

## 16 Batch Console

You can use SP Guru Transport Planner's batch console to open scenarios and run network design operations automatically. The batch console supports actions like routing, dimensioning, grooming, ring design, calculation of service availability, and evaluation of traffic variations.

To record commands in a batch file, you enter a "recording batch file" mode and specify operations using the SP Guru Transport Planner user interface. SP Guru Transport Planner writes commands to the batch file that describe the actions and options you specified.

After you create a batch file, you can run it at your convenience. For example, you might want to run a complex batch file overnight so you can view the results the next morning.

Batch files have the following characteristics:

- A batch file specifies one or more command sequences. Each sequence has three sets of commands:
  - a) Open a source scenario
  - b) Run one or more design operations (such as routing or dimensioning)
  - c) Save the results to an output scenario
- When you run a batch file, SP Guru Transport Planner runs the commands in the order in which they are listed in the file. This means that the network state after operation  $x$  is the input to operation  $x+1$ . In this situation, the  $x$  and  $x+1$  operations take place on the same network project and scenario, following a single open action.

Figure 16-1 shows an example of a batch file with two command sequences:

- 1) Open project\_1, groom the DCL\_0 traffic matrix in baseline\_scenario1, dimension the resulting OCH traffic matrix (OCH\_DCL\_0\_Grooming), and save the results to baseline\_scenario2 (lines 1 to 4)
- 2) Open project\_2, route the OCH\_0 traffic matrix in scenario BLSR1, and save the results to scenario BLSR2 (lines 5 to 7)

**Figure 16-1 SP Guru Transport Planner Batch File: Example**

```
open project_1-baseline_scenario1
groom -load DCL_0 -grbr 2 -grfixed 0 -gra 0 -gro 0 -pt 0
dimension -layer OCH -load OCH_DCL_0_Grooming -pt 0 -rc 0 -lex 0
save baseline_scenario2
open project_2-BLSR1
route -layer OCH -load OCH_0 -pt 0 -rs 0 -sort 1 -rnl 1 -rnld 0 -rc 0
save BLSR2
```

## Workflow Description

The following steps outline the general workflow for creating and running a batch file:

- 1) Create a source scenario.

Because a batch file runs automatically, you must specify all the required information in your source scenario before you run a batch file.

For more information, see [Creating a Source Scenario](#) on page TrP-16-3.

- 2) Create and record a batch file.

For more information, see [Recording a SP Guru Transport Planner Batch File](#) on page TrP-16-4.

- 3) Edit the batch file (optional).

For more information, see [Editing a Batch File Manually](#) on page TrP-16-8.

- 4) Run the batch file.

For more information, see [Running a SP Guru Transport Planner Batch File](#) on page TrP-16-6.

- 5) Import the results into the target project.

Each batch run should create at least one results file. You can include “save” commands in batch files to mark the results files that you want to import into the corresponding SP Guru Transport Planner project.

To import a data file, open the project file for the target scenario; then select **File > Import > Batch Results**. SP Guru Transport Planner then prompts you to add the results files to the project.

## Creating a Source Scenario

Before you run a batch file, you must create a source scenario that includes all the information needed for the batch commands to run correctly. Table 16-1 is a checklist of the steps to create the baseline scenario.

**Table 16-1 Creating a Source for a Batch File: Checklist**

Step	Reference
Create the topology using the Object Palette or File/Scenario importing capabilities.	The Object Palette on page TrP-3-9 Importing and Exporting Data on page TrP-5-1
Create the SONET/SDH and optical traffic matrices.	Creating Network Traffic on page TrP-3-26
Specify the network properties (OCH layer mode, node models, etc)	Network Properties on page TrP-3-23
Specify the equipment properties (such as cost and size)	Configuring Individual Objects on page TrP-3-45
If you plan to run Evaluate Availability actions, specify the availability settings (for example, equipment failure rates)	Availability Settings on page TrP-3-42
Design the OTS links	Link Design on page TrP-3-45
If you plan to run Ring Design actions, create rings.	Creating Rings on page TrP-12-4
<b>End of Table 16-1</b>	

## Recording a SP Guru Transport Planner Batch File

Procedure 16-1 describes how to record a batch file.

