

## 5 Mapping Layer-2/3 Links to Transport Connections

---

After you map Layer-2/3 nodes to transport nodes, the next step is to map Layer-2/3 links to the transport connections that support those links. SWIM includes a Map Links dialog box that you can use to define the link/connection mapping. Link mappings are always one-to-one: a link is supported by exactly one transport connection.

SP Guru Transport Planner groups mapped connections with the same bit rate and protection strategy into one traffic matrix. You can use these matrices as inputs for SP Guru Transport Planner design operations such as routing and dimensioning. These types of matrices are denoted as “External” and cannot be edited in the Traffic Matrix Editor.

---

**Note**—To map a Layer-2/3 link to a transport connection, you must have the end nodes of the link mapped to separate transport nodes. This is necessary because SP Guru Transport Planner does not allow connections in which both end nodes are the same.

---

---

**Note**—You cannot map a link to a connection in a traffic matrix that has already been routed, dimensioned, or groomed in SP Guru Transport Planner. You must first tear down the matrix so that connections can be added to it, as described in Tearing Down a Traffic Matrix on page TrP-6-20.

---

### Mapping Links: Procedure Descriptions

SWIM includes a Map Links dialog box that you can use to specify these mappings. To open this dialog box, choose SWIM > Node/Link Mapping > Link Mapping in the Project Editor of SP Guru Network Planner.

This section describes the supported procedures for mapping Layer-2/3 links to transport connections:

- Automatic Link-to-Connection Mapping (New SP Guru Transport Planner Traffic Matrix) on page TC-5-2
- Link-to-Connection Mapping (Existing SP Guru Transport Planner Traffic Matrix) on page TC-5-2
- Link-to-Connection Mapping (New SP Guru Transport Planner Traffic Matrices) on page TC-5-3
- Unmapping Layer-2/3 Links on page TC-5-4
- Clearing All Node and Link Mappings on page TC-5-4

- Importing Node and Link Mappings from an External File on page TC-5-5
- Renaming or Deleting a Traffic Matrix on page TC-5-5

## Automatic Link-to-Connection Mapping (New SP Guru Transport Planner Traffic Matrix)

This procedure maps one or more Layer-2/3 links to connections in a new SP Guru Transport Planner traffic matrix.

---

### Procedure 5-1 Automatically Mapping One or More Layer-2/3 links to Transport Connections

- 1 From the Project Editor of SP Guru Network Planner, choose SWIM > Node/Link Mapping > Map Links.

➔ The SWIM - Map Links Dialog Box appears.

- 2 In the Layer-2/3 Links treeview, select the links to map.

To select multiple links, hold down the Ctrl key while selecting.

To select all links in a subnet, select the subnet in the treeview (this is possible only if the Show Hierarchy checkbox is selected).

- 3 Click the “Auto >>” button. SP Guru Transport Planner creates a new traffic matrix for each link model used for the selected links, and maps all selected links to connections in the corresponding matrix (that is, the matrix that corresponds to the model used by that link).

The network layer (DCL/OCH) and bit rate of the new matrix—and, as a result, the connections supporting the links—are determined by the mapping defaults specified for the underlying link models. If a link model has no default mapping, links using that model will remain unmapped. For more information, see Setting Link Mapping Defaults on page TC-5-7.

### End of Procedure 5-1

---

## Link-to-Connection Mapping (Existing SP Guru Transport Planner Traffic Matrix)

This procedure maps one or more Layer-2/3 links to connections in an existing SP Guru Transport Planner traffic matrix.

---

### Procedure 5-2 Mapping One or More Layer-2/3 links to Transport Connections (Existing Traffic Matrices)

- 1 From the Project Editor of SP Guru Network Planner, choose SWIM > Node/Link Mapping > Map Links.

➔ The SWIM - Map Links Dialog Box appears.

- 2 In the Layer-2/3 Links treeview, select the links to map.

To select multiple links, hold down the Ctrl key while selecting.

To select all links in a subnet, select the subnet in the treeview (this is possible only if the Show Hierarchy checkbox is selected).

- 3 In the Transport Traffic Matrices treeview, select the matrix for the mapped connections.
- 4 Click the >> button. The selected links appear as children of the matrix.

