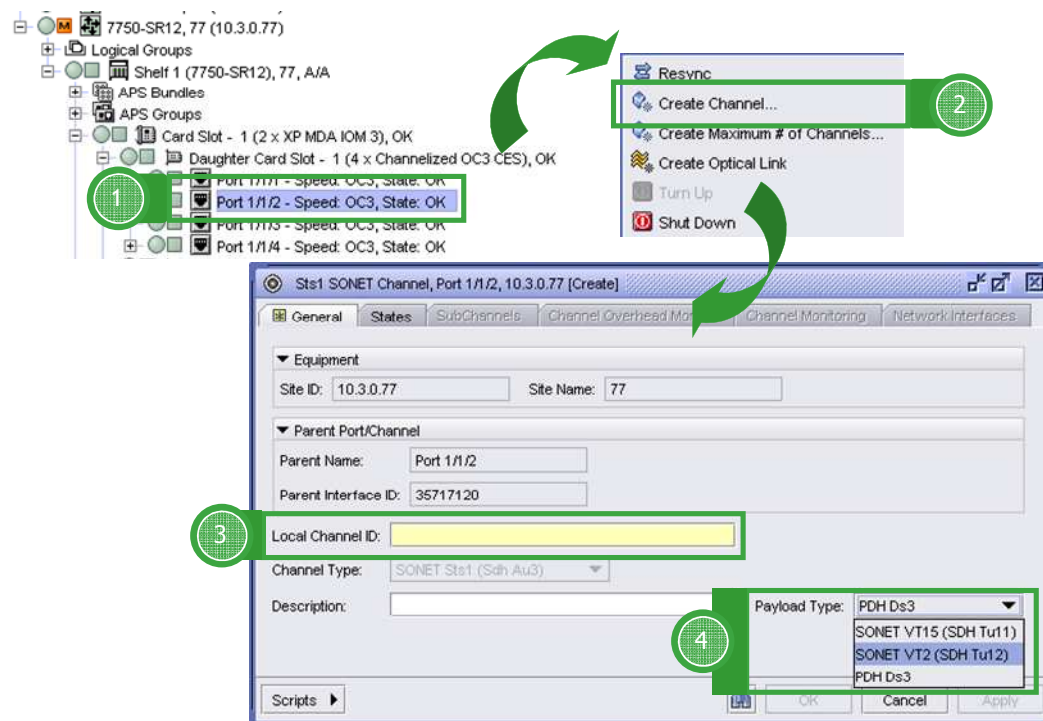
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## 2 Configure Port for Access Interface

## 2.1 Configure Channel Group to Support Access Interface



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A Cpipe is a service that provides connectivity between two PE devices that are interfacing with TDM Interfaces, the data for which is to be carried through the IP/ MPLS core. To support this, the SR-OS nodes must be populated with an MDA that supports Circuit Emulation Services (CES), the example to be illustrated in the following procedure being the OC3/ STS1 CES card supported in the SR-12 chassis.

A Channel Group must be created on a CES port to be able to support an Access Interface. To create a Channel Group on an OC3/ STS1 CES port:

- Navigate to the designated port under the **Equipment** view of the Navigation Tree;
- Select the port and right click to view the contextual menu for the port;
- Select **Create Channel** from the menu. Note that the **Channel Port [Create]** window opens.
- Set the **Local Channel ID** (mandatory) for the Channel group. This ID maps to the DS3 or VT structure of the interface;
- Define the **Payload Type (SONET or PDH)** from the drop down menu, as required. Click on the **Apply** button to save the changes and keep the window open.

## 2.1 Configure Channel Group to Support Access Interface [cont.]



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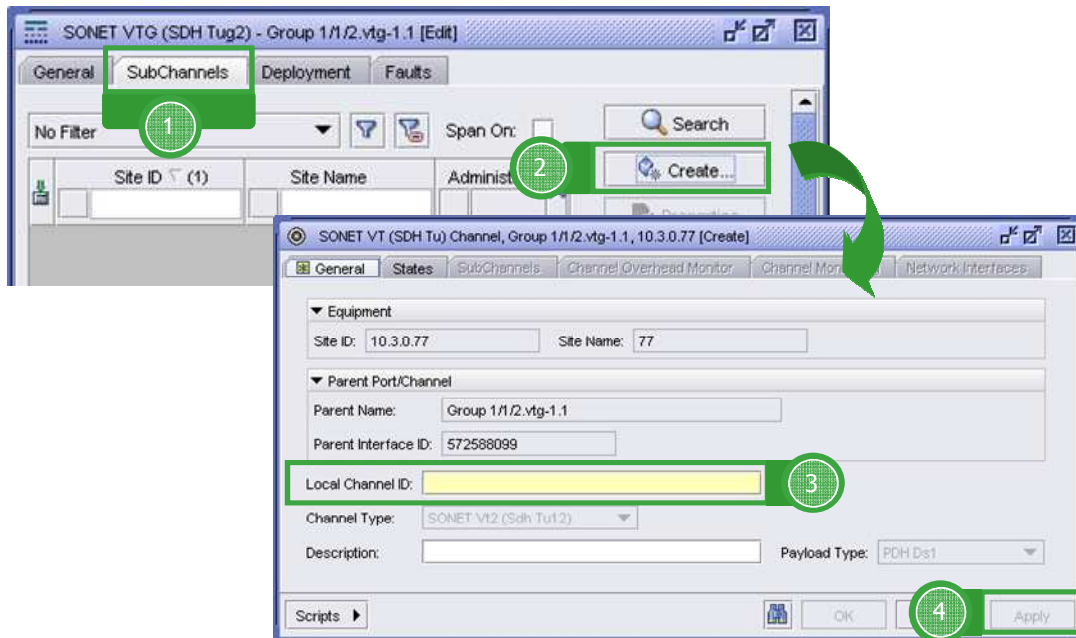
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Note that a Default name has been generated by the node as well as the Interface ID, which maps to the Index number calculated by the node and stored in the .ndx file on the node file system.

- Enable the Local Channel by clicking on the **Turn-Up** button at the bottom of the configuration window.
- Open the **SubChannels** tab to define the characteristics of the DS3/ VT channels to be supported with the Channel;
- From the list, select a DS3/ VT and click on the **Properties** button at the right side of the window.

## 2.1 Configure Channel Group to Support Access Interface [cont.]



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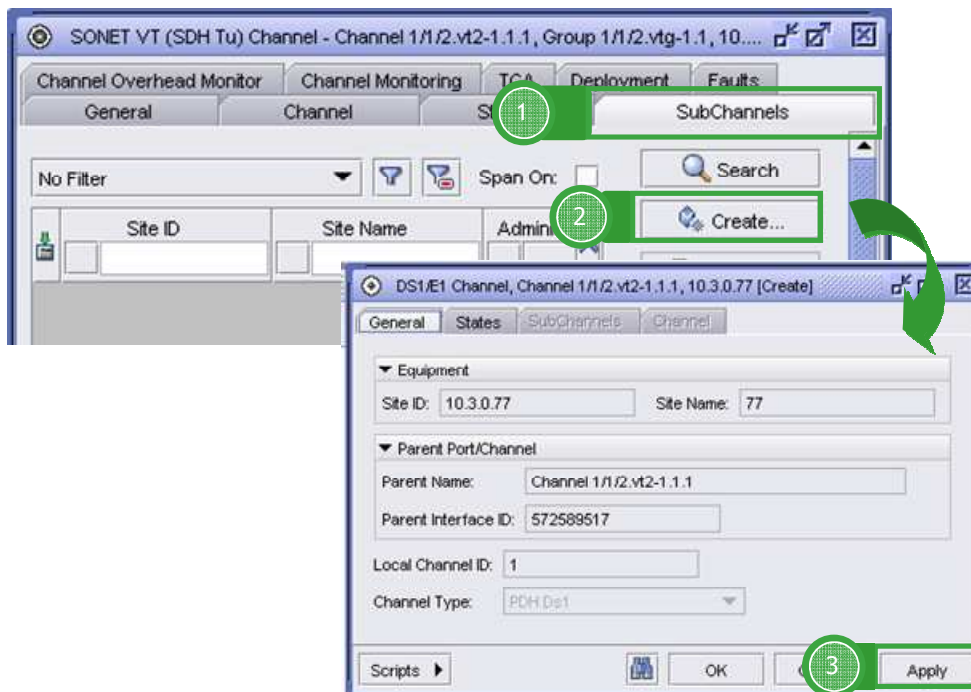
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The SONET Group [Edit] window opens with the General tab open. Review the information to confirm its accuracy.

- Open the **SubChannels** tab;
- Click on the **Create** button at the right side of the window. A new **[Create]** window appears;
- Specify the **Local Channel ID** based upon the PDN or SONET structure;
- Click **Apply** to save the changes to the database and update the configuration window.

## 2.1 Configure Channel Group to Support Access Interface [cont.]



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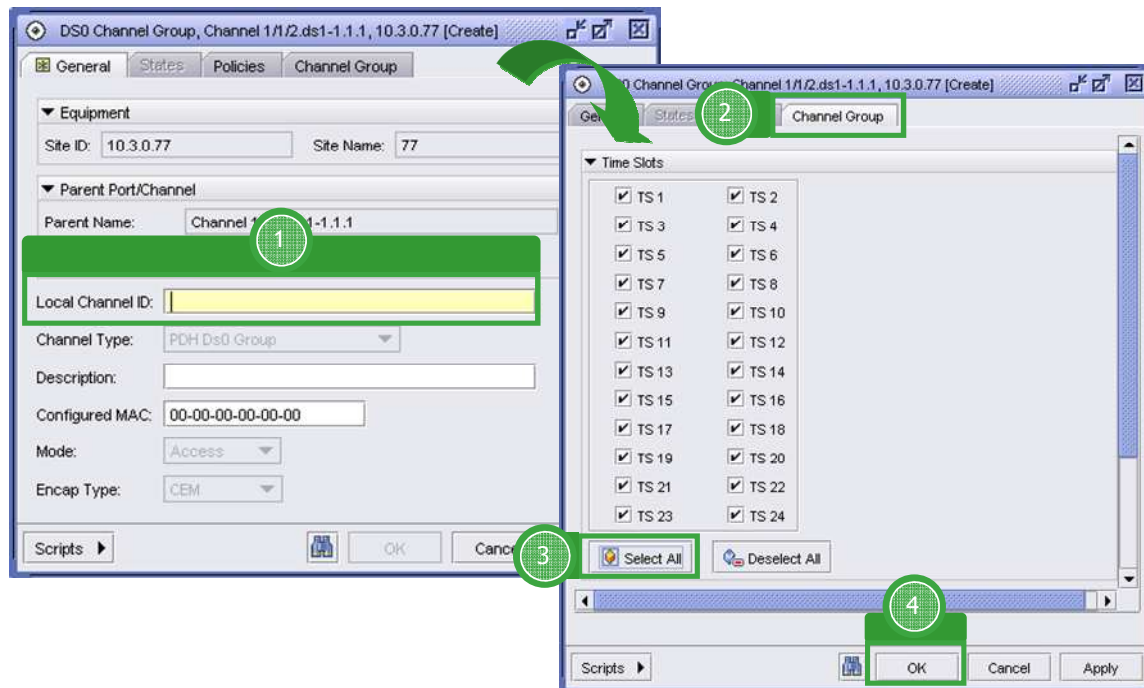
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Create a subChannel for the next level down the SONET/ PDH hierarchy towards accessing the DSO structure as follows:

- Open the **SubChannel** tab that has appeared after the configuration window was updated;
- Click on the **Create** button at the right side of the window;
- Click the **Apply** button at the bottom of the window to create the Channel Group and be able to access the DSO structure of the TDM interface.

## 2.1 Configure Channel Group to Support Access Interface [cont.]



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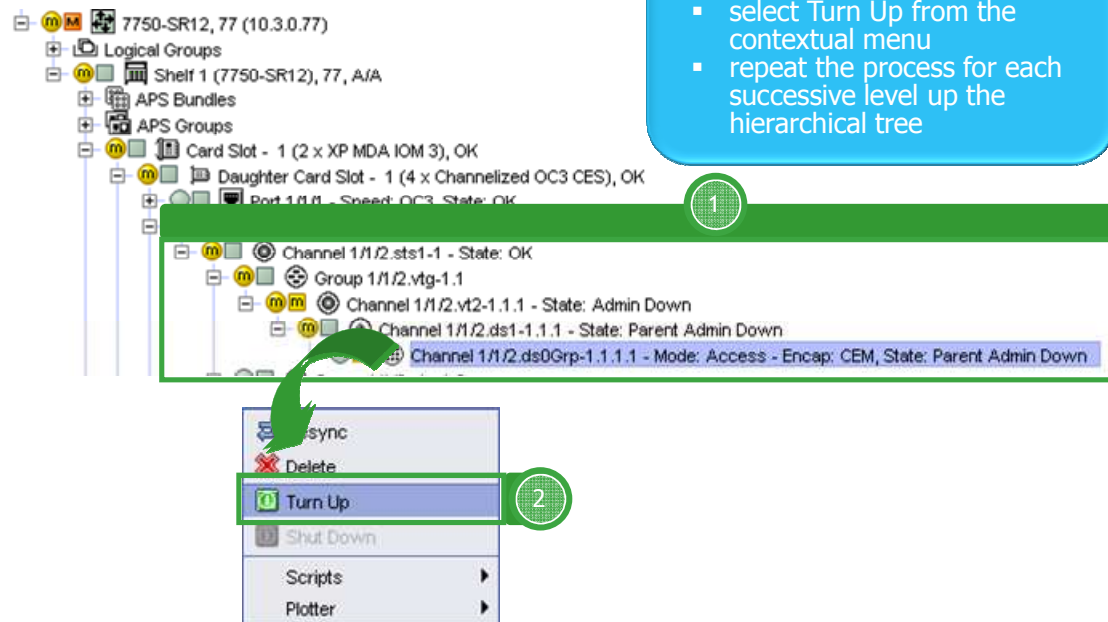
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The Channel group is now at the stage where the operator will assign the DSOs to the Channel Group. To do so:

- Set the Local Channel ID (mandatory);
- Open the Channel Group tab. Note that all available DSOs are listed unchecked.
- Assign the appropriate DSOs (TS) to the channel group. In the example above, clicking on Select All adds all DSOs into the CG.
- Click on the OK button to save the changes and close the configuration window.



## 2.2 Enable the Channel Group



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Unlike Ethernet ports, TDM Channels are set as Administrative Down as a default action. It is therefore a best practice to ensure that all levels of the newly created Channel Group are administratively enabled to be able to properly support an interface for customer data to gain access to the IP/ MPLS routed core network.

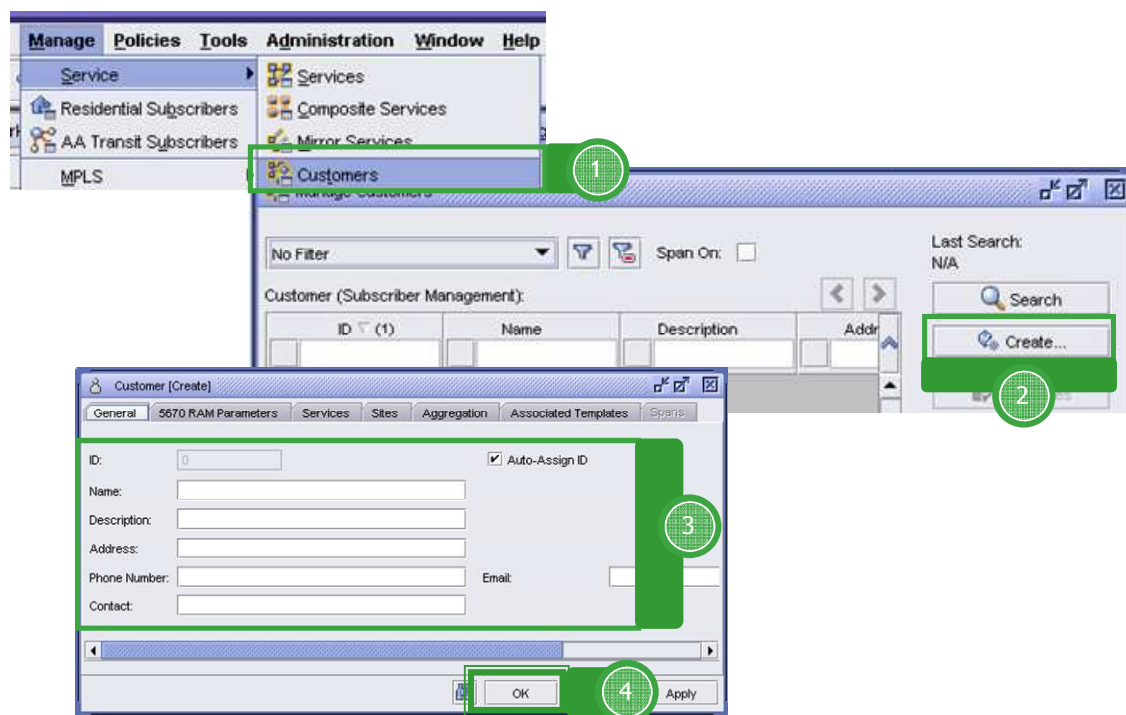
The following is only one method to verify the administrative status of a channel group:

- Navigate to the Channel Group for within the Equipment view of the Navigation Tree;
- Select the Channel group and right click;
- Select Turn-UP from the drop-down menu and verify the Admin State. Repeat this process for each level up the hierarchical tree until all levels have been Enabled.
- Verify the status of the Channel group to ensure that its status changes to OK and the object color is grey/ green.

Ensure that the Channel Group on the other PE device is also appropriately configured.

## 3 Create a Customer

## 3.1 Create a Service Customer



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Services must be associated with a customer. Though a service may only have one customer, that customer may have more than one associated to them.

To create a Customer using the 5620 SAM, the network administrator or operator will use the following sequence:

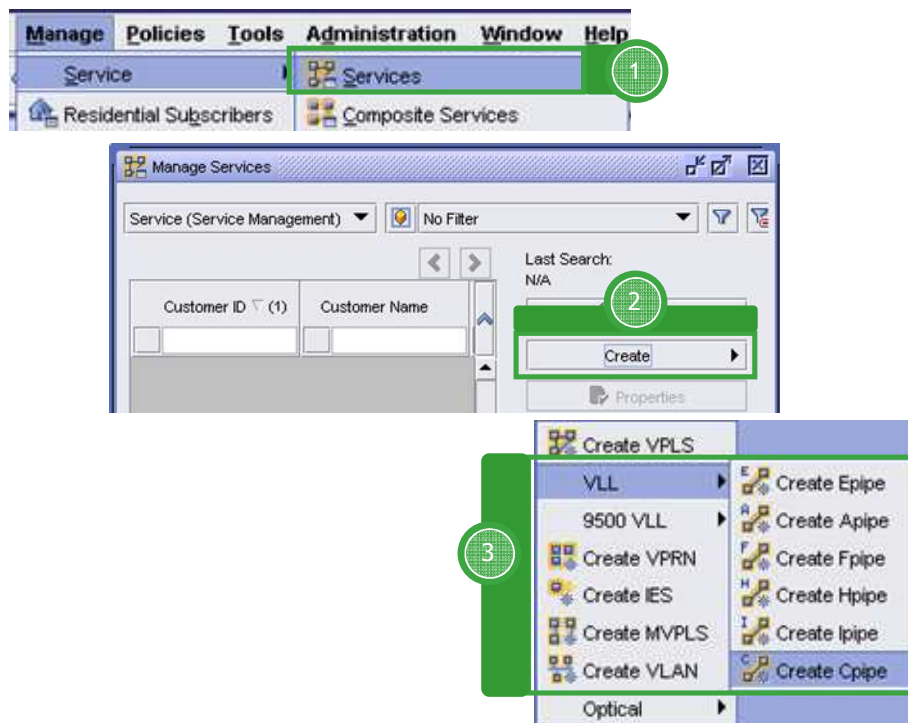
- From the Main Menu, select **Manage > Service > Customer**;
- In the new window, click on the **Create** button;
- Complete the customer's details as provided in the configuration window. Note that the Auto-Assign ID box is checked to permit the 5620 SAM to ensure that the customer ID is unique within the network. However, should corporate policy require an ID to be manually assigned, simply uncheck the box and enter the ID value (mandatory);
- Click on the **OK** button.

To verify that the customer was created, or edit any detail:

- Select **Manage > Service > Customers** from the Main Menu;
- Click on the **Search** button;
- Double-click on the appropriate entry or, select the appropriate customer and click on the **Edit** button;
- Review or modify the details, as required.

## 4 Create a Cpipe Service

## 4.1 Create a Cpipe Service



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With the PE ports set to support Access interfaces and the service Customer created, the operator is now ready to create the Cpipe service to leverage these components.

The procedure to create a Cpipe service through the 5620 SAM is illustrated above using the following steps:

- Select **Manage > Service > Services** from the main menu;
- In the **Manage Services** window, click on the **Create** button;
- From the sub-menu, select **VLL > Create Cpipe**

## 4.2 Assign the Customer and Service ID

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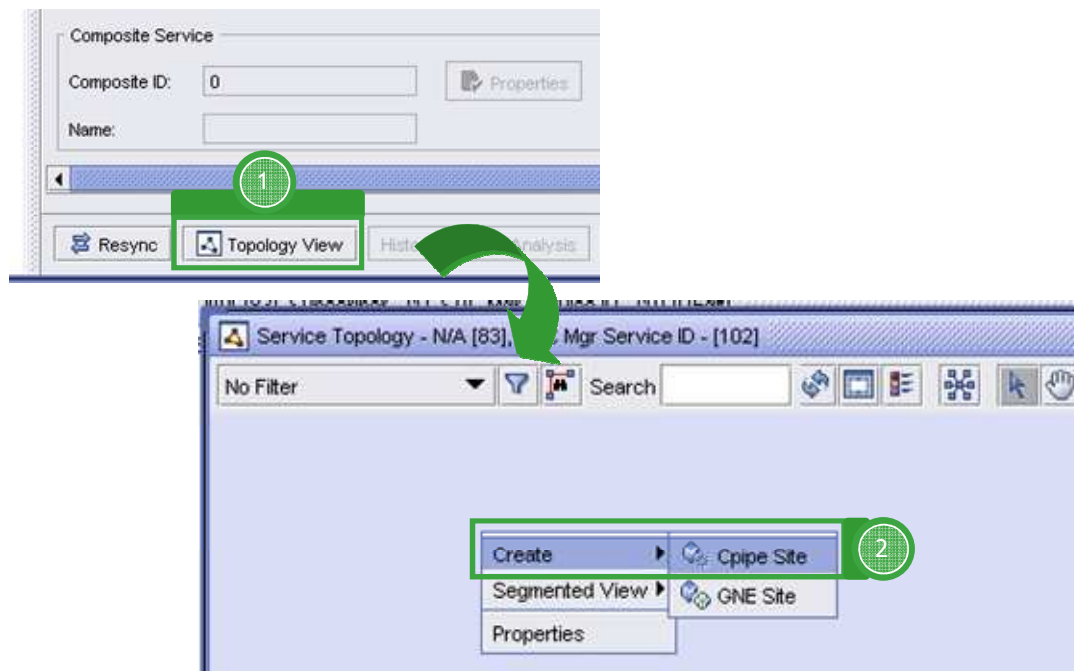
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The **Cpipe Service [Create]** window opens under the **General** tab.

- Assign the appropriate customer to the service by clicking on the **Select** button (step 1 above). Choose the customer from the list and click **OK** at the right side of the window.
- Specify the **Service ID** and **Default VC ID**. Note that the **Auto-Assign ID** and **Inherit Service ID Value** options are checked. (Inherit Service ID value is recommended best practice.) This is to support the network-wide unique service ID constraint for the 5620 SAM and mapping the VC label to the Service ID for easier identification within the IP/ MPLS Core, as previously discussed. Uncheck the box to manually assign IDs based upon the corporate policy;
- Click on the drop down menu to set the **VC Type** to **CESoPSN (Circuit Emulation Service over Public Switched Network)**;
- Click on the **Apply** button to save the changes to the database and update the configuration window.

## 5 Add the Service Components

## 5.1 Add Service Components using the Topology View



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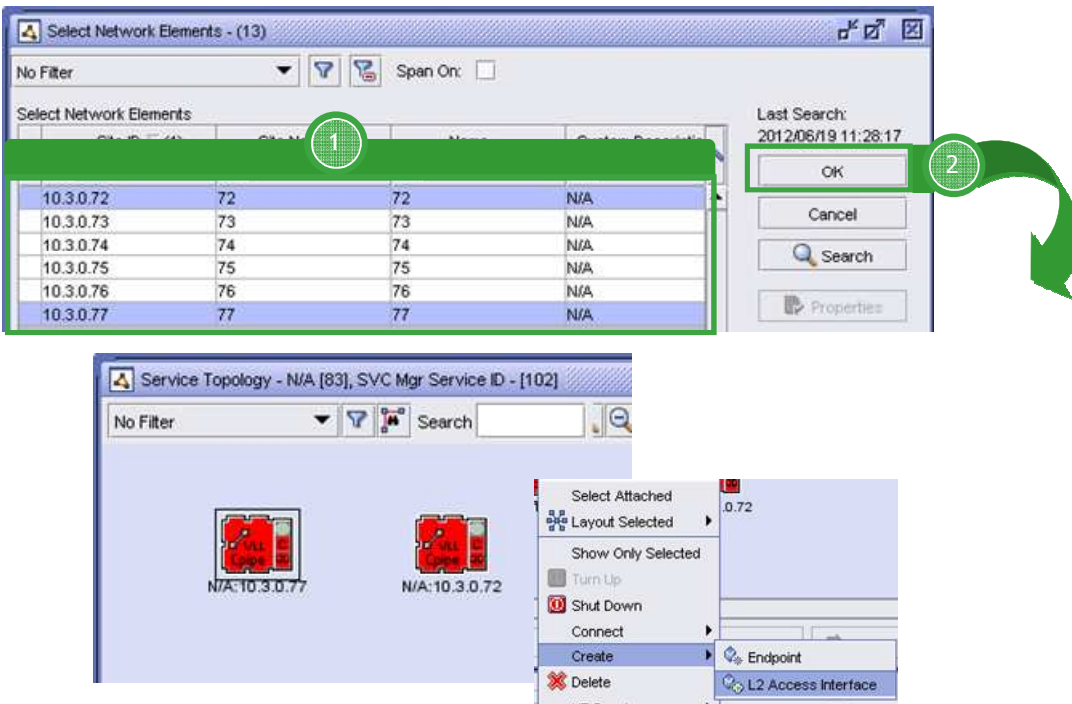
As previously discussed, the SR-OS Service Model consists of various components starting with Service Sites that are the PE devices for customer data.

There are several ways to add service components; one of which is using the Service Topology View. To use this method:

- Click on the **Topology View** button at the bottom of the Service configuration window;
- From within the Topology View map window, right click and select **Create > Cpipe Site** from the contextual menu.



## 5.1 Add Service Components using the Topology View [cont.]



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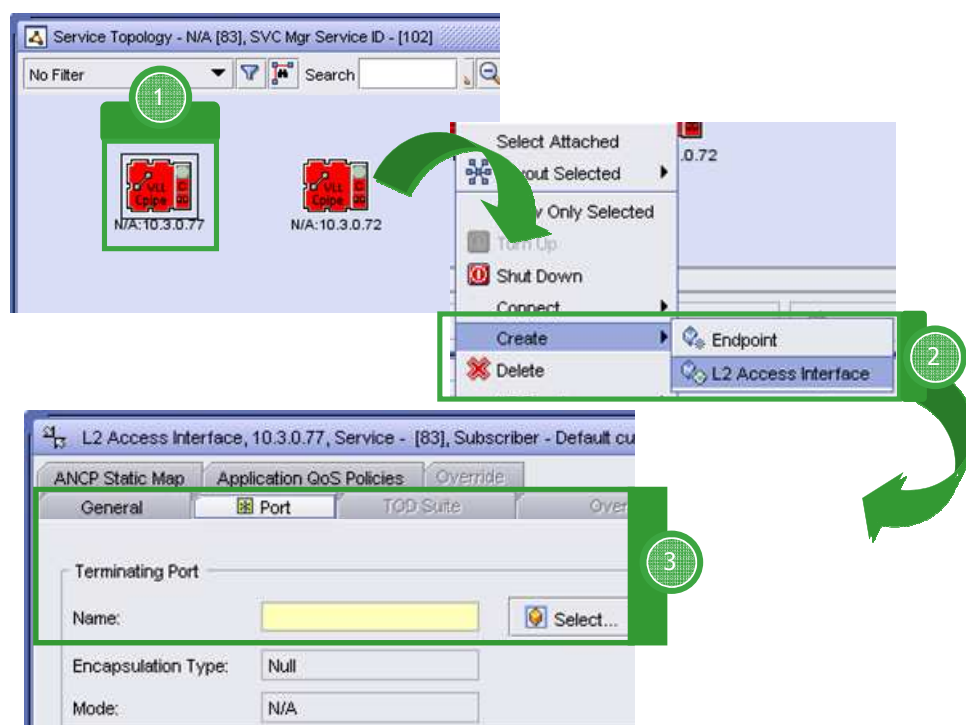
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A list of available nodes appears in the Select Network Elements window.

- Select the PE devices for the service and click **OK** at the right side of the window. Sites can be added individually or multiples at a time by using **Ctrl + Click** keys on the keyboard.
- The window closes and returns the operator to the **Topology View** window. Note that the Service Sites (10.3.0.72 and 10.3.0.77, in this example) appear in the window.

## 5.1 Add Service Components using the Topology View [cont.]



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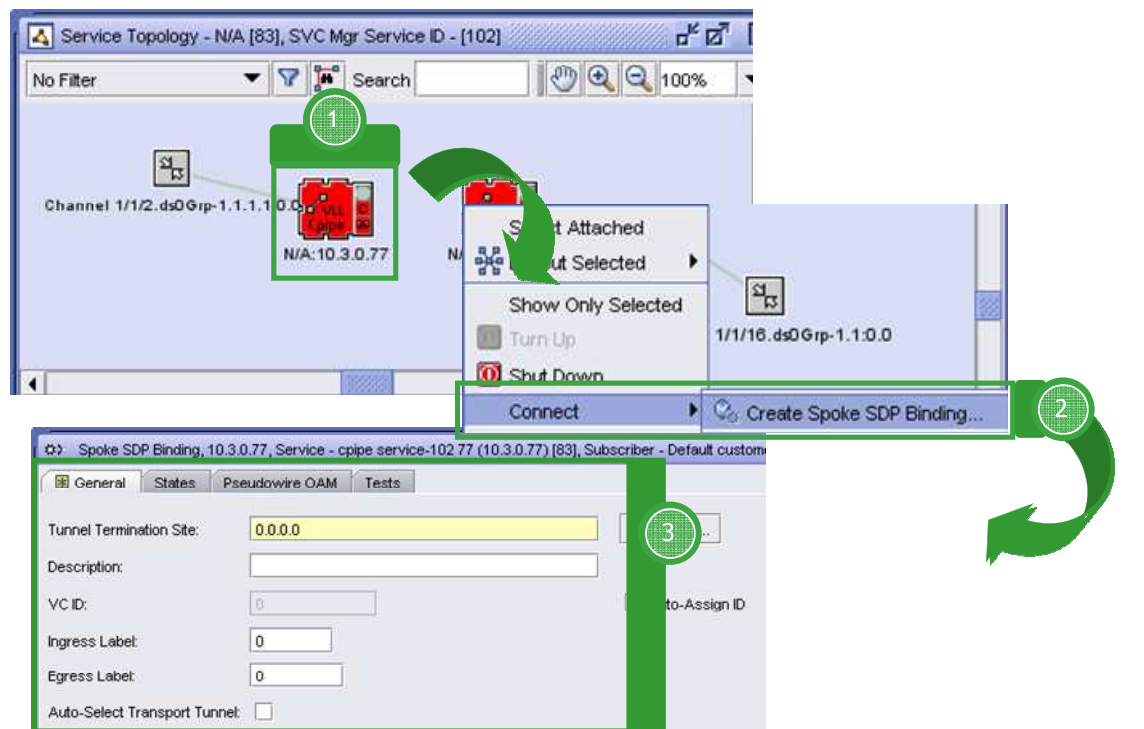
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The next component to be added is the L2 Access Interface (SAP) to each of the Service Site nodes.

Select one of the service sites from within the Topology View and right click to access the contextual menu:

- Select **Create > L2 Access Interface** from the menu. The **L2 Access Interface [Edit]** window opens:
- Set the **General** parameters, as required and open the **Port** tab. Note the icon next to the tab title. This icon indicates there is a mandatory configureable parameter under that heading:
- Click on the **Select** button to assign the **Terminating Port**. This is the Channel Group that has been previously configured for this purpose. From the list that appears, select the appropriate Channel Group and click on the **OK** button at the right side of the window. Note that the port information is automatically populated under the **Port** tab.
- Click on the **OK** button at the bottom of the window. Note that the L2 Access Interface appears in the Topology View.
- Using the procedure discussed above, add the L2 Access Interface to the other service site.

## 5.2 Add SDP Bindings using the Topology View



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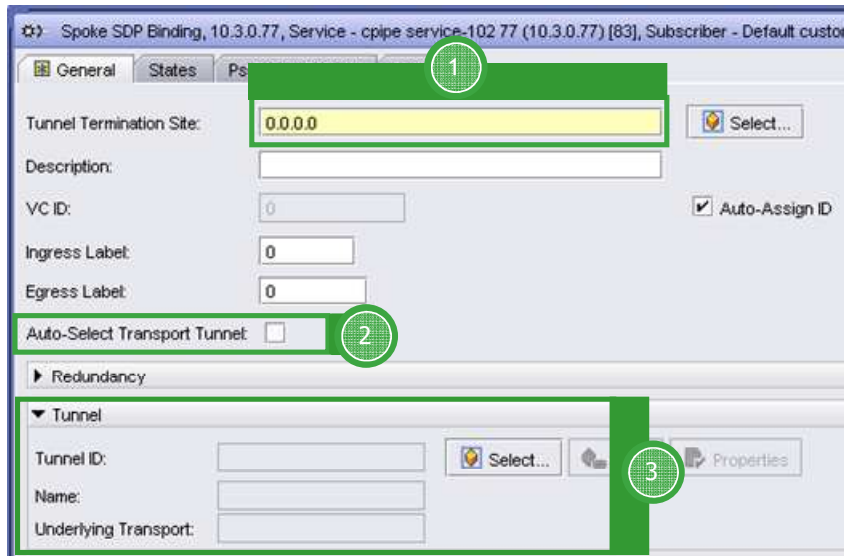
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Since the service involves moving customer data between two (2) PE devices, the service will require the use of service tunnels which are associated with Service Distribution Paths. To accomplish this, SDP Bindings will be required.

To establish the SDP Binding:

- Select a service site from within the Topology View:
- Right click and select **Connect > Create Spoke SDP Binding** from contextual menu. The **Spoke SDP Binding [Edit]** window appears:
- Set the parameters as defined on the next page.

## 5.2 Add SDP Bindings using the Topology View [cont.]



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To connect SDP Bindings within a service:

- Specify the **Tunnel Termination Site**, which would be the opposite PE device. The IP address is usually set as the system interface address that can either be defined manually or automatically by clicking on the **Select** button and choosing the appropriate entry from the list that is presented:
- Specify which Tunnel is to be used to connect to the destination PE. This can be accomplished automatically by the 5620 SAM or manually defined by the operator.

**Automatic** - where the decision is to enable the 5620 SAM to determine which Tunnel (SDP) is to be used to connect to the remote PE:

- Check the **Auto-Select Transport Tunnel** box. Once this been completed, a **drop down menu** will appear under which the operator can specify the transport protocol to which the binding must be made.

**Manual** - where the decision is for the operator to manually assign the manually:

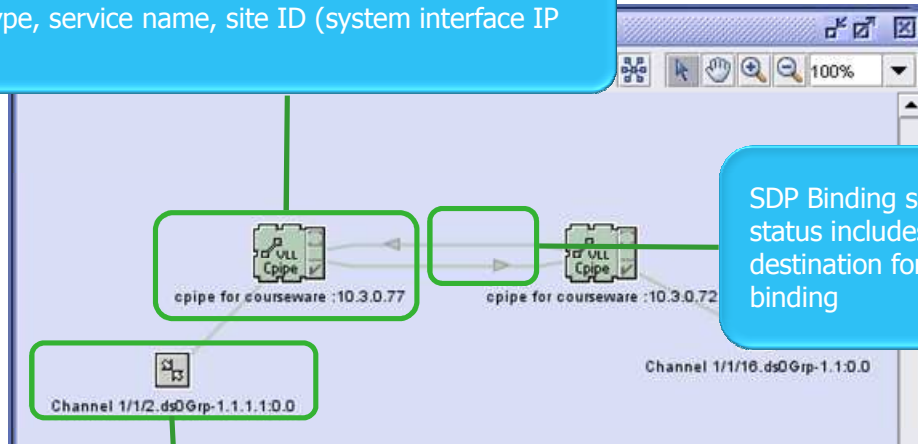
- Click on the **Select** button within the **Tunnel** heading of the window. A list of available service tunnels to the destination PE will appear:
- Select the appropriate tunnel and click **OK** at the right side of the window. The Tunnel information will automatically be populated in the configuration window;
- Click on the **OK** button at the bottom of the configuration window to save the change and return to the Topology View.

Connect the return SDP binding using the procedure described above.

## 6 Verify Service Configuration and Status

## 6.1 Topology

Service Site summary and status includes: service type, service name, site ID (system interface IP)



SDP Binding summary and status includes source and destination for each binding

L2 Access Interface (SAP) summary and status includes SAP ID (channel ID and encap (VLAN) ID)

Service, binding, and SAP status defined by color:  
grey/ green = online and operational

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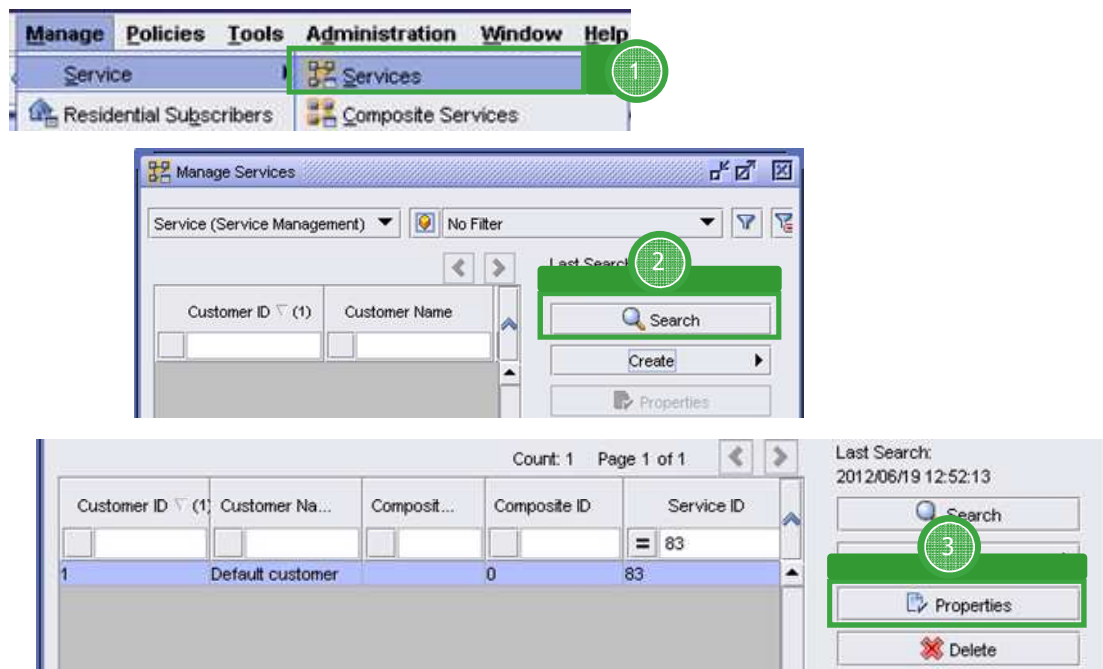
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A summary of service component configuration and status can be quickly obtained through the service Topology View.

As defined above, the service type, as well as: service name, ID, site name; SAP (L2 Access Information); and SDP Bindings are readily displayed.

Additionally, the status is quickly determined by the color coding defined by the Alarm Management functions of the 5620 SAM. The grey/ green illustrated above indicates that the service components are online and operational.

## 6.2 Properties



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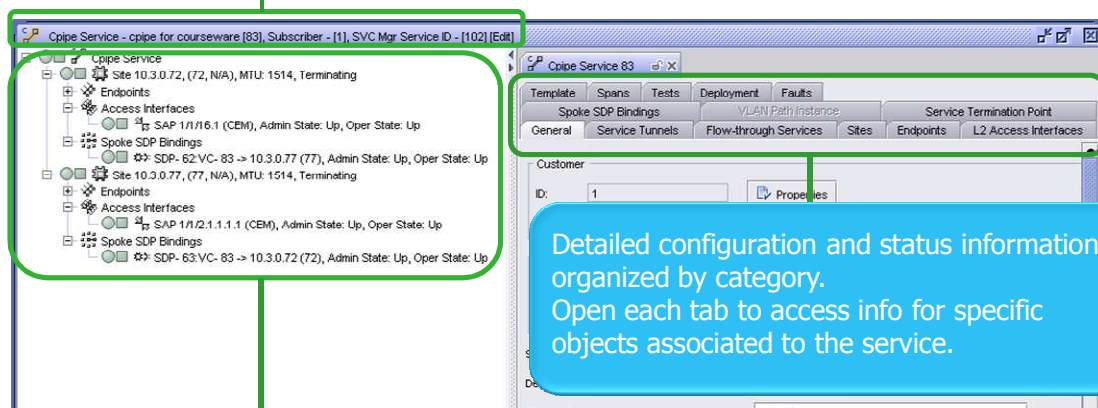
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Alternatively, service configuration information and status (the equivalent of the configure > service and show service commands of CLI) can be obtained from within the Properties window of the service.

To view this information:

- Navigate to **Manage > Service > Services** from the Main Menu:
- Click on the **Search** button to list all configured services. Remember, using the quick filter or advanced filter features of the 5620 SAM can help the operator to more quickly locate the service under review:
- Select the appropriate entry from the list and click on the **Properties** button.

Service information, including: service type, service ID and customer ID



Service Components summary and status in tabular format, including the site IDs; Access Interface admin and operational status, and spoke SDP Binding admin and operational status

Status also color coded: grey/green = online and operational

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The Service Properties window opens with a Navigation Tree representation of the service components on the left side and configuration information pertaining to the selected object, organized under Tab headings on the right.

The Navigation Tree provides a tabular (list) format of the service components and their hierarchical relationship to other components as well as a configuration and status summary.

Detailed information can be obtained under the appropriate Tab headings on the right side of the window. This information will change depending upon which component is selected in the Navigation Tree.

In this example, the Service itself is selected therefore the headings are displayed accordingly. If the operator selects the entry **Site 72** in the list, the tab headings will change to reflect only the information associated to Site 72.

Review the information, as required, to establish the status of the service and its components.



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End of module  
VLL Cpipe

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## Section 3 Service Types

# Module 6

# IES

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5620 SAM  
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2.1	2013-08-16	MCGRATH, John	TOS36042_V2.0 Second edition – SAM 11.0 R1 (update)
3.0	2014-04-03	MCGRATH, John	TOS36042_V3.0 First edition – SAM 12.0 R1



Upon completion of this module, you should be able to:

- Create an IES service
- Add the IES access interface to the routing protocol

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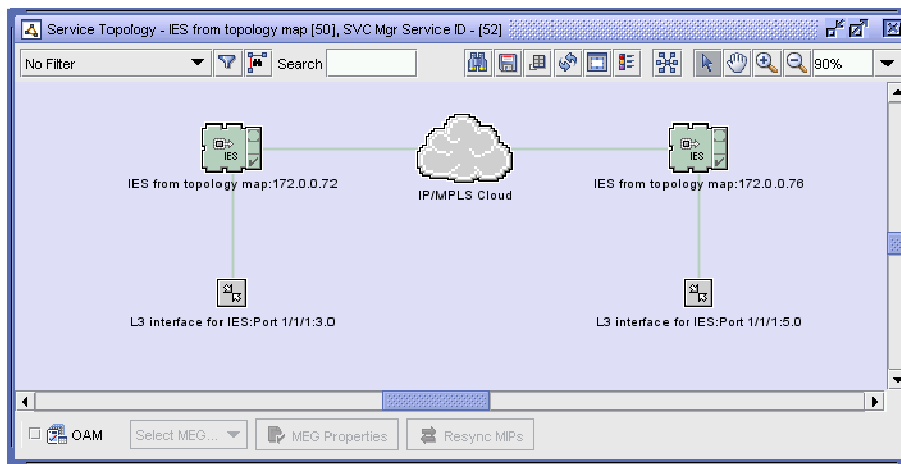
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# 1 IES Provisioning

# 1.1 Lab overview



**This lab demonstrates how to configure the core components of a IES using the form-based configuration method and the point-and-click provisioning method.**

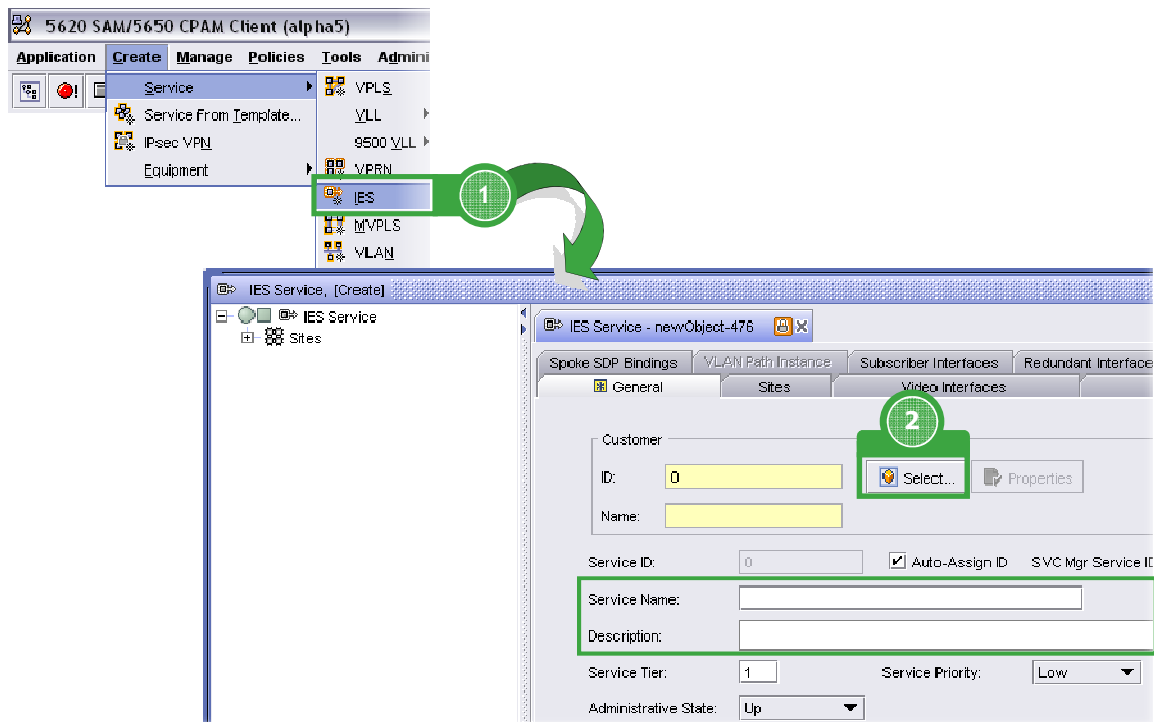
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## 1.2 Create IES Service



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The following lab exercises will guide you through the steps necessary to configure an Internet Enhanced Service (IES) in the lab's managed network.

1. Create an IES Service
2. Assign a Port to SAP
3. Apply routing protocol or protocols



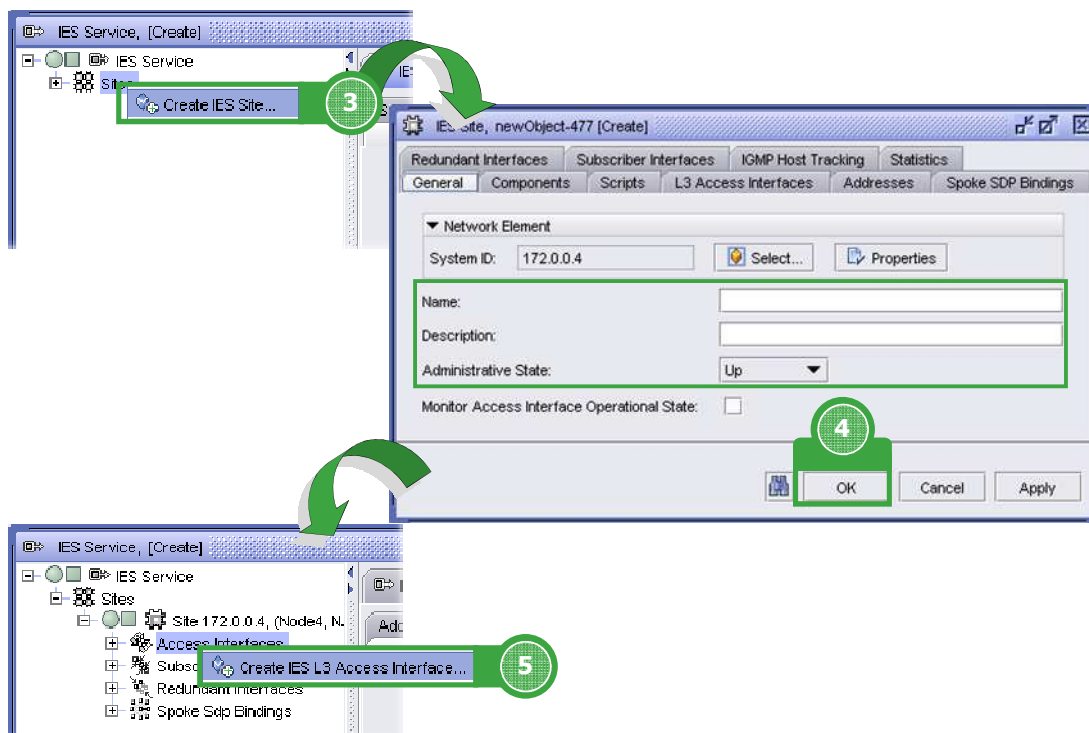
### Technical Reference

*For more details on the procedure to create an IES service see the Alcatel-Lucent 5620 SAM User Guide.*

The following lines summarize the steps recommended to create a IES service for this lab:

1. Choose **Create** → **Service** → **IES** from the main menu. The **IES Service [Create]** form opens with the **General** tab displayed
2. From the **General** tab, click the **Select** button to add the **Customer** and specify a **Service Name** and **Description**.

