配置PfRv2性能监控方法

Contents

Introduction

本文描述在性能路由版本2的使用的方法(PfRv2)监控广域网络(广域网)链路的性能在分支路由器的。

Prerequisites

Requirements

Cisco建议您有基础知识性能路由(PfR)。

Components Used

This document is not restricted to specific software and hardware versions.

The information in this document was created from the devices in a specific lab environment.All of the devices used in this document started with a cleared (default) configuration.If your network is live, make sure that you understand the potential impact of any command.

请注意:北极星代码16.x.x不支持PFRv2。

背景信息

PfRv2使用三个方法测量边界路由器(增殖比)链路的性能。主令控制器使用收集的信息(MC) PfR策略

实施。三个方法是：

被动监控

在此模式下，在边界路由器启用的(默认情况下与PfR) Netflow收集关于话务类别的跟随的信息并且送回它到主令控制器。

以下为穿过增殖比的TCP流可适用的：

- **可到达性**：这根据对应的TCP ACK有不被接受的TCP SYN被计算。
- **延迟**：在TCP三通的握手期间，时间计算了在TCP SYN和TCP ACK消息之间。总值由2.然后划分。
- **损失**：测量根据TCP序列编号。例如：当接收的TCP序列号高于或低于预计时，损失报告。

以下为(包括TCP)穿过增殖比的所有流可适用的：

- **出口带宽**：egressing BRs的话务类别的吞吐量(计算在比特每秒使用Netflow)。
- **入口带宽**：ingressing BRs的话务类别的吞吐量(计算在比特每秒使用Netflow)。

活动监控

在此模式下，增殖比派出在其广域网接口的IP SLA探测测量关于话务类别的几个参数。收集的信息被退还到主令控制器。以下参数被测量：

- 可到达性
- 延迟
- 损失
- 出口带宽
- 入口带宽

这些探测在主令控制器时自动地生成，当监控被配置的方法是活跃的，并且可能手工也被配置。默认情况下，被发送的探测是ICMP回音，但是可以更改到TCP或UDP探测根据在广域网链路被发送的流量类型。

当退出增殖比选择是持续的时，所有BRs将发送Netflow博学的前缀的活动探测。在退出增殖比的选择，其他BRs将停止发送活动探测。所选的增殖比将继续发送活动探测。