---

**End of Procedure 5-2**

---

## Link-to-Connection Mapping (New SP Guru Transport Planner Traffic Matrices)

This procedure maps Layer-2/3 links to transport connections. This operation creates one or more new traffic matrices and maps the selected links to connections in the new matrices.

---

### Procedure 5-3 Mapping One or More Layer-2/3 links to Transport Connections (New Traffic Matrices Per Model)

- 1 From the Project Editor of SP Guru Network Planner, choose SWIM > Node/Link Mapping > Map Links.  
➡ The SWIM - Map Links Dialog Box appears.
- 2 In the Layer-2/3 Links treeview, select the links to map.  
To select multiple links, hold down the Ctrl key while selecting.  
To select all links in a subnet, select the subnet in the treeview (this is possible only if the Show Hierarchy checkbox is selected).
- 3 In the Transport Traffic Matrices treeview, select either "New... all to 1" or "New... per model".  
If you select "New... all to 1", SWIM creates one traffic matrix in SP Guru Transport Planner. Each selected link will be mapped onto a connection in that matrix, regardless of the link model.  
If you select "New... per model", SWIM creates multiple traffic matrices—one matrix for each link model used by the set of all selected links. This means that each link is mapped to a connection in the traffic matrix that corresponds to its link model.
- 4 Click the ">>" Button.  
➡ The SWIM - Map To New Transport Traffic Matrix dialog box appears for the selected set of Layer-2/3 links.
- 5 Select the network layer and bit rate.

The initially selected network layer and bit rate matrix—and, as a result, the connections that support the links—are determined by the mapping defaults specified for the underlying link models. If a link model has no default mapping, links that use that model will remain unmapped. For more information, see Setting Link Mapping Defaults on page TC-5-7.

- 6 Enter the name of the traffic matrix.
- 7 Click OK to close the SWIM - Map To New Transport Traffic Matrix dialog box.
- 8 If you selected “New...per model” in step 3, repeat step 5 through step 7 for each link model and its associated set of selected links.
- 9 Click OK to confirm the mapping and close the SWIM - Map Links dialog box.

---

**End of Procedure 5-3**

---

## Unmapping Layer-2/3 Links

This procedure unmaps an existing Layer-2/3<—> Transport connection mapping.

---

**Note**—If you unmap some (but not all) links of an LOP or DCL traffic matrix, this does not clear connections on lower Transport layers. As a result, you might need to redesign your Transport network to reflect the mapping changes.

---

---

### Procedure 5-4 Unmapping a Layer-2/3 Link from a Connection

- 1 From the Project Editor of SP Guru Network Planner, choose SWIM > Node/Link Mapping > Map Links.
  - ➡ The SWIM - Map Links Dialog Box appears.
- 2 In the Transport Traffic Matrices treeview, select the connections to unmap.
  - To select all connections in a matrix, select the matrix in the treeview.
- 3 Click the << button.

---

**End of Procedure 5-4**

---

## Clearing All Node and Link Mappings

To clear all existing node and link mappings, choose SWIM > Node/Link Mapping > Clear Node and Link Mapping.

## Importing Node and Link Mappings from an External File

You can import node and link mappings defined in an external SWIM or XML data file. This option is useful if you have an existing SWIM file that contains the link mappings you want to apply to the current scenario.

---

### Procedure 5-5 Importing Node/Link Mappings from an External File

- 1 From the Project Editor of SP Guru Network Planner, choose SWIM > Node/Link Mapping > Map Links.
  - ➔ The SWIM - Map Links Dialog Box appears.
- 2 Click Import.
  - ➔ The SWIM - Import Link Mapping dialog box appears.
- 3 Select the SWIM (\*.wdmnt.xml) or XML file that specifies the link mapping you want to import, then click Open.
  - ➔ SWIM imports the link mappings specified in the file, and ignores all other information.
  - ➔ A log message appears and shows all mapping data that was imported.

### End of Procedure 5-5

---

## Renaming or Deleting a Traffic Matrix

To delete or rename a traffic matrix, right-click on the matrix in the Transport Traffic Matrices treeview of the SWIM - Map Links Dialog Box. You can also delete a traffic matrix from the Traffic Matrix Editor in SP Guru Transport Planner.

