

FabricPath:为FTag映射多目标树

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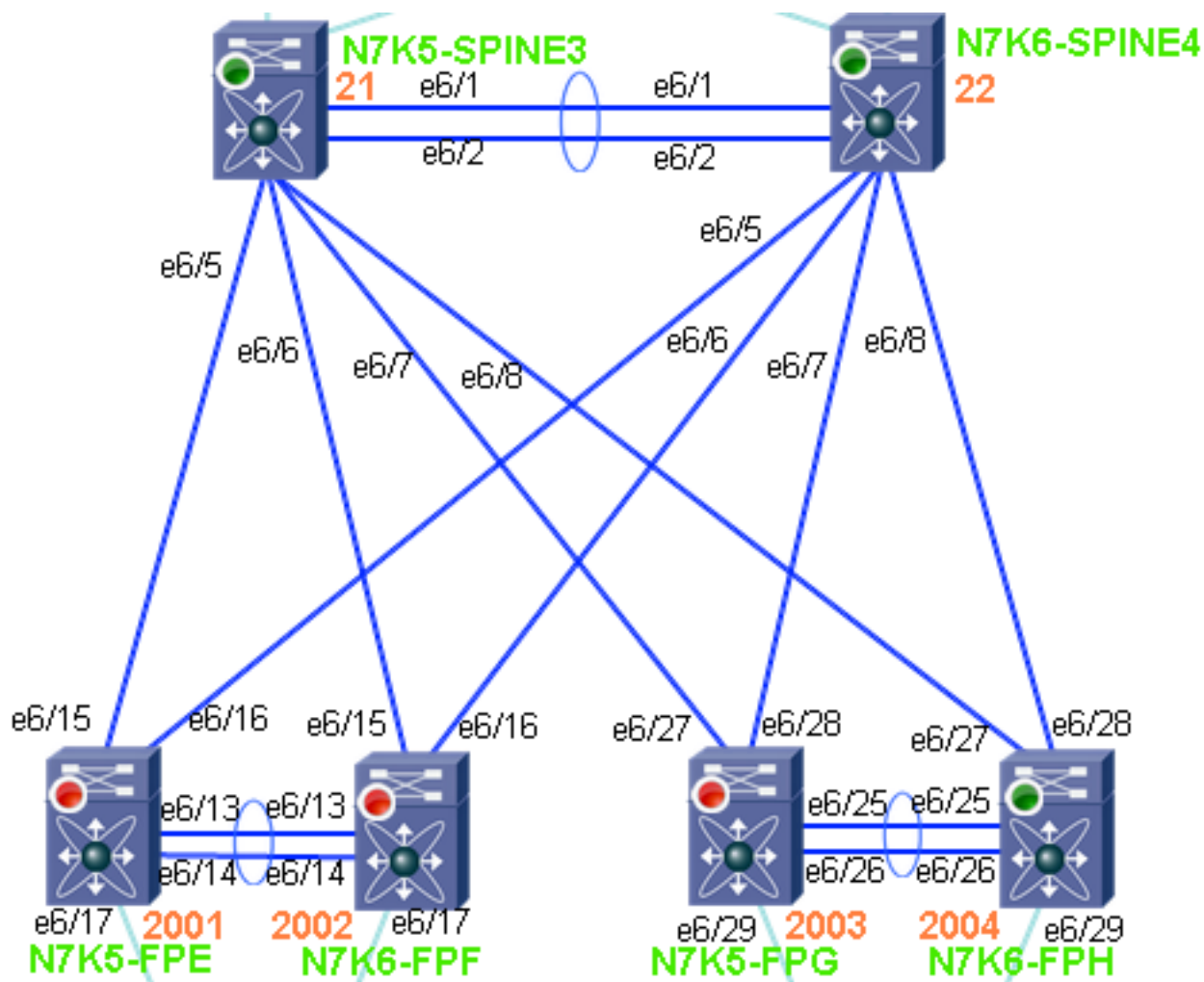
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简介

本文档介绍如何在FabricPath拓扑中为给定转发标记(FTag)映射多目标树。这允许您跟踪给定FTag的多目标数据包的预期流。在本示例中，您从FabricPath边缘交换机N7K5-FPE开始，然后映射出FTag 1树。完整的FabricPath域拓扑如下图所示。



