



Using Pathtrace

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Pathtrace

The Pathtrace feature builds on the Traceroute feature to provide information about interfaces, such as ingress and egress interface names and the number of transmitted and received frames and errors, at each hop in the path between 2 devices in a fabric. Pathtrace provides an end-to-end view of the shortest path without the need to connect to individual switches and check the Fabric Shortest Path First (FSPF) topology hop by hop.

Pathtrace is used to trace the path from a switch on which the **pathtrace** command is run, to a destination device or all the devices in a destination domain. The Pathtrace feature works with the Fibre Channel, Fibre Channel over Ethernet (FCoE), and Fibre Channel over IP (FCIP) interfaces. Pathtrace collects information about the available paths within the fabric and provides information for devices along the shortest path. Pathtrace displays the source interface, destination interface, cost, speed, and other statistics when used with the **detail** keyword. The **pathtrace** command can also be used to display the reverse path information (from destination back to the source). If the destination cannot be reached, Pathtrace displays the device on which the connectivity terminated.

The statistics displayed for various types of interfaces are:

- Fibre Channel interface—The statistics are displayed for the associated Fibre Channel interfaces.
- Virtual Fibre Channel (VFC) interface—The statistics are displayed for the associated Ethernet interfaces.
- Fibre Channel port channel—The statistics are displayed for port channels.
- VFC port channel—The statistics are displayed for VFC port channels.
- FCIP interface or FCIP port channel—The statistics are displayed for the FCIP interfaces or FCIP port channels.

Guidelines and Limitations for Pathtrace

- Pathtrace is not supported on Cisco MDS switches that are operating in the Cisco NPV mode.
- Pathtrace does not support interop mode.
- Pathtrace is supported only on Cisco MDS switches and not on other vendor switches.

- Pathtrace does not support virtual domains (Inter-VSAN Routing [IVR] for Pathtrace).
- Pathtrace is not manageable via Simple Network Management Protocol (SNMP).
- Pathtrace supports a maximum of 16 hops without the reverse option, and 8 hops with the reverse option.
- Statistics are displayed only for egress interfaces.
- Statistics for FCIP and FCIP port-channel interfaces are not displayed for devices in the path running Cisco MDS NX-OS Release 6.2(5).

Pathtrace Multipath

The Pathtrace Multipath feature builds on the Pathtrace feature to collect and display all Equal-Cost Multi-Path (ECMP) paths and statistics between source and destination switches. This feature provides information for all the links between the 2 endpoints to be displayed, including individual equal-cost links of a port channel. This feature can aid in troubleshooting difficult situations, for example, when a single link in a port channel has errors and the remaining do not.

Guidelines and Limitations for Pathtrace Multipath

- Pathtrace Multipath is not supported on Cisco NPV switches.
- Pathtrace Multipath does not support interop mode.
- Pathtrace Multipath is supported only on Cisco MDS switches and not on other vendor switches.
- Pathtrace Multipath does not support virtual domains (Inter-VSAN Routing [IVR] for Pathtrace Multipath).
- Pathtrace Multipath is not manageable via SNMP.
- Pathtrace Multipath does not have any limitation on the number of hops between the endpoints unlike the Pathtrace feature.
- Pathtrace Multipath is supported on F ports that are connected to Qlogic and Emulex host bus adapters (HBAs).

Using Pathtrace or Pathtrace Multipath

To display per-hop interface information along the paths between 2 devices, run this command:

```
switch# pathtrace {domain id | fcid id} vsan id [[reverse] [detail] | [multipath]]
```

The following example shows how to trace the path between a switch in which the command is executed and an edge device, using the edge device's FCID:

```
switch# pathtrace fcid 0xca016c vsan 2000
The final destination port type is F_Port
-----
Hop Domain In-Port          Out-Port          Speed Cost  Switchname
-----
0  111    embedded             fc1/6             4G    250    switch1
1  202    fc1/6                fc1/1             2G    -      switch2
NOTE: The stats are displayed for the egress interface only
```

