

Using CESoPSN Bundles to Group DSOs on IP Circuits

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Using CESoPSN Bundles to Group DS0s on IP Circuits
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Using Bundles to Create Logical Configurations for Physical Interfaces Overview

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Types of Bundles Overview

[Table 1 on page 3](#) shows the typical application for each bundle type, and lists the interfaces that each type of bundle supports.

NOTE: Starting in CTPOS Release 9.1R3, the T1/E1 Daughter card is not supported in CTP150, CTP151, and CTP2000. If the Daughter card is present in these devices, then you will get an error message "System is unusable Reason: 1) Unsupported T1E1/IRIG/4WTO Dcard" when you use CTP nodes. Remove the Daughter card to access the node.

Table 1: Bundle Types and Supported Interfaces

Bundle Type	Generally Used For	Interface Types Supported
CTP (circuit-to-packet)	Connecting legacy serial interfaces to the IP network	<ul style="list-style-type: none"> • CTP150 <ul style="list-style-type: none"> • Serial interface • Multiservices interface • T1/E1 interface • CTP2000 <ul style="list-style-type: none"> • Multiservices interface • Serial interface • Serial interface with T1/E1 daughter card (Not supported from CTPOS 9.1R3 Release) • Serial interface with 4WTO daughter card • Serial interface with IRIG-B daughter card • T1/E1 interface
SAToP (structure-agnostic TDM over IP)	Connecting single T1 or E1 interfaces to an IP network	<ul style="list-style-type: none"> • CTP150 <ul style="list-style-type: none"> • T1/E1 interface • CTP2000 <ul style="list-style-type: none"> • Serial interface with T1/E1 daughter card (Not supported from CTPOS 9.1R3 Release) • T1/E1 interface

Table 1: Bundle Types and Supported Interfaces *(Continued)*

Bundle Type	Generally Used For	Interface Types Supported
CESoPSN (circuit emulation services over a packet-switched network)	Grouping multiple DS0s to one IP circuit	<ul style="list-style-type: none"> • CTP2000 <ul style="list-style-type: none"> • T1/E1 interface—digital voice or data • FXS interface (starting from CTPOS release 7.0) • FXO interface (starting from CTPOS release 7.0) • 4W-E&M interface (starting from CTPOS release 7.0) • CTP150 <ul style="list-style-type: none"> • T1/E1 interface—digital voice or data • Serial interface—Nx64Kbps (starting from CTPOS release 6.6) • 4WTO analog audio interface—1 or 2 audio channels (starting from CTPOS release 7.3R7)
VComp (voice compression)	Grouping multiple analog circuits (channels) into one IP circuit (IPv4 only)	<ul style="list-style-type: none"> • CTP2000 <ul style="list-style-type: none"> • T1/E1 interface • 4W-E&M interface • Voice compression module • FXS interface • FXO interface

Interface Naming Conventions for the CTP Series

In the CTP software, interfaces are specified in the format:

type-slot/port

where

type Type of interface. A two-character abbreviation.

slot Slot number on the CTP device.

port Port number on the CTP device.

If the interface module has a daughter card installed, the interface format is as follows:

type-slot/port w/daughter-card

Table 2: Interface Type Specifiers

Interface Type	Type Specifier
4WE&M	4w
4WTO	4w
E1	e1
2W-FXO	fo
2W-FSX	fs
IRIG	irig
Serial	se
T1	t1

Table 2: Interface Type Specifiers (*Continued*)

Interface Type	Type Specifier
T1E1	t1e1

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CESoPSN Bundle Overview

A CESoPSN bundle represents an IP circuit emulation flow. With CESoPSN bundles, you can group multiple DS0s on one IP circuit, and you can have more than one circuit emulation IP flow created from a single physical interface. For example, some DS0 channels from a T1 interface can go in an IP flow to destination A, and other DS0 channels from that same T1 interface can go to destination B. This feature allows for payload optimization.

CESoPSN bundles comply with *RFC 5086, Structure-Aware Time Division Multiplexed (TDM) Circuit Emulation Service over Packet Switched Network (CESoPSN), December 2007*. RFC-5086 defines a standard for transporting multiple bundles of DS0s from a single physical interface to different network destinations.

CESoPSN bundles are supported on the following interface types:

- CTP2000
 - T1/E1 interface—digital voice or data
 - FXS interface (starting from CTPOS release 7.0)
 - FXO interface (starting from CTPOS release 7.0)
 - 4W-E&M interface (starting from CTPOS release 7.0)
- CTP150
 - T1/E1 interface—digital voice or data
 - Serial interface—Nx64Kbps (starting from CTPOS release 6.6)

- 4WTO analog audio interface—1 or 2 audio channels (starting from CTPOS release 7.3R7)

And, they are all interoperable, if the number of channels and the signaling configuration (on or off) are consistent at each end of the bundle.

CESoPSN bundles support the following signaling:

- T1 interfaces support channel-associated signaling (CAS).
- E1 interfaces support CAS and common channel signaling (CCS).

Starting from CTPOS Release 7.0, CTP2000 devices support analog CESoPSN bundles over T1/E1, even if a VComp module is not installed. To create an analog CESoPSN bundle, the T1E1 interface module must be installed in slot 0. If the T1E1 interface module is not installed in slot 0, the system displays the following message:

Analog CESoPSN Bundle will be created only when there is a T1E1 card present in slot 0.

NOTE: You cannot create an analog CESoPSN bundle and a VComp bundle on the same card.

You can interconnect the following voice applications with CESoPSN bundles:

- Analog 4WE&M voice applications using the 4WE&M interface module
- Digital voice applications using the T1/E1 interface module

Providing QoS for CTP Bundles by Using Service Type Overview

In IP networks, the IP flow is typically classified based on the Differentiated Services Code Point (DSCP) setting in the type of service (TOS) byte of the IP header. DSCP is a scalable solution for classifying flows in a large IP network based on the *class of service* desired on specific IP traffic flows.

With the CTP device, you can configure DSCP settings for each circuit's IP flow. For example, some circuits could be configured for the expedited forwarding (EF) class. When the network routers receive this EF-marked flow from the CTP device, they place the marked traffic into a high-priority queue, enabling this traffic to be serviced before lower priority traffic. As an EF-marked flow traverses the IP network, routers can use its classification to provide the flow a more predictable level of performance across the network

When you configure the service type of a bundle, you specify the ToS byte to be used in IP headers of packets sent from the CTP device to the IP network. The ToS setting is applied to circuits created by the bundle for which the service type is configured.

[Table 3 on page 9](#) shows the mapping for each DSCP class and setting to the ToS setting that you configure as the service type for a bundle. The EF class (ToS setting 184) is commonly used for circuit traffic.

Table 3: DSCP Classes and Service Type

DSCP Class	DSCP Setting	ToS Setting
CS7	56	224
CS6	48	192
EF	46	184
CS5	40	160
AF43	38	152
AF42	36	144
AF41	34	136
CS4	32	128
AF33	30	120
AF32	28	112
AF31	26	104
CS3	24	96
AF23	22	88

Table 3: DSCP Classes and Service Type *(Continued)*

DSCP Class	DSCP Setting	ToS Setting
AF22	20	80
AF21	18	72
CS2	16	64
AF13	13	52
AF12	12	48
AF11	10	40
CS1	8	32

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Creating Bundles

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Adding a Bundle (CTPView)

Before you begin:

- Log in to the CTPView software at least at the Net_Admin level.
- Connect the CTPView server to the CTP device for which you want to configure bundles.

To add a bundle using CTPView:

1. In the side pane, select **Bundle > Configuration**.
2. Run your mouse over the **Open Add Bundles Display** bar.
3. Under **New Bndl Number**, select a bundle number.
4. Under the type of bundle you want to add, select a source port and click the button for the type of bundle.

Before you create a VComp bundle, you must ensure that the CTP system has a VComp card installed. The CTP system displays a warning message if no VComp card is installed. If you create a VComp bundle on a CTP system that does not have a VComp card installed and try to activate it, the CTP system displays the following warning message:

There is not enough system DSP resource for the bundle.