先决条件

要求

本文档没有任何特定的要求。

使用的组件

本文档中的信息基于以下软件和硬件版本：

- 带版本6.1(2)的Nexus 7000
- F2系列线卡

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您使用的是真实网络，请确保您已经了解所有命令的潜在影响。

背景信息

用户应熟悉FabricPath概念和术语。本节将介绍在FabricPath报头中使用FTag（转发标记）参数的简要说明。

FTag的功能由帧的类型来检测。具体来说，如果帧是单播或多目标。对于单播帧，FTag标识并选择给定帧应经过的FabricPath拓扑。单拓扑支持，其值为“1”。

对于多目的帧，接收该帧的入口交换机需要确定给定帧经过的多目的转发树。

当多目标流量进入FabricPath域时，入口交换机使用散列算法来确定在FabricPath报头中编程哪个FTag。每个FabricPath拓扑有两个多目标树，即FTag 1和FTag 2树。每个FTag都有一个根交换机，其计算方式类似于生成树根。选举基于FabricPath优先级和系统ID。具有最高优先级的交换机或默认优先级时的系统ID成为FTag 1的根，而runner-up是FTag 2的根。

一旦入口FabricPath边缘交换机选择了FTag，FabricPath核心的其余部分就会根据该FTag转发多目标数据包。多目标数据包包括任何广播、组播或未知单播数据包。每台交换机根据最低开销将数据包转发到根。一旦根桥收到数据包，它会将其转发到该FTag中的所有交换机，接收该数据包 of 的交换机除外。

为FTag映射多目标树

1. 确认本地交换机ID。注意：当FabricPath交换机是vPC+域的成员时，它具有非模拟（独立）交换机ID和模拟(vPC+)交换机ID。在输出示例中，请注意此系统ID(6c9c.ed4f.28c4)显示了两次。对于非模拟交换机ID为一次，对于模拟交换机ID为一次。

```
N7K5-FPE# show fabricpath switch-id
FABRICPATH SWITCH-ID TABLE
Legend: '*' - this system
=====
SWITCH-ID      SYSTEM-ID      FLAGS      STATE      STATIC      EMULATED
-----+-----+-----+-----+-----+-----
21             6c9c.ed4f.28c3 Primary    Confirmed  Yes        No
22             6c9c.ed4d.d943 Primary    Confirmed  Yes        No
201            6c9c.ed4f.28c4 Primary    Confirmed  No         Yes
201            6c9c.ed4d.d944 Primary    Confirmed  No         Yes
202            6c9c.ed4f.28c5 Primary    Confirmed  No         Yes
202            6c9c.ed4d.d945 Primary    Confirmed  No         Yes
*2001          6c9c.ed4f.28c4 Primary    Confirmed  Yes        No
2002          6c9c.ed4d.d944 Primary    Confirmed  Yes        No
2003          6c9c.ed4f.28c5 Primary    Confirmed  Yes        No
2004          6c9c.ed4d.d945 Primary    Confirmed  Yes        No
Total Switch-ids: 10
```

2. 确定FTag值的根。如输出示例所示，FTag 1的根是switch-id 21。

```
N7K5-FPE# show fabricpath isis topology summ
Fabricpath IS-IS domain: default FabricPath IS-IS Topology Summary
MT-0
  Configured interfaces:  Ethernet6/15  Ethernet6/16  port-channel1
  Number of trees: 2
    Tree id: 1, ftag: 1 [transit-traffic-only], root system: 6c9c.ed4f.28c3, 21
    Tree id: 2, ftag: 2, root system: 6c9c.ed4d.d943, 22
```

3. 确定FabricPath路由以到达交换机ID 21。

```
N7K5-FPE# show fabricpath route switchid 21
FabricPath Unicast Route Table
'a/b/c' denotes ftag/switch-id/subswitch-id
'[x/y]' denotes [admin distance/metric]
ftag 0 is local ftag
subswitch-id 0 is default subswitch-id
```

```
FabricPath Unicast Route Table for Topology-Default
1/21/0, number of next-hops: 1
via Eth6/15, [115/40], 10 day/s 20:49:54, isis_fabricpath-default
```

