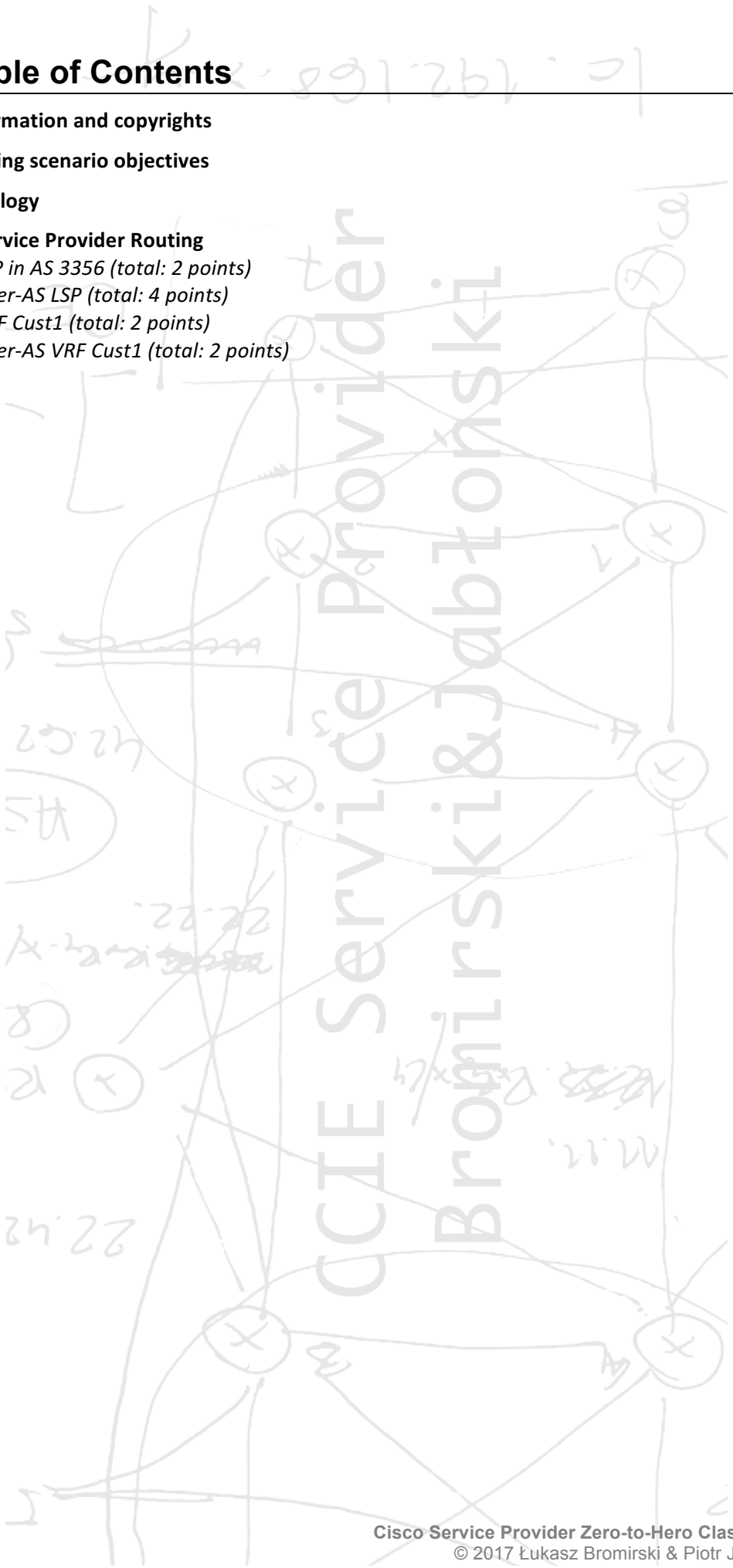
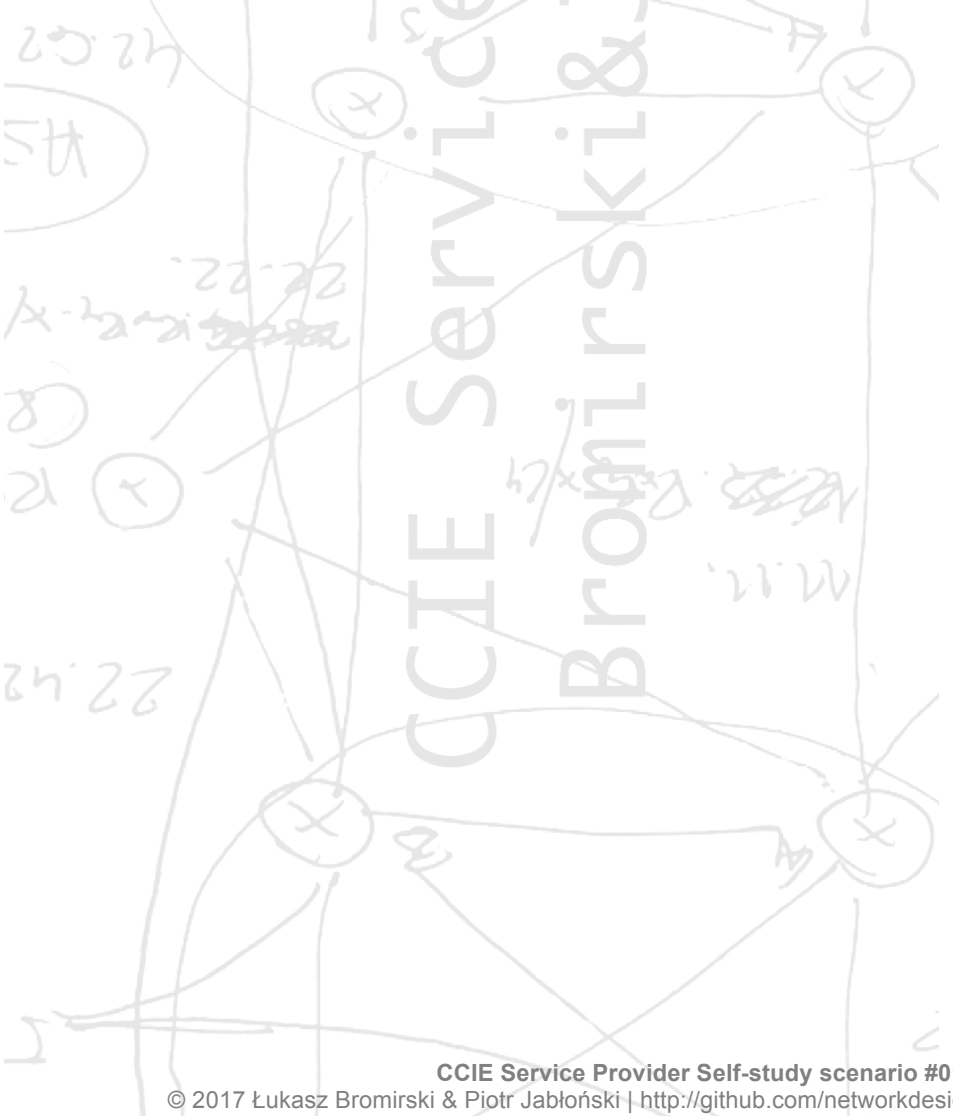
CCIE Service Provider Troubleshooting section

