配置PfRv2性能监控方法

目录

简介

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

先决条件

要求

思科建议您有基础知识性能路由(PfR)。

使用的组件

本文档不限于特定的软件和硬件版本。

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

PfRv2使用三个方法测量边界路由器(BR)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：

被动监听

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

以下为通过通过BR的TCP流可适用的：

- **可接通性：**这根据对应的TCP ACK有不接收的TCP SYN计算。
- **延迟:**在TCP三通的握手期间，时间计算在TCP SYN和TCP ACK消息之间。总值由2.然后划分。
- **损耗：**测量根据TCP序列编号。例如：当已接收TCP序列号比预计时高或更低，损耗报告。

以下为(包括TCP)通过通过BR的所有流可适用的：

- **出口带宽：**egressing BR的数据流类别的吞吐量(计算在比特/秒使用Netflow)。
- **入口带宽：**ingressing BR的数据流类别的吞吐量(计算在比特/秒使用Netflow)。

活动监听

在此模式， BR派出在其广域网接口的IP SLA探测器测量关于数据流类别的几个参数。收集的信息被退还的到主令控制器。以下参数被测量：

- 可接通性
- 迪莱
- 损耗
- 出口带宽
- 入口带宽

这些探测器自动地生成，当监控在主令控制器时配置的方法是活跃的，并且可能手工也配置。默认情况下，被发送的探测器是ICMP回音，但是可以更改到TCP或UDP探测器根据在广域网链路发送的流量类型。

当退出BR选择是持续的时，所有BR将发送Netflow博学的前缀的活动探测器。在退出BR的选择，其他BR将停止发送活动探测器。选定BR将继续发送活动探测器。

混合模式

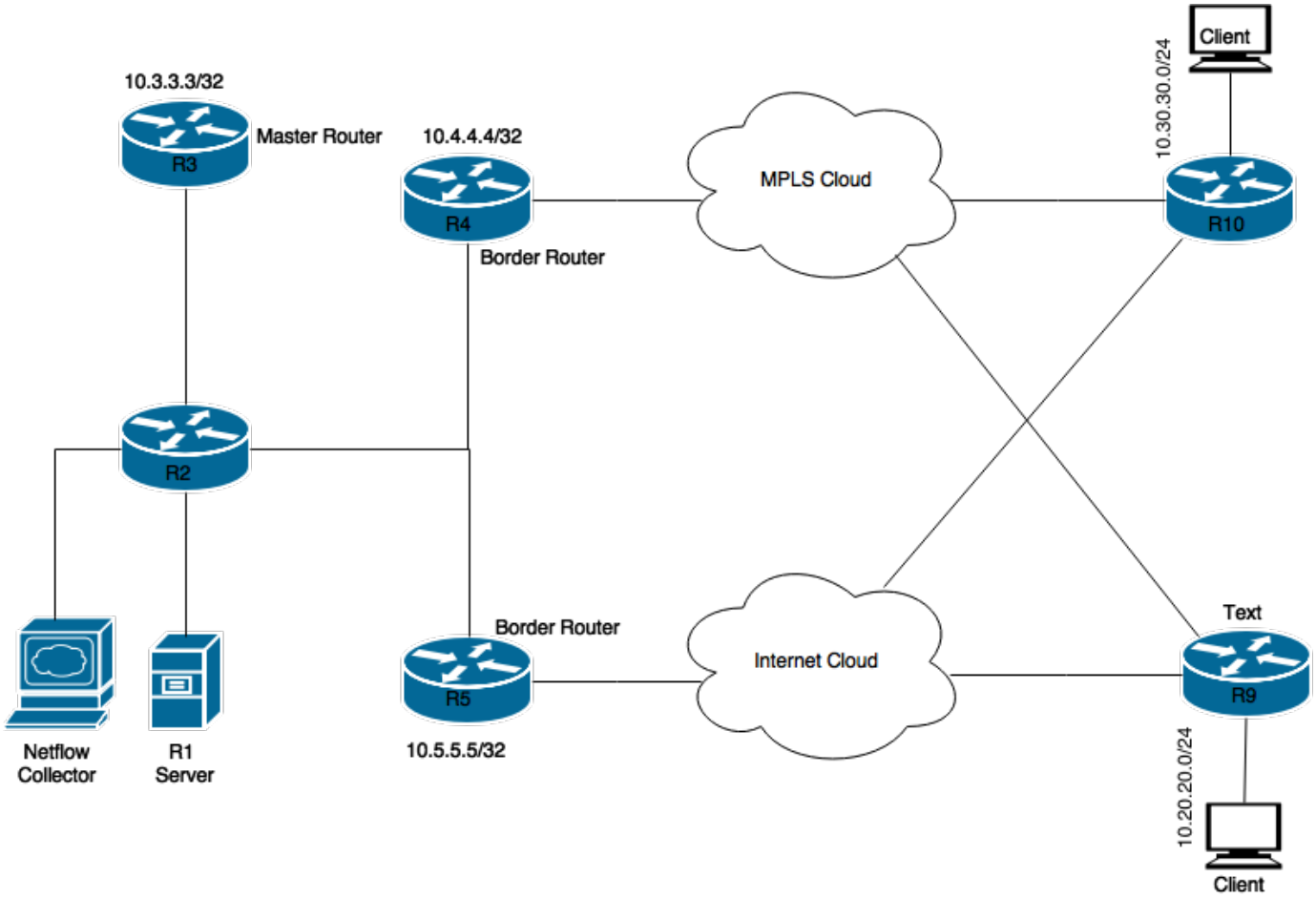
混合模式使用Netflow统计信息，并且IP服务成水平协议(要决定的SLA)出口点(边界路由器)和链路监听。在此模式， IP SLA探测器信息用于选择出口点Netflow统计信息然后用于监控往目的地的该边界路由器的WAN连接。

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

配置

跟随的镜像将使用作为拓扑示例本文的其余：

网络图



相关配置

跟随的基本配置要求为使用不同的模式。因为MC，因此这些配置在R3，将必须执行R3配置：

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
```

“”

```
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
```

注意：“”default

验证

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数据流，您能看到迪莱和也被增加不可得到的计数器，但是在UDP数据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”BR1BR 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”BR(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，探测器在BR将终止，一旦TCs移动到“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>
```

故障排除

目前没有针对此配置的故障排除信息。