

# 1. Basic TE Tunnel.

## Case C: Basic TE Tunnel Test

### C7. Test results.

|   |
|---|
| <p><b>Step C4.4:</b></p> <pre>semtec#sh mpls traffic-eng tunnels Name: semtec_t1 (Tunnel 1) Destination: 10.130.255.2 Status:   Admin: up Oper: up Path: valid Signalling: connected   path option 1, type dynamic (Basis for Setup, path weight 1)  Config Parameters:   Bandwidth: 750 kbps (Global) Priority: 0 0 Affinity: 0x0/0xFFFF   AutoRoute: disabled LockDown: disabled  InLabel : - OutLabel : POS3/3, implicit-null RSVP Signalling Info:   Src 10.130.255.3, Dst 10.130.255.2, Tun_Id 1, Tun_Instance 59 RSVP Path Info:   My Address: 10.130.255.3   Explicit Route: 10.130.49.2 10.130.255.2   Record Route: NONE   Tspec: ave rate=750 kbits, burst=1000 bytes, peak rate=750 kbits RSVP Resv Info:   Record Route: NONE   Fspec: ave rate=750 kbits, burst=1000 bytes, peak rate=Inf History:   Current LSP:   Uptime: 11 minutes, 21 seconds  Name: semtec_t2 (Tunnel 2) Destination: 10.130.255.2 Status:   Admin: up Oper: up Path: valid Signalling: connected   path option 1, type dynamic (Basis for Setup, path weight 1)  Config Parameters:   Bandwidth: 100 kbps (Global) Priority: 0 0 Affinity: 0x0/0xFFFF   AutoRoute: disabled LockDown: disabled  InLabel : - OutLabel : POS3/3, implicit-null RSVP Signalling Info:   Src 10.130.255.3, Dst 10.130.255.2, Tun_Id 2, Tun_Instance 1 RSVP Path Info:   My Address: 10.130.255.3   Explicit Route: 10.130.49.2 10.130.255.2   Record Route: NONE   Tspec: ave rate=100 kbits, burst=1000 bytes, peak rate=100 kbits RSVP Resv Info:   Record Route: NONE   Fspec: ave rate=100 kbits, burst=1000 bytes, peak rate=Inf History:   Current LSP:   Uptime: 2 minutes, 52 seconds</pre> |
| <p><b>Verdict:</b></p>  |
| <p>Pass. Tunnels 1&amp;2 both exit GSR A via interface pos1A (Explicit Route 10.130.49.2 10.130.255.2).</p>   |
| <p><b>Comments:</b></p>   |
| <p>We noticed that we had to configure</p> <ul style="list-style-type: none"><li>• mpls traffic-eng router-id Loopback0</li><li>• mpls traffic-eng area 0</li></ul> <p>under the “router ospf 100” command before the router would accept</p>   |

the interface command

- tunnel mpls traffic-eng path-option 1 dynamic.

Also, note that the path weight for both of these connections is 1.

#### Step C4.6:

```
semtec#sh mpls traffic-eng tunnel Tunnel 3
Name: semtec_t3 (Tunnel 3) Destination: 10.130.255.2
Status:
  Admin: up Oper: up Path: valid Signalling: connected
  path option 1, type dynamic (Basis for Setup, path weight 2)

Config Parameters:
  Bandwidth: 200 kbps (Global) Priority: 0 0 Affinity: 0x0/0xFFFF
  AutoRoute: disabled LockDown: disabled

InLabel : -
OutLabel : POS3/1, 16
RSVP Signalling Info:
  Src 10.130.255.3, Dst 10.130.255.2, Tun_Id 3, Tun_Instance 1
RSVP Path Info:
  My Address: 10.130.255.3
  Explicit Route: 10.130.2.1 10.130.1.2 10.130.255.2
  Record Route: NONE
  Tspec: ave rate=200 kbits, burst=1000 bytes, peak rate=200 kbits
RSVP Resv Info:
  Record Route: NONE
  Fspec: ave rate=200 kbits, burst=1000 bytes, peak rate=Inf
Shortest Unconstrained Path Info:
  Path Weight: 1
  Explicit Route: 10.130.49.2 10.130.255.2
History:
  Current LSP:
    Uptime: 1 minutes, 40 seconds
```

#### Verdict:

Pass. Tunnel 3 exits GSR A via interface pos2A (Explicit Route 10.130.2.1 10.130.1.2 10.130.255.2).