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### Procedure 16-1 Recording a SP Guru Transport Planner Batch File

- 1 Create a source scenario, if you have not already done so. For more information, see *Creating a Source Scenario* on page TrP-16-3.
- 2 Close all SP Guru Transport Planner projects (including the project containing your baseline scenario).
- 3 From the main SP Guru Transport Planner window, choose File > Batch Console.
  - ➔ The Batch Console dialog box appears. For more information, see *Batch Console Dialog Box* on page TrP-16-7.
- 4 To start recording the batch file, click Record Batch File.
  - ➔ A file browser window appears and prompts you for the batch file you want to record.
- 5 Specify a directory and file name:
  - To record in an existing file, select the file and click OK.
  - To record in a new file, browse to the desired directory, enter a filename, and click OK.
  - ➔ The Recording Batch File dialog box appears, and you are now in “recording batch file” mode.
- 6 Open the source scenario and do the operations that you want the batch file to run. For example, choose Design > Route DCL/OCH Traffic, specify the options you want the batch file to use, and click Route. Because you are in “recording batch file” mode, SP Guru Transport Planner writes a command to the batch file without running the routing operation.
  - ➔ As you complete each action, a command that describes the action appears in the Recording Batch File dialog box.
- 7 When you want to stop the batch recording, close the project.
  - ➔ A dialog box appears and prompts you to supply a name for the output scenario. The output scenario records the results from the previous batch commands.
- 8 Enter a name for the output scenario and click OK.
- 9 Click Finish to close the Recording Batch File dialog box and return to the Batch Console dialog box.

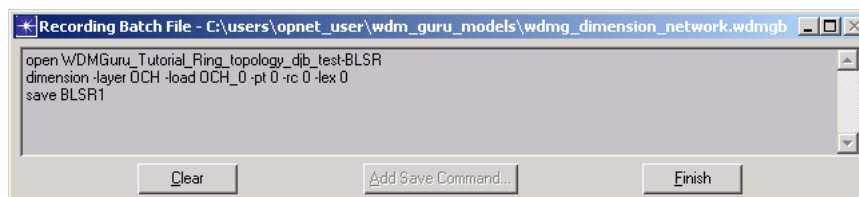
### End of Procedure 16-1

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## Recording Batch File Dialog Box

The Recording Batch File dialog box appears when you click Record Batch File in the Batch Console Dialog Box, and stays open as long as you are in “recording batch file” mode. As you open scenarios and run design operations, this window shows the batch commands that correspond to your actions (opening a scenario, routing a traffic matrix, and so on).

**Figure 16-2 Recording Batch File Dialog Box**



**Table 16-2 Recording Batch File Dialog Box**

Option	Description
Clear	Clear the contents of the batch file
Add Save Command	<p>If a batch file includes design operations but no save command, you can use this button to specify an output scenario. Otherwise, the results of the batch run will not be saved.</p> <p>When you close a project while in “recording batch file” mode, SP Guru Transport Planner usually prompts you for the name of the output scenario. Therefore, in most cases you do not need to add a save command from this window and the button appears dimmed.</p>
Finish	Exit “recording batch file” mode and return to the Batch Console dialog box
<b>End of Table 16-2</b>	

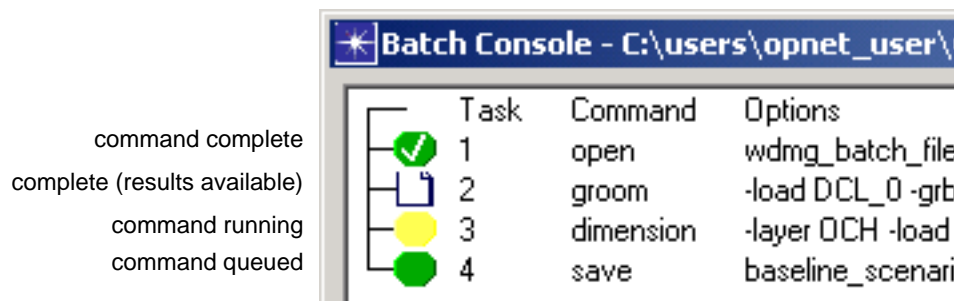
## Running a SP Guru Transport Planner Batch File

Procedure 16-2 describes how to run a batch file.

