

Nexus 9000 : Packet Tracer工具说明

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简介

Packet-tracer是Nexus 9000上的内置实用程序，可用于跟踪数据包通过交换机的路径。它可以使用命令行调用，并可以配置为匹配IP地址和或第4层属性。它不能用于匹配ARP流量。

此工具将确认流是否流经交换机。它还提供一个计数器来跟踪流统计信息，这对于间歇性/完全丢包的场景非常有用。

先决条件

要求

Cisco 建议您具有以下主题的基础知识：

- Cisco Nexus 9000硬件架构

使用的组件

本文档中的信息基于以下软件和硬件版本：

- 思科Nexus 9500
- 软件版本7.0(3)I2(2a)

使用案例场景

- 仅适用于IPv4流 (不支持IPv6和非IP)

- 此工具不显示Wireshark所示的数据包内部详细信息。
- 间歇性丢包：Ping或任何其他实用程序都可以明确显示丢失数据包的症状
- 完全丢包

支持的硬件

仅支持带有Broadcom Trident IIasic的线卡/交换矩阵模块或TOR。列表如下：

- N9K-C9372TX
- N9K-C9372PX
- N9K-C9332PQ
- N9K-C9396TX
- N9K-C9396PX
- N9K-C93128TX
- N9K-C9336PQ
- N9K-X9564PX
- N9K-X9564TX
- N9K-X9636PQ

不支持的硬件

- N9K-C93180YC-EX
- N9K-X9732C-EX
- N9K-C9232C
- N9k-C9272Q
- N9k-C92160YC

注意：如果未列出特定线卡/TOR，请联系TAC

如何使用Packet Tracer

配置

Packet-tracer命令是EXEC级命令。

```
N9K-9508#test packet-tracer src_ip <src_ip> dst_ip <dst_ip> <==== provide your src and dst ip>
N9K-9508#test packet-tracer start <==== Start packet tracer>
N9K-9508#test packet-tracer stop <==== Start packet tracer>
N9K-9508#test packet-tracer show <==== Check for packet matches>
```

上述命令对线卡或交换矩阵模块上存在的每个Broadcom Trident II Asic编程触发器。当具有匹配属性的流通过这些模块时，它将显示正在命中的计数器，从而帮助识别交换机内的路径(Ingress module—>One of fabric module—>egress module)。

计数器可用于关联丢包。

背景信息

交换矩阵模块与I/O模块插槽相互连接。所有交换矩阵模块都处于活动状态并传输流量。每个交换矩

阵模块有两个Broadcom Trident II ASIC(T2)实例。

问题

PACL (端口访问列表) 用于查看特定物理接口是否收到我们感兴趣的流量。但是，在Nexus平台上，某些线卡没有为PACL划分TCAM。TCAM雕刻需要重新加载模块。在这些情况下，使用Packet Tracer匹配感兴趣的流量。您还可以跟踪数据包向上到交换矩阵端口和向出口模块传输。因此，Packet Tracer可让您更深入地了解流量在交换机内的转发方式。