4. 这是步骤3的替代方法。使用第二种方法确定到达交换机ID 21的FabricPath路由。

```
N7K5-FPE# show fabricpath isis trees multidestination 1
Fabricpath IS-IS domain: default
Note: The metric mentioned for multidestination tree is from the root of that tree to that
switch-id
```

```
MT-0
Topology 0, Tree 1, Swid routing table
21, L1
  via Ethernet6/15, metric 0
22, L1
  via Ethernet6/15, metric 20
201, L1
  via Ethernet6/15, metric 40
202, L1
  via Ethernet6/15, metric 40
2002, L1
  via Ethernet6/15, metric 40
2003, L1
  via Ethernet6/15, metric 40
2004, L1
  via Ethernet6/15, metric 40
```

5. 查看Ethernet6/15的相邻设备，然后telnet至该设备。

```
N7K5-FPE# show cdp neighbors int e6/15 detail
-----
Device ID:N7K5-SPINE3(JAF1620ABAB)
System Name: N7K5-SPINE3
Interface address(es):
IPv4 Address: 14.2.36.51
Platform: N7K-C7009, Capabilities: Router Switch IGMP Filtering Supports-STP-Dispute
Interface: Ethernet6/15, Port ID (outgoing port): Ethernet6/5
Holdtime: 149 sec
Version:
Cisco Nexus Operating System (NX-OS) Software, Version 6.1(1)
Advertisement Version: 2
Native VLAN: 1
Duplex: full
MTU: 1500
Mgmt address(es):
IPv4 Address: 14.2.36.51
```

6. 验证N7K5-SPINE3是否同意谁拥有FTag 1的根。

```
N7K5-SPINE3# show fabricpath isis topology summary
Fabricpath IS-IS domain: default FabricPath IS-IS Topology Summary
```

MT-0

Configured interfaces: Ethernet6/5 Ethernet6/6 Ethernet6/7 Ethernet6/8 port-channell

Number of trees: 2

Tree id: 1, ftag: 1, root system: 6c9c.ed4f.28c3, 21

Tree id: 2, ftag: 2, root system: 6c9c.ed4d.d943, 22

7. 检查本地交换机ID以确定您是根交换机还是需要移动到根交换机。输出示例显示此系统为 switch-id 21。您从步骤2和步骤6中了解这一点。它是FTag 1的根。

N7K5-SPINE3# **show fabricpath switch-id**

FABRICPATH SWITCH-ID TABLE

Legend: '*' - this system

```
=====
SWITCH-ID      SYSTEM-ID      FLAGS          STATE          STATIC  EMULATED
-----+-----+-----+-----+-----+-----
*21            6c9c.ed4f.28c3 Primary        Confirmed      Yes      No
22            6c9c.ed4d.d943 Primary        Confirmed      Yes      No
201           6c9c.ed4f.28c4 Primary        Confirmed      No       Yes
201           6c9c.ed4d.d944 Primary        Confirmed      No       Yes
202           6c9c.ed4f.28c5 Primary        Confirmed      No       Yes
202           6c9c.ed4d.d945 Primary        Confirmed      No       Yes
2001          6c9c.ed4f.28c4 Primary        Confirmed      Yes      No
2002          6c9c.ed4d.d944 Primary        Confirmed      Yes      No
2003          6c9c.ed4f.28c5 Primary        Confirmed      Yes      No
2004          6c9c.ed4d.d945 Primary        Confirmed      Yes      No
=====
```

Total Switch-ids: 10

8. 由于您知道N7K5-SPINE3是根，因此您需要了解它如何转发通过FTag 1接收的多目标帧。根据此输出，N7K5-SPINE3将带FTag 1的多目标帧转发到Eth6/5 - Eth6/8和Port-channel 1。

N7K5-SPINE3# **show fabricpath isis trees multideestination 1**

Fabricpath IS-IS domain: default

Note: The metric mentioned for multideestination tree is from the root of that tree to that switch-id