## 1.2 Create IES Service [cont.]



3 • 6 • 10

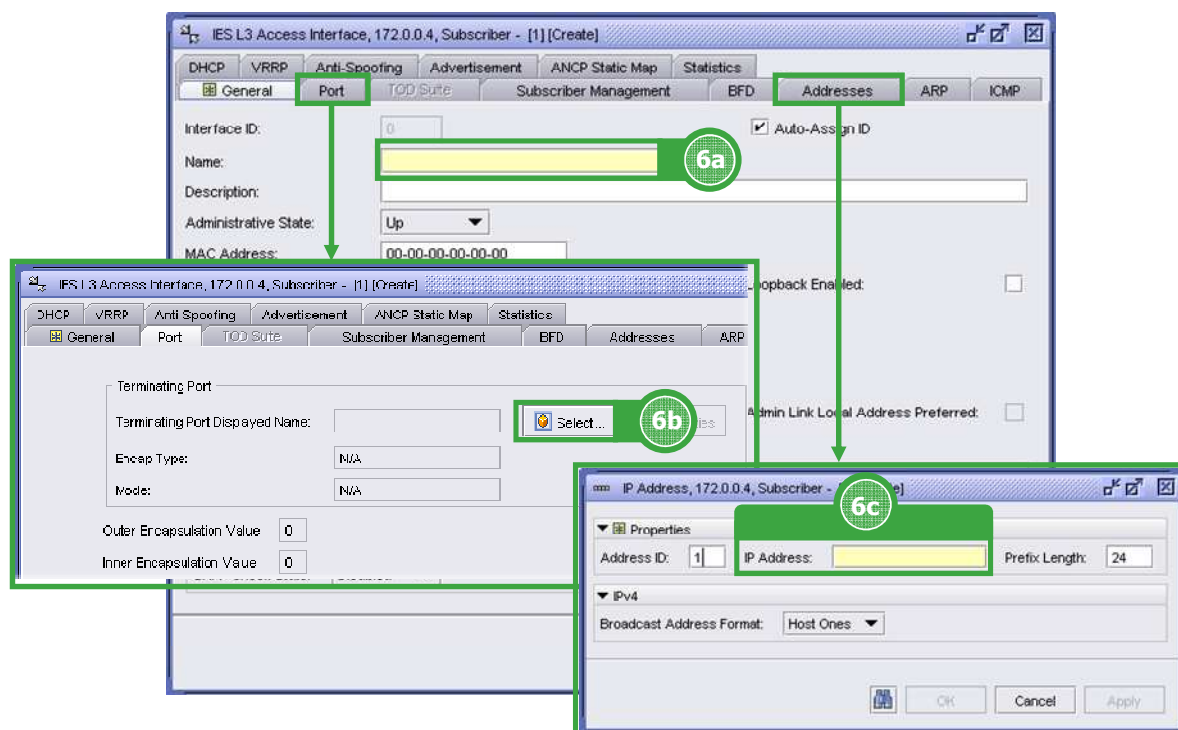
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3. From the **Components** tree on the **IES Service [Create]** form, right-click on **IES Service** and choose **Create Site**. The **Select Network Elements - IES Service** form opens with a list of available sites. Select a site and click on the **OK** button.
4. The **IES Site (Create)** form opens with general information about the site displayed in the **Network Element** panel. Optionally configure the parameters **Name**, **Description** and **Administrative State**. Click on the **OK** button.
5. From the **Components** tree on the **IES Service [Create]** form, click on the site to which you want to add the access interface; click on the plus sign to expand the entries for that site. Right-click on **Access Interfaces** select **Create IES L3 Access Interface**. The **IES L3 Access Interface (Create)** form opens with the **General** tab displayed.

# 1.3 Create Access Interface



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6. On the IES L3 Access Interface (Create) form, configure the following:
  - a. From the **General** tab specify an interface **Name**.
  - b. From the **Port** tab specify the terminating port. Click on the **Select** button to choose a port for the L3 access interface. The **Select Terminating Port - IES L3 Access Interface** form opens.
  - c. From the **Addresses** tab assign an IP address to the interface by clicking on the **Create** button. The **IP Address (Create)** form opens. Enter an IP Address and click on the **OK** button. The **IP Address (Create)** form closes and the Addresses tab list refreshes displaying the assigned IP address.

## 1.3.1 Routing Protocol



3 · 6 · 12

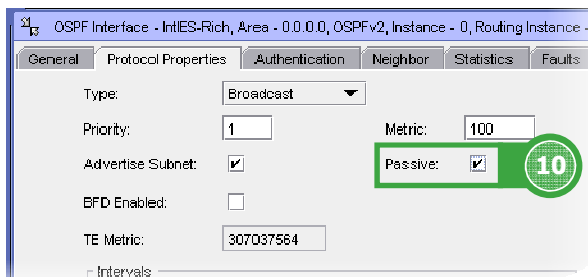
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7. Add the IES Access Interface to the routing protocol.  
The example above shows the steps to add the IES Access Interface to OSPF - Right-click the newly created interface, select **Properties**. Select the **Protocols** tab.
8. Click on the **Add** button, the **Create Interface...** form opens.
9. Select **OSPF** from the dropdown menu, and click on the **OK** button.

## 1.3.1 Routing Protocol [cont.]



10. Modify the default actions of the IGP on this interface. For example, the IES interface may be used to provide routing to another carrier's network, in which case it may be desirable to prevent the exchange of routing tables by configuring the interface for passive mode. As shown in the image above.

## 1.3.1 Routing Protocol [cont.]

OSPF Interface, Area - , OSPFv2, Routing Instance - 1, 172.0.0.4 [Create]

General Protocol Properties Authentication

Site

Site ID: 172.0.0.4 Site Name: SR1\_4 Properties

Routing Instance

Routing Instance ID: 1 Routing Instance Name: Base

Area ID: Version: 2 Properties Select

Instance ID: 0 View OSPF Site...

Interface

Interface ID: 2 Interface Name: intIES

OSPF-Network (1)

OSPF

Network

- OSPFv2 Area 0.0.0.0 Backbone
  - Router 8.8.8.8 Instances
    - Router 9.9.9.9 Instances
      - Router 172.0.0.4 Instances
        - Instance 0
          - Interface Interface to SAR8\_9 (11, 4.0.0.4) : Broadcast, Status: OK, Oper: Backup Designated Router
            - Neighbor - 4.0.0.9, Status: full
            - Interface Interface to OTHERs1 (12, 4.5.0.4) : Broadcast, Status: OK, Oper: Backup Designated Router
              - Neighbor - 4.5.0.5, Status: full
              - Interface To\_ESS7\_7 (15, 192.168.0.42) : Broadcast, Status: OK, Oper: Backup Designated Router
                - Neighbor - 192.168.0.41, Status: full
                - Interface intIES (3, 192.168.15.15) : Broadcast, Status: OK, Oper: Designated Router
                - Interface system (1, 172.0.0.4) : Broadcast, Status: OK, Oper: Designated Router

Service Topology - regIES [212], SVC Mgr Service II

No Filter Search

IP/MPLS Cloud

regIES:172.0.0.4 intIES:Port 1/1/1:1.0

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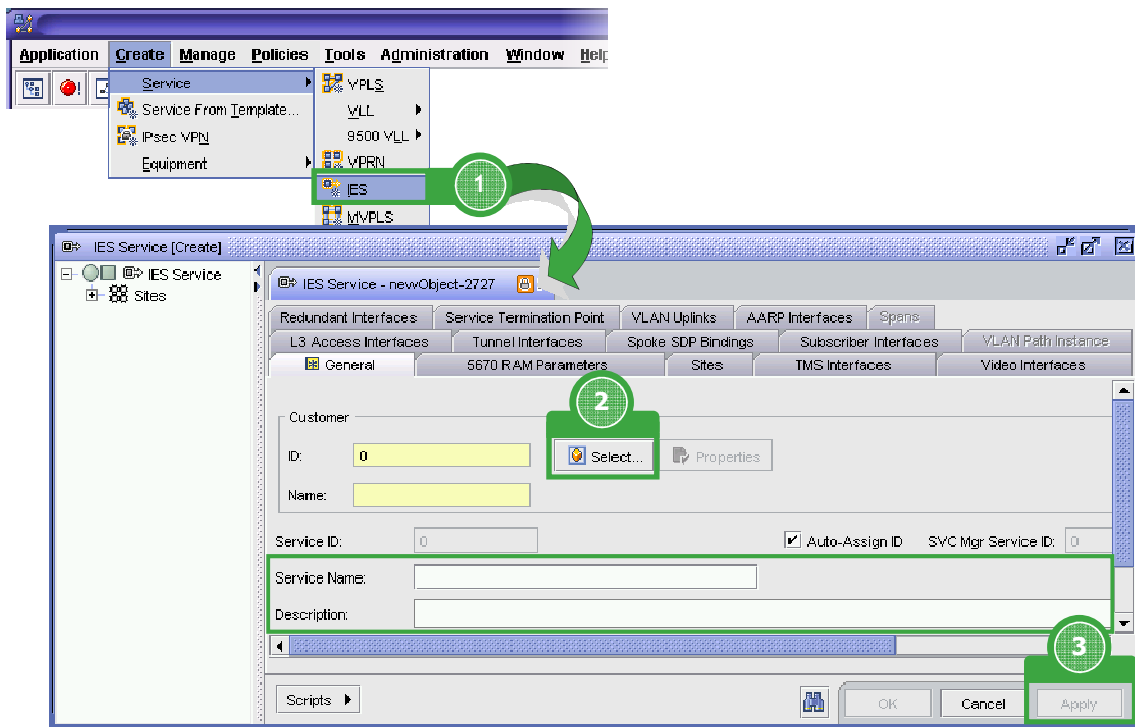
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- Working in the OSPF Interface window and the **General** Tab, click the **Select** button to add the interface to area 0.
- Once the service is populated with your access interface, select the **Topology View** button to view the service you have created.



## 2 IES Point-and-Click Provisioning Method

## 2.1 Create an IES



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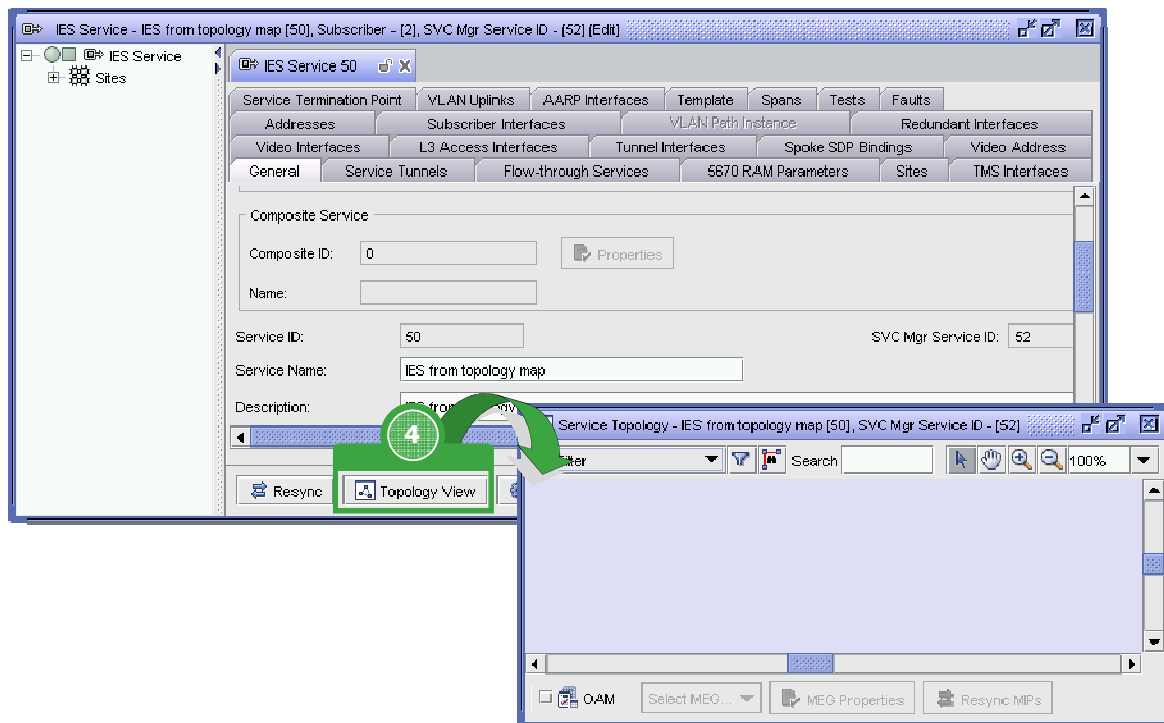
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The following lines and the images above summarize the steps recommended to create an IES using the point-and-click provisioning method for this lab:

1. Choose **Create** → **Service** → **IES** from the main menu. The **IES Service [Create]** form opens with the **General** tab displayed
2. In the **Customer** panel, click the **Select** button to add the customer. Specify a **Service Name** and **Description**.
3. Click on the **Apply** button. The form refreshes into the **IES Service - Name [Create]** form opens displaying additional tabs and with the **General** tab displayed.

## 2.1 Create an IES [cont.]



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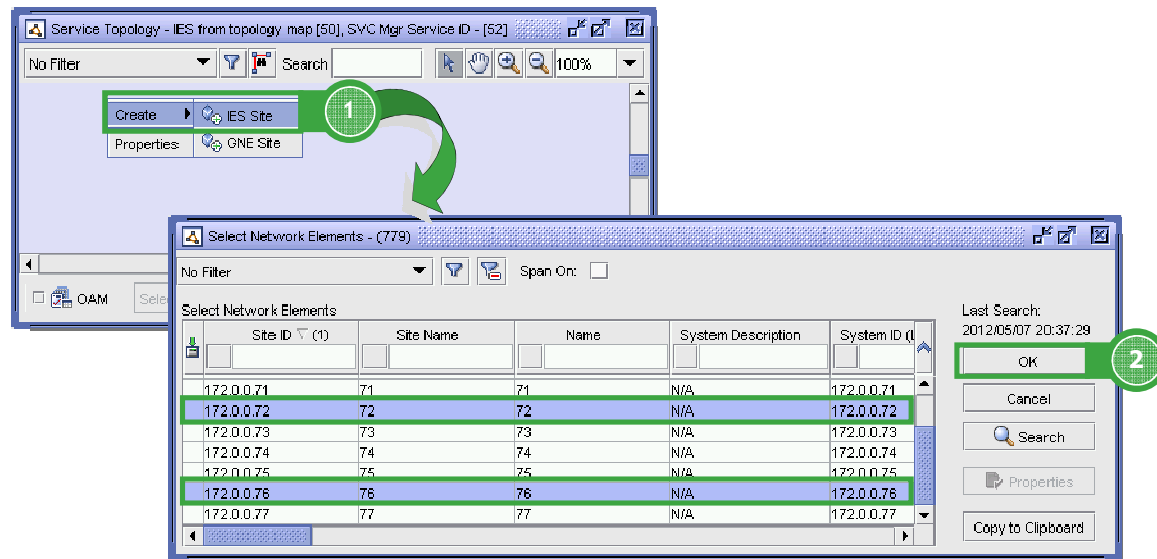
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4. On the IES Service - **Name [Create]** form, click on the More Actions and choose Topology View from the contextual menu. The Service Topology map opens.

## 2.1.1 Add Site(s)



The following lines and the images above summarize the steps recommended to create IES sites using the point-and-click provisioning method for this lab:

1. Click on an empty portion of the **Service Topology** map. Choose **Create**→**IES Site** from the contextual menu. The **Select Network Elements** form opens with a list of available sites.
2. Choose a site or multiple sites and click on the **OK** button. The **Site (Create)** form opens with the **General** tab displayed.

## 2.1.1 Add Site(s) [cont.]

IES Site, (Multiple Instances) [Create]

Redundant Interfaces | Subscriber Interfaces | ISMP Host Tracking | Statistics

Video Address | Addresses | Spoke SDP Bindings | Tunnel Interfaces

General | Components | Video Interfaces | L3 Access Interfaces

▼ Network Element

System ID:

Name:

Description:

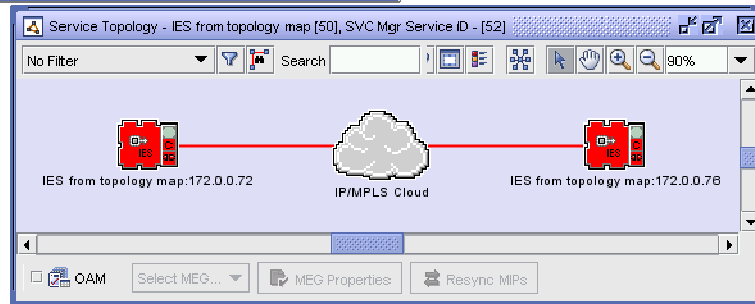
Administrative State:

Monitor Access Interface Operational State: ☐

► Facility Maps

Scripts ►

OK Cancel Apply



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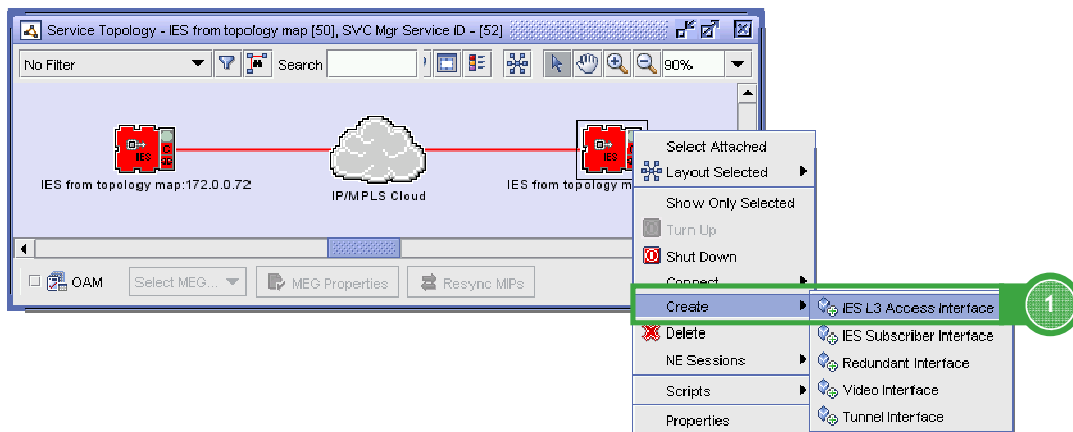
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- On the **IES Site (Create)** form assign a Name and Description. Click on the **OK** button. The **IES Site (Create)** form closes and the **Service Topology** map refreshes displaying the created IES sites.

## 2.1.2 Create L3 Access Interfaces



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Service Types · IES  
5620 SAM · Services Operations and Provisioning

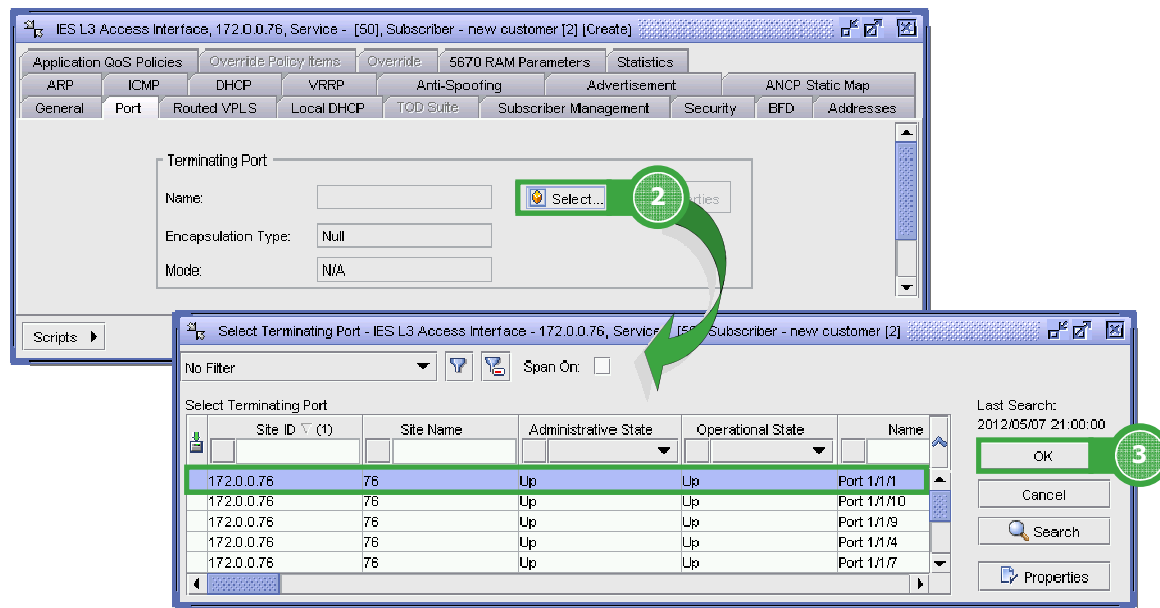
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The following lines and the images above summarize the steps recommended to create access interfaces using the point-and-click provisioning method for this lab:

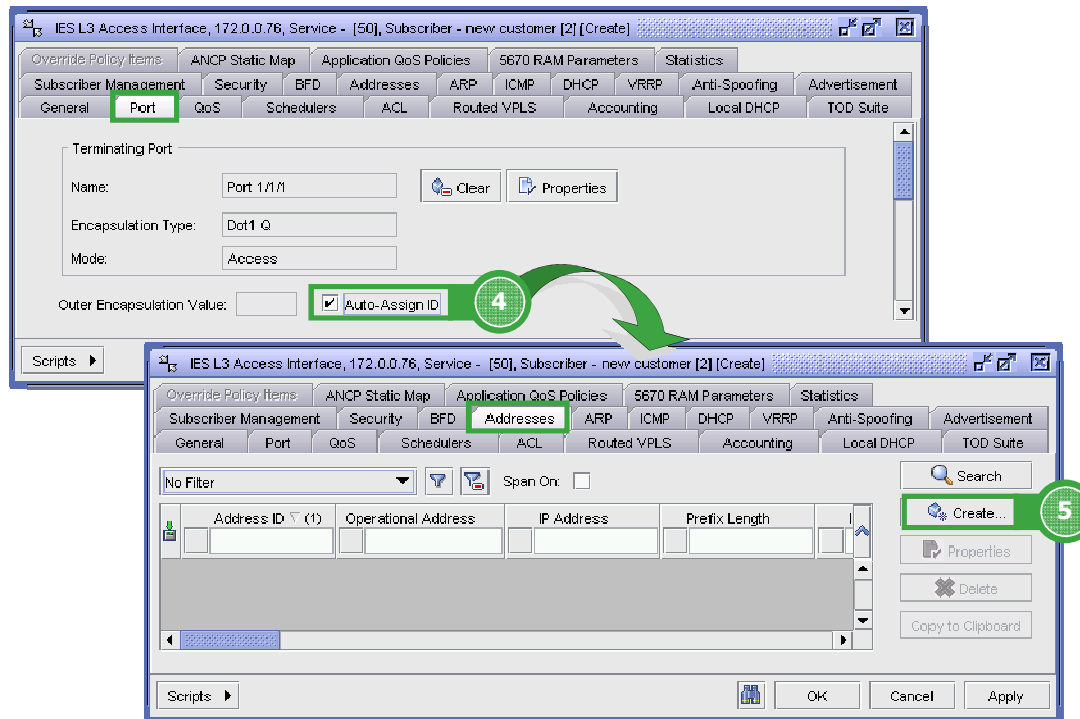
1. On **Service Topology** map, right-click on an IES site and choose **Create**→**L3 Access Interface** from the contextual menu. The **IES L3 Access Interface [Create]** form opens with the **General** tab displayed.

## 2.1.2 Create L3 Access Interfaces [cont.]



- Click on the **Port** tab and click on the **Select** button in the **Terminating Port** panel. The **Select Terminating Port** form opens with a list of available access ports.
- Choose a port from the list and click on the **OK** button. The **Select Terminating Port** form and the **L3 Access Interface [Create]** form refreshes with selected port name is displayed in the **Terminating Port** panel.

## 2.1.2 Create L3 Access Interfaces [cont.]



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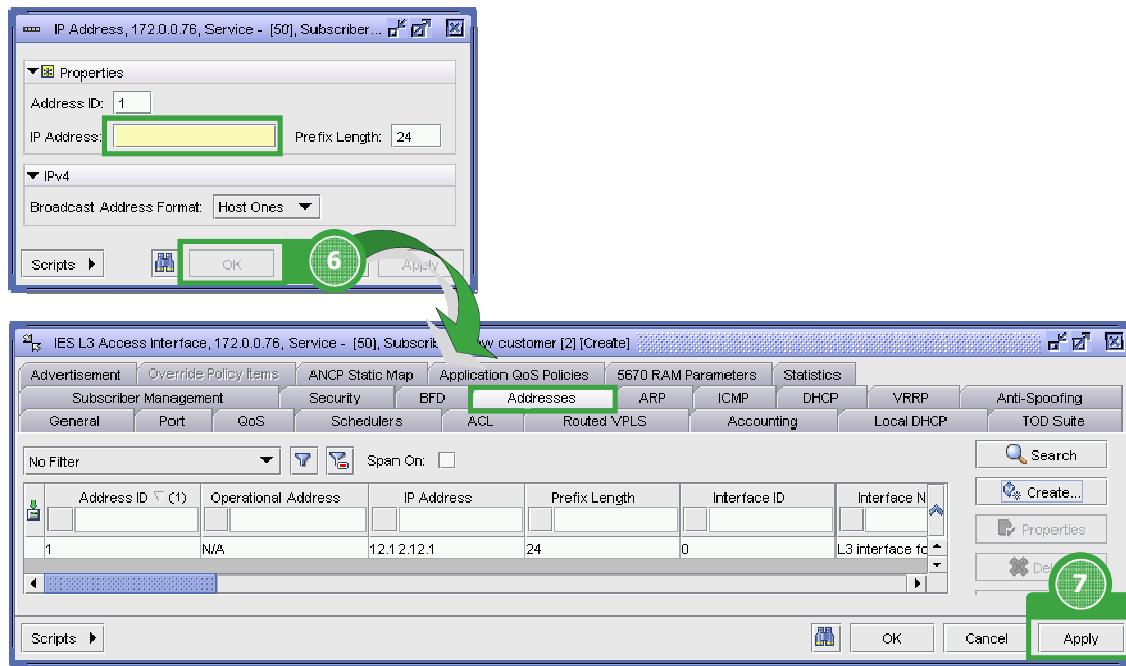
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4. Enable the Auto-Assign ID parameter for the outer encapsulation value that is associated with the port.
5. Click on the Addresses tab and click on the Create button.



## 2.1.2 Create L3 Access Interfaces [cont.]



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6. Enter the IP address for the interface and click on the OK button.
7. Click on the Apply button.

## 2.1.2 Create L3 Access Interfaces [cont.]

The screenshot displays the Alcatel-Lucent IES configuration interface for an L3 Access Interface. The main window shows the 'Protocols' tab, and a 'Create Interface...' dialog box is open, prompting the user to select the type of interface to create. The 'OSPFv2' option is selected in the dropdown menu. Below this, the 'OSPF Interface, Area - , OSPFv2, Routing Instance - 1, 172.0.0.76 [Create]' dialog box is shown, with the 'Routing Instance' section expanded. The 'Routing Instance ID' is set to 1, and the 'Routing Instance Name' is 'Base'. The 'Area ID' is set to 172.0.0.76, and the 'Version' is set to 2. The 'Select...' button is highlighted in the 'Routing Instance' section.

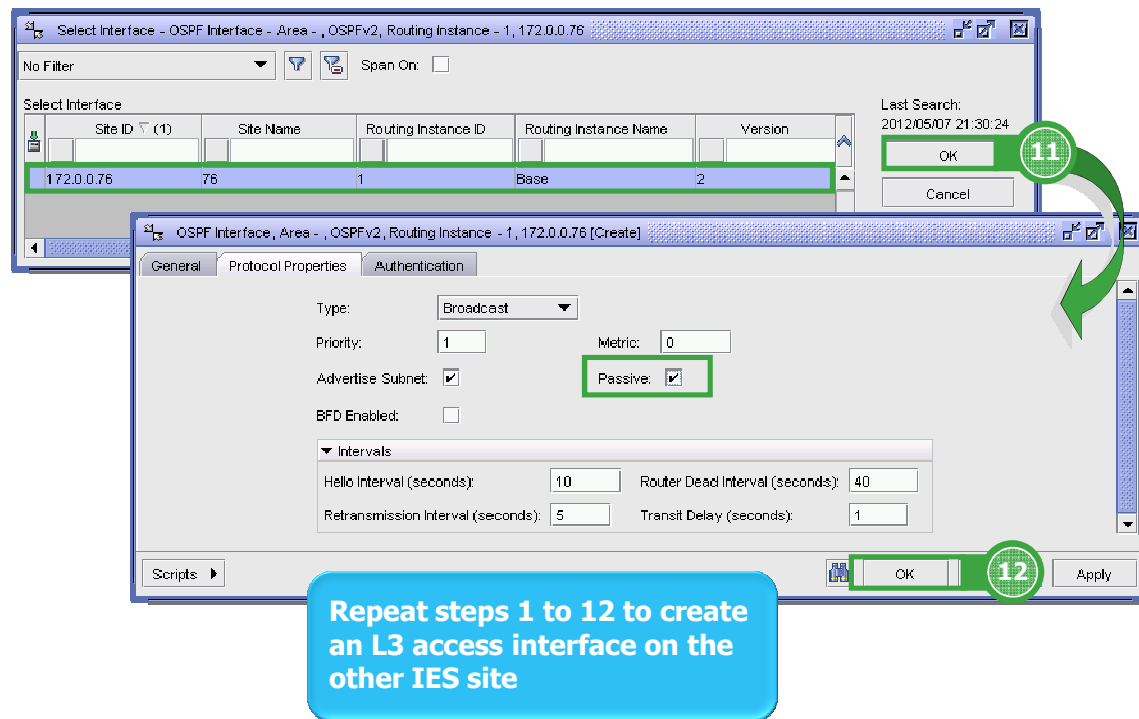
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8. Add the IES Access Interface to the routing protocol. The example above shows the steps to add the IES Access Interface to OSPF. Select the **Protocols** tab and click on the **Add** button.
9. Select **OSPF** from the dropdown menu, and click on the **OK** button.
10. Click on the **Select** button in the Routing Instance display area.

## 2.1.2 Create L3 Access Interfaces [cont.]



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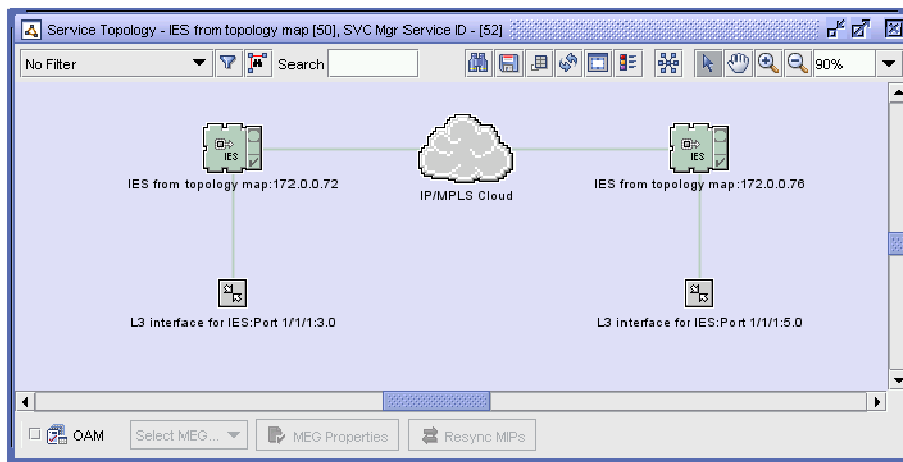
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11. Select a Routing Instance and click on the OK button.
12. Modify the default actions of the IGP on this interface. For example, the IES interface may be used to provide routing to another carrier's network, in which case it may be desirable to prevent the exchange of routing tables by configuring the interface for passive mode. As shown in the image above.
13. Once the service is populated with your access interface, select the **Topology View** button to view the service you have created.

## 2.2 Topology Map View of Service



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End of module  
IES

.....  
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## Section 3 Service Types

# Module 7 VPRN

TOS36042\_V3.0-EQ-English-Ed1 Module 3.7 Edition 1

5620 SAM  
Services Operations and Provisioning  
TOS36042\_V3.0-EQ Edition 1

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Edition	Date	Author	Remarks
1.0	2012-10-12	MCGRATH, John	TOS36042_V1.0 – SAM 10.0 R1
1.1	2012-11-16	MCGRATH, John	TOS36042_V1.1 – SAM 10.0 R5
2.0	2013-04-10	MCGRATH, John	TOS36042_V2.0 First edition – SAM 11.0 R1
2.1	2013-08-16	MCGRATH, John	TOS36042_V2.0 Second edition – SAM 11.0 R1 (update)
3.0	2014-04-03	MCGRATH, John	TOS36042_V3.0 First edition – SAM 12.0 R1





Upon completion of this module, you should be able to:

- Configure BGP Peering
- Create a VPRN
- Create a Service Site
- Create a L3 Interface

.....  
3 • 7 • 3

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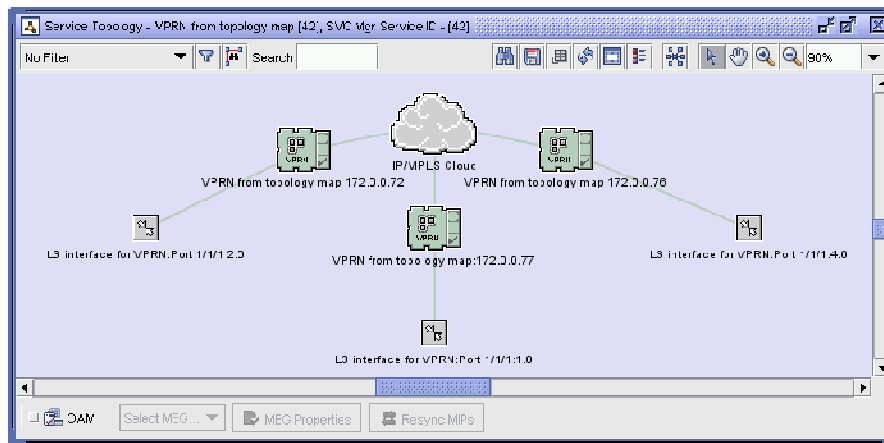


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# 1 VPRN Provisioning

# 1.1 Lab overview



**This lab demonstrates how to configure the core components of a VPRN service using the form-based configuration method and the point-and-click provisioning method.**

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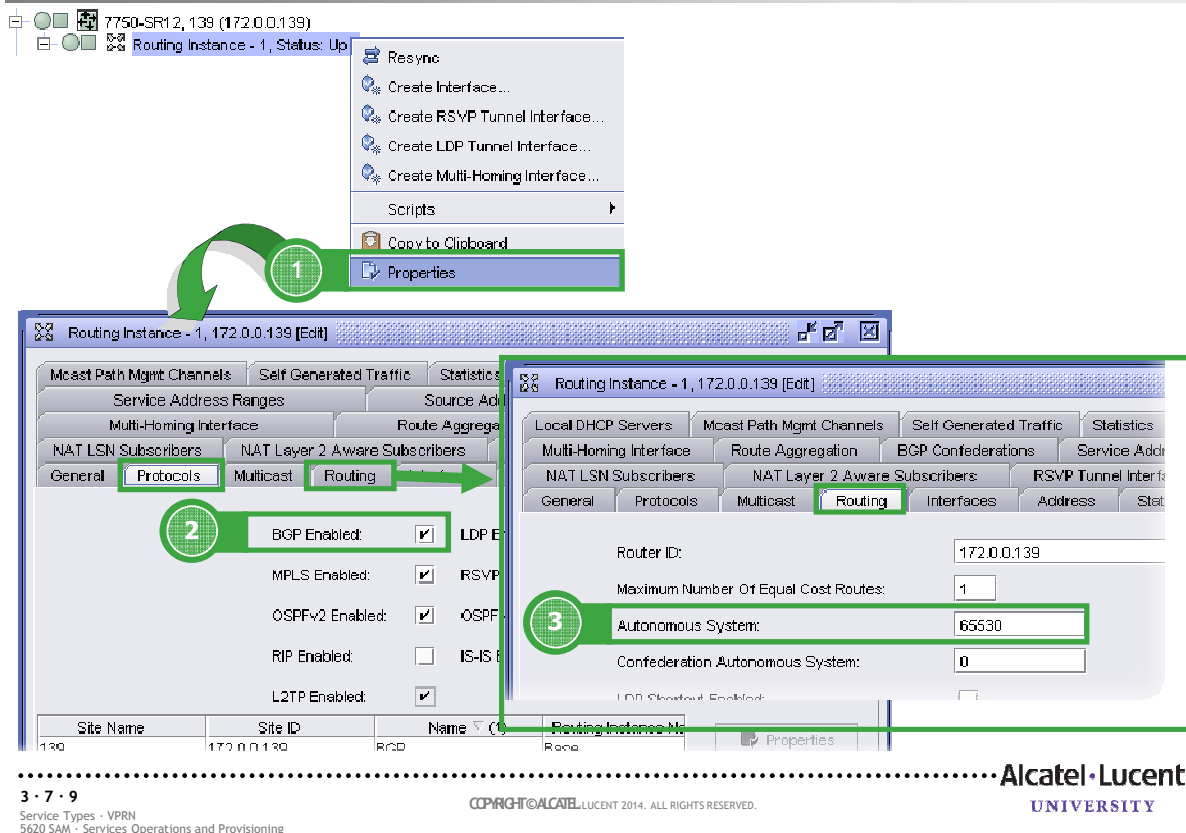
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## 1 VPRN Provisioning

### 1.2 Enable BGP



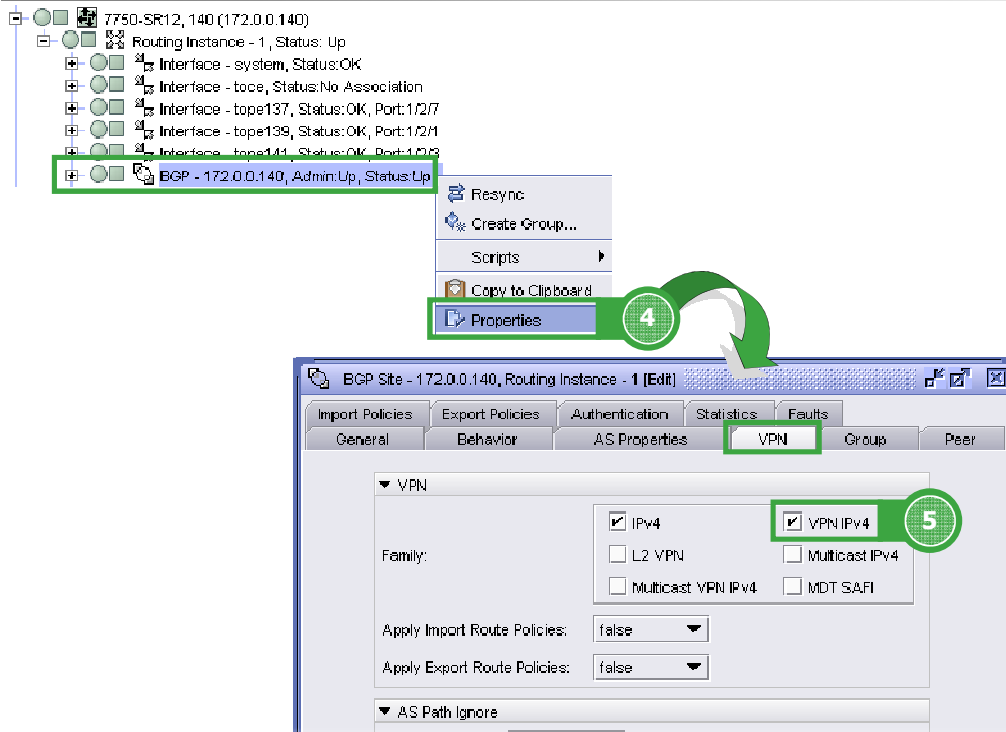
The following lab exercises will guide you through the steps necessary to configure VPRN and assign the service sites upon which the service will terminate in the lab's managed network.

1. Configure a BGP mesh among participating sites
2. Create a VPRN
3. Create a Service Site
4. Create an L3 Interface (SAP)

### Enable BGP

1. Working from the **Routing** drop-down menu item. Click the plus button beside the router. Right-click on a **Routing Instance** and choose **Properties**
2. Click on the **Protocols** Tab and check the appropriate protocol (BGP)
3. Continue working in the **Routing Instance** window. Click on the **Routing** Tab. Specify the **Autonomous System** value (65530)  
Click on the **OK** button

## 1.2 Enable BGP [cont.]



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4. Verify the protocol appears on the list. Right-click BGP, select **Properties** from the contextual menu. The **BGP Site [Edit]** form opens with the General tab displayed.
5. On the **BGP Site [Edit]** form click on the **VPN** tab, select **VPN IPv4**.
6. Repeat the above steps (BGP) for each router in your network

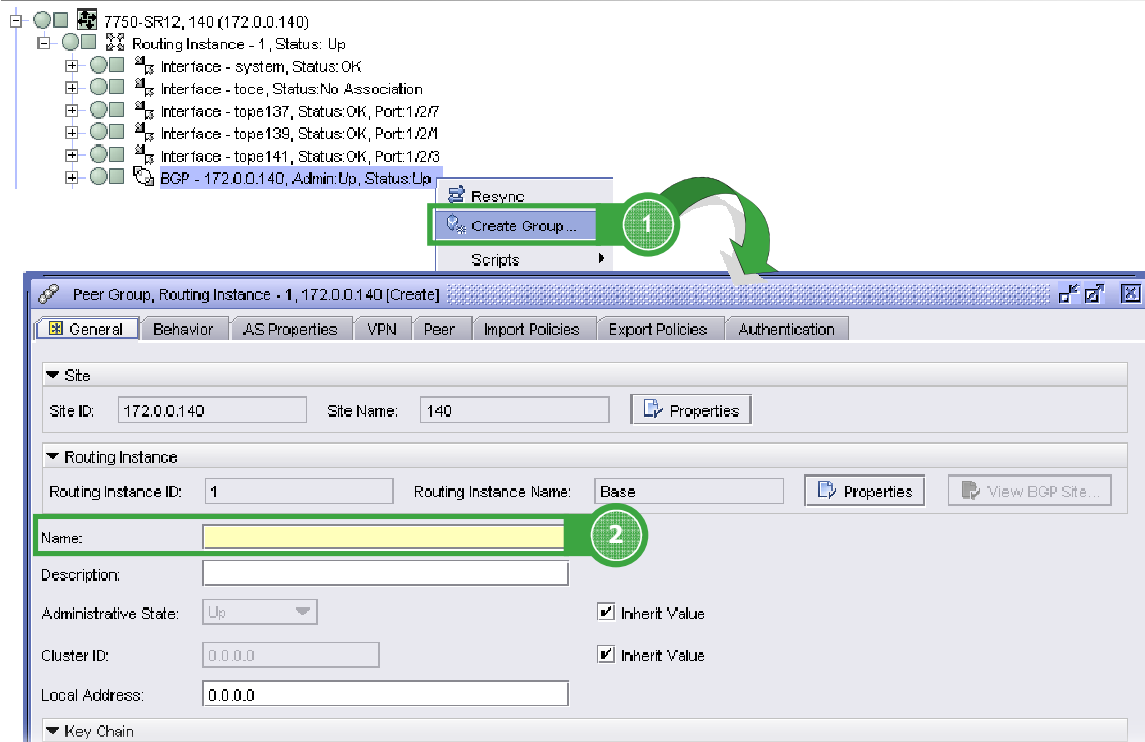
**Notes**

*If you do not specify the Autonomous System Value, BGP will stay Admin: UP, Status: DOWN.*

*By ticking the VPN IPv4 box, all BGP groups inherit this setting making creating BGP Groups easier.*



## 1.3 Create BGP Group



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1. Right click BGP from the list and select **Create Group** from the contextual menu. The **Peer Group [Create]** form opens with the **General** tab displayed.
2. Configure the parameter **Name** to assign a **Group name** (VPRN). You must also perform the following tasks:
  - click on the **Behavior** tab and assign a **Local Address** (System IP)
  - click on the **AS Properties** tab and define the **Peer AS** value (65530)
  - click on the **VPN** tab and ensure that within Family: VPN IPv4 and IPv4 are already selected

## 1.4 Create BGP Peers

7750-SR12, 140 (172.0.0.140)

- Routing Instance - 1, Status: Up
  - Interface - system, Status: OK
  - Interface - toce, Status: No Association
  - Interface - tope137, Status: OK, Port: 1/2/7
  - Interface - tope139, Status: OK, Port: 1/2/1
  - Interface - tope141, Status: OK, Port: 1/2/3
  - BGP - 172.0.0.140, Admin: Up, Status: Up
  - Peer Group VPRN, Admin: Up, Status: Up

Resync  
Copy...  
Delete  
Turn Up  
Shut Down  
Create Peer...

Peer, Peer Group - VPRN, Routing Instance - 1, 172.0.0.140 [Create]

General Behavior AS Properties VPN Import Policies Export Policies Authentication

Site

Site ID: 172.0.0.140 Site Name: 140

Routing Instance

Routing Instance ID: 1 Routing Instance Name: Base View BGP Site...

Group: VPRN Properties

Description:

Peer Address: 0.0.0.0 Interface Name:

Administrative State: Up Inherit Value

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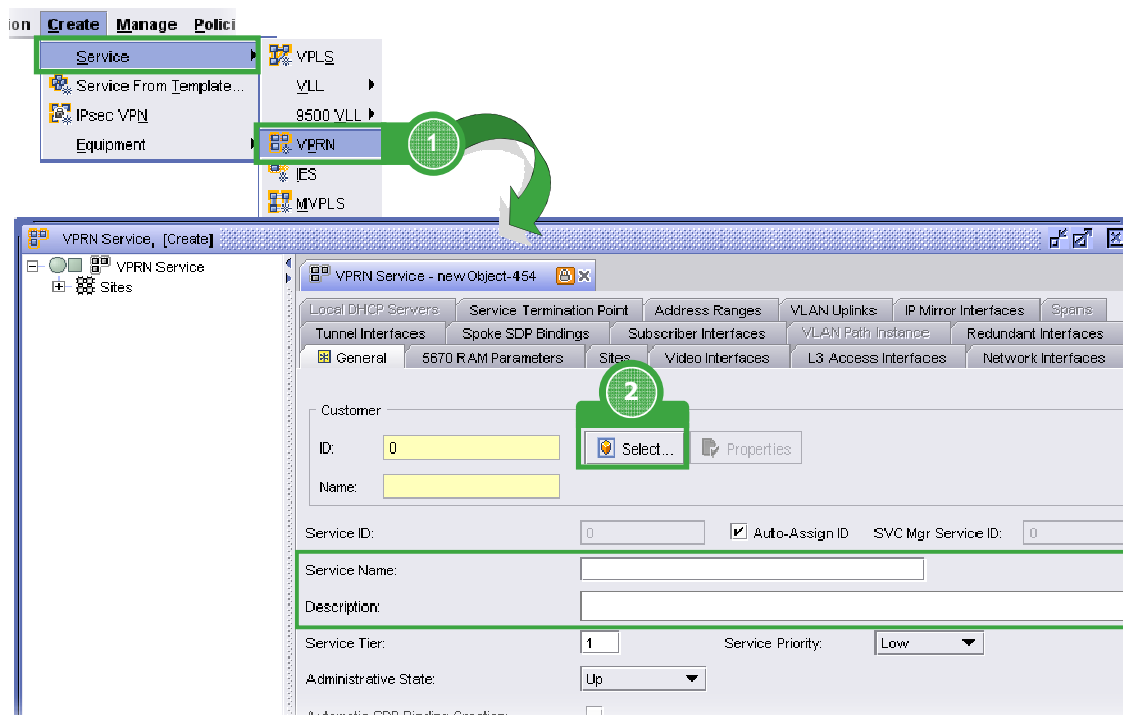
1. Right click on the **Peer Group VPRN** choose **Create Peer** from the contextual menu. The Peer, Peer Group [Create] form opens with the General tab displayed.
2. Configure the **Peer Address** (System IP) parameter.



### Note

*The peer will stay in Critical status until the other end is completed.*

# 1.5 Create a VPRN



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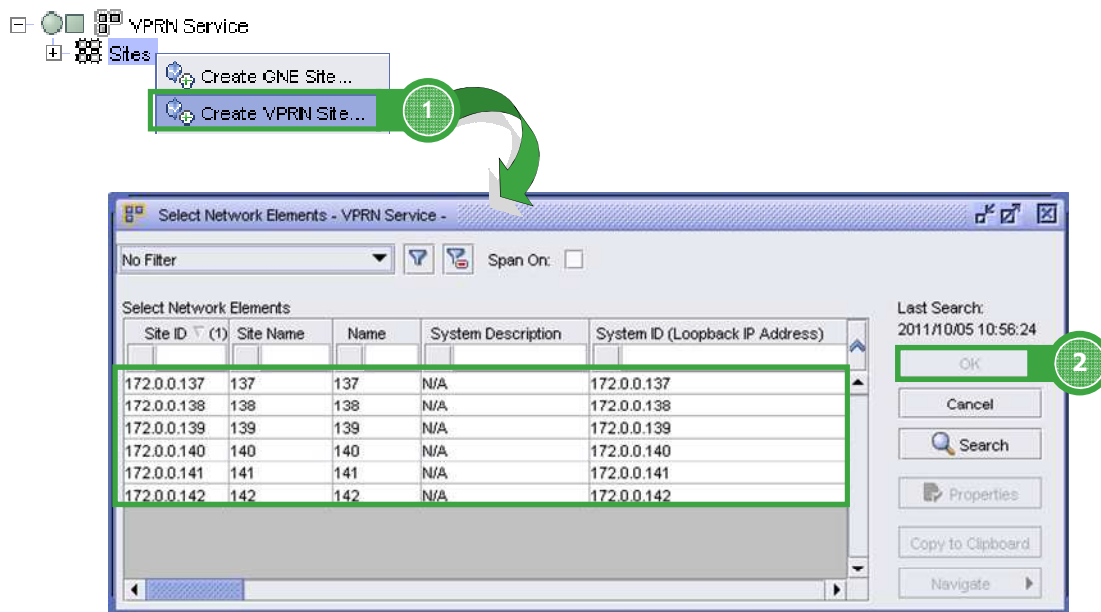
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The following lines and the images above summarize the steps recommended to create a VPRN for this lab:

1. Choose **Create** → **Service** → **VPRN** from the main menu. The **VPRN Service [Create]** form opens with the **General** tab displayed.
2. In the **Customer** panel, click the **Select** button to add the customer. Specify a **Service Name** and **Description**.

## 1.6 Add Site(s)



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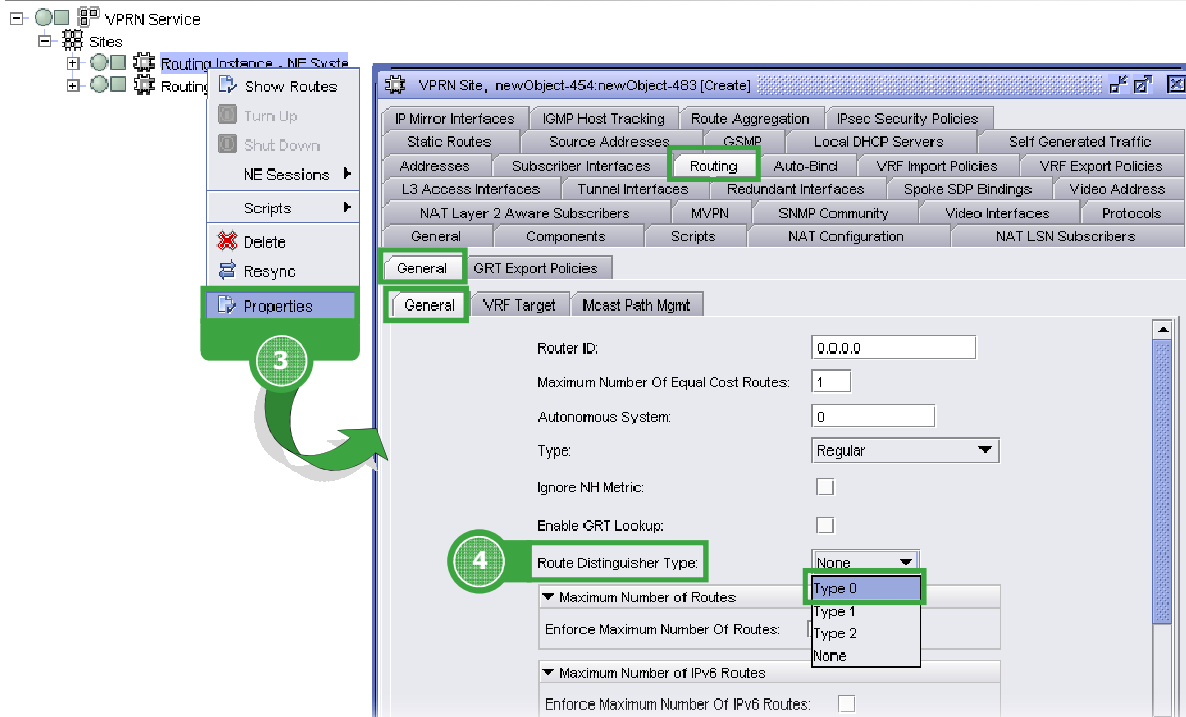
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1. From the **Components Tree**, right-click on **Sites** and choose **Create VPRN Site** from the contextual menu. The **Select Network Elements** opens with a list of available sites.
2. Choose a site or multiple sites and click on the **OK** button. The **Select Network Elements** closes and the **VPRN Service [Create]** form refreshes displaying the selected sites in the **Components Tree**.