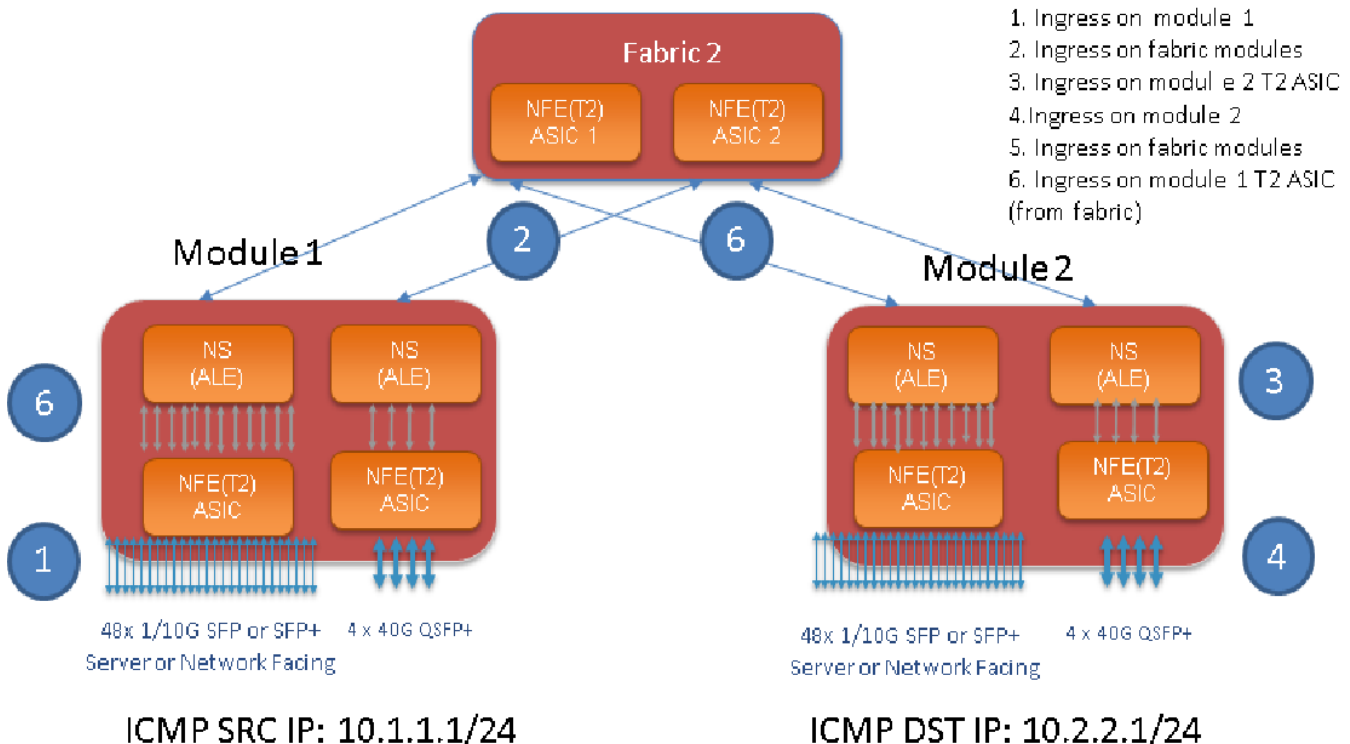
Packet Tracer使用为SPAN划分的TCAM条目。

解决方案

NS — 北星ASIC
T2 — 三叉戟II ASIC
NFE — 网络转发引擎
ALE - ACI枝叶引擎

有关Nexus 9000交换机架构的详细信息，请参阅：

<http://www.cisco.com/c/en/us/products/collateral/switches/nexus-9000-series-switches/white-paper-c11-729987.html>



注意：

9500机箱上最多有六个交换矩阵模块。在上图中仅显示一个交换矩阵，以简化操作。来自模块的流量可以到达任何交换矩阵模块

使用案例：匹配入口模块上的流量、交换矩阵模块上的流量传入和出口模块上的流量传入T2 ASIC

以下是需要配置以匹配我们感兴趣的流量的基本步骤：

```
switch#test packet-tracer {<src-ip>|<dst-ip>|<src-l4-port>|<dst-l4-port>} [<protocol>] [detail-  
fp|detail-hg]
```

以下是您需要的配置：

```
switch#test packet-tracer src_ip <====  
<==== S  
<====
```

您无需将其应用于任何特定界面。上述配置在T2 ASIC的所有实例上在所有LC/FM上安装过滤器ACL。

它将显示流量所依赖的模块上的数据包计数。这与我们在模块上传入的感兴趣流量匹配，包括线卡和交换矩阵。

以下是配置示例：

```
N9K-9508# test packet-tracer src-ip 10.1.1.1 dst-ip 10.2.2.1 protocol 1 <=== Protocol 1 matches  
ICMP traffic  
N9K-9508# test packet-tracer start
```