v1.0

Main Table of Contents



Material information and copyrights



Troubleshooting scenario objectives

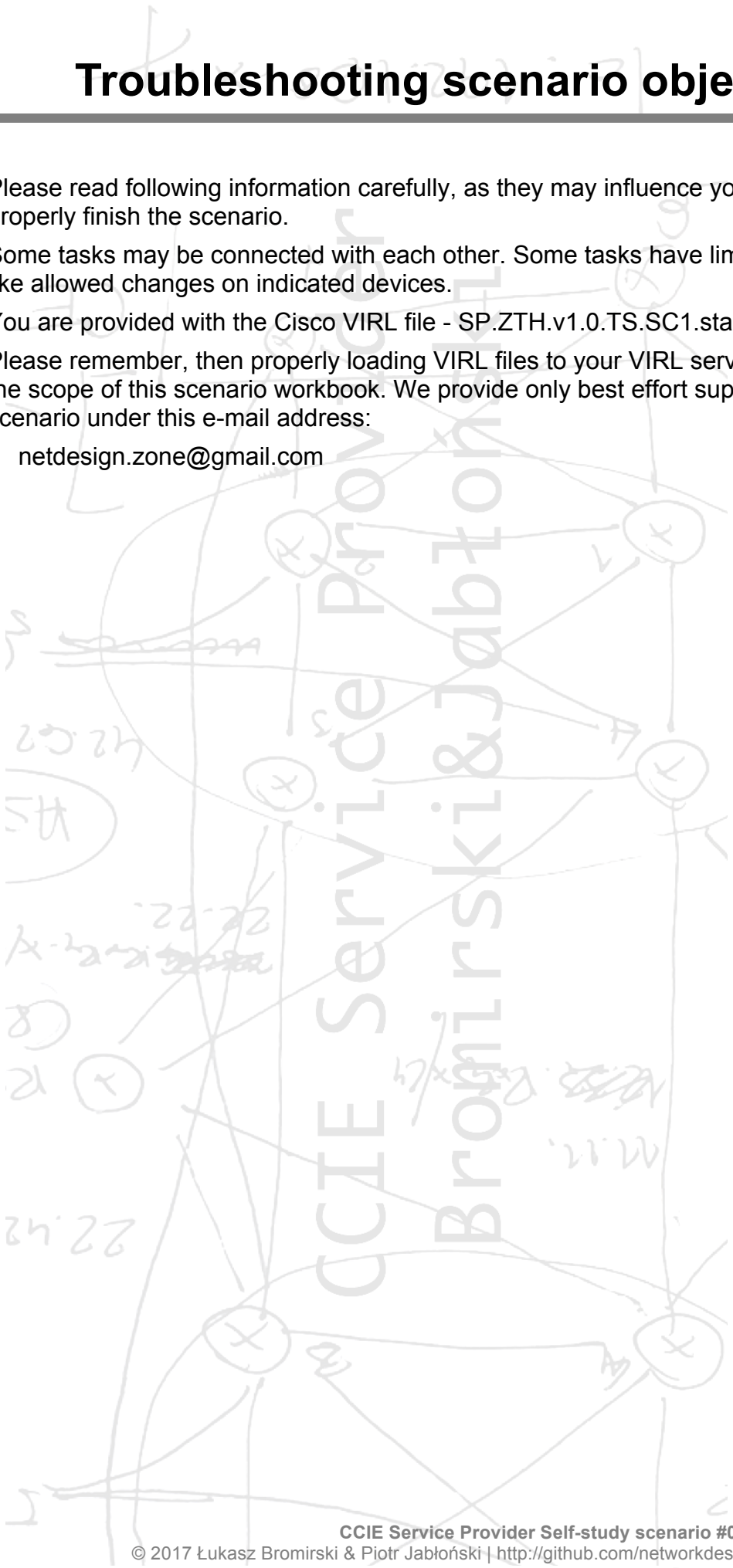
Please read following information carefully, as they may influence your ability to properly finish the scenario.

Some tasks may be connected with each other. Some tasks have limitations like allowed changes on indicated devices.

You are provided with the Cisco VIRL file - SP.ZTH.v1.0.TS.SC1.start.virl.