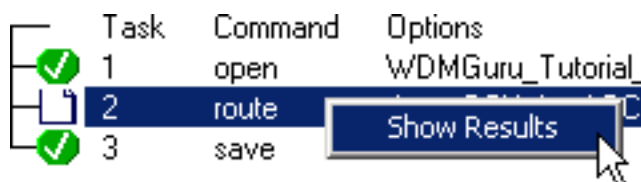
### Procedure 16-2 Running a SP Guru Transport Planner Batch File

- 1 Create a source scenario, if you have not already done so. For more information, see *Creating a Source Scenario* on page TrP-16-3.
- 2 Close all SP Guru Transport Planner projects (including the project containing your baseline scenario).
- 3 Choose File > Batch Console.
  - ➔ The Batch Console dialog box appears. For more information, see *Batch Console Dialog Box* on page TrP-16-7.
- 4 Click Open Batch File and select the file you want to run.
- 5 Click Start.
  - ➔ SP Guru Transport Planner runs the batch file.
  - ➔ The icons in the treeview show the progress of the run.

**Figure 16-3 Treeview Icons During a Batch File Run**



- 6 To stop a run, click Stop.
- 7 To see the results for a command, right-click on the command in the Batch Console treeview and choose Show Results.

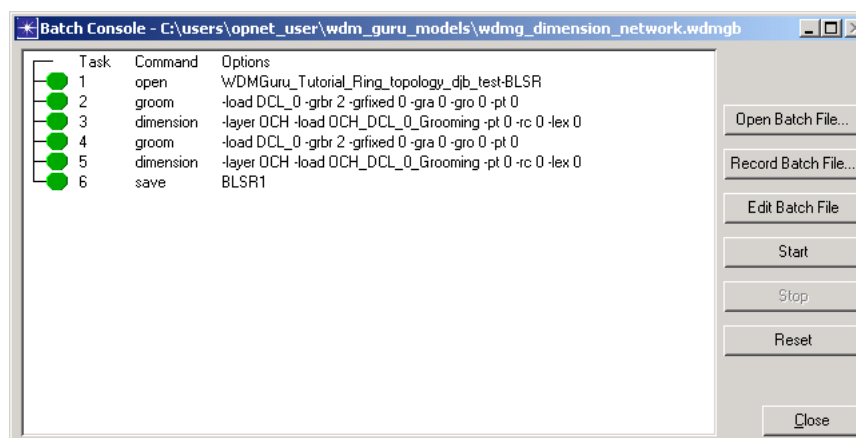


**End of Procedure 16-2**

## Batch Console Dialog Box

The Batch Console dialog box appears when you choose File > Batch Console from the main SP Guru Transport Planner window.

**Figure 16-4 Batch Console Dialog Box**



**Table 16-3 Batch Console Dialog Box**

Option	Description
Open Batch File	Open a batch file
Record Batch File	Start “recording batch file” mode (for more information, see Recording a SP Guru Transport Planner Batch File on page TrP-16-4)
Edit Batch File	Edit a batch file
Start	Start the batch file run
Stop	Stop the batch file run
Reset	Reset the console after a batch run finishes. This enables you to run the batch file again.
Close	Close the batch console
<b>End of Table 16-3</b>	

## Editing a Batch File Manually

This section lists the network design operations supported by batch files and the command-line options for each command. Advanced SP Guru Transport Planner users can edit the batch file, using the batch commands and options described in the following sections.