## 1.6.1 Add Site (Route Distinguisher)



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3. Right-click each VPRN site and select **Properties**. The **VPRN Site [Create]** form opens with the General tab displayed.
4. On the **VPRN Site [Create]** form click the **Routing** tab, work on the **General** Tab and **General** Subtab (see figure above): Select the **Route Distinguisher Type** (Type 0)

## 1.6.2 Add Site (Route Target)

VPRN Site, newObject-454: newObject-463 [Create]

IP Mirror Interfaces | ICMP Host Tracking | Route Aggregation | IPsec Security Policies

Static Routes | Source Addresses | GSMP | Local DHCP Servers | Self Generated Traffic

Addresses | Subscriber Interfaces | **Routing** | Auto-Bind | VRF Import Policies | VRF Export Policies

L3 Access Interfaces | Tunnel Interfaces | Redundant Interfaces | Spoke SDP Bindings | Video Address

NAT Layer 2 Aware Subscribers | MVRN | SHMP Community | Video Interfaces | Protocols

General | Components | Scripts | NAT Configuration | NAT LSN Subscribers

**General** | GRT Export Policies

General | **VRF Target** | Mcast Path Mgmt

VRF Target Type: Define Default (5a)

None

Define Default

Define Import and Export

▼ Default Target

Target Format: AS (5b)

None

AS

IP Address

AS-4Byte

▼ AS-Based Target

Target AS Value: 1

Target Extended Community Value: 0

Suggest Value (5c)

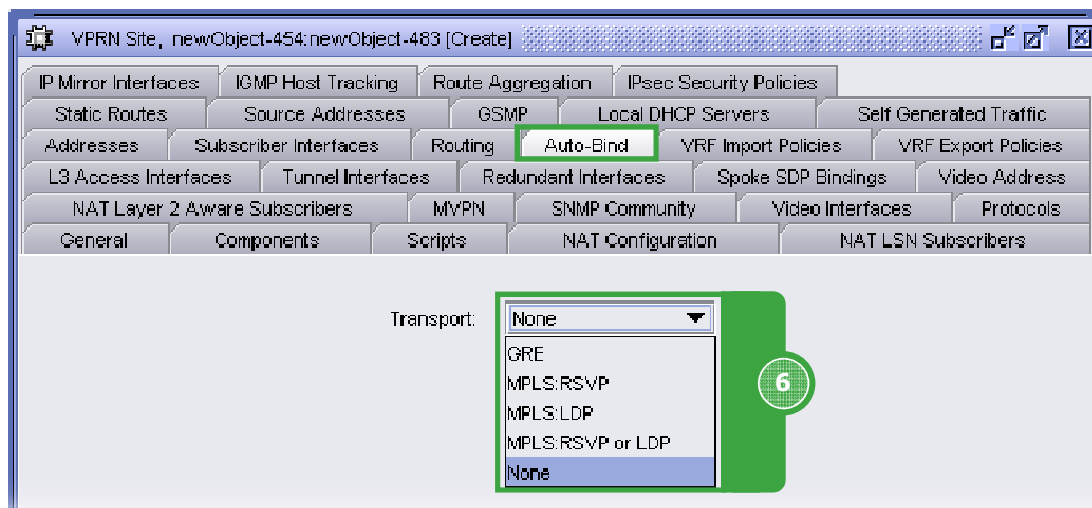
Select VRF Target:

85530:18

Generate Unique VRF Target

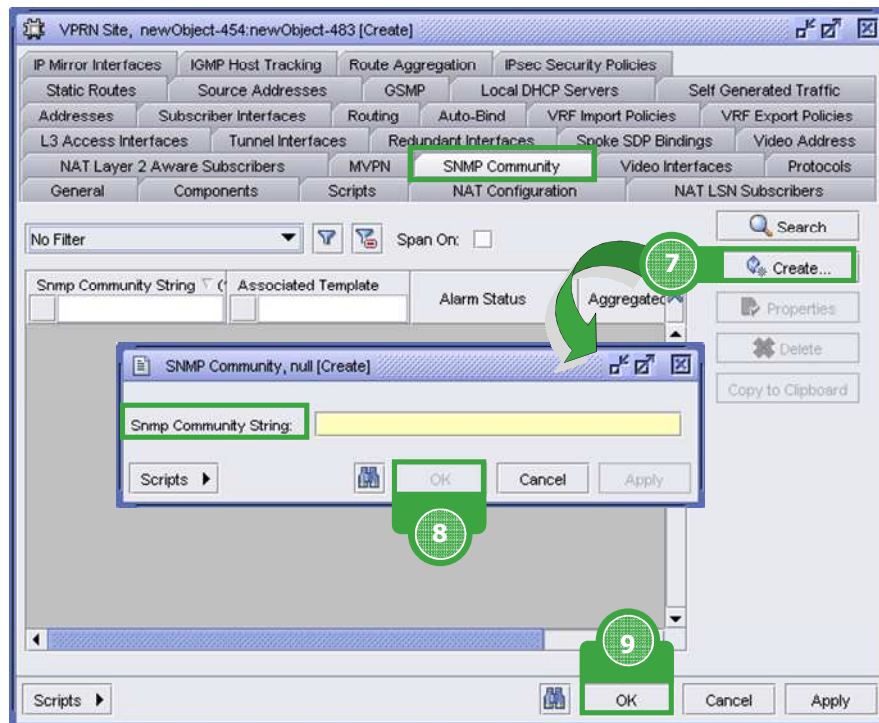
5. On the VPRN Site [Create] form click the Routing tab, work on the General Tab and click on the VRF Target subtab:
  - a. Set the VRF Target Type (Typically for this lab “Define Default”)
  - b. Select a Target Format (Typically for this lab “AS”)
  - c. Enter the Target AS Value and Target Extended Community Value (The Suggest Value Button is useful)

## 1.6.3 Add Site (Auto-Bind)



- On the **VPRN Site [Create]** form click on the **Auto-Bind** tab to configure the binding of the site to service tunnels

## 1.6.4 Specify SNMP Community



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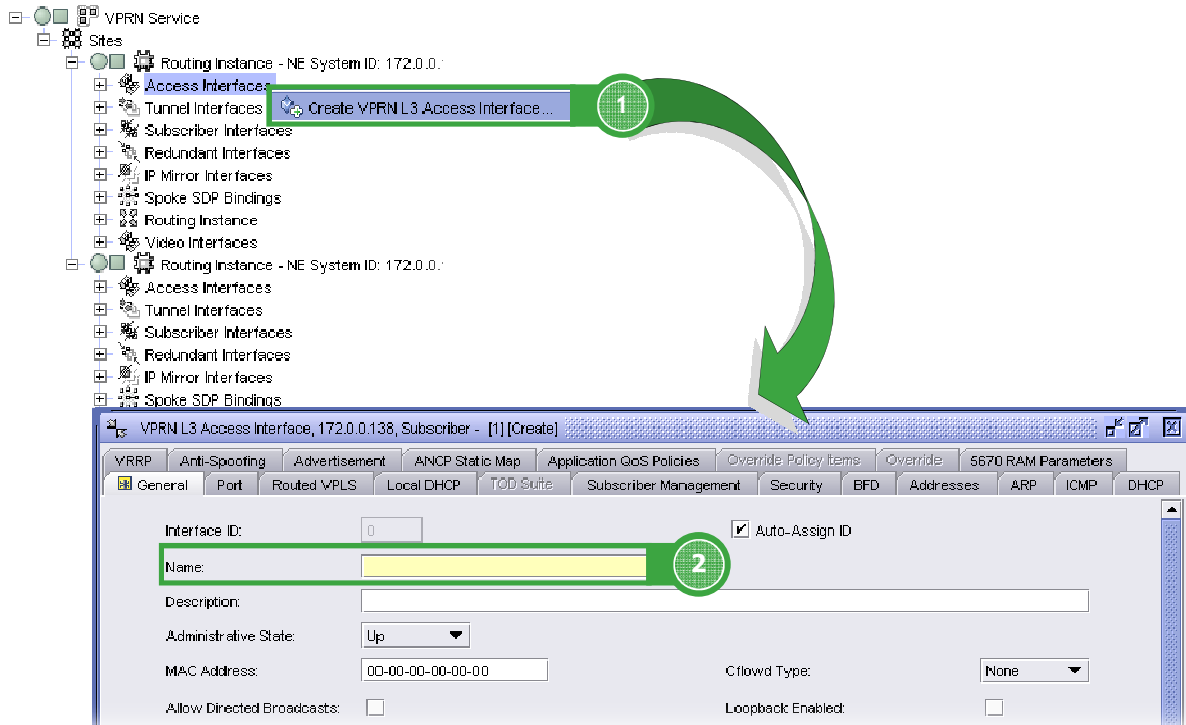
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7. On the **VPRN Site [Create]** form click on the **SNMP Community** tab to configure the Community String. Click on the **Create** button. The **SNMP Community [Create]** form opens.
8. On the **SNMP Community [Create]** form configure the SNMP Community String Parameter and click on the **OK** button. The **SNMP Community [Create]** form closes, and the **VPRN Site [Create]** form **SNMP Community** tab refreshes displaying the configured SNMP community.
9. On the **VPRN Site [Create]** form click on the **OK** button.



# 1.7 Create L3 Access Interface



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Service Types - VPRN  
5620 SAM - Services Operations and Provisioning

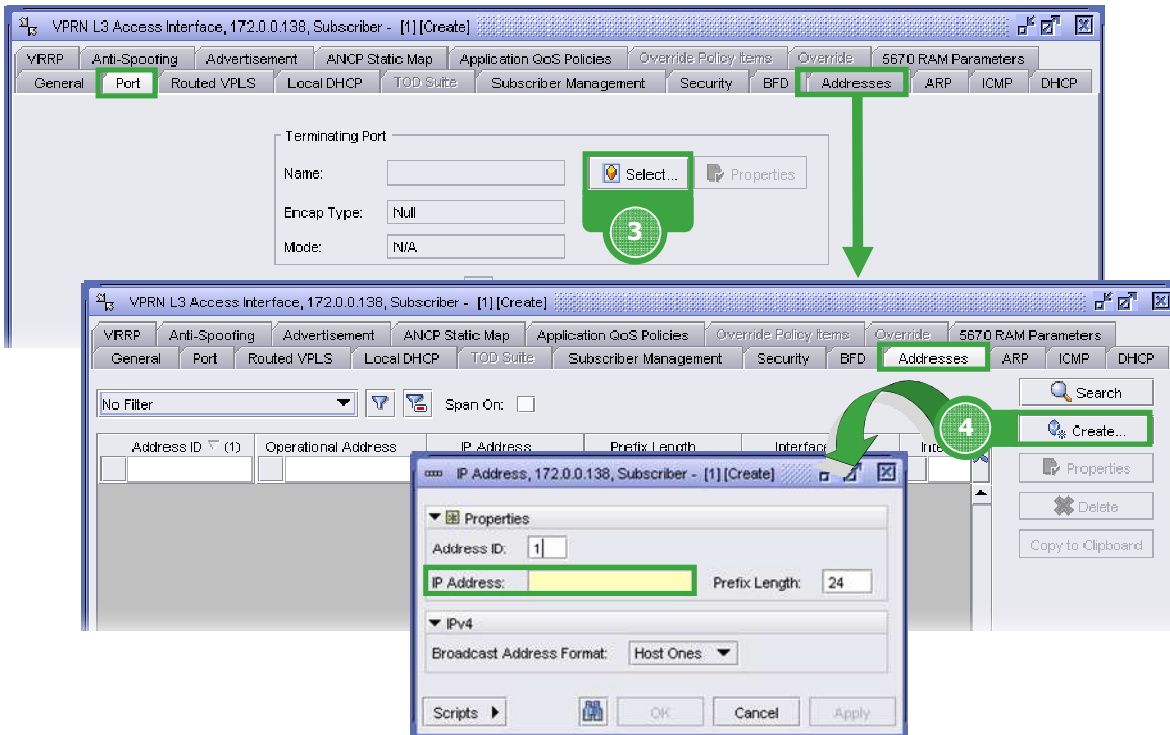
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To create the L3 access interface for the VPRN:

1. From the **Components Tree**, right-click on an **Access Interface** and choose **Create VPRN L3 Access Interface** from the contextual menu. The **VPRN L3 Access Interface [Create]** form opens with the **General** tab displayed.
2. Configure the parameter **Name**.

## 1.7 Create L3 Access Interface [cont.]



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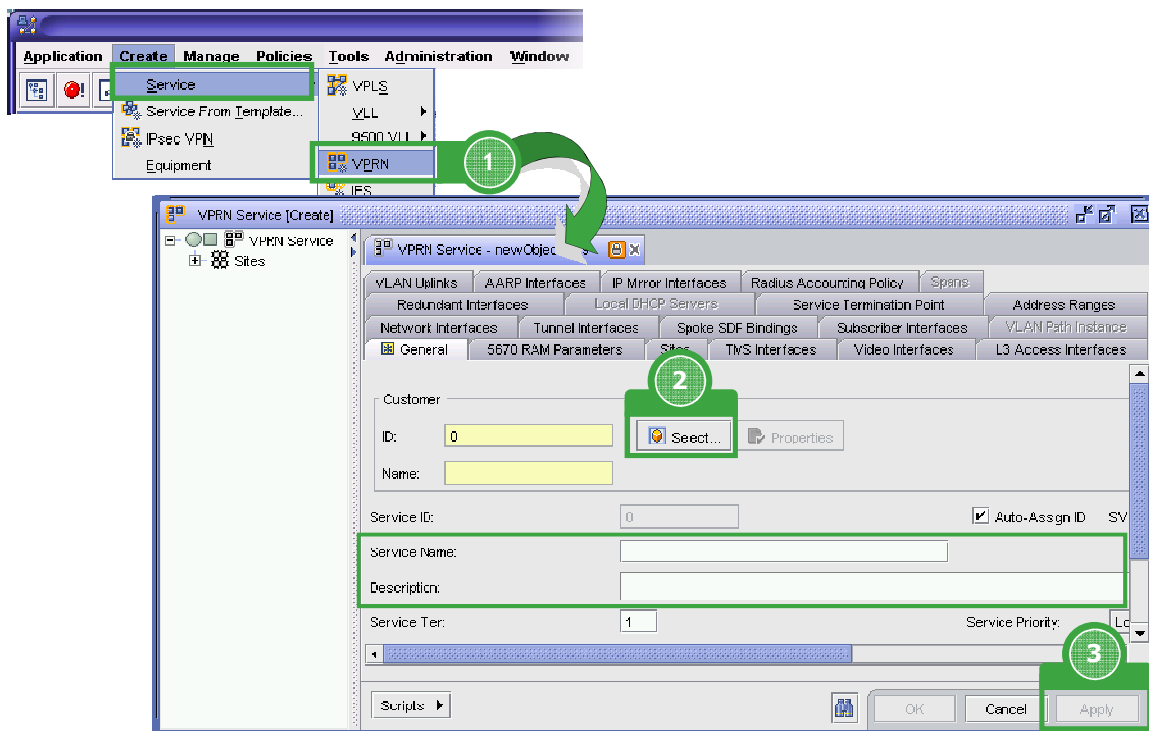
3. On the **VPRN L3 Access Interface [Create]** form, click on the **Port** Tab to specify the access port.
4. On the **VPRN L3 Access Interface [Create]** form, click on the **Address** Tab to specify the interface address.

## To view the VPRN:

- Choose **Manage** → **Services** from the main menu.
- Select your **VPRN** service from the list and click on the **Topology View** button

## 2 VPRN Point-and-Click Provisioning Method

## 1.1 Create a VPRN



3 - 7 - 22

Service Types - VPRN  
5620 SAM - Services Operations and Provisioning

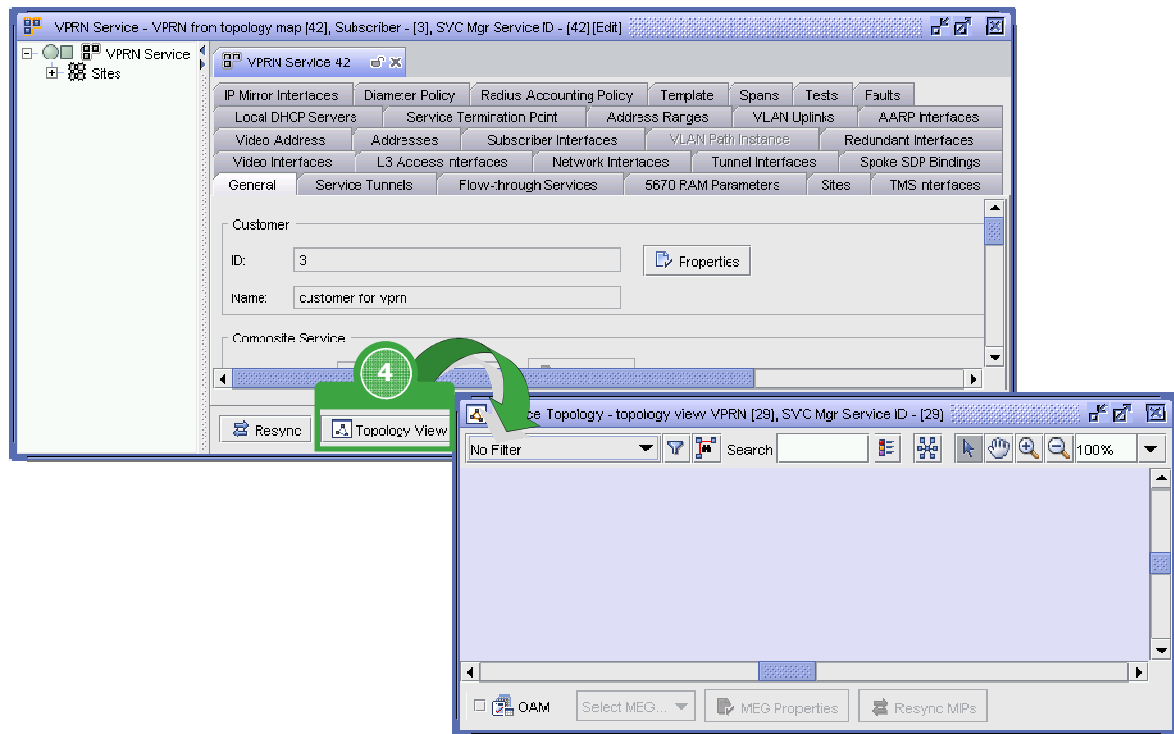
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The following lines and the images above summarize the steps recommended to create an Epipe using the point-and-click provisioning method for this lab:

1. Choose **Create** → **Service** → **VPRN** from the main menu. The **VPRN Service [Create]** form opens with the **General** tab displayed.
2. In the **Customer** panel, click the **Select** button to add the customer. Specify a **Service Name** and **Description**.
3. Click on the **Apply** button. The form refreshes into the **VPRN Service - Name [Create]** form opens displaying additional tabs and with the **General** tab displayed.

## 1.1 Create a VPRN [cont.]



3 • 7 • 23

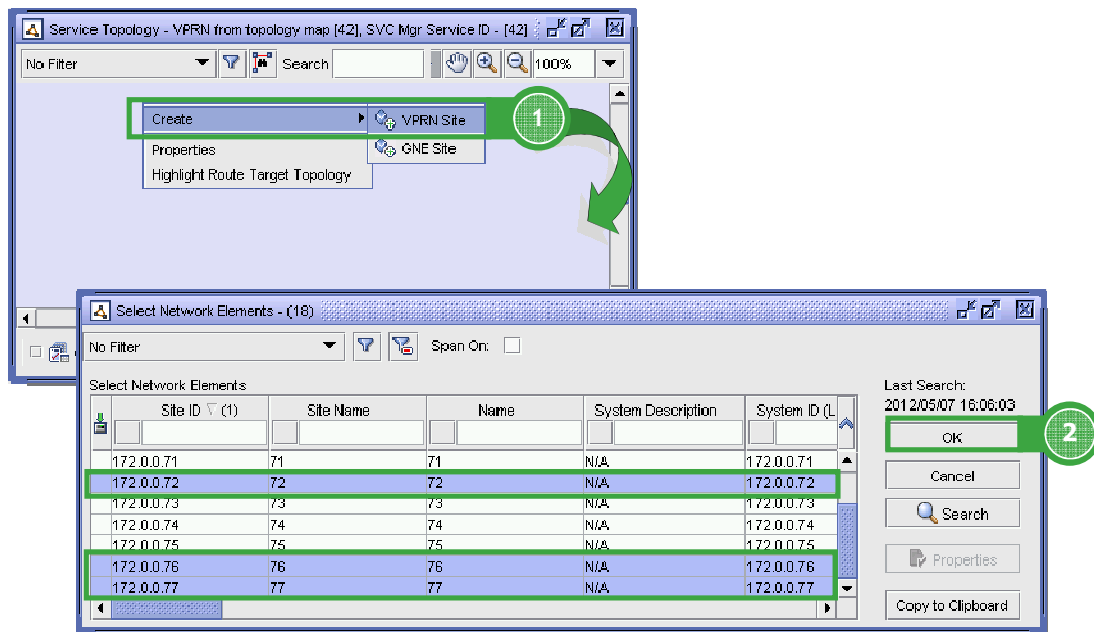
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4. On the **VPRN Service - Name [Create]** form, click on the **Topology View** button. The **Service Topology** map opens.

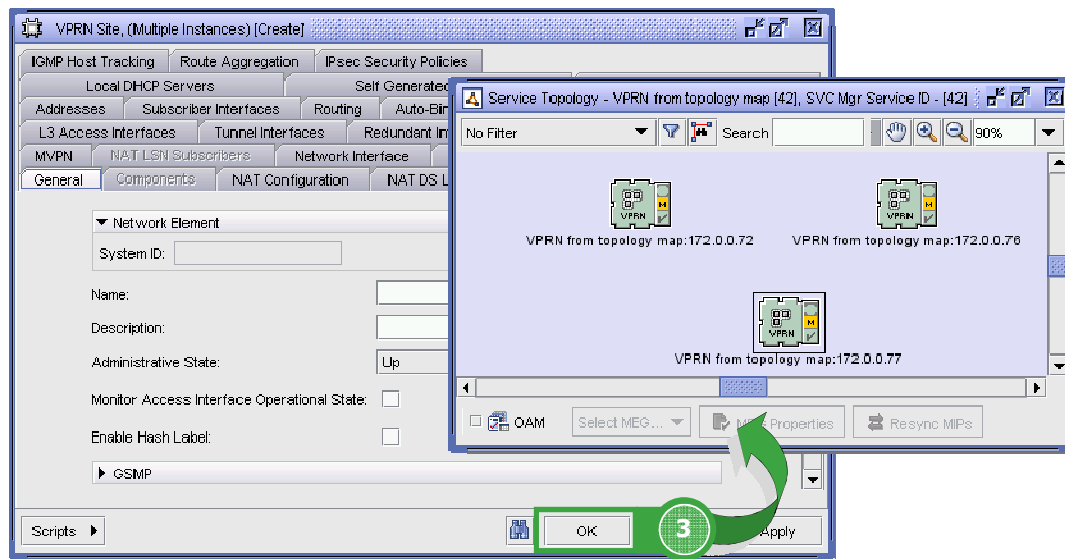
## 1.1.1 Add Site(s)



The following lines and the images above summarize the steps recommended to create VPRN sites using the point-and-click provisioning method for this lab:

1. Click on an empty portion of the **Service Topology** map. Choose **Create**→**VPRN Site** from the contextual menu. The **Select Network Elements** form opens with a list of available sites.
2. Choose a site or multiple sites and click on the **OK** button. The **Site (Create)** form opens with the **General** tab displayed.

## 1.1.1 Add Site(s) [cont.]



3 - 7 - 25

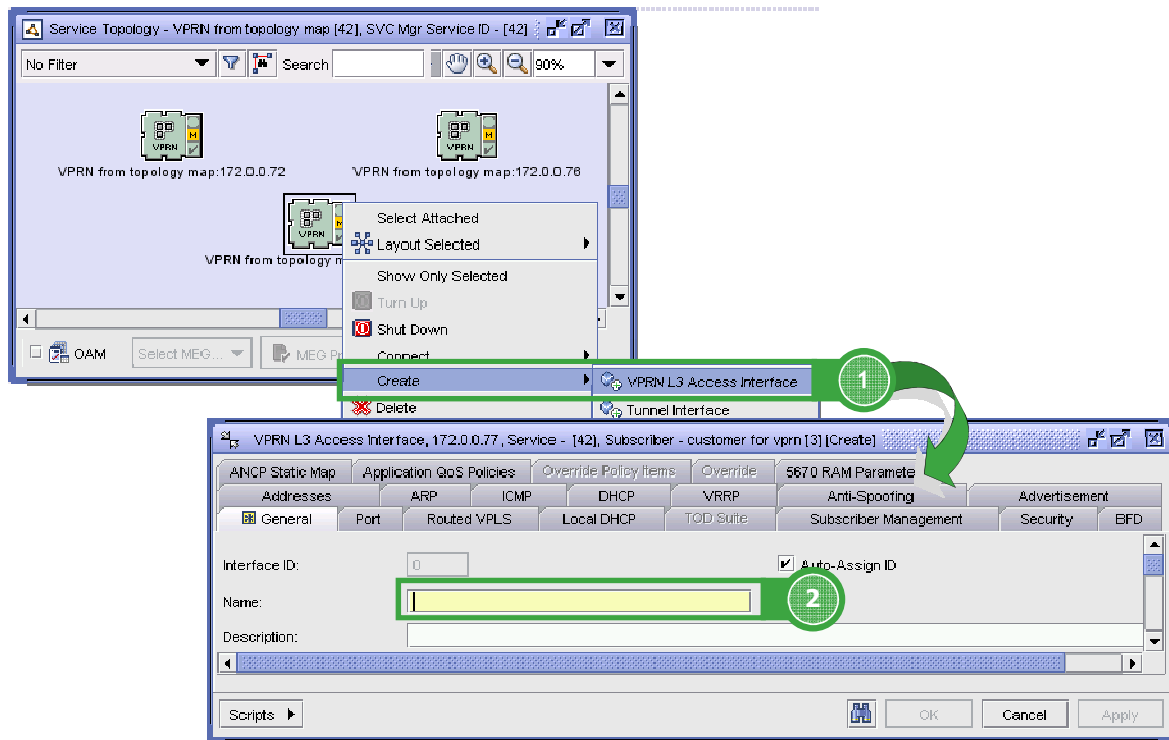
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- On the **VPRN Site (Create)** form assign a Name and Description. Click on the **OK** button. The **VPRN Site (Create)** form closes and the **Service Topology** map refreshes displaying the created Epipe sites.

## 1.1.2 Create VPRN L3 Access Interfaces



3 - 7 - 26

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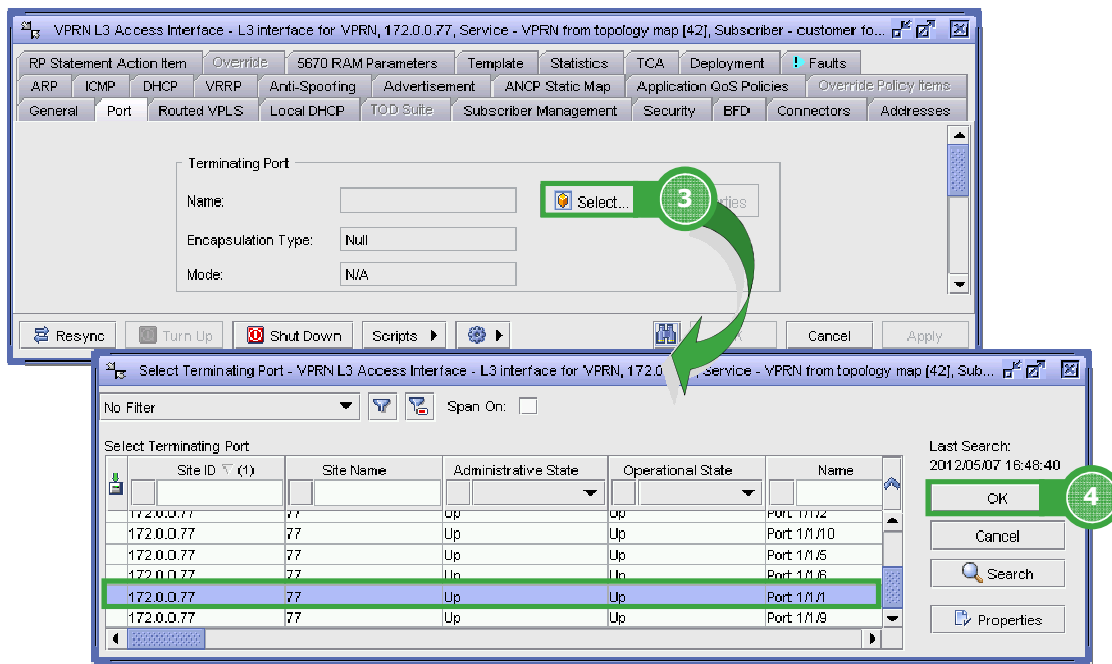
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The following lines and the images above summarize the steps recommended to create access interfaces using the point-and-click provisioning method for this lab:

1. On **Service Topology** map, right-click on an VPRN site and choose **Create**→**VPRN L3 Access Interface** from the contextual menu. The **VPRN L3 Access Interface [Create]** form opens with the **General** tab displayed.
2. Enter a name for the interface.



## 1.1.2 Create VPRN L3 Access Interfaces [cont.]



3 - 7 - 27

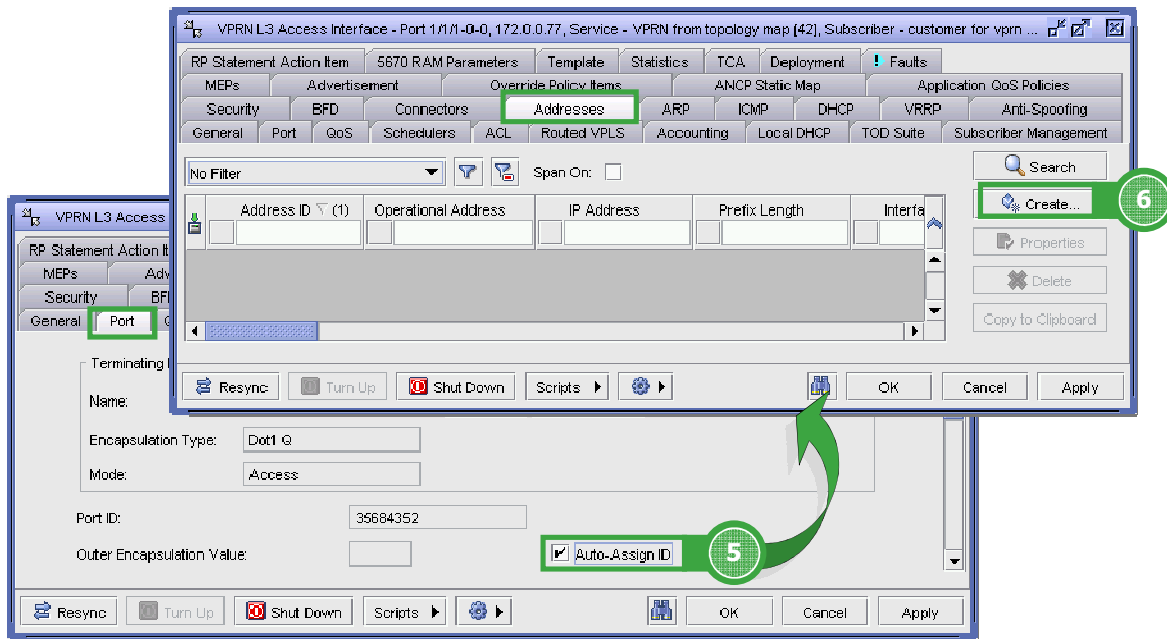
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- Click on the **Port** tab button and click on the **Select** button in the **Terminating Port** panel. The **Select Terminating Port** form opens with a list of available access ports.
- Choose a port from the list and click on the **OK** button. The **Select Terminating Port** form and the **VPRN L3 Access Interface [Create]** form refreshes with selected port name is displayed in the **Terminating Port** panel.

## 1.1.2 Create VPRN L3 Access Interfaces [cont.]



3 - 7 - 28

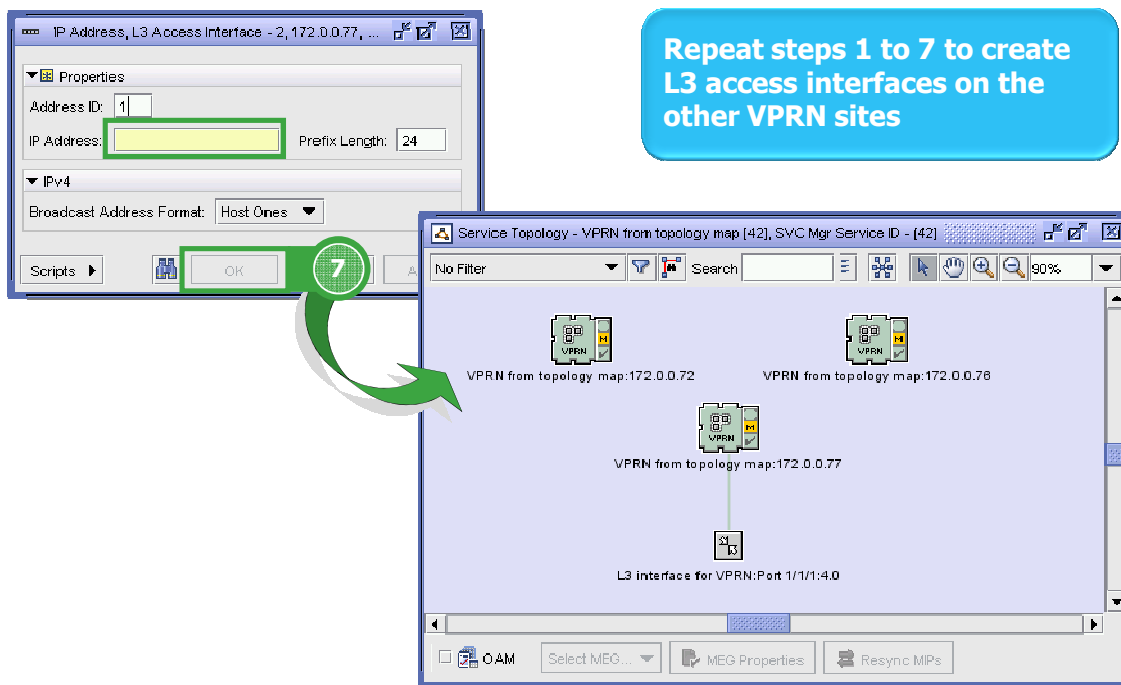
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5. Enable the Auto-Assign ID parameter for the outer encapsulation value that is associated with the port.
6. Click on the Addresses tab and click on the Create button.

## 1.1.2 Create VPRN L3 Access Interfaces [cont.]



3 · 7 · 29

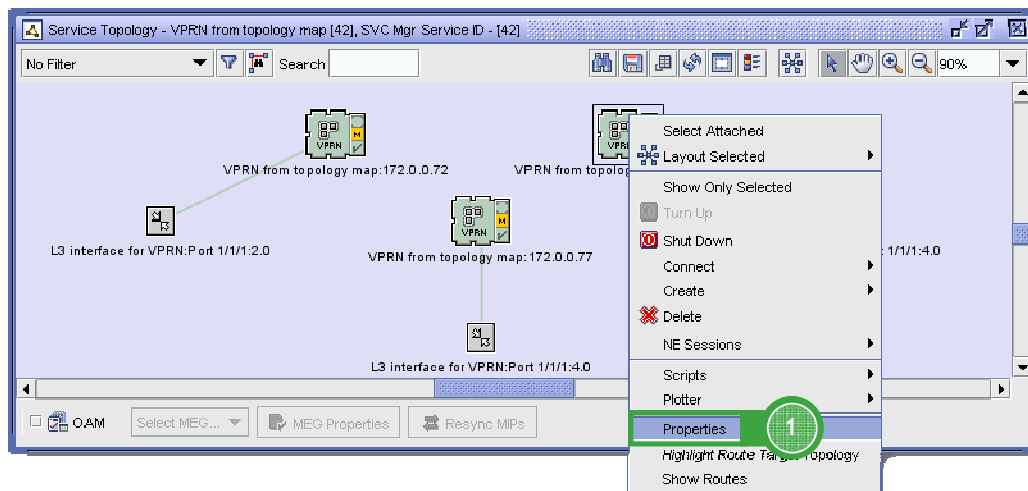
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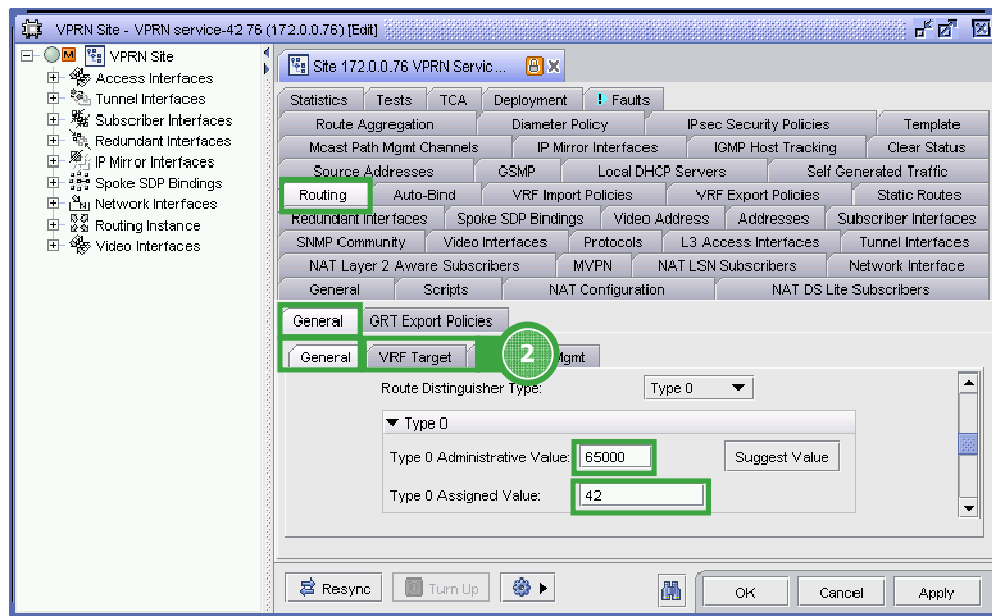
7. Enter the IP address for the interface and click on the OK button. You must apply the changes to the interface by clicking on the Apply button on the VPRN L3 Access Interface form.

## 1.1.3 Creating Route Distinguisher



1. Right-click on a VPRN site and select the Properties command for the contextual menu.

## 1.1.3 Creating Route Distinguisher [cont.]



3 • 7 • 31

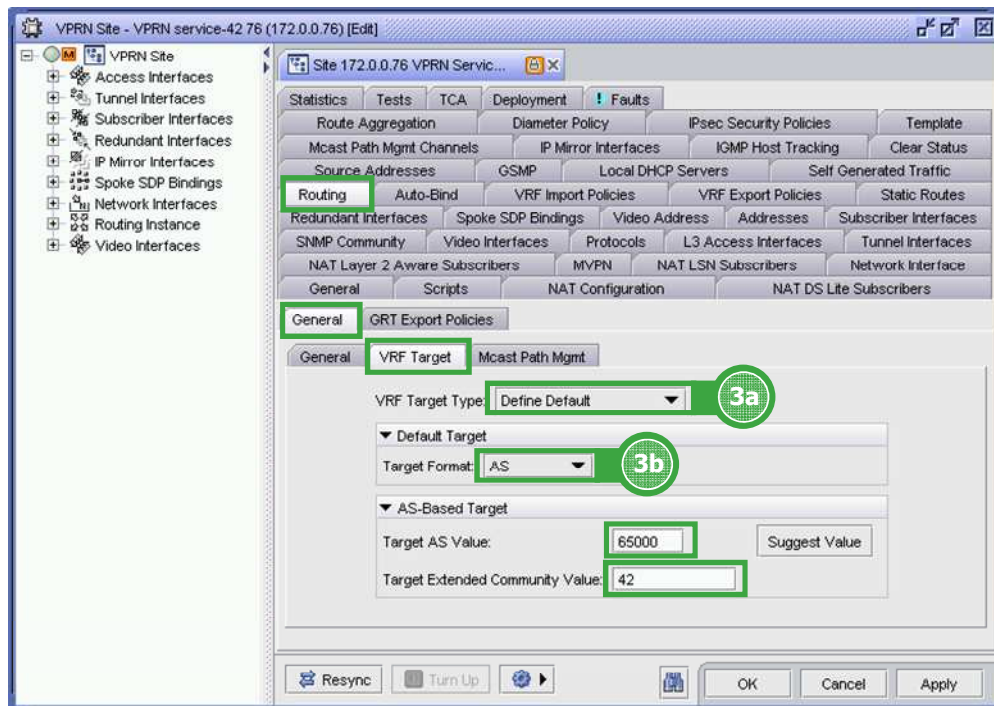
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2. Define the route distinguisher type.

## 1.1.4 Creating Route Target



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- Define the VRF Target type.

## 1.1.5 Creating Auto-Bind

**Repeat steps 1 to 5 for the remaining L3 access interfaces that are associated with this VPRN service**

Transport: **MPLS LDP**

**OK**

Network diagram showing VPRN topology:

- IP/MPLS Cloud
- VPNN from topology map: 172.0.0.72
- VPNN from topology map: 172.0.0.78
- L3 interface for VPRN: Port 1/1/1:0.0
- VPNN from topology map: 172.0.0.77
- L3 interface for VPRN: Port 1/1/1:1.0

3 - 7 - 33

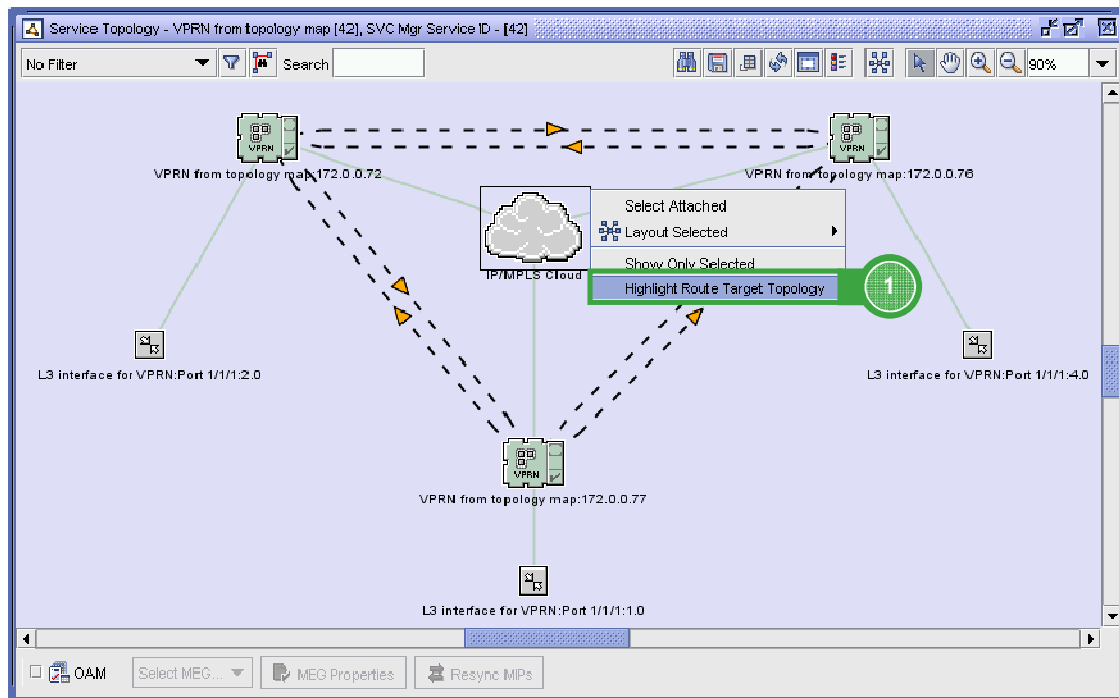
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4. Click on the Auto-bind tab and define the transport type.
5. Click on the OK button.

## 1.1.6 Creating Route Target Topology



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1. Right-click on the service and select the Highlight Route Target Topology command from the contextual menu.



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## End of module VPRN

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## Section 3 Service Types

# Module 8 Composite Service

TOS36042\_V3.0-EQ-English-Ed1 Module 3.8 Edition 1

5620 SAM  
Services Operations and Provisioning  
TOS36042\_V3.0-EQ Edition 1

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1.0	2012-10-12	MCGRATH, John	TOS36042_V1.0 – SAM 10.0 R1
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2.0	2013-04-10	MCGRATH, John	TOS36042_V2.0 First edition – SAM 11.0 R1
2.1	2013-08-16	MCGRATH, John	TOS36042_V2.0 Second edition – SAM 11.0 R1 (update)
3.0	2014-04-03	MCGRATH, John	TOS36042_V3.0 First edition – SAM 12.0 R1



Upon completion of this module, you should be able to:

- Configure a composite service
- Create a VPLS with an L3 gateway

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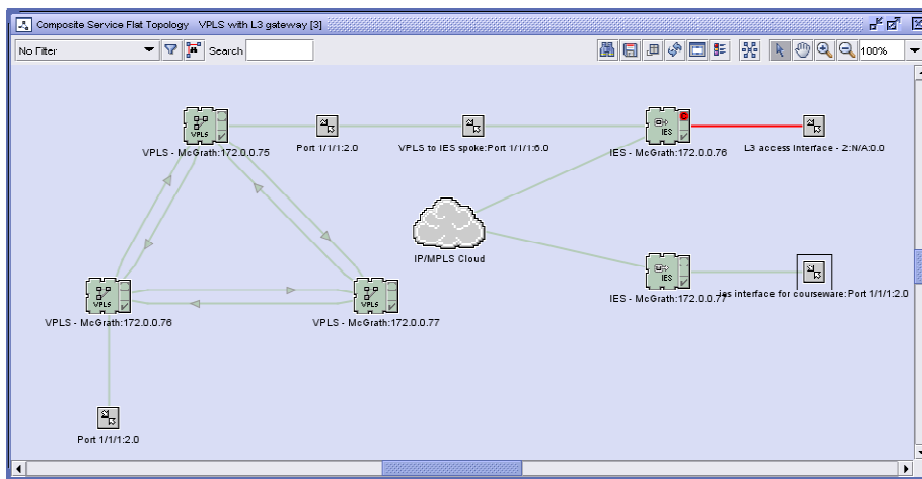


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1.2 Creating a composite service	9
1.2.1 Adding services	10
1.3 VPLS connection to IES	12
1.4 Topology view	14
1.5 Overview of components	15

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# 1 Composite Service Provisioning



**This lab demonstrates how to configure a composite service that consists of 2 services, 5 sites, and one SCP connector that joins the IES and VPLS.**

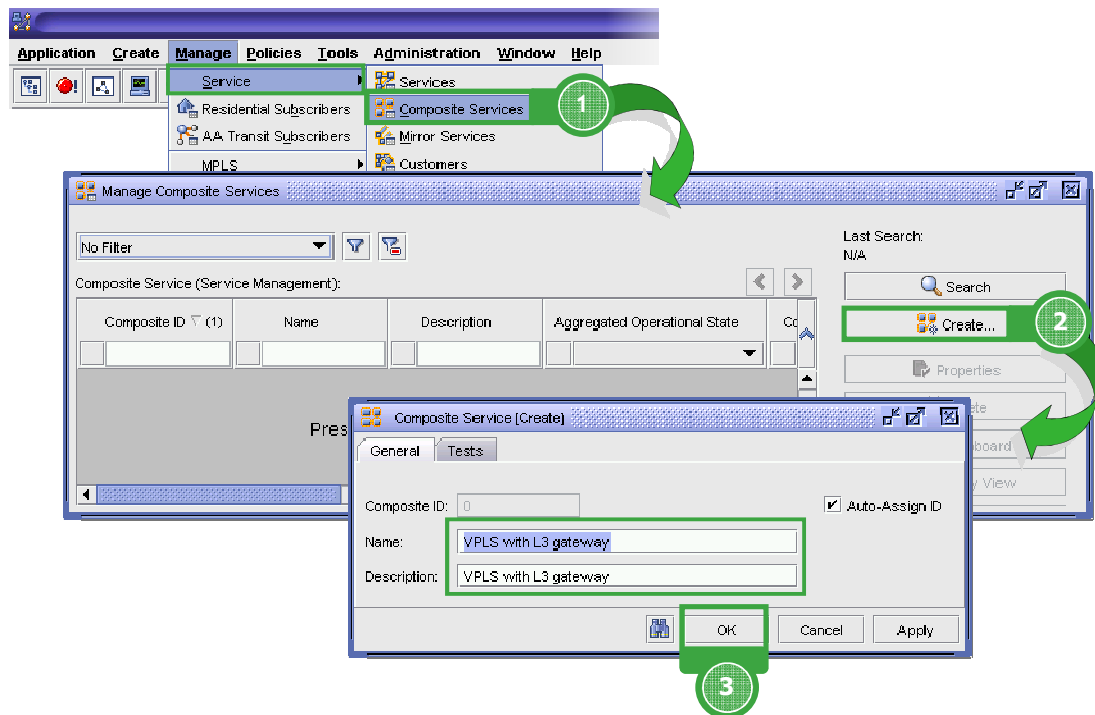
3 • 8 • 8

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## 1.2 Creating a composite service



3 • 8 • 9

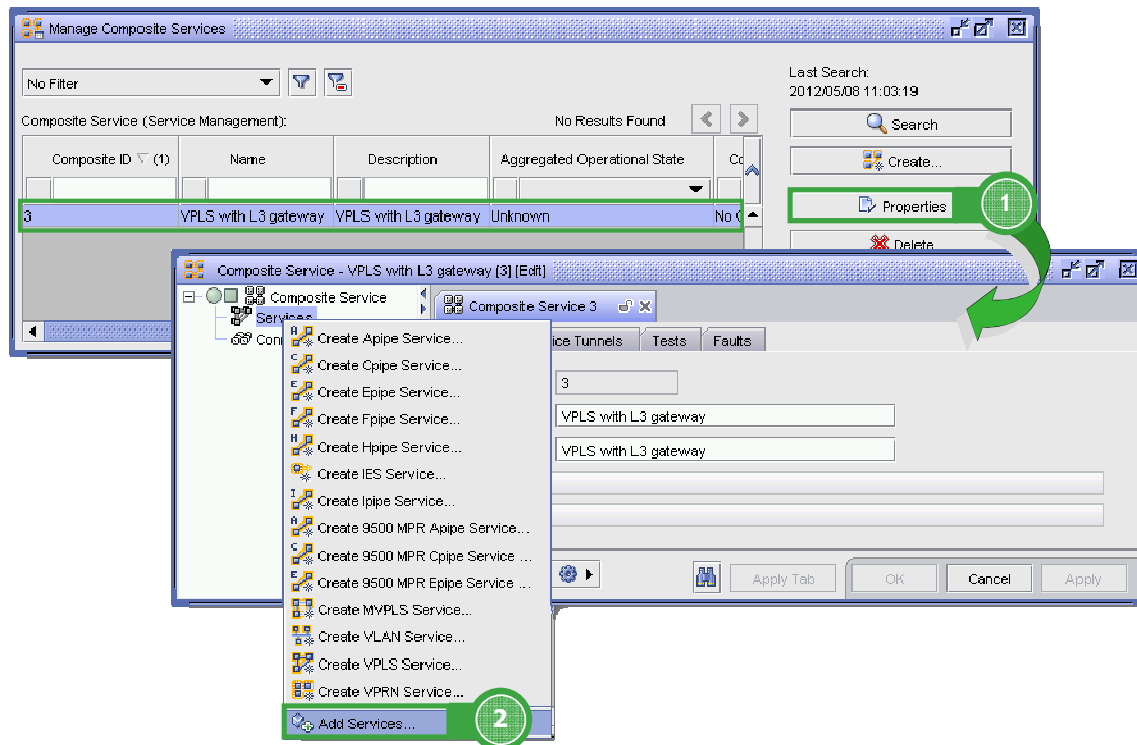
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1. Choose Manage→Service→Composite Services from the 5620 SAM main menu. The Manage Composite Services form opens.
2. Click on the Create button. The Composite Service (Create) form opens with the General tab displayed.
3. Enter the service name and description, and click on the OK button.