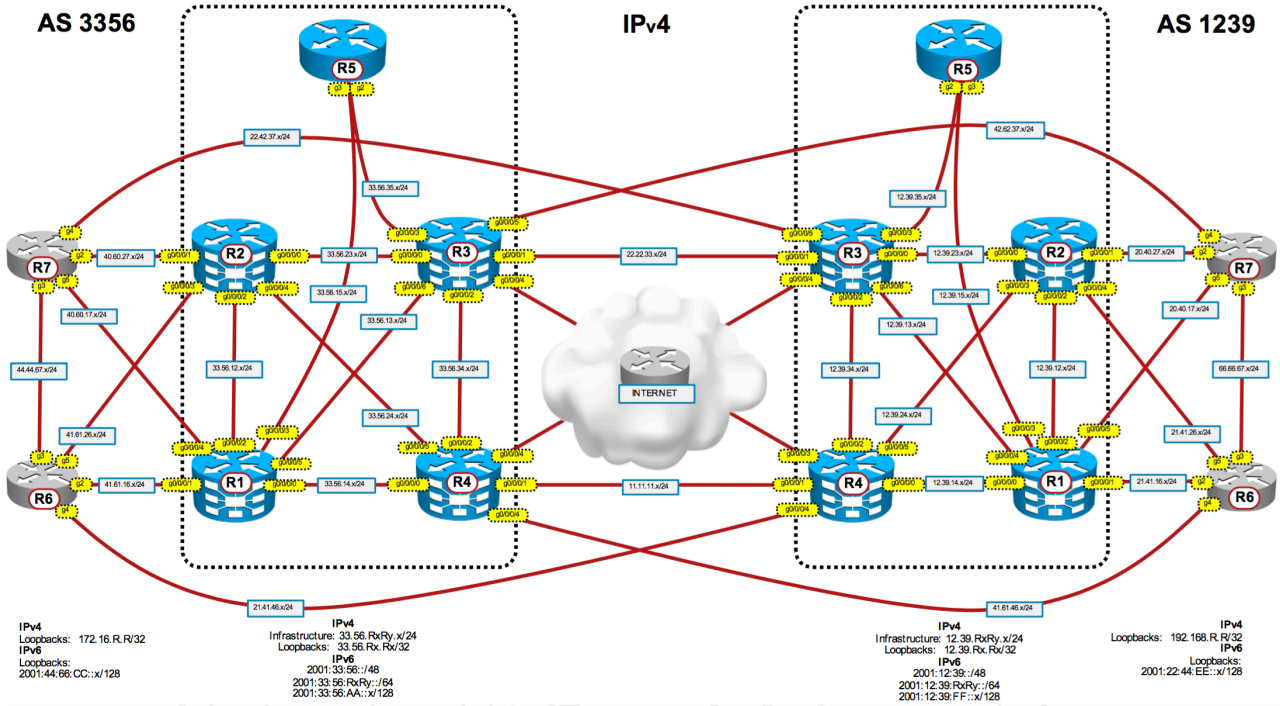
Please remember, then properly loading VIRL files to your VIRL server is out of the scope of this scenario workbook. We provide only best effort support for the scenario under this e-mail address:

netdesign.zone@gmail.com



Scenario topology

Please read following information carefully, as they may influence your ability to properly finish the scenario.



Task #1: IGP in AS 3356 (total: 2 points)

Make sure that the route type of 33.56.3.3/32 on SP1R2 is intra area. Do not change any OSPF configuration.

```
RP/0/0/CPU0:SP1R2#sh route 33.56.3.3/32

Routing entry for 33.56.3.3/32
  Known via "ospf AS3356", distance 110, metric 2, type intra area
  Installed Aug 12 15:09:50.116 for 00:00:07
  Routing Descriptor Blocks
    33.56.23.3, from 33.56.3.3, via GigabitEthernet0/0/0/0
      Route metric is 2
  No advertising protos.
```

The label learnt from a neighbour should be Explicit-Null.

```
RP/0/0/CPU0:SP1R2#sh mpls for | i 33.56.3.3/32
102003 Exp-Null-v4 33.56.3.3/32       Gi0/0/0/0    33.56.23.3      53614
```

Task #2: Inter-AS LSP (total: 4 points)

There is no resiliency for the path to 33.56.2.2/32. Please fix a config so the following route appears on SP2R2.

```
RP/0/0/CPU0:SP2R2#sh route | i 33.56.2.2
i L2 33.56.2.2/32 [115/10] via 12.39.24.4, 00:00:03, GigabitEthernet0/0/0/3
```

There should be just two routes learnt via BGP related to the subnet 33.56.0.0/16.

```
RP/0/0/CPU0:SP2R4#sh ip bgp | i 33.56.
*> 33.56.0.0/16       11.11.11.1                             0 3356 i
*> 33.56.2.2/32       11.11.11.1                             0 3356 ?
```