混合模式

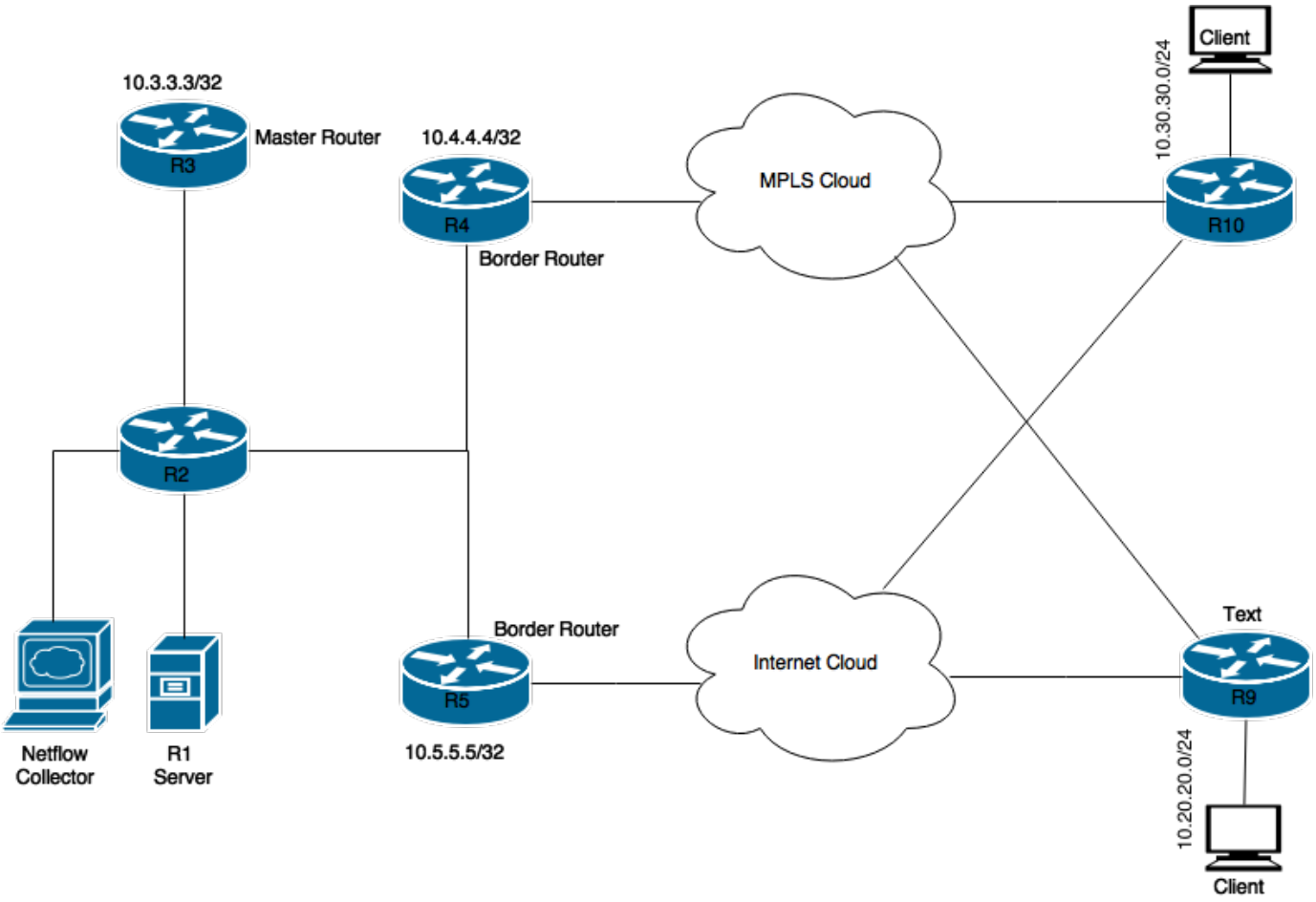
混合模式使用Netflow统计数据和IP服务级别协议决定出口点(边界路由器)和链路监控。在此模式下，IP SLA探测信息用于选择出口点Netflow统计数据然后用于监控往目的地的该边界路由器的WAN连接。

当PfR在学习状态和未搬入“INPOLICY”状态时，所有BRs将发送从Netflow收集的前缀的活动探测。这是为了确定各自链路情况。 当在对“INPOLICY的” MC状态变换，所有BRs将终止发送活动探测和当前监控将被动地执行(使用Netflow)。

Configure

跟随的镜像将使用作为拓扑示例本文的其余：

Network Diagram



相关配置

跟随的基本配置对于使用不同的模式是必需的。R3被配置作为MC，因此这些配置在R3将必须被执行：

被动模式：

```
pfr master
 !
 border 10.4.4.4 key-chain pfr
 interface Ethernet0/1 external
 interface Ethernet0/0 internal
 !
 border 10.5.5.5 key-chain pfr
 interface Ethernet0/0 internal
 interface Ethernet0/1 external
 !
 mode monitor passive
```

```
pfr master
 !
 border 10.4.4.4 key-chain pfr
 interface Ethernet0/1 external
```

```
 interface Ethernet0/0 internal
 !
 border 10.5.5.5 key-chain pfr
 interface Ethernet0/0 internal
 interface Ethernet0/1 external
 !
 mode monitor active
```

DEFAULT“”enable (event)

```
pfr master
 !
 border 10.4.4.4 key-chain pfr
 interface Ethernet0/1 external
 interface Ethernet0/0 internal
 !
 border 10.5.5.5 key-chain pfr
 interface Ethernet0/0 internal
 interface Ethernet0/1 external
```

Note:“”default

Verify

多数验证命令在MC被执行。以下命令可以用于验证不同的模式工作：

被动模式

```
R3#show pfr master
<Output suppressed>
Default Policy Settings:
  backoff 90 900 90
  delay relative 50
  holddown 90
  periodic 0
  probe frequency 56
  number of jitter probe packets 100
  mode route control
mode monitor passive
  loss relative 10
  jitter threshold 20
  mos threshold 3.60 percent 30
  unreachable relative 50
  trigger-log percentage 30
```