**Note**—Editing a batch file manually is an advanced feature. You must edit a batch file carefully, to avoid specifying a set of parameters that is not supported by SP Guru Transport Planner.

### Actions Supported by Batch Files

Table 16-4 lists the operations that are supported by batch files and includes links to the corresponding section.

**Table 16-4 Actions Supported by Batch Files**

Command	Description	Reference
dimension	Dimensions the OCH or DCL layer	Dimensioning: Batch Options on page TrP-16-11
eval_avail	Calculates the service availability	Evaluate Availability: Batch Options on page TrP-16-21
groom	Applies the grooming algorithm to an LOP or a DCL traffic matrix	Grooming: Batch Options on page TrP-16-15
open	Opens a SP Guru Transport Planner project and scenario. Use a hyphen (-) to separate the project and scenario name. For example, the command  open spgtranplan_91batch_test-grid_9  opens the project “WDMGuru_91batch_test”, scenario “grid_9”	—
ring_design	Dimensions DCL rings	Ring Design: Batch Options on page TrP-16-18
route	Routes a traffic matrix in the OCH or DCL layer	Routing: Batch Options on page TrP-16-9
save	Adds the resulting output scenario to the list of files you can import into a project using the File > Import > Batch Results operation	—
tv	Evaluates traffic variations in the OCH layer	Traffic Variations: Batch Options on page TrP-16-19
<b>End of Table 16-4</b>		



## Routing: Batch Options

Table 16-5 lists the options you can specify for a routing command. For more information, see Chapter 6 Routing on page TrP-6-1.

**Note**—To perform a design action on several traffic matrices at once, specify the `-load` option multiple times. For example, the option `-load OCH_0 -load OCH_1` performs a single design action on both traffic matrices, "OCH-0" and "OCH\_1."

**Table 16-5 Routing: Batch Options**

Option	Description	Comment
-aedb	Allow equipping of dark bands: <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	For OCH routing only
-cp	Client protection: <ul style="list-style-type: none"> <li>• 0 = no client protection</li> <li>• 1 = client protection</li> </ul>	For 1+1 protection only
-drm	Diverse routing method <ul style="list-style-type: none"> <li>• 0 = with the same end node</li> <li>• 1 = within single traffic matrix</li> <li>• 2 = between multiple traffic matrices</li> </ul>	For diverse routing only
-dro	Diverse routing optimization <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	
-imname	Name and path of the file containing the routes to import	
-layer	Layer in which to route: <ul style="list-style-type: none"> <li>• DCL = digital client layer</li> <li>• OCH = optical channel layer</li> </ul>	
-ldlay	Link disjointness down to: <ul style="list-style-type: none"> <li>• DCL = digital client layer</li> <li>• OCH = optical channel layer</li> <li>• OMS = optical multiplex section</li> <li>• OTS = optical transmission section</li> </ul>	For 1+1 protection only
-load	Traffic matrix to route	
-lut	Apply link usage thresholds <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	

**Table 16-5 Routing: Batch Options (Continued)**

Option	Description	Comment
-mli	Maximum number of local iterations without improvement	For optimized routing only
-ncos	Initial changes per major iteration	For optimized routing only
-nrl	Node limitations: <ul style="list-style-type: none"> <li>• 0 = no node limitations</li> <li>• 1 = impose node limitations</li> </ul>	Only if discrete nodes are applied
-rnld	Constrain OCH routing by DCL node size: <ul style="list-style-type: none"> <li>• 0 = no constrain by DCL node size</li> <li>• 1 = constrain by DCL node size</li> </ul>	For routing in the OCH layer and discrete DCL node types only
-ncli	Number of changes per local iteration	For optimized routing only
-nd	Disjointness of working and protecting path: <ul style="list-style-type: none"> <li>• 0 = link disjoint</li> <li>• 1 = link and node disjoint</li> </ul>	For 1+1 protection only
-nos	Number of optimization steps	For optimized routing only
-pt	Protection type: <ul style="list-style-type: none"> <li>• 0 = no protection</li> <li>• 1 = 1+1 protection</li> </ul>	
-pur	Penalty unrouted	For optimized routing only
-rc	Routing cost: <ul style="list-style-type: none"> <li>• 0 = hop count</li> <li>• 1 = hop count with in-line regenerators considered as an extra hop</li> <li>• 2 = fiber length</li> <li>• 3 = real cost</li> <li>• 4 = user specified</li> <li>• 5 = max availability</li> <li>• 6 = least used</li> <li>• 7 = combined metric</li> </ul>	Hop count and real cost are applicable for transparent routing only

