



ITU Seminar

Warsaw, Poland , 6-10 October 2003

Session 5.6

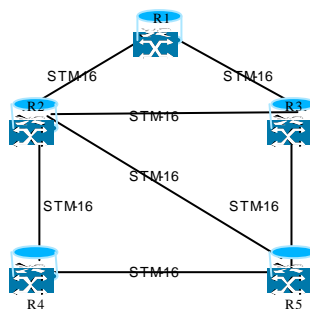
Features, Inputs and outputs for most frequent tools: VPI

Live demo: A case study on MPLS VPIserviceMaker™ IP



VPIserviceMaker™ IP

Case Study on MPLS Network Design (1)



MPLS Traffic Trunk List

To From	R1	R2	R3	R4	R5
R1		1.2	1.2	1.2	1.2
R2	1.2		0.6	1.0	1.8
R3	1.2	2.2		0.2	0.6
R4	1.2	1.2	0.6		1.8
R5	1.2	1.8	0.6	2.4	

Objectives:

- Find out if there is a LSP among any two nodes that can meet the traffic demand
- If the above solution does not exist, find out if there are multiple LSP among any two nodes that can meet the traffic demand.

VPIserviceMaker™ IP MPLS Network Design – GUI elements

The screenshot displays the VPIserviceMaker IP GUI with several key components highlighted:

- LSR Topology View:** A network diagram showing nodes and their interconnections.
- MPLS Traffic Trunk List:** A table listing traffic trunks with columns for Name, Address, Status, Priority, No. of LSP Paths, Allowed, and Routed.
- Traffic Trunk View:** A detailed view of a specific traffic trunk showing its path through the network.
- Traffic Trunk Detail:** A dialog box providing further information about a selected traffic trunk.

Network Planning Strategy for evolving Network Architectures www.vpisystems.com Session 5.5_AM - 3

VPIserviceMaker™ IP MPLS network design – LSR routing settings

The screenshot displays the VPIserviceMaker IP GUI with two key dialog boxes highlighted:

- LSP Routing Dialog:** A dialog box for configuring LSP routing settings.
 - Basic Settings:**
 - Complete LSP Redesign (remove existing LSPs)
 - Traffic Quantity to be routed, %: 100
 - Routing Method:**
 - Shortest Path Routing (e.g. OSPF)
 - Constraint-based Routing
 - Maximum Link Fillrate, %: 100
 - Options:**
 - Consider Traffic Trunk Priorities
 - Allow Traffic Trunk Splitting
- LSP Routing Result Summary:** A dialog box showing the results of the routing process.
 - LSP Routing has been performed successfully.
 - Number of LSP paths generated or modified: 20
 - All traffic trunks are routed completely.

Network Planning Strategy for evolving Network Architectures www.vpisystems.com Session 5.5_AM - 4

VPIserviceMaker™ IP
Case study results (1)

The screenshot displays several windows from the VPIserviceMaker IP software. On the left is the 'IP Link Utilization' dialog box with fields for 'Name', 'Max capacity (Mbit/s)', and 'Floating metric code'. In the center is a network diagram with nodes and links, labeled 'LSP Visualization'. On the right is the 'LSP Path List' window showing a table of paths. Below it is the 'LSP Path Details' window showing specific path information.

Path	Trunk Name	Trunk Metric	Trunk Status	Trunk Type	Trunk Priority	Trunk % of LSP	Trunk % of Total
1	PC_RA_1_P2	PC_RA_1	PC	1000	10	1000	100
2	PC_RA_1_P3	PC_RA_1	PC	1000	10	1000	100
3	PC_RA_1_P4	PC_RA_1	PC	1000	10	1000	100
4	PC_RA_1_P5	PC_RA_1	PC	1000	10	1000	100
5	PC_RA_1_P6	PC_RA_1	PC	1000	10	1000	100
6	PC_RA_1_P7	PC_RA_1	PC	1000	10	1000	100
7	PC_RA_1_P8	PC_RA_1	PC	1000	10	1000	100
8	PC_RA_1_P9	PC_RA_1	PC	1000	10	1000	100
9	PC_RA_1_P10	PC_RA_1	PC	1000	10	1000	100
10	PC_RA_1_P11	PC_RA_1	PC	1000	10	1000	100
11	PC_RA_1_P12	PC_RA_1	PC	1000	10	1000	100
12	PC_RA_1_P13	PC_RA_1	PC	1000	10	1000	100
13	PC_RA_1_P14	PC_RA_1	PC	1000	10	1000	100
14	PC_RA_1_P15	PC_RA_1	PC	1000	10	1000	100
15	PC_RA_1_P16	PC_RA_1	PC	1000	10	1000	100
16	PC_RA_1_P17	PC_RA_1	PC	1000	10	1000	100
17	PC_RA_1_P18	PC_RA_1	PC	1000	10	1000	100
18	PC_RA_1_P19	PC_RA_1	PC	1000	10	1000	100
19	PC_RA_1_P20	PC_RA_1	PC	1000	10	1000	100
20	PC_RA_1_P21	PC_RA_1	PC	1000	10	1000	100
21	PC_RA_1_P22	PC_RA_1	PC	1000	10	1000	100
22	PC_RA_1_P23	PC_RA_1	PC	1000	10	1000	100
23	PC_RA_1_P24	PC_RA_1	PC	1000	10	1000	100
24	PC_RA_1_P25	PC_RA_1	PC	1000	10	1000	100
25	PC_RA_1_P26	PC_RA_1	PC	1000	10	1000	100
26	PC_RA_1_P27	PC_RA_1	PC	1000	10	1000	100
27	PC_RA_1_P28	PC_RA_1	PC	1000	10	1000	100
28	PC_RA_1_P29	PC_RA_1	PC	1000	10	1000	100
29	PC_RA_1_P30	PC_RA_1	PC	1000	10	1000	100

VPIserviceMaker™ IP
Case study results (2):

The screenshot displays several windows from the VPIserviceMaker IP software. On the left is the 'Traffic Link View' window showing a network diagram with red links. In the center is the 'Traffic Trunk List Table' window showing a table of traffic trunks. Below it is the 'Node-to-node Traffic Trunk List' window showing a table of node-to-node trunks. On the right is the 'LSP Path' window showing a network diagram with a highlighted path, labeled 'LSP Visualization'.

