

使用成形 VP 隧道的 LANE、CES 和 VBR PVC

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简介

本文显示配置示例LANE仿真(LANE)、电路仿真服务(CES)和可变比特率(VBR)永久虚拟连接(PVC)在整形的虚拟路径通道。在本文显示的配置中，LANE、CES和可变比特率非实时(vbr-nrt) PVC在广域网间传输。这些示例使用整形VP隧道保证遵照约定的数据流。当曾经整形有流量参数的VP隧道相同与服务提供商，服务提供商的ATM网络不应该丢弃任何信元。

VP隧道必须是恒定比特率(CBR)服务类别为了被整形：它当前是该唯一的成形隧道思科支持。您必须有三个VP隧道，因为LANE使用未指明的比特率(UBR)交换虚拟连接(SVC)，CES用途CBR PVC，您有VBR PVC，并且您使用整形的VP隧道。您有一个每个服务类别的：CBR虚拟信道(VC)和UBR VC。通过使用分层VP通道，您可能使用了一个通道。

先决条件

要求

本文档的读者应掌握以下这些主题的相关知识：

- [LANE LANE 设计推荐配置 LANE](#)
- [CES 电路仿真服务 介绍配置 电路仿真服务](#)
- [VBR 了解 ATM VC 的可变比特率实时 \(VBR-rt\) 服务类别 了解 ATM VC 的 VBR-nrt 服务类别和流量整形](#)
- [VP 隧道配置 VP 隧道与 VP 交换](#)

使用的组件

本文档中的信息基于以下软件和硬件版本：

- Cisco IOS软件版本11.3(0.8)tw4 ASP或以上为LightStream1010 (LS1010)
- Cisco 8540-MSR的任何版本

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。

规则

有关文档规则的详细信息,请参阅 [Cisco 技术提示规则](#)。

假定

在本文显示的示例假设这些事实:

- 成形隧道必须是CBR服务种类,因此此示例有能只包含CBR VC的一个CBR VP隧道。它使用CES CBR PVC(被标记VPI1在[网络图中](#))。注意虚拟路径标识符(VPI)编号是局部重要的对交换机端口,因此您能有在同一交换机的同一个VPI编号,但是两不同的交换机端口。
- 由于整形的VP隧道不能同时传输多个服务类别VC,用于CBR VC的第一个VP隧道不可能用于LANE UBR VC或vbr-nrt PVC。您必须创建(另一个VP隧道使用UBR服务类别VC)的LANE的。所以,第二个VP隧道(被标记VPI2在[网络图中](#))是仅UBR VC允许的一个CBR成形的VP隧道。
- 第三成形的VP隧道传输vbr-nrt PVC(被标记VPI3在[网络图中](#))。
- 您需要采购从服务提供商的三CBR VPs。
- 假设,三CBR VPs有10 Mbps峰值信元速率和500个信元信元延迟变化容限。注意所有VP隧道PCR的总和在同一个物理接口定义的一定小于物理接口的线路速率的95百分比(假设,仅VP隧道在物理接口配置)。
- 对于VBR PVC,平均信元速率PVC小于CBR成形的VP隧道的PCR的95百分比一定。换句话说,PVC SCR小于vbr-nrt的9.5 Mbps一定。如果多个通过CBR的VBR PVC小于成形的VP隧道的PCR的95百分比建立隧道,所有VBR PVC SCR的总和一定。5百分比保持为发信号和其他必须协议保留。
- 设备5500-asp-f是为VP交换。服务提供商典型地执行此功能。
- LANE服务在8540-MSR定义;LAN仿真客户端(LEC)在8540-MSR和5500 aspe定义。**注意:**在本例中,LANE服务在为了简化的ATM交换机被放置。那不是,然而,LANE服务的最佳位置。LAN仿真服务器(LES)或广播及未知服务器的(BUS)最好的地方在Catalyst 5500的LANE模块。LEC的理想的地方在Cisco 7500系列路由器。
- 两个专用分支交换(PBX)在本图中使用CES CBR电路。关于关于怎样的详细信息配置电路仿真,参考[配置电路仿真服务](#)。

配置

本部分提供有关如何配置本文档所述功能的信息。

注意: 要查找本文档所用命令的其他信息,请使用[命令查找工具](#)([仅限注册用户](#))。

网络图

点击交换机在此图表中查看配置示例:

配置

本文档使用以下配置：

- [5500 aspe](#)
- [5500-asp-f](#)
- [8540-MSR](#)