The bundle remains disabled until you install a VComp card and activate the bundle again. If you remove the VComp card from a CTP system that has an active VComp bundle, the Run state of the VComp bundle changes to MisCf.

5. Enter the parameters and click **Click to Submit Bundle AND Port Changes**.

Adding a Bundle (CTP Menu)

To add a bundle using the CTP Menu:

1. From the CTP Main Menu, select **1) Bundle Operations**.
2. Select the type of bundle that you want to configure.

Before you create a VComp bundle, you must ensure that the CTP system has a VComp card installed. The CTP system displays a warning message if no VComp card is installed. If you create a VComp bundle on a CTP system that does not have a VComp card installed and try to activate it, the CTP system displays the following warning message:

There is not enough system DSP resource for the bundle.

The bundle remains disabled until you install a VComp card and activate the bundle again. If you remove the VComp card from a CTP system that has an active VComp bundle, the Run state of the VComp bundle changes to MisCfg.

3. Enter **add** to add a new bundle.
4. Select the port you want to attach the bundle to.

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Configuring T1 and E1 Port Parameters for CESoPSN Bundles (CTP Menu)

This topic describes how to configure port parameters for T1/E1 interfaces.

To configure port parameters for T1/E1 interfaces for CESoPSN bundles using the CTP Menu:

1. From the Main Menu, select **1) Bundle Operations**.
2. Select **3) CESoPSN**.
3. Select a bundle from the list.
If you select an active bundle, you are prompted to disable the bundle before configuring it.
4. Select **3) Port Config**.
5. Follow the onscreen instructions, and configure the options as described in [Table 4 on page 15](#).
The options vary depending on whether the bundle is T1 or E1.

NOTE: BITS input is a T1/E1 line interface unit (LIU), with AMI (alternate mark inversion) encoding enabled and B8ZS/HDB3 (Zero Suppression) disabled. The equalization is set for a 0-133 feet cable. An internal 100 ohm termination is present, although it might need to be externally augmented based on the type of cabling used. Any valid AMI signal works properly and it is not restricted to only the "all 1" BITS signal but the ones density must be sufficient to prevent LOS (according to the ITU G.775 recommendation). The TTL input has a slice point of $3.3V/2 = 1.65V$ relative to chassis ground (GND). Therefore, any signal on the coaxial center conductor that transitions through that voltage registers a transition. There are many signals, besides TTL, that satisfy this criteria. An external termination must be provided that matches the impedance of the cable that goes to the BNC connector.

If you can configure the rate in CTP menu, then the TTL supports a frequency of 2048 KHz for the TTL clock input, provided the signal is good and noise-free (terminated properly). TTL is rate-agile, while BITS is restricted to T1/E1 frequencies.

The TTL input is high-impedance (no on-board termination provided) because a variety of cable types might exist that you can use to drive signal to this connector, such as RG-58 coax (50 ohm), RG-59 coax (75 ohm), or twisted pair (100-120 ohm). Instead of applying a particular impedance termination on the board and have it incorrectly done, we recommend that you configure the impedance termination based on your network environment. For example, a 50 ohm termination is needed if you are using RG-58/U coax cable, which has 50 ohm impedance.

Table 4: CESoPSN Bundle T1/E1 Port Parameter Settings in the CTP Menu

Field	Function	Your Action
Port descriptor	Specifies a description for the port.	Enter a description of up to 62 alphanumeric characters. Do not use the following characters: (; ' ")]
Type	Specifies the type of interface. The type of interface that you select affects the default packet size and buffer sizes for the bundle.	Select one: <ul style="list-style-type: none"> • T1 • E1

Table 4: CESoPSN Bundle T1/E1 Port Parameter Settings in the CTP Menu *(Continued)*

Field	Function	Your Action
Option (for T1)	Specifies the T1 encoding method used on this bundle.	Select one: <ul style="list-style-type: none"> • B8ZS • AMI
Option (for E1)	For E1 interfaces, the termination is configured to work with HDB3.	
BuildOut	For T1 interfaces, specifies the line buildout.	Select one: <ul style="list-style-type: none"> • 0) ~133 ft • 1) ~266 ft • 2) ~399 ft • 3) ~533 ft • 4) ~655 ft • 5) -7.5dB CSU • 6) -15dB CSU • 7) -22.5dB CSU
Frame Mode (for T1)	Specifies the frame format to be used for T1 interfaces.	Select one: <ul style="list-style-type: none"> • ESF • D4

Table 4: CESoPSN Bundle T1/E1 Port Parameter Settings in the CTP Menu *(Continued)*

Field	Function	Your Action
Clock synthesizer	<p>The following clock synthesizer settings are set by the software, and you cannot change them:</p> <ul style="list-style-type: none"> • For T1, the clock synthesizer is set to 1544 KHz. • For E1 the clock synthesizer is set to 2048 KHz. 	
Clock Config	Specifies the type of clocking for the port.	<p>Select one:</p> <ul style="list-style-type: none"> • CTP is Clock Source—The PBX either returns the clock received from the CTP or it returns a clock that is traceable to the same source as the CTP node clock reference. You typically use this configuration when you configure the CTP device with a clock reference input. • CTP is Loop Timed—The PBX provides the clock and the CTP returns the same clock to the PBX. You typically use this configuration when the PBX has the more accurate clock source. You can configure the far end of the circuit with adaptive clocking to recover this clock if necessary. • CTP is Clock Source (Adaptive End)—The PBX returns the clock received from the CTP, and the CTP uses the adaptive recovered clock. You typically use this configuration when the CTP does not have a reference input and the PBX typically requires clock from the distant PBX. <p>On CTP150 devices, If you set clocking to CTP is Clock Source (Adaptive End), the first bundle activated on the interface is assigned as the adaptive master bundle on which the transmit clock is adjusted. This bundle is also the last bundle to be deactivated on the interface.</p>

Table 4: CESoPSN Bundle T1/E1 Port Parameter Settings in the CTP Menu *(Continued)*

Field	Function	Your Action
Signal	<p>For T1 interfaces, specifies whether or not CAS signaling is used.</p> <p>E1 interfaces support both CCS and CAS.</p>	<p>For T1 interfaces, select one:</p> <ul style="list-style-type: none"> • On—Signaling is on. • Off—Signaling is off. <p>For E1 interfaces, select one:</p> <ul style="list-style-type: none"> • CCS • CAS

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Configuring Analog Port Parameters for CESoPSN Bundles (CTP Menu)

Starting from CTPOS Release 7.0, you can configure a CESoPSN bundle on CTP2000 devices to transfer voice data between analog ports (FXO, FXS, and 4W) and T1E1 ports. You can configure a maximum of 64 CESoPSN bundles on a CTP2000 device. The maximum number of CESoPSN bundles supported over analog ports is limited to 16 per node.

NOTE: Runtime diagnostics is not supported for CESoPSN bundles configured over analog ports.

To configure port parameters for analog interfaces for CESoPSN bundles by using the CTP Menu:

1. From the Main Menu, select **1) Bundle Operations**.
2. Select **3) CESoPSN**.
3. Select a bundle from the list.

If you select an active bundle, you are prompted to disable the bundle before configuring it.

4. Select **3) Port Config**.
5. Follow onscreen instructions, and configure the options as described in [Table 5 on page 19](#).

Table 5: CESoPSN Bundle Analog Port Parameter Settings on the CTP Menu

Field	Function	Your Action
Voice port Tx gain	Specifies gain in direction from the analog interface toward the IP network	Enter a number from -15 dB through 10.4 dB.
Voice port Rx gain	Specifies gain in direction from the IP network to the analog interface.	Enter a number from -15 dB through 10.4 dB.
Signaling	Specifies the type of analog signaling used.	<p>Select one:</p> <ul style="list-style-type: none"> ground start—Typically used between a central office (CO) and a PBX to prevent glare. Glare occurs when the FXS device establishes a call and the FXO device attempts to make a call before the ring is detected. loop start—Typically used for residential phones.
PLAR	<p>Enables or disables Private line automatic ringdown (PLAR) signaling. PLAR allows you to connect two 2W-FXS interfaces.</p> <p>You must set signaling to loop start before you enable PLAR.</p> <p>For PLAR to work, both ends of the bundle must have PLAR enabled.</p> <p>With PLAR, two handsets are directly connected so that when someone picks up a handset, the handset at the remote end starts to ring. There is no call routing (dialing) involved.</p> <p>To hear a ringback tone, you must enable tone detection for the bundle.</p>	<p>Select one:</p> <ul style="list-style-type: none"> Enabled Disabled

RELATED DOCUMENTATION

Configuring Serial Port Parameters for CESoPSN Bundles (CTP Menu)

This topic describes how to configure port parameters for serial interfaces on CTP150 device.