For more information, see Creating Network Traffic on page TrP-3-26.

---

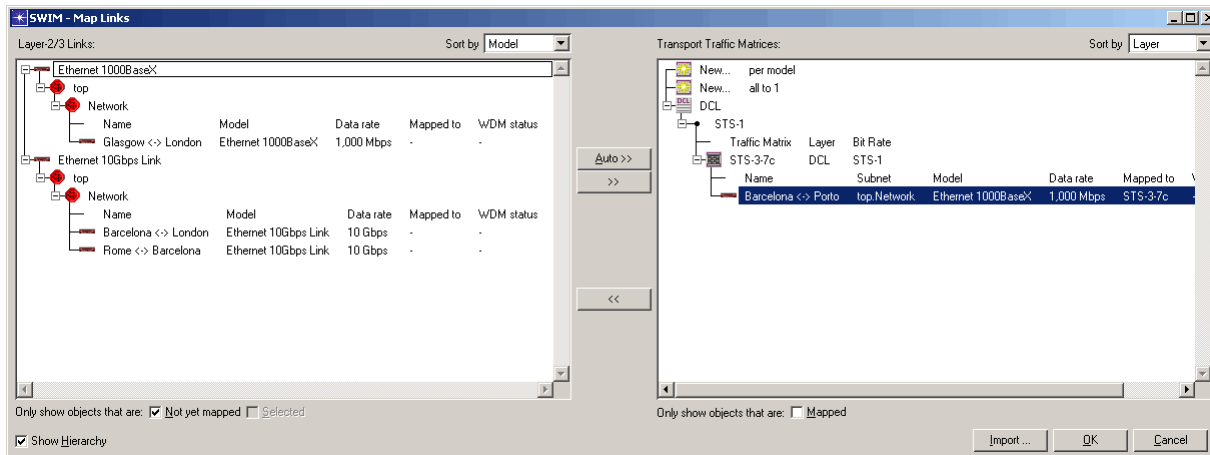
**Note**—You can delete a traffic matrix only if it has no connections that are mapped to Layer-2/3 links.

---

## SWIM - Map Links Dialog Box

To open this dialog box, choose SWIM > Node/Link Mapping > Link Mapping in the Project Editor of SP Guru Network Planner. For procedure descriptions, see Mapping Links: Procedure Descriptions on page TC-5-1.

**Figure 5-1 SWIM - Map Links Dialog Box**



**Table 5-1 SWIM - Map Links Dialog Box**

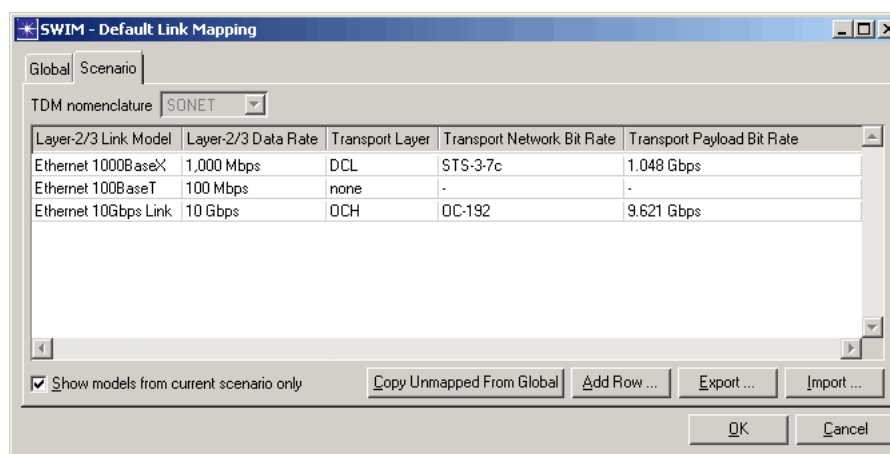
Control	Description
Auto >>	Map selected Layer-2/3 links to connections and group the connections into new traffic matrices by based on Transport network layer and bit rate, as specified in the default link mappings (see Setting Link Mapping Defaults on page TC-5-7).
>>	Maps link(s) selected in the Layer-2/3 treeview to connections in one or more Transport traffic matrices (depending on the selection in the Transport Traffic Matrices treeview)
<<	Unmaps Layer-2/3 link(s) selected in the Transport Traffic Matrices treeview
Import	Import node mappings from a SWIM (*.wdmnt.xml) or XML data file
OK	Apply the specified mapping to the SP Guru Network Planner and SP Guru Transport Planner scenarios
Cancel	Cancels mapping operations and leaves the SP Guru Network Planner and SP Guru Transport Planner scenarios unchanged
<b>End of Table 5-1</b>	