5500 aspe配置示例

5500 aspe

```
5500-asp-e# show running-config Building
configuration... Current configuration: ! version 11.3
no service pad service timestamps debug datetime msec
service timestamps log uptime no service password-
encryption ! hostname 5500-asp-e ! boot system flash
slot0:LS1010-wp-mz.120-3c.W5.9.bin ! ip host-routing !
atm connection-traffic-table-row index 63997 vbr-nrt pcr
20480 scr10 9000 mbs 100 atm connection-traffic-table-
row index 64000 cbr pcr 10240 cdvt 500 atm lecs-address-
default
47.0091.8100.0000.0090.2144.8401.0090.2144.8405.00 1 atm
address
47.0091.8100.0000.0050.537e.1401.0050.537e.1401.00 atm
router pnni no aesa embedded-number left-justified node
1 level 56 lowest redistribute atm-static ! !
interface CBR10/0/0 no ip address ces circuit 0 circuit-
name test ces pvc 0 interface ATM11/0/1.6 vpi 6 vci 100
! interface ATM11/0/1 no atm signaling enable no ip
address atm pvp 5 shaped rx-cttr 64000 tx-cttr 64000 atm
pvp 6 shaped rx-cttr 64000 tx-cttr 64000 atm pvp 7
shaped rx-cttr 64000 tx-cttr 64000 ! interface
ATM11/0/1.5 point-to-point atm cac service-category cbr
deny atm cac service-category ubr permit ! interface
ATM11/0/1.6 point-to-point ! interface ATM11/0/1.7
point-to-point atm cac service-category cbr deny atm cac
service-category vbr-nrt permit atm pvc 7 100 rx-cttr
63997 tx-cttr 63997 interface ATM10/1/0 0 100 !
interface ATM11/0/2 no ip address ! interface ATM11/0/3
no ip address ! interface ATM11/1/0 no ip address !
interface ATM11/1/1 no ip address ! interface ATM11/1/2
no ip address ! interface ATM11/1/3 no ip address !
interface ATM13/0/0 no ip address atm maxvp-number 0 !
interface ATM13/0/0.1 multipoint ip address
100.100.100.2 255.255.255.0 lane client ethernet test !
interface Ethernet13/0/0 no ip address ! no ip classless
logging buffered 16000 debugging ! line con 0 line aux 0
line vty 0 4 login ! end
```

功能显示

您能使用显示in命令此部分验证在设备的配置功能。[命令输出解释程序工具](#) ([仅限注册用户](#)) 支持某些 show 命令，使用此工具可以查看对 show 命令输出的分析。

注意： 您能使用其他显示命令验证配置;不是所有在本文包括。

要保证所有LANE VC在正确VP隧道间去(换句话说，防止发信号启动通过主接口)，发信号使用no atm signaling enable命令，在接口atm11/0/1禁用。同一操作在8540-MSR被执行了。