#### Comments:

Note that the path weight for this tunnel is 2.

#### Step C4.7:

```
semtec#sh mpls traffic-eng link-management advertisements
Flooding Status: ready
Configured Areas: 1
IGP Area[1] ID: ospf area 0
System Information:
  Flooding Protocol: OSPF
Header Information:
  IGP System ID: 10.130.255.3
  MPLS TE Router ID: 10.130.255.3
  Flooded Links: 2
Link ID: 0
Link IP Address: 10.130.2.2
IGP Neighbor: ID 10.130.255.1, IP 10.130.2.1
Admin. Weight: 1
Physical Bandwidth: 622000 kbits/sec
Res. Global BW: 1000 kbits/sec
Res. Sub BW: 0 kbits/sec
Downstream:
          Global Pool Sub Pool
Reservable Bandwidth[0]: ----- 800 0 kbits/sec
Reservable Bandwidth[1]: ----- 800 0 kbits/sec
```

|  |                                 |            |
|--|---------------------------------|------------|
| Reservable Bandwidth[2]:   | 800                             | 0 kbps/sec |
| Reservable Bandwidth[3]:   | 800                             | 0 kbps/sec |
| Reservable Bandwidth[4]:   | 800                             | 0 kbps/sec |
| Reservable Bandwidth[5]:   | 800                             | 0 kbps/sec |
| Reservable Bandwidth[6]:   | 800                             | 0 kbps/sec |
| Reservable Bandwidth[7]:   | 800                             | 0 kbps/sec |
| Attribute Flags:   | 0x00000000                      |            |
| Link ID:   | 1                               |            |
| Link IP Address:   | 10.130.49.1                     |            |
| IGP Neighbor:  | ID 10.130.255.2, IP 10.130.49.2 |            |
| Admin. Weight:   | 1                               |            |
| Physical Bandwidth:  | 622000 kbps/sec                 |            |
| Res. Global BW:  | 1000 kbps/sec                   |            |
| Res. Sub BW:   | 0 kbps/sec                      |            |
| Downstream:  |                                 |            |
|  | Global Pool                     | Sub Pool   |
|  | -----                           | -----      |
| Reservable Bandwidth[0]:   | 150                             | 0 kbps/sec |
| Reservable Bandwidth[1]:   | 150                             | 0 kbps/sec |
| Reservable Bandwidth[2]:   | 150                             | 0 kbps/sec |
| Reservable Bandwidth[3]:   | 150                             | 0 kbps/sec |
| Reservable Bandwidth[4]:   | 150                             | 0 kbps/sec |
| Reservable Bandwidth[5]:   | 150                             | 0 kbps/sec |
| Reservable Bandwidth[6]:   | 150                             | 0 kbps/sec |
| Reservable Bandwidth[7]:   | 150                             | 0 kbps/sec |
| Attribute Flags:   | 0x00000000                      |            |
| <b>Verdict:</b>  |                                 |            |
| Pass. Link ID 0 (Link L3) has 800 kbps remaining after reserving 200 kbps (1000 kbps total available). Link ID 1 has 150 kbps remaining after reserving 750 kbps and 100 kbps (1000 kbps total available). |                                 |            |
| <b>Comments:</b>   |                                 |            |
| None   |                                 |            |