## Setting Link Mapping Defaults

Typically, the layer and bit rate of a mapped connection is determined by the link model in SP Guru Network Planner. You can create traffic matrices with the correct layer and bit rate automatically in the SWIM - Map Links Dialog Box.

To configure the default mapping behavior, choose SWIM > Set Link Mapping Defaults. This opens the Default Link Mapping dialog box, which you can use to edit the default mapping options for the current scenario (Scenario tabbed page). You can use the Global tabbed page to edit the default settings for new scenarios in SWIM projects.

**Figure 5-2 SWIM - Default Link Mapping Dialog Box**



**Table 5-2 Default Link Mapping Dialog Box**

Option/Field	Description
Global/Scenario tabs	View/edit default settings for new scenarios or for the current scenario
TDM Nomenclature	The naming scheme of the current SP Guru Transport Planner scenario. When the Global tab is selected, you can edit the global settings for SDH or SONET.
Default mapping table	Lists Layer-2/3 link models and the Transport layers and bit rates they should be mapped to. To edit the layer or bit rate, click in a cell.
Show models from current scenario only	If this option is selected, the table shows only link models that are used in the current scenario.
Copy Unmapped From Global ( <i>Scenario page only</i> )	For link models which have no default mapping yet, copy mapping settings from the global settings (if any).
Add Row	Add new Layer-2/3 link models to the table
Export	Export the current link mappings to a link-mapping file (XML format). The format is similar to that of the SWIM file, in that it will have a SWIM Default Link Mapping element as root.

**Table 5-2 Default Link Mapping Dialog Box (Continued)**

Option/Field	Description
Import	Import link mappings from an XML file—either full SWIM data file or a link mapping file (generated using the Export button in this dialog box).
OK	Close the dialog box and store the link mappings in the SWIM XML file for the current scenario.
Cancel	Close the dialog box and discard any changes
End of Table 5-2	

## Viewing the Current Mapping Status

SWIM includes several commands for viewing and editing the mapping status for links and nodes. The SWIM menu (in SP Guru Network Planner) has the following commands for viewing and editing the mapping status:

- SWIM > Node/Link Mapping > Select Mapped Nodes—Select all Layer-2/3 nodes that are mapped to Transport nodes
- SWIM > Node/Link Mapping > Select Mapped Links—Select all Layer-2/3 links that are mapped to Transport connections
- SWIM > Open Mapped Connections Browser—View the status of all mapped Layer-2/3 links and the Transport connections that support those links. For more information, see Mapped Connections Browser on page TC-5-9.
- SWIM > Open Mapped Connections Browser for Selection—Same as the previous operation, but shows only mapped links that are currently selected (instead of all mapped links).
- SWIM > Automatically Visualize Operational Status Visualization—If this option is selected, icons appear over all mapped links that are failed and indicate the condition in the transport layer that caused the failure.