**Table 16-5 Routing: Batch Options (Continued)**

Option	Description	Comment
-rs	Routing strategy: <ul style="list-style-type: none"> <li>• 0 = sequential</li> <li>• 1 = distributed</li> <li>• 2 = combined</li> <li>• 3 = optimized</li> <li>• 4 = diverse routing</li> </ul>	
-sits	Apply service identifiers <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	For DCL routing only
-sort	Sorting order: <ul style="list-style-type: none"> <li>• 0 = unsorted</li> <li>• 1 = longest first</li> <li>• 2 = shortest first</li> <li>• 3 = biggest first</li> <li>• 4 = smallest first</li> </ul>	
End of Table 16-5		

### Dimensioning: Batch Options

Table 16-6 lists the options you can specify for a dimensioning command. For more information, see Chapter 7 Dimensioning on page TrP-7-1.

**Table 16-6 Dimensioning: Batch Options**

Option	Description	Comment
-cp	Client protection: <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	For dimensioning with 1+1 protection only
-ctyp	Candidate line system (as defined in WDM Link Equipment Properties) / bit rate types: 0 = <first_LS_type> / STM-1 / OC-3 1 = <second_LS_type> / STM-4 / OC-12 2 = <third_LS_type> / STM-16 / OC-48 3 = <fourth_LS_type> / STM-64 / OC-192 4 = <fifth_LS_type> / STM-256 / OC-768 5 = <sixth_LS_type> / STM-512 / OC-1536 6 = <seventh_LS_type> / STM-1024 / OC-3072	Relevant only if optimized set is selected. To specify multiple types, separate the numbers by a '+' character (for example, "-ctyp 1+3+4")
-dr	Diverse Routing: <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	For dimensioning without protection only
-drm	Diverse routing method <ul style="list-style-type: none"> <li>• 0 = with the same end node</li> <li>• 1 = within single traffic matrix</li> <li>• 2 = between multiple traffic matrices</li> </ul>	For diverse routing only
-dro	Diverse routing optimization <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	For diverse routing only
-dth	Threshold in %, resources used below threshold or no candidate for removal	This option is relevant only if link or node optimization is chosen. You can express a value between 0 and 100
-eab	Equip all bands on added fiber pairs: <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	For OCH dimensioning only
-imname	Name and path of the file containing the routes to import	
-k	<ul style="list-style-type: none"> <li>• Value for K shortest paths</li> <li>• Value for the number of alternative paths</li> </ul>	<ul style="list-style-type: none"> <li>• For dimensioning with protection</li> <li>• For optimized diverse dimensioning</li> </ul>
-layer	Layer to dimension: <ul style="list-style-type: none"> <li>• DCL = digital client layer</li> <li>• OCH = optical channel layer</li> </ul>	The DCL option is applicable for all-ECC networks only (that is, networks with no EOCC or OCC nodes)

