

T1 Unstructured CES with Adaptive Clocking and Soft PVCs

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Introduction

This document provides a sample configuration of T1 Unstructured Circuit Emulation Services (CES) using Adaptive clocking. Unstructured service means that the PVCs utilize the entire T1/E1 bandwidth. The ATM switch doesn't look into the T1/E1, but simply reproduces a stream of bits with clocking from the receiving port to the target port. Adaptive clocking means that the CES module infer appropriate timing for data transmission by calculating an average receive data rate. The main advantage of this is that it does not require network clock synchronization. For a more detailed explanation on CES Services please read An Introduction to Circuit Emulation Services.

Assumptions

The sample configurations in this document are based on the following assumptions:

- This example uses adaptive clocking mode. Since we are using adaptive clocking, you do not need a **network-clock-select** statement. However, you may choose to configure the buffer length to prevent buffer overflow and underflow and, at the same time, control delay (greater buffer size means greater delay). The buffer length is proportional to the maximum cell delay variation (CDV), which you can configure with the **ces circuit circuit-id [cas] [cdv max-req]** command. The default value is 2000 milliseconds. The measured value is displayed in the output of the **show ces circuit** command.
- Framing on both PBXs is Extended Superframe (ESF). This is the default on the LS1010 so it does not need to be explicitly configured. However, we will configure it in this example for the sake of demonstration.
- The line-code on both PBXs is binary 8-zero substitution (B8ZS). This is the default on the LS1010 so it does not need to be explicitly configured. However, we will configure it in this example for the sake of demonstration.
- The LS1010 is the active side of the soft PVC; the 8540-MSR is the passive side.
- The distance between the PBX and the ATM switch is less than 110 feet on the CES PAM. This length is the default line build-out (lbo) so it does not need to be explicitly configured. However, we will configure it in this example for the sake of demonstration.
- The LS1010 is equipped with a feature card per-flow queueing (FC-PFQ), which uses a phase lock loop (PLL) capable of locking onto and tracking the selected the clock source. This high quality, locked clock is then fed to the network clock interfaces to provide interface timing. The 8540 MSR is equipped with a Network Clock Module (NetClkMod), which offers the added advantage of a Stratum

3 clock source.

- The ATM Pseudo interfaces (ATM-Px/y/z) is created when the circuit is defined. Refer to the document Configuring Circuit Emulation Services for more details.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

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

Conventions

For more information on document conventions, see the Cisco Technical Tips Conventions.

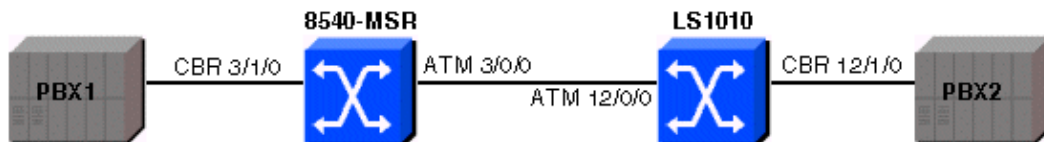
Configure

In this section, you are presented with the information to configure the features described in this document.

Note: To find additional information on the commands used in this document, use the Command Lookup Tool (registered customers only) .

Network Diagram

This document uses the network setup shown in the diagram below.



Configurations

This document uses the configurations shown below.

- 8540-MSR
- LS1010-A

```
8540-MSR
8540-MSR#show running-config
Building configuration...

Current configuration:
!
version 12.0
no service pad
```

```

service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
service internal
!
hostname 8540-MSR
!
boot system flash bootflash:cat8540m-wp-mz.120-1a.W5.7.bin
logging buffered 4096 debugging
!
redundancy
main-cpu
  no sync config startup
  sync config running
facility-alarm core-temperature major 53
facility-alarm core-temperature minor 45
network-clock-select 1 system
ip subnet-zero
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
!
interface ATM3/0/0
  no ip address
  no ip directed-broadcast
!
interface ATM3/0/1
  no ip address no
  ip directed-broadcast
!

interface CBR3/1/0
  no ip address no
  ip directed-broadcast
  ces aall clock adaptive
  ces circuit 0 circuit-name example
  ces dsx1 linecode b8zs
  ces dsx1 framing esf
  ces dsx1 lbo 0_110
!
interface ATM0
  no ip address
  no ip directed-broadcast
  atm maxvp-number 0
!
interface Ethernet0
  no ip directed-broadcast
!
line con 0
transport input none
line aux 0
line vty 0 4
login
!
end

```

Use **show ces address** on the passive side of the soft PVC to get the address and VPI/VCI pair that you need to configure the active side of the soft PVC (the LS1010 in this example). See the sample output below:

```
8540-MSR#show ces address
```

```
CES-IWF ATM Address(es):47.0091.8100.0000.0090.2144.8401.4000.0c81.9030.10 CBR3/1/0:0
vpi 0 vci 16
```

