

6. Basic GB Tunnel with Sub-pool

CASE F: Basic GB Tunnel with Sub-pooling

F6. Test Results.

```
Step F4.3:
semtec#show mpls traffic-eng tunnel

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: 10000 kbps (Global) Priority: 3 3 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 311
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=10000 kbits, burst=1000 bytes, peak rate=10000 kbits
RSVP Resv Info:
  Record Route: NONE
  Fspec: ave rate=10000 kbits, burst=1000 bytes, peak rate=Inf
History:
  Current LSP:
    Uptime: 49 minutes, 10 seconds
    Selection: reoptimization
  Prior LSP:
    ID: path option 1 [310]
    Removal Trigger: configuration changed

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: 1000 kbps (Sub) Priority: 3 3 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 175
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=1000 kbits, burst=1000 bytes, peak rate=1000 kbits
RSVP Resv Info:
  Record Route: NONE
  Fspec: ave rate=1000 kbits, burst=1000 bytes, peak rate=1000 kbits
History:
  Current LSP:
    Uptime: 48 minutes, 48 seconds
    Selection: reoptimization
  Prior LSP:
    ID: path option 1 [174]
    Removal Trigger: path verification failed

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 1)

Config Parameters:

Bandwidth: 1000 kbps (Sub) Priority: 3 3 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 3, Tun_Instance 169

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=1000 kbps, burst=1000 bytes, peak rate=1000 kbps

RSVP Resv Info:

Record Route: NONE

Fspec: ave rate=1000 kbps, burst=1000 bytes, peak rate=1000 kbps

History:

Current LSP:

Uptime: 48 minutes, 47 seconds

Selection: reoptimization

Prior LSP:

ID: path option 1 [168]

Removal Trigger: path verification failed

Name: semtec_t4 (Tunnel 4) 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: 1000 kbps (Sub) Priority: 3 3 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 4, 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=1000 kbps, burst=1000 bytes, peak rate=1000 kbps

RSVP Resv Info:

Record Route: NONE

Fspec: ave rate=1000 kbps, burst=1000 bytes, peak rate=1000 kbps

History:

Current LSP:

Uptime: 47 minutes, 30 seconds

Name: semtec_t5 (Tunnel 5) 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: 1000 kbps (Sub) Priority: 3 3 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 5, 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=1000 kbps, burst=1000 bytes, peak rate=1000 kbps

RSVP Resv Info:

Record Route: NONE

Fspec: ave rate=1000 kbps, burst=1000 bytes, peak rate=1000 kbps

History:

Current LSP:

Uptime: 47 minutes, 13 seconds

```
semtec#show 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 kbps/sec
  Res. Global BW: 20000 kbps/sec
  Res. Sub BW: 10000 kbps/sec
  Downstream:
      Global Pool      Sub Pool
      -----
Reservable Bandwidth[0]: 20000      10000 kbps/sec
Reservable Bandwidth[1]: 20000      10000 kbps/sec
Reservable Bandwidth[2]: 20000      10000 kbps/sec
Reservable Bandwidth[3]: 20000      10000 kbps/sec
Reservable Bandwidth[4]: 20000      10000 kbps/sec
Reservable Bandwidth[5]: 20000      10000 kbps/sec
Reservable Bandwidth[6]: 20000      10000 kbps/sec
Reservable Bandwidth[7]: 20000      10000 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: 20000 kbps/sec
  Res. Sub BW: 10000 kbps/sec
  Downstream:
      Global Pool      Sub Pool
      -----
Reservable Bandwidth[0]: 20000      10000 kbps/sec
Reservable Bandwidth[1]: 20000      10000 kbps/sec
Reservable Bandwidth[2]: 20000      10000 kbps/sec
Reservable Bandwidth[3]: 6000       6000 kbps/sec
Reservable Bandwidth[4]: 6000       6000 kbps/sec
Reservable Bandwidth[5]: 6000       6000 kbps/sec
Reservable Bandwidth[6]: 6000       6000 kbps/sec
Reservable Bandwidth[7]: 6000       6000 kbps/sec
Attribute Flags: 0x00000000
```

Verdict:

Pass. All five tunnels use Link L4 (Explicit Route 10.130.49.2 10.130.255.2). The available bandwidth on Link ID 1 (Link L4) agrees with that configured:

- Global Pools (20 Mbps reserved – one 10 Mbps tunnel = 10 Mbps available)
- Sub Pools (10 Mbps reserved – four 1 Mbps tunnels = 6 Mbps available)

Comments:

None

Step F4.5.1:

```

semtec#sh int t1 acc
Tunnel 1
      Protocol Pkts In  Chars In  Pkts Out  Chars Out
      IP      0      0      40540    4621560

semtec#sh int t2 acc
Tunnel 2
      Protocol Pkts In  Chars In  Pkts Out  Chars Out
      IP      0      0      40540    4621560

semtec#sh int t3 acc
Tunnel 3
      Protocol Pkts In  Chars In  Pkts Out  Chars Out
      IP      0      0      40540    4621560

semtec#sh int t4 acc
Tunnel 4
      Protocol Pkts In  Chars In  Pkts Out  Chars Out
      IP      0      0      40540    4621560

semtec#sh int t5 acc
Tunnel 5
      Protocol Pkts In  Chars In  Pkts Out  Chars Out
      IP      0      0      40540    4621560

```

```

Extended IP access list 101
  permit ip any host 10.150.1.11 (40325 matches)
  permit ip any host 10.150.1.12 (40329 matches)
  permit ip any host 10.150.1.13 (40303 matches)
  permit ip any host 10.150.1.14 (40365 matches)
  permit ip any host 10.150.1.15 (40349 matches)

```

Smartbits Output:

Name	Frame Size	Load (%)	Sent	Received	Lost	Loss (%)
Total		4	202700	201671	1029	0.50765
Tunnel 1	128	4	40540	40325	215	0.53034
Tunnel 2	128	4	40540	40329	211	0.52047
Tunnel 3	128	4	40540	40303	237	0.58461
Tunnel 4	128	4	40540	40365	175	0.43167
Tunnel 5	128	4	40540	40349	191	0.47114

Verdict:

Pass. Traffic was successfully passed over all five tunnels.

Comments:

We were inadvertently running a large amount of background traffic across the core during this test, which is why there is a small amount of loss noted by SmartBits.

Step F4.6:

```

semtec#show int t1 acc
Tunnel 1
      Protocol Pkts In  Chars In  Pkts Out  Chars Out
      IP      0      0      40540    4783720

semtec#show int t2 acc
Tunnel 2
      Protocol Pkts In  Chars In  Pkts Out  Chars Out
      IP      0      0      40540    4783720

semtec#show int t3 acc
Tunnel 3
      Protocol Pkts In  Chars In  Pkts Out  Chars Out
      IP      0      0      40540    4783720