| <b>Step C4.9:</b>   |       |          |       |          |      |          |
|---|-------|----------|-------|----------|------|----------|
| <pre> semtec#show interface tunnel 1 accounting Tunnel 1       Protocol  Pkts In  Chars In  Pkts Out  Chars Out       IP         0      0         35559    4046346 semtec#show interface tunnel 2 accounting Tunnel 2       Protocol  Pkts In  Chars In  Pkts Out  Chars Out       IP         0      0         5067     577638 semtec#show interface tunnel 3 accounting Tunnel 3       Protocol  Pkts In  Chars In  Pkts Out  Chars Out       IP         0      0         5067     597906 </pre> |       |          |       |          |      |          |
| SmartBits Output:   |       |          |       |          |      |          |
| Name  | Frame | Load (%) | Sent  | Received | Lost | Loss (%) |
| Total   |       | 0.9      | 45603 | 45603    | 0    | 0        |
| Tunnel 1 - Stream 1   | 128   | 0.9      | 5067  | 5067     | 0    | 0        |
| Tunnel 2  | 128   | 0.9      | 5067  | 5067     | 0    | 0        |
| Tunnel 3  | 128   | 0.9      | 5067  | 5067     | 0    | 0        |
| Tunnel 1 - Stream 2   | 128   | 0.9      | 5067  | 5067     | 0    | 0        |
| Tunnel 1 - Stream 3   | 128   | 0.9      | 5067  | 5067     | 0    | 0        |
| Tunnel 1 - Stream 4   | 128   | 0.9      | 5067  | 5067     | 0    | 0        |
| Tunnel 1 - Stream 5   | 128   | 0.9      | 5067  | 5067     | 0    | 0        |
| Tunnel 1 - Stream 6   | 128   | 0.9      | 5067  | 5067     | 0    | 0        |

|                     |     |     |      |      |   |   |
|---------------------|-----|-----|------|------|---|---|
| Tunnel 1 - Stream 6 | 128 | 0.9 | 5067 | 5067 | 0 | 0 |
| Tunnel 1 - Stream 7 | 128 | 0.9 | 5067 | 5067 | 0 | 0 |

**Narrative for Smartbits results:** A limitation in Smartbits traffic generator hardware and software requires that each stream or flow on an interface be equal in size. Thus to create 700Kbps load for tunnel 1 and 100Kbps load each for tunnels 2 and 3, seven streams of 100Kbps each had to be created for tunnel 1 and one stream of 100Kbps each had to be created for tunnels 2 and 3. The total load on the interface was 900Kbps or 0.9% of the total load on the 100BaseT interface.

**Verdict:**

Pass. The amount of traffic seen by the router is approximately the same as that sent by the test tool:

- Tunnel 1 = 35,559 packets (from router CLI)
- Tunnel 2 = 5,067 packets (from router CLI)
- Tunnel 3 = 5,067 packets (from router CLI)
- Total from router CLI = 45,693
  
- Tunnel 1 = 5067\*7 = 35,469 packets (from test tool)
- Tunnel 2 = 5067 packets (from test tool)
- Tunnel 3 = 5067 packets (from test tool)
- Total packets sent = 45,603 (from test tool)

**Comments:**

None

**Step C4.9:**

```

semtec#sh interface POS3/3
POS3/3 is up, line protocol is up
  Hardware is Packet over SONET
  Internet address is 10.130.49.1/24
  MTU 4470 bytes, BW 622000 Kbit, DLY 100 usec, rely 255/255, load 217/255
  Encapsulation HDLC, crc 32, loopback not set
  Keepalive not set
  Scramble disabled
  Last input 00:00:05, output 00:00:00, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 2 drops, 0 flushes
  5 minute input rate 529751000 bits/sec, 534028 packets/sec
  5 minute output rate 529778000 bits/sec, 534056 packets/sec
    429236065 packets input, 1685653730 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
      0 parity
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    429278423 packets output, 1690476812 bytes, 0 underruns
    0 output errors, 0 applique, 0 interface resets
    0 output buffer failures, 0 output buffers swapped out
    1 carrier transitions

```

**Verdict:**

Pass. The background traffic sent is NOT using the tunnel. The amount of background traffic seen by the router interface POS1A is approximately the same as that sent by the test tool.

**Comments:**

None

