Sun Ethernet Fabric Operating System Uplink Port Trailing Administration Guide

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Using This Documentation

- **Overview -** Configure and manage Sun Ethernet Fabric Operating System (SEFOS) Uplink Port Trailing on Oracle switches
- **Audience -** Enterprise network and system administrators
- **Required knowledge -** Advanced experience configuring switch software

- "Product Documentation Libraries" on page 7
- "Feedback" on page 7

Product Documentation Libraries

http://www.oracle.com/goto/ES1-24/docs

http://www.oracle.com/goto/SN-10GbE-72p/docs

http://www.oracle.com/goto/SB6K-24p-10GbE/docs

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Sun Ethernet Fabric Operating System Uplink Port Trailing Protocol

Uplink Port Trailing monitors the state of uplink ports to manage downlink ports. If an uplink goes down, Uplink Port Trailing shuts down related downlink ports, allowing the server's High Availability features to switch over to an alternate uplink port. When an uplink is restored to service, the related downlink ports are also restored.

This feature is supported on all Oracle Ethernet rack and blade switches.

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- "Configure NEM24p-0" on page 10
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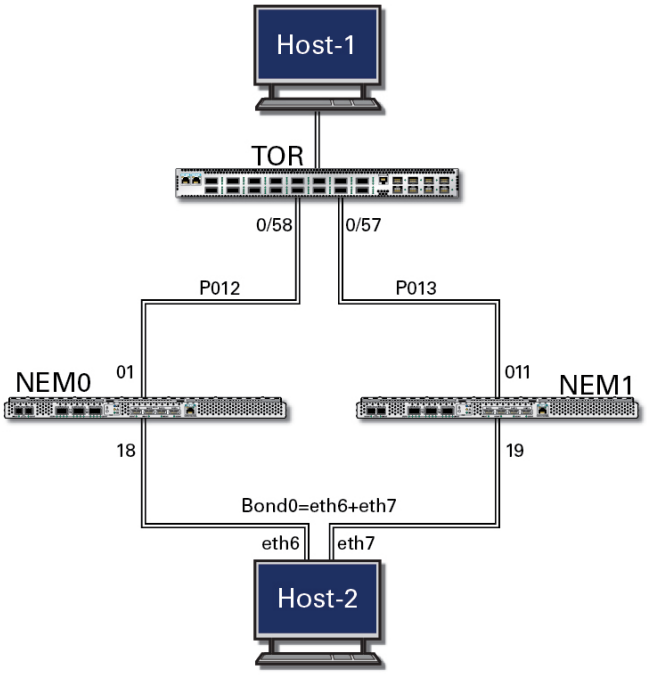
Uplink Port Trailing Topology Example

The following topology demonstrates the Uplink Port Trailing feature configured on access switches connecting to the servers. The example uses the Sun Blade 6000 Ethernet Switched NEM 24p 10GbE at the access layer. To enable this feature, the interfaces connecting from the access switch to the Sun Ethernet 10GbE Switch 72 (ToR72) and server-facing interfaces are bound together in a group.



▼ Configure NEM24p-0

1. **Start the configuration with all ports and the default VLAN shut down.**

   Also, enable the Uplink port trailing feature.

   Tip - It is a best practice to start the configuration with all the ports and default VLAN shut down. Disable GVRP and GMRP, because dynamic VLAN learning is not suggested.

```
NEM24p-0 SEFOS# configure terminal
NEM24p-0 SEFOS(config)# set gvrp disable
NEM24p-0 SEFOS(config)# set gmrp disable
NEM24p-0 SEFOS(config)# set port-channel enable
NEM24p-0 SEFOS(config)# set uplink-trailing enable
% Enabling Uplink Trailing Module
NEM24p-0 SEFOS(config)# interface vlan 1
NEM24p-0 SEFOS(config-if)# shutdown
NEM24p-0 SEFOS(config-if)# no ip address
NEM24p-0 SEFOS(config-if)# exit
NEM24p-0 SEFOS(config)# interface range extreme-ethernet 0/1-24
NEM24p-0 SEFOS(config-if-range)# shutdown
NEM24p-0 SEFOS(config-if-range)# end
```