以下是如何解释“test packet-tracer show”输出：

```
N9K-9508# test packet-tracer show  
Packet-tracer stats  
-----  
Module 1: <=== Slot #. Same output will be displayed for other Linecards's and Fabric modules.  
Filter 1 installed: src-ip 10.1.1.1 dst-ip 10.2.2.1 <==== Our filter #1  
ASIC instance 0: <==== Trident ASIC instance #0  
Entry 0: id = 7425, count = 0, active, fp, <==== pakcet match count on front panel port. it  
could be any port  
Entry 1: id = 7426, count = 0, active, hg, <==== packet match count from fabric module to T2  
ASIC on the linecard  
ASIC instance 1:  
Entry 0: id = 7425, count = 0, active, fp,  
Entry 1: id = 7426, count = 0, active, hg,  
Filter 2 uninstalled:  
Filter 3 uninstalled:  
Filter 4 uninstalled:  
Filter 5 uninstalled:
```

配置示例:

配置Packet Tracer:

```
N9K-9508# test packet-tracer src-ip 10.1.1.1 dst-ip 10.2.2.1 protocol 1 <==== Filter to match  
echo traffic. Protocol 1 to match icmp traffic  
N9K-9508# test packet-tracer src-ip 10.2.2.1 dst-ip 10.1.1.1 protocol 1 <=== Filter to match  
echo reply traffic  
N9K-9508# test packet-tracer start <==== Start packet tracer  
N9K-9508# test packet-tracer show non-zero <==== Command to see packet statistics  
Packet-tracer stats  
-----  
Module 1:  
Filter 1 installed: src-ip 10.1.1.1 dst-ip 10.2.2.1  
Filter 2 installed: src-ip 10.2.2.1 dst-ip 10.1.1.1
```

```
Filter 3 uninstalled:
Filter 4 uninstalled:
Filter 5 uninstalled:
Module 2:
Filter 1 installed: src-ip 10.1.1.1 dst-ip 10.2.2.1
Filter 2 installed: src-ip 10.2.2.1 dst-ip 10.1.1.1
Filter 3 uninstalled:
Filter 4 uninstalled:
Filter 5 uninstalled:
Module 22:
Filter 1 installed: src-ip 10.1.1.1 dst-ip 10.2.2.1
Filter 2 installed: src-ip 10.2.2.1 dst-ip 10.1.1.1
Filter 3 uninstalled:
Filter 4 uninstalled:
Filter 5 uninstalled:
Module 23:
Filter 1 installed: src-ip 10.1.1.1 dst-ip 10.2.2.1
Filter 2 installed: src-ip 10.2.2.1 dst-ip 10.1.1.1
Filter 3 uninstalled:
Filter 4 uninstalled:
Filter 5 uninstalled:
Module 24:
Filter 1 installed: src-ip 10.1.1.1 dst-ip 10.2.2.1
Filter 2 installed: src-ip 10.2.2.1 dst-ip 10.1.1.1
Filter 3 uninstalled:
Filter 4 uninstalled:
Filter 5 uninstalled:
Module 25:
Filter 1 installed: src-ip 10.1.1.1 dst-ip 10.2.2.1
Filter 2 installed: src-ip 10.2.2.1 dst-ip 10.1.1.1
Filter 3 uninstalled:
Filter 4 uninstalled:
Filter 5 uninstalled:
```

测试：从模块1的SRC IP连接到模块2的DST IP运行ping:

```
Router# ping 10.1.1.1 source 10.2.2.1
PING 10.1.1.1 (10.1.1.1) from 10.2.2.1: 56 data bytes
64 bytes from 10.1.1.1: icmp_seq=0 ttl=253 time=0.77 ms
64 bytes from 10.1.1.1: icmp_seq=1 ttl=253 time=0.43 ms
64 bytes from 10.1.1.1: icmp_seq=2 ttl=253 time=0.408 ms
64 bytes from 10.1.1.1: icmp_seq=3 ttl=253 time=0.398 ms
64 bytes from 10.1.1.1: icmp_seq=4 ttl=253 time=0.383 ms
--- 10.1.1.1 ping statistics ---
5 packets transmitted, 5 packets received, 0.00% packet loss
round-trip min/avg/max = 0.383/0.477/0.77 ms
```