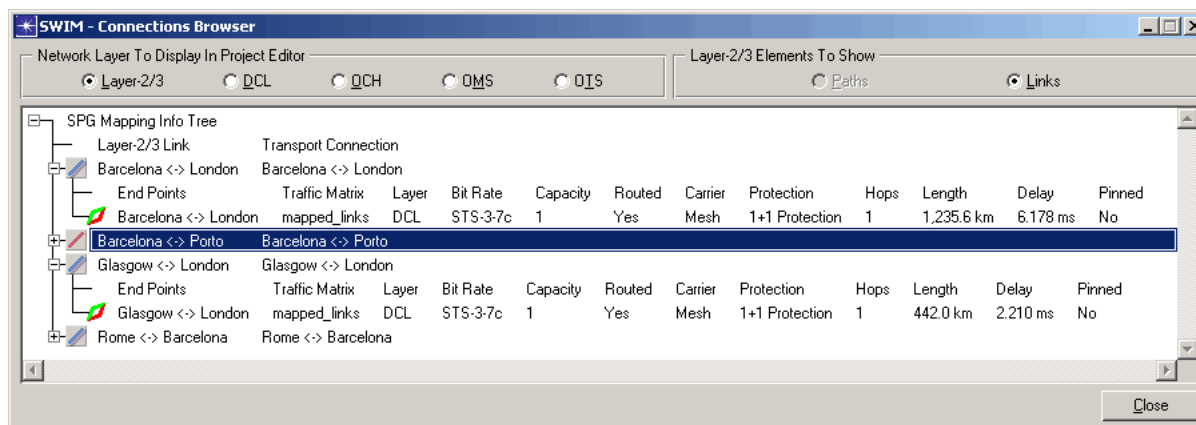
## Mapped Connections Browser

SWIM includes a Mapped Connections Browser that shows the status of mapped Layer-2/3 links and their corresponding Transport connections across different network layers. To open the Mapped Connections Browser, choose one of the following menu items in SP Guru Network Planner:

- SWIM > Open Mapped Connections Browser—View the status of all mapped Layer-2/3 links and the Transport connections that support those links.
- SWIM > Open Mapped Connections Browser for Selection—Same as the previous menu item, but shows only mapped links that are selected in the Project Editor (instead of all mapped links).

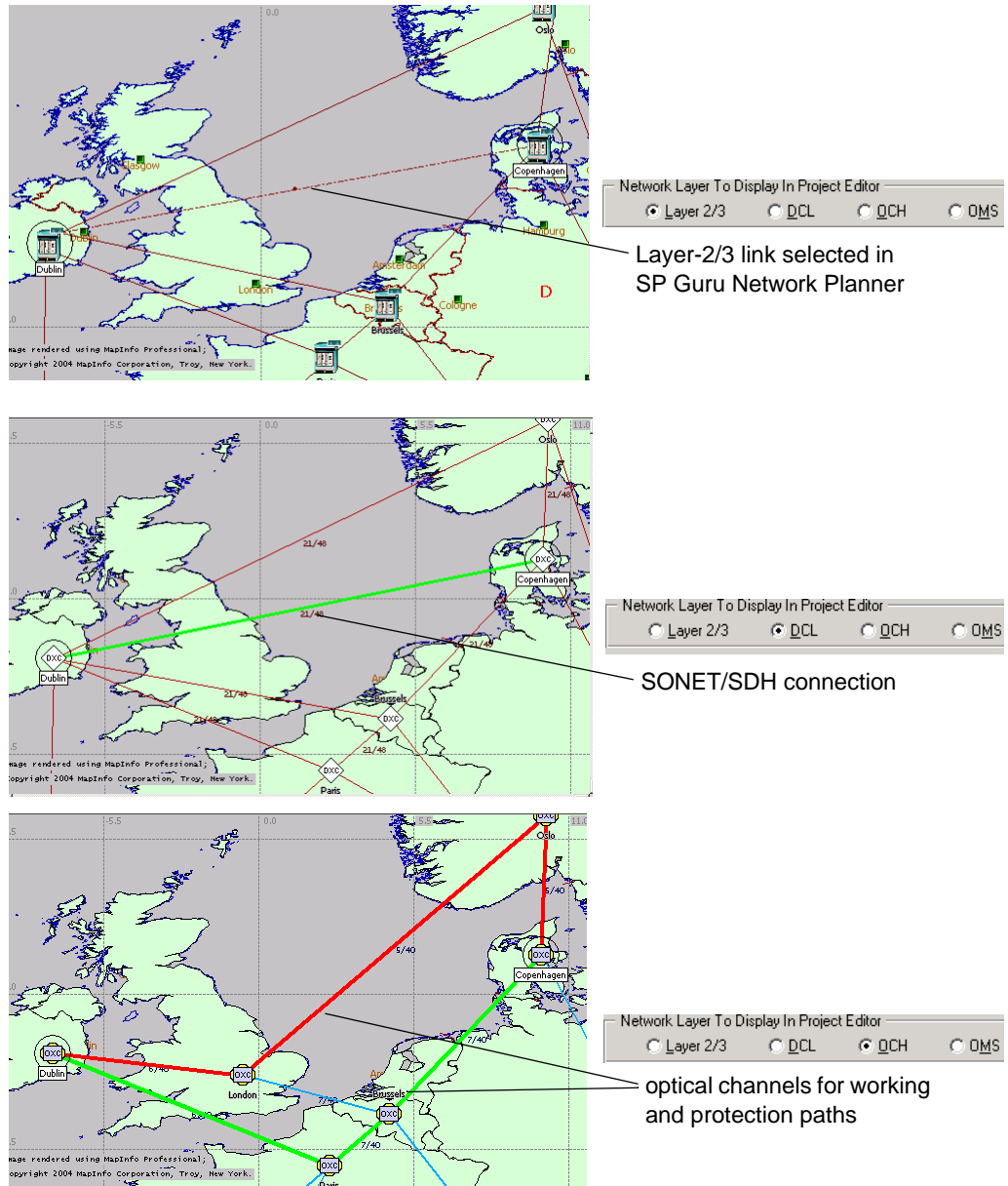
For more information, see Table 5-3 on page TC-5-11 and Table 5-4 on page TC-5-12.