2. **Create and enable port-channel between switches according to the topology.**

```
NEM24p-0 SEFOS# configure terminal
NEM24p-0 SEFOS(config)# interface port-channel 12
NEM24p-0 SEFOS(config-if)# no shutdown
NEM24p-0 SEFOS(config-if)# exit
NEM24p-0 SEFOS(config)# end
```

3. **Configure VLANs manually.**

   You must add at least one port to the VLAN before you can assign the VLAN a name.

```
NEM24p-0 SEFOS# configure terminal
NEM24p-0 SEFOS(config)# vlan 300
NEM24p-0 SEFOS(config-vlan)# ports add port-channel 12 name vlan-1
NEM24p-0 SEFOS(config-vlan)# vlan active
NEM24p-0 SEFOS(config-vlan)# exit
NEM24p-0 SEFOS(config)# vlan 301
NEM24p-0 SEFOS(config-vlan)# ports add port-channel 12 name vlan-2
NEM24p-0 SEFOS(config-vlan)# vlan active
NEM24p-0 SEFOS(config-vlan)# exit
NEM24p-0 SEFOS(config)# end
```

4. **Create an uplink trailing group.**

   The group number can be 1 to 65355.

```
NEM24p-0 SEFOS# configure terminal
NEM24p-0 SEFOS(config)# uplink-trailing 10
%  Uplink Trailing Group 10 Created
NEM24p-0 SEFOS(config-ultr)# description "Uplink-trailing between NEM24p-0 & ToR72p -1"
NEM24p-0 SEFOS(config-ultr)# end
```

5. **Configure the port-channel to allow all VLANs.**

```
NEM24p-0 SEFOS# configure terminal
NEM24p-0 SEFOS(config)# interface port-channel 12
NEM24p-0 SEFOS(config-if)# switchport mode trunk
NEM24p-0 SEFOS(config-if)# exit
NEM24p-0 SEFOS(config)# end
```

6. **Enable the ports and add them to the appropriate port-channels.**

   Assign the ports to the uplink-trailing group as uplink or downlink to bind them together

```
NEM24p-0 SEFOS# configure terminal
NEM24p-0 SEFOS(config)# interface range extreme-ethernet 0/1
NEM24p-0 SEFOS(config-if-range)# description "connected to ToR72p-1"
NEM24p-0 SEFOS(config-if-range)# channel-group 12 mode active
```

```
NEM24p-0 SEFOS(config-if-range)# uplink-trailing group 10 uplink
NEM24p-0 SEFOS(config-if-range)# no shutdown
NEM24p-0 SEFOS(config-if-range)# exit
NEM24p-0 SEFOS(config)# interface extreme-ethernet 0/18
NEM24p-0 SEFOS(config-if)# description "connected to Linux blade, Host-2"
NEM24p-0 SEFOS(config-if)# switchport mode trunk
NEM24p-0 SEFOS(config-if)# uplink-trailing group 10 downlink
NEM24p-0 SEFOS(config-if)# no shutdown
NEM24p-0 SEFOS(config-if)# exit
NEM24p-0 SEFOS(config)# end
```

7. **Save the configuration.**

```
NEM24p-0 SEFOS# copy run start
Building configuration ...
[OK]
```

▼ Configure NEM24p-1

1. **Start the configuration with all ports and the default VLAN shut down.**

   Also, enable the Uplink port trailing feature.

   Tip - It is a best practice to start the configuration with all the ports and default VLAN shut down. Disable GVRP and GMRP, because dynamic VLAN learning is not suggested.

```
NEM24p-1 SEFOS# configure terminal
NEM24p-1 SEFOS(config)# set gvrp disable
NEM24p-1 SEFOS(config)# set gmrp disable
NEM24p-1 SEFOS(config)# set port-channel enable
NEM24p-1 SEFOS(config)# set uplink-trailing enable
% Enabling Uplink Trailing Module
NEM24p-1 SEFOS(config)# interface vlan 1
NEM24p-1 SEFOS(config-if)# shutdown
NEM24p-1 SEFOS(config-if)# no ip address
NEM24p-1 SEFOS(config-if)# exit
NEM24p-1 SEFOS(config)# interface range extreme-ethernet 0/1-24
NEM24p-1 SEFOS(config-if-range)# shutdown
NEM24p-1 SEFOS(config-if-range)# end
```