LS1010-A

```
ls1010#show running-config
```

```
Building configuration...
```

```
Current configuration:
```

```
!  
version 11.3  
no service pad  
service timestamps debug datetime msec  
service timestamps log datetime msec  
no service password-encryption  
service internal  
!  
hostname ls1010  
!  
atm address 47.0091.8100.0000.0090.92b8.6401.0090.92b8.6401.00  
atm router pnni  
  no aesa embedded-number left-justified  
  node 1 level 56 lowest  
  redistribute atm-static  
!  
no ip address  
!  
interface CBR12/1/0  
  no ip address  
  ces aall clock adaptive  
  ces circuit 0 circuit-name example  
  ces dsx1 linecode b8zs  
  ces dsx1 framing esf  
  ces dsx1 lbo 0_110  
  ces pvc 0 dest-address 47.0091.8100.0000.0090.2144.8401.4000.0c81.9030.10  
  vpi 0 vci 16  
!  
interface CBR12/1/1  
  no ip address  
!  
interface CBR12/1/2  
  no ip address  
!  
interface CBR12/1/3  
  no ip address  
!  
interface ATM13/0/0  
  no ip address  
  atm maxvp-number 0  
!  
interface Ethernet13/0/0  
ip classless  
!  
line con 0  
line aux 0  
line vty 0 4  
login  
!  
end
```

Use the **show ces interface** command to verify that the CES circuits are up on both sides. See the sample output below:

```
ls1010#show ces interface cbr 12/1/0
```

```
Interface: CBR12/1/0 Port-type:T1-DCU  
IF Status: UP Admin Status: UP
```

```

Channels in use on this port: 1-24
LineType: ESF LineCoding: B8ZS LoopConfig: NoLoop
SignalMode: NoSignalling XmtClockSrc: network-derived
DataFormat: UnStructured AAL1 Clocking Mode: Adaptive LineLength: 0_110
LineState: NoAlarm<
Errors in the Current Interval:
PCVs 514 LCVs 2 ESs 0 SESs 1 SEFSs 0
UASs 0 CSSs 0 LESs 0 BESs 0 DMs 0
Errors in the last 24Hrs:
PCVs 2057 LCVs 10 ESs 0 SESs 4 SEFSs 0
UASs 19 CSSs 0 LESs 0 BESs 0 DMs 0
Input Counters: 1054405 cells, 49557035 bytes
Output Counters: 1054405 cells, 49557035 bytes

```

Use the **show atm vc** command to verify that the soft PVC was established between the two ATM switches. See the sample output below:

```

8540-MSR#show atm vc interface ATM-P3/1/3

Interface   VPI   VCI   Type   X-Interface   X-VPI   X-VCI   Encap Status
ATM-P3/1/3   0     16   SoftVC   ATM3/0/0       0       39           UP

LS1010#show atm vc interface ATM-P12/1/3

Interface   VPI   VCI   Type   X-Interface   X-VPI   X-VCI   Encap Status
ATM-P12/1/3  0     16   SoftVC   ATM12/0/0     0       39           UP

```

Use the **show ces circuit cbr x/y/z 0** command to verify that there are no clocking slips and see if the underflows or overflows are increasing. Make sure to use this command on the 8540-MSR side as well. See the sample output below:

```

ls1010#show ces circuit cbr 12/1/0 0

Circuit: Name sil, Circuit-state ADMIN_UP / Interface CBR12/1/0,
Circuit_id 0, Port-Type T1, Port-State UP
Port Clocking network-derived, aal1 Clocking Method CESIWF_AAL1_CLOCK_ADAPT
Channel in use on this port: 1-24
Channels used by this circuit: 1-24
Cell-Rate: 4107, Bit-Rate 1544000
cas OFF, cell_header 0x100 (vci = 16)
Configured CDV 2000 usecs, Measured CDV 373 usecs
De-jitter: UnderFlow 1, Overflow 0
ErrTolerance 8, idleCircuitdetect OFF, onHookIdleCode 0x0
state: VcActive, maxQueueDepth 823, startDequeueDepth 435
Partial Fill: 47, Structured Data Transfer 0
Active SoftVC
Src: atm addr 47.0091.8100.0000.0090.92b8.6401.4000.0c86.1030.10 vpi 0, vci 16
Dst: atm addr 47.0091.8100.0000.0090.2144.8401.4000.0c81.9030.10

```

Verify

There is currently no verification procedure available for this configuration.

Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

Related Information

- [ATM Technology Support Pages](#)
 - [An Introduction to Circuit Emulation Services](#)
 - [ATM Switch Router Command Reference](#)
 - [Technical Support – Cisco Systems](#)
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