要看到哪些VC通过与VPI的VP隧道通过7，请发出show atm vc interface interface-number命令：

```
5500-asp-e# show atm vc interface atm11/0/1.7 Interface VPI VCI Type X-Interface X-VPI X-VC
Encap Status ATM11/0/1.7 7 3 PVC ATM13/0/0 0 181 SNAP UP ATM11/0/1.7 7 4 PVC ATM13/0/0 0 182
SNAP UP ATM11/0/1.7 7 5 PVC ATM13/0/0 0 180 QSAAL UP ATM11/0/1.7 7 16 PVC ATM13/0/0 0 179 ILMI
UP ATM11/0/1.7 7 18 PVC ATM13/0/0 0 183 PNNI UP ATM11/0/1.7 7 100 PVC ATM10/1/0 0 100 UP 5500-
asp-e# show atm interface resource atm11/0/1.7 Resource Management configuration: Service
Categories supported: vbr-nrt Link Distance: 0 kilometers Best effort connection limit: disabled
0 max connections Max traffic parameters by service (rate in Kbps, tolerance in cell-times):
Peak-cell-rate RX: none vbr, Peak-cell-rate TX: none vbr, Sustained-cell-rate: none vbr RX, none
vbr TX Minimum-cell-rate RX: Minimum-cell-rate TX: CDVT RX: none vbr, CDVT TX: none vbr, MBS:
none vbr RX, none vbr TX Resource Management state: Available bit rates (in Kbps): 0 cbr RX, 0
cbr TX, 613 vbr RX, 613 vbr TX, 0 abr RX, 0 abr TX, 0 ubr RX, 0 ubr TX Allocated bit rates: 0
cbr RX, 0 cbr TX, 9114 vbr RX, 9114 vbr TX, 0 abr RX, 0 abr TX, 0 ubr RX, 0 ubr TX 5500-asp-e#
show atm interface resource atm11/0/1 Resource Management configuration: Service Classes:
Service Category map: c1 cbr, c2 vbr-rt, c3 vbr-nrt, c4 abr, c5 ubr Scheduling: RS c1 WRR c2,
WRR c3, WRR c4, WRR c5 WRR Weight: 8 c2, 1 c3, 1 c4, 1 c5 Pacing: disabled 0 Kbps rate
configured, 0 Kbps rate installed Service Categories supported: cbr,vbr-rt,vbr-nrt,abr,ubr Link
Distance: 0 kilometers Controlled Link sharing: Max aggregate guaranteed services: none RX, none
TX Max bandwidth: none cbr RX, none cbr TX, none vbr RX, none vbr TX, none abr RX, none abr TX,
none ubr RX, none ubr TX Min bandwidth: none cbr RX, none cbr TX, none vbr RX, none vbr TX, none
abr RX, none abr TX, none ubr RX, none ubr TX Best effort connection limit: disabled 0 max
connections Max traffic parameters by service (rate in Kbps, tolerance in cell-times): Peak-
cell-rate RX: none cbr, none vbr, none abr, none ubr Peak-cell-rate TX: none cbr, none vbr, none
abr, none ubr Sustained-cell-rate: none vbr RX, none vbr TX Minimum-cell-rate RX: none abr, none
ubr Minimum-cell-rate TX: none abr, none ubr CDVT RX: none cbr, none vbr, none abr, none ubr
CDVT TX: none cbr, none vbr, none abr, none ubr MBS: none vbr RX, none vbr TX Resource
Management state: Available bit rates (in Kbps): 117023 cbr RX, 117023 cbr TX, 117023 vbr RX,
117023 vbr TX, 117023 abr RX, 117023 abr TX, 117023 ubr RX, 117023 ubr TX Allocated bit rates:
30720 cbr RX, 30720 cbr TX, 0 vbr RX, 0 vbr TX, 0 abr RX, 0 abr TX, 0 ubr RX, 0 ubr TX Best
effort connections: 0 pvcs, 4 svcs
```

5500-asp-f配置示例

交换机为VP交换配置。

5500-asp-f

```
5500-asp-f# show running-config Building
configuration... Current configuration: ! version 11.3
no service padservice timestamps debug uptime service
timestamps log uptime no service password-encryption !
hostname 5500-asp-f ! ! atm connection-traffic-table-
row index 63997 vbr-nrt pcr 20480 scr10 9000 mbs 100 atm
connection-traffic-table-row index 64000 cbr pcr 10240
cdvt 500 atm address
47.0091.8100.0000.0050.5308.2401.0050.5308.2401.00 atm
router pnni no aesa embedded-number left-justified node
1 level 56 lowest redistribute atm-static ! ! !
interface ATM11/0/0 no ip address ! interface ATM11/0/1
no ip address atm pvp 5 interface ATM11/0/0 10 atm pvp 6
rx-cttr 64000 tx-cttr 64000 interface ATM11/0/0 6 rx-
cttr 64000 tx-cttr 64000 atm pvp 7 rx-cttr 63997 tx-cttr
63997 interface ATM11/0/0 7 rx-cttr 63997 tx-cttr 63997
! interface ATM13/0/0 no ip address atm maxvp-number 0 !
interface Ethernet13/0/0 no ip address ! ip classless !
! line con 0 line aux 0 line vty 0 4 login ! end
```

功能显示

要验证VP是可操作的，请发出show atm vp命令：

```
5500-asp-f# show atm vp Interface VPI Type X-Interface X-VPI Status ATM11/0/0 6 PVP ATM11/0/1 6
UP ATM11/0/0 7 PVP ATM11/0/1 7 UP ATM11/0/0 10 PVP ATM11/0/1 5 UP ATM11/0/1 5 PVP ATM11/0/0 10
UP ATM11/0/1 6 PVP ATM11/0/0 6 UP ATM11/0/1 7 PVP ATM11/0/0 7 UP
```