2. **Create and enable port-channel between switches according to the topology.**

```
NEM24p-1 SEFOS# configure terminal
NEM24p-1 SEFOS(config)# interface port-channel 13
NEM24p-1 SEFOS(config-if)# no shutdown
NEM24p-1 SEFOS(config-if)# exit
NEM24p-1 SEFOS(config)# end
```

3. Configure VLANs manually.

You must add at least one port to the VLAN before you can assign the VLAN a name.

```
NEM24p-1 SEFOS# configure terminal
NEM24p-1 SEFOS(config)# vlan 300
NEM24p-1 SEFOS(config-vlan)# ports add port-channel 13 name vlan-1
NEM24p-1 SEFOS(config-vlan)# vlan active
NEM24p-1 SEFOS(config-vlan)# exit
NEM24p-1 SEFOS(config)# vlan 301
NEM24p-1 SEFOS(config-vlan)# ports add port-channel 13 name vlan-2
NEM24p-1 SEFOS(config-vlan)# vlan active
NEM24p-1 SEFOS(config-vlan)# exit
NEM24p-1 SEFOS(config)# end
```

4. Create a uplink trailing group.

The group number can be 1 to 65355.

```
NEM24p-1 SEFOS# configure terminal
NEM24p-1 SEFOS(config)# uplink-trailing 20
%  Uplink Trailing Group 20 Created
NEM24p-1 SEFOS(config-ultr)# description "Uplink-trailing between NEM24p-1 & ToR72p -1"
NEM24p-1 SEFOS(config-ultr)# end
```

5. Configure the port-channel to allow all VLANs.

```
NEM24p-1 SEFOS# configure terminal
NEM24p-1 SEFOS(config)# interface port-channel 13
NEM24p-1 SEFOS(config-if)# switchport mode trunk
NEM24p-1 SEFOS(config-if)# exit
NEM24p-1 SEFOS(config)# end
```

6. Enable the ports and add them to the appropriate port-channels.

Assign the ports to the uplink-trailing group as uplink or downlink to bind them together

```
NEM24p-1 SEFOS# configure terminal
NEM24p-1 SEFOS(config)# interface range extreme-ethernet 0/1
NEM24p-1 SEFOS(config-if-range)# description "connected to ToR72p-1"
NEM24p-1 SEFOS(config-if-range)# channel-group 13 mode active
NEM24p-1 SEFOS(config-if-range)# uplink-trailing group 20 uplink
NEM24p-1 SEFOS(config-if-range)# no shutdown
NEM24p-1 SEFOS(config-if-range)# exit
NEM24p-1 SEFOS(config)# interface extreme-ethernet 0/18
NEM24p-1 SEFOS(config-if)# description "connected to Linux blade, Host-2"
NEM24p-1 SEFOS(config-if)# switchport mode trunk
NEM24p-1 SEFOS(config-if)# uplink-trailing group 20 downlink
NEM24p-1 SEFOS(config-if)# no shutdown
NEM24p-1 SEFOS(config-if)# exit
```

```
NEM24p-1 SEFOS(config)# end
```

7. **Save the configuration.**

```
NEM24p-1 SEFOS# copy run start
Building configuration ...
[OK]
```