**Table 16-6 Dimensioning: Batch Options (Continued)**

Option	Description	Comment
-ldlay	Link disjointness down to: <ul style="list-style-type: none"> <li>• DCL = digital client layer</li> <li>• OCH = optical channel layer</li> <li>• OMS = optical multiplex section</li> <li>• OTS = optical transmission section</li> </ul>	For dimensioning with 1+1 protection only
-lex	Link expansion: <ul style="list-style-type: none"> <li>• 0 = default line system</li> <li>• 1 = optimized set of line systems</li> </ul>	Not relevant for transparent routing
-load	Traffic matrix to accommodate in the network	
-lut	Apply link usage thresholds <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	
-nd	Disjointness of working and protecting path: <ul style="list-style-type: none"> <li>• 0 = link disjoint</li> <li>• 1 = link and node disjoint</li> </ul>	For dimensioning with 1+1 or shared path protection only
-noi	Number of optimization iterations	Relevant only if optimized set is selected
-oadmdim	OADM dimensioning: <ul style="list-style-type: none"> <li>• 0 = do not add OADMs</li> <li>• 1 = expand existing OADM relations</li> <li>• 2 = add unique OADM relations</li> <li>• 3 = add multiple OADM relations</li> </ul>	For transparent routing only
-otl	Optimize link expansion: <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	For OCH dimensioning with no protection or 1 + 1 protection only
-otn	Optimize node expansion: <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	For OCH dimensioning with no protection and 1+1 protection only
-pt	Protection type: <ul style="list-style-type: none"> <li>• 0 = no protection</li> <li>• 1 = 1+1 protection</li> <li>• 2 = shared path protection</li> <li>• 3 = link restoration</li> <li>• 4 = path restoration</li> </ul>	Shared path protection and link or path restoration are applicable for transparent networks only if link dimensioning is included

**Table 16-6 Dimensioning: Batch Options (Continued)**

Option	Description	Comment
-rc	Routing cost: <ul style="list-style-type: none"> <li>• 0 = hop+fiber</li> <li>• 1 = hop+reg+fiber</li> <li>• 2 = fiber length</li> <li>• 3 = real cost</li> <li>• 4 = user specified</li> <li>• 5 = max availability</li> <li>• 6 = least used</li> </ul>	Only hop+fiber and real cost are applicable when using transparent routing
-rrf	Name and path of restoration routes file	For dimensioning with mesh restoration only
-shm	Value for m	For dimensioning with shared path protection only
-shn	Value for n	For dimensioning with shared path protection only
<b>End of Table 16-6</b>		

## Grooming: Batch Options

If a batch file runs a grooming operation with 1+1 protection and link disjointness at the OCH, OMS, or OTS layer, SP Guru Transport Planner automatically accommodates the supporting OCH traffic matrix in the network.

In all other cases, the batch file must also include a command to accommodate the supporting OCH traffic matrix in the network. To do this, run a routing or dimensioning action. For more information, see Chapter 8 Grooming DCL to OCH Traffic on page TrP-8-1.

Table 16-7 lists the options you can specify for a grooming command.

**Table 16-7 Grooming: Batch Options**

Option	Description	Comment
-cp	Client protection: <ul style="list-style-type: none"> <li>• 0 = no client protection</li> <li>• 1 = client protection</li> </ul>	For grooming with 1+1 protection only
-gra	Grooming algorithm: <ul style="list-style-type: none"> <li>• 0 = end to end grooming</li> <li>• 1 = link by link grooming</li> </ul>	For grooming with optimized routes only
-grbr	Target bit rate optical channels (if DCL layer): <ul style="list-style-type: none"> <li>• 0 = STM-1 / OC-3</li> <li>• 1 = STM-4 / OC-12</li> <li>• 2 = STM-16 / OC-48</li> <li>• 3 = STM-64 / OC-192</li> <li>• 4 = STM-256 / OC-768</li> <li>• 5 = STM-512 / OC-1536</li> <li>• 6 = STM-1024 / OC-3072</li> </ul> Target bit rate digital trunks (if LOP layer): <ul style="list-style-type: none"> <li>• 0 = STM-1 / STS-1</li> <li>• 1 = STM-4 / STS-3</li> <li>• 2 = STM-16 / STS-12</li> <li>• 3 = STM-64 / STS-48</li> <li>• 4 = 1 GbE / STS-192</li> <li>• 5 = 1 GbE</li> </ul>	
-grfixed	Grooming approach: <ul style="list-style-type: none"> <li>• 0 = optimized routes</li> <li>• 1 = fixed routes</li> </ul>	For DCL grooming only