验证：检查Packet Tracer计数：

```
N9K-9508# test packet-tracer show non-zero <==== Command to see packet statistics
```

```
Packet-tracer stats
-----
```

```
Module 1:
Filter 1 installed: src-ip 10.1.1.1 dst-ip 10.2.2.1 protocol 1
ASIC instance 0:
Entry 0: id = 7425, count = 5, active, fp, <==== 5 Echo packets ingress on Module 1
Filter 2 installed: src-ip 10.2.2.1 dst-ip 10.1.1.1 protocol 1
Filter 3 uninstalled:
Filter 4 uninstalled:
```

Filter 5 uninstalled:

Module 2:

Filter 1 installed: src-ip 10.1.1.1 dst-ip 10.2.2.1 protocol 1

Filter 2 installed: src-ip 10.2.2.1 dst-ip 10.1.1.1 protocol 1

ASIC instance 0:

Entry 0: id = 7457, count = 5, active, fp, <===== 5 Echo reply packets ingress on Module 2

Filter 3 uninstalled:

Filter 4 uninstalled:

Filter 5 uninstalled:

Module 3:

Filter 1 installed: src-ip 10.1.1.1 dst-ip 10.2.2.1 protocol 1

Filter 2 installed: src-ip 10.2.2.1 dst-ip 10.1.1.1 protocol 1

Filter 3 uninstalled:

Filter 4 uninstalled:

Filter 5 uninstalled:

Module 4:

Filter 1 installed: src-ip 10.1.1.1 dst-ip 10.2.2.1 protocol 1

Filter 2 installed: src-ip 10.2.2.1 dst-ip 10.1.1.1 protocol 1

Filter 3 uninstalled:

Filter 4 uninstalled:

Filter 5 uninstalled:

Module 22:

Filter 1 installed: src-ip 10.1.1.1 dst-ip 10.2.2.1 protocol 1

ASIC instance 0:

Entry 0: id = 7425, count = 4, active, hg, <===== Fabric module 22 received 4 echo packets

Filter 2 installed: src-ip 10.2.2.1 dst-ip 10.1.1.1 protocol 1

Filter 3 uninstalled:

Filter 4 uninstalled:

Filter 5 uninstalled:

Module 23:

Filter 1 installed: src-ip 10.1.1.1 dst-ip 10.2.2.1 protocol 1

ASIC instance 0:

Entry 0: id = 7425, count = 1, active, hg, <===== Fabric module 23 received 1 echo packets

Filter 2 installed: src-ip 10.2.2.1 dst-ip 10.1.1.1 protocol 1

ASIC instance 0:

Entry 0: id = 7425, count = 3, active, hg, <===== Fabric module 23 received 3 echo reply packets

Filter 3 uninstalled:

Filter 4 uninstalled:

Filter 5 uninstalled:

Module 24:

Filter 1 installed: src-ip 10.1.1.1 dst-ip 10.2.2.1 protocol 1

Filter 2 installed: src-ip 10.2.2.1 dst-ip 10.1.1.1 protocol 1

ASIC instance 0:

Entry 0: id = 7425, count = 2, active, hg, <===== Fabric module 23 received 2 echo reply packets

Filter 3 uninstalled:

Filter 4 uninstalled:

Filter 5 uninstalled:

Module 26:

Filter 1 installed: src-ip 10.1.1.1 dst-ip 10.2.2.1 protocol 1

Filter 2 installed: src-ip 10.2.2.1 dst-ip 10.1.1.1 protocol 1

Filter 3 uninstalled:

Filter 4 uninstalled:

Filter 5 uninstalled:

N9K-9508#

其他有用的命令:

test packet-tracer remove-all <===删除所有已配置的过滤器

test packet-tracer clear <filter #> <===清除所有过滤器或指定过滤器的计数器

test packet-tracer src_ip <.> dst_ip <> l4-dst-port <dst_port> | L4-src-port <src_port> | protocol
<===根据L4 src_port、L4 dst_port或协议进行匹配。