



## Reports

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WAE Design enables you to generate reports that compare IP/MPLS topology and configuration information, demand routings, LSP routings, or traffic between two plan files. You can also generate a complete plan comparison. Following are a few examples of how these reports could be used.

- Plan for upgrades—Compare plan files before and after topology and configuration changes are made to a current network. For example, you could compare the original plan file to a proposed new plan in which circuits or nodes were added or upgraded.
- Mitigate congestion—Compare plans before and after making configuration changes to mitigate congestion due to a failure or planned maintenance, such as metric changes or LSP additions and reroutings.
- Validate simulations—Compare the simulated traffic under failure in one plan to the measured traffic after a failure has occurred in another plan to validate the accuracy of the simulation.
- Plan audit—Review any changes between two plan files.
- Identify demand and LSP reroutes—Compare plans to determine which demands or LSPs experienced routing changes, for example as the result of an interface metric change or capacity upgrades.
- Create patch files—Compare plans to create patch files to show differences in LSPs.

Upon comparing plan files, a report of the results automatically opens. You can access this report later by selecting the Window->Reports menu.

For information on creating table interactions with reports, see the *WAE Design Integration and Development Guide*.

## Plan Comparison Reports

Comparison reports enable you to compare objects between two plan files to determine

- Which objects are present in one plan, but not in the other, and
- Which objects are present in both plans and which, if any, have different properties.

Plan 1: 160113\_0711\_UTC  
 Plan 2: 160113\_0407\_UTC

Report

IP/MPLS topology and configuration  
 Generate Patch File

Demand routings  
 LSP routings  
 Complete plan comparison

For each object

Only show properties with differences  
 Show all properties compared

You can run four types of plan comparison reports, as follows.

- IP/MPLS topology and configuration—Objects describing the topology (such as nodes, circuits, and interfaces), configured objects (such as LSPs and LSP paths), and related properties (such as IGP metrics and capacity). For a complete list of compared objects and properties, see [Table 25-1](#).
- Demand routings—Demand paths and the properties that indicate routing changes, such as Path Length and Max Latency. For a complete list of compared properties, see [Table 25-1](#).
- LSP routings—Properties of LSPs that indicate routing changes, such as TE Path Metric and Active Path Sim. For a complete list of compared properties, see [Table 25-2](#).
- Complete plan comparison—All tables in the table schema are compared, except for internal simulation caching tables. For a complete list of these tables, refer to the `$CARIDEN_HOME/docs/table_schema` file.

## Report Columns

Each WAE Design table has key columns that uniquely identify objects. For example, the key columns in the Interfaces table are the Node and Interface columns, which represent the name of the node containing the interface and the name of the interface itself. In a Plan Comparison report, an object in one plan is identified with an object in another plan only if the key columns of the two objects match. That is, key columns determine if an object is present in both plans or in only one of the plans.

The Plan Comparison report displays three other types of columns. [Table 25-1](#), [Table 25-2](#), and [Table 25-3](#) list the properties reported upon and their associated column type.

- Information only (Info)—There are no comparisons made. Information is reported for the plan file from which you are running the report (Plan 1).

- **Differences (Diff)**—Specific properties are compared for each object that has matching key columns across the two plan files. Objects are then identified as belonging in either Plan 1 only (file from which you are running the report), in Plan 2 only (plan file to which you are comparing), or in both Plan 1 and Plan 2. If the object exists in both plan files, but has different properties, a Diff column shows T (true) if there are any differences or F (false) if there are none.

Differences are based on the current state of the open plan files. For instance, if a circuit is currently failed, the demand routings change to route around the failure.

- **Summary Differences (Summ Diff)**—These are not columns within WAE Design tables. They are T/F (true or false) values, depending on some differences in the table objects that are not represented in the table columns. For example, if a common LSP path is configured differently between plans, this difference would be represented in a summary difference column in the LSP section. If demand routings are different, this would be represented in a summary difference column in the Demands section.

**Note**

For easy reference, the following tables list columns in the order of type first: Key, Info, Diff, and Summ Diff. Properties within each column type are alphabetical.