Trunk Name	Trunk Metric	Trunk Status	Trunk Type	Trunk Priority	Trunk % of LSP	Trunk % of Total
PC_RA_1	PC	1000	10	1000	100	100
PC_RA_2	PC	1000	10	1000	100	100
PC_RA_3	PC	1000	10	1000	100	100
PC_RA_4	PC	1000	10	1000	100	100
PC_RA_5	PC	1000	10	1000	100	100
PC_RA_6	PC	1000	10	1000	100	100
PC_RA_7	PC	1000	10	1000	100	100
PC_RA_8	PC	1000	10	1000	100	100
PC_RA_9	PC	1000	10	1000	100	100
PC_RA_10	PC	1000	10	1000	100	100
PC_RA_11	PC	1000	10	1000	100	100
PC_RA_12	PC	1000	10	1000	100	100
PC_RA_13	PC	1000	10	1000	100	100
PC_RA_14	PC	1000	10	1000	100	100
PC_RA_15	PC	1000	10	1000	100	100
PC_RA_16	PC	1000	10	1000	100	100
PC_RA_17	PC	1000	10	1000	100	100
PC_RA_18	PC	1000	10	1000	100	100
PC_RA_19	PC	1000	10	1000	100	100
PC_RA_20	PC	1000	10	1000	100	100
PC_RA_21	PC	1000	10	1000	100	100
PC_RA_22	PC	1000	10	1000	100	100
PC_RA_23	PC	1000	10	1000	100	100
PC_RA_24	PC	1000	10	1000	100	100
PC_RA_25	PC	1000	10	1000	100	100
PC_RA_26	PC	1000	10	1000	100	100
PC_RA_27	PC	1000	10	1000	100	100
PC_RA_28	PC	1000	10	1000	100	100
PC_RA_29	PC	1000	10	1000	100	100
PC_RA_30	PC	1000	10	1000	100	100

VPIserviceMaker™ IP Case study results (3): Reporting

IP Link Report

Node 1	Node 2	No. of links	Link Type	Routing metric interface	Max. capacity (Mbps)	Effective utilization (Mbps) 1-2	Effective Utilization % 1-2	OSPF utilization 1-2	LSP utilization 1-2	Effective utilization (Mbps) 2-1	Effective Utilization % 2-1	OSPF utilization 2-1	LSP utilization 2-1	Free capacity 1-2	Free ca 2-1
R1	R2	1	STM-16SFS-48		1 2406 376800									376800	2406.3
R1	R3	1	STM-16SFS-48		1 2406 376800									376800	2406.3
R2	R4	1	STM-16SFS-48		1 2406 376800									376800	2406.3
R2	R3	1	STM-16SFS-48		1 2406 376800									376800	2406.3
R3	R5	1	STM-16SFS-48		1 2406 376800									376800	2406.3
R5	R4	1	STM-16SFS-48		1 2406 376800									376800	2406.3

LSP Path Report

LSP Path Name	Traffic Trunk Name	From Node	To Node	Amount	Active
R2_RS_1_Path	R2_RS_1	R2	R5	1800	1
R2_RS_2_Path	R2_RS_2	R5	R2	1800	1
R3_RS_1_Path	R3_RS_1	R3	R5	800	1
R3_RS_2_Path	R3_RS_2	R5	R3	800	1
R1_RS_1_Path	R1_RS_1	R1	R5	1200	1
R1_RS_2_Path	R1_RS_2	R5	R1	1200	1
R4_RS_1_Path	R4_RS_1	R4	R5	1800	1
R4_RS_2_Path	R4_RS_2	R5	R4	1800	1
R4_RS_3_Path	R4_RS_3	R4	R5	2400	1
R4_RS_4_Path	R4_RS_4	R5	R4	2400	1
R1_RS_1_Path	R1_RS_1	R1	R2	1200	1
R1_RS_2_Path	R1_RS_2	R2	R1	1200	1
R2_RS_1_Path	R2_RS_1	R2	R3	800	1
R2_RS_2_Path	R2_RS_2	R3	R2	800	1
R3_RS_1_Path	R3_RS_1	R3	R4	2000	1
R3_RS_2_Path	R3_RS_2	R4	R3	1200	1
R4_RS_1_Path	R4_RS_1	R4	R3	1200	1
R4_RS_2_Path	R4_RS_2	R3	R4	1200	1

LSP Path Section Report

From Node	To Node	Amount	Active
R2	R5	1800	1
R5	R2	1800	1
R3	R5	800	1
R5	R3	800	1
R1	R5	1200	1
R5	R1	1200	1
R4	R5	1800	1
R5	R4	1800	1
R4	R5	2400	1
R5	R4	2400	1
R1	R2	1200	1
R2	R1	1200	1
R2	R3	800	1
R3	R2	800	1
R3	R4	2000	1
R4	R3	1200	1
R4	R3	1200	1
R3	R4	1200	1