▼ Configure the ToR72

- **Configure the switch.**

```
ToR72p-1 SEFOS# configure terminal
ToR72p-1 SEFOS(config)# set gvrp disable
ToR72p-1 SEFOS(config)# set gmrp disable
ToR72p-1 SEFOS(config)# set port-channel enable
ToR72p-1 SEFOS(config)# interface vlan 1
ToR72p-1 SEFOS(config-if)# shutdown
ToR72p-1 SEFOS(config-if)# no ip address
ToR72p-1 SEFOS(config-if)# exit
ToR72p-1 SEFOS(config)# interface range extreme-ethernet 0/1-72
ToR72p-1 SEFOS(config-if-range)# shutdown
ToR72p-1 SEFOS(config-if-range)# end
ToR72p-1 SEFOS# configure terminal
ToR72p-1 SEFOS(config)# interface port-channel 12
ToR72p-1 SEFOS(config-if)# no shutdown
ToR72p-1 SEFOS(config-if)# exit
ToR72p-1 SEFOS(config)# interface port-channel 13
ToR72p-1 SEFOS(config-if)# no shutdown
ToR72p-1 SEFOS(config-if)# exit
ToR72p-1 SEFOS(config)# end
ToR72p-1 SEFOS# configure terminal
ToR72p-1 SEFOS(config)# vlan 300
ToR72p-1 SEFOS(config-vlan)# ports add port-channel 12,13 name vlan-1
ToR72p-1 SEFOS(config-vlan)# vlan active
ToR72p-1 SEFOS(config-vlan)# exit
ToR72p-1 SEFOS(config)# vlan 301
ToR72p-1 SEFOS(config-vlan)# ports add port-channel 12,13 name vlan-2
ToR72p-1 SEFOS(config-vlan)# vlan active
ToR72p-1 SEFOS(config-vlan)# exit
ToR72p-1 SEFOS(config)# end
ToR72p-1 SEFOS# configure terminal
ToR72p-1 SEFOS(config)# interface port-channel 12
ToR72p-1 SEFOS(config-if)# switchport mode trunk
ToR72p-1 SEFOS(config-if)# exit
ToR72p-1 SEFOS(config)# interface port-channel 13
ToR72p-1 SEFOS(config-if)# switchport mode trunk
ToR72p-1 SEFOS(config-if)# exit
ToR72p-1 SEFOS(config)# end
```

```
ToR72p-1 SEFOS# configure terminal
ToR72p-1 SEFOS(config)# interface range extreme-ethernet 0/57
ToR72p-1 SEFOS(config-if-range)# description "connected to NEM24p-1"
ToR72p-1 SEFOS(config-if-range)# channel-group 13 mode active
ToR72p-1 SEFOS(config-if-range)# no shutdown
ToR72p-1 SEFOS(config-if-range)# exit
ToR72p-1 SEFOS(config)# interface range extreme-ethernet 0/58
ToR72p-1 SEFOS(config-if-range)# description "connected to NEM24p-0"
ToR72p-1 SEFOS(config-if-range)# channel-group 12 mode active
ToR72p-1 SEFOS(config-if-range)# no shutdown
ToR72p-1 SEFOS(config-if-range)# exit
ToR72p-1 SEFOS(config)# interface extreme-ethernet 0/21
ToR72p-1 SEFOS(config-if)# description "connected to eth3 Host-1"
ToR72p-1 SEFOS(config-if)# switchport mode trunk
ToR72p-1 SEFOS(config-if)# no shutdown
ToR72p-1 SEFOS(config-if)# exit
ToR72p-1 SEFOS(config)# end
ToR72p-1 SEFOS# copy run start
Building configuration ...
[OK]
```

▼ Verify the Configurations

1. Check the Uplink Port Trailing feature status.

```
NEM24p-0 SEFOS# show uplink-trailing global
% Uplink Trailing enabled
```

2. Verify the configuration of all groups configured on this switch.

```
NEM24p-0 SEFOS# show uplink-trailing group summary
Uplink Trailing Group 10
Description:     Uplink-trailing between NEM24p-0 & ToR72p-1
        Admin Status:            Enabled
        Status:                  Up

Port             Type   Status
Ex0/1        uplink      Up
Ex0/18       downlink    Up


NEM24p-0 SEFOS# show uplink-trailing group detail
Uplink Trailing Group 10
Description:     Uplink-trailing between NEM24p-0 & ToR72p-1
        Admin Status:            Enabled
        Status:                  Up
Link State Change: Up   1       Down    0

Port             Type   Status
```

```
Ex0/1       uplink      Up
Ex0/18      downlink    Up
```