**Table 25-1 Plans Comparison Report: IP/MPLS Topology and Configuration**

Compared Table	Compared Columns	Comparison Column Type	Summary Difference Description
Interfaces	Name	Key	
	Node	Key	
	Remote Node	Info	
	Affinities	Diff	
	Area	Diff	
	Capacity	Diff	
	Circuit	Diff	
	Description	Diff	
	FRR Protect	Diff	
	IGP Metric	Diff	
	IP Address	Diff	
	PC Min BW	Diff	
	PC Min Links	Diff	
	Resv BW	Diff	
TE Metric	Diff		
Circuits	InterfaceA	Key	
	InterfaceB	Key	
	NodeA	Key	
	NodeB	Key	
	Name	Info	
	Active	Diff	

Table 25-1 Plans Comparison Report: IP/MPLS Topology and Configuration

Compared Table	Compared Columns	Comparison Column Type	Summary Difference Description
	Capacity	Diff	
	Delay	Diff	
Nodes	Name	Key	
	Active	Diff	
	AS	Diff	
	BGP ID	Diff	
	ECMP Max	Diff	
	IP Address	Diff	
	IP Manage	Diff	
	Model	Diff	
	OS	Diff	
	Vendor	Diff	
LSPs	Node	Key	
	Source	Key	
	Active	Diff	
	Destination	Diff	
	Exclude	Diff	
	FRR Link Protect	Diff	
	Hold Pri	Diff	
	Hop Limit	Diff	
	Include	Diff	
	Include Any	Diff	
	Load Share	Diff	
	Metric	Diff	
	Metric Type	Diff	
	Setup BW	Diff	
	Setup Pri	Diff	
	Unresolved Destination	Diff	
	LSPs Path Diff	Summ Diff	T (true) if there are any differences in the LSP Paths table for this LSP. If two LSPs have differences in their named path hops or LSP paths, these differences are propagated to this column.
LSP Paths	Node	Key	
	Path Option	Key	
	Source	Key	
	Exclude	Diff	

**Table 25-1 Plans Comparison Report: IP/MPLS Topology and Configuration**

Compared Table	Compared Columns	Comparison Column Type	Summary Difference Description
	Hold Pri	Diff	
	Hop Limit	Diff	
	Include	Diff	
	Include Any	Diff	
	Path Name	Diff	
	Setup BW	Diff	
	Setup Pri	Diff	
	Standby	Diff	
	Named Path Diff	Summ Diff	T (true) if there are any differences in the Named Paths table for this LSP path.
Named Paths	Active	Key	
	Name	Key	
	Source	Key	
	Named Path Hops Diff	Summ Diff	T (true) if there are any differences in the Named Path Hops table for this named LSP path.
Named Path Hops	Name	Key	
	Source	Key	
	Step	Key	
	Interface	Diff	
	IP Address	Diff	
	Node	Diff	
	Type	Diff	
	Unresolved Hop	Diff	

**Table 25-2 Plans Comparison Report: Demand Routings**

Compared Table	Compared Columns	Comparison Column Type	Summary Difference Description
Demands	Destination	Key	
	Name	Key	
	Service Class	Key	
	Source	Key	
	Destination Site	Info	
	Source Site	Info	
	Active	Diff	
	ECMP Min %	Diff	

Table 25-2 Plans Comparison Report: Demand Routings

Compared Table	Compared Columns	Comparison Column Type	Summary Difference Description
	Max Latency	Diff	
	Path Metric	Diff	
	Path Diff	Summ Diff	T (true) if there are any differences in routing of the demand.

Table 25-3 Plans Comparison Report: LSP Routings

Compared Table	Compared Columns	Comparison Column Type	Summary Difference Description
LSPs	Name	Key	
	Source	Key	
	Active Path Sim	Diff	
	Destination	Diff	
	Routed	Diff	
	Shortest TE Path	Diff	
	TE Path Metric	Diff	
	Actual Path Diff	Summ Diff	T (true) if there are any differences in routing of the actual LSP path.
	Simulated Path Diff	Summ Diff	T (true) if there are any differences in routing of the LSP.