8540-MSR配置示例

8540-MSR

```
8540-MSR# show running-config Building configuration...
Current configuration: ! version 12.0 no service pad
service timestamps debug uptime service timestamps log
uptime no service password-encryption ! hostname 8540-
MSR ! logging buffered 4096 debugging ! redundancy main-
cpu sync config startup sync config running facility-
alarm core-temperature major 53 facility-alarm core-
temperature minor 45 ip subnet-zero ! atm connection-
traffic-table-row index 63997 vbr-nrt pcr 20480 scr10
9000 mbs 100 atm connection-traffic-table-row index
63998 cbr pcr 10000 atm connection-traffic-table-row
index 63999 cbr pcr 10240 cdvt 500 atm lecs-address-
default
47.0091.8100.0000.0090.2144.8401.0090.2144.8405.00 1 atm
address
47.0091.8100.0000.0090.2144.8401.0090.2144.8401.00 atm
router pnni no aesa embedded-number left-justified node
1 level 56 lowest redistribute atm-static ! ! lane
database PVP name test server-atm-address
47.00918100000009021448401.009021448403.01 ! !
interface CBR1/0/0 no ip address no ip directed-
broadcast shutdown ces circuit 0 circuit-name test ces
pvc 0 interface ATM2/1/0.6 vpi 6 vci 100 ! interface
ATM2/1/0 no atm signaling enable no ip address no ip
directed-broadcast atm pvp 6 shaped rx-cttr 63999 tx-
cttr 63999 atm pvp 7 shaped rx-cttr 63999 tx-cttr 63999
atm pvp 10 shaped rx-cttr 63999 tx-cttr 63999 !
interface ATM2/1/0.6 point-to-point no ip directed-
broadcast ! interface ATM2/1/0.7 point-to-point no ip
directed-broadcast atm cac service-category cbr deny atm
cac service-category vbr-nrt permit atm pvc 7 100 rx-
cttr 63997 tx-cttr 63997 interface ATM1/1/0 0 100 !
interface ATM2/1/0.10 point-to-point no ip directed-
broadcast atm cac service-category cbr deny atm cac
service-category ubr permit ! interface ATM2/1/1 no ip
address no ip directed-broadcast ! interface ATM2/1/2 no
ip address no ip directed-broadcast ! interface ATM2/1/3
no ip address no ip directed-broadcast ! interface ATM0
no ip address no ip directed-broadcast atm maxvp-number
0 lane config auto-config-atm-address lane config
database PVP ! interface ATM0.1 multipoint ip address
100.100.100.1 255.255.255.0 no ip directed-broadcast
lane server-bus ethernet test lane client ethernet test
! interface Ethernet0 no ip address no ip directed-
broadcast ! ip classless ! ! line con 0 transport input
none line aux 0 line vty 0 4 ! end
```

功能显示

您能使用显示in命令此部分验证在设备的配置功能。

```
8540-MSR# show atm interface resource atm2/1/0.7 Resource Management configuration: Service
Categories supported: vbr-nrt Link Distance: 0 kilometers Best effort connection limit: disabled
0 max connections Max traffic parameters by service (rate in Kbps, tolerance in cell-times):
```