1 -TCP

```
R3#show pfr master traffic-class
OER Prefix Statistics:
 Pas - Passive, Act - Active, S - Short term, L - Long term, Dly - Delay (ms),
 P - Percentage below threshold, Jit - Jitter (ms),
 MOS - Mean Opinion Score
 Los - Packet Loss (percent/10000), Un - Unreachable (flows-per-million),
 E - Egress, I - Ingress, Bw - Bandwidth (kbps), N - Not applicable
 U - unknown, * - uncontrolled, + - control more specific, @ - active probe all
 # - Prefix monitor mode is Special, & - Blackholed Prefix
```

```
 % - Force Next-Hop, ^ - Prefix is denied

DstPrefix           Appl_ID Dscp Prot     SrcPort     DstPort SrcPrefix
          Flags              State     Time            CurrBR  CurrI/F Protocol
        PasSDly  PasLDly   PasSUn   PasLUn  PasSLos  PasLLos      EBw      IBw
        ActSDly  ActLDly   ActSUn   ActLUn  ActSJit  ActPMOS  ActSLos  ActLLos
------------------------------------------------------------------------------
10.20.20.0/24              N    N    N           N           N N
                         INPOLICY        0          10.4.4.4 Et0/1           BGP
             46       46        0        0    35502    35502        2        1
              N        N        N        N        N        N
                                                                
10.30.30.0/24              N    N    N           N           N N
                         INPOLICY        0          10.5.5.5 Et0/1           BGP
              1        1        0        0        0        0       14        1
             N        N        N        N        N        N
```

2 -UDP

```
R3#show pfr master traffic-class
OER Prefix Statistics:
 Pas - Passive, Act - Active, S - Short term, L - Long term, Dly - Delay (ms),
 P - Percentage below threshold, Jit - Jitter (ms),
 MOS - Mean Opinion Score
 Los - Packet Loss (percent/10000), Un - Unreachable (flows-per-million),
 E - Egress, I - Ingress, Bw - Bandwidth (kbps), N - Not applicable
 U - unknown, * - uncontrolled, + - control more specific, @ - active probe all
 # - Prefix monitor mode is Special, & - Blackholed Prefix
 % - Force Next-Hop, ^ - Prefix is denied

DstPrefix           Appl_ID Dscp Prot     SrcPort     DstPort SrcPrefix
          Flags              State     Time            CurrBR  CurrI/F Protocol
        PasSDly  PasLDly   PasSUn   PasLUn  PasSLos  PasLLos      EBw      IBw
        ActSDly  ActLDly   ActSUn   ActLUn  ActSJit  ActPMOS  ActSLos  ActLLos
------------------------------------------------------------------------------
10.20.20.0/24              N    N    N           N           N N
                         INPOLICY        0          10.5.5.5 Et0/1           BGP
             U        U        0        0        0        0       13        0
             N        N        N        N        N        N
                                                                
10.30.30.0/24              N    N    N           N           N N
                         INPOLICY        0          10.5.5.5 Et0/1           BGP
             U        U        0        0        0        0       14        0
             N        N        N        N        N        N
```

如上所述，为TCP通信流，您能看到延迟和也被增加不可得到的计数器，但是在UDP流的情况下您能只看到带宽计数器被增加。

主动模式

```
R3#show pfr master
<Output suppressed>
Default Policy Settings:
  backoff 90 900 90
  delay relative 50
  holddown 90
  periodic 0
  probe frequency 56
  number of jitter probe packets 100
  mode route control
  mode monitor active
```

```
  loss relative 10
  jitter threshold 20
  mos threshold 3.60 percent 30
  unreachable relative 50
  trigger-log percentage 30
-TCP
```