**Table 16-7 Grooming: Batch Options (Continued)**

Option	Description	Comment
-gro	Grooming optimization: <ul style="list-style-type: none"> <li>• 0 = no optimization</li> <li>• 1 = optimization</li> </ul>	For DCL grooming only
-gruec	Use existing capacity: <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	For LOP grooming only
-granc	Add new capacity: <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	For LOP grooming only
-imname	Name and path of the file containing the OTS routes to import	For grooming with fixed routes only
-k	Value for K shortest paths	For DCL grooming with 1+1 protection only
-layer	Layer in which to groom: <ul style="list-style-type: none"> <li>• LOP = lower order path layer</li> <li>• DCL = digital client layer</li> </ul>	
-ldlay	Link disjointness down to: <ul style="list-style-type: none"> <li>• DCL = digital client layer</li> <li>• OCH = optical channel layer</li> <li>• OMS = optical multiplex section</li> <li>• OTS = optical transmission section</li> </ul>	For grooming with optimized routes and with 1+1 protection only
-load	Traffic matrix subject to the grooming action	
-lut	Apply link usage thresholds <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	
-nd	Disjointness of working and protecting path: <ul style="list-style-type: none"> <li>• 0 = link disjoint</li> <li>• 1 = link and node disjoint</li> </ul>	For grooming with 1+1 protection only
-pt	1+1 protection in DCL: <ul style="list-style-type: none"> <li>• 0 = no protection</li> <li>• 1 = 1+1 protection</li> </ul>	For DCL grooming only



**Table 16-7 Grooming: Batch Options (Continued)**

Option	Description	Comment
-rc	Routing cost to calculate OTS routes: <ul style="list-style-type: none"> <li>• 0 = hop+fiber</li> <li>• 1 = hop+reg+fiber</li> <li>• 2 = fiber length</li> <li>• 3 = real cost</li> <li>• 4 = user specified</li> <li>• 5 = max availability</li> <li>• 6 = least used</li> </ul>	For grooming with fixed routes only. These options are applicable only if the option "Calculate OTS Routes" is chosen (that is, if the routes are not imported from a data file)
-rnp	Name and path of the file containing the candidate node pairs to import	For DCL grooming only
-sits	Apply service identifiers <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	For DCL grooming only
-split	Split off ungroomable <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	For DCL grooming only
<b>End of Table 16-7</b>		

## Ring Design: Batch Options

Table 16-5 lists the options you can specify for a ring-design command. For more information, see Chapter 12 Ring Design on page TrP-12-1.

**Table 16-8 Ring Design: Batch Options**

Option	Description	Comment
-load	DCL traffic matrix to route on rings	
-rdapm	Allow connections partly over mesh: <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	
-rdasr	Add stacked rings: <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	
-rdbr	Ring bit rate: <ul style="list-style-type: none"> <li>• 0 = STM-1 / OC-3</li> <li>• 1 = STM-4 / OC-12</li> <li>• 2 = STM-16 / OC-48</li> <li>• 3 = STM-64 / OC-192</li> <li>• 4 = STM-256 / OC-768</li> <li>• 5 = STM-512 / OC-1536</li> <li>• 6 = STM-1024 / OC-3072</li> </ul>	Relevant only if you choose to add stacked rings
-rdenf	Equip new fibers: <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	Relevant only if you choose to add stacked rings
-rdexc	Expand DXC/OXC: <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	Relevant for discrete node models only
-rdip	Interconnection penalty	
-rdlrf	Existing ring factor	
-rdmf	Mesh factor	Only relevant if connections partly over mesh are allowed
-rdmu	Maximum utilization (%)	Value between 0 and 100