## Report Sections

The opening section, Summary, gives a numeric summary of the number of objects in each plan file, as well as the number of objects in both plan files and of these in both, the number of objects with property differences (Figure 25-1).

**Example:** Nodes A, B, and C are in Plan 1, and B, C, and D are in Plan 2. Nodes B and C have matching key columns. The B nodes have identical properties, but the C nodes have different IP addresses. Therefore, in the Summary section, the In Both Plans column shows 2, and the Different Properties column shows 1.

An individual section is generated for each object that appears in only one plan file and if there are differences between the properties, a section is generated showing these differences. Thus, there is the potential of generating one to three sections per compared table: one for objects appearing only in Plan 1, one for objects appearing only in Plan 2, and one listing objects existing in both plan files, along with their differences noted with a T (true) or F (false).

Figure 25-1 Example Plan Comparison Report Summary

Number of	Plan 1	Plan 2	Plan 1 Only	Plan 2 Only	In Both Plans	In Both Plans, Different Properties
Interfaces	100	100	0	0	100	14
LSPs	1056	1056	0	0	1056	1056
Demands	89	95	0	6	89	0
Demand Traffic	89	95	0	6	89	89
Interface Traffic	100	99	1	0	99	99
Plot Layout Elements	57	46	11	0	46	0

Other than Summary, the report sections and columns (properties) that appear depend on the options selected when generating the report.

- If you select to show only properties with differences, only those columns with differences in properties appear in the report. If only one value is different, all objects are listed (not just the one with the different property).
- If you select to show all properties compared, all compared properties appear in the report whether there are differences between the two plan files or not.

## Create Plan File Comparison Reports

- Step 1** Open the two plan files you want to compare.
- Step 2** In either of these two plan files, select the Tools->Reports->Compare Plans menu. A Compare Plans dialog box appears.
- Step 3** Select a plan file for comparison.
- Step 4** Select the type of comparisons you want to generate.
  - IP/MPLS topology and configuration
  - Demand routings
  - LSP routings
  - Complete plan files
- Step 5** Select whether to show only properties with differences or whether to show all properties compared. Then click OK.

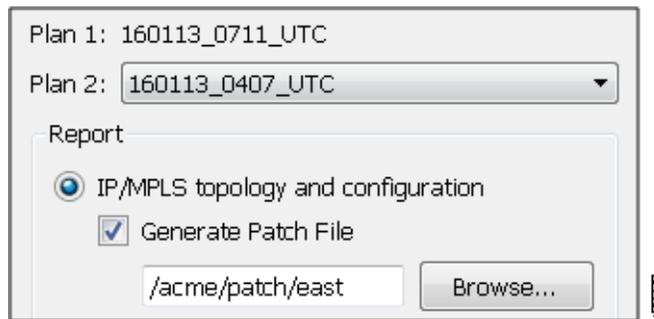
## Patch Files

If comparing IP/MPLS topology and configurations, you can optionally create a patch file. This patch file contains differences between Plan 1 and Plan 2. These differences include new, modified, and deleted LSPs, LSP paths, named paths, named path hops, segment lists, and segment list hops.

The plan on which the report is initiated is Plan 1 (as labeled in the dialog box). The plan to which it is being compared is Plan 2 (the plan selected for comparison as labeled in the dialog box). The patch file gives the information for getting from Plan 1 to Plan 2.

#### Examples:

- If Plan 1 contained 33 LSPs and Plan 2 contained 23 LSPs, the patch file would identify which 10 LSPs to delete from Plan 1 to create Plan 2.
- If Plan 1 contained 10 LSPs and Plan 2 contained 15 LSPs, the patch file would identify which 5 LSPs to add to Plan 1 to create Plan 2.
- If both plan files contained the same LSP, but in Plan 1 the LSP had a PCEP property of T (true), whereas in Plan 2 it did not, the patch file would identify the need to modify the PCEP property of this LSP in Plan 1 so that it matches Plan 2.