在主令控制器上：

```
R3#show pfr master traffic-class
OER Prefix Statistics:
 Pas - Passive, Act - Active, S - Short term, L - Long term, Dly - Delay (ms),
 P - Percentage below threshold, Jit - Jitter (ms),
 MOS - Mean Opinion Score
 Los - Packet Loss (percent/10000), Un - Unreachable (flows-per-million),
 E - Egress, I - Ingress, Bw - Bandwidth (kbps), N - Not applicable
 U - unknown, * - uncontrolled, + - control more specific, @ - active probe all
 # - Prefix monitor mode is Special, & - Blackholed Prefix
 % - Force Next-Hop, ^ - Prefix is denied

DstPrefix           Appl_ID Dscp Prot     SrcPort     DstPort SrcPrefix
           Flags             State     Time            CurrBR  CurrI/F Protocol
         PasSDly  PasLDly   PasSUn   PasLUn  PasSLos  PasLLos      EBw      IBw
         ActSDly  ActLDly   ActSUn   ActLUn  ActSJit  ActPMOS  ActSLos  ActLLos
------------------------------------------------------------------------------
10.10.20.0/24               N    N    N           N           N N
                          INPOLICY        0          10.4.4.4 Et0/1           BGP
               N        N        N        N        N        N        N        N
              54       54        0        0        N        N        N        N

10.30.30.0/24               N    N    N           N           N N
                          INPOLICY        0          10.4.4.4 Et0/1           BGP
               N        N        N        N        N        N        N        N
              54       54        0     1000        N        N        N        N
```

BR1

```
R4#show pfr border active-probes
        OER Border active-probes
Type      = Probe Type
Target    = Target IP Address
TPort     = Target Port
Source    = Send From Source IP Address
Interface = Exit interface
Att       = Number of Attempts
Comps   = Number of completions
N - Not applicable

Type     Target          TPort Source          Interface           Att   Comps
DSCP
echo    10.10.20.11        N 192.168.1.1      Et0/1                3       3
0
echo    10.30.30.12         N 192.168.1.1      Et0/1                3       3
0
```

BR2

```
R5#show pfr border active-probes
        OER Border active-probes
Type      = Probe Type
Target    = Target IP Address
TPort     = Target Port
Source    = Send From Source IP Address
Interface = Exit interface
Att       = Number of Attempts
Comps   = Number of completions
N - Not applicable

Type     Target          TPort Source        Interface           Att   Comps
DSCP
echo     10.10.20.11       N 192.168.2.1      Et0/1                3       3
0
echo     10.30.30.12       N 192.168.2.1      Et0/1                3       3
0
```

MC“INPOLICY”BR1 BR2

```
R4#show pfr border active-probes
        OER Border active-probes
Type      = Probe Type
Target    = Target IP Address
TPort     = Target Port
Source    = Send From Source IP Address
Interface = Exit interface
Att       = Number of Attempts
Comps   = Number of completions
N - Not applicable

Type     Target          TPort Source          Interface           Att   Comps
DSCP
echo     10.10.20.11         N 192.168.1.1      Et0/1                10      10
0
echo     10.30.30.12         N 192.168.1.1      Et0/1                10      10
0


R5#show pfr border active-probes
        OER Border active-probes
Type      = Probe Type
Target    = Target IP Address
TPort     = Target Port
Source    = Send From Source IP Address
Interface = Exit interface
Att       = Number of Attempts
Comps   = Number of completions
N - Not applicable

Type     Target          TPort Source          Interface           Att   Comps
DSCP

<No Active Probes>



R3#show pfr master
OER state: ENABLED and ACTIVE
<Output Suppressed>
Default Policy Settings:
```

```
  backoff 90 900 90
  delay relative 50
  holddown 90
  periodic 0
  probe frequency 56
  number of jitter probe packets 100
  mode route control
  mode monitor both
  loss relative 10
  jitter threshold 20
  mos threshold 3.60 percent 30
  unreachable relative 50
  trigger-log percentage 30
```

-TCP

(TC)“INPOLICY”Netflow

在MC ：

```
R3#show pfr mas traffic-class
OER Prefix Statistics:
 Pas - Passive, Act - Active, S - Short term, L - Long term, Dly - Delay (ms),
 P - Percentage below threshold, Jit - Jitter (ms),
 MOS - Mean Opinion Score
 Los - Packet Loss (percent/10000), Un - Unreachable (flows-per-million),
 E - Egress, I - Ingress, Bw - Bandwidth (kbps), N - Not applicable
 U - unknown, * - uncontrolled, + - control more specific, @ - active probe all
 # - Prefix monitor mode is Special, & - Blackholed Prefix
 % - Force Next-Hop, ^ - Prefix is denied

DstPrefix           Appl_ID Dscp Prot     SrcPort     DstPort SrcPrefix
           Flags              State     Time            CurrBR  CurrI/F Protocol
         PasSDly  PasLDly   PasSUn   PasLUn  PasSLos  PasLLos      EBw      IBw
         ActSDly  ActLDly   ActSUn   ActLUn  ActSJit  ActPMOS  ActSLos  ActLLos
--------------------------------------------------------------------------------
10.20.20.0/24              N    N    N           N           N N
                          HOLDDOWN       61          10.5.5.5 Et0/1           BGP
               1        1        0        0        0        0       16        1
               1        1        0        0        N        N        N        N

10.30.30.0/24              N    N    N           N           N N
                          HOLDDOWN       61          10.5.5.5 Et0/1           BGP
               1        1        0        0        0        0       16        1
               4        4        0        0        N        N        N        N
```

