



如何使用高级过滤模式过滤带 Vlan 的流量

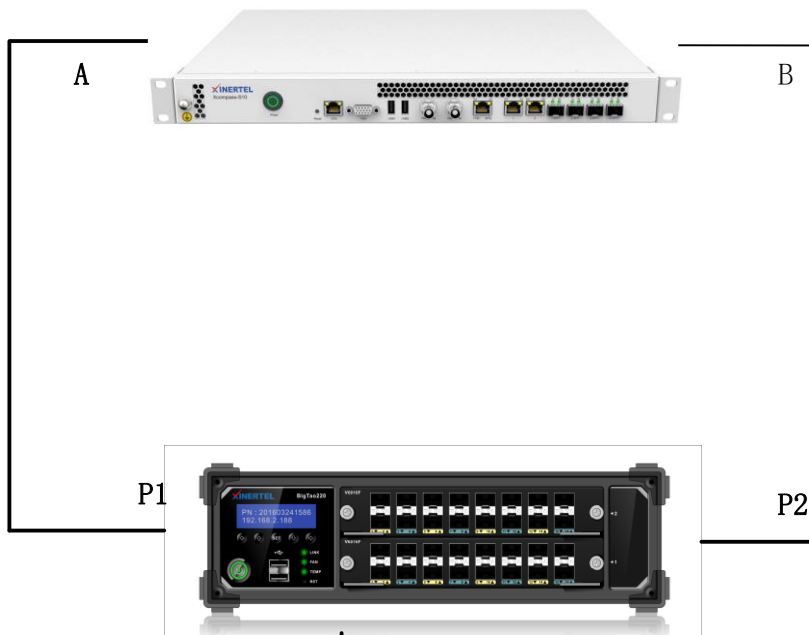
目录

1.1 测试说明.....	3
1.2 测试拓扑.....	3
1.3 测试思路.....	3
1.4 测试步骤.....	3

1.1 测试说明

本文以偏移量+数据值的模式来过滤带vlan 的流量为例，来介绍损伤仪高级过滤模式使用方法。

1.2 测试拓扑



拓扑说明

- 测试仪两个端口和损伤仪的两个端口相连
- 测试 P1 端口发出流量，经过损伤仪后，从 B 端口发出，进入 P2 端口。

1.3 测试思路

1. 测试仪上发送一条带 Vlan 的流量
2. 损伤仪上创建高级过滤，过滤源 IP，设置 1ms 时延
3. 损伤仪上应用损伤后，可以在测试仪统计中发现流量最大时延为 1ms

1.4 测试步骤

1.4.1 测试上创建带 Vlan 流量

Name	Value
Frame	
Ethernet II Header	
Destination MAC Address	00:00:00:13:40:20
Source MAC Address	00:00:00:12:30:10
Protocol Type (hex)	<AUTO> VLAN
VLAN Header	
Priority (int)	0
CFI (bit)	0
ID (int)	100
Protocol Type (hex)	<AUTO> IPv4
IPv4 Header	
Version (int)	<AUTO> 4
Header Length (int)	<AUTO> 5
TOS/DiffServ	Tos Operate
Total Length (int)	<AUTO> 20
Identification (int)	<AUTO> 123
Flags (bit)	000
Fragment Offset (int)	0
TTL (int)	128
Protocol (int)	<AUTO> Experimental
Checksum (hex)	<AUTO> 0000
Source Address	192.168.0.2
Destination Address	192.168.0.10
Header Option	
IPv4 Padding (hex)	<AUTO>
Gateway Address	192.168.0.1


```

Hex Editor
00 01 02 03 04 05 06 07 08 09 0a 0b 0c 0d 0e 0f
00000000 00 00 00 13 40 20 00 00 00 12 30 10 81 00 00 64  ....@....0....d
00000010 08 00 45 00 00 14 00 7b 00 00 80 fd 00 00 c0 a8  ..E...{...ÿ..Ä
00000020 00 02 c0 a8 00 0a  ..Ä...
  