3. Verify the configuration of a particular group.

```
NEM24p-0 SEFOS# show uplink-trailing group 10
Uplink Trailing Group 10
Description:     Uplink-trailing between NEM24p-0 & ToR72p-1
        Admin Status:            Enabled
        Status:                  Up

Port             Type   Status
Ex0/1       uplink      Up
Ex0/18      downlink    Up

NEM24p-1 SEFOS# show uplink-trailing group 20
Uplink Trailing Group 20
Description:     Uplink-trailing between NEM24p-1 & ToR72p-1
        Admin Status:            Enabled
        Status:                  Up

Port             Type   Status
Ex0/1       uplink      Up
Ex0/18      downlink    Up
```

4. Verify the Uplink Port trailing configuration on an interface.

```
NEM24p-0 SEFOS# show uplink-trailing interface extreme-ethernet 0/1 summary
Interface Ex0/1
Uplink Trailing Group    10
Port Type                uplink
Port Link Status         Up

NEM24p-0 SEFOS# show uplink-trailing interface extreme-ethernet 0/1 detail
Interface Ex0/1
Uplink Trailing Group    10
Group Description:       Uplink-trailing between NEM24p-0 & ToR72p-1
Group Admin Status:      Enabled
Group Link Status:       Up
Port Type                uplink
Port Link Status         Up

NEM24p-0 SEFOS#
NEM24p-0 SEFOS# show uplink-trailing interface extreme-ethernet 0/18 detail
Interface Ex0/18
Uplink Trailing Group    10
Group Description:       Uplink-trailing between NEM24p-0 & ToR72p-1
Group Admin Status:      Enabled
Group Link Status:       Up
Port Type                downlink
Port Link Status         Up
```

▼ Configure the Host

1. **Configure the Host-1 interface to accept VLAN 300 and 301 traffic.**

```
[Host-1]# ifconfig -a

eth4.300  Link encap:Ethernet  HWaddr 90:E2:BA:79:83:94
          inet addr:192.168.30.20  Bcast:192.168.30.255  Mask:255.255.255.0
          inet6 addr: fe80::92e2:baff:fe79:8394/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:374 errors:0 dropped:0 overruns:0 frame:0
          TX packets:377 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:30622 (29.9 KiB)  TX bytes:35858 (35.0 KiB)

eth4.301  Link encap:Ethernet  HWaddr 90:E2:BA:79:83:94
          inet addr:192.168.31.20  Bcast:192.168.31.255  Mask:255.255.255.0
          inet6 addr: fe80::92e2:baff:fe79:8394/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:2 errors:0 dropped:0 overruns:0 frame:0
          TX packets:6 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:92 (92.0 b)  TX bytes:468 (468.0 b)
```

2. **Configure a bond interface using two interfaces connecting to the NEM24p-0 and NEM24p-1 such that the bond interface accepts both VLAN 300 and 301 traffic.**

```
[Host-2]# cat /proc/net/bonding/bond0
Ethernet Channel Bonding Driver: v3.7.1 (April 27, 2011)

Bonding Mode: fault-tolerance (active-backup)
Primary Slave: eth7 (primary_reselect always)
Currently Active Slave: eth7
MII Status: up
MII Polling Interval (ms): 100
Up Delay (ms): 0
Down Delay (ms): 0

Slave Interface: eth6
MII Status: up
Speed: 10000 Mbps
Duplex: full
Link Failure Count: 5
Permanent HW addr: 00:1b:21:66:48:ec
Slave queue ID: 0

Slave Interface: eth7
MII Status: up
Speed: 10000 Mbps
Duplex: full
Link Failure Count: 11
```

```
Permanent HW addr: 00:1b:21:66:48:ed
Slave queue ID: 0

[Host-2]# ifconfig -a

bond0.300 Link encap:Ethernet  HWaddr 00:1B:21:66:48:EC
          inet addr:192.168.30.50  Bcast:192.168.30.255  Mask:255.255.255.0
          inet6 addr: fe80::21b:21ff:fe66:48ec/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:374 errors:0 dropped:0 overruns:0 frame:0
          TX packets:536 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:30622 (29.9 KiB)  TX bytes:45960 (44.8 KiB)

bond0.301 Link encap:Ethernet  HWaddr 00:1B:21:66:48:EC
          inet addr:192.168.31.50  Bcast:192.168.31.255  Mask:255.255.255.0
          inet6 addr: fe80::21b:21ff:fe66:48ec/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:39 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:0 (0.0 b)  TX bytes:2646 (2.5 KiB)
```

```
NEM24p-1 SEFOS# sh uplink-trailing group 20 detail
Uplink Trailing Group 20
Description:     Uplink-trailing between NEM24p-1 & ToR72p-1
        Admin Status:            Enabled
        Status:                  Up
Link State Change: Up   1       Down    0

Port             Type   Status
Ex0/1        uplink      Up
Ex0/18       downlink    Up
```