The following example shows how to trace both the forward path and the return path between a switch in which the command is executed and an edge device, using the edge device's FCID:

```
switch# pathtrace fcid 0xca016c vsan 2000 reverse
The final destination port type is F_Port
-----
Hop Domain In-Port          Out-Port          Speed Cost  Switchname
-----
0  111  embedded                fc1/6             4G   250  switch1
1  202  fc1/6                   fc1/1             2G   -    switch2
2  202  embedded                fc1/6             4G   250  switch2
3  111  fc1/6                   embedded          -    -    switch1
NOTE: The stats are displayed for the egress interface only
```

The following example shows how to display detailed information about the interfaces (both the forward path and the return path) between a switch in which the command is executed and an edge device, using the edge device's FCID:

```
switch# pathtrace fcid 0xca016c vsan 2000 reverse detail
The final destination port type is F_Port
-----
Hop 0          Domain In-Port          Out-Port          Speed Cost  Switchname
-----
          111  embedded                fc1/6             4G   250  switch1
-----
Stats for egress port: fc1/6
TxRt (B/s): 2944
RxRt (B/s): 3632
TxB_B: 32
RxB_B: 32
TxFrame: 137467
RxFrame: 137475
Errors: 0
Discard: 0
CRC: 0
-----
Hop 1          Domain In-Port          Out-Port          Speed Cost  Switchname
-----
          202  fc1/6                   fc1/1             2G   -    switch2
-----
Stats for egress port: fc1/1
TxRt (B/s): 1424
RxRt (B/s): 1528
TxB_B: 0
RxB_B: 32
TxFrame: 711
RxFrame: 649
Errors: 0
Discard: 15
CRC: 0
-----
Hop 2          Domain In-Port          Out-Port          Speed Cost  Switchname
-----
          202  embedded                fc1/6             4G   250  switch2
-----
Stats for egress port: fc1/6
TxRt (B/s): 3632
RxRt (B/s): 2952
TxB_B: 32
RxB_B: 32
TxFrame: 137476
RxFrame: 137467
Errors: 0
Discard: 0
```

```

CRC: 0
-----
Hop 3      Domain In-Port      Out-Port      Speed Cost  Switchname
        111   fc1/6          embedded      -    -    switch1
-----
Stats for egress port: embedded
TxRt (B/s): -
RxRt (B/s): -
TxB_B: -
RxB_B: -
TxFrame: -
RxFrame: -
Errors: -
Discard: -
CRC: -
NOTE: The stats are displayed for the egress interface only

```

The following example shows how to trace all the links (including equal-cost parallel links) in the paths between all the edge devices in a domain and a switch in which the command is executed:

```

switch# pathtrace domain 238 vsan 1 multipath
***NOTE ***
I - Ingress
E - Egress
M - Member Port-channel
* - Fport
.....
PATH 1  switch1 switch2
Domain  236      235
.....
-----
HOP 1  switch1 (fc1/11) (E) ----- (I) (fc1/12) switch2
-----
Interface Spd(G) Tx(B/s) Rx(B/s) TxB2B  RxB2B  Errors  Discards  CRC
TxWait(1s/1m/1h/72h) FibDrops  ZoneDrops
-----
(E) fc1/11  8.0    84     44     64    64    0       2         0    0%/0%/0%/0%
-          -
(I) fc1/12  8.0    44     84     64    64    0       0         0    0%/0%/0%/0%
-          -
-----
HOP 2  switch2 (fc1/3) (E) *End Device
-----
Interface Spd(G) Tx(B/s) Rx(B/s) TxB2B  RxB2B  Errors  Discards  CRC
TxWait(1s/1m/1h/72h) FibDrops  ZoneDrops
-----
(E) fc1/3   4.0     0       0     16    64    0       0         0    0%/0%/0%/0%
-          -
.....
PATH 2  switch1 switch2
Domain  236      235
.....
-----
HOP 1  switch1 (fc1/12) (E) ----- (I) (fc1/11) switch2
-----
Interface Spd(G) Tx(B/s) Rx(B/s) TxB2B  RxB2B  Errors  Discards  CRC
TxWait(1s/1m/1h/72h) FibDrops  ZoneDrops
-----
(E) fc1/12  8.0    64     180    64    64    0       0         0    0%/0%/0%/0%
-          -
(I) fc1/11  8.0   180     64     64    64    0       0         0    0%/0%/0%/0%
-          -
-----