Before you begin:

- Disable the bundle before you modify the bundle options.

To configure serial port parameters for CESoPSN bundles using the CTP Menu:

1. From the CTP Main Menu, select **1) Bundle Operations**.
2. Select **3) CESoPSN**.
3. Select a bundle from the list.

If you select an active bundle, you are prompted to disable the bundle before configuring it.

4. Select **3) Port Config**.
5. Configure the options as described in [Table 6 on page 20](#).

Table 6: CESoPSN Bundle Serial Port Parameter Settings in the CTP Menu

Field	Function	Your Action
Port descriptor text	Specifies a description for the port.	Enter a description of up to 64 alphanumeric characters. Do not use the following characters: (; ' ")]
Interface	Displays the menu used to configure the interface type, mode, and encoding.	Select 2) Interface and configure interface type, mode and encoding.

Table 6: CESoPSN Bundle Serial Port Parameter Settings in the CTP Menu *(Continued)*

Field	Function	Your Action
Type	Specifies the electrical standard used on the serial interface.	Select one: <ul style="list-style-type: none"> • OFF—Do not set the interface type to OFF. • EIA-530 • EIA-530A • RS-232 • V.35 • Optional Interface: MultiSvc—Not supported.
Mode	Specifies that the interface is connected to a data communication equipment (DCE) device or to a data terminal equipment (DTE) device.	Select one: <ul style="list-style-type: none"> • DCE—The interface is connected to a DCE device. • DTE—The interface is connected to a DTE device.
Encoding	Specifies the serial encoding method used on this bundle. CESoPSN bundles on Serial interfaces support only NRZ encoding. The system displays an error message if you select a different encoding.	Select NRZ (nonreturn to zero line encoding).

Table 6: CESoPSN Bundle Serial Port Parameter Settings in the CTP Menu *(Continued)*

Field	Function	Your Action
Clock Config	Specifies the type of clocking for the port and the port speed.	<p>Select 3) Clock Config. Select 1) Port Clock Config to specify the port clock and 2) Port Speed (kHz) to specify the port speed.</p> <p>You can specify the following clocking methods for NRZ with DCE mode specified:</p> <ul style="list-style-type: none"> • Cfg Rate - Int Clk—Configured rate without external TX clock (TT). The CTP device synthesizes the rate that is used on the ST and RT outputs to the attached device. The ST is used to sample Send Data from the attached DTE. The clock is created by the CTP DDS circuitry and logic. This option is commonly used on circuits that are less than 1 Mbps. • Cfg Rate - Ext Clk—Configured rate with external TX clock (TT). The CTP device synthesizes the rate that is used on the ST and RT outputs to the attached device. The clock is created by the DDS circuitry and logic. This option is used to sample Send Data from the attached device. It assumes that the attached device is using ST or clock reference that is traceable to CTP reference. It is typically used for higher data rates (>1 Mbps) and long cables.

Table 6: CESoPSN Bundle Serial Port Parameter Settings in the CTP Menu *(Continued)*

Field	Function	Your Action
		<ul style="list-style-type: none"> • All Clock - Ext Clk—All clocked with external TX clock (TT). The CTP clock uses the external TT timing from the DTE for all clocking. Ext TT is used to sample Send Data from the attached device, to generate the RT clock, and to clock data into the IP network. • Adap Rate - Ext Clk—Adaptive clocking with the external TX clock (TT). • Adap Rate - Int Clk—Adaptive clocking with the internal clock.
Port Clock Config	Specifies the clocking for the port.	Specify the clocking method.
Port Speed	<p>Specifies the port speed. The port speed must be entered in multiples of 64 Kbps</p> <p>In networks without bandwidth constraints, we recommend a multiple of 64.</p>	Enter a number from 64.00 through 2048.00 KHz.

Table 6: CESoPSN Bundle Serial Port Parameter Settings in the CTP Menu *(Continued)*

Field	Function	Your Action
Only High TT Checking	<p>Specifies that the CTP device disqualifies transmit timing (TT) only when it is higher than the port speed.</p> <p>When enabled, this setting keeps the port from going to the TtFail state when the incoming user clock fluctuates between 0 and the configured port rate. If the TT rate goes above the configured port rate, the CTP device sends the port to the TtFail state to protect the system from an overspeed TT, which would cause problems for the port, CTP device, or network.</p>	Specify y or n .

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Configuring DS0 Time Slots for CESoPSN Bundles (CTP Menu)

This topic describes how to configure the DS0 time slots used by the bundle. By default, all unused DS0s are attached to a bundle. An unused DS0 is a DS0 not assigned to another bundle.

To configure time slots for CESoPSN bundles using the CTP Menu:

1. From the Main Menu, select **1) Bundle Operations**.
2. Select **3) CESoPSN**.
3. Select a bundle from the list.

If you select an active bundle, you are prompted to disable the bundle before configuring it.

4. Select **2) Config** to configure the bundle.
5. Configure the options as described in [Table 7 on page 25](#).

Table 7: CESoPSN Bundle DS0 Time Slot Settings in the CTP Menu

Field	Function	Your Action
Time Slots	<p>Specifies the time slots assigned to this bundle.</p> <p>The number of time slots that you select affects the default packet size and packet buffer set size for the bundle.</p>	<p>Enter the number of the time slots that you want to configure for the bundle.</p> <ul style="list-style-type: none"> To enter a list of time slots, separate the list with commas. To enter a range of time slots, separate the range with a hyphen (-).

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[Configuring IP Parameters for CESoPSN Bundles on CTP2000 Devices \(CTP Menu\) | 25](#)

Configuring IP Parameters for CESoPSN Bundles on CTP2000 Devices (CTP Menu)

The CTP software uses the IP parameters to create IP packets.

To configure IP parameters for CESoPSN bundles using the CTP Menu:

1. From the Main Menu, select **1) Bundle Operations**.
2. Select **3) CESoPSN**.
3. Select a bundle from the list.

If you select an active bundle, you are prompted to disable the bundle before configuring it.

4. Select **2) Config** to configure the bundle.
5. Configure the options as described in [Table 8 on page 26](#).

Table 8: CESoPSN Bundle IP Parameter Settings on CTP2000 Devices in the CTP Menu

Field	Function	Your Action
Destination IP	Specifies the name and IP address of the remote CTP device.	Enter the address of the remote CTP device.
Source UDP port	<p>Specifies the source UDP port.</p> <p>The source UDP port is used as the circuit identifier; you must configure both circuit endpoints to use the same UDP port. The UDP port must be unique on the CTP device. You will not be able to activate a port if another port is using the same source UDP port number.</p>	Enter a number from 1 through 65535.
Hairpin Rem UDP port	A hairpin allows the creation of a pair of CESoPSN bundles on the same port or different ports with the IP address of the node as remote IP.	<p>Enter the source UDP port number of the remote CESoPSN hairpin bundle on the same CTP2000 device.</p> <p>A value of '0' implies that this bundle is not configured as a hairpin bundle.</p>

Table 8: CESoPSN Bundle IP Parameter Settings on CTP2000 Devices in the CTP Menu *(Continued)*

