Network Topology

DES-3528

Service Provider Network
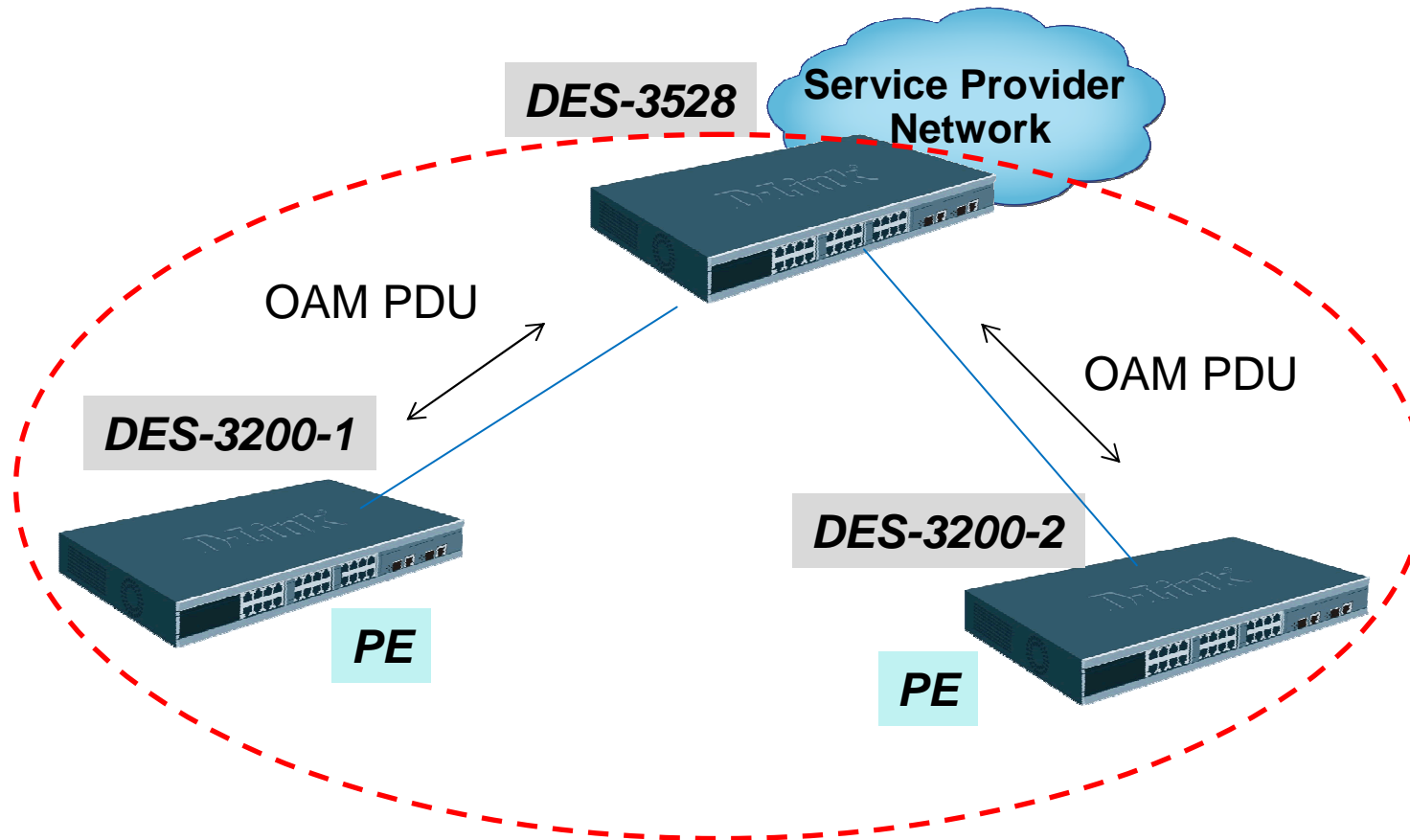
OAM PDU

DES-3200-1

PE

OAM PDU

DES-3200-2

PE

The Goals:

1. Enable the **Ethernet OAM** & monitor the remote client status
2. Enable OAM **Remote Loopback** mechanism
3. Enable the **Critical Event notification**

Ethernet OAM

DGS-3528
config ethernet_oam ports 1-2 state enable
config ethernet_oam ports 1-2 mode active

DES-3200 (1 & 2)
config ethernet_oam ports 1 state enable
config ethernet_oam ports 1 mode passive

Pull and plug Port 1 of DES-3200 and check the OAM status on Port 1 of DES-3200 or Port 1 of DGS-3538
*>**show ethernet_oam ports 1-2 status***

```
DES-3528P:5#show ethernet_oam ports 1-2 status
Command: show ethernet_oam ports 1-2 status

Port 1
Local Client
------------------------------------------------------------
  OAM                    : Enabled
  Mode                   : Active
  Max OAMPDU             : 1518  Bytes
  Remote Loopback        : Support
  Unidirection           : Not Supported
  Link Monitoring        : Support
  Variable Request       : Not Supported
  PDU Revision           : 2
  Operation Status       : Operational
  Loopback Status        : No Loopback

Remote Client
------------------------------------------------------------
  Mode                   : Passive
  MAC Address            : 00-1E-58-6E-97-80
  Vendor (OUI)           : 00055d
  Max OAMPDU             : 1518 Bytes
  Unidirection           : Not Supported
  Link Monitoring        : Support

  Variable Request       : Not Supported
  PDU Revision           : 1
  Vendor Info            : 0
```

Ethernet OAM Packet Capture

| No. ▾	Time	Source	Destination	Protocol	Info
1	0.000000	00:22:b0:7a:66:81	Slow-Protocols	OAM	OAMPDU: Information
2	0.056746	D-Link_6e:97:80	Slow-Protocols	OAM	OAMPDU: Information
3	1.000006	00:22:b0:7a:66:81	Slow-Protocols	OAM	OAMPDU: Information
4	1.056723	D-Link_6e:97:80	Slow-Protocols	OAM	OAMPDU: Information

```
⊞ Frame 1 (64 bytes on wire, 64 bytes captured)
⊟ Ethernet II, Src: 00:22:b0:7a:66:81 (00:22:b0:7a:66:81), Dst: Slow-Protocols (01:80:c2:00:00:02)
  ⊞ Destination: Slow-Protocols (01:80:c2:00:00:02)
  ⊞ Source: 00:22:b0:7a:66:81 (00:22:b0:7a:66:81)
    Type: Slow Protocols (0x8809)
⊟ OAM Protocol
    Slow Protocols subtype: OAM (0x03)
  ⊞ Flags: 0x0050 (local: Discovery complete, remote: Discovery complete)
    OAMPDU code: Information (0x00)
  ⊞ Type: Local Information TLV (0x01)
  ⊞ Type: Remote Information TLV (0x02)
```

OAMPDU, which is the multicast MAC address "**01-80-C2-00-00-02**"