MT-0

Topology 0, Tree 1, Swid routing table

22, L1

via port-channell, metric 20

201, L1

via Ethernet6/6, metric 40

202, L1

via Ethernet6/8, metric 40

2001, L1

via Ethernet6/5, metric 40

2002, L1

via Ethernet6/6, metric 40

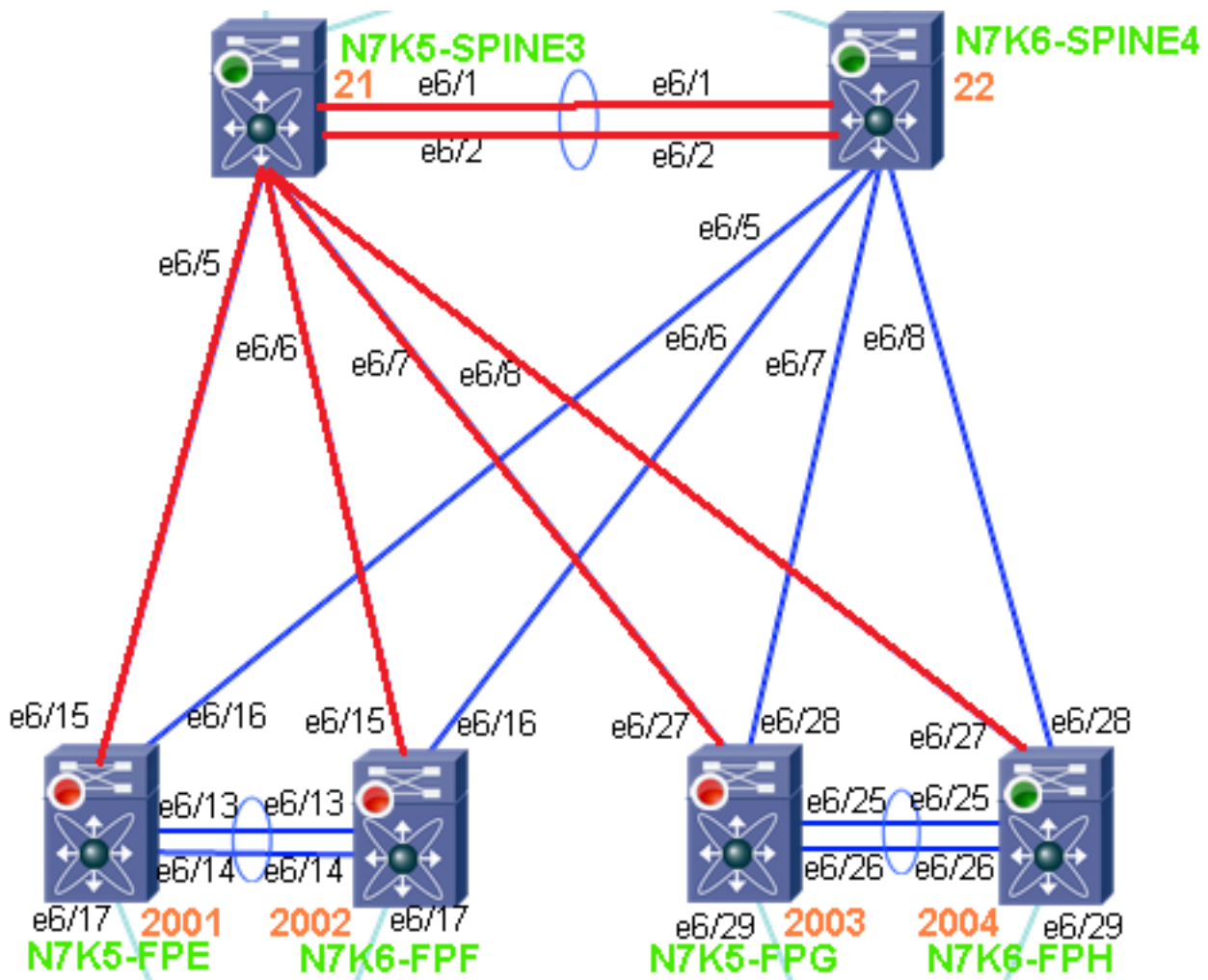
2003, L1

via Ethernet6/7, metric 40

2004, L1

via Ethernet6/8, metric 40

使用您收集的信息，为FTag 1绘制多目标树。FTag 1的多目标树在此拓扑中以红色链路突出显示。



命令参考：

```
show fabricpath isis topology summary
```

```
show fabricpath isis trees multidestination <ftag>
```

```
show fabricpath route switchid <switch-id>
```

```
show fabricpath switch-id
```