Provided the patch files meet the requirements for deployment, you can deploy them to the network using the File->Save to WAE feature. For information on deployment requirements, see the *WAE Platform Configuration Guide*. For information on deploying through WAE Design, see the “Access Remote WAE Automation Server” chapter in the *WAE Design Visualization Guide*.

## Create Patch Files

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- Step 1** Open the two plan files that you are using for the patch file creation.
- Step 2** In the plan file used as a base (Plan 1) for the comparison, select the Tools->Reports->Compare Plans menu. A Compare Plans dialog box appears.
- Step 3** Select the plan file used for comparison (Plan 2).
- Step 4** Select the IP/MPLS option.
- Step 5** Select Generate Patch File.
- Step 6** If this patch file does not exist, click Browse, navigate to the location where you want it to reside, and **enter the patch file name**. Then click OK.
- If this patch file exists, click Browse to navigate to and select the file, and click OK.



**Note** If the patch file exists by the same name and location, the patch file is overwritten.

- Step 7** Click OK.
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# Traffic Comparison Reports

Traffic Comparison reports compare traffic values within a single plan or between two plan files. You can compare traffic on one object at a time (nodes, interfaces, circuits, demands, LSPs, multicast flows, and flows). Each object has a different set of comparisons from which to choose. For example, interface traffic and capacity can be compared, and LSP traffic and setup bandwidth can be compared. Another example would be to compare the simulated interface traffic in a plan file before a failure to the measured interface traffic of a plan file in which a failure has occurred. Such a comparison would enable you to determine which interfaces show the greatest differences.

For each plan file compared, the current traffic level and either the selected service class or queue are used. They can be different in each plan.

The opening section, Summary, gives a high-level summary of what is being compared. Additionally, a section of the difference on the selected object and traffic columns is generated and named accordingly.

<b>Plan 1</b>	us_wan	
<b>Plan 2</b>	us_wan_L1	
<b>Compare</b>	Interfaces	
	<b>Plan 1</b>	<b>Plan 2</b>
Traffic Type	TraffSim	TraffSim
Traffic Level	Default	Default
QoS	Undifferentiated	Undifferentiated
Total Traffic	108830 Mbps	58286 Mbps

Plan 1 has 50544.1 Mbps more traffic in total than Plan 2

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## Create Traffic Comparison Reports

**Step 1** If comparing traffic from the open plan file to another, open the other plan file.

Compare Traffic on	Interfaces
Plan 1	
Current Plan:	euro4_net
Column:	Traff Sim
Plan 2	
Select Plan:	euro4_bru
Column:	Traff Sim

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**Step 2** In each plan file, select the travel levels and select either the service class or queue traffic you want to compare.

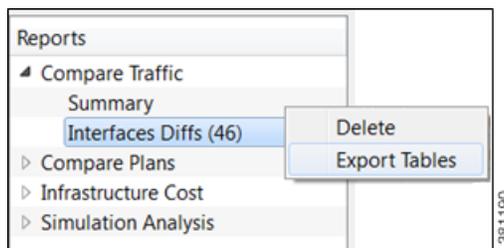
- Step 3** Select the Tools->Reports->Compare Traffic menu. This plan file is identified as Plan 1 in the Compare Traffic dialog box that appears.
- Step 4** Select the object type on which you want to compare traffic: interfaces, nodes, LSPs, demands, multicast flows, or flows.
- Step 5** Select the traffic column in the current plan that you want to compare (Plan 1).
- Step 6** The default Plan 2 is the current plan file. To change this, select a different plan file for Plan 2.
- Step 7** Select the traffic column being compared for Plan 2.
- Step 8** Click OK.

## View or Export Reports

Upon generating a report, it automatically opens in a window. From there you can select the various sections of the report from the left navigation pane.

To view a report after having closed it, select the Window->Reports menu. All reports generated on that plan file appear and are selectable from one report window.

If you want to save these reports for later use, you must save the plan file. However, running the report again overwrites the report. To preserve the information, you can export the data by report section. Right-click any of the sections from the left navigation pane, and select Export Tables.



## Related Topics

- [Plan Files and Patch Files](#) chapter
- *WAE Design Integration and Development Guide*