Enable Ethernet OAM Critical Event
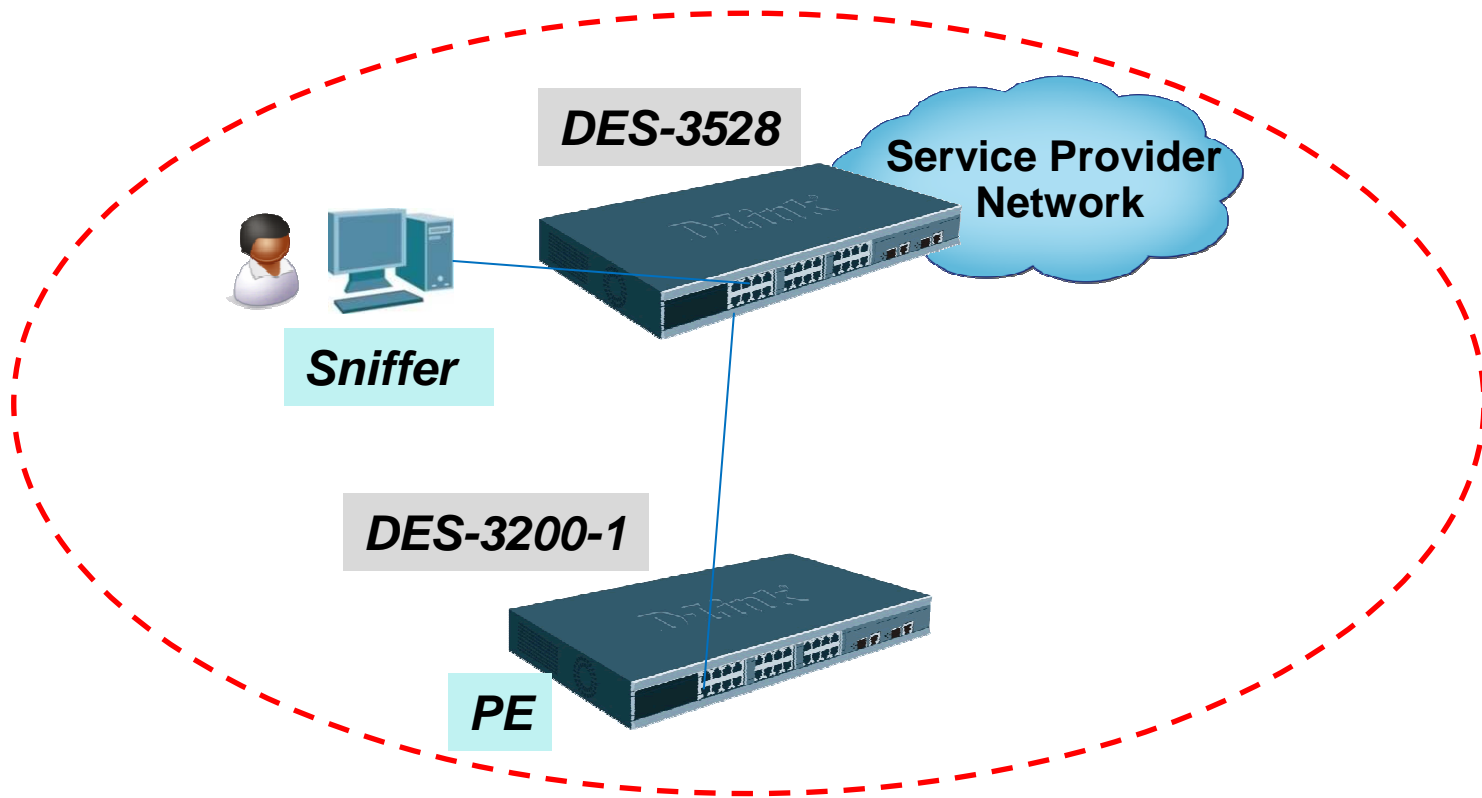
Remote Loopback OAM Configurations

DGS-3528
config vlan vlanid 1 delete 3
create vlan 3 tag 3
config vlan vlanid 3 add untagged 3
config mirror port 3 add source ports 1 both
enable mirror

config ipif System ipaddress 10.90.90.90/8
config ethernet_oam ports 1 mode active
config ethernet_oam ports 1 state enable
config ethernet_oam ports 1 received_remote_loopback process

DES-3200 (1 & 2)
config ipif System ipaddress 10.90.90.91/8
config ethernet_oam ports 1 mode active
config ethernet_oam ports 1 state enable
config ethernet_oam ports 1 received_remote_loopback process

Issue the following command to **Start/Stop** the Remote_Loopback on DES-3528
>config ethernet_oam ports 1 remote_loop start
>config ethernet_oam ports 1 remote_loop stop