To test redundancy, you can shut the interface G0/0/0/1 on SP2R3.

```
RP/0/0/CPU0:SP2R2#trace 33.56.2.2 source 12.39.2.2
Type escape sequence to abort.
Tracing the route to 33.56.2.2

 1  12.39.24.4 [MPLS: Label 123336 Exp 0] 9 msec  9 msec  0 msec
 2  11.11.11.1 [MPLS: Label 104002 Exp 0] 9 msec  9 msec  9 msec
 3  33.56.24.2 9 msec  *  0 msec

RP/0/0/CPU0:SP2R2#ping mpls ipv4 33.56.2.2/32
Sending 5, 100-byte MPLS Echos to 33.56.2.2/32,
      timeout is 2 seconds, send interval is 0 msec:

Codes: '!' - success, 'Q' - request not sent, '.' - timeout,
  'L' - labeled output interface, 'B' - unlabeled output interface,
  'D' - DS Map mismatch, 'F' - no FEC mapping, 'f' - FEC mismatch,
```

```
  'M' - malformed request, 'm' - unsupported tlvs, 'N' - no rx label,
  'P' - no rx intf label prot, 'p' - premature termination of LSP,
  'R' - transit router, 'I' - unknown upstream index,
  'X' - unknown return code, 'x' - return code 0

Type escape sequence to abort.

!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/6/10 ms
```

After bringing back G0/0/0/1 on SP2R3 the path should be as depicted below.

```
RP/0/0/CPU0:SP2R2#trace 33.56.2.2 source 12.39.2.2
Type escape sequence to abort.
Tracing the route to 33.56.2.2

 1  12.39.23.3 [MPLS: Label 123319 Exp 0] 9 msec  0 msec  0 msec
 2  22.22.33.1 [MPLS: Label 103004 Exp 0] 0 msec  0 msec  9 msec
 3  33.56.23.2 0 msec  *  9 msec

RP/0/0/CPU0:SP2R2#ping mpls ipv4 33.56.2.2/32
Sending 5, 100-byte MPLS Echos to 33.56.2.2/32,
      timeout is 2 seconds, send interval is 0 msec:

Codes: '!' - success, 'Q' - request not sent, '.' - timeout,
  'L' - labeled output interface, 'B' - unlabeled output interface,
  'D' - DS Map mismatch, 'F' - no FEC mapping, 'f' - FEC mismatch,
  'M' - malformed request, 'm' - unsupported tlvs, 'N' - no rx label,
  'P' - no rx intf label prot, 'p' - premature termination of LSP,
  'R' - transit router, 'I' - unknown upstream index,
  'X' - unknown return code, 'x' - return code 0

Type escape sequence to abort.

!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/8/10 ms
```

Task #3: VRF Cust1 (total: 2 points)

There is no communication between SP1R6 172.16.6.6 and the service 172.16.3.31 located at VRF siteB on SP1R3. Diagnose the configuration and make necessary changes. An expected result after troubleshooting.

```
CEL6#ping 172.16.3.31 source 172.16.6.6
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.3.31, timeout is 2 seconds:
Packet sent with a source address of 172.16.6.6
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 5/6/7 ms
```

Task #4: Inter-AS VRF Cust1 (total: 2 points)

There is a communication between SP2R7 192.168.7.7 and the service 172.16.3.31 located at VRF siteB on SP1R3 through SP2R4.

```
CER7#trace 172.16.3.31 source 192.168.7.7
Type escape sequence to abort.
Tracing the route to 172.16.3.31
VRF info: (vrf in name/id, vrf out name/id)
  1 20.40.27.2 [AS 1239] 1 msec 2 msec 1 msec
  2 12.39.24.4 [MPLS: Labels 0/123308 Exp 0] 18 msec 12 msec 16 msec
  3 11.11.11.1 [MPLS: Label 104020 Exp 0] 11 msec 10 msec 11 msec
  4 33.56.34.3 13 msec *  13 msec
```

Make the necessary minimal changes on SPxR3 routers so the traffic takes the route to 172.16.3.31 via SP2R3 NOT via SP3R4. Other routes or paths should NOT be affected by these changes.

```
CER7#trace 172.16.3.31 source 192.168.7.7
Type escape sequence to abort.
Tracing the route to 172.16.3.31
VRF info: (vrf in name/id, vrf out name/id)
  1 20.40.27.2 [AS 1239] 1 msec 1 msec 2 msec
  2 12.39.23.3 [MPLS: Labels 0/123309 Exp 0] 10 msec 8 msec 8 msec
  3 22.22.34.1 10 msec *  12 msec
```