## 1.2.1 Adding services



3 · 8 · 10

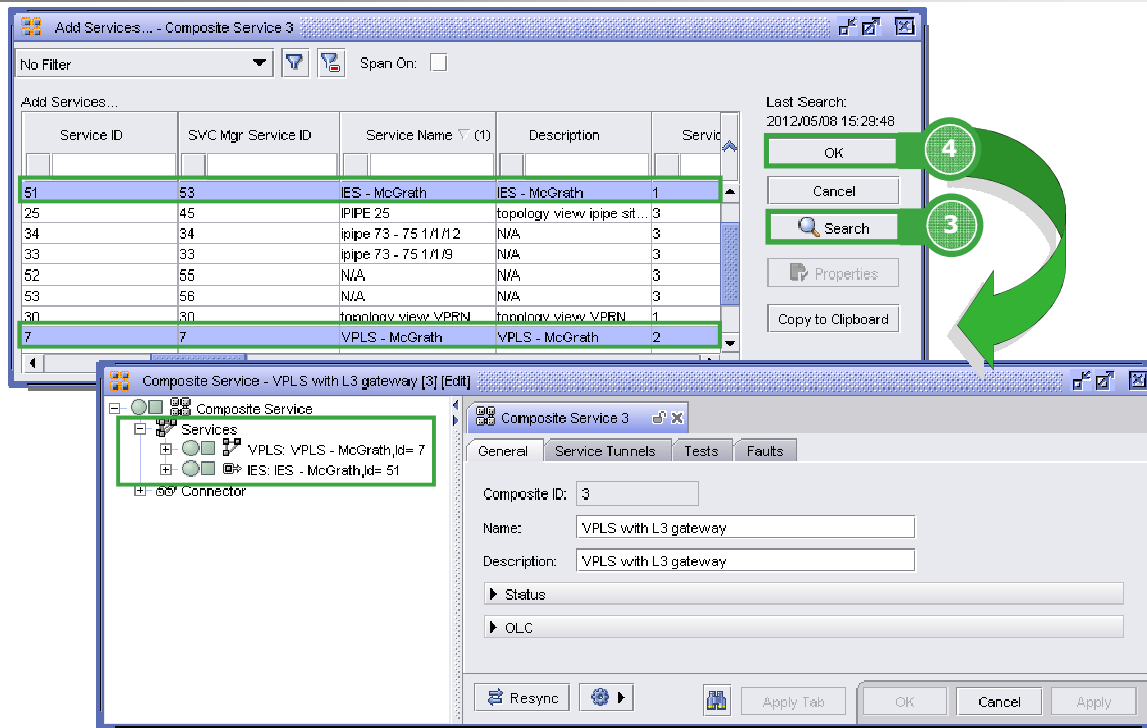
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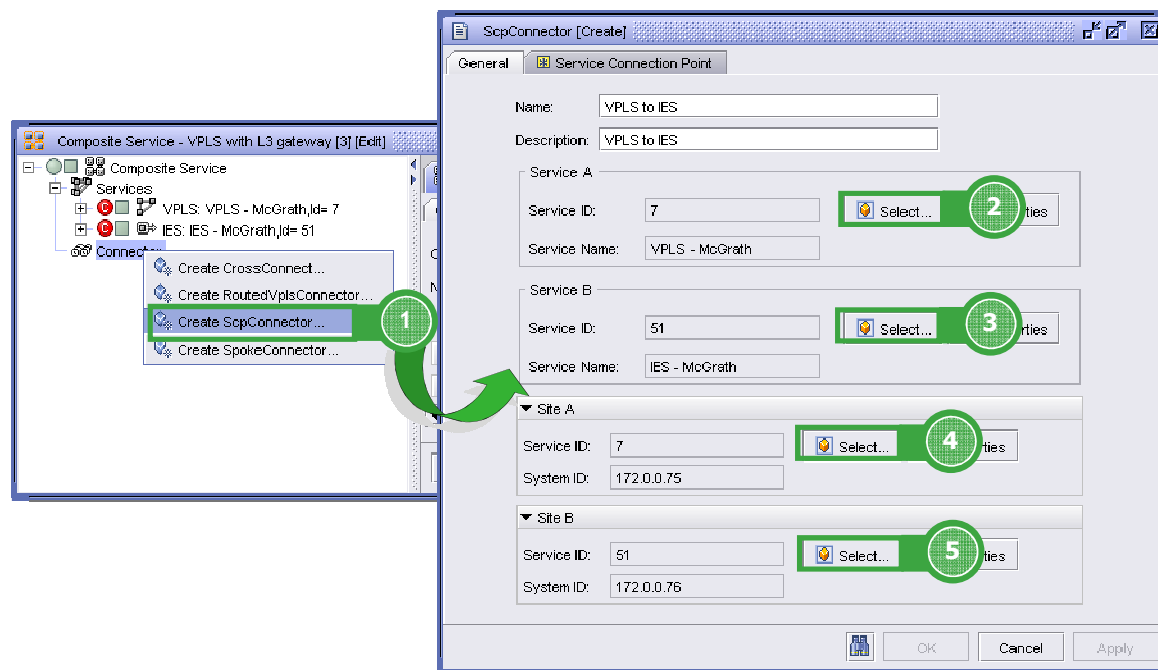
1. Select the composite service and click on the Properties button.
2. Right-click on Composite Service→Services in the navigation area and select the Add Services command from the contextual menu.

## 1.2.1 Adding services [cont.]



- Click on the Search button. A list of available services is displayed.
- Select the services for inclusion in the composite services and click on the OK button.

## 1.3 VPLS connection to IES



3 • 8 • 12

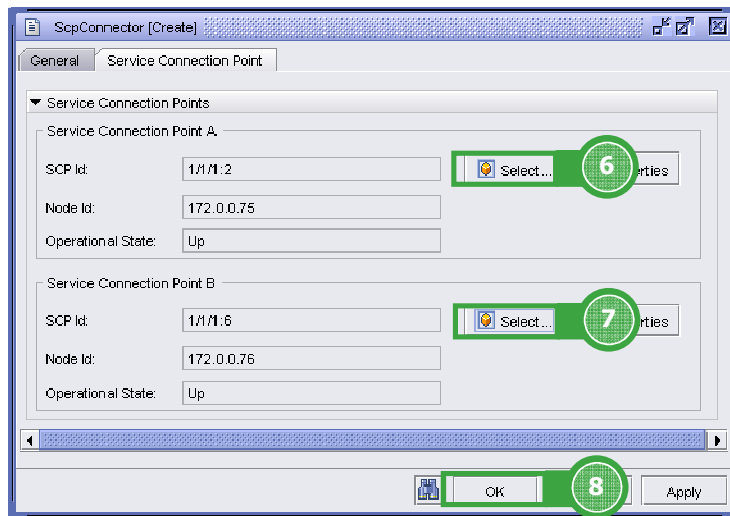
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1. Right-click on Composite Service→Connector in the navigation area and select the Create ScpConnector command from the contextual menu.
2. Click on the Select button in the Service A panel to choose an SC to associate with the connector. The Select Service A - ScpConnector form opens with a list of available SCs displayed.
3. Click on the Select button in the Service B panel to choose an SC to associate with the connector. The Select Service B - ScpConnector form opens with a list of available SCs displayed.
4. Click on the Select button in the Site A panel to choose a site to associate with the connector. The Select Site - ScpConnector form opens with a list of available sites displayed.
5. Click on the Select button in the Site B panel to choose a site to associate with the connector. The Select Site - ScpConnector form opens with a list of available sites displayed.

## 1.3 VPLS connection to IES [cont.]



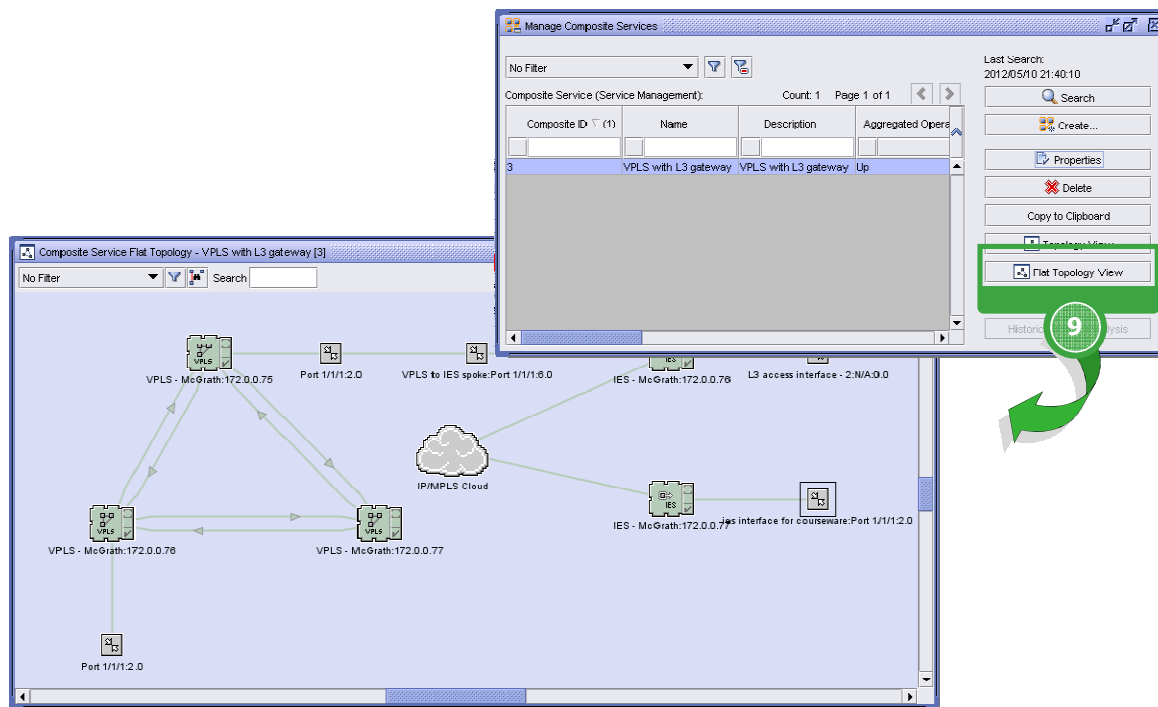
3 • 8 • 13

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6. Click on the Service Connection Point tab and click on the Select button in the Service Connection Point A panel to choose an SCP to associate with the connector.
7. Click on the Select button in the Service Connection Point B panel to choose an SCP to associate with the connector.
8. Click on the OK button.



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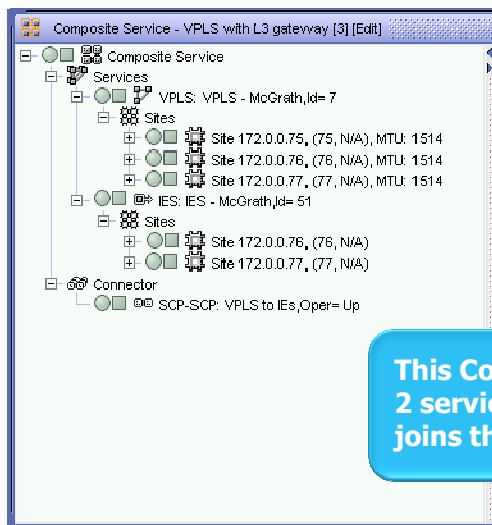
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9. Click on the Flat Topology View button to view the composite service on the topology map.



# 1.5 Overview of components



**This Composite service consists of 2 services, 5 sites, and one SCP connector that joins the IES and VPLS.**



## End of module Composite Service

.....  
**3 • 8 • 16**

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## Section 3 Service Types

# Module 9 Service Mirror

TOS36042\_V3.0-EQ-English-Ed1 Module 3.9 Edition 1

5620 SAM  
Services Operations and Provisioning  
TOS36042\_V3.0-EQ Edition 1

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1.1	2012-11-16	MCGRATH, John	TOS36042_V1.1 – SAM 10.0 R5
2.0	2013-04-10	MCGRATH, John	TOS36042_V2.0 First edition – SAM 11.0 R1
2.1	2013-08-16	MCGRATH, John	TOS36042_V2.0 Second edition – SAM 11.0 R1 (update)
3.0	2014-04-03	MCGRATH, John	TOS36042_V3.0 First edition – SAM 12.0 R1



Upon completion of this module, you will be able to:

- Configure a service mirror
- Identify the components of a basic service mirror

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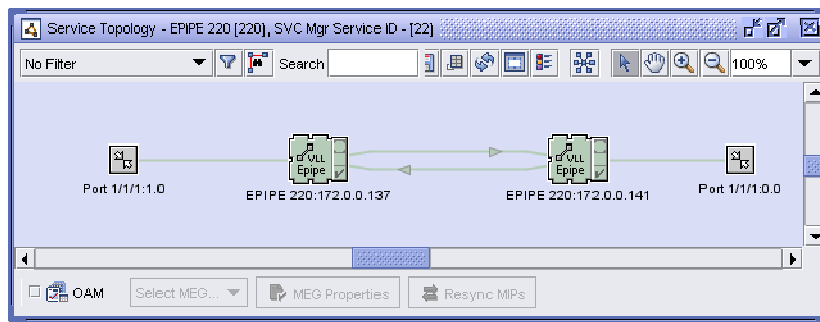
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# 1 Service Mirror Configuration

# 1.1 Lab overview



**This lab demonstrates how to configure the core components of a service mirror for the above Epipe service.**

3 · 9 · 8

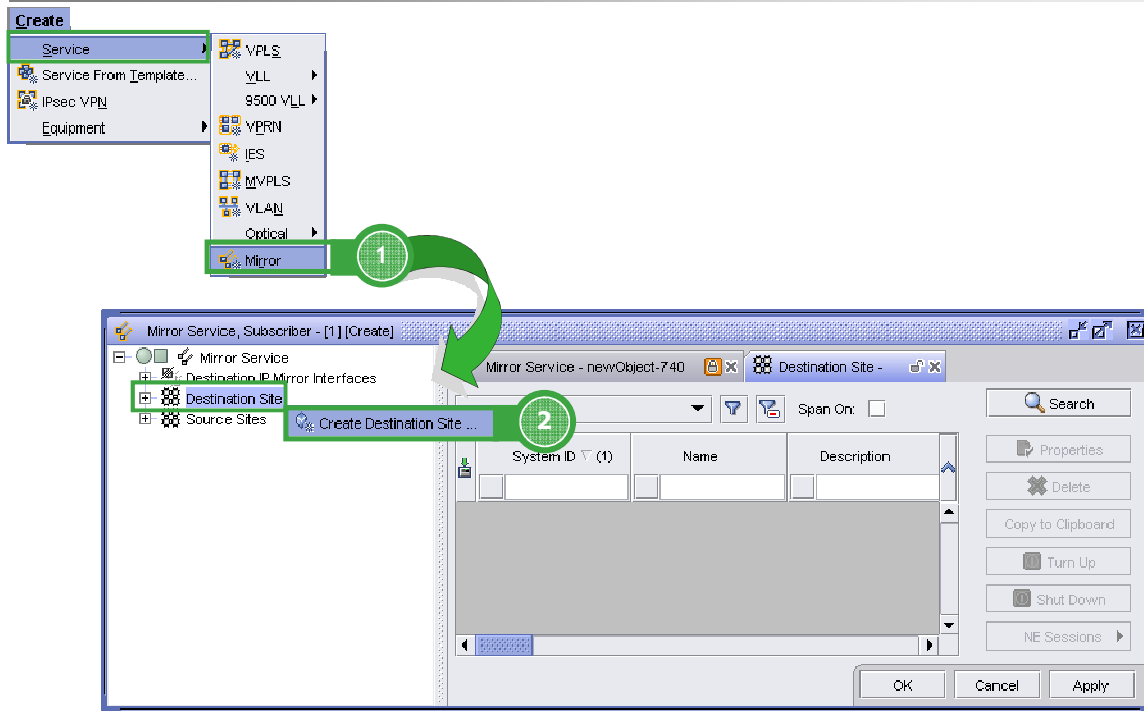
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## 2 Configure the destination site

## 2.1 Create destination site



3 · 9 · 10

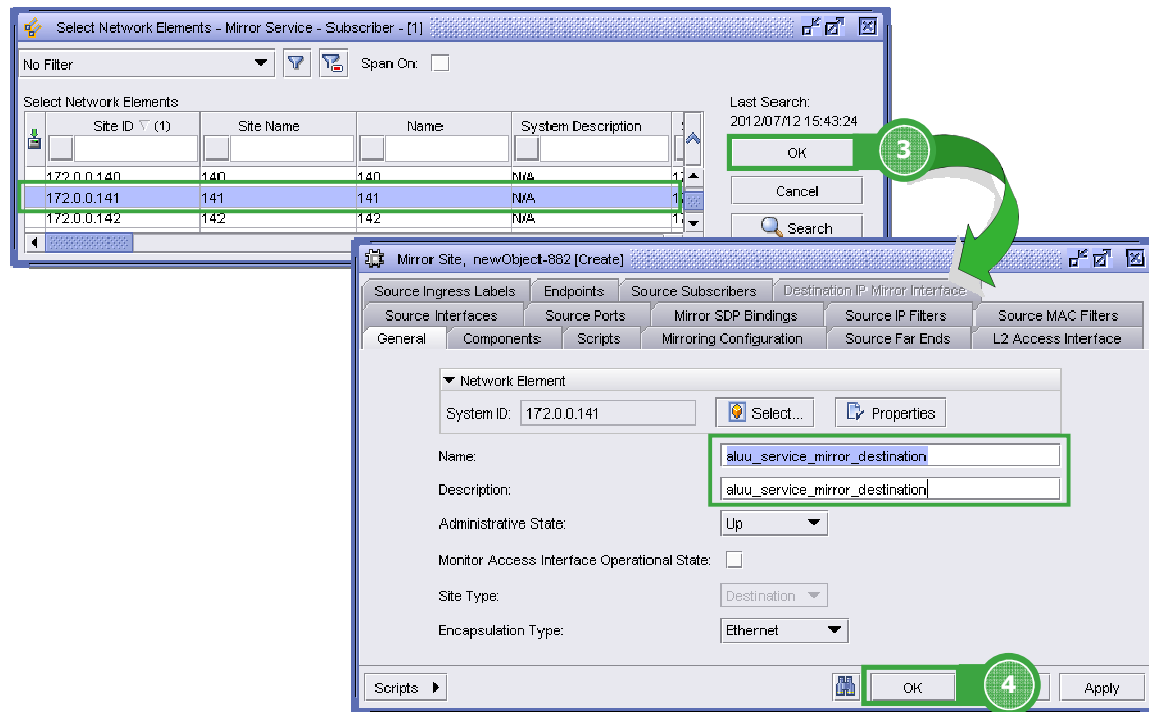
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1. Choose Create→Service→Mirror from the 5620 SAM main menu. The Mirror Service (Create) form opens with the General tab displayed.
2. On the navigation tree, right-click on Destination Site and choose Create Destination Site from the contextual menu. The Select Network Elements - Mirror Service form opens with a list of available sites displayed.

## 2.1 Create destination site [cont.]



3 • 9 • 11

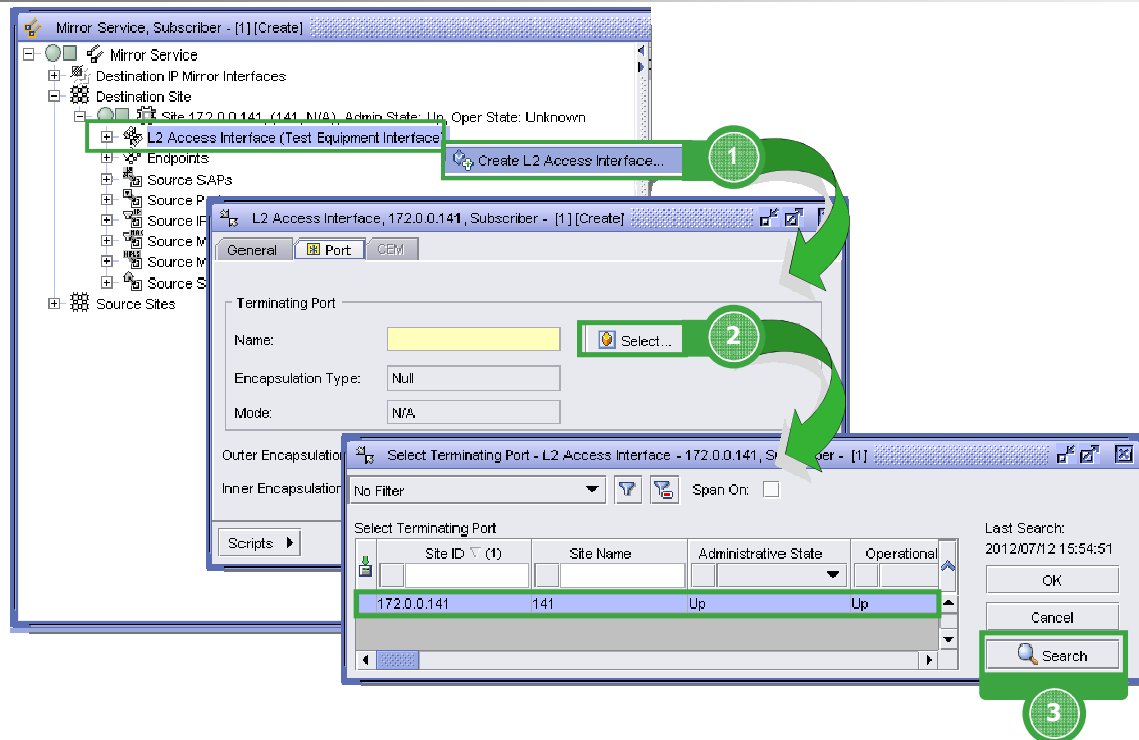
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3. Select a site and click on the OK button.
4. Enter the name and description for the mirror site and click on the OK button.

## 2.2 Create L2 access interface



3 • 9 • 12

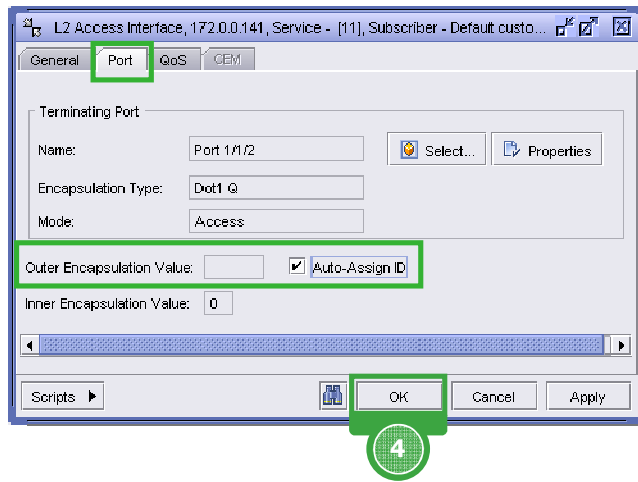
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1. On the navigation tree, right-click on L2 Access Interface associated with the destination site and choose **Create→L2 Access Interface** from the contextual menu. The **L2 Access Interface [Create]** form opens with the **General** tab displayed.
2. Click on the **Port** tab and click on the **Select** button in the **Terminating Port** panel. The **Select Terminating Port** form opens with a list of available access ports.
3. Choose a port from the list and click on the **OK** button. The **Select Terminating Port** form and the **L2 Access Interface [Create]** form refreshes with selected port name is displayed in the **Terminating Port** panel.

## 2.2 Create L2 access interface [cont.]

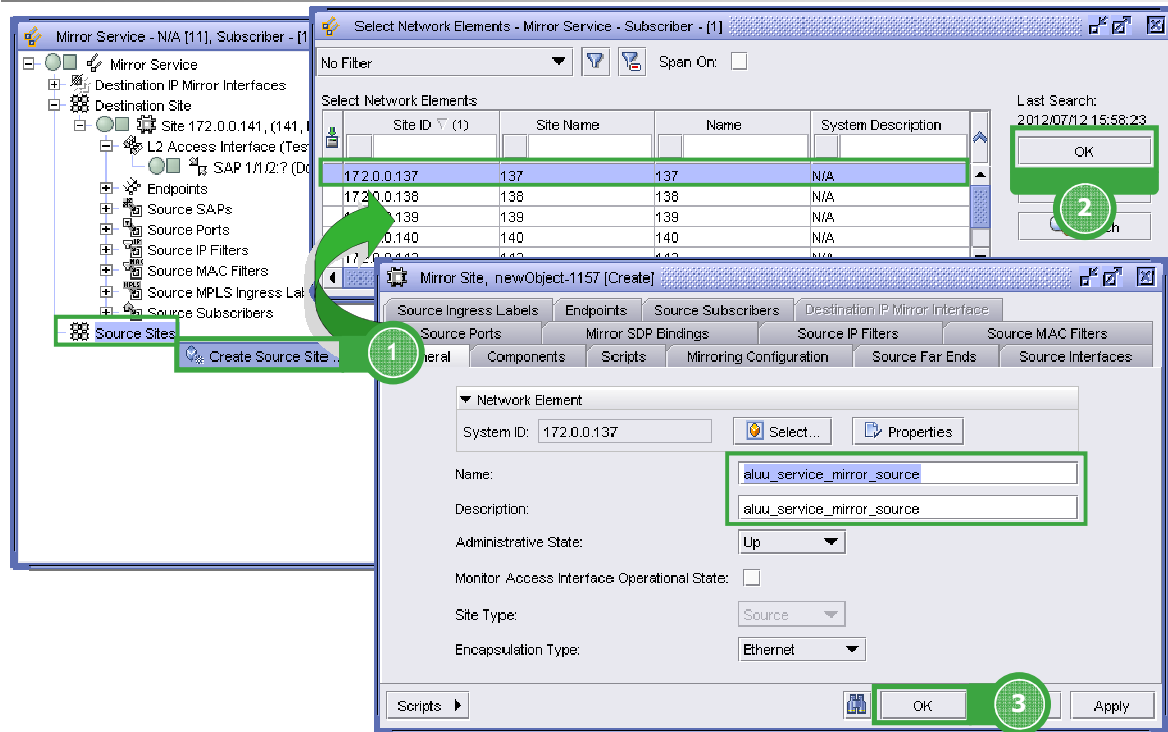


4. Enable the Auto-Assign ID parameter for the outer encapsulation value that is associated with the port.

## 3 Configure the source site



## 3.1 Create source site



3 · 9 · 15

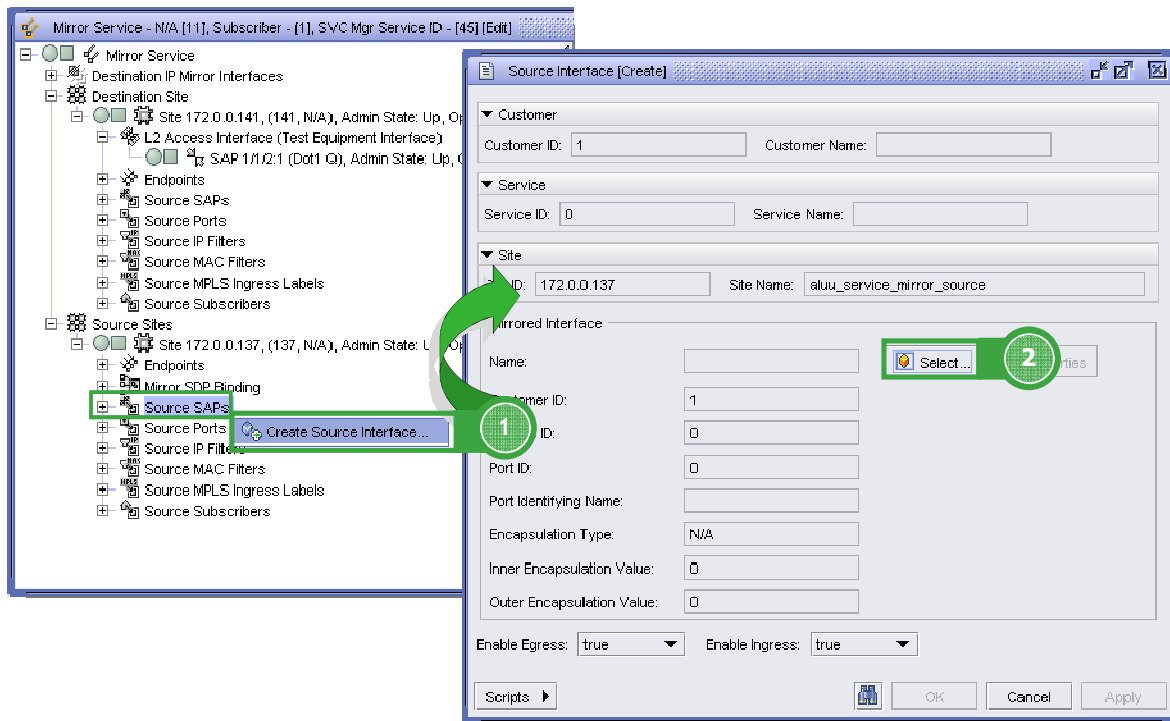
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1. On the navigation tree, right-click on Source Site and choose Create Source Site from the contextual menu. The Select Network Elements - Mirror Service form opens with a list of available sites displayed.
2. Click on the Search button, select a site, and click on the OK button.
3. Enter a name and description for the site and click on the OK button.

## 3.2 Create source interface



3 · 9 · 16

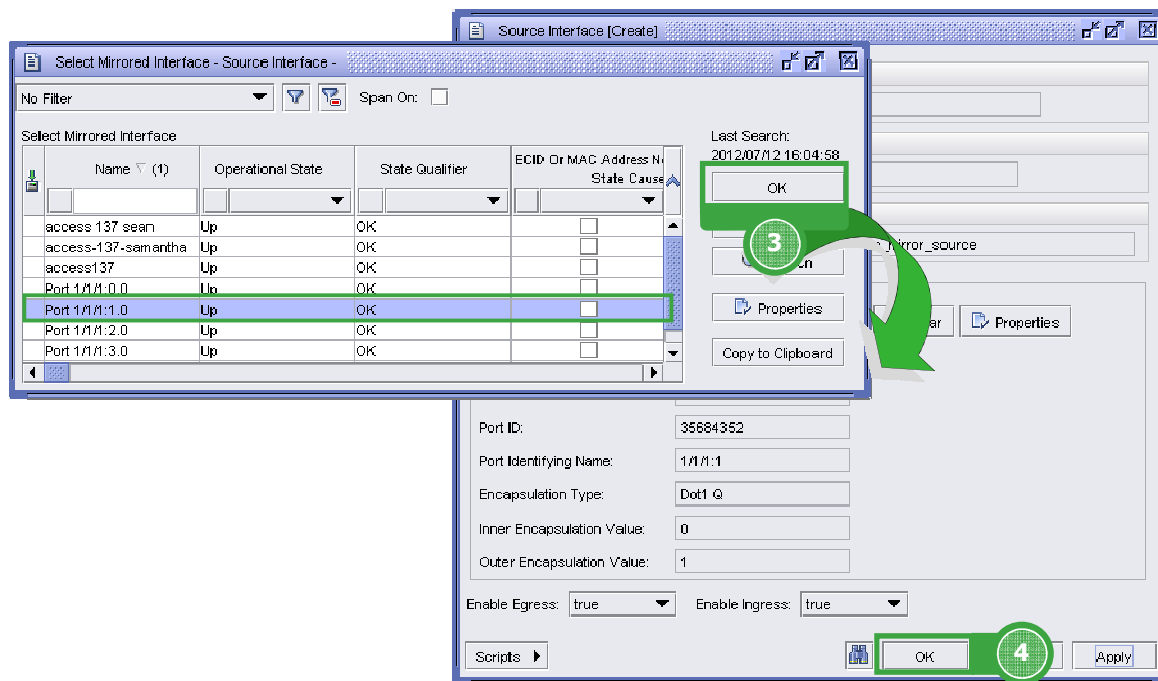
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1. On the navigation tree, right-click on the Source SAP associated with the site and choose Create Source Interface from the contextual menu. The Source Interface (Create) form opens.
2. Click on the Select button to initiate the selection of the source interface.

## 3.2 Create source interface [cont.]



3 · 9 · 17

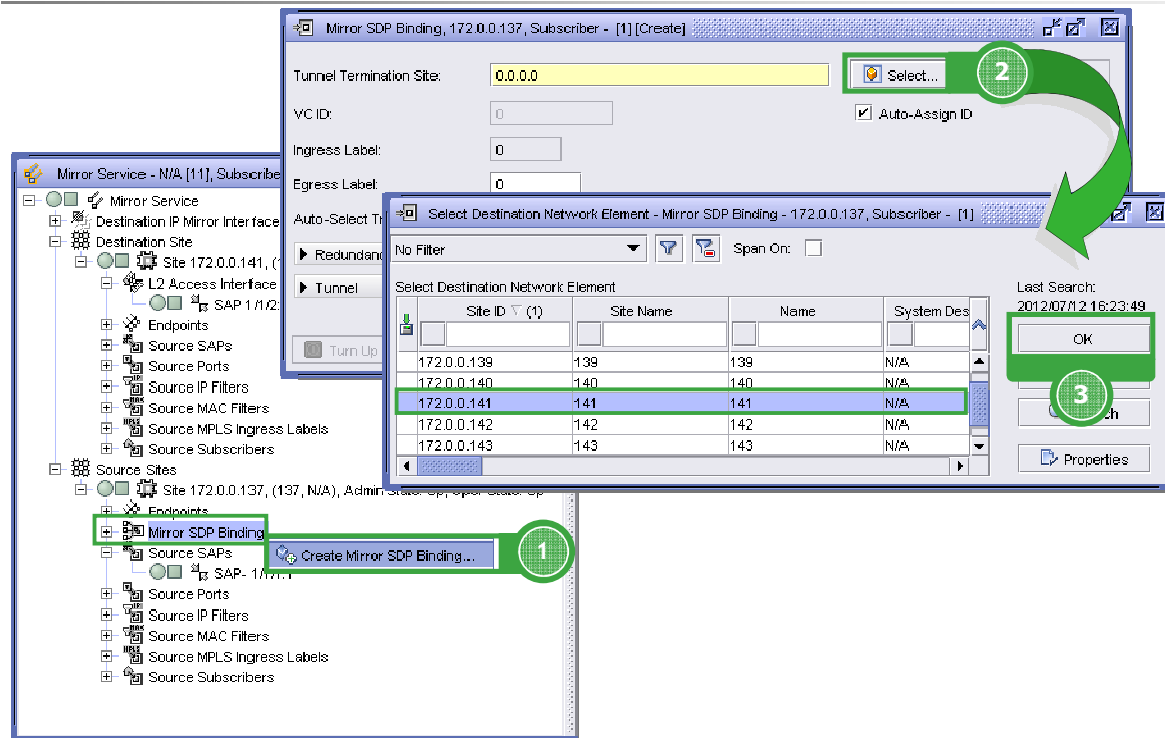
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3. Select the interface and click on the OK button.
4. Click on the OK button.

## 3.3 Create mirror SDP binding



3 · 9 · 18

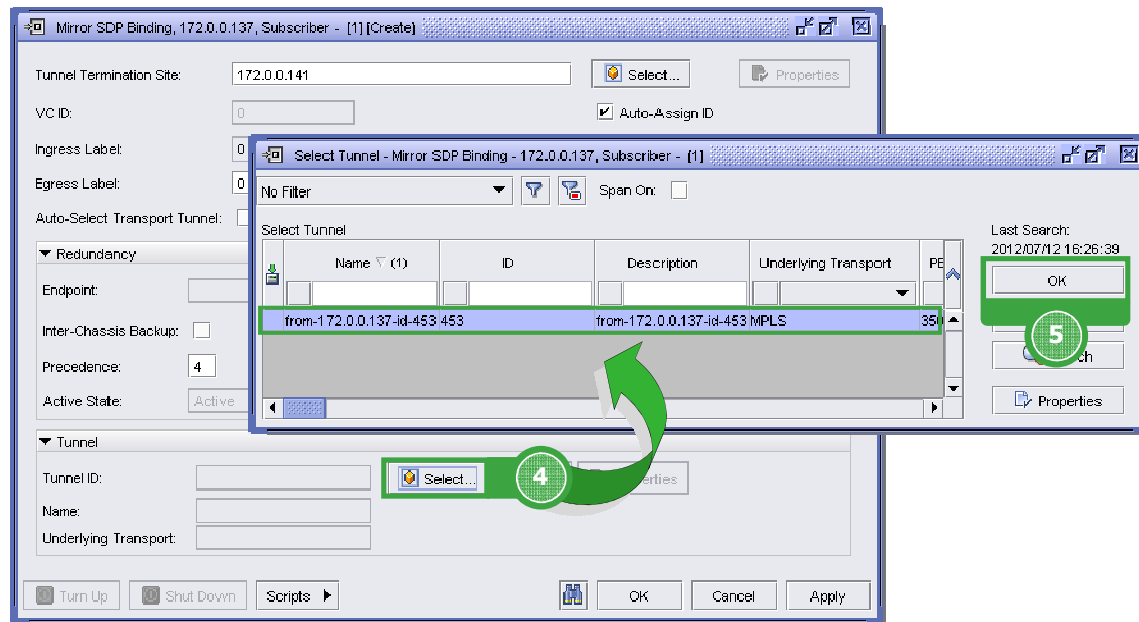
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1. On the navigation tree, right-click on the Mirror SDP Binding associated with the Source Site and choose Create Mirror SDP Binding from the contextual menu.
2. Click on the Select button to initiate the selection of the Tunnel Termination site.
3. Select a site and click on the OK button.

## 3.3 Create mirror SDP binding [cont.]



3 · 9 · 19

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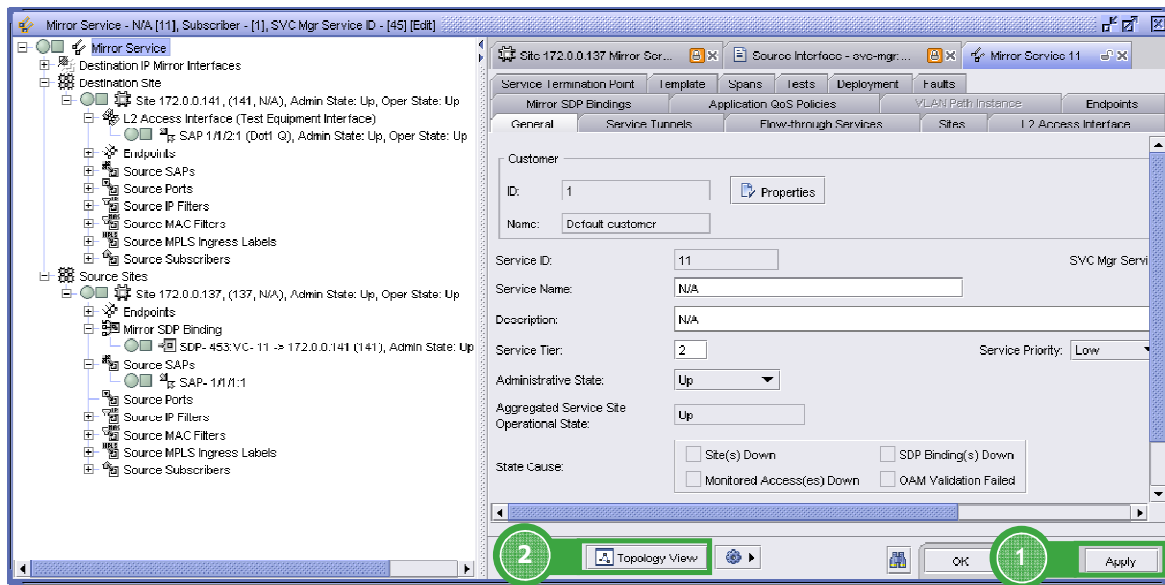
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4. Click on the Select button to initiate the selection of a transport tunnel for the mirror SDP binding.
5. Select the tunnel and click on the OK button.

## 4 Review the service mirror configuration

## 4.1 Apply configuration changes and view topology map



3 · 9 · 21

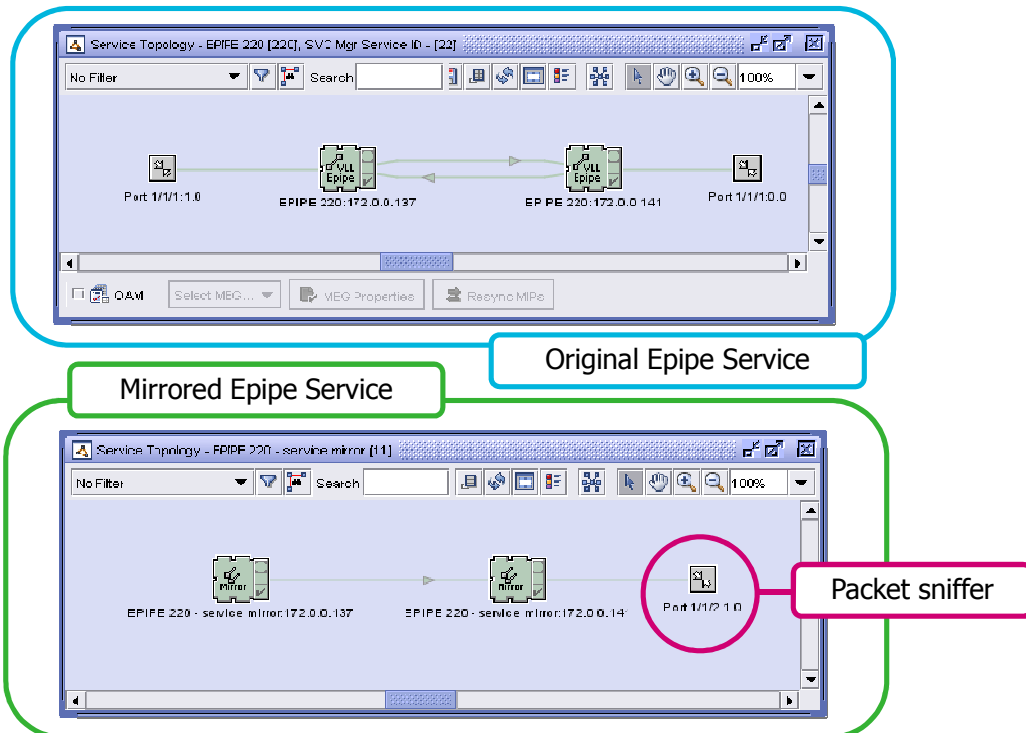
Service Types · Service Mirror  
5620 SAM · Services Operations and Provisioning

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1. Click on the Apply button to save the changes to the service mirror.
2. Click on the Topology View button.

## 4.1 Apply configuration changes and view topology map [con



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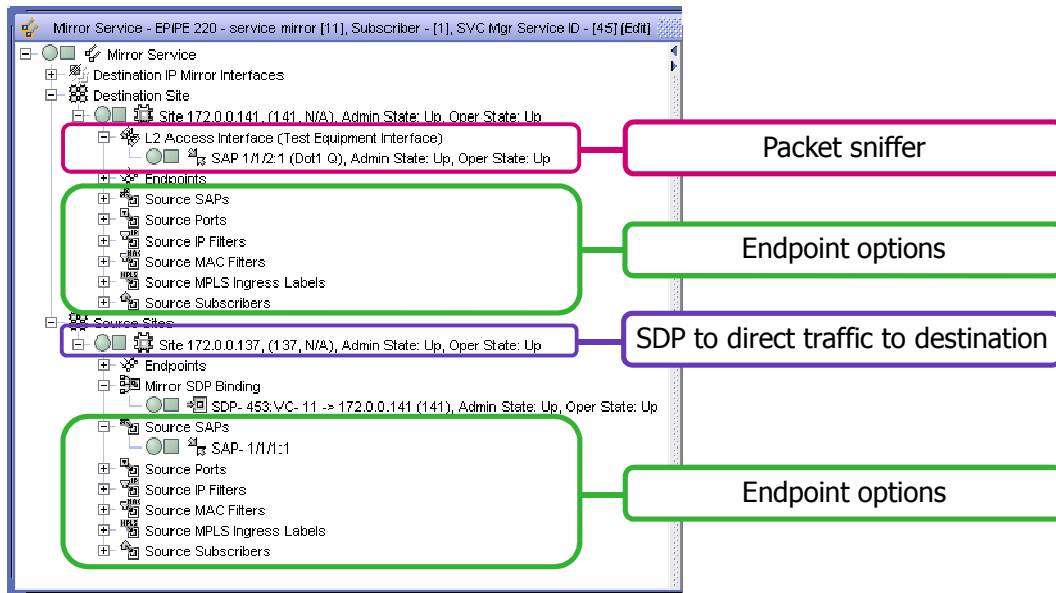
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## 4.2 Basic service mirror components



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- A destination site is a service site with the attached test equipment. A service mirror must have a destination site.
- A source site is a service site where the traffic that is being monitor exists. A source site is created only if the port to be monitored is not on the same site as the test equipment.
- You do not need to specify a destination site if the test equipment is attached to the same service site as the source site.
- Test Equipment connects are restricted to the L2 access interface on the destination site.



## End of module Service Mirror

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## Section 4 OAM diagnostics

# Module 1 VPLS OAM Test

TOS36042\_V3.0-EQ-English-Ed1 Module 4.1 Edition 1

5620 SAM  
Services Operations and Provisioning  
TOS36042\_V3.0-EQ Edition 1

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Edition	Date	Author	Remarks
1.0	2012-10-12	MCGRATH, John	TOS36042_V1.0 – SAM 10.0 R1
1.1	2012-11-16	MCGRATH, John	TOS36042_V1.1 – SAM 10.0 R5
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2.1	2013-08-16	MCGRATH, John	TOS36042_V2.0 Second edition – SAM 11.0 R1 (update)
3.0	2014-04-03	MCGRATH, John	TOS36042_V3.0 First edition – SAM 12.0 R1



Upon completion of this module, you should be able to:

- Create OAM diagnostic tests for a Virtual Private LAN Service (VPLS)

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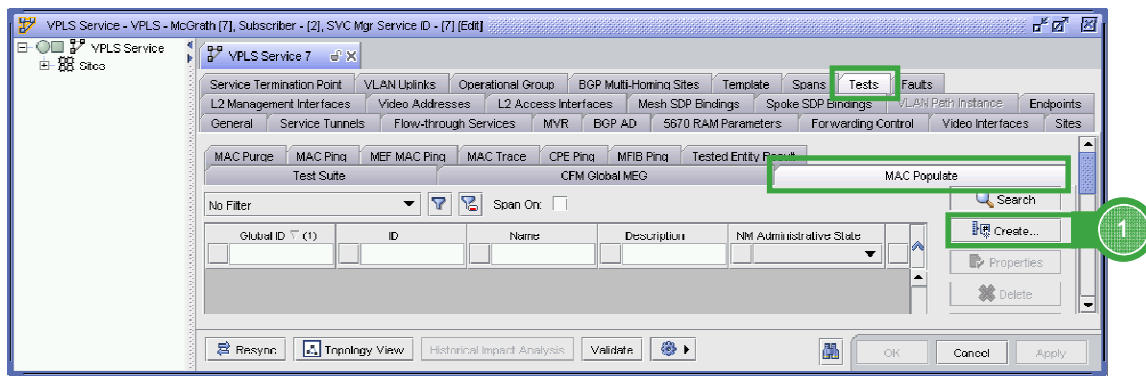
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# 1 VLL Populate

# 1.1 MAC Populate - Create



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To configure the **MAC Populate** OAM test:

1. Navigate to the **Test** tab of the service to be tested. From the main menu, select **Manage > Services**, click on the **Search** button, select the appropriate service from the list and click on the **Properties** tab;
2. Click on the **Test** tab to open the configuration window;
3. Click on the **MAC Populate** tab;
4. Open the configuration window by clicking on the **Create** button at the right side of the window.
5. Provide a unique **ID** (mandatory). **Name** and **Description** are defined as per corporate policy. Though optional, these parameters will be useful as a filtering tool to quickly identify the test at a later date.

## 1.1 MAC Populate - Create [cont.]

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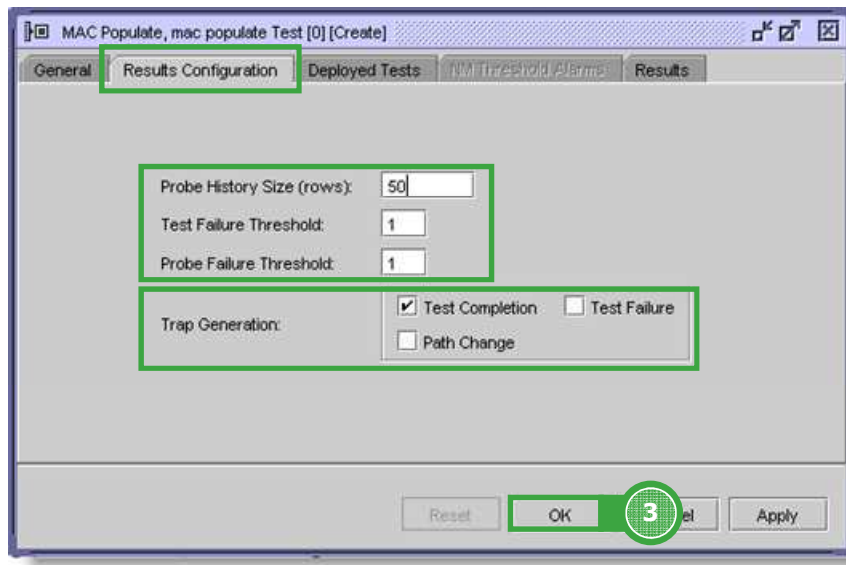
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The **MAC Populate Test [Create]** configuration window appears on the screen. Set the following parameters, as required:

1. Provide a unique **ID** (mandatory). **Name** and **Description** are defined as per corporate policy. Though optional, these parameters will be useful as a filtering tool to quickly identify the test at a later date;
2. **NE Schedulable** and **Persistent** - enabling these parameters will result in the test being sent to the network elements which then becomes available through the node CLI;
3. **Test Object** - sets the **Target MAC** and the **Source MAC Address** from which the ping will originate. If the Target address is a broadcast (all ones), it will generate a response from all sites within the VPLS instance. The Source MAC set to all zeros indicates that the ping test will be generated using the base MAC address of the selected node CPM;
4. **Service** - this is automatically populated by the 5620 SAM and corresponds to the selected service to be tested;
5. **Site Information** - this is a mandatory parameter that specifies the site within the service to which the MAC ping will be generated. Click on the **Select** button and choose the appropriate entry from the list that is provided. Network personnel may have to click on the **Search** button for the available sites to be listed.