在BR1 ：

```
R4#show pfr border active-probes
        OER Border active-probes
Type      = Probe Type
Target    = Target IP Address
TPort     = Target Port
Source    = Send From Source IP Address
Interface = Exit interface
Att       = Number of Attempts
Comps   = Number of completions
N - Not applicable

Type     Target          TPort Source          Interface           Att   Comps
DSCP
```

```
echo     10.20.20.1          N 192.168.1.1      Et0/1                1       1
0
echo     10.30.30.1          N 192.168.1.1     Et0/1                 1       1
0
```

在BR2 ：

```
R5#show pfr border active-probes
        OER Border active-probes
Type      = Probe Type
Target    = Target IP Address
TPort     = Target Port
Source    = Send From Source IP Address
Interface = Exit interface
Att       = Number of Attempts
Comps   = Number of completions
N - Not applicable

Type     Target          TPort Source          Interface           Att   Comps
DSCP
echo     10.20.20.1          N 192.168.2.1      Et0/1                1       1
0
echo     10.30.30.1          N 192.168.2.1      Et0/1                1       1
```

MC“INPOLICY” BRs(Netflow)

```
R3#show pfr master traffic-class
OER Prefix Statistics:
 Pas - Passive, Act - Active, S - Short term, L - Long term, Dly - Delay (ms),
 P - Percentage below threshold, Jit - Jitter (ms),
 MOS - Mean Opinion Score
 Los - Packet Loss (percent/10000), Un - Unreachable (flows-per-million),
 E - Egress, I - Ingress, Bw - Bandwidth (kbps), N - Not applicable
 U - unknown, * - uncontrolled, + - control more specific, @ - active probe all
 # - Prefix monitor mode is Special, & - Blackholed Prefix
 % - Force Next-Hop, ^ - Prefix is denied

DstPrefix           Appl_ID Dscp Prot     SrcPort     DstPort SrcPrefix
          Flags              State     Time            CurrBR  CurrI/F Protocol
         PasSDly  PasLDly   PasSUn   PasLUn  PasSLos  PasLLos      EBw      IBw
         ActSDly  ActLDly   ActSUn   ActLUn  ActSJit  ActPMOS  ActSLos  ActLLos
------------------------------------------------------------------------------
10.20.20.0/24              N    N    N           N           N N
                          INPOLICY        0          10.5.5.5 Et0/1           BGP
               1        1        0        0        0        0        3        1
               1        1        0        0      N        N        N        N

10.30.30.0/24            N    N    N           N           N N
                          INPOLICY        0          10.5.5.5 Et0/1           BGP
               1        1        0        0        0        0       14        1
               1        1        0        0      N        N        N        N
```

如上所述，您能为被动和激活组件看到计数器。并且，探测在BRs将终止，一旦TCs移动对“INPOLICY”状态。

```
R4#show pfr border active-probes
        OER Border active-probes
Type      = Probe Type
Target    = Target IP Address
```

```
TPort     = Target Port
Source    = Send From Source IP Address
Interface = Exit interface
Att       = Number of Attempts
Comps   = Number of completions
N - Not applicable

Type     Target          TPort Source          Interface           Att   Comps
DSCP

<No Active Probes>


R5#show pfr border active-probes
        OER Border active-probes
Type      = Probe Type
Target    = Target IP Address
TPort     = Target Port
Source    = Send From Source IP Address
Interface = Exit interface
Att       = Number of Attempts
Comps   = Number of completions
N - Not applicable

Type     Target          TPort Source          Interface           Att   Comps
DSCP

<No Active Probes>
```

Troubleshoot

目前没有针对此配置的故障排除信息。