Field	Function	Your Action
Max Buffer (ms)	<p>Specifies the maximum buffer size.</p> <p>The maximum buffer size setting is based on the number of packets in the buffer and the number of milliseconds that it takes the packets to go through the buffer. For example, a setting of 10.000 ms - 2 packets means that it will take 10 ms for 2 packets to go through the buffer.</p> <p>We recommend that you use the default setting unless you require changes because of network performance.</p>	<p>Select a buffer size. The software displays a list of possible buffer sizes. The list varies depending on the type of interface (T1 or E1), and the type of signaling (CCS or CAS).</p> <p>For example, the following are the available buffer sizes for an E1 interface with CCS signaling:</p> <ul style="list-style-type: none"> • 10.000 ms 2 packets • 20.000 ms 4 packets • 40.000 ms 8 packets • 80.000 ms 16 packets • 160.000 ms 32 packets • 320.000 ms 64 packets • 640.000 ms 128 packets
Pkt Buffer Set (ms)	<p>Specifies the buffer size when the circuit enters a running state.</p> <p>The CTP software calculates a default setting based on the type of interface (T1 or E1), the type of signaling (CCS or CAS), and the packet size.</p> <p>We recommend that you use the default setting unless you require changes because of network performance.</p>	<p>Enter a number from the range displayed on the screen.</p> <p>This number must be divisible by the packet size. If you enter a number that is not divisible by the packet size, the software changes the setting to the closest number that is divisible by the packet size.</p>

Table 8: CESoPSN Bundle IP Parameter Settings on CTP2000 Devices in the CTP Menu *(Continued)*

Field	Function	Your Action
Packet Size	<p>Specifies the size of IP packets that are created from data received at the port.</p> <p>The CTP software calculates a default packet size based on the number of time slots configured, the type of interface (T1 or E1), and the type of signaling (CCS or CAS).</p> <p>We recommend that you use the default setting unless you require changes because of network performance.</p> <p>If you choose to change the signaling, use the following guidelines:</p> <ul style="list-style-type: none"> For CCS signaling, the packet size must be divisible by the number of timeslots in case of E1-CCS and T1-signal - OFF. For CAS signaling, use the following formula: $\text{packet size} = \text{number-of-slots} * \text{frames-per-packet} + \text{signaling-size}$ <p>where</p> $\text{signaling-size} = \text{number-of-slots}/2 + \text{number-of-slots}\%2$ <p>frames-per-packet for E1 = 16</p> <p>frames-per-packet for T1 = 24</p>	Enter a packet size.
Service Type	<p>Specifies the ToS byte to be used in the IP headers of packets sent from the CTP device to the IP network.</p> <p>For a mapping of ToS byte values to DSCP classes and settings, see "Providing QoS for CTP Bundles by Using Service Type Overview" on page 8.</p> <p>You do not need to set the ToS value to the same value on local and remote bundles.</p>	Enter a number from 0 through 255.

Table 8: CESoPSN Bundle IP Parameter Settings on CTP2000 Devices in the CTP Menu *(Continued)*

Field	Function	Your Action
Time to Live	Specifies the maximum number of router hops that a packet can traverse. The CTP device sets the TTL value in IP packets that it sends to the IP network. The IP network does not alter or optimize the packet routing based on the TTL setting. You do not need to set the same TTL value on local and remote ports.	Enter a number from 0 through 255.
Bundle Description	Specifies identifying information about the bundle.	Type a description for the bundle.
Signal Disable	Disables or enables signalling at the bundle level for T1/E1 ports.	Select one: <ul style="list-style-type: none"> • Yes • No

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Configuring IP Parameters for CESoPSN Bundles on CTP150 Devices (CTP Menu)

The CTP software uses the IP parameters to create IP packets.

Default buffer settings for CESoPSN bundles on CTP150 devices are calculated as follows:

- If the packet size is less than 3 ms of payload, set the buffers as follows:
 - Minimum buffer=8 ms
 - Maximum buffer=16 ms
 - Packet buffer set=12 ms
- If the packet size is greater than 3 ms of payload, set the buffers as follows:

- Minimum buffer=1 (packet time)
- Maximum buffer=2 (packet time)
- Packet buffer set=3 (packet time)

For example, if the packet size is 80 bytes with one channel in the bundle and signaling is off, one packet time is calculated as:

$$80/8=10 \text{ ms}$$

To configure IP parameters for CESoPSN bundles using the CTP Menu:

1. From the Main Menu, select **1) Bundle Operations**.
2. Select **3) CESoPSN**.
3. Select a bundle from the list.

If you select an active bundle, you are prompted to disable the bundle before configuring it.

4. Select **2) Config** to configure the bundle.
5. Configure the options as described in [Table 9 on page 30](#).

Table 9: CESoPSN Bundle IP Parameter Settings on CTP150 Devices in the CTP Menu

Field	Function	Your Action
Destination IP	Specifies the name and IP address of the remote CTP device.	Enter the address of the remote CTP device.
Source UDP port	Specifies the source UDP port. The source UDP port is used as the circuit identifier; you must configure both circuit endpoints to use the same UDP port. The UDP port must be unique on the CTP device. You will not be able to activate a port if another port is using the same source UDP port number.	Enter a number from 1 through 65535.
Min Buffer (ms)	Specifies the minimum buffer size. We recommend that you use the default setting unless you require changes because of network performance.	Enter the number of milliseconds. The number that you can enter varies depending on the type of interface and signaling.

Table 9: CESoPSN Bundle IP Parameter Settings on CTP150 Devices in the CTP Menu *(Continued)*

Field	Function	Your Action
Max Buffer (ms)	<p>Specifies the maximum buffer size.</p> <p>We recommend that you use the default setting unless you require changes because of network performance.</p>	Enter the number of milliseconds. The number that you can enter varies depending on the type of interface and signaling.
Pkt Buffer Set (ms)	<p>Specifies the buffer size when the circuit enters a running state (the start buffer fill).</p> <p>We recommend that you use the default setting unless you require changes because of network performance.</p>	Enter the number of milliseconds. The number that you can enter varies depending on the type of interface and signaling.

Table 9: CESoPSN Bundle IP Parameter Settings on CTP150 Devices in the CTP Menu *(Continued)*

Field	Function	Your Action
Packet Size	<p>Specifies the size of IP packets that is created from data received at the port.</p> <p>The CTP software calculates a default packet size based on the number of time slots configured, the type of interface (T1 or E1), and the type of signaling (CCS or CAS).</p> <p>We recommend that you use the default setting unless you require changes because of network performance.</p> <p>If you choose to change the signaling, use the following guidelines:</p> <ul style="list-style-type: none"> For CCS signaling, the packet size must be divisible by the number of time slots. For CAS signaling, use the following formula: $\text{packet size} = \text{number-of-slots} * \text{frames-per-packet} + \text{signaling-size}$ <p>where</p> $\text{signaling-size} = \text{number-of-slots}/2 + \text{number-of-slots}\%2$ <p>frames-per-packet for E1 = 16</p> <p>frames-per-packet for T1 = 24</p>	Enter a packet size.
Service Type	<p>Specifies the ToS byte to be used in the IP headers of packets sent from the CTP device to the IP network.</p> <p>For a mapping of ToS byte values to DSCP classes and settings, see "Providing QoS for CTP Bundles by Using Service Type Overview" on page 8.</p> <p>You do not need to set the ToS value to the same value on local and remote bundles.</p>	Enter a number from 0 through 255.

Table 9: CESoPSN Bundle IP Parameter Settings on CTP150 Devices in the CTP Menu *(Continued)*

Field	Function	Your Action
Time to Live	Specifies the maximum number of router hops that a packet can traverse. The CTP device sets the TTL value in IP packets that it sends to the IP network. The IP network does not alter or optimize the packet routing based on the TTL setting. You do not need to set the same TTL value on local and remote ports.	Enter a number from 0 through 255.
Bundle Description	Specifies identifying information about the bundle.	Type a description for the bundle.
Signal Disable	Disables or enables signalling at the bundle level for T1/E1 ports.	Select one: <ul style="list-style-type: none"> • Yes • No

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Configuring Virtual IP Parameters for CESoPSN Bundles (CTP Menu)

The virtual IP parameters allow you to use a separate IP address for each bundle and to use an address that is different from the IP address for the CTP device. If you configure the IP address on the:

- Same subnet as the CTP IP address, you do not need a static route on the router.
- Different subnet as the CTP IP address, you need a static route on the router.

Before you begin:

- Create a list of the virtual IP addresses that will be associated with the CTP device. To do so, from the main menu select **Node Operations > Configure network settings > Virtual IP addresses**, and follow the onscreen instructions. You can create up to 100 virtual IP addresses (IPv4 only).