# 1.1 MAC Populate - Create [cont.]



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**Results Configuration** sets up the format for the test results.

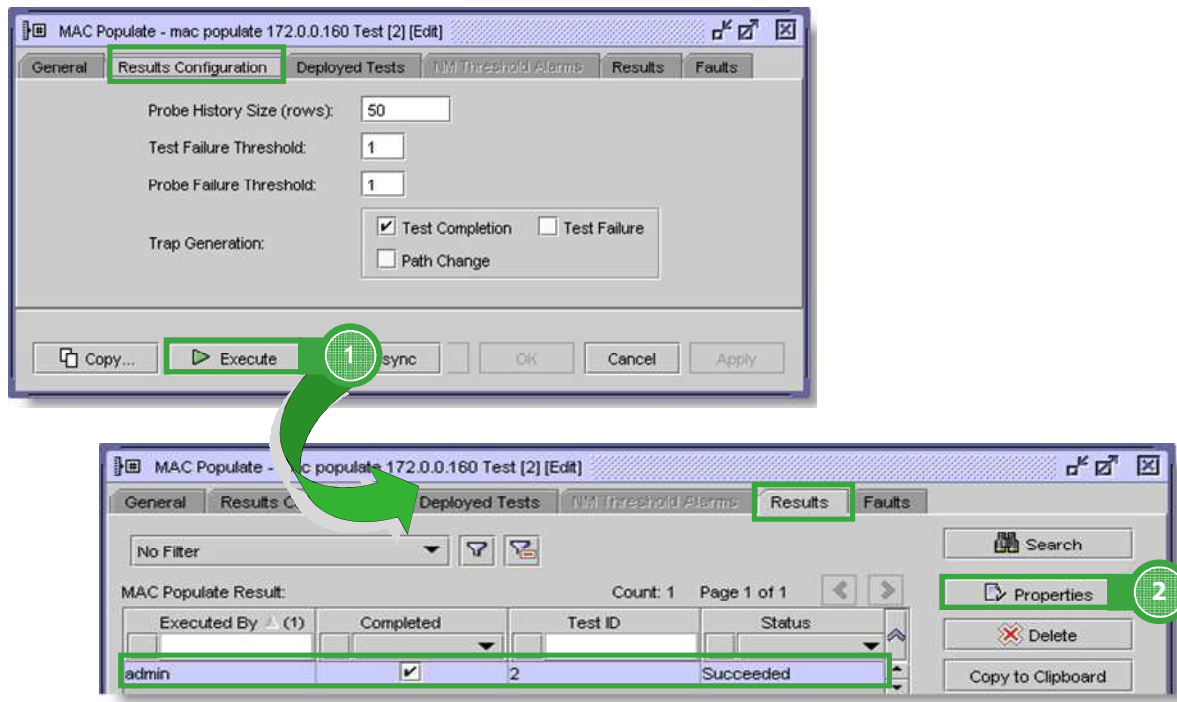
Test Probe configuration sets the maximum number of rows in the Probe History as well as defining failure thresholds; the point at which an trap will be generated.

- Test Failure Threshold - the number of times for which the test fails before a trap is generated;
- Probe Failure Threshold - the number of failed probes at which a trap will be generated.

Trap generation deals with sending messages to the node syslog and to the 5620 SAM. By default, a trap will be generated when the test has completed. Network personnel may choose to enable traps to be generated upon Test failure and Path Changes, in any combination, by checking or unchecking the parameter box associated with the attribute.

Click on the **OK** or **Apply** button to save the changes to the 5620 SAM database.

## 1.2 MAC Populate - Execute



To manually launch the **MAC Populate** test:

1. Click on the **Execute** button that has appeared at the bottom of the window after the configuration has been saved;
2. To view the test results, click on the **Results** tab at the top of the window. A list of the available tests appears in the list.
3. Select the appropriate test from the list. Network personnel may be required to click on the **Search** button to create the list or to apply a filter to reduce the number of entries;
4. Click on the **Properties** button at the right side of the window.

# 1.3 MAC Populate - Results

MAC Populate Result - Result - [admin], Test - [2], [172.0.0.160] [Edit]

Executed By: admin

Completed: ☒ Timed Out: ☐

Test ID: 2 Status: Succeeded

Time Captured: 2009/08/11 12:52:02 539 EDT Reason: N/A

From Node: 172.0.0.160 Execution Trigger: SAM Triggered

Test Result

Test Execution Status: Completed

Target MAC Address: 22-11-11-11-11-11

Service ID: 16

Send via Control Plane: ☐

Flood: ☒

Force OAM: ☐

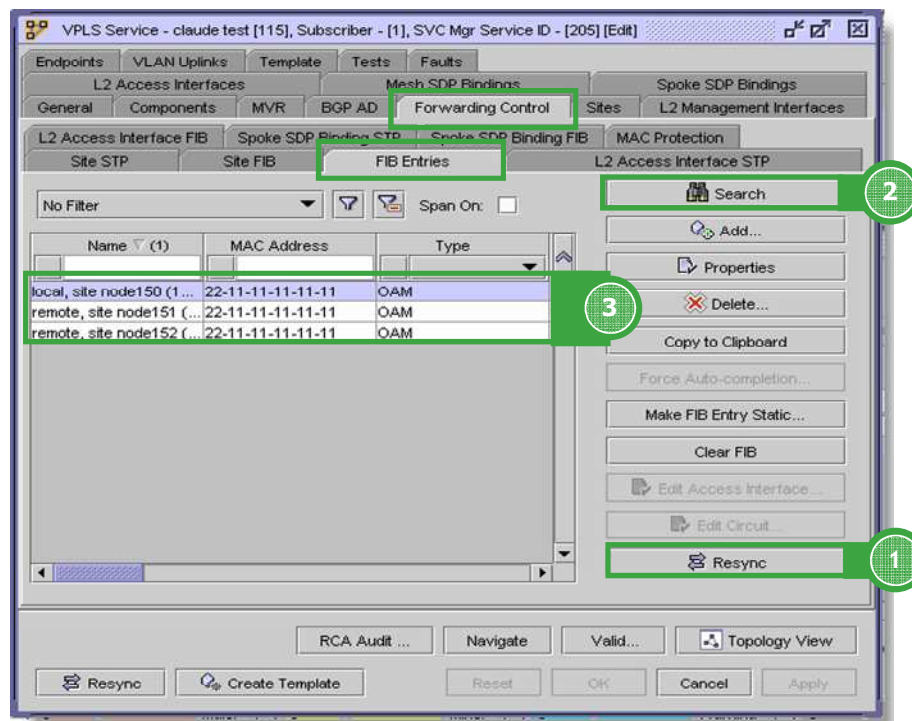
Age (seconds): 3600

View Test... View Tested Object... Reset OK Cancel Apply

The **MAC Populate Result** provides the test results within the one window. From this context, it is possible to determine a wide variety of information including; test status, the time the result was captured by the 5620 SAM, the event trigger mechanism, service tested and the MAC address that was used in this test.

1. Review the general test information.
2. Review the test results.

## 1.4 MAC Populate – View FIB Tables



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The network operator may also view the OAM MAC in the Forwarding Database from within the VPLS.

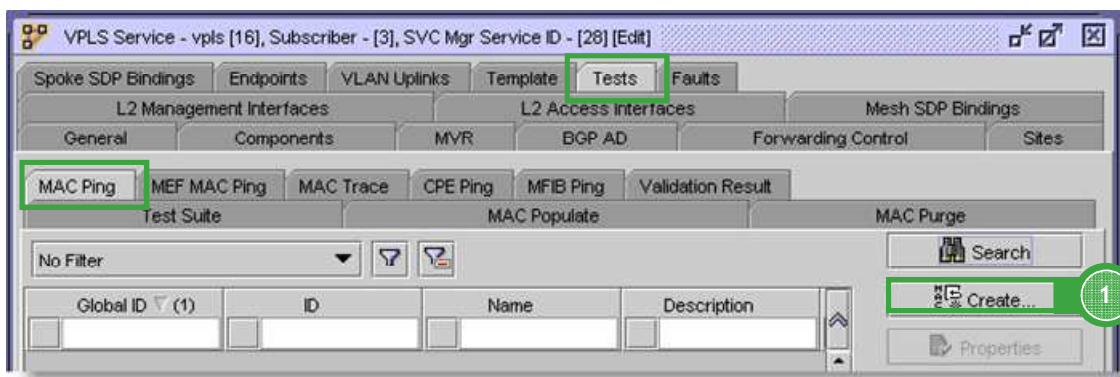
To view the FDB:

1. Click in the **Resync** button at the bottom left of the window;
2. Click on the **Search** button at the top left side of the window;
3. A complete list of the MAC addresses within the service will appear. The OAM MAC addresses will be listed as OAM in the **Type** column in the table.

## 2 VLL Ping



## 2.1 MAC Ping - Create



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To configure the MAC Ping OAM test:

1. Navigate to the **Test** tab of the service to be tested. From the main menu, select **Manage > Services**, click on the **Search** button, select the appropriate service from the list and click on the **Properties** tab;
2. Click on the **Test** tab to open the configuration window;
3. Click on the **MAC Ping** tab;
4. Open the configuration window by clicking on the **Create** button at the right side of the window.

## 2.1 MAC Ping - Create [cont.]

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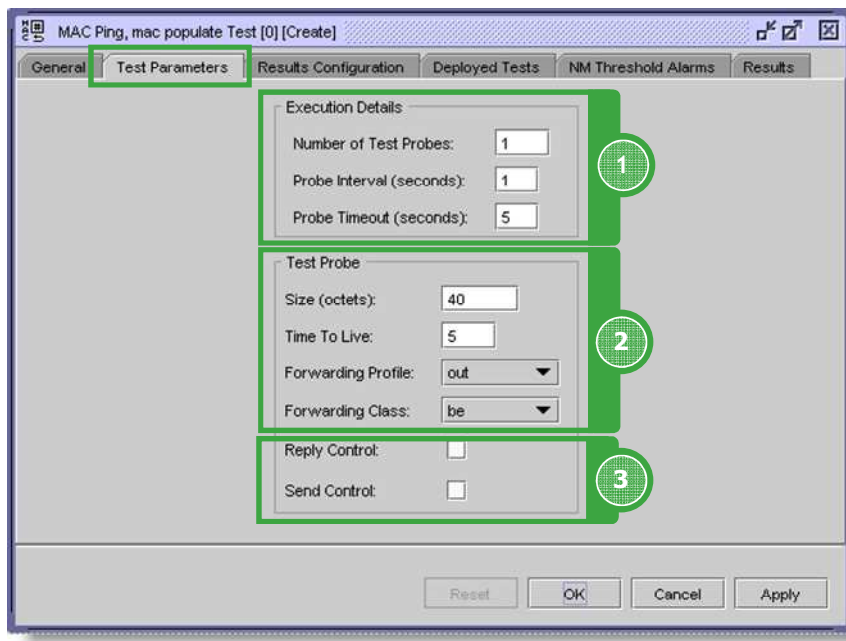
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The MAC Ping Test [Create] configuration window appears on the screen. Set the following parameters, as required:

- Provide a unique **ID** (mandatory). **Name** and **Description** are defined as per corporate policy. Though optional, these parameters will be useful as a filtering tool to quickly identify the test at a later date;
- **NE Schedulable** and **Persistent** - enabling these parameters will result in the test being sent to the network elements which then becomes available through the node CLI;
- **Test Object** - sets the **Target MAC** and the **Source MAC Address** from which the ping will originate. If the Target address is a broadcast (all ones), it will generate a response from all sites within the VPLS instance. The Source MAC set to all zeros indicates that the ping test will be generated using the base MAC address of the selected node CPM;
- **Service** - this is automatically populated by the 5620 SAM and corresponds to the selected service to be tested;
- **Site Information** - this is a mandatory parameter that specifies the site within the service to which the MAC ping will be generated. Click on the **Select** button and choose the appropriate entry from the list that is provided. Network personnel may have to click on the **Search** button for the available sites to be listed.

## 2.1 MAC Ping - Create [cont.]



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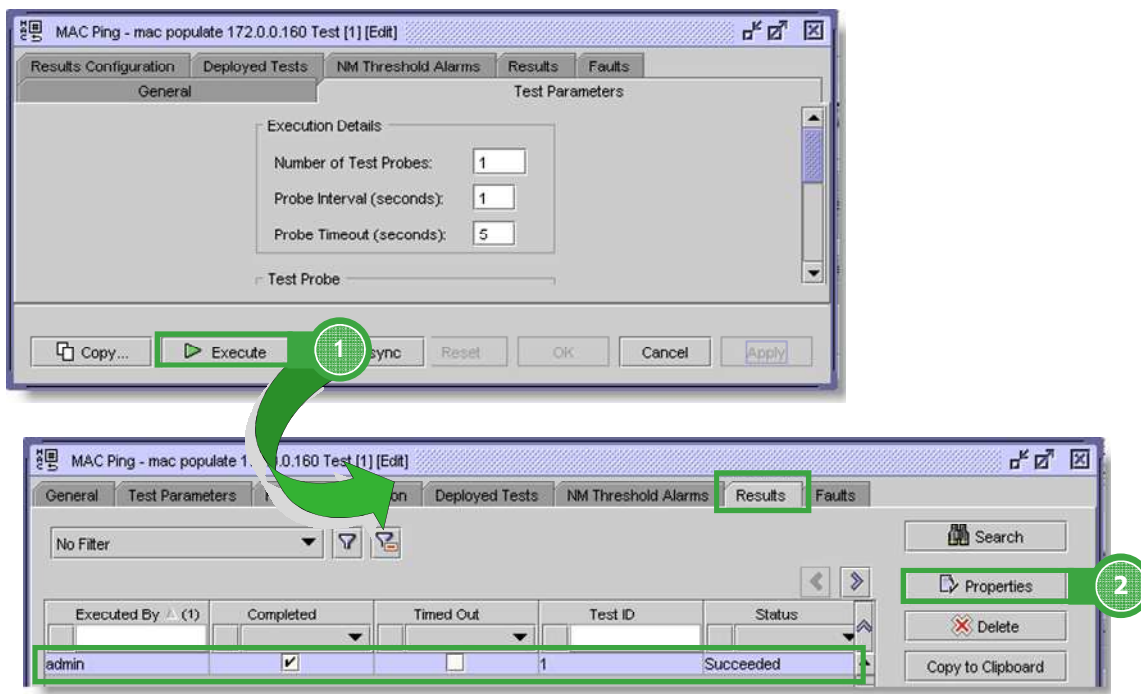
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Test Parameters allows network personnel to define that characteristics of the MAC Ping test, as follows:

- **Execution Details** - specifies the test probe characteristics, including; the number of probes, the Interval expressed in seconds between sending probes, and the Timeout interval that is the maximum wait time for a probe response before it is considered having failed;
  - **Test Probe** - sets up the probe itself.
  - **Probe Size** - packet size for the probe. This permits network personnel to take into consideration the propagation delays generated through processing different size packets;
  - **Time to Live** - defines the maximum number of hops to which the Target MAC must be reachable;
  - **Forwarding Profile and Class** - permits network personnel to pass the test packets through the QoS configuration associated to the service;
  - **Reply and Send Control** - by default, the 5620 SAM will run the test through the data plane. By enabling these parameters, the test packets will be processed through the control plane instead. These parameters may be configured independently of the other (i.e. the probe may be sent via the data plane and the response returned via the control plane).
- Click on the **Apply** button at the bottom of the page to save the changes and keep the window open.

## 2.2 MAC Ping - Execute



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To manually launch the MAC ping test:

1. Click on the **Execute** button that has appeared at the bottom of the window after the configuration has been saved;
2. To view the test results, click on the **Results** tab at the top of the window. A list of the available tests appears in the list.
3. Select the appropriate test from the list. Network personnel may be required to click on the **Search** button to create the list or to apply a filter to reduce the number of entries;
4. Click on the **Properties** button at the right side of the window.

## 2.3 MAC Ping - Results

MAC Ping Result - Result - [admin], Test - [1], [172.0.0.160] [Edit]

General Responders and Probes Details

Executed By: admin

Completed: ☒ Timed Out: ☐

Test ID: 1 Status: Succeeded

Time Captured: 2009/08/10 23:15:28 604 EDT Reason: N/A

From Node: 172.0.0.160 Execution Trigger: SAM Triggered

Ping Attempt

Service ID: 16 Size (octets): 40

Target MAC Address: FF-FF-FF-FF-FF-FF Source MAC Address: 00-00-00-00-00-00

Time To Live: 0

Forwarding Profile: out

Forwarding Class: be

Reply Control: ☐

Control Plane: ☐

General Results

Probes Sent: 1 Probe Timeouts (Probes): 0

Responses Received: 1

Last Good Probe Time: 2009/08/10 17:50:51 000 EDT

View Test... View Tested Object... Reset OK Cancel Apply

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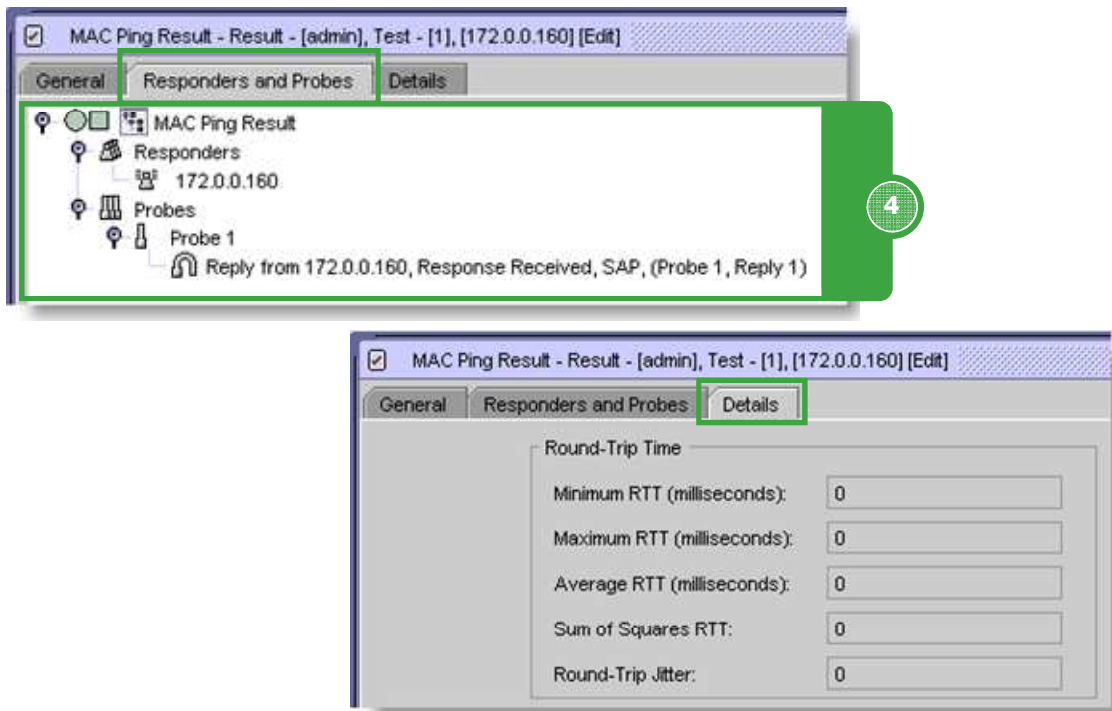
The **Results** window organizes information under three (3) tabs; **General**, **Responders and Probes**, and **Details**.

The window opens to the **General** tab as its default action. Information includes; general information about the test such as, the **Status** of the test, the time at which it was executed and where the trigger was originated. From the information available in the illustration above, it can be determined that the test was **successfully completed** on **08 August, 2009** and was **triggered** from the **5620 SAM**.

**Ping Attempt** provides the test configuration details. This is the same information that was provided when the test was configured.

**General Results** is a summary of the test which includes the Probe information (**Sent**, **Received**, **Timeout**) and the 5620 SAM Server time at which the last good probe was received.

## 2.4 MAC Ping – Results



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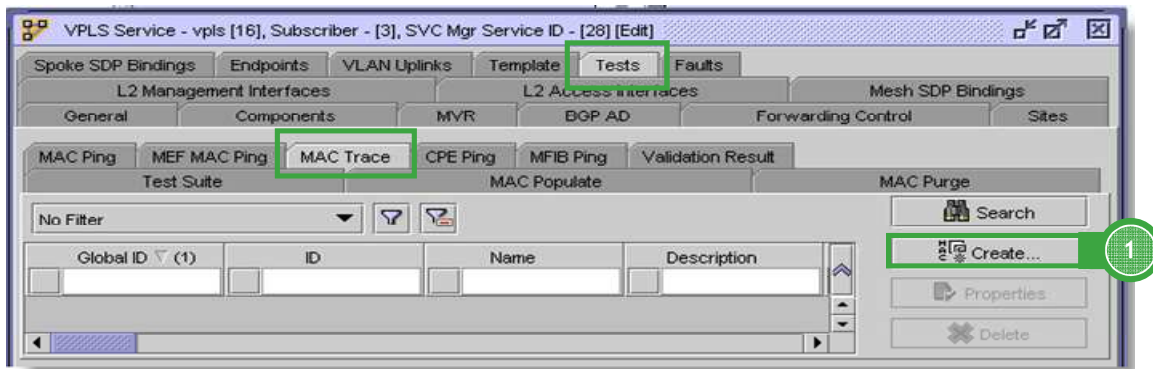
The Responders and Probes tab provides information pertaining to each probe in a tabular form. The Responder is the node to which the MAC ping was directed and the Probe indicates what object provided the response. To expand the table, click on the key at the left of the entry.

The Details tab provides the results dealing with the propagation of the probe(s), such as; **Round-Trip Time**, **Outbound One-Way Time** and **Inbound One-Way Time**.

These results are stored in the 5620 SAM database permitting network personnel to retrieve this information at a later date. They may also choose to delete the results, as deemed necessary.

## 3 VLL Trace

## 3.1 MAC Trace - Create



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To configure the MAC Trace OAM test:

1. Navigate to the **Test** tab of the service to be tested. From the main menu, select **Manage > Services**, click on the **Search** button, select the appropriate service from the list and click on the **Properties** tab;
2. Click on the **Test** tab to open the configuration window;
3. Click on the **MAC Trace** tab;
4. Open the configuration window by clicking on the **Create** button at the right side of the window.



## 3.1 MAC Trace - Create [cont.]

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The **MAC Trace Test [Create]** configuration window appears on the screen. Set the following parameters, as required:

- Provide a unique **ID** (mandatory). **Name** and **Description** are defined as per corporate policy. Though optional, these parameters will be useful as a filtering tool to quickly identify the test at a later date;
- **NE Schedulable** and **Persistent** - enabling these parameters will result in the test being sent to the network elements which then becomes available through the node CLI;
- **Test Object** - sets the **Target MAC** and the **Source MAC Address** from which the ping will originate. If the Target address is a broadcast (all ones), it will generate a response from all sites within the VPLS instance. The Source MAC set to all zeros indicates that the ping test will be generated using the base MAC address of the selected node CPM;
- **Service** - this is automatically populated by the 5620 SAM and corresponds to the selected service to be tested;
- **Site Information** - this is a mandatory parameter that specifies the site within the service to which the MAC trace will be generated. Click on the **Select** button and choose the appropriate entry from the list that is provided. Network personnel may have to click on the **Search** button for the available sites to be listed.

## 3.1 MAC Trace - Create [cont.]

MAC Trace, Test [0] [Create]

General Test Parameters Results Configuration Deployed Tests NM Threshold Alarms Results

Execution Details:

Number of Test Probes: 1

Probe Interval (seconds): 1

Probe Timeout (seconds): 1

Test Probe

Initial Time To Live: 1

Maximum Time To Live: 4

Send Control: ☐

Reply Control: ☐

Forwarding Profile: out

Forwarding Class: be

Size (octets): 40

Reset OK Cancel Apply

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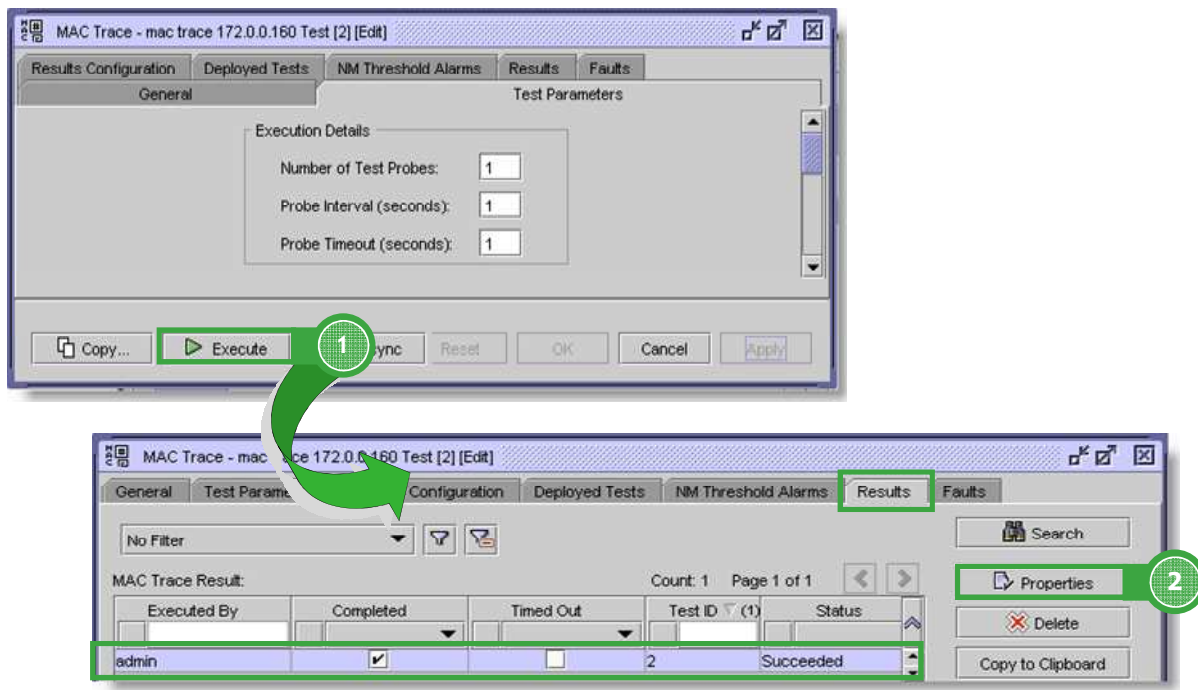
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Test Parameters allows network personnel to define that characteristics of the MAC Ping test, as follows:

- **Execution Details** - specifies the test probe characteristics, including; the number of probes, the Interval expressed in seconds between sending probes, and the Timeout interval that is the maximum wait time for a probe response before it is considered having failed;
- **Test Probe** - sets up the probe itself.
- **Probe Size** - packet size for the probe. This permits network personnel to take into consideration the propagation delays generated through processing different size packets;
- **Time to Live** - defines the maximum number of hops to which the Target MAC must be reachable;
- **Forwarding Profile and Class** - permits network personnel to pass the test packets through the QoS configuration associated to the service;
- **Reply and Send Control** - by default, the 5620 SAM will run the test through the data plane. By enabling these parameters, the test packets will be processed through the control plane instead. These parameters may be configured independently of the other (i.e. the probe may be sent via the data plane and the response returned via the control plane);
- **Forwarding Profile** - enables personnel to send the trace along the data path through the QoS (Quality of Service) queues, as required. Use the drop down menu to select the appropriate forwarding profile and class.

Click on the **Apply** button at the bottom of the page to save the changes and keep the window open.

## 3.2 MAC Trace - Execute



To manually launch the **MAC Trace** test:

1. Click on the **Execute** button that has appeared at the bottom of the window after the configuration has been saved;
2. To view the test results, click on the **Results** tab at the top of the window. A list of the available tests appears in the list.
3. Select the appropriate test from the list. Network personnel may be required to click on the **Search** button to create the list or to apply a filter to reduce the number of entries;
4. Click on the **Properties** button at the right side of the window.

## 3.3 MAC Trace - Results

MAC Trace Result - Result - [admin], Test - [2], [172.0.0.160] [Edit]

General Detailed Results Replies

Executed By: admin

Completed: ☒ Timed Out: ☐

Test ID: 2 Status: Succeeded

Time Captured: 2009/08/11 11:58:23 705 EDT Reason: N/A

From Node: 172.0.0.160 Execution Trigger: SAM Triggered

Trace Attempt

Service ID: 16 Size (octets): 40

Target MAC Address: FF-FF-FF-FF-FF-FF Source MAC Address: 00-00-00-00-00-00

Initial Time To Live: 1 Maximum Time To Live: 4

Send via Control Plane: ☐ Reply via Control Plane: ☐

General Results

Last Good Path Time: 2009/08/11 06:33:45 000 EDT

Path Changed: ☐

View Test... View Tested Object... Reset OK Cancel Apply

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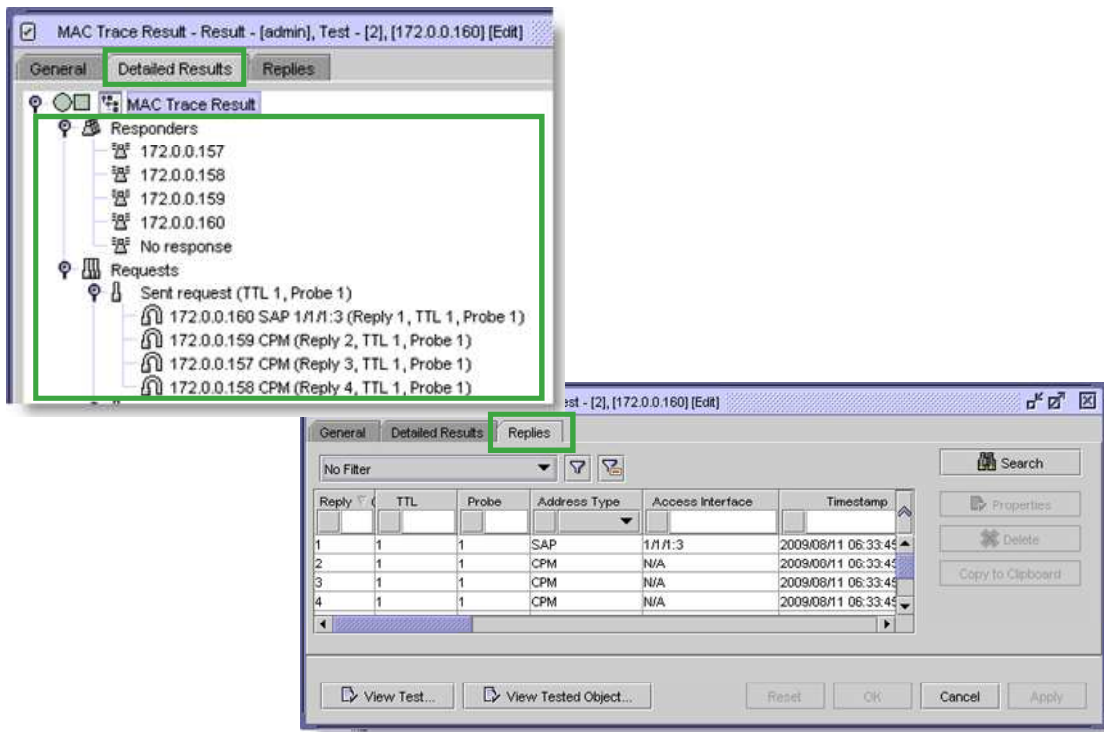
The **Results** window organizes information under three (3) tabs; **General**, **Detailed Results**, and **Replies**.

The window opens to the **General** tab as its default action. Information includes; general information about the test such as, the **Status** of the test, the time at which it was executed and where the trigger was originated. From the information available in the illustration above, it can be determined that the test was **successfully completed** on **11 August, 2009** and was **triggered** from the **5620 SAM**.

**Trace Attempt** provides the test configuration details. This is the same information that was provided when the test was configured.

**General Results** is a summary of the test results, including **Last Good Path Time** which is the time at which the last good probe was received.

## 3.3 MAC Trace - Results [cont.]



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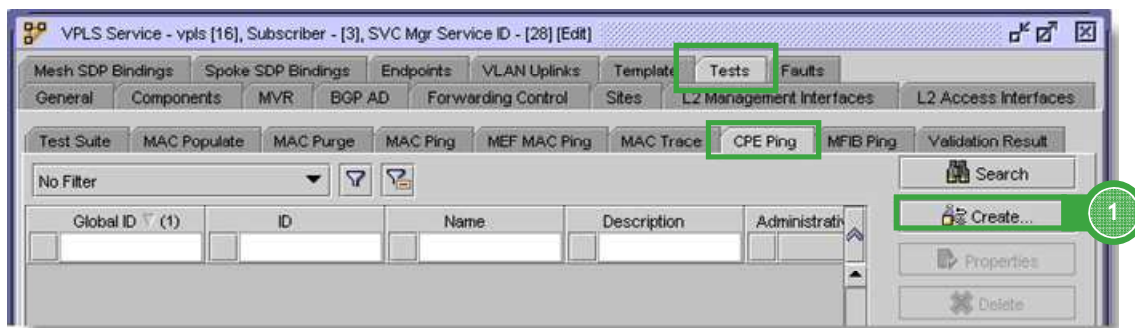
The **Detailed Results** tab provide information about the sites that responded to the trace request, referred to as **Responders**, and the **Requests** themselves in a tabular form. To expand the navigation tree, click on the key at the left side of the listing. The key moves to point down and opens the tree below the entry.

The **Replies** tab lists each of the requests to which network personnel can select and click on the **Properties** button at the right side of the window.

These results are stored in the 5620 SAM database permitting network personnel to retrieve this information at a later date. They may also choose to delete these entries, as deemed necessary.

## 4 CPE Ping

## 4.1 CPE Ping - Create



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To configure the **CPE Ping OAM** test:

1. Navigate to the **Test** tab of the service to be tested. From the main menu, select **Manage > Services**, click on the **Search** button, select the appropriate service from the list and click on the **Properties** tab;
2. Click on the **Test** tab to open the configuration window;
3. Click on the **CPE Ping** tab;
4. Open the configuration window by clicking on the **Create** button at the right side of the window.

## 4.1 CPE Ping - Create [cont.]

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Under the CPE Ping [Create] window, set the following parameters:

- **Unique ID** - set for Auto-Assign as the default but may be changed as required;
- **Name** and **Description** - optional and set according to corporate policy. These parameters may be used to simplify the Search function by creating a filter to reduce the number of entries in a list;
- **Service** - automatically populated by the 5620 SAM;
- **Site** - sets the site to which the CPE is connected (SAP). Click on the **Select** button to obtain a list of the available sites within the service. Select the appropriate entry from the list provided in the sub-window and click on **OK** to proceed;
- **Test Object** - defines the object (CPE) to be tested. The Destination IP Address is the CPE address and must be reachable from the Source IP Address from within the network. Network personnel may also choose to define a specific MAC address for the Source address which is within the service path. By default, all zeros is set which defines the base MAC address of the system as the source.



## 4.1 CPE Ping - Create [cont.]

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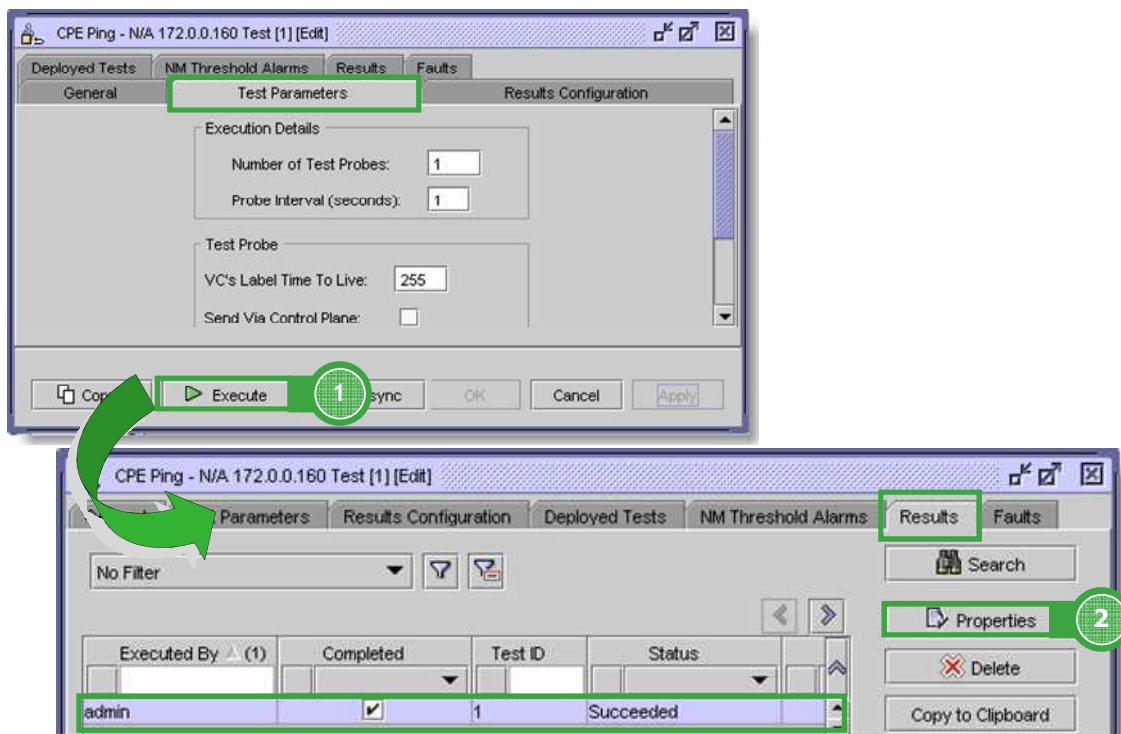
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Open the Test Parameters tab to define the test actions:

- **Number of Test Probes and Probe Interval** - defines how many times the CPE ping will be performed and the time between each event;
- **Test Probe configuration**, that includes:
  - **Label TTL** - defines the number of hops within which the CPE Ping response must occur after which the ping packet will be discarded;
  - **Send and Reply via Control Plane** - uses the control plane controlled by the IRP tables to send and receive the ping;
  - **Forwarding Profile and Class** - allows network personnel the option to test the ping path through the appropriate QoS policing. Use the drop down menu to select the appropriate parameters
- Click on the **Apply** button at the bottom of the page to save the changes to the 5620 SAM database and keep the window open.

## 4.2 CPE Ping - Execute



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To manually launch the **CPE Ping** test:

1. Click on the **Execute** button that has appeared at the bottom of the window after the configuration has been saved;
2. To view the test results, click on the **Results** tab at the top of the window. A list of the available tests appears in the list.
3. Select the appropriate test from the list. Network personnel may be required to click on the **Search** button to create the list or to apply a filter to reduce the number of entries;
4. Click on the **Properties** button at the right side of the window.

## 4.3 CPE Ping - Results

The screenshot shows the 'CPE Ping Result - Result - [admin], Test - [1], [172.0.0.160] [Edit]' window. It is divided into three main sections: General, Test Probe, and General Results. The General section shows test execution details. The Test Probe section shows configuration parameters. The General Results section shows the outcome of the test, including RTT values. Green callouts 1 and 2 highlight the General and General Results sections respectively.

General	
Executed By:	admin
Completed:	<input checked="" type="checkbox"/>
Test ID:	1
Time Captured:	2009/08/12 16:57:36 400 EDT
From Node:	172.0.0.160
Timed Out:	<input type="checkbox"/>
Status:	Succeeded
Reason:	N/A
Execution Trigger:	SAM Triggered

Test Probe	
Service ID:	16
Source IP Address:	192.168.0.1
Send Via Control Plane:	<input type="checkbox"/>
VC's Label Time To Live:	255
Size (octets):	40
Target IP Address:	20.20.20.20
Reply Via Control Plane:	<input type="checkbox"/>

General Results	
Probes Sent:	1
Responses Received:	1
Loss Percentage (%):	0.0
Last Good Probe Time:	2009/08/12 11:32:58 000 EDT
Probe Timeouts (Probes):	0
Probes Lost (Probes):	0

Round-Trip	
Minimum RTT (milliseconds):	16569
Maximum RTT (milliseconds):	16569
Average RTT (milliseconds):	16569
Sum of Squares RTT:	274531761

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The **Results** window provides all of the information on a single page with the results organized into several groupings, as illustrated above.

Information includes; general information about the test such as, the **Status** of the test, the time at which it was executed and where the trigger was originated. From the information available in the illustration above, it can be determined that the test was **successfully completed** on **12 August, 2009** and was **triggered** from the **5620 SAM**.

**Test Probe** provides the test configuration details. This is the same information that was provided when the test was configured.

**General Results** is a summary of the test which includes the Probe information (**Sent, Received, Lost**) and the 5620 SAM Server time at which the last good probe was received.



## End of module VPLS OAM Test

.....  
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## Section 4 OAM diagnostics **Module 2** **VLL OAM Test**

TOS36042\_V3.0-EQ-English-Ed1 Module 4.2 Edition 1

5620 SAM  
Services Operations and Provisioning  
TOS36042\_V3.0-EQ Edition 1

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Document History			
Edition	Date	Author	Remarks
1.0	2012-10-12	MCGRATH, John	TOS36042_V1.0 – SAM 10.0 R1
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2.0	2013-04-10	MCGRATH, John	TOS36042_V2.0 First edition – SAM 11.0 R1
2.1	2013-08-16	MCGRATH, John	TOS36042_V2.0 Second edition – SAM 11.0 R1 (update)
3.0	2014-04-03	MCGRATH, John	TOS36042_V3.0 First edition – SAM 12.0 R1



Upon completion of this module, you will be able to:

- Describe the traffic flow for a VCCV Ping or Trace OAM packet within a service under test
- Understand when to use the Control Channel or IP VCCV OAM response capability
- Configure, execute and interpret results of a VCCV Ping and VCCV Trace test

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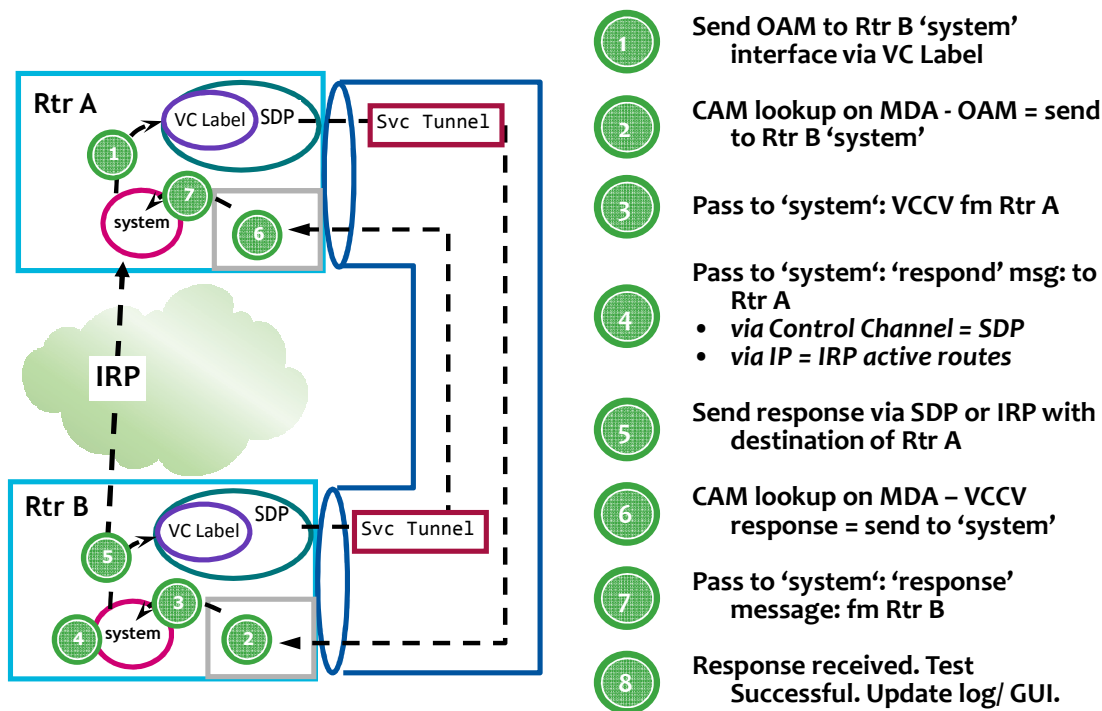


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# 1 Virtual Channel Connectivity Verification (VCCV) - Overview

## 1.1 VCCV Ping & Trace – Overview



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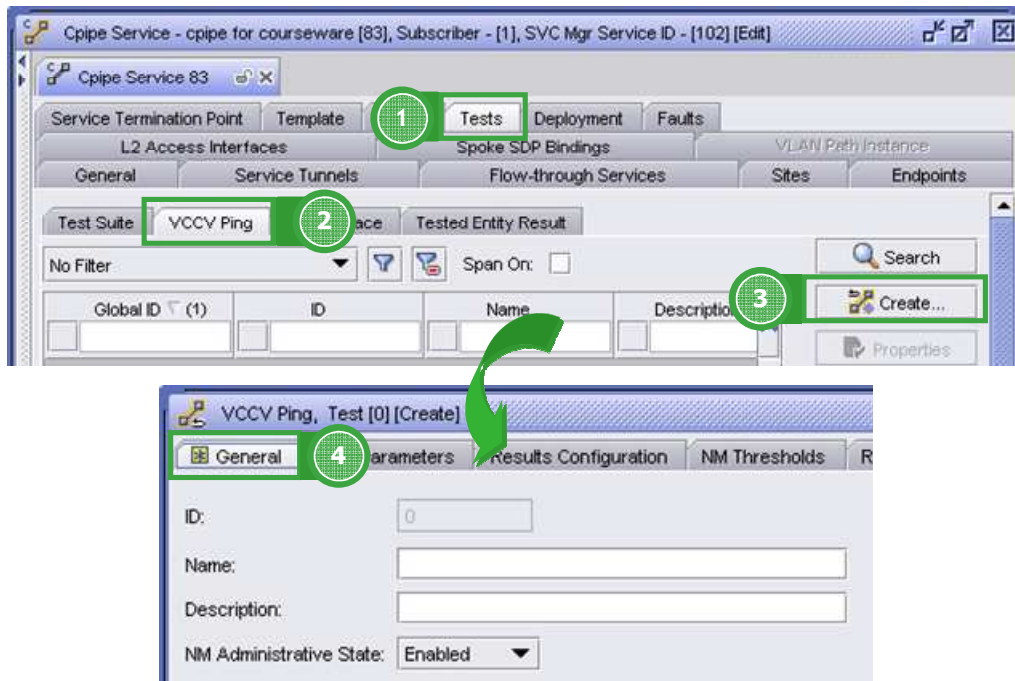
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VCCV ping is used to check connectivity of a VLL in-band. It checks that the destination (target) PE is the egress for the Layer 2 FEC. It provides a cross-check between the data plane and the control plane. It is in-band, meaning that the VCCV ping message is sent using the same encapsulation and along the same path as user packets in that VLL. This is equivalent to the LSP ping for a VLL service. VCCV ping reuses an LSP ping message format and can be used to test a VLL configured over an MPLS and GRE SDP.

The VCCV OAM test packet is sent from the originating node's „system“ interface to the destination node's system interface using the in-band service connection. At the destination node, a echo response is sent back to the originating node either via an IPv4/IPv6 UDP packet or via application level control channel. This mode sends the reply message inband over the pseudowire from Rtr B to Rtr A.

## 2 Virtual Channel Connectivity Verification (VCCV) Ping

## 2.1 VCCV Ping Configuration



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The 5620 SAM includes the ability to configure and execute a VCCV Ping OAM test from within the GUI for any pseudowire service. OAM tests are accessible through the Properties tab for the service under test.

Once the service **Properties** window has been open:

- Navigate to the **Tests** tab, as shown above;
- Click on the **VCCV Ping** tab. Note whether a test exists or not. To configure a new test, click on the **Create** button and note that a **VCCV Ping [Create]** window appears.
- Under the **General** tab, set the parameters, as required. A more detailed description of the parameters is provided on the next page.

## 2.1 VCCV Ping Configuration [cont.]

The screenshot shows the 'VCCV Ping, Test (0) [Create]' window. The 'General' tab is active. The 'ID' field is set to 0, and the 'Auto-Assign ID' checkbox is checked. The 'Name' and 'Description' fields are both set to 'vccv ping for courseware'. The 'NM Administrative State' is set to 'Enabled'. The 'NE Schedulable' checkbox is unchecked. The 'Time to Live' is set to 1. The 'Test Object' section is expanded, showing 'First Spoke SDP Binding' with fields for 'Path Id' (0), 'VC ID' (0), 'Source Node ID' (0.0.0.0), 'Destination Node ID' (0.0.0.0), 'Service ID' (0), and 'Service Name'. The 'Creation Mode' is set to 'Manual'. A green box highlights the 'Test Object' section, and a green circle with the number 3 is next to the 'Select...' button.

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As is the case for any object in the database, the OAM test must have a unique ID. Using the **Auto-Assign ID** feature ensures this state. However, where corporate policy dictates specific IDs be used, uncheck the box and enter the appropriate ID in the parameter box.

**Name** and **Description** - optional parameters that are provided for quick and easy identification of a test within a list. When used, these parameters should reflect corporate policy.

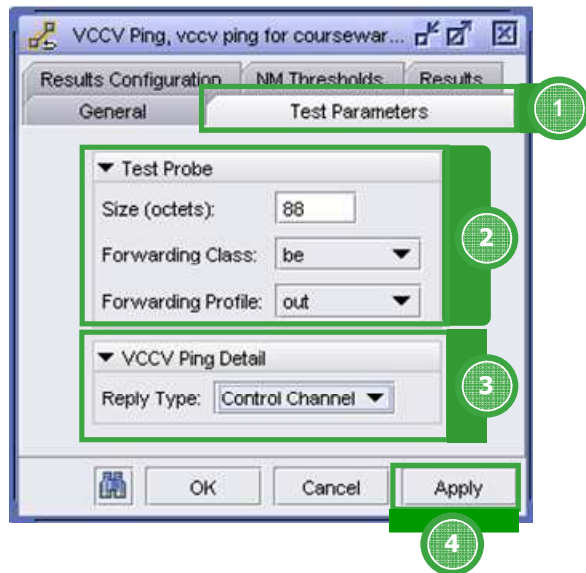
**Administrative State** - Enabled by default.

**NE Schedulable** - checking the box will generate an equivalent test within the CLI context of the Service Assurance Agent of the SR-OS and enable an associated cron.

**Test Object** - defines the originating site and associated service objects to be tested. To use the 5620 SAM to auto populate these parameters:

- Click on the Select button;
- Choose which site from which the test will originate and click OK. The associated object information will automatically be populated in the appropriate areas.

## 2.1 VCCV Ping Configuration [cont.]



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Within the **Test Parameters** tab, the operator will define the characteristics of the OAM packet to be generated. Once the parameters have been configured, click **Apply** to save the changes to the database.