**Figure 5-3 Mapped Connections Browser**



In addition to showing details about specific connections, the Mapped Connections Browser is also useful for visualizing the network paths taken by a connection at different network layers. Using the “Network Layer to Display in Project Editor” radio buttons, you can see the paths used to support a connection at different network layers in SP Guru Transport Planner.






**Figure 5-4 Viewing a Connection at Different Layers Using the Mapped Connections Browser**



**Table 5-3 Mapped Connections Browser**

Item	Description
Network Layer to Display in Project Editor	Switch the network layer shown in the Project Editor. Layer-2/3 is the network in SP Guru Network Planner; DCL, OCH, OMS, and OTS are separate layers in the Transport network.
Layer-2/3 Elements to Show	<p>Specifies the elements shown in the treeview:</p> <ul style="list-style-type: none"> <li>• Links—Top-level elements in the treeview will be mapped Layer-2/3 links</li> <li>• Paths—Top-level elements in the treeview will be path objects that traverse Layer-2/3 links. If you select a path in the treeview, all links that use that path will be selected.</li> </ul>
Treeview	<p>Lists Layer-2/3 links or paths. If a link or path is mapped, its children will be Transport connections. Selecting an element in the treeview will highlight it in the Project Editor.</p> <p>This browser also shows the following information about each connection:</p> <ul style="list-style-type: none"> <li>• The traffic matrix, layer, bit rate, and endpoints of the connection</li> <li>• Capacity—The capacity (number of units) of the connection</li> <li>• Routed—Yes if the connection is routed, No if not. In Failure Analysis (SP Guru Transport Planner) mode, this field also indicates whether the connection is Lost or Recovered.</li> <li>• Carrier—Whether the connection was carried on Mesh, Ring, Ring &amp; Mesh or Partial (that is, partly on rings (routed), partly on mesh (unrouted)). For more information, see Chapter 12 Ring Design on page TrP-12-1.</li> <li>• The protection type</li> <li>• The number of hops of the path(s)</li> <li>• The length (in km or miles) of the path(s)</li> <li>• The end-to-end delay of the connection</li> <li>• Pinned—Yes if the connection is pinned, No if not</li> </ul> <p>For descriptions of the icons used in this treeview, see Table 5-4 on page TC-5-12 of this manual and Table 4-10 Connection Browser: Treeview on page TrP-4-24.</p>
<b>End of Table 5-3</b>	

**Table 5-4 Icons Used in the Mapped Connections Browser**

Icon	Description
	Mapped Layer-2/3 link for which the underlying Transport connection is up
	Mapped Layer-2/3 link for which the underlying Transport connection is down
	Layer-2/3 path for which all traversed Layer-2/3 links are up
	Layer-2/3 path for which some, but not all, traversed Layer-2/3 links are down
	Layer-2/3 path for which all traversed Layer-2/3 links are down
<b>End of Table 5-4</b>	