When you submit your new configuration, the CTP device reboots.

To configure virtual IP parameters for CESoPSN bundles using the CTP Menu:

1. From the Main Menu, select **1) Bundle Operations**.
2. Select **3) CESoPSN**.
3. Select a bundle from the list.

If you select an active bundle, you are prompted to disable the bundle before configuring it.

4. Select **2) Config**.
5. Select **10) Advanced Options**.
6. Configure the options as described in [Table 10 on page 34](#).

Table 10: CESoPSN Bundle Virtual IP Parameter Settings in the CTP Menu

Field	Function	Your Action
Use virtual ip for port	Specifies whether or not the bundle uses an address that is different from the IP address of the CTP device. The virtual IP address is used in the IP packet's Origination Address field, and is used for the circuit's data and OAM flow.	Select one: <ul style="list-style-type: none"> n (no)—Circuits created by this bundle use the IP address of the CTP device. y (yes)—Circuits created by this bundle use an address that is different from the CTP device.
Virtual ip for port	Specifies the virtual IP address for circuits created by this bundle.	Select an IP address from the list displayed. At the remote end of the bundle, specify this IP address as the Remote Address of the bundle.

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Configuring the Missing Packet Fill Pattern for CESoPSN Bundles on CTP150 Devices (CTP Menu)

To configure the missing packet fill pattern for CESoPSN bundles using the CTP Menu:

1. From the Main Menu, select **1) Bundle Operations**.
2. Select **3) CESoPSN**.
3. Select a bundle from the list.

If you select an active bundle, you are prompted to disable the bundle before configuring it.

4. Select **2) Config.**
5. Select **10) Advanced Options.**
6. Configure option **3) Missing pkt fill pattern** as described in [Table 11 on page 35](#).

Table 11: CESoPSN Bundle Missing Packet Fill Pattern Parameter Setting in the CTP Menu

Field	Function	Your Action
Missing pkt fill pattern	<p>Specifies the data that the CTP device inserts into the circuit bit stream when an IP packet is dropped. The number of bits inserted is equal to the number of bits in the missed packet.</p> <p>This data insertion method prevents a loss of bit count integrity to attached circuit devices and encryptors.</p>	<p>Enter two hexadecimal digits. You must enter a value other than ff. This field does not require the 0x characters.</p>

Configuring Circuit Restart Parameters for CESoPSN Bundles on CTP150 Devices (CTP Menu)

This topic describes how to configure advanced options that are related to circuit restart. Set these parameters to the same values on the local and remote CTP devices.

To configure circuit restart parameters using the CTP Menu:

1. From the Main Menu, select **1) Bundle Operations**.
2. Select **3) CESoPSN**.
3. Select a bundle from the list.

If you select an active bundle, you are prompted to disable the bundle before configuring it.

4. Select **2) Config.**
5. Select **10) Advanced Options.**
6. Configure the options as described in [Table 12 on page 36](#).

Table 12: CESoPSN Bundle Advanced Options Parameter Settings for Circuit Startup in the CTP Menu

Field	Function	Your Action
Consecutive pkts loss to starve	Specifies how many consecutive circuit packets the IP network must drop before the CTP device restarts the circuit. We recommend that you set the parameter to a larger value when the IP network uses packet-encrypting devices. These devices cause momentary interruption in packet flows when encryption keys are updated.	Enter a number from 1 through 64.
In sequence pkts after starve	Specifies the number of in-sequence packets the CTP device must receive after a starvation before the circuit transitions from in-sync to running.	Enter a number from 1 through 64.

Configuring UDP Source and Destination Port Matching for CESoPSN Bundles (CTP Menu)

The UDP source and destination port matching feature allows the CTP to use a CESoPSN packet format which is compatible with third-party vendor equipment.

The CESoPSN standard supports multiple packet formats. When this feature is disabled for CTP CESoPSN bundles, the supported CESoPSN packet format uses a fixed destination UDP port of 2142, and a user-selected source UDP port is in the range from 1 through 65535 (0x1 through 0xFFFF).

When this feature is enabled, the packet format changes so that both the source and destination UDP ports use the same user-selected value that is restricted to the range from 49152 through 65535 (0xC000 through 0xFFFF). If the existing configured bundle source UDP port (with this feature flag set) is not within the valid range, then both the source and destination UDP ports will automatically be modified to a default value of 49152 (0xC000). CESoPSN bundles between CTPs will not function properly unless this feature flag is set identically at both ends of the bundle.

To enable the configured source UDP port to be used for both the source and the destination for CESoPSN bundles:

1. From the Main Menu, select **1) Bundle Operations**.
2. Select **3) CESoPSN**.
3. Select a bundle from the list.

If you select an active bundle, you are prompted to disable the bundle before configuring it.

4. Select **2) Config.**
5. Select **11) Advanced Options.**
6. Configure option **14) UDP src / dst port matching** as described in [Table 13 on page 37](#).

Table 13: CESoPSN Bundle UDP Source and Destination Port Matching in the CTP Menu

Field	Function	Your Action
UDP src / dst port matching	<p>Enables you to use the configured source UDP port for both the source and the destination.</p> <p>The configured source UDP port number must be in the range from 49152 through 65535 while enabling this option. If not, the CTP system displays the following warning message and the source UDP port will be set to the default value 49152.</p> <p>Source UDP Port not in the range 49152-65535. Please re-configure Source UDP Port. Setting the Source UDP Port to default value 49152.</p>	<p>Select one:</p> <ul style="list-style-type: none"> • Yes • No <p>Default value is No.</p>

Configuring Multiservice 4WTO Mode Port Parameters for CESoPSN Bundles on CTP150 and CTP151 Devices (CTP Menu)

Before you begin:

- Disable the CESoPSN bundle before you modify the bundle options.

NOTE: CESoPSN bundle on multiservice 4WTO mode is supported only on CTP150 and CTP151 devices.

To configure Multiservice 4WTO mode port parameters using the CTP Menu:

1. From the CTP Main Menu, select **1) Bundle Operations**.
2. Select **3) CESoPSN**.
3. Select a CESoPSN bundle from the list. The bundle port must have a 4WTO daughter card installed.
If you select an active bundle, you are prompted to disable the bundle before configuring it.
4. Select **3) Port Config**.
5. Select **2) Interface**.

6. Select **1) Type** and set the type to **Optional Interface: MultiSvc**.

7. Configure the options as described in [Table 14 on page 38](#).

Table 14: CESoPSN Bundle Multiservice 4WTO Port Parameter Settings in the CTP Menu

Field	Function	Your Action
Mode	Specifies that the CESoPSN bundle will run in 4WTO mode.	Select 4WTO-Em.
Primary/Backup	Specifies whether this end of the circuit provides clocking or uses adaptive clocking. If the CTP devices at both ends of the circuit are synchronized, you can configure both ends as Primary.	Select one: <ul style="list-style-type: none"> • Primary—This end of the circuit provides clocking. • Backup—This end of the circuit uses adaptive clocking.
Dual Channel	Two channels are supported—channel 0 and channel 1. Enables or disables the use of both channels.	Select one: <ul style="list-style-type: none"> • Disable—Channel 0 is the only active channel. • Enable—Both channel 0 and channel 1 are active.
Talk Squelch	Enables or disables the active squelch function on the circuit. If enabled, specifies whether the squelch is active or inactive. The squelch function gates local audio output when DSR-A (channel 0) or RTS-A (channel 1) inputs are active or inactive.	Select one: <ul style="list-style-type: none"> • Disable—Disables the active squelch function on the circuit. • Enable and active—Squelch input is grounded and analog output is disabled. • Enable and inactive—No signal is applied to the squelch input. Input is open and analog output is possible.

Table 14: CESoPSN Bundle Multiservice 4WTO Port Parameter Settings in the CTP Menu *(Continued)*

Field	Function	Your Action
Ch 0 Output Level: 1.00x (decimal 128)	<p>Specifies the output level for channel 0.</p> <p>Note the following information about the values:</p> <ul style="list-style-type: none"> • 0—There is no output. • 128—Unity gain, which means there is no attenuation or gain. • 255—Gain is 2:1. 	Enter a number from 0 through 255.
Ch 1 Output Level: 1.00x (decimal 128)	<p>Specifies the output level for channel 1.</p> <p>Note the following information about the values:</p> <ul style="list-style-type: none"> • 0—There is no output. • 128—Unity gain, which means there is no attenuation or gain. • 255—Gain is 2:1. 	Enter a number from 0 through 255.

