T1 Unstructured CES using Synchronous Clocking and PVCs

Document ID: 10427

Contents

Introduction

This document provides a sample configuration of Unstructured Circuit Emulation Services (CES) using Synchronous clocking and a Permanent Virtual Circuit (PVC). Unstructured service means that the PVCs utilize the entire T1/E1 bandwidth. The ATM switch does not look into the T1/E1, but simply reproduces a stream of bits with clocking from the receiving port to the target port. Synchronous service assumes that synchronized clocks are available on each end. Therefore, no clocking information is transported in the ATM cell. Propagation of the clock source throughout the network is required. For a more detailed explanation on CES Services, please read An Introduction to Circuit Emulation Services.

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, refer to Cisco Technical Tips Conventions.

Background Information

Assumptions

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

- This example uses synchronous clocking.
- PBX1 provides the clock source primary reference source (PRS) to the ATM network. See the diagram below.
- PBX2 is clocked from the same clock as PBX1 (from the service provider).

  Note: These clocks need to be same of the accuracy and need to be in phase.
- 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.
- PVC 0/100 is used between 8540−MSR and LS1010.
- 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 FC−PFQ and the 8540MSR is equipped with the RP Stratum 3 clock. You need those cards to ensure good clocking recovery.
- The ATM Pseudo interfaces (ATM−Px/y/z) is created when the circuit is defined. Refer to this related documentation for more details.
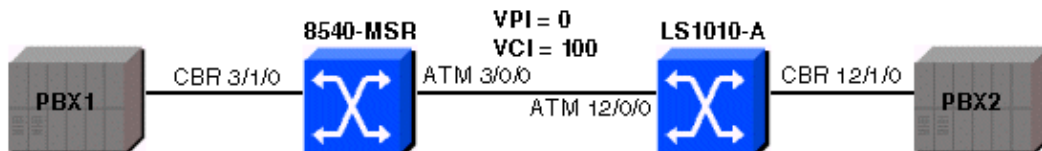
Configure

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 this network setup:

Configurations

This document uses these configurations:

8540−MSR Configuration

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
!
network-clock-select 1 cbr3/1/0
!
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
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 circuit 0 circuit-name example
ces pvc 0 interface atm3/0/0 vpi 0 vci 100
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
```

LS1010–A Configuration

LS1010–A

```
ls1010#show running-config

Building configuration...

Current configuration:
!
version 11.3
no service pad
service time
stamps debug date
time msec
service time
stamps log date
time mse
cno service password-encryption
service internal
!
hostname ls1010
!
network-clock-select 1 CBR12/1/0
!
atm address 47.0091.8100.0000.0090.92b8.6401.0090.92b8.6401.00
atm router pnnino aes
a embedded-number left-justified
node 1 level 56 lowestre
distribute atm-static
!
!
no ip address
!
interface CBR12/1/0
no ip address
ces circuit 0 circuit-name example
ces pvc 0 interface atm12/0/0 vpi 0 vci 100
ces dsx1 linecode b8zs
ces dsx1 framing esfces dsx1 lbo 0_110
!
interface CBR12/1/1no 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
```

Verify

Certain **show** commands are supported by the Output Interpreter Tool (registered customers only) , which allows you to view an analysis of **show** command output.

To verify that the CES circuits are up on both sides, use the **show ces interface** command. 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: Synchronous 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 so that the PVC is established between the two ATM switches. See the sample output below:

```
8540-MSR#show atm vc int 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     100             UP

LS1010#show atm vc int 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     100             UP
```

To verify that there are no clocking slips, use the **show ces circuit cbr x/y/z 0** command 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_SYNC
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
```

Troubleshoot

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

Related Information

- **An Introduction to Circuit Emulation Services**
- **ATM Switch Router Command Reference**
- **ATM Technology Support Page**
- **Technical Support & Documentation – Cisco Systems**

Updated: Jun 05, 2005

Document ID: 10427