semtec#show int t4 acc

```


Status:
Admin: up Oper: up Path: valid Signalling: connected
path option 1, type dynamic (Basis for Setup, path weight 11)

Config Parameters:
Bandwidth: 1000 kbps (Sub) Priority: 3 3 Affinity: 0x0/0xFFFF
AutoRoute: disabled LockDown: disabled

InLabel : -
OutLabel : POS3/1, 18
RSVP Signalling Info:
Src 10.130.255.3, Dst 10.130.255.2, Tun_Id 3, Tun_Instance 172
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=1000 kbits, burst=1000 bytes, peak rate=1000 kbits
RSVP Resv Info:
Record Route: NONE
Fspec: ave rate=1000 kbits, burst=1000 bytes, peak rate=1000 kbits
History:
Current LSP:
Uptime: 1 minutes, 40 seconds
Prior LSP:
ID: path option 1 [169]
Removal Trigger: tunnel shutdown

Name: semtec_t4 (Tunnel 4) Destination:
10.130.255.2

Status:
Admin: up Oper: up Path: valid Signalling: connected
path option 1, type dynamic (Basis for Setup, path weight 11)

Config Parameters:
Bandwidth: 1000 kbps (Sub) Priority: 3 3 Affinity: 0x0/0xFFFF
AutoRoute: disabled LockDown: disabled

InLabel : -
OutLabel : POS3/1, 19
RSVP Signalling Info:
Src 10.130.255.3, Dst 10.130.255.2, Tun_Id 4, Tun_Instance 4
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=1000 kbits, burst=1000 bytes, peak rate=1000 kbits
RSVP Resv Info:
Record Route: NONE
Fspec: ave rate=1000 kbits, burst=1000 bytes, peak rate=1000 kbits
History:
Current LSP:
Uptime: 1 minutes, 35 seconds
Prior LSP:
ID: path option 1 [1]
Removal Trigger: tunnel shutdown

Name: semtec_t5 (Tunnel 5) Destination:
10.130.255.2

Status:
Admin: up Oper: up Path: valid Signalling: connected
path option 1, type dynamic (Basis for Setup, path weight 11)

Config Parameters:
Bandwidth: 1000 kbps (Sub) Priority: 3 3 Affinity: 0x0/0xFFFF
AutoRoute: disabled LockDown: disabled

InLabel : -
OutLabel : POS3/1, 20
RSVP Signalling Info:
Src 10.130.255.3, Dst 10.130.255.2, Tun_Id 5, Tun_Instance 4
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=1000 kbits, burst=1000 bytes, peak rate=1000 kbits
RSVP Resv Info:
Record Route: NONE

Fspec: ave rate=1000 kbits, burst=1000 bytes, peak rate=1000 kbits

History:

Current LSP:

Uptime: 1 minutes, 31 seconds

Prior LSP:

ID: path option 1 [1]

Removal Trigger: tunnel shutdown

Smartbits Output:

Name	Frame Size	Load (%)	Sent	Received	Lost	Loss (%)
Total		4	202700	202700	0	0
Tunnel 1	128	4	40540	40540	0	0
Tunnel 2	128	4	40540	40540	0	0
Tunnel 3	128	4	40540	40540	0	0
Tunnel 4	128	4	40540	40540	0	0
Tunnel 5	128	4	40540	40540	0	0

semtec#sh mpls traff link adver

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: 10

Physical Bandwidth: 622000 kbits/sec

Res. Global BW: 20000 kbits/sec

Res. Sub BW: 10000 kbits/sec

Downstream:

Global Pool Sub Pool

```
-----  
Reservable Bandwidth[0]: 20000 10000 kbits/sec  
Reservable Bandwidth[1]: 20000 10000 kbits/sec  
Reservable Bandwidth[2]: 20000 10000 kbits/sec  
Reservable Bandwidth[3]: 6000 6000 kbits/sec  
Reservable Bandwidth[4]: 6000 6000 kbits/sec  
Reservable Bandwidth[5]: 6000 6000 kbits/sec  
Reservable Bandwidth[6]: 6000 6000 kbits/sec  
Reservable Bandwidth[7]: 6000 6000 kbits/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: 40

Physical Bandwidth: 622000 kbits/sec

Res. Global BW: 20000 kbits/sec

Res. Sub BW: 10000 kbits/sec

Downstream:

Global Pool Sub Pool

```
-----  
Reservable Bandwidth[0]: 20000 10000 kbits/sec  
Reservable Bandwidth[1]: 20000 10000 kbits/sec  
Reservable Bandwidth[2]: 20000 10000 kbits/sec  
Reservable Bandwidth[3]: 20000 10000 kbits/sec  
Reservable Bandwidth[4]: 20000 10000 kbits/sec  
Reservable Bandwidth[5]: 20000 10000 kbits/sec  
Reservable Bandwidth[6]: 20000 10000 kbits/sec  
Reservable Bandwidth[7]: 20000 10000 kbits/sec
```

Attribute Flags: 0x00000000

Verdict:

Pass. Traffic was successfully passed over the tunnels. Note that the administrative weight for Link 0 (Link L3) was set to 10 and for Link 1 (Link L4) was set to 40 (see the “sh mpls traff link adver” command). This caused all five tunnels to be routed over Link L3 (Explicit Route: 10.130.2.1 10.130.1.2 10.130.255.2).

Comments:

None