Table 14: CESoPSN Bundle Multiservice 4WTO Port Parameter Settings in the CTP Menu *(Continued)*

Field	Function	Your Action
+10 dB Input gain	<p>Activates a 10 dB gain on Audio input.</p> <p>NOTE: This works only on CESoPSN bundles and has no effect on a CTP bundle.</p>	<p>Select one:</p> <ul style="list-style-type: none"> • Disabled—Disables a 10 dB gain on input. • Enabled—Enables a 10 dB gain on input. <p>Default value is Disabled. 20) +10 dB Input gain: Disabled</p> <p>To Enable:</p> <p>1. Select Your choice [0]:20</p> <p>You will be presented with a choice: Please select a number from the following list: ----- ----- 0) Disabled 1) Enabled ----- Your choice [0]:</p> <p>2. Select 1</p> <p>It now reflects as: 20) +10 dB Input gain: Enabled</p>

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| *Serial Multiservice Interface Module Overview*

Configuring CESoPSN Bundles (CTPView)

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Configuring T1 and E1 Port Parameters for CESoPSN Bundles (CTPView)

This topic describes how to configure port parameters for T1/E1 interfaces.

Before you begin:

- Log in to the CTPView software at least at the Net_Admin level.
- Connect the CTPView server to the CTP device for which you want to configure bundles.

To configure T1 and E1 port parameters using CTPView:

1. In the side pane, select **Bundle > Configuration**.
2. Run your mouse over the **Display and Select an Existing Bundle** bar.
3. In the table of bundles, select the bundle that you want to modify.
4. Under **Port Options**, configure the parameters described in [Table 15 on page 42](#).

The options vary depending on whether the bundle is T1 or E1.

5. Click **Click to Submit Bundle AND Port Changes**.

Table 15: CESoPSN Bundle T1 and E1 Port Parameter Settings in CTPView

Field	Function	Your Action
Port Description	Specifies a description for the port.	Enter a description of up to 62 alphanumeric characters. Do not use the following characters: (; ' ")]
T1/E1 Choice	Specifies the type of interface. The type of interface that you select affects the default packet size and buffer sizes for the bundle.	Select one: <ul style="list-style-type: none"> • T1 • E1
T1 Line Coding	For T1 interfaces, specifies the T1 encoding method used on this bundle.	Select one: <ul style="list-style-type: none"> • B8ZS • AMI
E1 Connector Type	For E1 interfaces, the termination is configured to work with HDB3.	

Table 15: CESoPSN Bundle T1 and E1 Port Parameter Settings in CTPView *(Continued)*

Field	Function	Your Action
Line Buildout	For T1 interfaces, specifies the line buildout.	Select one: <ul style="list-style-type: none"> • ~133 ft • ~266 ft • ~399 ft • ~533 ft • ~655 ft • -7.5dB CSU • -15dB CSU • -22.5dBCSU
Frame Mode (for T1)	Specifies the frame format to be used for T1 interfaces.	Select one: <ul style="list-style-type: none"> • ESF • D4
Signaling	For T1 interfaces, specifies whether or not CAS signaling is used. E1 interfaces support both CCS and CAS.	For T1 interfaces, select one: <ul style="list-style-type: none"> • On—Signaling is on. • Off—Signaling is off. For E1 interfaces, select one: <ul style="list-style-type: none"> • CCS • CAS

Table 15: CESoPSN Bundle T1 and E1 Port Parameter Settings in CTPView *(Continued)*

Field	Function	Your Action
Clock Cfg	Specifies the type of clocking for the port.	<p>Select one:</p> <ul style="list-style-type: none"> • CTP is Clock Source—The PBX either returns the clock received from the CTP or it returns a clock that is traceable to the same source as the CTP node clock reference. You typically use this configuration when you configure the CTP device with a clock reference input. • CTP is Looped Timed—The PBX provides the clock and the CTP returns the same clock to the PBX. You typically use this configuration when the PBX has the more accurate clock source. You can configure the far end of the circuit with adaptive clocking to recover this clock if necessary. • CTP is Clock Source – Adap—The PBX returns the clock received from the CTP, and the CTP uses the adaptive recovered clock. You typically use this configuration when the CTP does not have a reference input and the PBX typically requires clock from the distant PBX. <p>On CTP150 devices, If you set clocking to CTP is Clock Source – Adap, the first bundle activated on the interface is assigned as the adaptive master bundle on which the transmit clock is adjusted. This bundle is also the last bundle to be deactivated on the interface.</p>

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Configuring Analog Port Parameters for CESoPSN Bundles (CTPView)

Starting from CTPView Release 7.0, you can configure CESoPSN bundles on CTP2000 devices to transfer voice data between analog ports (FXO, FXS, and 4W) and T1E1 ports. You can configure a maximum of 64 CESoPSN bundles on a CTP2000 device. The maximum number of CESoPSN bundles supported over analog ports is limited to 16 per node.

NOTE: Runtime diagnostics is not supported for CESoPSN bundles configured over analog port.

Before you begin:

1. Log in to the CTPView software with at least the Net_Admin level.
2. Connect the CTPView server to the CTP device for which you want to configure bundles.

To configure analog port parameters by using CTPView:

1. From the side pane, select **Bundle > Configuration**.
2. Mouse over the **Display and Select an Existing Bundle** bar.
3. From the table of bundles, select the bundle that you want to modify.
4. Under **Port Options**, configure the parameters described in [Table 16 on page 45](#).

The options vary depending on whether the bundle is T1 or E1.

5. Click **Click to Submit Bundle AND Port Changes**.

Table 16: Analog Port Parameter Settings for CESoPSN Bundle (CTPView)

Field	Function	Your Action
Voice Port Tx Gain	Specifies gain in direction from the analog interface toward the IP network.	Select a dB value from the list.
Voice Port Rx Gain	Specifies gain in direction from the IP network to the analog interface.	Select a dB value from the list.

Table 16: Analog Port Parameter Settings for CESoPSN Bundle (CTPView) *(Continued)*

Field	Function	Your Action
Voice Port Signalling	Specifies the type of analog signaling used.	<p>Select one:</p> <ul style="list-style-type: none"> ground start—Typically used between a central office (CO) and a PBX to prevent glare. Glare occurs when the FXS device establishes a call and the FXO device attempts to make a call before the ring is detected. loop start—Typically used for residential phones
Voice Port PLAR	<p>Enables or disables Private line automatic ringdown (PLAR) signaling. PLAR allows you to connect two 2W-FXS interfaces.</p> <p>You must set signaling to loop start before you enable PLAR.</p> <p>For PLAR to work, both ends of the bundle must have PLAR enabled.</p> <p>With PLAR, two handsets are directly connected so that when someone picks up a handset, the handset at the remote end starts to ring. There is no call routing (dialing) involved.</p> <p>To hear a ringback tone, you must enable tone detection for the bundle.</p>	<p>Select one:</p> <ul style="list-style-type: none"> Disabled Enabled

Table 16: Analog Port Parameter Settings for CESoPSN Bundle (CTPView) *(Continued)*

Field	Function	Your Action
Companding	<p>Specifies the pulsecode modulation (PCM) encoding standard used on the port PCM input to the VComp bundle.</p> <p>When a CESoPSN bundle is built with:</p> <ul style="list-style-type: none"> Analog voice interfaces, this configuration is applied on both the analog voice port and the voice compression module, so there are no compatibility issues. T1/E1 channels, set companding to match the type of companding that is used for the external connecting equipment. <p>Generally, mu-law is used in the US and a-law is used in Europe and elsewhere.</p>	<p>Select one:</p> <ul style="list-style-type: none"> Mu-law—Generally used in the United States A-law—Generally used in Europe and elsewhere

RELATED DOCUMENTATION

[Configuring Analog Port Parameters for CESoPSN Bundles \(CTP Menu\) | 18](#)

Displaying the Running CTP Bundle Configuration, State, and Counters (CTP Menu)

Configuring Serial Port Parameters for CESoPSN Bundles (CTPView)

This topic describes how to configure port parameters for serial interfaces on CTP150 devices.