### Test Probe:

**Size** - specifies the number of octets within the OAM PDU. This can be used to imitate a customer data packet (ie. 1514 byte ethernet packet)

**Forwarding Class and Profile** - apply QoS parameters to the OAM PDU as if it were a customer data packet

### VCCV Ping Detail:

**Reply Type** - defines Ping echo response mode. From the drop down menu, the options are:

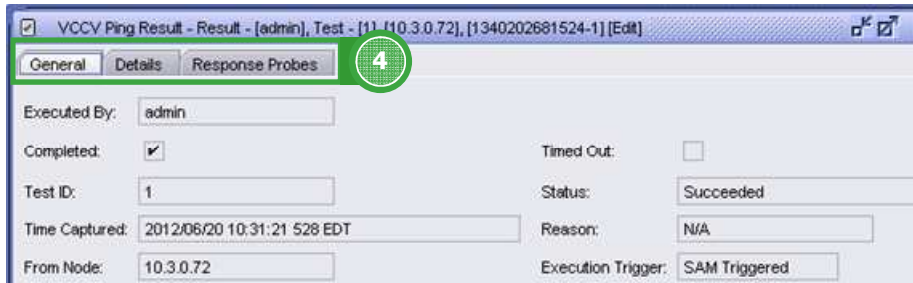
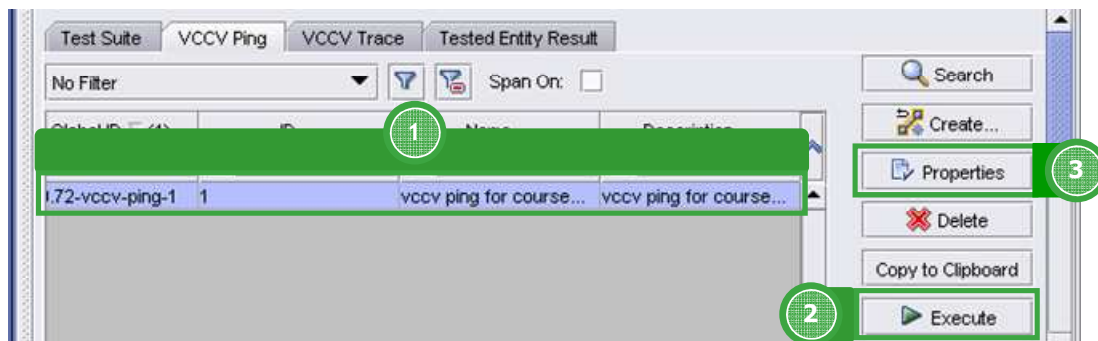
**Control Channel** - indicates to the destination PE that the echo response is to be sent via the application level control channel (within the service infrastructure),

**IP** - send the echo response as an IPv4/IPv6 UDP packet back to the originating PE using the IRP active routes. In this manner, one-way reachability through the application level control channel can be verified.

**Results Configuration** defines trap generating events and NM Thresholds permit the operator to define **Jitter**, **Latency** and **Round-Trip** thresholds to which traps can be applied to notify Operations personnel of non-standard alarm events.



## 2.2 VCCV Ping - Results



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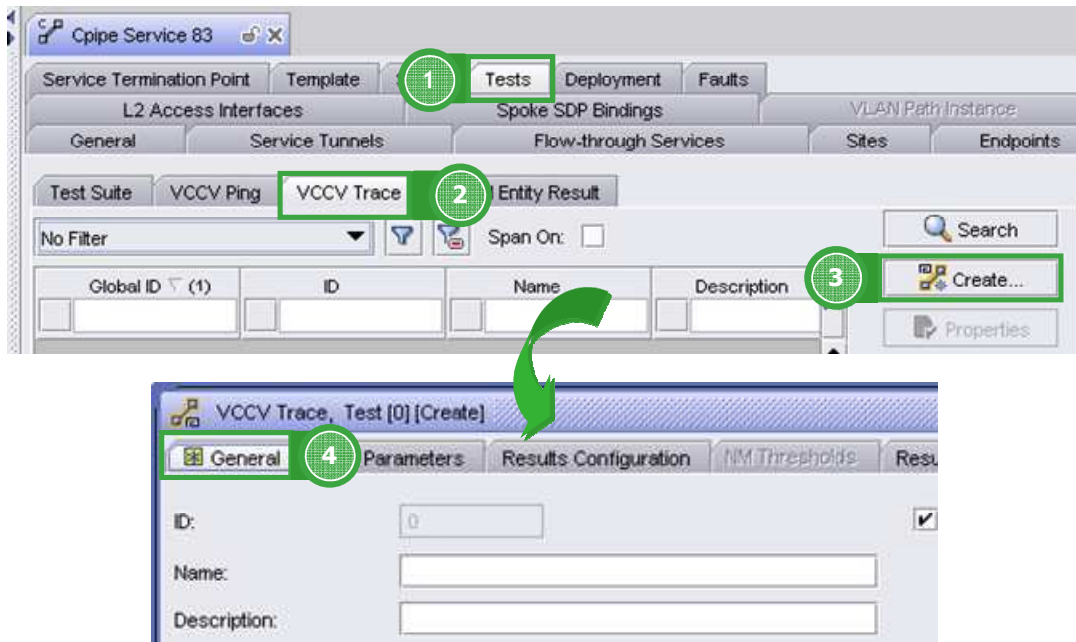
Existing tests will be listed under the VCCV Ping tab once they have been saved. To run the test:

- Select the appropriate entry from the list;
- click **Execute** at the right side of the window;
- open the **Properties** window by clicking on the appropriate button;
- the **VCCV Ping Result** window opens with the **General** tab already selected. Review the information provided under each tab to verify that the test was successful.

Note that the information also includes: time the test was executed; user to execute the test, summary of the results; and the details for Outbound, Inbound and Round Trip Jitter.

## 3 VCCV Trace

## 3.1 VCCV Trace Configuration



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The 5620 SAM includes the ability to configure and execute a VCCV Trace OAM test from within the GUI for any pseudowire service. OAM tests are accessible through the Properties tab for the service under test.

Once the service **Properties** window has been open:

- Navigate to the **Tests** tab, as shown above;
- Click on the **VCCV Ping** tab. Note whether a test exists or not. To configure a new test, click on the **Create** button and note that a **VCCV Trace [Create]** window appears.
- Under the **General** tab, set the parameters, as required. A more detailed description of the parameters is provided on the next page.

## 3.1 VCCV Trace Configuration [cont.]

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As is the case for any object in the database, the OAM test must have a unique ID. Using the **Auto-Assign ID** feature ensures this state. However, where corporate policy dictates specific IDs be used, uncheck the box and enter the appropriate ID in the parameter box.

**Name** and **Description** - optional parameters that are provided for quick and easy identification of a test within a list. When used, these parameters should reflect corporate policy.

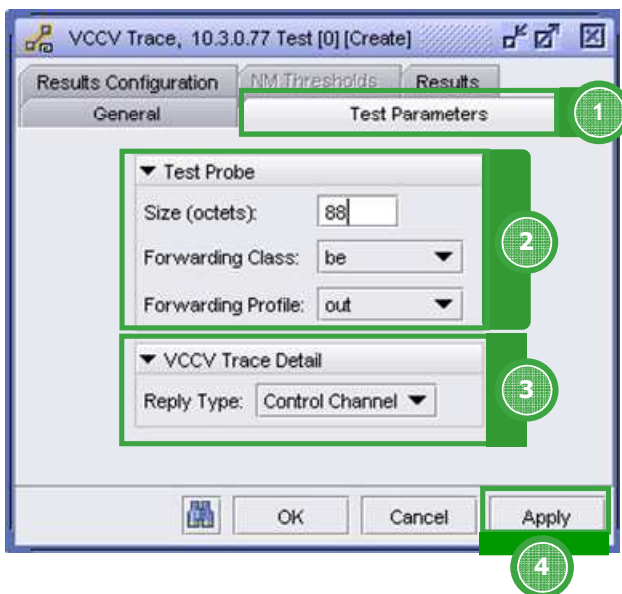
**Administrative State** - Enabled by default.

**NE Schedulable** - checking the box will generate an equivalent test within the CLI context of the Service Assurance Agent of the SR-OS and enable an associated cron.

**Test Object** - defines the originating site and associated service objects to be tested. To use the 5620 SAM to auto populate these parameters:

- Click on the Select button;
- Choose which site from which the test will originate and click OK. The associated object information will automatically be populated in the appropriate areas.

## 3.1.1 Test Parameters



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Within the **Test Parameters** tab, the operator will define the characteristics of the OAM packet to be generated. Once the parameters have been configured, click **Apply** to save the changes to the database.

### Test Probe:

**Size** - specifies the number of octets within the OAM PDU. This can be used to imitate a customer data packet (ie. 1514 byte ethernet packet)

**Forwarding Class and Profile** - apply QoS parameters to the OAM PDU as if it were a customer data packet

### VCCV Trace Detail:

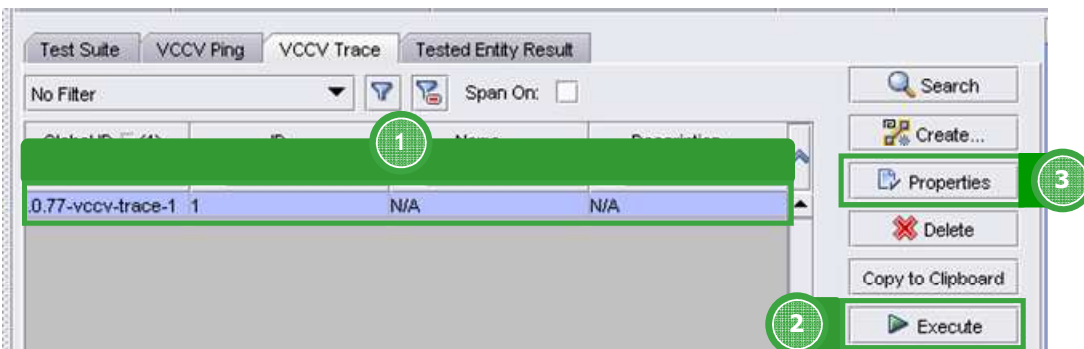
**Reply Type** - defines Ping echo response mode. From the drop down menu, the options are:

**Control Channel** - indicates to the destination PE that the echo response is to be sent via the application level control channel (within the service infrastructure),

**IP** - send the echo response as an IPv4/IPv6 UDP packet back to the originating PE using the IRP active routes. In this manner, one-way reachability through the application level control channel can be verified.

**Results Configuration** defines trap generating events.

## 3.2 VCCV Trace – Execution and Results



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Existing tests will be listed under the VCCV Ping tab once they have been saved. To run the test:

- Select the appropriate entry from the list;
- Click **Execute** at the right side of the window;
- Open the **Properties** window by clicking on the appropriate button;
- The **VCCV Trace Result** window opens with the **General** tab already selected. Review the information provided under each tab to verify that the test was successful.

Note that the **Details** tab provides information related to the probe hop counts.

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## End of module VLL OAM Test

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## Section 5 Service and Network Tests

# Module 1 Generated STM Test

TOS36042\_V3.0-EQ-English-Ed1 Module 5.1 Edition 1

5620 SAM  
Services Operations and Provisioning  
TOS36042\_V3.0-EQ Edition 1

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1.0	2012-10-12	MCGRATH, John	TOS36042_V1.0 – SAM 10.0 R1
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2.0	2013-04-10	MCGRATH, John	TOS36042_V2.0 First edition – SAM 11.0 R1
2.1	2013-08-16	MCGRATH, John	TOS36042_V2.0 Second edition – SAM 11.0 R1 (update)
3.0	2014-04-03	MCGRATH, John	TOS36042_V3.0 First edition – SAM 12.0 R1



Upon completion of this module, you should be able to:

- Configure a generated STM test
- Create a test policy and test suite

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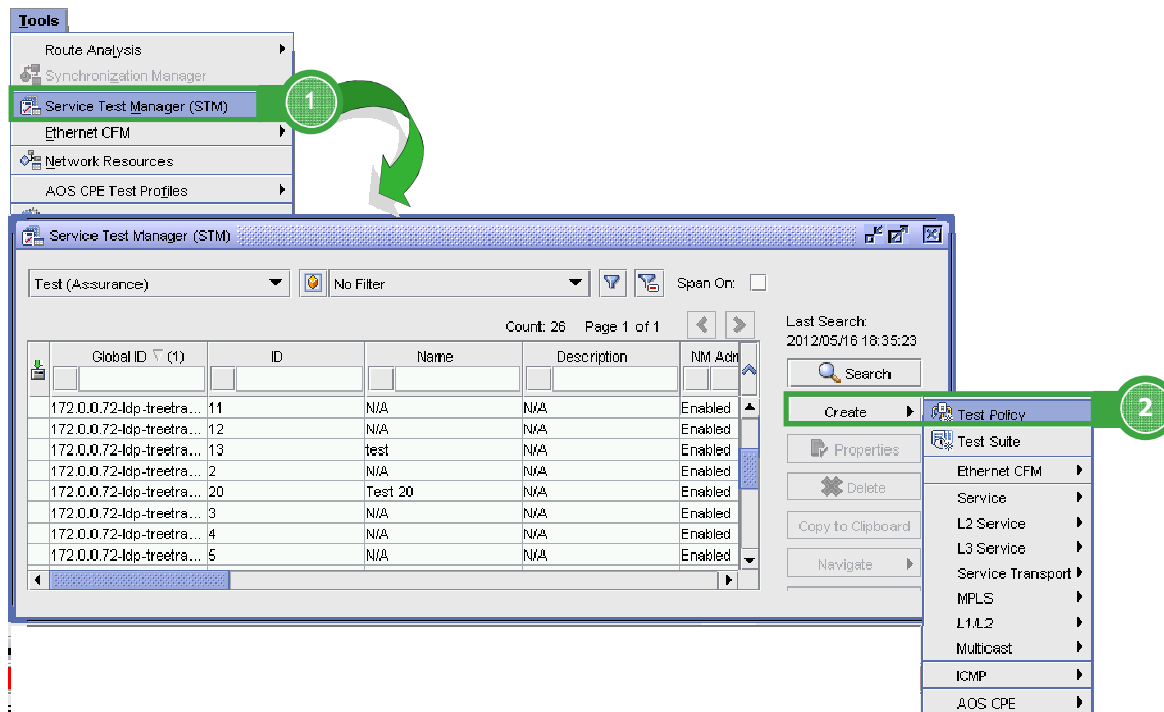


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# 1 Creating a Test Policy

## 2.1 Create Test Policy



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You can initiate the creation of a test policy using the Service Test Manager form.

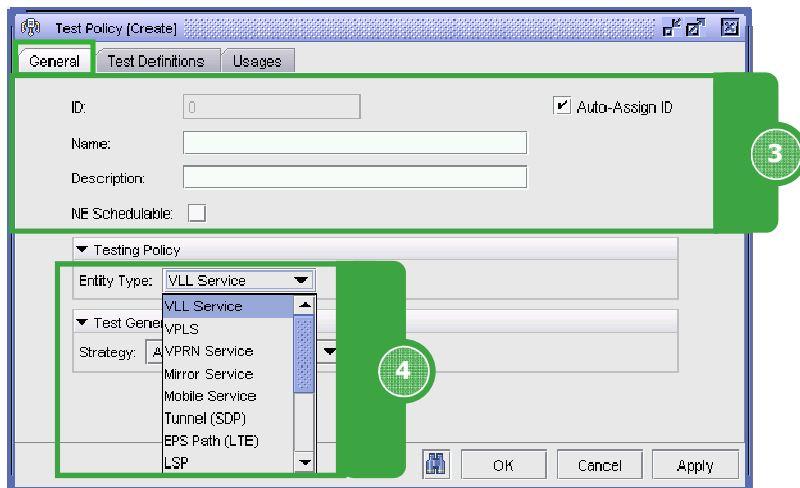
The Test Policy defines the type of test, or tests, to be performed, whether the 5620 SAM will generate the tests or not and how they will be configured.

To create a Test Policy:

- Navigate to the service test manager configuration window through **Tools > Service Test Manager (STM)** from the main menu. The STM configuration window opens;
- Click on the **Create** button at the right side of the window;
- Select **Create Test Policy** from the contextual menu.



## 2.1 Create Test Policy [cont.]



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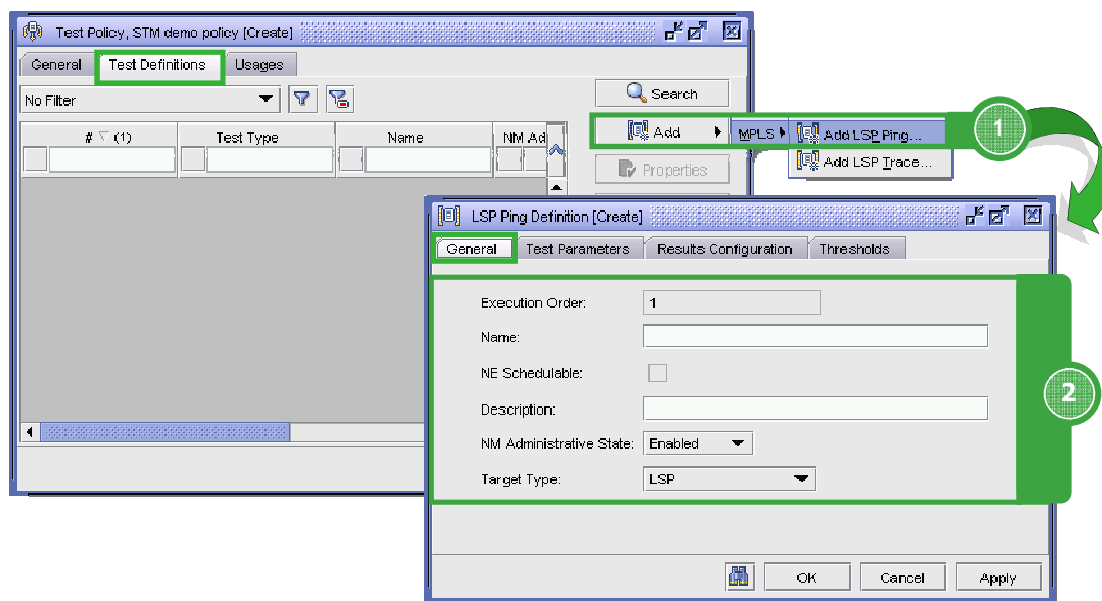
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The **Test Policy (Create)** configuration window opens to the **General** tab.

In the new window, the test personnel will be prompted to set general parameters as follows:

- **Policy ID** - a unique identifier within the 5620 SAM database. The network engineer may either manually assign or use the Auto-Assign ID feature of the 5620 SAM;
- **Name and Description** - optional parameters that are completed as per the work order. These parameters can be useful in identifying the policy when using the Search function;
- **NE Schedulable** -
- **Test Policy** - defines the network object to be tested. The default is VLL Service however, a drop-down menu is available from which a list of available test entities enables test personnel to change the entity;
- **Test Generation** - defines the extent to which the 5620 SAM will generate OAM for the tested entity.

## 2.2 Test Definitions



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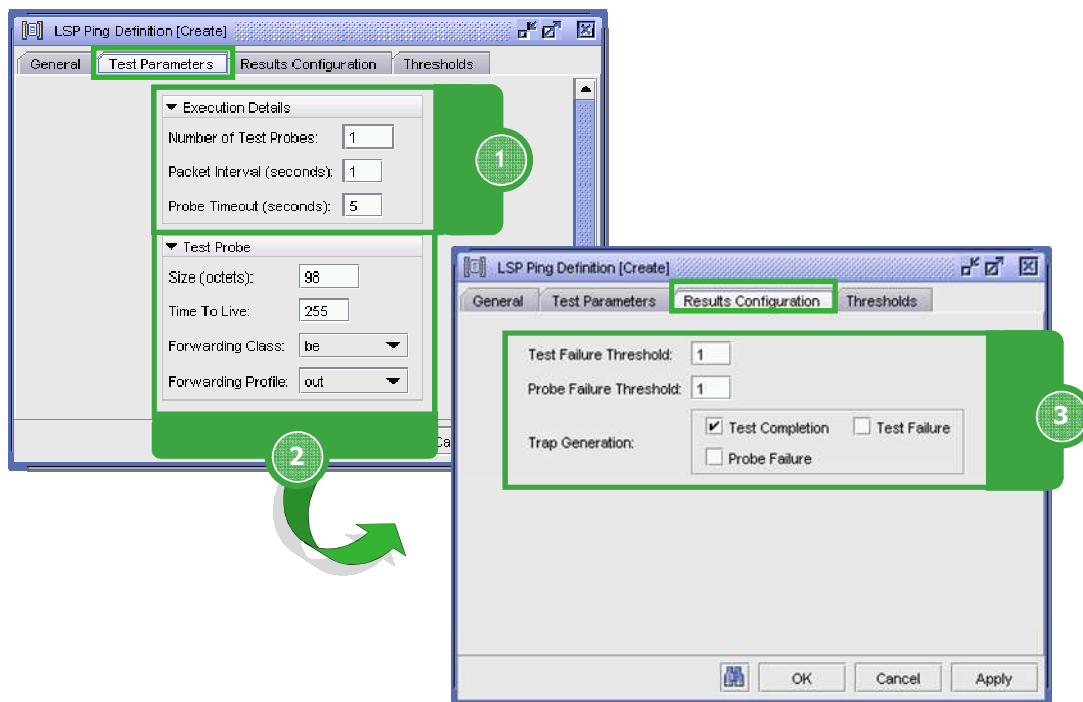
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**Test Definitions** deals with configuring the OAM tests to be performed against selected network objects. In this example, OAM tests will be configured to verify LSPs.

To define the OAM tests for the chosen test entity (specified under the **General** tab):

- Open the **Test Definitions** tab;
- Click on the **Add** button at the right side of the window. Users may also modify existing test policies by clicking on the **Search** button, select the appropriate test policy from the list and then clicking in the **Properties** tab;
- From the contextual menu, select **MPLS** and then **Add LSP Ping** or **Add LSP Trace**, as required. In this example, both OAM tests will be created within the test policy;
- The **LSP Ping Definition (Create)** window opens to the **General** tab;
- Enter the **Name** and **Description** for the test as specified in the work order;
- Set the **NE Persistent** parameter if this test is to be distributed to network elements as part of the Service Assurance Agent feature of SR-OS nodes;
- Set the **Administrative State** to **Enabled** or **Disabled** from the drop-down menu, as required;
- There may be other attributes to define dependant upon the entity type that has been selected. In the example above, the **Target Type** is may be either the **LSP Path** or the **LSP** itself (In SR-OS nodes, LSP implies RSVP-signaled LSP which requires a Path and a LSP). Select the appropriate attribute and click on the **Apply** button at the bottom of the window.

## 2.3 Test Parameters and Results Configuration



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The **Test Parameters** window enables the network operator or administrator to configure the test probes. These parameters are grouped into two categories: the execution details, which defines how the test probes will behave during the test; and, how the test probes are configured. Set the parameters, as required, and click on the **Apply** button to save the changes and keep the LSP Ping test configuration window open.

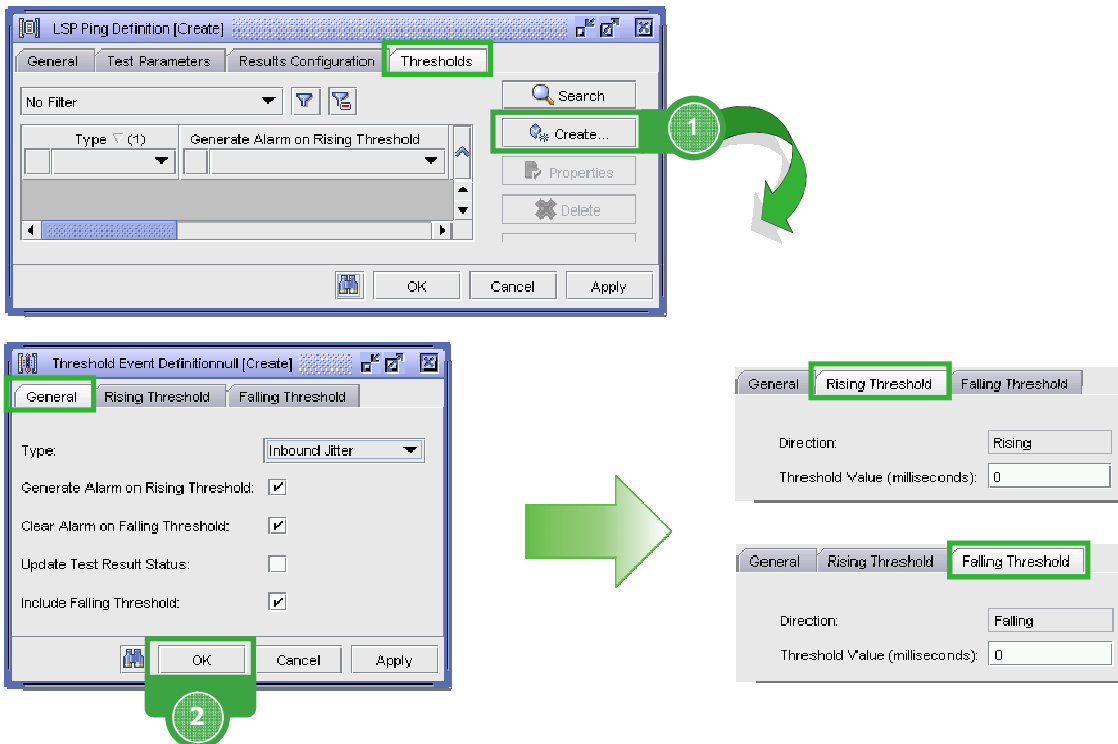
### Execution Details

- **Number of Probes** specifies the number of packets to be sent along the LSP under test.
- **Packet Interval** (seconds) parameter specifies the minimum amount of time, in seconds, that must expire before the next message request is sent. The range is 1 to 10. The default is 1.
- **Probe Timeout** (seconds) parameter specifies the time, in seconds, before a message request times out and is aborted. The message request depends on receiving a message reply from the target corresponding to the outstanding request.

### Test Probe

- **Probe Size** (octets) parameter specifies the size, in octets, of the message in an OAM diagnostic. The range is 40 to 9198.
- **Time To Live** parameter specifies the TTL value, in hops, added to the test packet to ensure that the probe does not circulate in a routing loop past the configured time.
- **Forwarding Class** parameter specifies the forwarding class for a tunnel ping, MAC ping, or LSP ping or trace.
- **Forwarding Profile** parameter specifies whether the test probes are in or out of profile, as compared to the forwarding class of the test packet.

## 2.4 Threshold crossings



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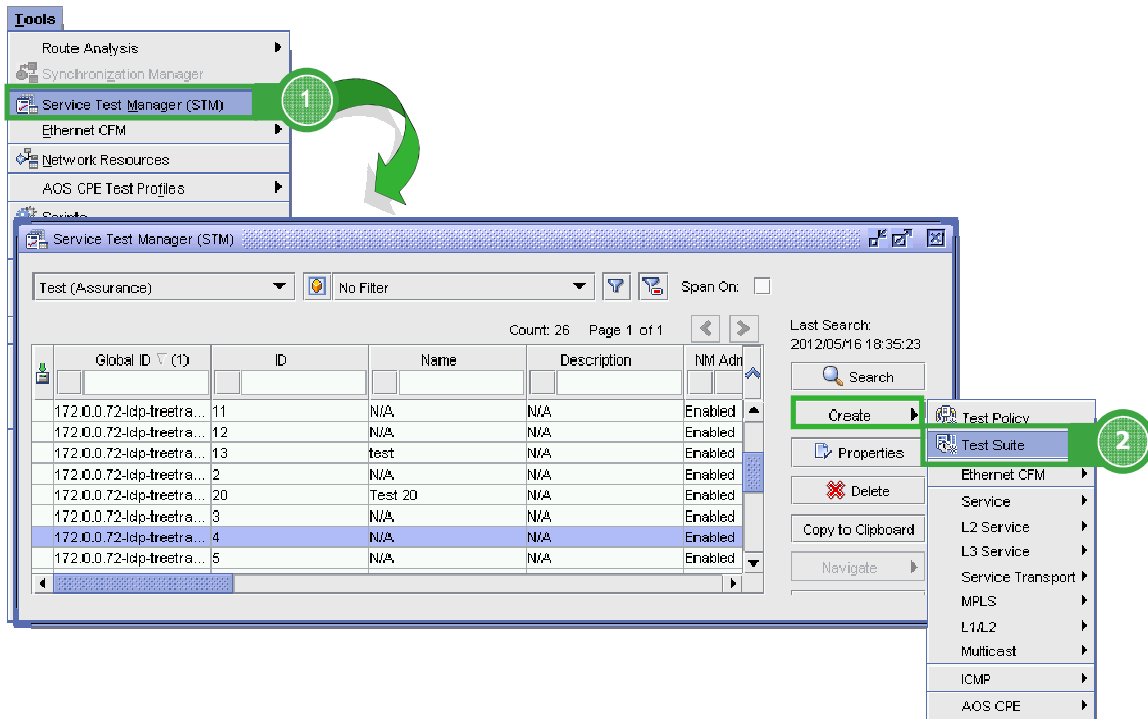
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Click on the Thresholds tab to configure threshold-crossing alarms, as required.

The Clear Alarm on Falling Threshold parameter is configurable only when you enable the Include Falling Threshold parameter. The Falling Threshold tab can be accessed only when the Include Falling Threshold parameter is enabled on the General tab of the Threshold Event Definition (Create) form.

## 2 Creating a Test Suite

## 3.1 Create Test Suite



The Test Suite is used to associate the test policy with network objects to be tested and the interval at which these tests will occur.

To create a Test Suite:

- From the **Service Test Manager** window, click on the **Create** button at the right side of the window. Users may also choose to modify an existing test suite by using the preconfigured filter from the drop-down menu, as shown above, and click on the **Search** button;
- Select **Create Test Suite** from the contextual menu.

## 3.1 Create Test Suite [cont.]

Test Suite, (New Instance) [Create]

First Run Tests | Generated Tests | Last Run Tests | Generation Logs

General | Results | Individual Test Results | Test Policy | Tested Entities

ID: 0 ☒ Auto-Assign ID

Name:

Description:

MEF35 Mode: ☐

NE Schedulable: ☐

Entity Type: LSP

Timeout (minutes): 15

Execution

First Run Execution Sequence: In Parallel

Last Run Execution Sequence: In Parallel

Tests in the test suite are executed in the following order:

1. First run tests
2. Generated tests (from policy)
3. Last run tests

Each group is run until completion before moving to the next group.

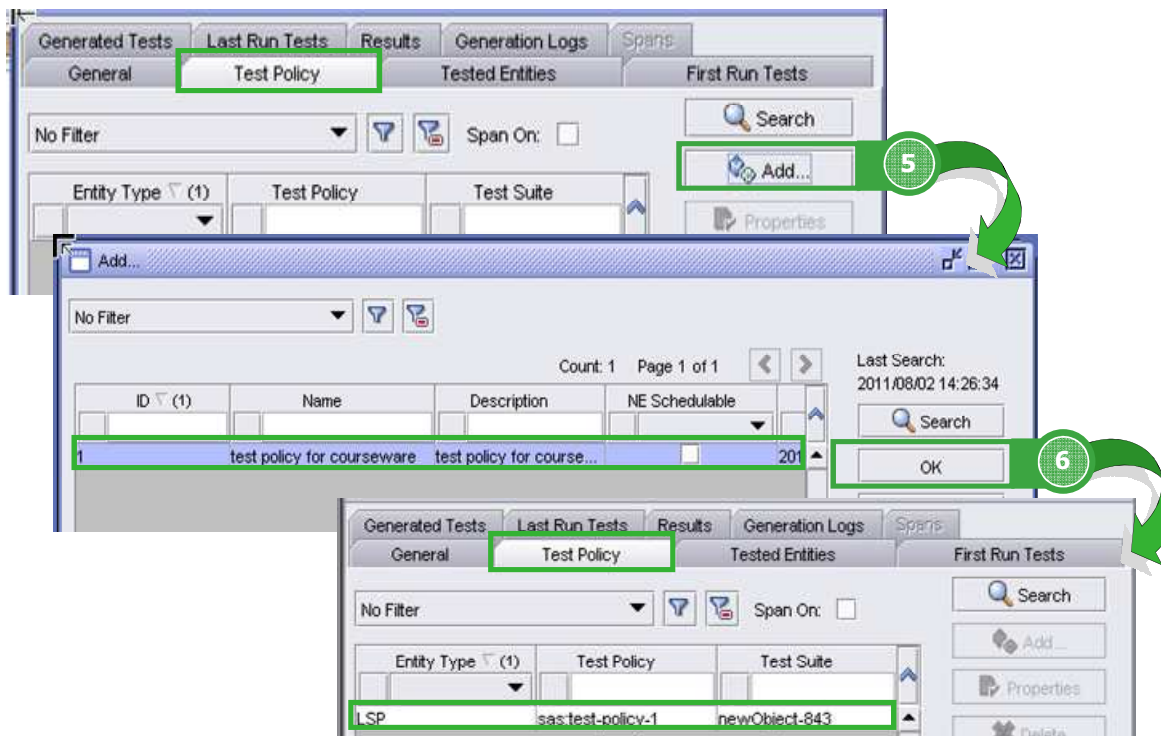
OK Cancel Apply

The **Test Suite (Create)** configuration window opens to the General tab.

In the new window, the test personnel will be prompted to set general parameters as follows:

- **Suite ID** - a unique identifier within the 5620 SAM database. The network engineer may either manually assign or use the Auto-Assign ID feature of the 5620 SAM;
- **Name and Description** - optional parameters that are completed as per the work order. These parameters can be useful in identifying the policy when using the Search function;
- **Entity Type** - defines the type of network object to be tested. In this example, the entity type will be LSPs which is available from the drop-down menu indicated by the down arrow head in the parameters window;
- **NE Schedulable** - distribute tests to the network elements over which the tested entities are configured;
- **Status Affected by Results** - specifies that the test suite is used to validate the connectivity of the tested service entity to which it is applied.
- **Timeout** - specifies the time, in minutes, for which the 5620 SAM will wait after a test failure to attempt another test deployment;
- **Execution** - specifies the order in which tests will be executed. **In Parallel** means that tests within each category will be executed at the same time. **All In Sequence** means that tests within each category will be run in order based upon the test ID (lowest numbered first).

## 3.1 Create Test Suite [cont.]



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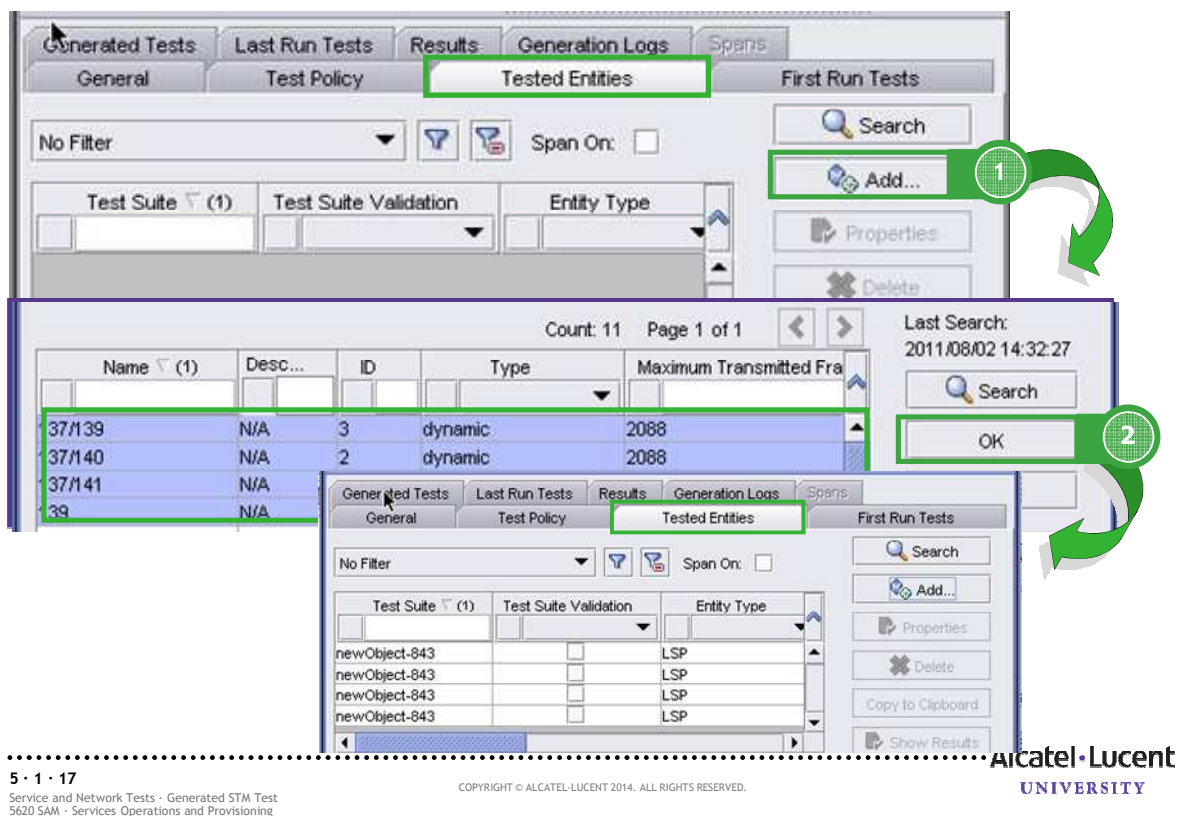
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The next step for the user is to associate a Test Policy, which defines the type of OAM tests, to the Test Suite. To do so:

- Click on the **Test Policy** tab of the **Test Suite (Create)** window;
- Click on the **Add** button at the right side of the window. The user may also choose to modify an existing Test Policy by applying a filter, as desired, and clicking on the Search button;
- The **Select Test Policy - Test Suite** window opens with a list of available test policies for the selected test entity. Select the appropriate entry from the list and click on the **OK** button at the right side of the window;
- The selected entry appears in the **Test Suite (Create)** configuration window under the **Test Policy** tab, as shown above.



## 3.2 Add Tested Entities

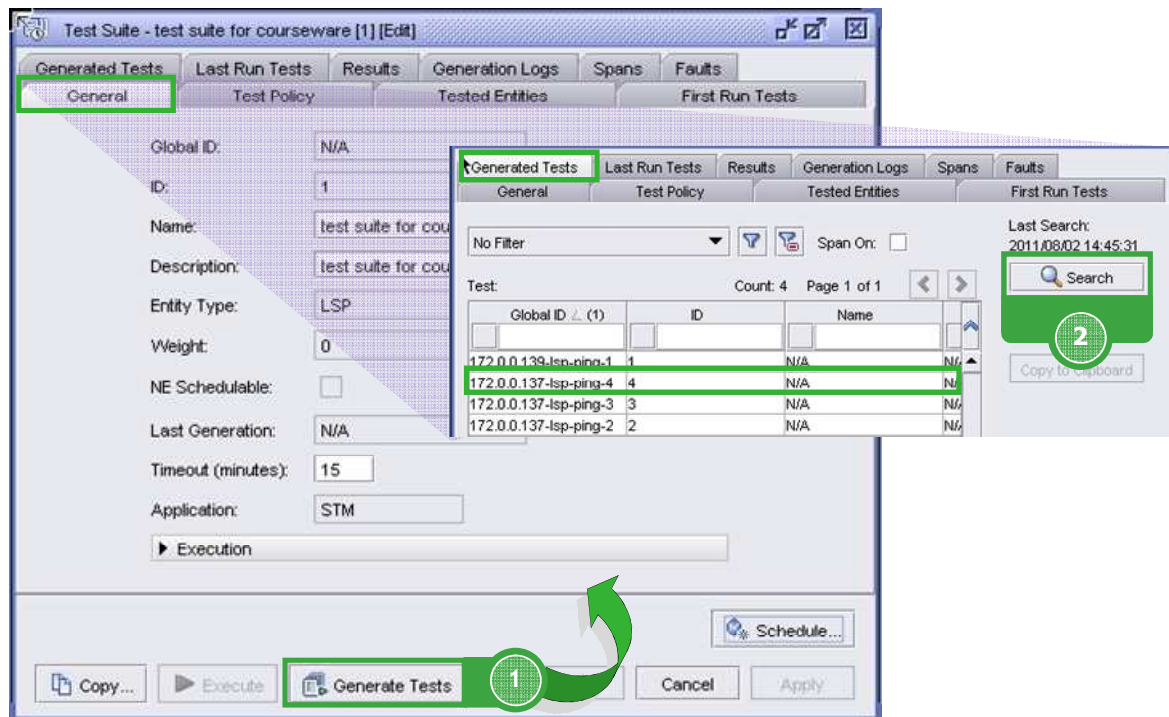


In summary, to this point, the user has created a test policy, which defines the types of OAM tests that will be performed, and what order these test will be conducted. The next thing for them to do is to apply this information to the specific network object or objects. These network objects are known as Tested Entities.

To assign the Tested Entities to the Test Suite:

- Open the **Tested Entities** tab in the **Test Suite (Create)** configuration window;
- Click on the **Add** button on the right side of the window. Users may choose to modify existing entries by applying a filter, as required, click on the **Search** button. Select the appropriate entry from the list and click on the **Properties** window;
- Click on the **Search** button. A list of all appropriate entities in the database (as defined under the General tab), will appear under **Select Test Entity**;
- Select the appropriate entity (object), or entities, from the list;
- Click on the **OK** or **Apply** button at the bottom of the window.

## 3.3 Generate Tests



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The last step in creating a test suite is to create, or generate, the OAM tests for each of the tested entities. To do so:

- Click on the **Generate Tests** button at the bottom of the window. Generates the OAM test (or tests) against the selected network objects. Open the **Generated Tests** tab at the top of the window;
- Click on the **Search** button at the right side of the window. A list of all of the tests that have been created will appear in the list.
- Select an entry and click on the **Properties** tab at the right side of the window. Review the configuration, make changes and save the result, as appropriate.

## 3.4 Launch Tests

The **Execute** button allows you to manually launch generated tests. The button is enable when you save a Test Suite.



The **Schedule** button allows you to automatically run the generated tests at a designated time or interval.

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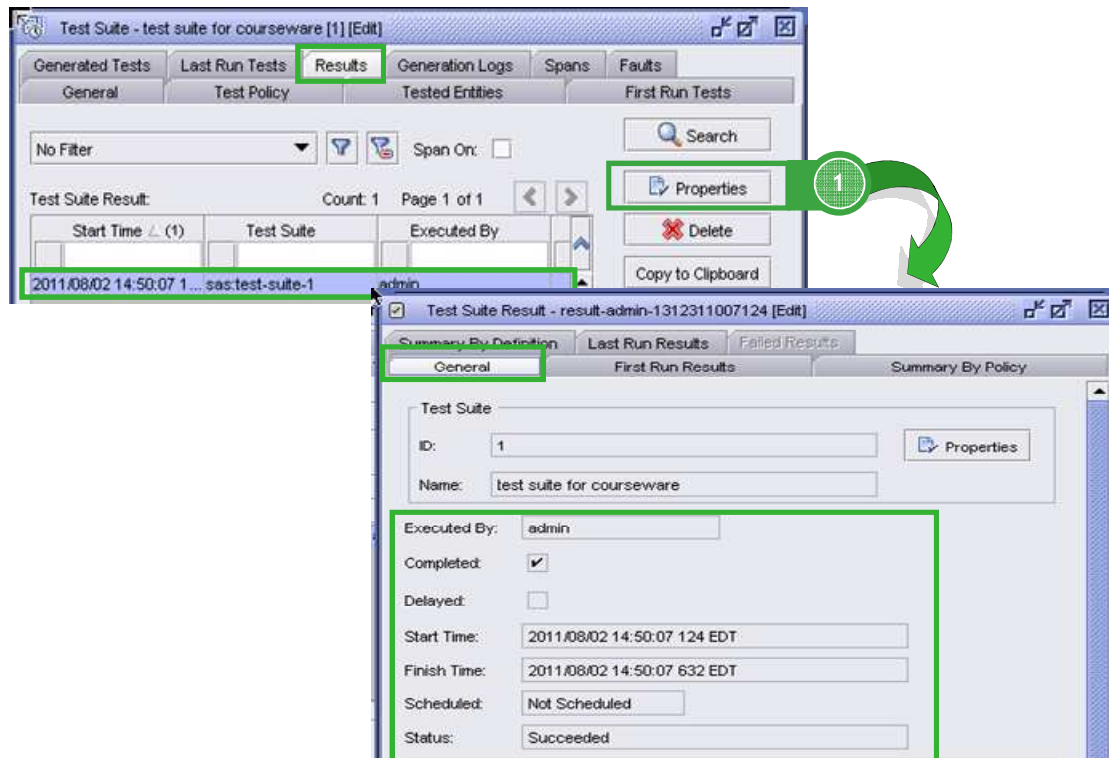
Now that the test suite has been configured, it is available for use by network personnel. There are two ways that the tests within the test suite can be executed: manually or as defined by a schedule.

To execute the test suite manually:

- Navigate to the test suite by selecting **Tools > Service Test Manager (STM)** from the main menu;
- List the test suites by using the pre-configured filter and clicking the **Search** button;
- Select the appropriate test suite from the list.
- The user may choose to click on the **Execute** button at the right side of the window. Alternatively, click on the **Properties** button and then click on the **Execute** button at the bottom of the window, as shown above. In either case, the generated tests will be performed as configured and the results will be provided under the **Properties** window. This will be discussed next.

A test suite may be executed as defined by a schedule, in which case, a schedule must be assigned to the test suite (to be discussed shortly).

## 3.5 View Test Results



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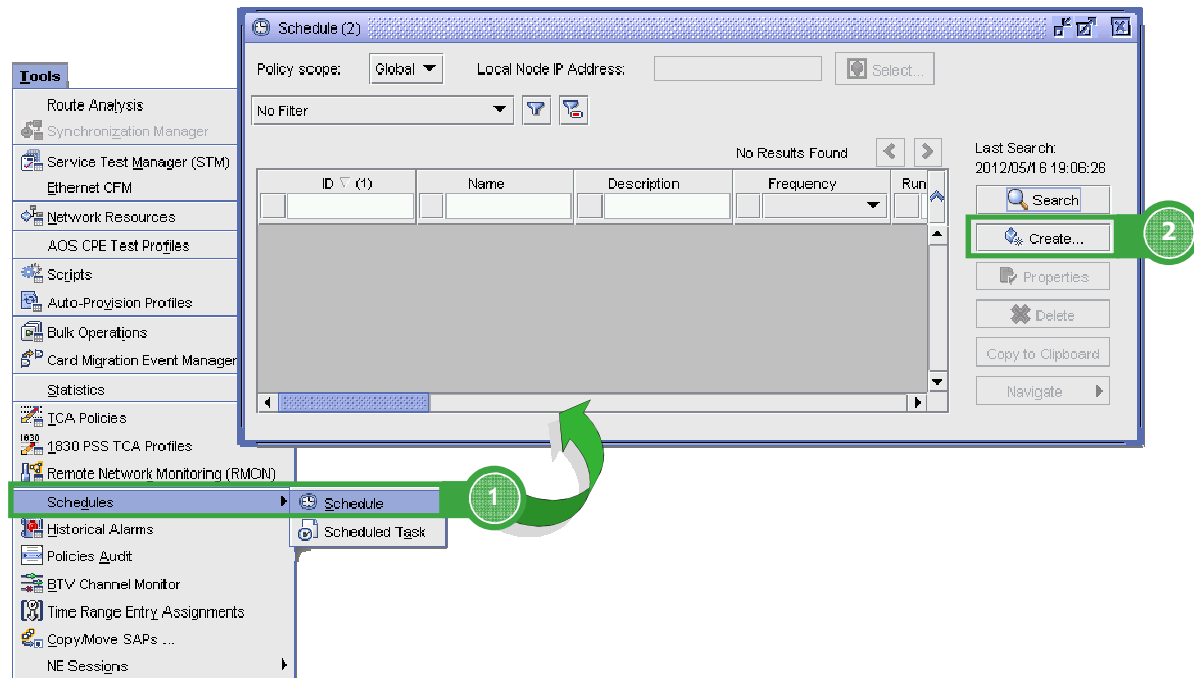
Test results are listed under the Results tab of the Properties window. To view test results:

Navigate to the Properties window as described on the previous page;

- Open the **Results** tab;
- Click on the **Search** button at the right side of the window. A filter may be applied to reduce the number of entries to be listed;
- Select the appropriate entry from the list and click on the **Properties** button at the right side of the window;
- The **Test Suite Result** window opens to the **General** tab. Review the information and provided under each of the tabs. Close the window or implement corporate troubleshooting procedures, as required.

## 3 Test Suite Scheduling

## 4.1 Create a Schedule



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The 5620 SAM provides users with the capability of setting tasks to be conducted on a recurring basis without the requirement for manual intervention. These automated tasks are controlled by a schedule that has been explicitly created and associated to a task or tasks. Test Suites are schedulable which provides for on-going testing to provide for proactive intervention in detecting and correcting network interruptions.

Schedules must be explicitly created after which they can be assigned to tasks. To create a schedule:

- Navigate to **Tools > Schedules** from the main menu;
- Select **Schedule** from the contextual menu. The **Schedule** configuration window opens.
  - **Policy Scope (Global)** - indicates policies that are available in the 5620 SAM database and available to all network elements;
  - **SAM Schedule** - indicates schedules created through the 5620 SAM.
- Click on the **Create** button at the right side of the window. Users may choose to modify an existing schedule by applying a filter and clicking on the **Search** button on the right side of the window.

## 4.1 Create a Schedule [cont.]

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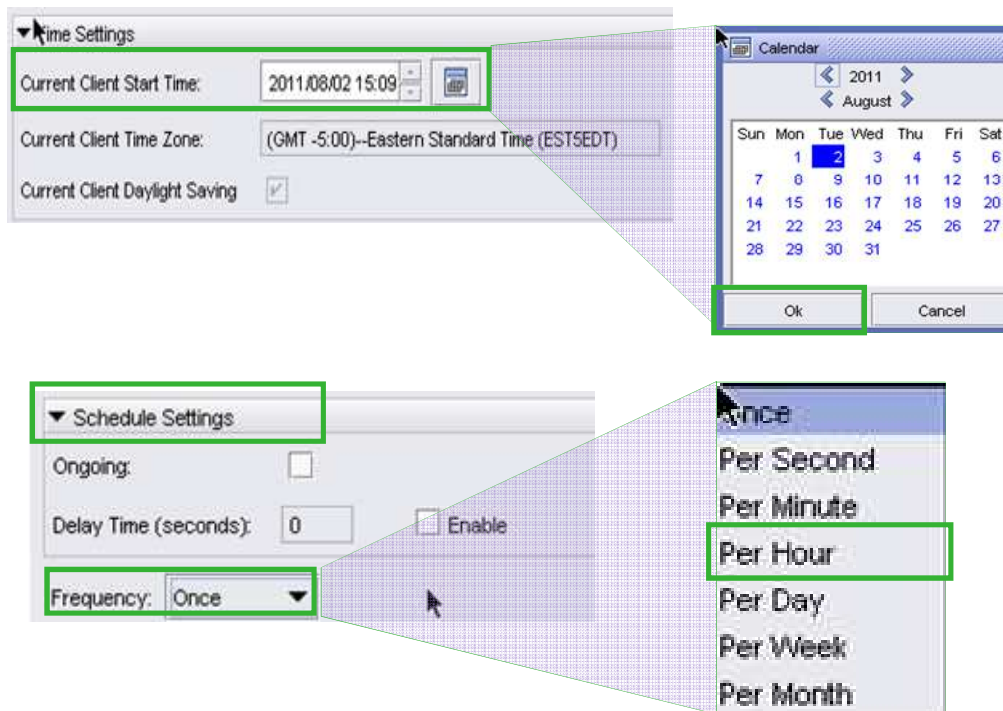
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The **SAM Schedule (Create)** configuration window appears. Apply the appropriate configuration attributes and save the changes.

Under the **Information** section of the **General** tab, the user is required to provide a **Name** for the schedule. The **Description** could be used as a search parameter which would help to more quickly identify the schedule at a later date.