**Table 16-8 Ring Design: Batch Options (Continued)**

Option	Description	Comment
-rdnrf	Added ring factor	
-rdrm	Routing method: <ul style="list-style-type: none"> <li>• 0 = shortest path</li> <li>• 1 = least cost path</li> <li>• 2 = cost optimized per ring</li> <li>• 3 = overall cost optimized</li> </ul>	
-rdrt	Ring type: <ul style="list-style-type: none"> <li>• 0 = SNCP / UPSR</li> <li>• 1 = 2F-MSSPRing / 2F-BLSR</li> <li>• 2 = 4F-MSSPRing / 4F-BLSR</li> </ul>	Relevant only if you choose to add stacked rings
<b>End of Table 16-8</b>		

### Traffic Variations: Batch Options

Table 16-9 lists the options you can specify for a traffic-variations command. For more information, see Traffic Variations on page TrP-6-21.

**Table 16-9 Traffic Variations: Batch Options**

Option	Description	Comment
-load	Traffic matrix subject to traffic variation evaluation	Only for OCH traffic matrices
-tvit	Number of iterations	
-typd	% decrease traffic pattern	Value between 0 and 100
-typi	% increase traffic pattern	Value between 0 and 100
-typir	% increase random	Value between 0 and 100
-tvrer	Retain original routing <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	
<b>End of Table 16-9</b>		

## Transparent Network Routing: Batch Options

Table 16-10 lists the options you can specify for transparent network routing operations. These options are relevant in transparent networks when you apply a routing, dimensioning, or grooming command. For more information, see Chapter 10 Transparent Networks on page TrP-10-1.

**Table 16-10 Transparent Network Routing: Batch Options**

Option	Description	Comment
-art	Add/remove transponders: <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	For WP-OXCs with integrated TMs only
-atp	Add trib ports: <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	For WP-OXCs with integrated TMs only
-awc	Allow wavelength conversion: <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	
-cf	Cost factor	
-cop	Algorithmic routing approach under link dimensioning condition: <ul style="list-style-type: none"> <li>• 0 = apply transparent routing algorithm</li> <li>• 1 = convert opaque routes to transparent routes</li> </ul>	Only relevant if link dimensioning is included
-cr	Regeneration cost	
-cwc	Wavelength conversion cost	
-ild	Include link dimensioning: <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	For the dimensioning algorithm only
-lsm	Transparency length specification: <ul style="list-style-type: none"> <li>• 0 = length units (km or miles)</li> <li>• 1 = OA Spans</li> </ul>	

**Table 16-10 Transparent Network Routing: Batch Options (Continued)**

Option	Description	Comment
-owo	Options for WP-OXC with integrated TMs: <ul style="list-style-type: none"> <li>• 0 = BOXC – trib</li> <li>• 1 = BOXC – tap</li> <li>• 2 = BOXC – mix</li> </ul>	For WP-OXC with integrated TMs only
-podw	Protection on different wavelength: <ul style="list-style-type: none"> <li>• 0 = no</li> <li>• 1 = yes</li> </ul>	For 1+1 protection only
-ponc	Penalty per optical node crossed	
<b>End of Table 16-10</b>		

### Evaluate Availability: Batch Options

Table 16-11 lists the options you can specify for an Evaluate Availability command. For more information, see Chapter 14 Failure Evaluation on page TrP-14-1.

**Table 16-11 Evaluating Availability: Batch Options**

Option	Description	Comment
-layer	Layer: <ul style="list-style-type: none"> <li>• DCL = digital client layer</li> <li>• OCH = optical channel layer</li> </ul>	DCL is the only applicable option if a network contains all EEC nodes (no OCC or EOCC nodes)
-load	Traffic matrix subject to evaluate availability	
-opdf	Evaluate double failures: <ul style="list-style-type: none"> <li>• 0 = neglect</li> <li>• 1 = calculate unaffected connections</li> <li>• 2 = apply restoration algorithm</li> </ul>	For shared path protection or mesh restoration only
-optf	Evaluate triple failures: <ul style="list-style-type: none"> <li>• 0 = neglect</li> <li>• 1 = calculate unaffected connections</li> </ul>	For shared path protection or mesh restoration only
<b>End of Table 16-11</b>		