Remote Loopback OAM Status

Show Ethernet_OAM Statistics by the following commands

```
DES-3200-28:4#show ethernet_oam ports 1 statistics
Command: show ethernet_oam ports 1 statistics

Port 1
-----------------------------------------------------------------------
     Information OAMPDU Tx                      : 24
     Information OAMPDU Rx                      : 22
     Unique Event Notification OAMPDU Tx       : 0
     Unique Event Notification OAMPDU Rx       : 0
     Duplicate Event Notification OAMPDU Tx:   : 0
     Duplicate Event Notification OAMPDU Rx:   : 0
     Loopback Control OAMPDU Tx                 : 1
     Loopback Control OAMPDU Rx                 : 0
     Variable Request OAMPDU Tx                 : 0
     Variable Request OAMPDU Rx                 : 0
     Variable Response OAMPDU Tx                : 0
     Variable Response OAMPDU Rx                : 0
     Organization Specific OAMPDUs Tx           : 0
     Organization Specific OAMPDUs Rx           : 0
     Unsupported OAMPDU Tx                       : 0
     Unsupported OAMPDU Rx                       : 0
     Frames Lost Due To OAM                      : 0
```

Remote_loopback packet (*Start*)

```
No. .  Time                       Source               Destination          Protocol  Info
 3 2010-02-01 17:22:54.805919 00:21:91:af:e9:d1    Slow-Protocols       OAM       OAMPDU: Information
 4 2010-02-01 17:22:54.826190 D-Link_03:52:81       Slow-Protocols       OAM       OAMPDU: Information
 5 2010-02-01 17:22:55.093401 D-Link_03:52:81       Slow-Protocols       OAM       OAMPDU: Loopback Control
 6 2010-02-01 17:22:55.114757 00:21:91:af:e9:d1    Slow-Protocols       OAM       OAMPDU: Information
```

```
⊞ Frame 5 (64 bytes on wire, 64 bytes captured)
⊞ Ethernet II, Src: D-Link_03:52:81 (00:80:c8:03:52:81), Dst: Slow-Protocols (01:80:c2:00:00:02)
⊟ OAM Protocol
     Slow Protocols subtype: OAM (0x03)
   ⊞ Flags: 0x0050 (local: Discovery complete, remote: Discovery complete)
     OAMPDU code: Loopback Control (0x04)
   ⊟ Commands: 0x01 (Enable Remote Loopack)
       .... ...1 = Enable Remote Loopback: True
       .... ..0. = Disable Remote Loopback: False
```

Remote_loopback packet (*Stop*)

```
No. .  Time                       Source               Destination          Protocol  Info
17 2010-02-01 17:23:00.355460 D-Link_03:52:81       Slow-Protocols       OAM       OAMPDU: Information
18 2010-02-01 17:23:00.356165 D-Link_03:52:81       Slow-Protocols       OAM       OAMPDU: Loopback Control
19 2010-02-01 17:23:00.357571 00:21:91:af:e9:d1    Slow-Protocols       OAM       OAMPDU: Information
20 2010-02-01 17:23:00.359541 D-Link_03:52:81       Slow-Protocols       OAM       OAMPDU: Information
```

```
⊞ Frame 18 (64 bytes on wire, 64 bytes captured)
⊞ Ethernet II, Src: D-Link_03:52:81 (00:80:c8:03:52:81), Dst: Slow-Protocols (01:80:c2:00:00:02)
⊟ OAM Protocol
     Slow Protocols subtype: OAM (0x03)
   ⊞ Flags: 0x0050 (local: Discovery complete, remote: Discovery complete)
     OAMPDU code: Loopback Control (0x04)
   ⊟ Commands: 0x02 (Disable Remote Loopback)
       .... ...0 = Enable Remote Loopback: False
       .... ..1. = Disable Remote Loopback: True
```