## 4.1 Create a Schedule [cont.]



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The user will also be required to set a reference start time and, depending upon the frequency to be selected, an End reference time may also be required. Where the **On-going** parameter is selected, the schedule will run ad-infinity and an end time will not be present.

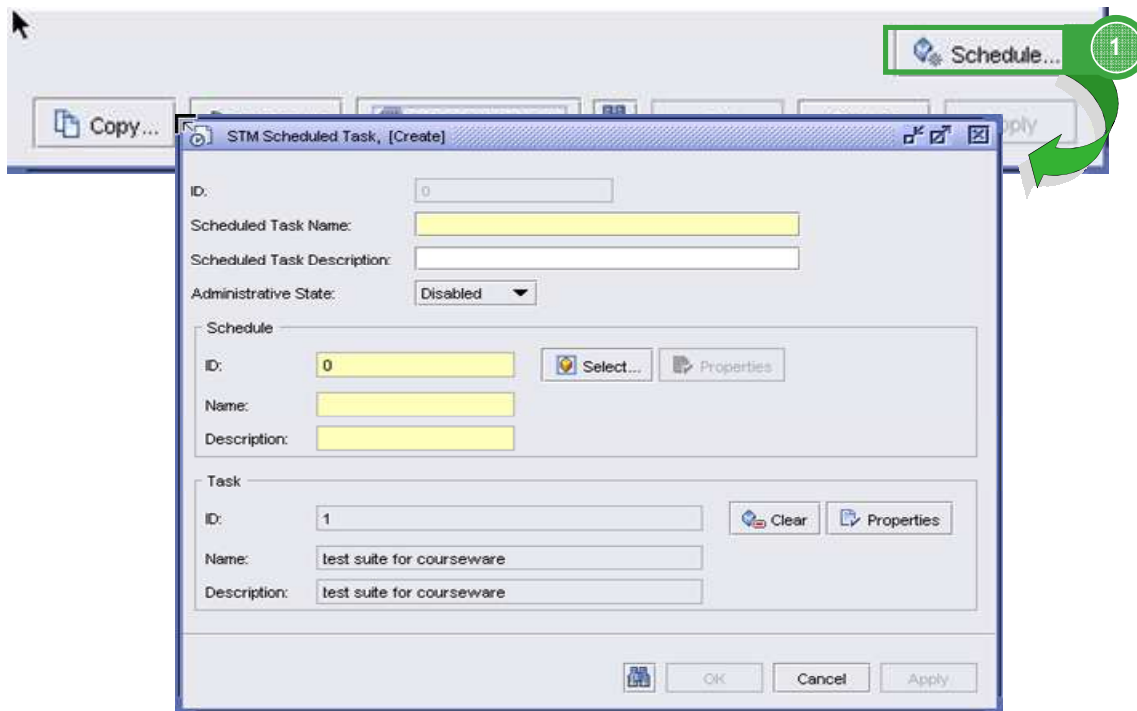
Date and time can be changed either by using the up and down arrow or clicking on the calendar button next to the attribute.

The **Frequency** defines the interval at which the schedule will run. To set the frequency, click on the down arrow head to view the available options. The **Frequency Settings** attribute appears when any option other than **Once** is selected.

In the example above, it has been decided that the Frequency will be defined in minutes (**Per Minute**). The **Frequency Settings** attribute then permits the user to use the default of **Run Every Minute** or to specify another value by selecting **Run Every Minutes** and then specifying the time (30) in the value box. Thus, a task assigned to this schedule will run once every 30 minutes from the configured start and end times.



## 4.2 Assign a Schedule to Test Suite



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Now that the schedule has been configured, it is available for use by network personnel.

To associate a schedule to a task:

- Navigate to the test suite by selecting **Tools > Service Test Manager (STM)** from the main menu;
- List the test suites by using the pre-configured filter and clicking the **Search** button;
- Select the appropriate test suite from the list.
- Click on the **Properties** button and then click on the **Schedule** button at the bottom of the window, as shown above. The **STM Scheduled Task (Create)** window appears;

## 4.2 Assign a Schedule to Test Suite [cont.]

STM Scheduled Task, [Create]

ID: 0

Scheduled Task Name:

Scheduled Task Description:

Administrative State: Disabled

**Schedule**

ID: 0 Select... Properties

Name:

Description:

**Task**

ID: 1 Clear Properties

Name: test suite for courseware

Description: test suite for courseware

OK Cancel Apply

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- Specify a **Scheduled Task Name**, which is mandatory, and provide a **Description**, as per the work order;
- Set the **Administrative State** to **Enabled**;
- Click on the **Select** button in the **Schedule** section of the configuration window. From the Search window, select the appropriate entry and click on the **OK** button;
- Click on the **OK** or **Apply** button to apply the schedule to the task.



### Note

*Test results are viewed in the manner already discussed. Notice that **Scheduled** appears next to the **Scheduled** attribute under the **General** tab of the **Test Suite Results** window.*

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End of module  
Generated STM Test

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## Section 5 Service and Network Tests

# Module 2 Service Throughput

TOS36042\_V3.0-EQ-English-Ed1 Module 5.2 Edition 1

5620 SAM  
Services Operations and Provisioning  
TOS36042\_V3.0-EQ Edition 1

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Document History			
Edition	Date	Author	Remarks
1.0	2012-10-12	MCGRATH, John	TOS36042_V1.0 – SAM 10.0 R1
1.1	2012-11-16	MCGRATH, John	TOS36042_V1.1 – SAM 10.0 R5
2.0	2013-04-10	MCGRATH, John	TOS36042_V2.0 First edition – SAM 11.0 R1
2.1	2013-08-16	MCGRATH, John	TOS36042_V2.0 Second edition – SAM 11.0 R1 (update)
3.0	2014-04-03	MCGRATH, John	TOS36042_V3.0 First edition – SAM 12.0 R1



Upon completion of this module, you should be able to:

- prepare a service throughput test for an existing service
- restore the pre-test state to the service

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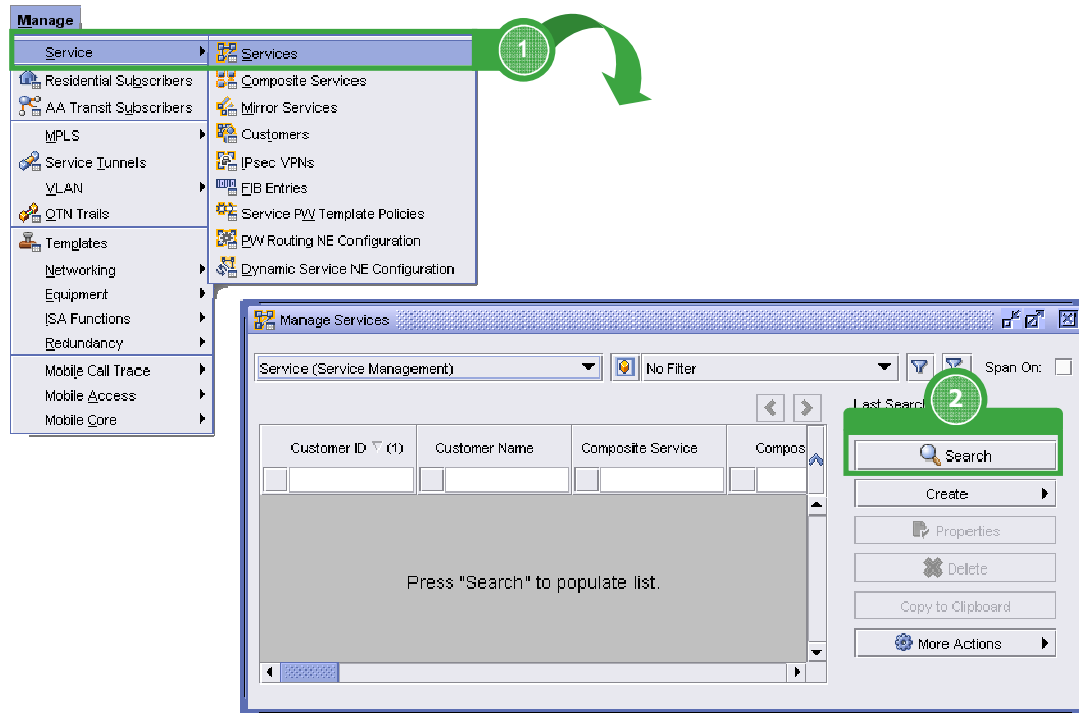


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<b>2 Preparing a service throughput test</b>	<b>10</b>
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## 1 Display service properties and set OLC state

## 2.1 Display a list of services



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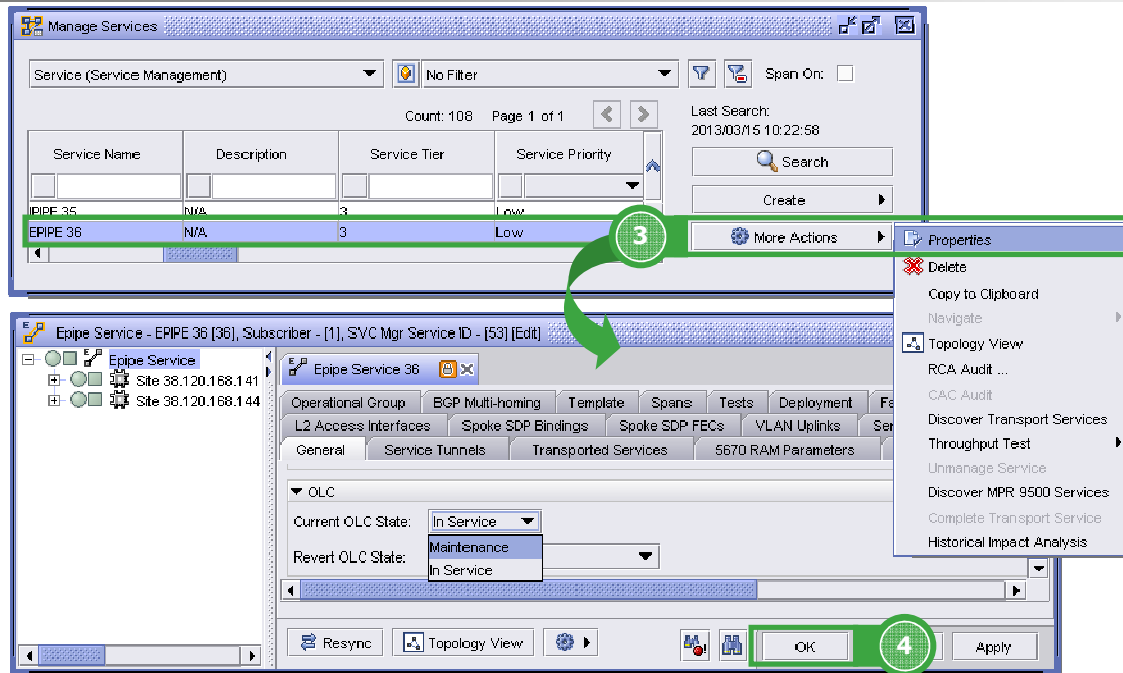
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1. Choose **Manage** → **Service** → **Services** from the main menu. The **Manage Services** form opens.
2. Click on the **Search** button.

## 2.2 Set the service OLC state to maintenance (if required)



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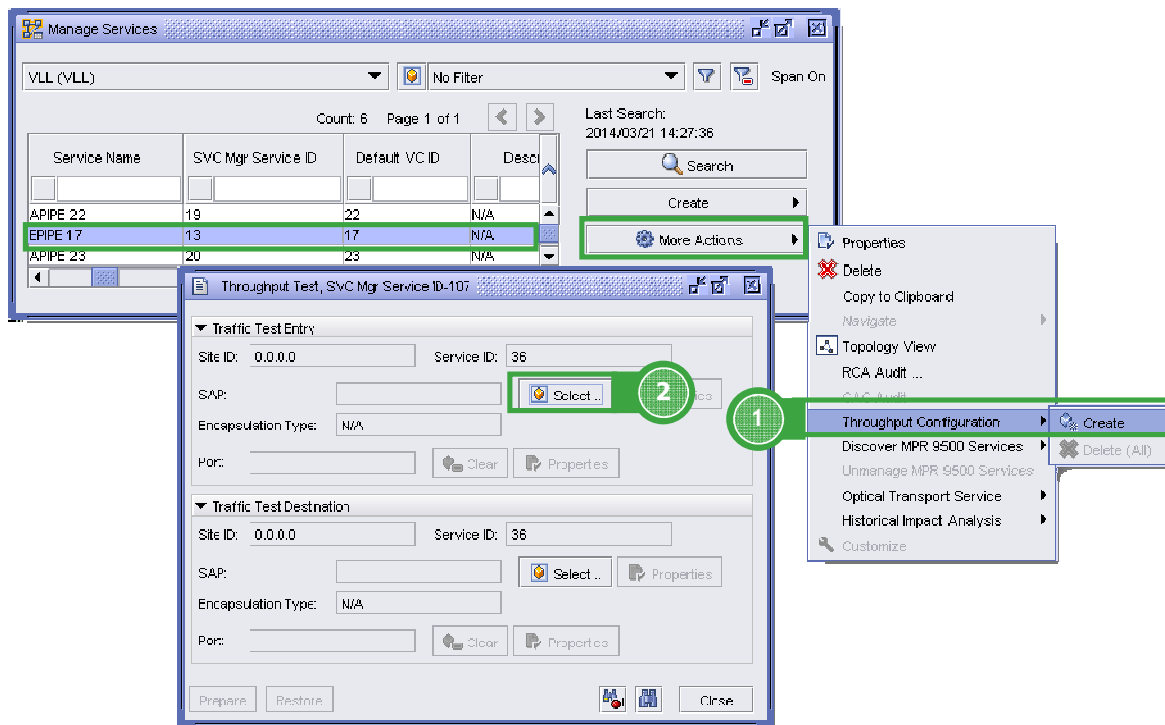
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3. Select a service and click on the More Actions→Properties button. The service properties form opens.
4. Configure the service state using the **Current OLC State** parameter. The Current OLC State parameter specifies whether a service object is in-service or in maintenance and can be used to filter alarms in the alarm window. Alarms are generated for service objects regardless of the Current OLC State parameter setting.

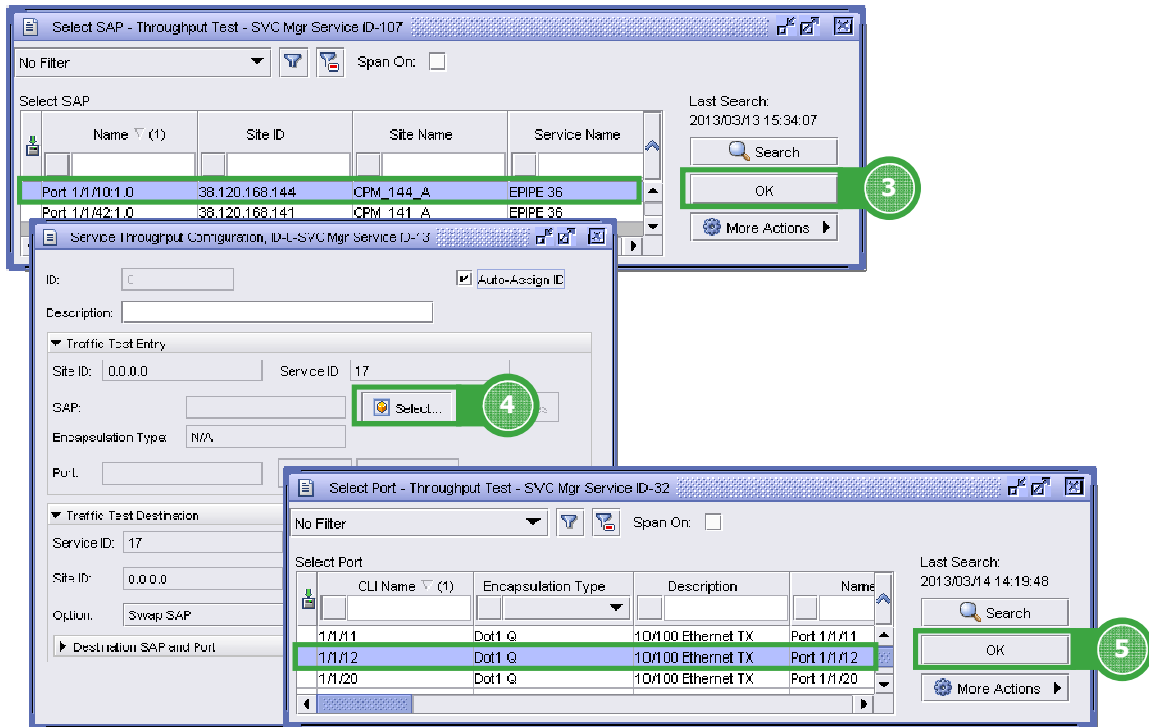
## 2 Preparing a service throughput test

## 3.1 Select the service and initiate the test



You specify the SAP to be replaced for testing in the Throughput Test form.

## 3.2 Select a SAP and port for the test



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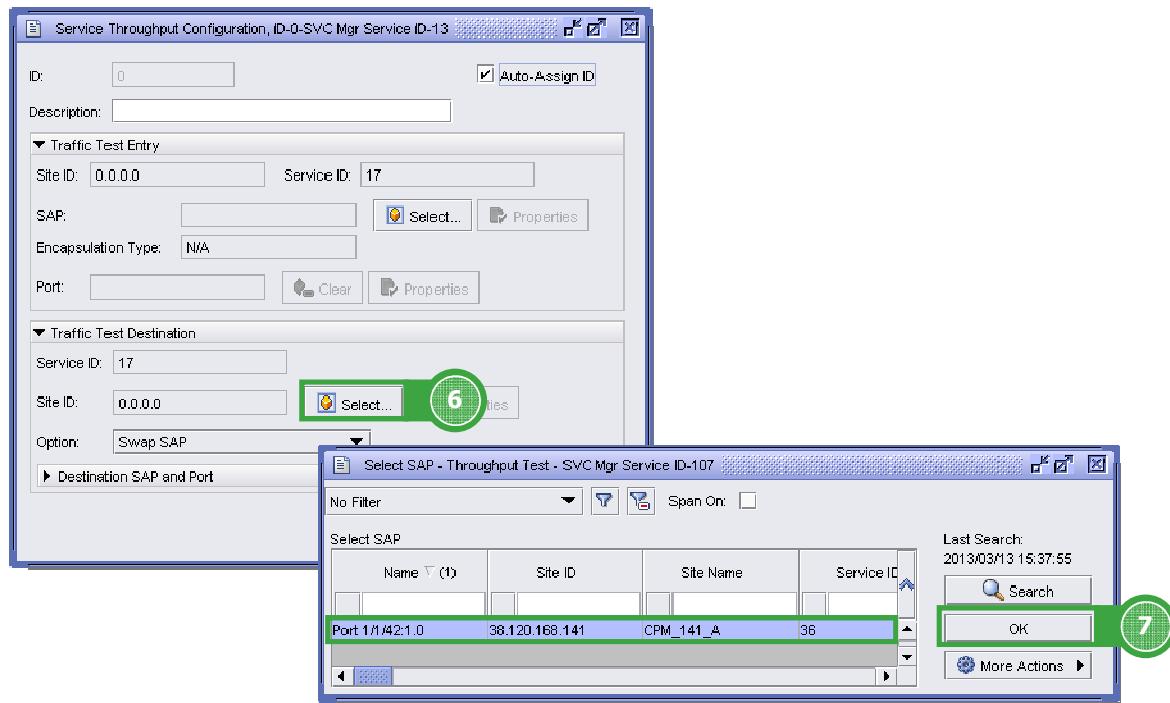
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You must specify a physical port or channel that is connected to the test entry and has the same encapsulation type as the SAP parameter in the Traffic Test Entry display area. By default, the displayed port is the underlying port of the selected SAP. If you choose a different port, the 5620 SAM creates a SAP on the selected port by copying the configuration from the original SAP during the test preparation. E-OAM objects are not copied to the SAP.

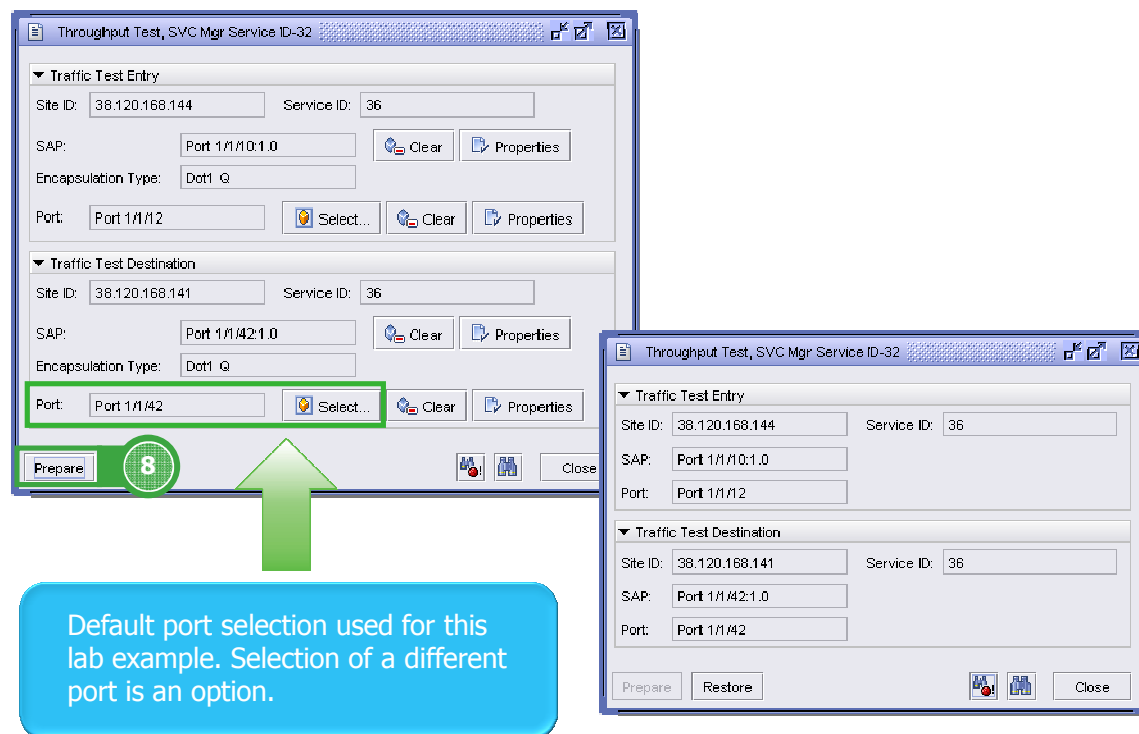


## 3.3 Select a destination SAP and port



Choose the destination SAP, which usually resides on a loopback port, or a port connected to a traffic generator. This specific configuration is unique to this lab. You can also put the traffic generator on the source SAP, or both the source and destination SAPs if you are troubleshooting directional faults in your network.

## 3.4 Activate the throughput test and review the settings



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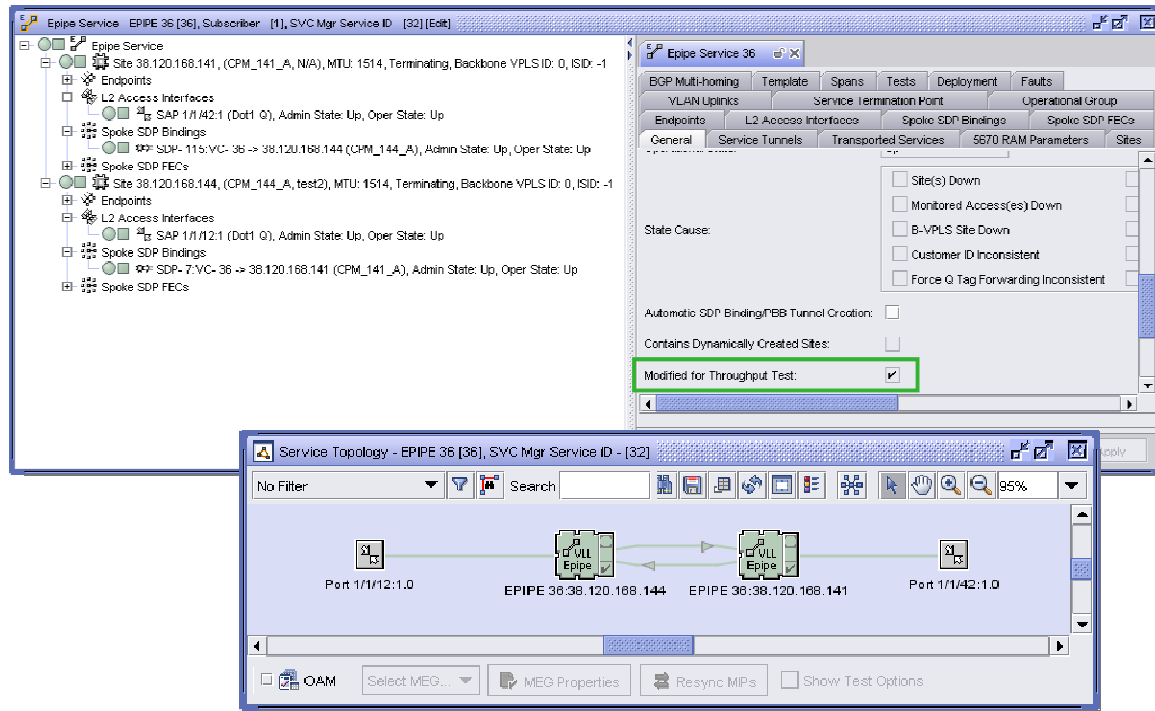
You can also specify a loopback port, or a port that is connected to a traffic generator, and has the same encapsulation type as the SAP parameter in the Traffic Test Destination display area. By default, the displayed port is the underlying port of the selected SAP. If you choose a different port, the 5620 SAM creates a SAP on the selected port by copying everything from the original SAP during the test preparation. E-OAM objects are not copied to the SAP.

If the test destination port you select is loopback-capable, you must configure additional parameters. The parameters that appear depend on the NE type and release.

The 5620 SAM performs all or some of the following functions when you click on the Prepare button:

- creates a SAP on the selected port if the selected port differs from the port on the SAP
- configures the SAP with the same configuration as the original SAP, including all child objects that are copied over to the SAP
- deletes the original SAP
- propagates loopback parameter changes to the test port
- updates the throughput information on the site
- updates the throughput information on the service

## 3.5 Review the service and the settings related to the test



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The Modified for Throughput Test parameter identifies if the service is modified for test purposes.

### 3 Perform OAM diagnostics on the service

## 4.1 Perform the OAM diagnostics for the VLL Epipe

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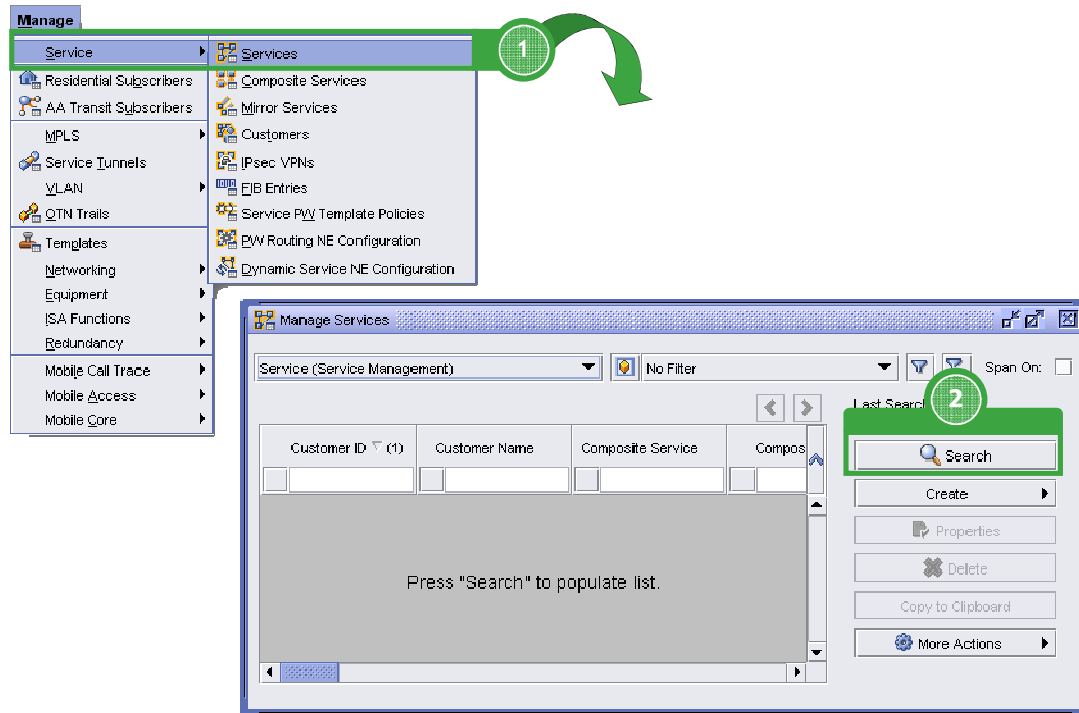
Configure, execute and interpret results of the VLL OAM diagnostics. The VLL OAM diagnostic lab in this course provides examples of VLL OAM diagnostic tests.

See the OAM Diagnostics — VLL module for more information.

The OAM Diagnostics - VLL lab can also be used in conjunction with the service throughput lab. OAM diagnostics are typically executed after preparing the test and before restoring the service to the original pre-test state.

## 4 Restoring service to original state

## 5.1 Display a list of services



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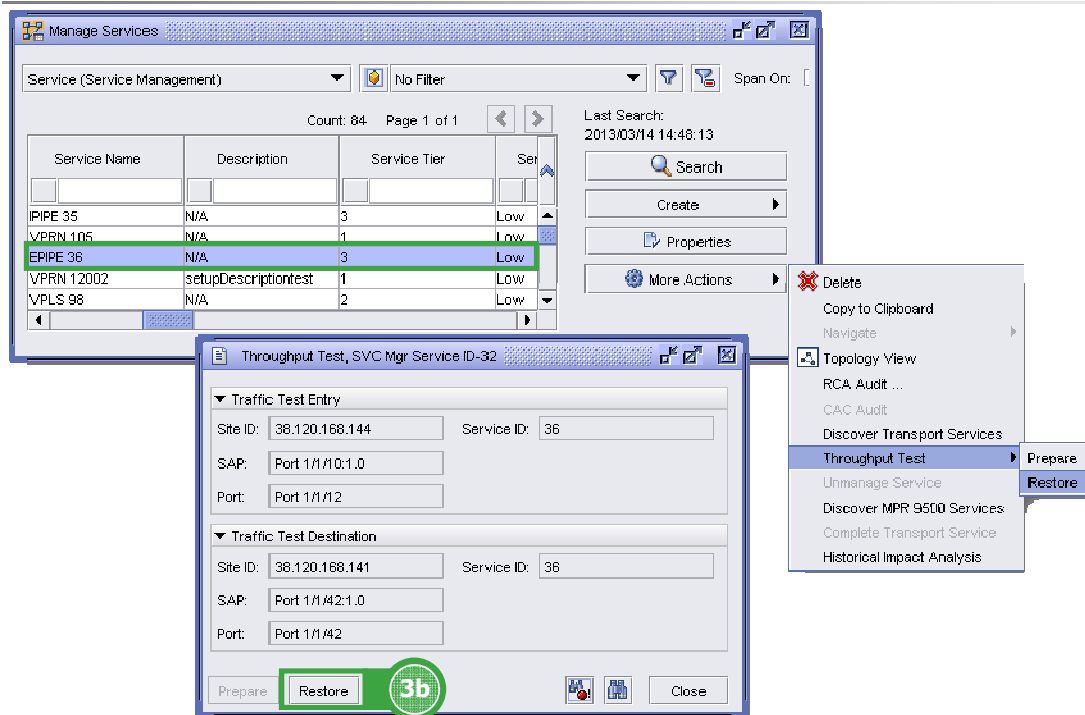
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1. Choose **Manage** → **Service** → **Services** from the main menu. The **Manage Services** form opens.
2. Click on the **Search** button.

## 5.2 Select the service and initiate the restoration of the serv



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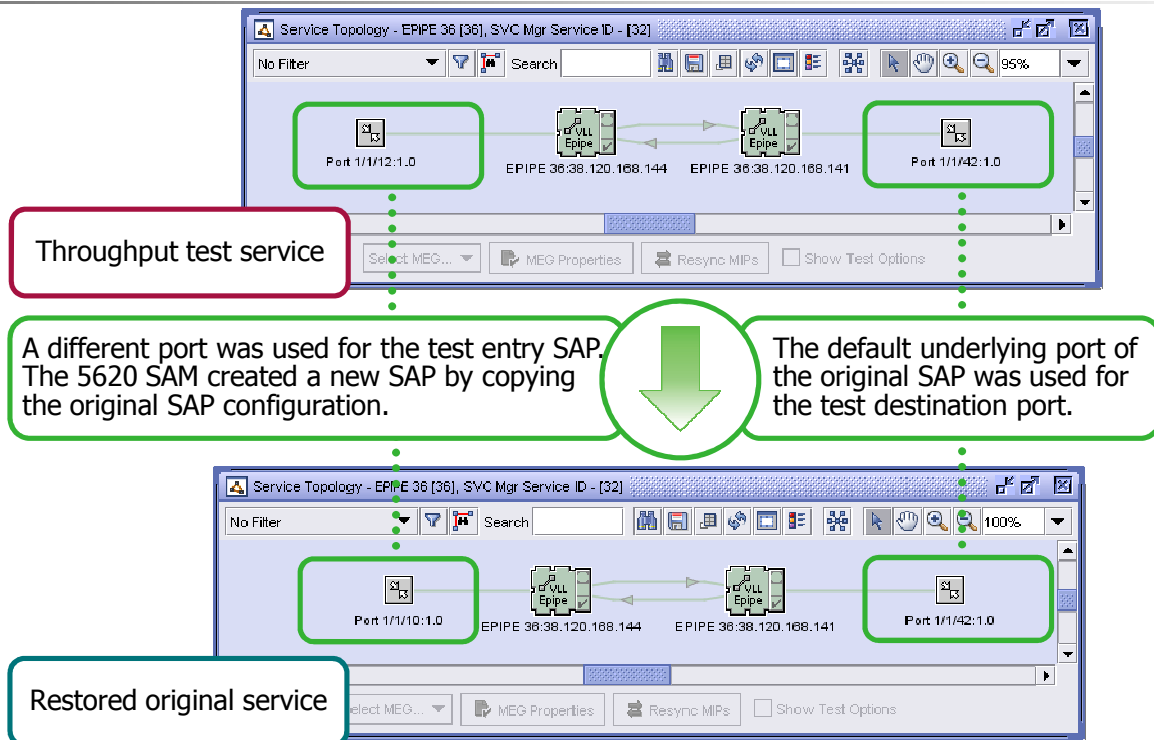
The 5620 SAM performs the following when you restore the service:

- deletes the newly create SAPs
- re-creates the original SAPs
- sets any loopback properties back to the original values, if applicable
- updates the site throughput status information
- updates the service throughput status information

When you perform a restore on a service, all of the modified sites within the service are restored. When you perform a restore on a composite service, all of the modified sites within that composite service are restored.



## 5.3 Review the restored service on the topology map (optional)



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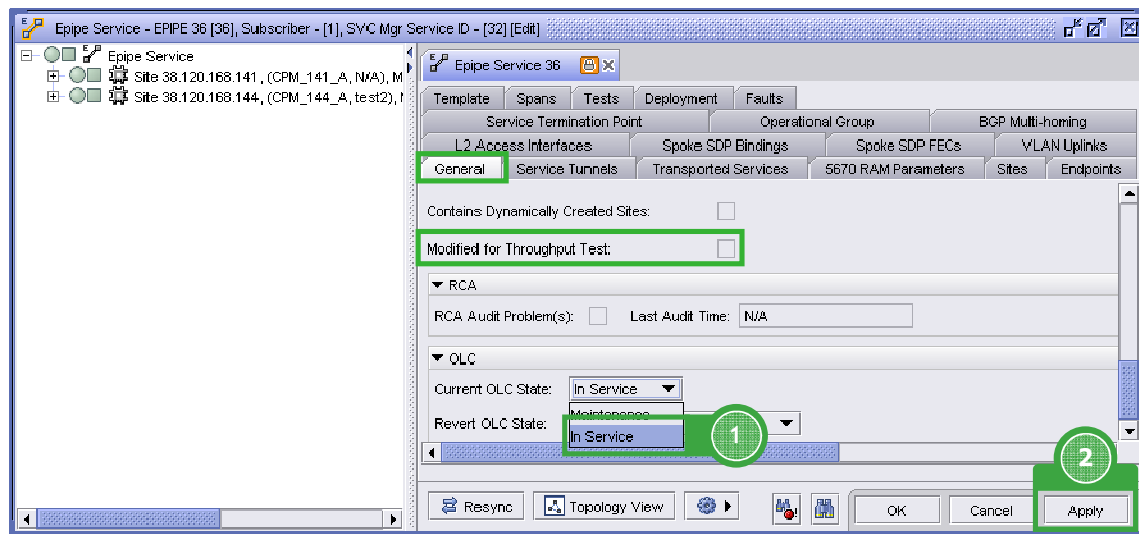
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## 5 Set the service OLC state

## 6.1 Set the service OLC state to in service (optional)



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1. Configure the service state using the **Revert OLC State** parameter. The Revert OLC State parameter specifies whether the service object reverts back to either the In Service mode or the Maintenance mode after the selected time, depending on the Current OLC State configuration. The associated schedule options are:
  - Not Scheduled (default)
  - In 4 hrs
  - In 1 day
  - In 7 days



## End of module Service Throughput

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## Section 5 Service and Network Tests

### **Module 3** **RCA Audit**

TOS36042\_V3.0-EQ-English-Ed1 Module 5.3 Edition 1

5620 SAM  
Services Operations and Provisioning  
TOS36042\_V3.0-EQ Edition 1

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1.0	2012-10-12	MCGRATH, John	TOS36042_V1.0 – SAM 10.0 R1
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2.0	2013-04-10	MCGRATH, John	TOS36042_V2.0 First edition – SAM 11.0 R1
2.1	2013-08-16	MCGRATH, John	TOS36042_V2.0 Second edition – SAM 11.0 R1 (update)
3.0	2014-04-03	MCGRATH, John	TOS36042_V3.0 First edition – SAM 12.0 R1



Upon completion of this module, you should be able to:

- Create an RCA Audit policy for a VLL service
- Identify the problems and review the solutions associated with a service
- Implement a fix for a service problem

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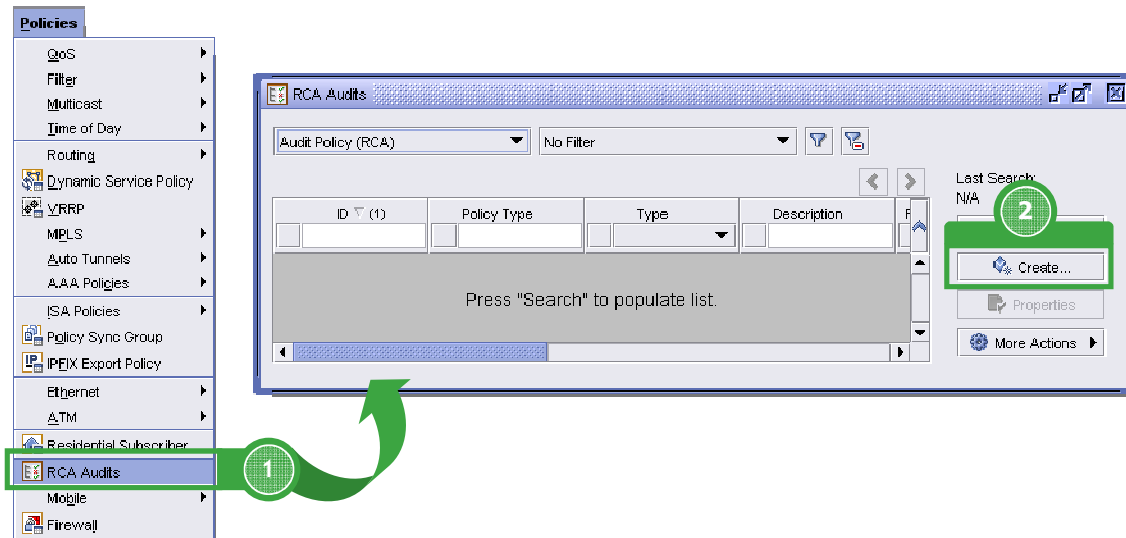


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5.1 Implement the recommended fix for the service problem	22

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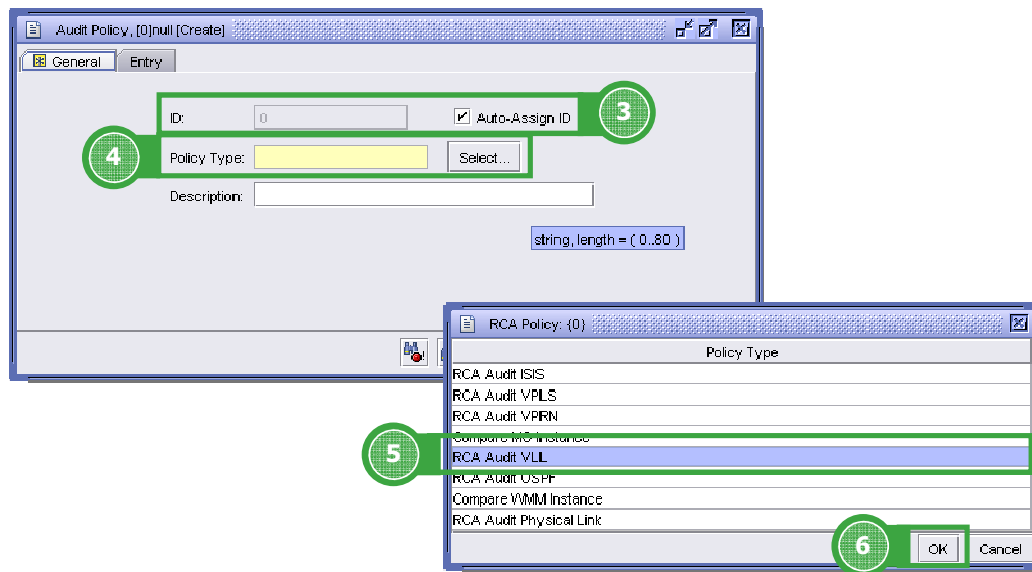
# 1 RCA audit policy

## 2.1 Create an RCA Audit policy



1. Choose Policies→RCA Audits from the 5620 SAM main menu. The RCA Audits form opens.
2. Click on the Create button.

## 2.2 Select an audit policy type



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3. Configure the ID parameter.
4. Click on the Select button to initiate the selection of a RCA Policy type.
5. Select the RCA Policy type. You require a 5650 CPAM license to create an RCA Audit ISIS or RCA Audit OSPF policy. You can also double-click on an entry to modify the policy description, if required.
6. Click on the OK button.

## 2.3 Add the policy description

The top screenshot shows the 'Audit Policy, [0]null [Create]' window. The 'Entry' tab is active. The 'ID' field is empty. The 'Policy Type' is 'RCA Audit VLL'. The 'Description' field is 'RCA Audit VLL - Mc G'. A green circle with the number 7 highlights the 'Description' field. The 'Apply' button is highlighted with a green circle with the number 8. A green arrow points from the 'Apply' button in the top screenshot to the 'Problems' tab in the bottom screenshot.

The bottom screenshot shows the 'Audit Policy - [0]vll [Edit]' window. The 'Problems' tab is active. The 'ID' field is '8'. The 'Policy Type' is 'RCA Audit VLL'. The 'Type' field is 'Service'. The 'Description' field is 'RCA Audit VLL - Mc G'. The 'Schedule', 'Copy...', and 'User Activity' buttons are highlighted with a green box.

5 · 3 · 10

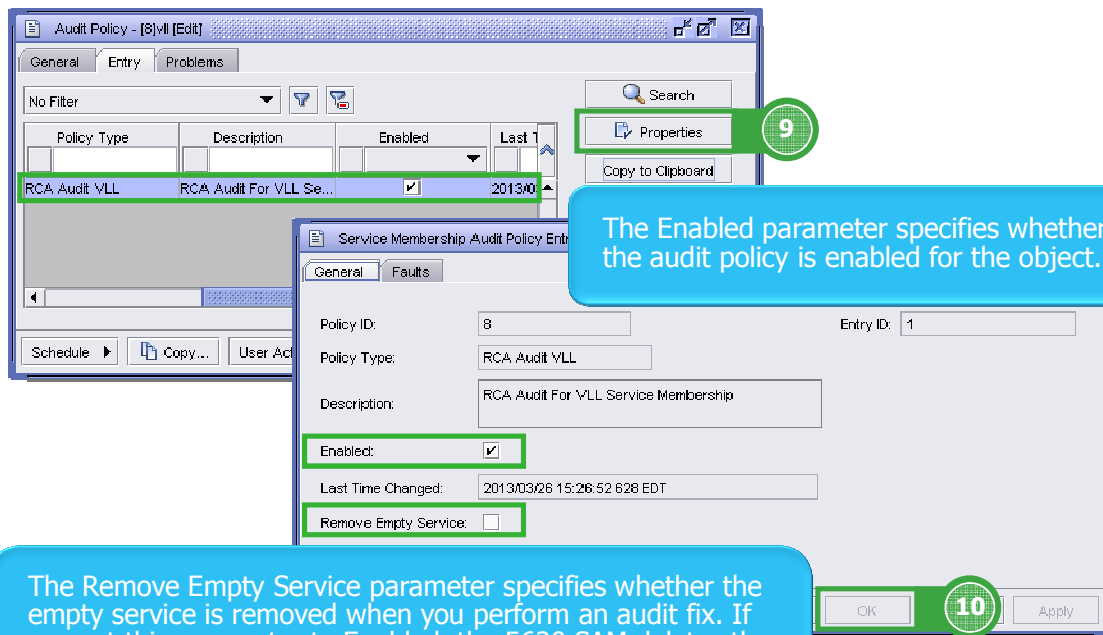
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7. Enter a policy description.
8. Click on the Apply button. The Audit Policy form refreshes with a new options.

## 2.4 Review the policy details



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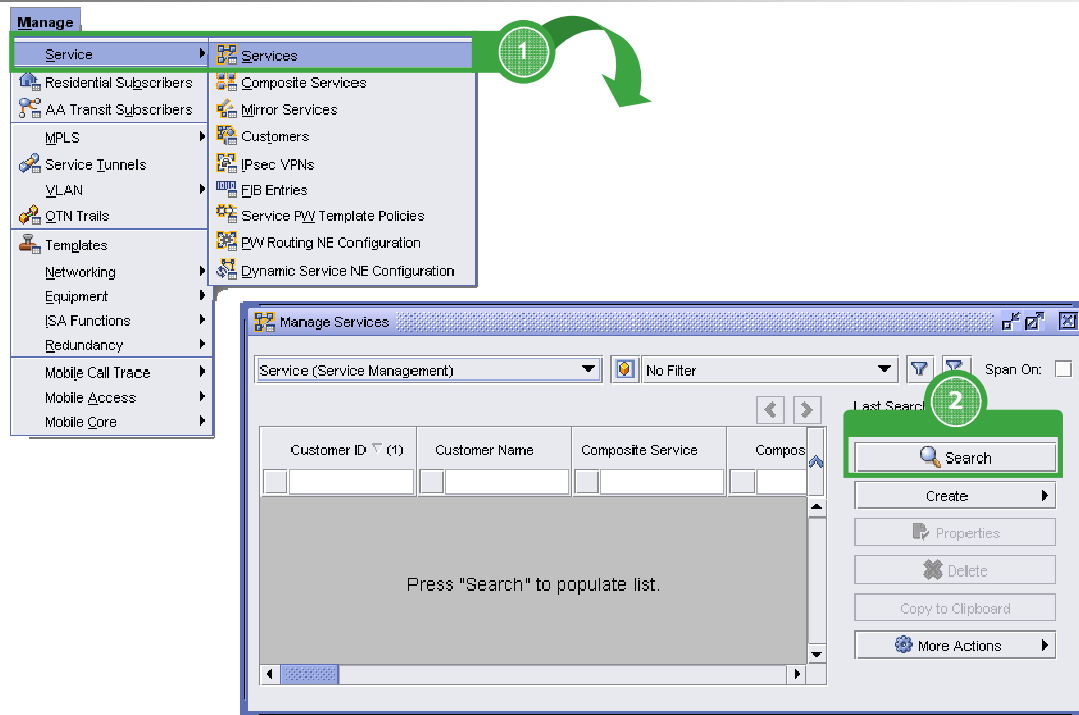
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9. Click on the Entry tab. Choose an entry from the list and click on the Properties button. The Audit Policy Entry - RCA Audit Policy - RCA Audit For *Network\_Object* (Edit) form opens with the General tab displayed. Review the configuration options.
10. Click on the OK button.

## 2 Run the RCA audit policy



## 3.1 Display a list of services



5 · 3 · 13

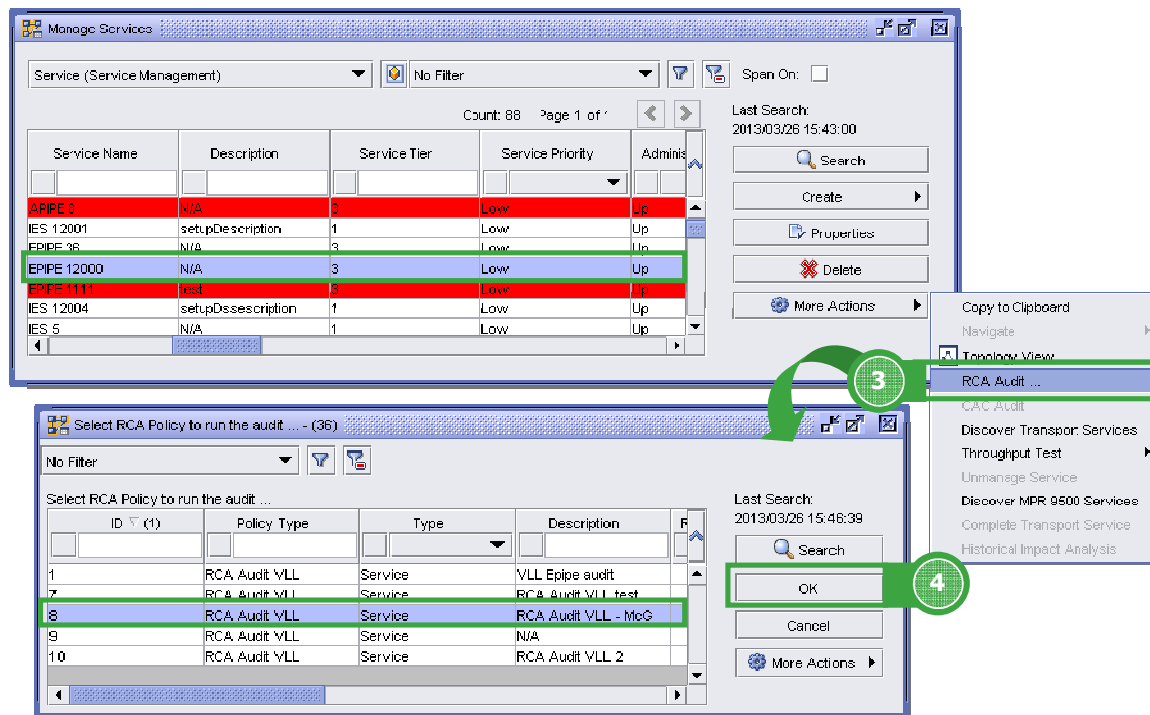
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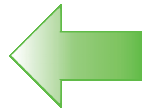
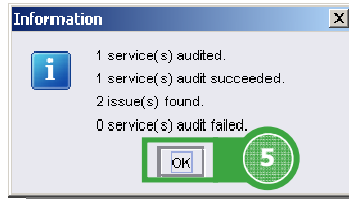
1. Choose **Manage** → **Service** → **Services** from the main menu. The **Manage Services** form opens.
2. Click on the **Search** button.