```

发送流量，可以看到最大时延为 2.688us。

Basic	Error	Latency And Jitter		发送报文数		接收报文数		发送报文速率(pps)		接收报文速率(pps)		最小延迟(us)	最大延迟(us)	平均延迟(us)	最小延迟抖动(us)	最大延迟抖动(us)	平均延迟抖动(us)
流量名称	发送端口	接收端口	发送报文数	接收报文数	发送报文速率(pps)	接收报文速率(pps)	最小延迟(us)	最大延迟(us)	平均延迟(us)	最小延迟抖动(us)	最大延迟抖动(us)	平均延迟抖动(us)					
StreamTe...	Port_1	Port_2	1,689,159	1,689,148	844,595	844,595	2.64	2.688	2.66	0	0.032	0.007					

1.4.2 损伤仪选择高级过滤模式

根据情况填写运算规则。这里使用正则表达式，例如本例子中只使用到规则 a，这里就只用填 a 即可

损伤模板

流过滤

时延损伤

时延抖动

丢包损伤

乱序损伤

重复帧损伤

包损坏

物理链路损伤

篡改替换

带宽限制

基本过滤模式 (首选)
 高级过滤模式

运算规则:

序号	选择	偏移量	数据	掩码
a	<input checked="" type="checkbox"/>	<input type="text" value="30"/>	<input type="text" value="C0A800020000"/>	<input type="text" value="FFFFFFF0000"/>
b	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="000000000000"/>	<input type="text" value="000000000000"/>
c	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="000000000000"/>	<input type="text" value="000000000000"/>
d	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="000000000000"/>	<input type="text" value="000000000000"/>
e	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="000000000000"/>	<input type="text" value="000000000000"/>
f	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="000000000000"/>	<input type="text" value="000000000000"/>
g	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="000000000000"/>	<input type="text" value="000000000000"/>
h	<input type="checkbox"/>	<input type="text" value="0"/>	<input type="text" value="000000000000"/>	<input type="text" value="000000000000"/>
i	<input type="checkbox"/>	包含VLAN		

1.4.3 介偏移量计算

偏移量是从报文开头开始算

MAC 头 14 字节:

```

> Frame 6: 128 bytes on wire (1024 bits), 128 bytes captured (1024 bits)
v Ethernet II, Src: 00:00:00_12:30:10 (00:00:00:12:30:10), Dst: 00:00:00_13:40:20 (00:00:00:13:40:20)
  v Destination: 00:00:00_13:40:20 (00:00:00:13:40:20)
    Address: 00:00:00_13:40:20 (00:00:00:13:40:20)
      ....0. .... = LG bit: Globally unique address (factory default)
      ....0. .... = IG bit: Individual address (unicast)
  v Source: 00:00:00_12:30:10 (00:00:00:12:30:10)
    Address: 00:00:00_12:30:10 (00:00:00:12:30:10)
      ....0. .... = LG bit: Globally unique address (factory default)
      ....0. .... = IG bit: Individual address (unicast)
    Type: 802.1Q Virtual LAN (0x8100)
  v 802.1Q Virtual LAN, PRI: 0, DEI: 0, ID: 100
    000. .... = Priority: Best Effort (default) (0)
    ...0. .... = DEI: Ineligible
  
```

```

0000 00 00 00 13 40 20 00 00 00 12 30 10 81 00 00 64  ....@ ..-0...d
0010 08 00 45 00 00 6a 0c ea 00 00 80 fd ab 50 c0 a8  ..E..j..-...P..
0020 00 02 c0 a8 00 0a 00 00 00 00 00 00 00 00 00  ....
0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0040 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0050 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  ....
0060 00 00 00 00 00 00 00 00 00 a5 00 e4 c7 00 00  ....
0070 00 00 0e 4e 0c ea 05 df 56 de 00 00 cf 2a ec 68  ...N....V...*.h
  
```

Vlan 头 4 个字节

```

v 802.1Q Virtual LAN, PRI: 0, DEI: 0, ID: 100
  000. .... = Priority: Best Effort (default) (0)
  ...0 .... = DEI: Ineligible
0000 00 00 00 13 40 20 00 00 00 12 30 10 81 00 00 64  ....@ . . . .θ . . . .d
0010 08 00 45 00 00 6a 0c ea 00 00 80 fd ab 50 c0 a8  ..E..j.. . . . .P..
0020 00 02 c0 a8 00 0a 00 00 00 00 00 00 00 00 00  .. . . . .
0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .. . . . .
0040 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .. . . . .
0050 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .. . . . .
0060 00 00 00 00 00 00 00 00 00 00 a5 00 e4 c7 00 00  .. . . . .
0070 00 00 0e 4e 0c ea 05 df 56 de 00 00 cf 2a ec 68  ...N... V...*..h
  
```

IP 头部在源 IP 之前有 12 个字节

```

Protocol: Unknown (253)
Header checksum: 0xab50 [validation disabled]
[Header checksum status: Unverified]
Source: 192.168.0.2
Destination: 192.168.0.10
Data (86 bytes)
  