▼ Verify the Uplink Port Trailing Feature

1. **Ping from Host-2 to a tagged interface on Host-1.**
   The ping should go through.

2. **On ToR72p-1, check that the bond MAC address is learned on port channel 12.**

```
ToR72p-1 SEFOS# show mac-address-table

Vlan    Mac Address         Type     Ports
----    -----------         ----     -----
1       00:14:4f:6c:63:4f   Learnt   po13
1       00:14:4f:6c:66:0f   Learnt   po12
1       90:e2:ba:79:83:94   Learnt   Ex0/21
```

```
300     00:1b:21:66:48:ec   Learnt   po12 <---------- in Bold
300     90:e2:ba:79:83:94   Learnt   Ex0/21

Total Mac Addresses displayed: 5
```

3. **While the ping is going through, shut down the port connecting to NEM24p-0 on ToR72p-1.**

   The ping should still go through.

4. **Verify the Uplink Port Trailing status on NEM24p-0.**

   Since the uplink is down, the downlink will also be shut down by the feature.

```
NEM24p-0 SEFOS# show uplink-trailing group 10 detail
Uplink Trailing Group 10
Description:     Uplink to ToR72p-1 and downlink to Host-1
        Admin Status:            Enabled
        Status:                  Down
Link State Change: Up   4       Down    4

Port             Type   Status
Ex0/1        uplink      Down
Ex0/18       downlink    Down
```

5. **Show the bonding status of the standby interface (`eth6`).**

```
[Host-2]# cat /proc/net/bonding/bond0
Ethernet Channel Bonding Driver: v3.7.1 (April 27, 2011)

Bonding Mode: fault-tolerance (active-backup)
Primary Slave: eth7 (primary_reselect always)
Currently Active Slave: eth6
MII Status: up
MII Polling Interval (ms): 100
Up Delay (ms): 0
Down Delay (ms): 0

Slave Interface: eth6
MII Status: up
Speed: 10000 Mbps
Duplex: full
Link Failure Count: 5
Permanent HW addr: 00:1b:21:66:48:ec
Slave queue ID: 0

Slave Interface: eth7
MII Status: down
Speed: Unknown
Duplex: Unknown
Link Failure Count: 13
Permanent HW addr: 00:1b:21:66:48:ed
```

```
Slave queue ID: 0
[root@nsn165-82 bonding]#
```

6. Check the Uplink Port Trailing configuration on NEM24p-1

```
NEM24p-1 SEFOS# show uplink-trailing group detail
Uplink Trailing Group 20
Description:     Uplink-trailing between NEM24p-1 & ToR72p-1
        Admin Status:            Enabled
        Status:                  Up
Link State Change: Up   1       Down    0

Port             Type   Status
Ex0/1        uplink      Up
Ex0/18       downlink    Up
```

7. On ToR72p-1, check that the bond MAC address is learned on port channel 13.

```
ToR72p-1 SEFOS# show mac-address-table

Vlan    Mac Address         Type     Ports
----    -----------         ----     -----
1       00:14:4f:6c:63:4f   Learnt   po13
1       90:e2:ba:79:83:94   Learnt   Ex0/21
300     00:1b:21:66:48:ec   Learnt   po13
300     90:e2:ba:79:83:94   Learnt   Ex0/21
301     00:1b:21:66:48:ec   Learnt   po13

Total Mac Addresses displayed: 5
```