```

HOP 2 switch2(fc1/3) (E)*End Device

Interface	Spd(G)	Tx(B/s)	Rx(B/s)	TxB2B	RxB2B	Errors	Discards	CRC
TxWait(1s/1m/1h/72h)		FibDrops		ZoneDrops				
(E) fc1/3	4.0	0	0	16	64	0	0	0
-	-	-	-	-	-	-	-	0%/0%/0%/0%

switch# pathtrace domain 132 vsan 447 multipath

***NOTE ***

I - Ingress

E - Egress

M - Member Port-channel

* - Fport

.....
 PATH 1 switch1 switch2
 Domain 187 132

HOP 1 switch1(port-channel216) (E)----- (I) (port-channel216) switch2

Interface	InputRate (B/s)	OutputRate (B/s)	InputFrames (/sec)	OutputFrames (/sec)
(E) port-channel216	3393959	640827945	161838662680576	1375239938244608
(M) fcip50	292049	55048436	3239	27507
(M) fcip51	291539	55052889	3237	27508
(M) fcip52	291702	55080573	3239	27522
(M) fcip53	278265	52552382	3090	26258
(M) fcip54	278291	52561525	3090	26263
(M) fcip55	278346	52559754	3090	26262
(M) fcip65	291647	55073072	3238	27518
(M) fcip66	278491	52584017	3092	26274
(M) fcip67	278362	52571056	3091	26268
(M) fcip86	278290	52554341	3090	26259
(M) fcip87	278426	52587737	3092	26276
(M) fcip88	278551	52602163	3093	26283
(I) port-channel216	640830213	3394016	1375252823146496	161842957647872
(M) fcip50	55058685	292105	27512	3240
(M) fcip51	55080107	291690	27522	3239
(M) fcip52	55097520	291794	27530	3240
(M) fcip53	52559881	278311	26262	3090
(M) fcip54	52570959	278345	26268	3091
(M) fcip55	52571081	278410	26268	3091

(M) fcip65	55051714	291539	27507	3237
(M) fcip66	52564219	278387	26264	3091
(M) fcip67	52562847	278324	26264	3090
(M) fcip86	52564931	278345	26265	3091
(M) fcip87	52571632	278350	26268	3091
(M) fcip88	52576637	278416	26271	3091

```
switch# pathtrace domain 83 vsan 70 multipath
```

```
***NOTE ***
```

```
I - Ingress
```

```
E - Egress
```

```
M - Member Port-channel
```

```
* - Fport
```

```
.....
```

```
PATH 1  switch1 switch2
```

```
Domain  144      83
```

```
.....
```

```
-----
```

```
HOP 1          switch1(vfc69) (E) ----- (I) (vfc69) switch2
```

```
-----
```

Interface	Spd(G)	FcoeOut(Oct)	FcoeIn(Oct)	FcoeOutPkt	FcoeInPkt
(E)vfc69	10.0	165604	153648	697	700
(I)vfc69	10.0	153716	166276	701	698

**Note**

- In the output, *embedded* indicates that the respective port is an HBA interface on an edge device.
- Some of the terminologies used in the multipath outputs are defined in the following table:

Table 1: Multipath Terminologies

Term	Description
FCIP	
InputRate(B/s)	The number of bytes received per second on the in port of an FCIP link.
OutputRate(B/s)	The number of bytes received per second on the out port of an FCIP link.
InputFrames(/sec)	The number of frames received per second on the in port of an FCIP link.
OutputFrames(/sec)	The number of frames received per second on the out port of an FCIP link.
vFC	
FcoeOut(Oct)	The number of egress FCoE octets on a vFC interface.
FcoeIn(Oct)	The number of ingress FCoE octets on a vFC interface.
FcoeOutPkt	The number of egress FCoE packets on a vFC interface.
FcoeInPkt	The number of ingress FCoE packets on a vFC interface.