Remote Loopback OAM Status

Check DES-3528 Ethernet Remote Loopback Port's Status

```
DES-3528:admin#show ethernet_oam ports 1:1 status
Command: show ethernet_oam ports 1:1 status

Port 1:1
Local Client
---------------------------------------------------------------
  OAM                         : Enabled
  Mode                        : Active
  Max OAMPDU                  : 1518  Bytes
  Remote Loopback             : Support
  Unidirection                : Not Supported
  Link Monitoring             : Support
  Variable Request            : Not Supported
  PDU Revision                : 0
  Operation Status            : Operational
  Loopback Status             : Remote Loopback
```

Check DES-3200 Ethernet Remote Loopback Port's Status

```
DES-3200:admin#show ethernet_oam ports 1 status
Command: show ethernet_oam ports 1 status

Port 1
Local Client
---------------------------------------------------------------
  OAM                         : Enabled
  Mode                        : Active
  Max OAMPDU                  : 1518  Bytes
  Remote Loopback             : Support
  Unidirection                : Not Supported
  Link Monitoring             : Support
  Variable Request            : Not Supported
  PDU Revision                : 0
  Operation Status            : Operational
  Loopback Status             : Local Loopback
```

Send data from DES-3528 to DES-3200 when Remote_Loopback started

Steps:

1. Start the Remote loopback on DES-3528
   >*config ethernet_oam ports 1 remote_loop start*
2. Issue a 'ping' packet from DES-3528's console to DES-3200
   > *ping 10.90.90.91*
3. From the sniff PC, you will see 2 ICMP packets captured as below.
   a.) The **first** ICMP packet is from DES-3528 to DES3200
   b.) the **second** ICMP packet is returned by DES-3200. The original packet's format will be kept **without changed**.

The first packet is from DES-3528

No. ▲	Time	Source	Destination	Protocol	Info
82	39.030850	D-Link_03:52:81	Slow-Protocols	OAM	OAMPDU: Information
83	39.287693	10.90.90.90	10.90.90.91	ICMP	Echo (ping) request
84	39.287860	10.90.90.90	10.90.90.91	ICMP	Echo (ping) request
85	39.998687	00:21:91:af:e9:d1	Slow-Protocols	OAM	OAMPDU: Information

⊞ Frame 83 (74 bytes on wire, 74 bytes captured)
⊞ Ethernet II, Src: D-Link_03:52:80 (00:80:c8:03:52:80), Dst: 00:21:91:af:e9:d0 (00:21:91:af:e9:d0)
⊞ Internet Protocol, Src: 10.90.90.90 (10.90.90.90), Dst: 10.90.90.91 (10.90.90.91)
⊞ Internet Control Message Protocol