## 3.2 Select the RCA policy for the service

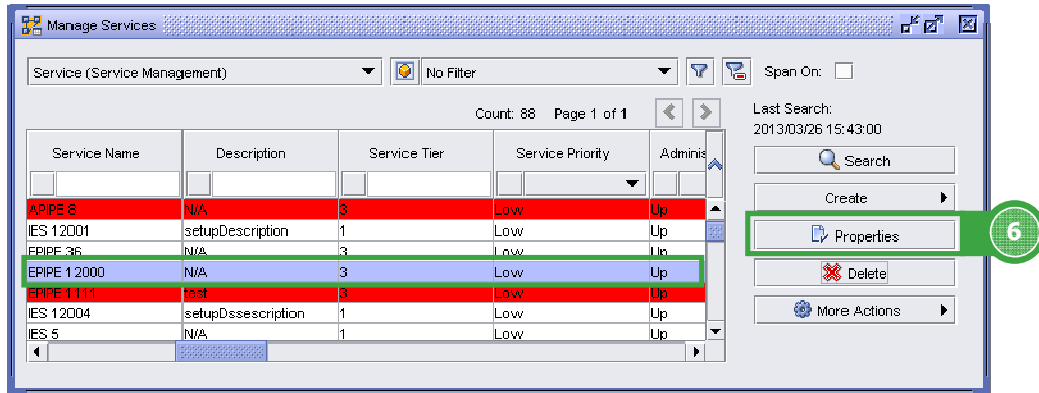


3. Select a service and click on the More Actions→RCA Audit button. The Select RCA Policy form opens.
4. Select the policy and click on the OK button.

### 3.3 Review the results for the service audit



Summary information for the service audit.



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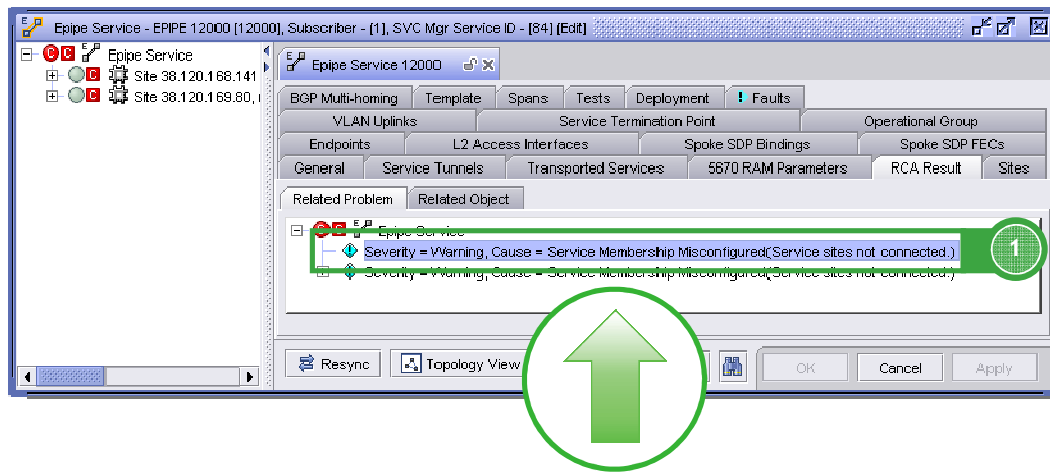
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- Click on the OK button to acknowledge the results of the policy audit.
- Select the service and click on the Properties button to initiate the investigation into the problem.

### 3 Identify the problems

## 4.1 Display the problems



Double-click on an entry in the Related Problem display area.

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1. Select the RCA Result tab and double-click on an entry in the Related Problem display area. The RCA Result tab is only available in the audit process detects a problem with the service.

## 4.2 Review the option to fix the problem

Problem - svc-mgr.service-84:cause-svcMemberMisconfigured-ConnectedComponent-1 (Edit)

General Related Problem Caused By Objects

Last Time Changed: 2013/03/26 15:48:02 EDT Probable Cause: Service Membership Misconfigured

Severity: Warning

Description: Service sites not connected.

Solution: Service could be split.

Policy

ID: 8

Policy Name: vll

Policy Type: RCA Audit VLL

Description: RCA Audit VLL - McG

Fix

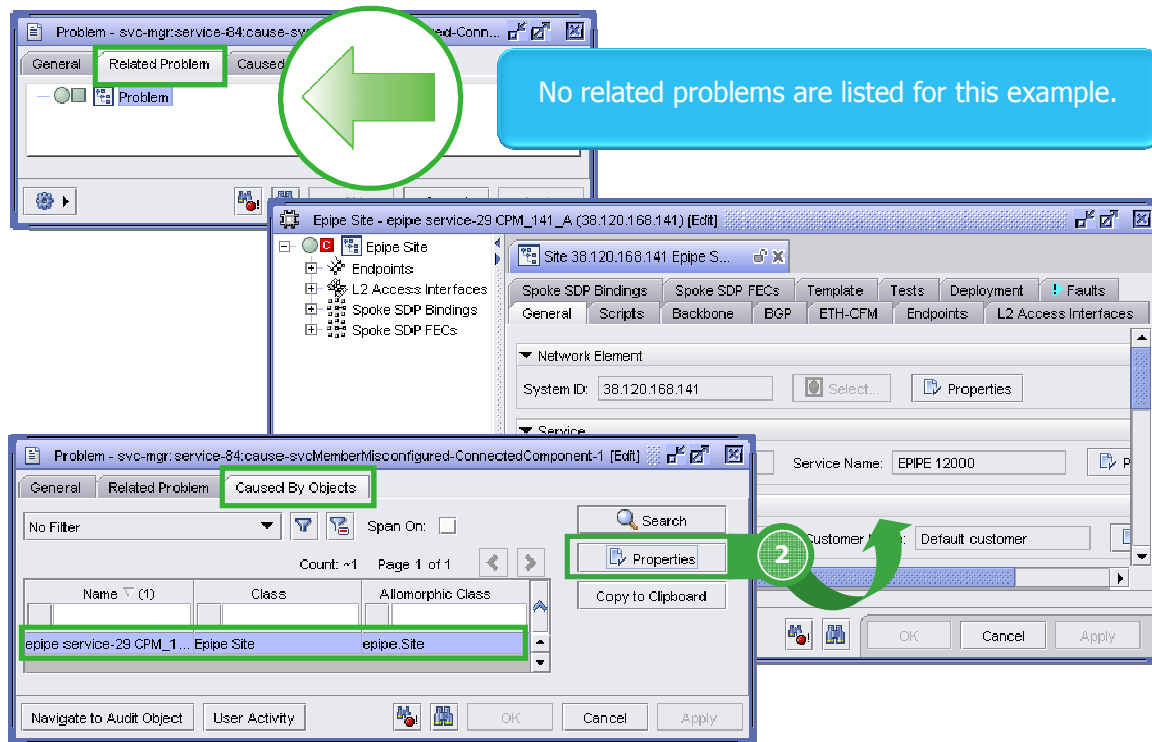
Disable Fix Window: ☐

Navigate to Audit Object User Activity OK Cancel Apply

The Disable Fix Window parameter specifies whether the solution recommended by the 5620 SAM can be applied to the problem.

When you set the Disable Fix Window parameter to Enabled, you cannot choose the Fix Problem option to apply the 5620 SAM-recommended solution.

## 4.3 Review the problems and related properties for the serv



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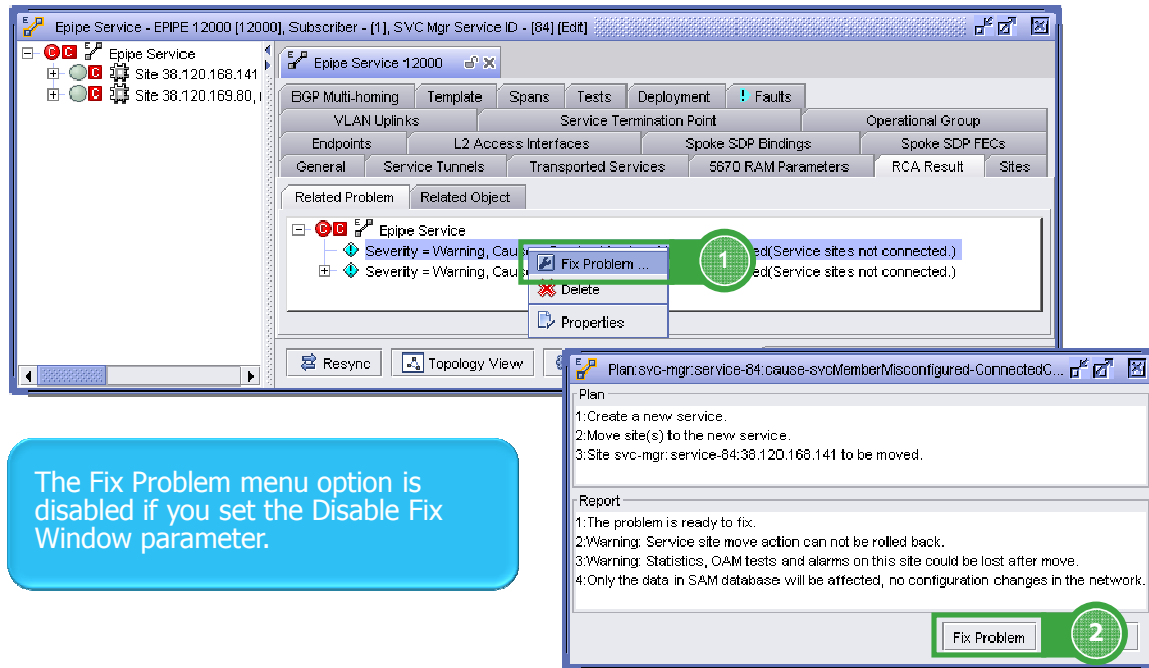
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2. Select the Caused By Objects tab, select an entry, and click on the Properties button.

## 4 Implement changes



## 5.1 Implement the recommended fix for the service problem



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1. Review the recommended plan to fix the problem in the Plan panel. Check the report about fixing the problem in the Report panel. Click on the Fix Problem button. The Plan form closes and a dialog box appears with a summary of the fix.
2. Confirm that you want to fix the problem.



## End of module RCA Audit

.....  
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## Section 6 Templates

# Module 1 VPLS from Template

TOS36042\_V3.0-EQ-English-Ed1 Module 6.1 Edition 1

5620 SAM  
Services Operations and Provisioning  
TOS36042\_V3.0-EQ Edition 1

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Document History			
Edition	Date	Author	Remarks
1.0	2012-10-12	MCGRATH, John	TOS36042_V1.0 – SAM 10.0 R1
1.1	2012-11-16	MCGRATH, John	TOS36042_V1.1 – SAM 10.0 R5
2.0	2013-04-10	MCGRATH, John	TOS36042_V2.0 First edition – SAM 11.0 R1
2.1	2013-08-16	MCGRATH, John	TOS36042_V2.0 Second edition – SAM 11.0 R1 (update)
3.0	2014-04-03	MCGRATH, John	TOS36042_V3.0 First edition – SAM 12.0 R1



Upon completion of this module, the student will be able to:

- Create a VPLS from a base Service template;
- View Service Properties;
- View the Service topology

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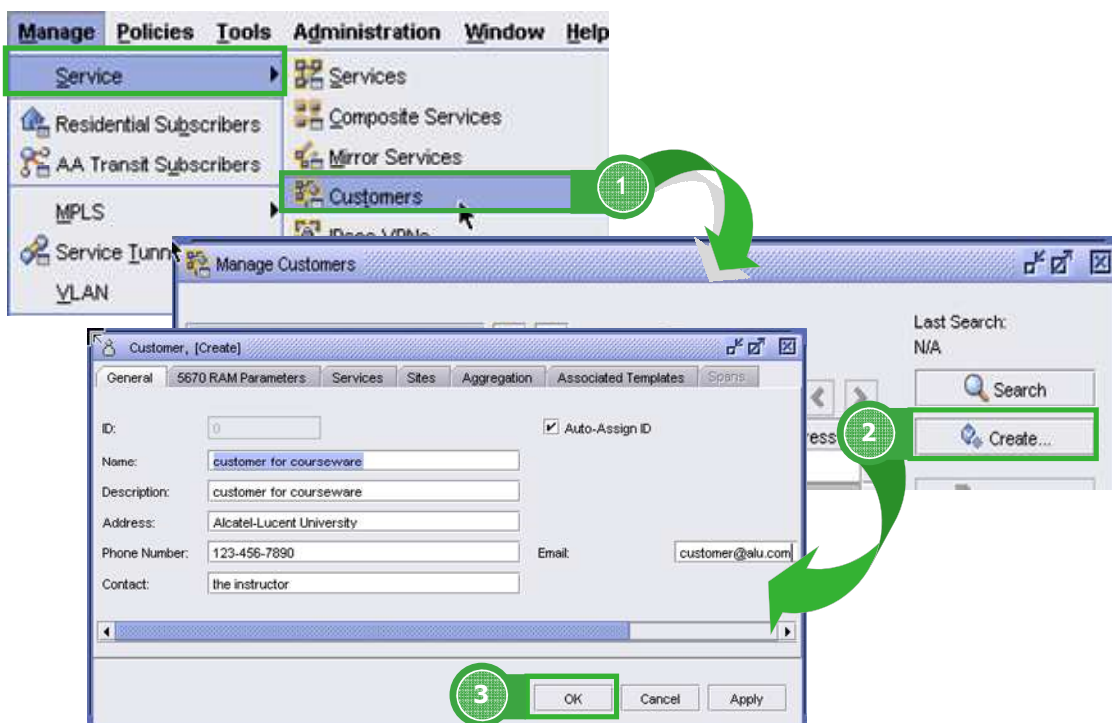
	Page
<b>1 Service Creation Using Templates</b>	<b>7</b>
1.2 Configure a customer	8
1.3 Configure Access Port	9
1.4 Create a VPLS from an existing template	10
1.5 Create a VPLS Site from an existing template	12
1.6 Create Access Interfaces	13
1.7 Add SDP Bindings	14
1.8 View SDP Bindings	16
1.9 Manage the VPLS	17
1.10 VPLS Topology View	18

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# 1 Service Creation Using Templates

## 1.2 Configure a customer



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Services must be associated with a customer. Though a service may only have one customer, that customer may have more than one associated to them.

To create a Customer using the 5620 SAM, the network administrator or operator will use the following sequence:

- From the Main Menu, select **Manage** → **Customers**;
- In the new window, click on the **Create** button;
- Complete the customer's details as provided in the configuration window;
- Click on the **OK** button.

To verify that the customer was created, or edit any detail:

- Select **Manage** → **Customers** from the Main Menu;
- Click on the **Search** button;
- Double-click on the appropriate entry or, select the appropriate customer and click on the **Edit** button;
- Review or modify the details, as required.

## 1.3 Configure Access Port

Equipment-Shelf 1 (7750-SR12), 68, A/A (2)

Equipment

Shelf 1 (7750-SR12), 68, A/A

APS Bundles

APS Groups

Card Slot - 1 (2 x 10-Gig MDA IOM Card, B), OK

Daughter Card Slot - 1 (40 x 10+00+000 Ethernet SFP), OK

Port 1/1/1 - Mode: Access - Encap: Null, State: OK

Resync

Turn Up

Shut Down

Create Optical Link

Import In New Tree

Make Root

Copy to Clipboard

Properties

General States Policies DDM Ethernet

Equipment

Site ID: 172.0.0.68 Site Name:

Name: Port 1/1/1

Interface ID: 35684352

Class: Variable Speed Ethernet

Description: 10/100/Gig Ethernet SFP

Hardware MAC: 82-44-01-01-00-01

Configured MAC: 82-44-01-01-00-01

Mode: Access

Encap Type: Null

Speed (Mbps): 1000

Actual Speed (kbps): 1000000

Access

Network

Null

Dot1 Q

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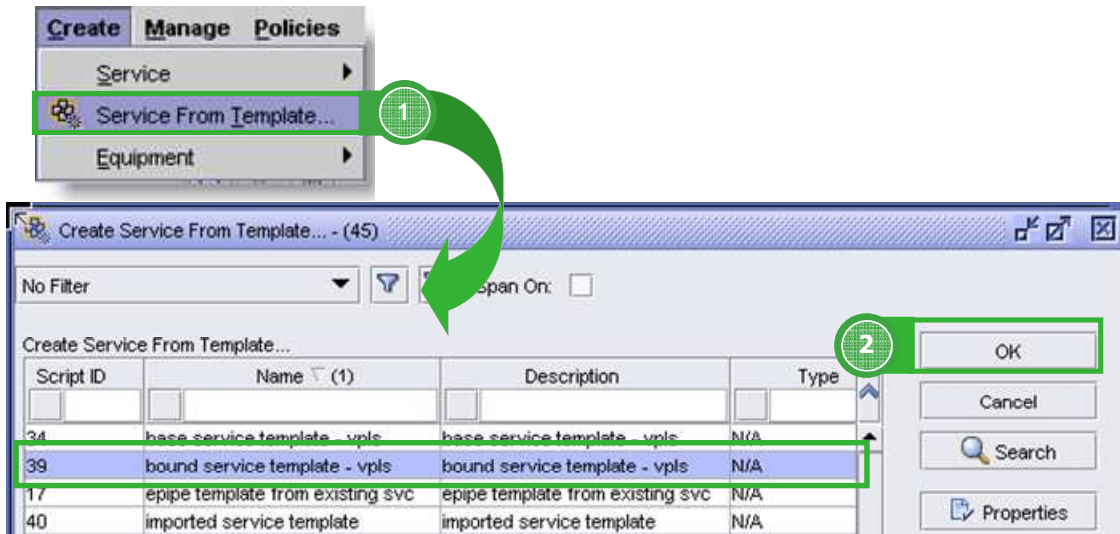
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As discussed, a service requires a port facing the customer edge to be configured for Access and an Encapsulation type specified. To configure a port:

- Navigate to the **Equipment** view in the Navigation Tree;
- Expand the tree and select the appropriate port or ports. It is possible to configure multiple ports at the same time by through the **Shift - Click** or **Ctrl - Click** method;
- Right-click and select **Properties** from the contextual menu;
- From the **Mode** drop-down menu, select **Access**;
- From the **Encapsulation Type** drop-down menu, select the appropriate encapsulation type;
- Set the port **MTU**. Remember that the port MTU must be set to a value set to support the largest service MTU to be supported on that port;
- Select **OK** to complete the configuration.

## 1.4 Create a VPLS from an existing template



To create a service from a template, select the appropriate template from a list and complete the configuration as would be done through the wizard.

To create a VPLS from a template:

- Select **Create → Service From Template** from the Main Menu;
- Select the appropriate template from the list in the new window. The network engineer can use the Search function to reduce the number of entries to be sorted through using filters;
- Click the **OK** button.

## 1.4 Create a VPLS from an existing template [cont.]

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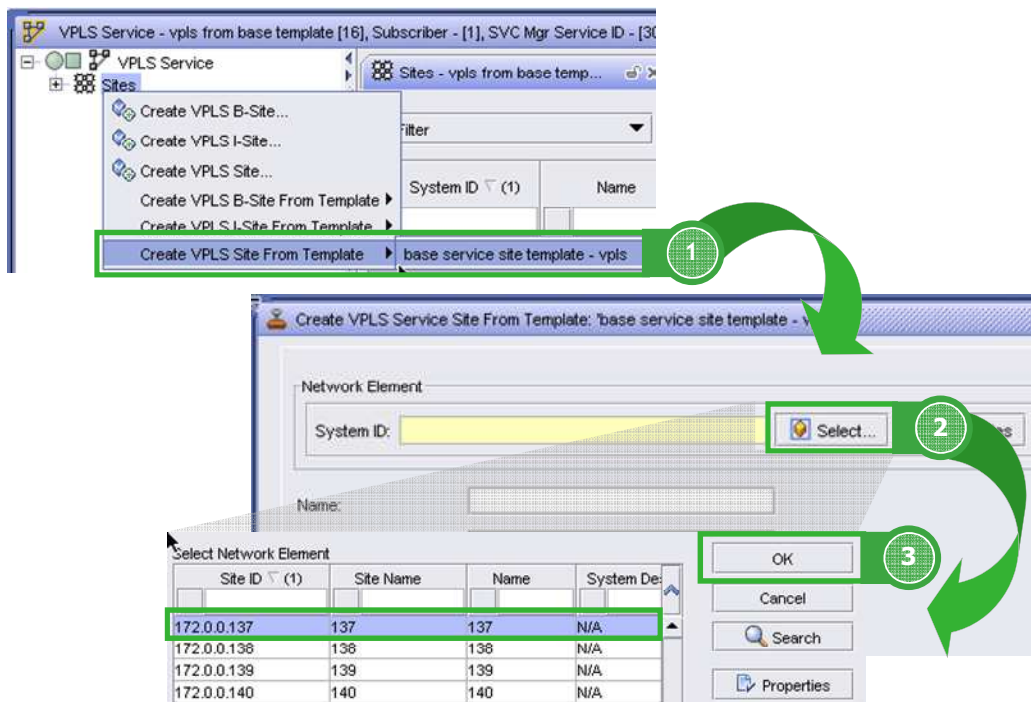
When the **Create VPLS Service From Template** window opens, the **General** tab will be populated as per the XML API script used to generate the template.

The General tab provides the following information:

- **Customer information** - this parameter may be already populated however, the network engineer can modify this entry by clicking in the Clear button and then use the Select button to reassign a customer to this service;
- **Service information** - this information provides the unique identifiers for the service. The ability to change these parameters will depend upon the template configuration. In the example above, the template has been configured to allow service provisioning personnel to change these parameters (bolded text in white configuration boxes);
- **Mesh SDP Binding** - these parameters define the characteristics of the Mesh SDP Binding. The service provisioning personnel will be required to define the VC ID, automatic Mesh SDP Bindings (where specific LSPs are not required) and the underlying Transport Type. In this example, it has been decided that the VC IP will be inherited from the Service ID, the automatic SDP Binding feature will be used and that the SDP will use RSVP-signaled LSPs;
- **OLC (Object Life Cycle)** - sets the status of the service for alarm recognition purposes. In service is used to signal network operations personnel that the service is passing customer traffic whereas Maintenance is intended to indicate that the service is under repair and not used for carrying customer data.

Click on the **Apply** button to save the changes and keep the window open.

## 1.5 Create a VPLS Site from an existing template

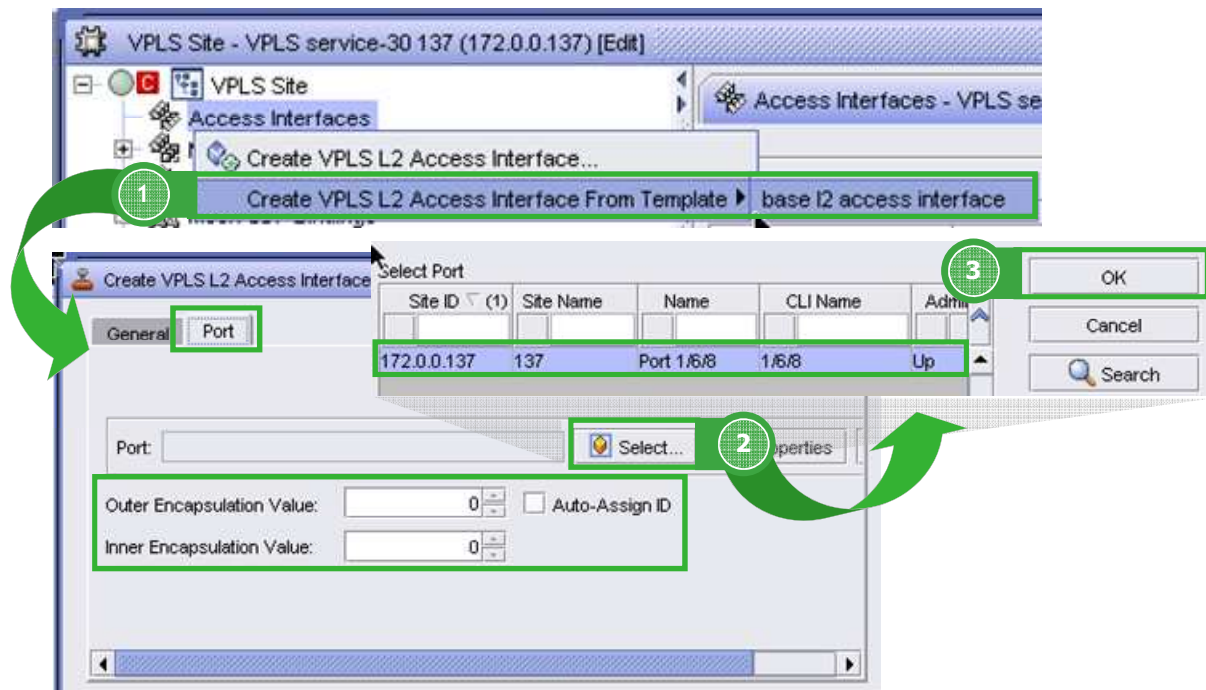


Having clicked the **Apply** button, the configuration window remains open and the changes are saved in the 5620 SAM database. However, service components (Service Sites, Access Interfaces and SDP Bindings) have yet to be configured for the service to be commissioned.

To configure service sites:

- Navigate to the **Components** window of the service configuration form;
- Select **Sites** from under the **VPLS Service** and right-click;
- Select **Create VPLS Site From Template** from the contextual menu and select the sites to participate in the VPLS service from the list. Each site is added individually, as shown above;
- The site template opens with the various tabs associated to it when it was first configured. Ensure all of the required attribute values are properly configured. Click the **OK** button.

## 1.6 Create Access Interfaces



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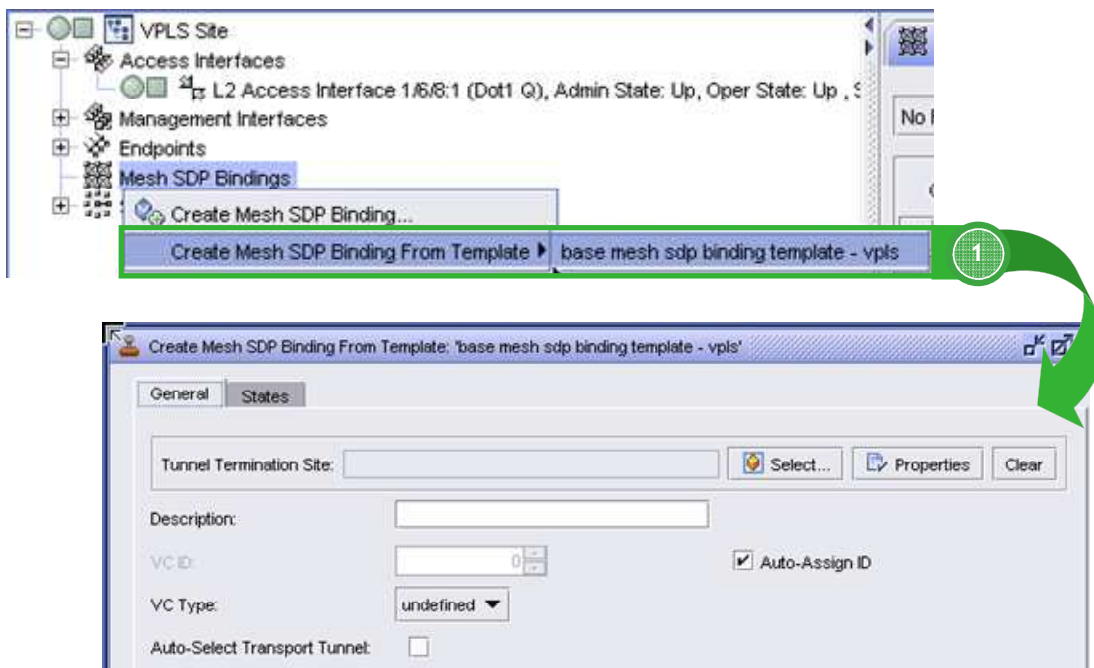
Service Access Points are virtual interfaces to provide customer access to the service provider's network. A SAP consists of: a physical port configured to support Access points; an encapsulation type; and, an encapsulation ID value unique to the port.

To create a SAP:

- Navigate to the **Component** window for the service;
- Navigate to the **Create L2 Access Interface From Template** of the appropriate **Site**;;
- Click the **Port** tab. The port may already be selected however, it may be possible to change the port assignment by clicking first the **Clear** button and then the **Select** button;
- Set the port **Encapsulation Value**, as required by the work order and click the **OK** button.



## 1.7 Add SDP Bindings



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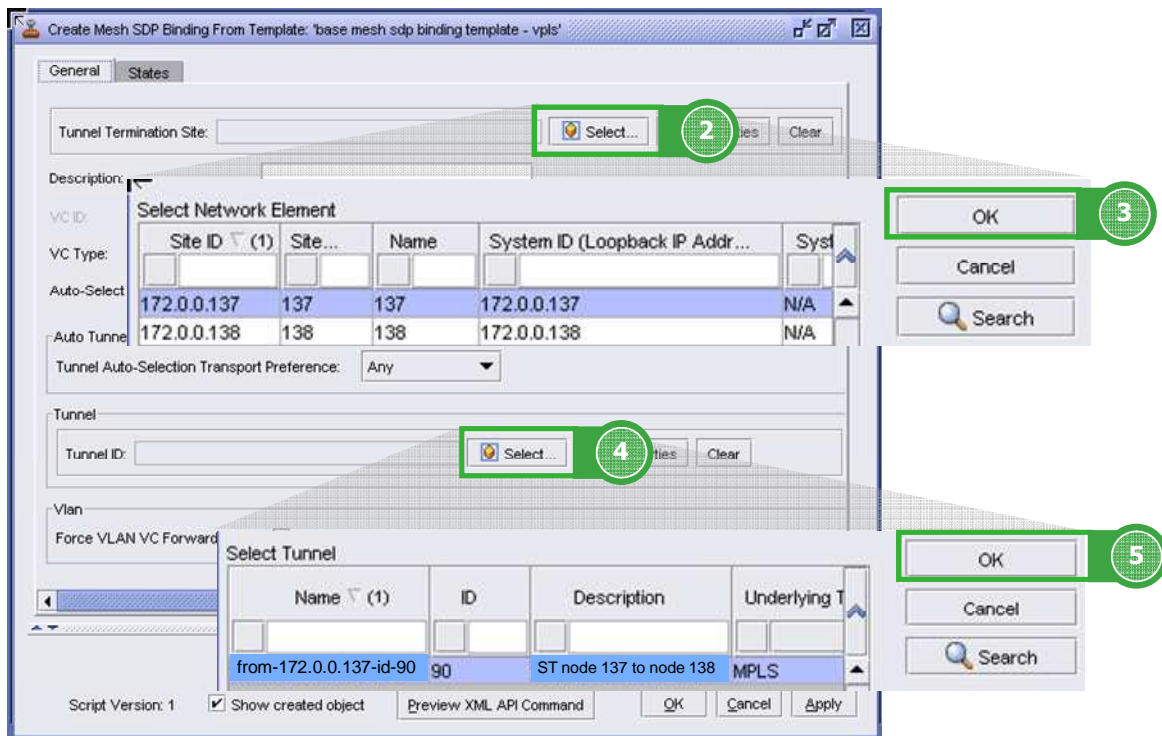
Service Distribution Paths are required when Service Access Points are located on separate network devices (distributed service). An SDP is created when a service is associated (bound) to a Service Tunnel.

The network administrator or operator has the option of either manually or automatically creating SDP bindings. To manually create the SDP Bindings:

- Expand the **Site** listing under the **Components** window for the service;
- Navigate to **Mesh SDP Bindings** entry in the list. Where the automatic Mesh SDP Bindings feature was selected under the General tab, as is the case in this example, the Bindings will automatically be created;
- If service provisioning personnel are to manually assign SDP Bindings, select the appropriate Binding type, right-click and select **Create <xxx> SDP Bindings From Template** (A VPLS supports both Spoke and Mesh SDP bindings);
- Select the appropriate template from the list provided and complete the configuration of the SDP Bindings, as per the work order.



## 1.7 Add SDP Bindings [cont.]



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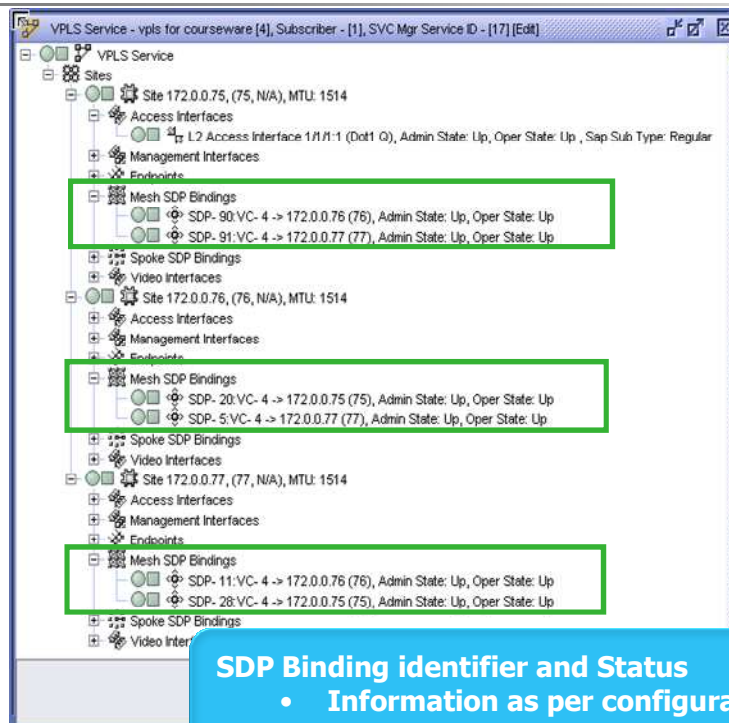
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- If service provisioning personnel are to manually assign SDP Bindings, select the appropriate Binding type, right-click and select **Create <xxx> SDP Bindings From Template** (A VPLS supports both Spoke and Mesh SDP bindings);
- Select the appropriate template from the list provided and complete the configuration of the SDP Bindings, as per the work order.

## 1.8 View SDP Bindings



### SDP Binding identifier and Status

- Information as per configuration
- note VC label is mapped to Service ID

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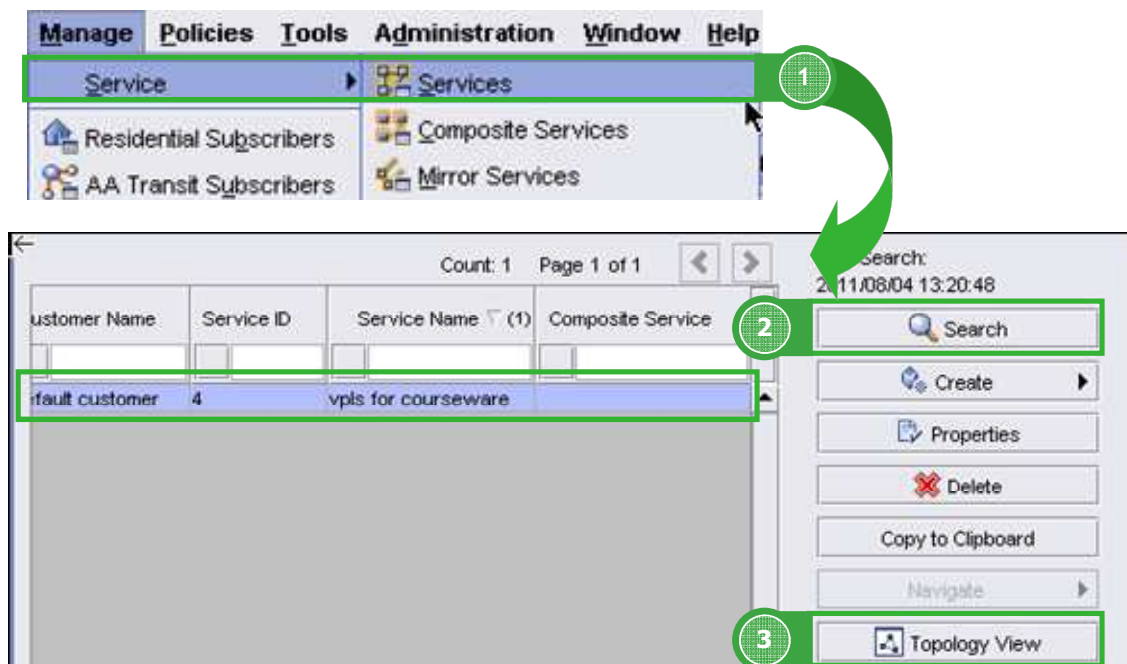
The network engineer completes the service configuration by ensuring that all the required components are included in the service. This is easily accomplished by selecting the **Components** tab and expanding the configuration tree for each of the service components, as shown above.

Verify that the VPLS contains:

- At least one service site (for a single site service) or two for a multiple site (distributed) service;
- At least two (2) service access points (SAPs);
- Endpoints, if SAP redundancy is being configured;
- Service Distribution Path Bindings, mesh and/ or spoke, as required to support the network topology.

Once it has been determined that all necessary components are present, click on the **OK** or **Apply** to save the service configuration to the 5620 SAM database, which in turn generates SNMP messages to the affected devices.

# 1.9 Manage the VPLS



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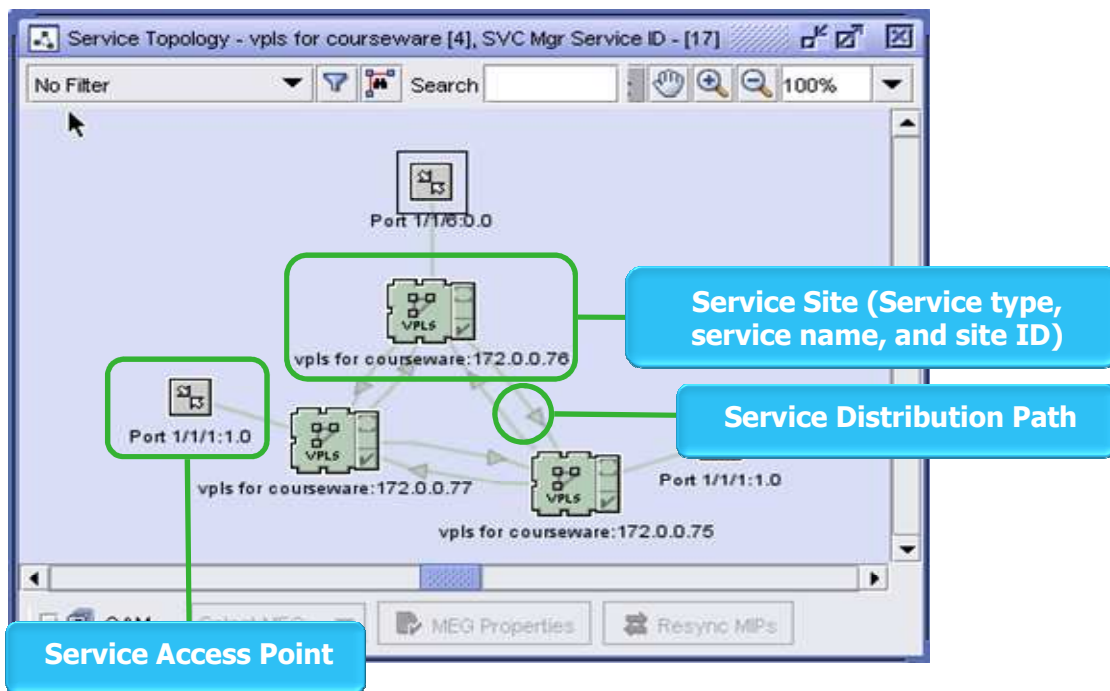
Once created, the network administrator or operator is able to view and/ or manage the Epipe service from the 5620 SAM GUI.

- To manage or view the Epipe service configuration:
- Select **Manage** → **Services** from the Main Menu
- Set the Search filter parameters, as required
- Click on the **Search** button
- Select the service from the list and click on either the **Properties** button or the **Topology View** button at the right side of the screen.

The **Properties** button opens the configuration window under the **General** tab for the selected service. Service configuration information is provided under the appropriate tabs listed at the top of the window. Parameters in drop-down menus or in the white blocks may be changed. Changes to an existing service will prompt a warning to which the network administrator or operator will be required to acknowledge before changes will be affected.

Viewing a graphical representation of the service is possible by clicking on the **Topology View** button of either window. An example is provided on the next page.

## 1.10 VPLS Topology View



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The **Topology View**, provides the network administrator or operator with a wealth of information about the service through a graphical representation. All components, and their status, will be represented in the window.

The network administrator or operator will be able to determine:

- Site IDs
- Service Type;
- Service Name;
- Service Access Points, including the Encapsulation IDs;
- Service Distribution Path Bindings
- Status and fault conditions of each of the above.

As is the case throughout the 5620 SAM, it is possible to view any component's **Properties** by selecting the component, then right-click and select the appropriate function from the contextual menu.

Color coding is used to indicate Fault conditions based upon the ITU-T X.733 standard (discussed later in the course). In the picture above, green indicates that the service components are reporting a normal operational status. The check mark within the service site icon indicates that the managed device is in active communication with the 5620 SAM.

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## End of module VPLS from Template

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## Section 7 Service classification and Forwarding

# Module 1 QoS

TOS36042\_V3.0-EQ-English-Ed1 Module 7.1 Edition 1

5620 SAM  
Services Operations and Provisioning  
TOS36042\_V3.0-EQ Edition 1

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2.0	2013-04-10	MCGRATH, John	TOS36042_V2.0 First edition – SAM 11.0 R1
2.1	2013-08-16	MCGRATH, John	TOS36042_V2.0 Second edition – SAM 11.0 R1 (update)
3.0	2014-04-03	MCGRATH, John	TOS36042_V3.0 First edition – SAM 12.0 R1





Upon completion of this module, you will be able to:

- Apply a rate limiting policy to a SAP

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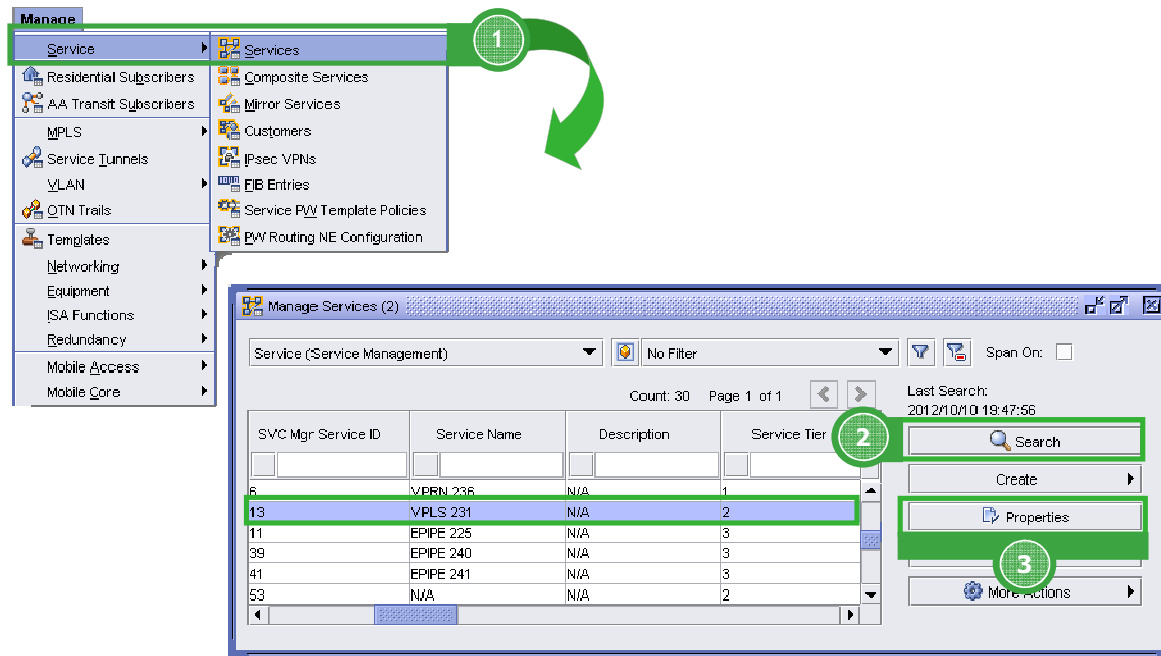


	Page
<b>1 Rate Limiting Policy on a SAP</b>	<b>7</b>
1.2 Apply access ingress policy to a SAP	8

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# 1 Rate Limiting Policy on a SAP

## 1.2 Apply access ingress policy to a SAP



7 · 1 · 8

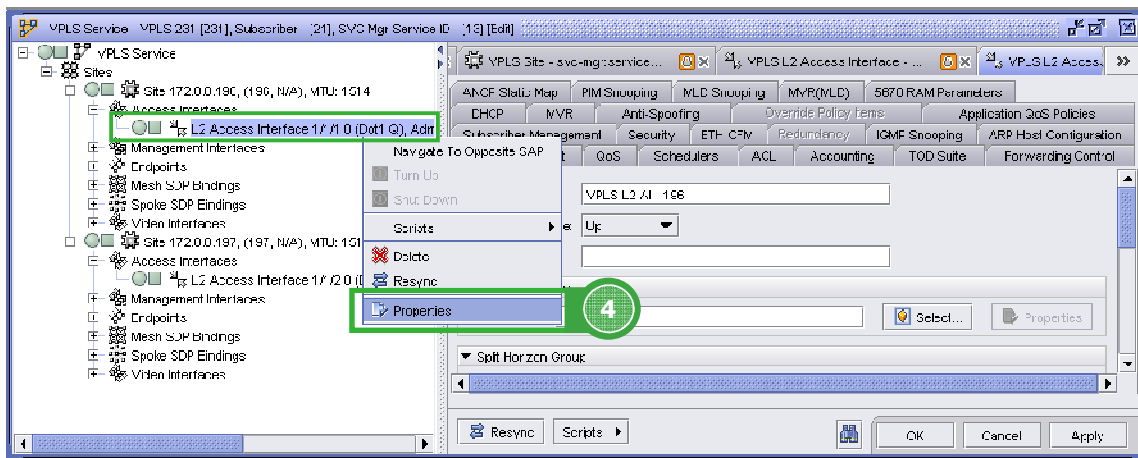
Service classification and Forwarding · QoS  
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1. Choose **Manage** → **Service** → **Services** from the main menu. The **Manage Services** form opens.
2. Click on the **Search** button.

## 1.2 Apply access ingress policy to a SAP [cont.]



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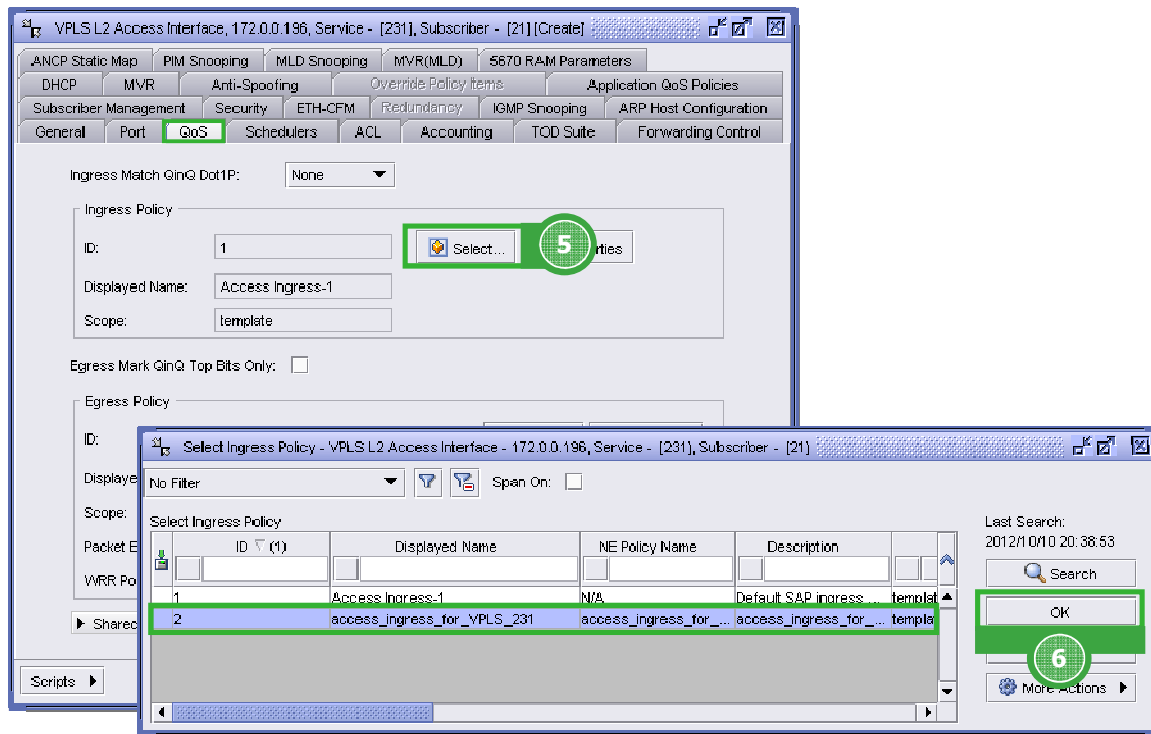
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4. Right-click on the L2 Access Interface associated with a site and select the Properties command.

## 1.2 Apply access ingress policy to a SAP [cont.]



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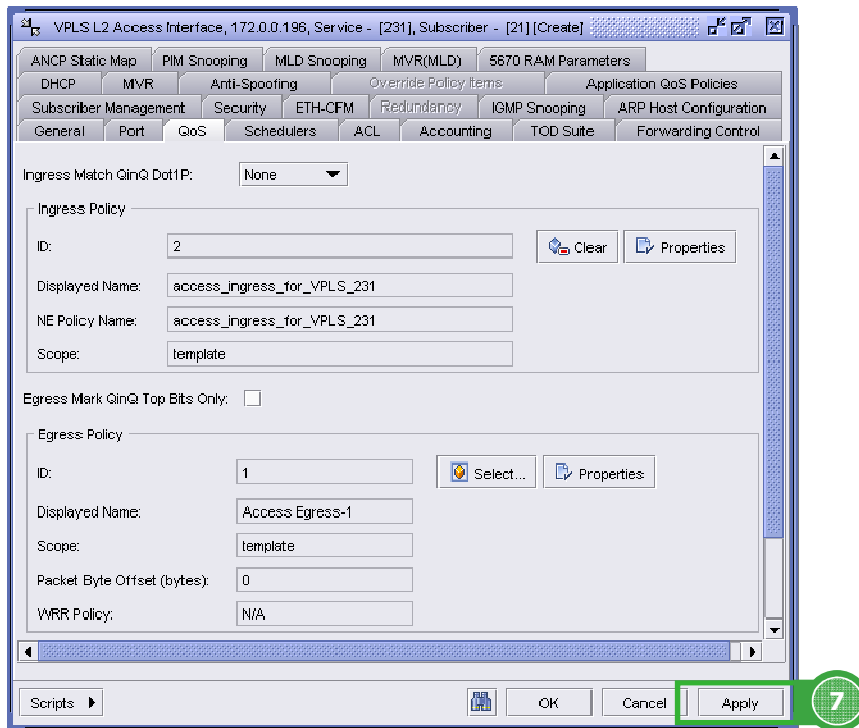
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5. Select the QoS tab and click on the Select button to initiate the selection of ingress policy.
6. Select an ingress policy and click on the OK button.



## 1.2 Apply access ingress policy to a SAP [cont.]



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- Click on the Apply button.



End of module  
QoS

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Please include the training reference in your email (see cover page)

Thank you!