Before you begin:

- Log in to the CTPView software at least at the Net_Admin level.
- Connect the CTPView server to the CTP device for which you want to configure bundles.

To configure serial port parameters using CTPView:

- In the side pane, select **Bundle > Configuration**.
- Run your mouse over the **Display and Select an Existing Bundle** bar.

3. In the table of bundles, select the bundle that you want to modify. To create a new CESoPSN bundle, run your mouse over the **Open Add Bundles Display** bar, select a serial port, and click **CESoPSN**.
4. Under **Port Options**, configure the parameters described in [Table 17 on page 48](#).
5. Click **Click to Submit Bundle AND Port Changes**.

Table 17: CESoPSN Bundle Serial Port Parameter Settings in CTPView

Field	Function	Your Action
Port Description	Specifies a description for the port.	Enter a description of up to 62 alphanumeric characters. Do not use the following characters: (; ' ")]
I/F Mode	Specifies that the interface is connected to a data communication equipment (DCE) device or to a data terminal equipment (DTE) device.	Select one: <ul style="list-style-type: none"> • DCE—The interface is connected to a DCE device. • DTE—The interface is connected to a DTE device.
Serial Encoding	Specifies the serial encoding method used on this bundle. CESoPSN bundles on serial interfaces only support NRZ encoding.	Select NRZ (nonreturn to zero line encoding).
I/F Type	Specifies the electrical standard used on the serial interface.	Select one: <ul style="list-style-type: none"> • EIA-530 • EIA-530A • RS-232 • V-35 • OFF—Do not set the interface type to OFF.

Table 17: CESoPSN Bundle Serial Port Parameter Settings in CTPView *(Continued)*

Field	Function	Your Action
Port Speed	Specifies the speed of the port. In networks without bandwidth constraints, we recommend a multiple of 64.	Enter a number from 64.00 through 2048.00 kHz.
Clock Cfg	Specifies the clocking method.	<p>You can specify the following clocking methods for NRZ with DCE mode specified:</p> <ul style="list-style-type: none"> • Cfg Rate - Int Clk—Configured rate without external TX clock (TT). The CTP device synthesizes the rate that is used on the ST and RT outputs to the attached device. The ST is used to sample Send Data from the attached DTE. The clock is created by the CTP DDS circuitry and logic. This option is commonly used on circuits that are less than 1 Mbps. • Cfg Rate - Ext Clk—Configured rate with external TX clock (TT). The CTP device synthesizes the rate that is used on the ST and RT outputs to the attached device. The clock is created by the DDS circuitry and logic. This option is used to sample Send Data from the attached device. It assumes that the attached device is using ST or clock reference that is traceable to CTP reference. It is typically used for higher data rates (>1 Mbps) and long cables. • All Clock - Ext Clk—All clocked with external TX clock (TT). The CTP clock uses the external TT timing from the DTE for all clocking. Ext TT is used to sample Send Data from the attached device, to generate the RT clock, and to clock data into the IP network. • Adap Rate - Ext Clk—Adaptive clocking with the external TX clock (TT). • Adap Rate - Int Clk—Adaptive clocking with the internal clock.

Table 17: CESoPSN Bundle Serial Port Parameter Settings in CTPView *(Continued)*

Field	Function	Your Action
Only High TT Checking	<p>Specifies that the CTP device disqualifies transmit timing (TT) only when it is higher than the port speed.</p> <p>When enabled, this setting keeps the port from going to the TtFail state when the incoming user clock fluctuates between 0 and the configured port rate. If the TT rate goes above the configured port rate, the CTP device sends the port to the TtFail state to protect the system from an overspeed TT, which would cause problems for the port, CTP device, or network.</p>	Select ENABLED or DISABLED.

RELATED DOCUMENTATION

| [Configuring Serial Port Parameters for CESoPSN Bundles \(CTP Menu\)](#) | 20

Configuring DS0 Time Slots for CESoPSN Bundles (CTPView)

This topic describes how to configure the DS0 time slots used by the bundle. By default, all unused DS0s are attached to a bundle. An unused DS0 is a DS0 not assigned to another bundle.

Before you begin:

- Log in to the CTPView software at least at the Net_Admin level.
- Connect the CTPView server to the CTP device for which you want to configure bundles.

To configure time slots for CESoPSN bundles using CTPView:

1. In the side pane, select **Bundle > Configuration**.
2. Run your mouse over the **Display and Select an Existing Bundle** bar.
3. In the table of bundles, select the bundle that you want to modify.

4. Under **Bundle Options**, configure the parameters described in [Table 18 on page 51](#), and click **Click to Submit Bundle AND Port Changes**.

Table 18: CESoPSN Bundle DS0 Time Slot Settings in CTPView

Field	Function	Your Action
Time Slots [Selected are green.]	<p>Specifies the time slots that are assigned to the bundle.</p> <p>The number of time slots that you select affects the default packet size and packet buffer set size for the bundle.</p>	Click on a time slot to select it for the bundle. Green time slots are selected. Gray time slots are not selected.

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Configuring IP Parameters for CESoPSN Bundles on CTP2000 Devices (CTPView) 51

Configuring IP Parameters for CESoPSN Bundles on CTP2000 Devices (CTPView)

The CTP software uses the IP parameters to create IP packets.

Before you begin:

- Log in to the CTPView software at least at the Net_Admin level.
- Connect the CTPView server to the CTP device for which you want to configure bundles.

To configure IP parameters for CESoPSN bundles using CTPView:

1. In the side pane, select **Bundle > Configuration**.
2. Run your mouse over the **Display and Select an Existing Bundle** bar.
3. In the table of bundles, select the bundle that you want to modify.
4. Under **Bundle Options**, configure the parameters described in [Table 19 on page 52](#), and click **Click to Submit Bundle AND Port Changes**.

Table 19: CESoPSN Bundle IP Parameter Settings on CTP2000 Devices in CTPView

Field	Function	Your Action
Bundle Description	Specifies identifying information about the bundle.	Type a description for the bundle.
State	Specifies whether the bundle is active or disabled.	<p>Select DISABLED or ACTIVE.</p> <p>After the bundle is activated, the bundle transitions to RUNNING or InSYNC state.</p>
Remote Address	Specifies the name and IP address of the remote CTP device.	<p>In the first field, select the CTP device.</p> <p>In the second field, select an interface on the CTP device.</p>

Table 19: CESoPSN Bundle IP Parameter Settings on CTP2000 Devices in CTPView *(Continued)*

Field	Function	Your Action
Packet Size	<p>Specifies the size of IP packets that are created from data received at the port.</p> <p>The CTP software calculates a default packet size based on the number of time slots configured, the type of interface (T1 or E1), and the type of signaling (CCS or CAS).</p> <p>We recommend that you use the default setting unless you require changes because of network performance.</p> <p>If you choose to change the signaling, use the following guidelines:</p> <ul style="list-style-type: none"> For CCS signaling, the packet size must be divisible by the number of timeslots in case of E1-CCS and T1-signal - OFF. For CAS signaling, use the following formula: $\text{packet size} = \text{number-of-slots} * \text{frames-per-packet} + \text{signaling-size}$ <p>where</p> $\text{signaling-size} = \text{number-of-slots}/2 + \text{number-of-slots} \% 2$ <p>frames-per-packet for E1 = 16</p> <p>frames-per-packet for T1 = 24</p>	Enter a packet size.