```

```

00 00 00 00 13 40 20 00 00 00 12 30 10 81 00 00 64  ....@ . . . .θ . . . .d
10 08 00 45 00 00 6a 0c ea 00 00 80 fd ab 50 c0 a8  ..E..j.. . . . .P..
20 00 02 c0 a8 00 0a 00 00 00 00 00 00 00 00 00  .. . . . .
30 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .. . . . .
40 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .. . . . .
50 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .. . . . .
60 00 00 00 00 00 00 00 00 00 00 a5 00 e4 c7 00 00  .. . . . .
70 00 00 0e 4e 0c ea 05 df 56 de 00 00 cf 2a ec 68  ...N... V...*..h
  
```

□

IP 头部在目的 IP 之前有 16 个字节

```

Header checksum: 0xab50 [validation disabled]
[Header checksum status: Unverified]
Source: 192.168.0.2
Destination: 192.168.0.10
> Data (86 bytes)
  
```

```

0000 00 00 00 13 40 20 00 00 00 12 30 10 81 00 00 64  ....@ . . . .θ . . . .d
0010 08 00 45 00 00 6a 0c ea 00 00 80 fd ab 50 c0 a8  ..E..j.. . . . .P..
0020 00 02 c0 a8 00 0a 00 00 00 00 00 00 00 00 00  .. . . . .
0030 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .. . . . .
0040 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .. . . . .
0050 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .. . . . .
0060 00 00 00 00 00 00 00 00 00 00 a5 00 e4 c7 00 00  .. . . . .
0070 00 00 0e 4e 0c ea 05 df 56 de 00 00 cf 2a ec 68  ...N... V...*..h
  
```

例如报文中，源 IP 地址为 192.168.0.2 (0xCAA80002) ,目的 IP 为 192.168.0.10 (0xCAA8000A)

Source: 192.168.0.2
 Destination: 192.168.0.10
 Data (86 bytes)

000	00 00 00 13 40 20 00 00	00 12 30 10 81 00 00 64	...@..
010	08 00 45 00 00 6a 0c ea	00 00 80 fd ab 50 c0 a8	..E..j..
020	00 00 c0 a8 00 0a 00 00	00 00 00 00 00 00 00 00
030	00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00
040	00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00
050	00 00 00 00 00 00 00 00	00 00 00 00 00 00 00 00
060	00 00 00 00 00 00 00 00	00 00 a5 00 e4 c7 00 00
070	00 00 0e 4e 0c ea 05 df	56 de 00 00 cf 2a ec 68	...N...

因此要对源 IP 做过滤，偏移量填写 14+4+12=30，（如果是目的 IP 偏移量就是 14+4+16=34）数据填写 C0A800020000（因为这里支持填写 6 个字节的数据，所有最后 2 个字节为 0），掩码填写 FFFFFFFF0000（只掩前 4 个字节）。

流过滤

时延损伤

时延抖动

丢包损伤

乱序损伤

重复帧损伤

包损坏

物理链路损伤

篡改替换

带宽限制

基本过滤模式 (首选) 高级过滤模式

运算规则: a

序号	选择	偏移量	数据	掩码
a	<input checked="" type="checkbox"/>	30	C0A800020000	FFFFFFFF0000
b	<input type="checkbox"/>	0	000000000000	000000000000
c	<input type="checkbox"/>	0	000000000000	000000000000
d	<input type="checkbox"/>	0	000000000000	000000000000
e	<input type="checkbox"/>	0	000000000000	000000000000
f	<input type="checkbox"/>	0	000000000000	000000000000
g	<input type="checkbox"/>	0	000000000000	000000000000
h	<input type="checkbox"/>	0	000000000000	000000000000
i	<input type="checkbox"/>	包含VLAN		

1. 设置时延损伤，1ms。并启动损伤

损伤模板

流过滤

时延损伤

时延抖动

丢包损伤

时延时间 ms 1

场景	正向模板	选择	反向模板	选择
1	<input checked="" type="checkbox"/> 自动成功 <input type="checkbox"/> 修改 <input type="checkbox"/> 删除	<input checked="" type="checkbox"/>	<input type="checkbox"/> 新建 <input type="checkbox"/> 加载模板	<input type="checkbox"/>

1.4.4 损伤结果

查看测试仪上时延统计，可以看到最大时延为 1ms

统计2												
Stream/Stream Block Statistic 选择结果视图 1/1 每页记录数: 25												
Basic	Error	Latency And Jitter										
流量名称	发送端口	接收端口	发送报文数	接收报文数	发送报文速率(fps)	接收报文速率(fps)	最小延迟(us)	最大延迟(us)	平均延迟(us)	最小延迟抖动(us)	最大延迟抖动(us)	平均延迟抖动(us)
StreamTe...	Port_1	Port_2	1,240,291,...	1,240,165,...	844,594	844,594	1,584	1,000,704	85.32	0	473,712	0.006