Peak-cell-rate RX: none vbr, Peak-cell-rate TX: none vbr, Sustained-cell-rate: none vbr RX, none vbr TX Minimum-cell-rate RX: Minimum-cell-rate TX: CDVT RX: none vbr, CDVT TX: none vbr, MBS: none vbr RX, none vbr TX **Resource Management state: Available bit rates (in Kbps): 0 cbr RX, 0 cbr TX, 613 vbr RX, 613 vbr TX, 0 abr RX, 0 abr TX, 0 ubr RX, 0 ubr TX Allocated bit rates: 0 cbr RX, 0 cbr TX, 9114 vbr RX, 9114 vbr TX, 0 abr RX, 0 abr TX, 0 ubr RX, 0 ubr TX** 8540-MSR# **show atm interface resource atm2/1/0** Resource Management configuration: Service Classes: Service Category map: c2 cbr, c2 vbr-rt, c3 vbr-nrt, c4 abr, c5 ubr Scheduling: RS c1 WRR c2, WRR c3, WRR c4, WRR c5 WRR Weight: 8 c2, 1 c3, 1 c4, 1 c5 Pacing: disabled 0 Kbps rate configured, 0 Kbps rate installed Service Categories supported: cbr,vbr-rt,vbr-nrt,abr,ubr Link Distance: 0 kilometers Controlled Link sharing: Max aggregate guaranteed services: none RX, none TX Max bandwidth: none cbr RX, none cbr TX, none vbr RX, none vbr TX, none abr RX, none abr TX, none ubr RX, none ubr TX Min bandwidth: none cbr RX, none cbr TX, none vbr RX, none vbr TX, none abr RX, none abr TX, none ubr RX, none ubr TX Best effort connection limit: disabled 0 max connections Max traffic parameters by service (rate in Kbps, tolerance in cell-times): Peak-cell-rate RX: none cbr, none vbr, none abr, none ubr Peak-cell-rate TX: none cbr, none vbr, none abr, none ubr Sustained-cell-rate: none vbr RX, none vbr TX Minimum-cell-rate RX: none abr, none ubr Minimum-cell-rate TX: none abr, none ubr CDVT RX: none cbr, none vbr, none abr, none ubr CDVT TX: none cbr, none vbr, none abr, none ubr MBS: none vbr RX, none vbr TX **Resource Management state: Available bit rates (in Kbps): 117023 cbr RX, 117023 cbr TX, 117023 vbr RX, 117023 vbr TX, 117023 abr RX, 117023 abr TX, 117023 ubr RX, 117023 ubr TX Allocated bit rates: 30720 cbr RX, 30720 cbr TX, 0 vbr RX, 0 vbr TX, 0 abr RX, 0 abr TX, 0 ubr RX, 0 ubr TX Best effort connections: 0 pvcs, 0 svcs** 8540-MSR# **show atm interface resource atm2/1/0.6** Resource Management configuration: **Service Categories supported: cbr** Link Distance: 0 kilometers Best effort connection limit: disabled 0 max connections Max traffic parameters by service (rate in Kbps, tolerance in cell-times): Peak-cell-rate RX: none cbr, Peak-cell-rate TX: none cbr, Minimum-cell-rate RX: Minimum-cell-rate TX: CDVT RX: none cbr, CDVT TX: none cbr, **Resource Management state: Available bit rates (in Kbps): 9727 cbr RX, 9727 cbr TX, 0 vbr RX, 0 vbr TX, 0 abr RX, 0 abr TX, 0 ubr RX, 0 ubr TX Allocated bit rates: 1741 cbr RX, 1741 cbr TX, 0 vbr RX, 0 vbr TX, 0 abr RX, 0 abr TX, 0 ubr RX, 0 ubr TX** 8540-MSR# **show atm interface resource atm2/1/0.7** Resource Management configuration: **Service Categories supported: vbr-nrt** Link Distance: 0 kilometers Best effort connection limit: disabled 0 max connections Max traffic parameters by service (rate in Kbps, tolerance in cell-times): Peak-cell-rate RX: none vbr, Peak-cell-rate TX: none vbr, Sustained-cell-rate: none vbr RX, none vbr TX Minimum-cell-rate RX: Minimum-cell-rate TX: CDVT RX: none vbr, CDVT TX: none vbr, MBS: none vbr RX, none vbr TX **Resource Management state: Available bit rates (in Kbps): 0 cbr RX, 0 cbr TX, 613 vbr RX, 613 vbr TX, 0 abr RX, 0 abr TX, 0 ubr RX, 0 ubr TX Allocated bit rates: 0 cbr RX, 0 cbr TX, 9114 vbr RX, 9114 vbr TX, 0 abr RX, 0 abr TX, 0 ubr RX, 0 ubr TX** 8540-MSR# **show atm interface resource atm2/1/0.10** Resource Management configuration: **Service Categories supported: ubr** Link Distance: 0 kilometers Best effort connection limit: disabled 0 max connections Max traffic parameters by service (rate in Kbps, tolerance in cell-times): Peak-cell-rate RX: none ubr Peak-cell-rate TX: none ubr Minimum-cell-rate RX: none ubr Minimum-cell-rate TX: none ubr CDVT RX: none ubr CDVT TX: none ubr Resource Management state: Available bit rates (in Kbps): 0 cbr RX, 0 cbr TX, 0 vbr RX, 0 vbr TX, 0 abr RX, 0 abr TX, 0 ubr RX, 0 ubr TX Allocated bit rates: 0 cbr RX, 0 cbr TX, 0 vbr RX, 0 vbr TX, 0 abr RX, 0 abr TX, 0 ubr RX, 0 ubr TX

[故障排除](#)

目前没有针对此配置的故障排除信息。

[相关信息](#)

- [虚拟路径\(Virtual Path\)交换及隧道技术支持](#)
- [LANE\(LAN仿真\)技术支持](#)
- [CES \(电路仿真服务\)技术支持](#)
- [技术支持和文档 - Cisco Systems](#)