The second packet is returned by DES-3200

Enable Ethernet OAM Critical Event
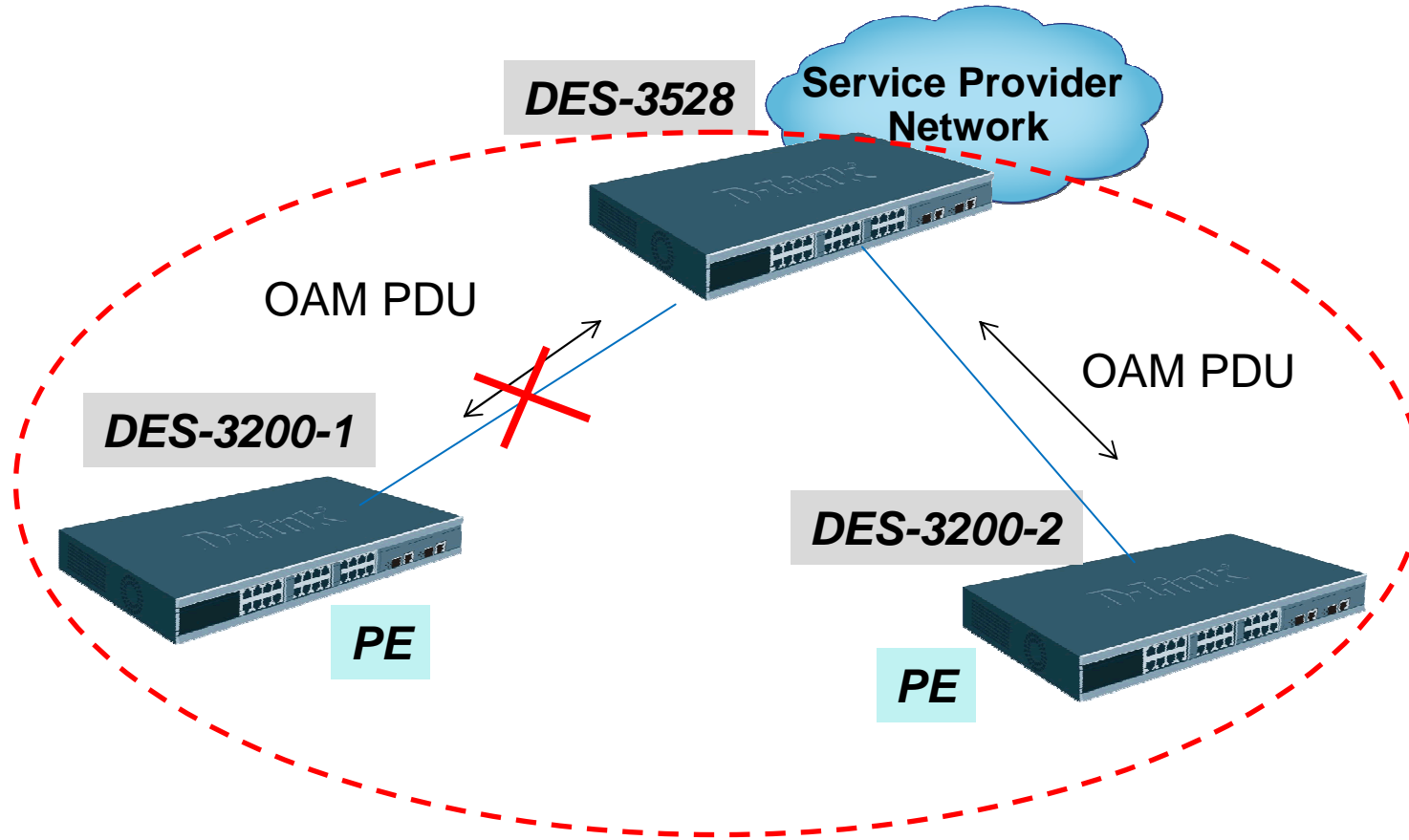
Enable Ethernet OAM Critical Event

DGS-3528
config ethernet_oam ports 1-2 state enable
config ethernet_oam ports 1-2 mode active
config ethernet_oam ports 1-2 critical_link_event critical_event notify_state enable

DES-3200 (1 & 2)
config ethernet_oam ports 1 state enable
config ethernet_oam ports 1 mode active
config ethernet_oam ports 1 critical_link_event critical_event notify_state enable

Issue the following command to **disaply** the event_log
>show ethernet_oam ports 1 event log

```
DES-3200-10:4#show ethernet_oam ports 1 event_log
Command: show ethernet_oam ports 1 event_log

 Port 1
--------------------------------------------------------------------
Event Listing
Index Type                    Location        Time Stamp
--------------------------------------------------------------------
1     Critical Event          Local           0-0-0 0:16

Local Event Statistics
   Error Symbol Event                         : 0
   Error Frame Event                          : 0
   Error Frame Period Event                   : 0
   Errored Frame Seconds Event                : 0
   Dying Gasp
   Critical Event                             : 1

Remote Event Statistics
   Error Symbol Event                         : 0
   Error Frame Event                          : 0
   Error Frame Period Event                   : 0
   Errored Frame Seconds Event                : 0
   Dying Gasp                                 : 0
   Critical Event                             : 0
```

Ethernet OAM Critical Event Packet Capture