Table 19: CESoPSN Bundle IP Parameter Settings on CTP2000 Devices in CTPView *(Continued)*

Field	Function	Your Action
Service Type	<p>Specifies the ToS byte to be used in the IP headers of packets sent from the CTP device to the IP network.</p> <p>For a mapping of ToS byte values to DSCP classes and settings, see "Providing QoS for CTP Bundles by Using Service Type Overview" on page 8.</p> <p>You do not need to set the ToS value to the same value on local and remote bundles.</p>	Enter a number from 0 through 255.
Time to Live	<p>Specifies the maximum number of router hops that a packet can traverse. The CTP device sets the TTL value in IP packets that it sends to the IP network. Based on the TTL setting, the IP network does not alter or optimize the packet routing. You do not need to set the same TTL value on local and remote ports.</p>	Enter a number from 0 through 255.
Source UDP Port	<p>Specifies the source UDP port.</p> <p>The source UDP port is used as the circuit identifier; you must configure both circuit endpoints to use the same UDP port. The UDP port must be unique on the CTP device. You will not be able to activate a port if another port is using the same source UDP port number.</p>	Enter a number from 1 through 65535.
Hairpin Rem UDP port	<p>A hairpin bundle allows the creation of a pair of CESoPSN bundles on the same port or different ports with the IP address of the node as remote IP.</p>	<p>Enter the source UDP port number of the remote CESoPSN hairpin bundle on the same CTP2000 device.</p> <p>A value of '0' implies that this bundle is not configured as a hairpin bundle.</p>

Table 19: CESoPSN Bundle IP Parameter Settings on CTP2000 Devices in CTPView *(Continued)*

Field	Function	Your Action
Max Buffer	<p>Specifies the maximum buffer size.</p> <p>The maximum buffer size setting is based on the number of packets in the buffer and the number of milliseconds that it takes the packets to go through the buffer. For example, a setting of 10 ms with a packet equivalent of 2 means that it will take 10 ms for 2 packets to go through the buffer.</p> <p>The CTP software calculates a default buffer size based on the type of interface (T1 or E1), and the type of signaling (CCS or CAS).</p> <p>We recommend that you use the default setting unless you require changes because of network performance.</p>	<p>Enter the number of milliseconds.</p> <p>The number that you can enter varies depending on the type of interface and signaling. When you enter a number, the software adjusts the number to the closest acceptable number, and it displays the packet equivalent.</p> <p>When you enter the number of milliseconds, the software displays the packet equivalent, which is the number of packets that can go through the buffer within the number of milliseconds.</p>
Buffer Set	<p>Specifies the buffer size when the circuit enters a running state.</p> <p>The CTP software calculates a default setting based on the type of interface (T1 or E1) the type of signaling (CCS or CAS), and the packet size.</p> <p>We recommend that you use the default setting unless you require changes because of network performance.</p>	<p>Enter the number of milliseconds.</p> <p>The number must be divisible by the packet size. If you enter a number that is not divisible by the packet size, the software changes the setting to the closest number that is divisible by the packet size.</p> <p>When you enter the number of milliseconds, the software displays the packet equivalent, which is the number of packets that can go through the buffer within the number of milliseconds.</p>
Bundle Description	Specifies identifying information about the bundle.	Type a description for the bundle.
Signal Disable	Disables or enables signalling at the bundle level for T1/E1 ports.	<p>Select one:</p> <ul style="list-style-type: none"> • Yes • No

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Configuring IP Parameters for CESoPSN Bundles on CTP150 Devices (CTPView)

The CTP software uses the IP parameters to create IP packets.

Default buffer settings for CESoPSN bundles on CTP150 devices are calculated as follows:

- If the packet size is less than 3 ms of payload, set the buffers as follows:
 - Minimum buffer=8 ms
 - Maximum buffer=16 ms
 - Packet buffer set=12 ms
- If the packet size is greater than 3 ms of payload, set the buffers as follows:
 - Minimum buffer=1 (packet time)
 - Maximum buffer=2 (packet time)
 - Packet buffer set=3 (packet time)

For example, if the packet size is 80 bytes with one channel in the bundle and signaling is off, one packet time is calculated as:

$$80/8=10 \text{ ms}$$

Before you begin:

- Log in to the CTPView software at least at the Net_Admin level.
- Connect the CTPView server to the CTP device for which you want to configure bundles.

To configure IP parameters for CESoPSN bundles using CTPView:

1. In the side pane, select **Bundle > Configuration**.
2. Run your mouse over the **Display and Select an Existing Bundle** bar.
3. In the table of bundles, select the bundle that you want to modify.

4. Under **Bundle Options**, configure the parameters described in [Table 20 on page 57](#), and click **Click to Submit Bundle AND Port Changes**.

Table 20: CESoPSN Bundle IP Parameter Settings on CTP150 Devices in CTPView

Field	Function	Your Action
Bundle Description	Specifies identifying information about the bundle.	Type a description for the bundle.
State	Specifies whether the bundle is active or disabled.	Select DISABLED or ACTIVE.
Remote Address	Specifies the name and IP address of the remote CTP device.	<p>In the first field, select the CTP device.</p> <p>In the second field, select an interface on the CTP device.</p>

Table 20: CESoPSN Bundle IP Parameter Settings on CTP150 Devices in CTPView (Continued)

Field	Function	Your Action
Packet Size	<p>Specifies the size of IP packets that are created from data received at the port.</p> <p>The CTP software calculates a default packet size based on the number of time slots configured, the type of interface (T1 or E1), and the type of signaling (CCS or CAS).</p> <p>We recommend that you use the default setting unless you require changes because of network performance.</p> <p>If you choose to change the signaling, use the following guidelines:</p> <ul style="list-style-type: none"> For CCS signaling, the packet size must be divisible by the number of time slots. For CAS signaling, use the following formula: $\text{packet size} = \text{number-of-slots} * \text{frames-per-packet} + \text{signaling-size}$ <p>where</p> $\text{signaling-size} = \text{number-of-slots}/2 + \text{number-of-slots}\%2$ <p>frames-per-packet for E1 = 16</p> <p>frames-per-packet for T1 = 24</p>	Enter a packet size.
Service Type	<p>Specifies the ToS byte to be used in the IP headers of packets sent from the CTP device to the IP network.</p> <p>For a mapping of ToS byte values to DSCP classes and settings, see "Providing QoS for CTP Bundles by Using Service Type Overview" on page 8.</p> <p>You do not need to set the ToS value to the same value on local and remote bundles.</p>	Enter a number from 0 through 255.

Table 20: CESoPSN Bundle IP Parameter Settings on CTP150 Devices in CTPView *(Continued)*

Field	Function	Your Action
Time to Live	Specifies the maximum number of router hops that a packet can traverse. The CTP device sets the TTL value in IP packets that it sends to the IP network. The IP network does not alter or optimize the packet routing based on the TTL setting. You do not need to set the same TTL value on local and remote ports.	Enter a number from 0 through 255.
Source UDP Port	Specifies the source UDP port. The source UDP port is used as the circuit identifier; you must configure both circuit endpoints to use the same UDP port. The UDP port must be unique on the CTP device. You will not be able to activate a port if another port is using the same source UDP port number.	Enter a number from 1 through 65535.
Min Buffer	Specifies the minimum buffer size.	Enter the number of milliseconds. The number that you can enter varies depending on the type of interface and signaling.
Max Buffer	Specifies the maximum buffer size. We recommend that you use the default setting unless you require changes because of network performance.	Enter the number of milliseconds. The number that you can enter varies depending on the type of interface and signaling.
Buffer Set	Specifies the buffer size when the circuit enters a running state. We recommend that you use the default setting unless you require changes because of network performance.	Enter the number of milliseconds. The number that you can enter varies depending on the type of interface and signaling.
Bundle Description	Specifies identifying information about the bundle.	Type a description for the bundle.

Table 20: CESoPSN Bundle IP Parameter Settings on CTP150 Devices in CTPView *(Continued)*

Field	Function	Your Action
Signal Disable	Disables or enables signalling at the bundle level for T1/E1 ports.	Select one: <ul style="list-style-type: none"> • Yes • No

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Configuring Virtual IP Parameters for CESoPSN Bundles (CTPView)

The virtual IP parameters allow you to use a separate IP address for each bundle and to use an address that is different from the IP address for the CTP device. If you configure the IP address on the:

- Same subnet as CTP IP address, you do not need a static route on the router.
- Different subnet as CTP IP address, you need a static route on the router.

Before you begin:

- Log in to the CTPView software at least at the Net_Admin level.
- Create a list of the virtual IP addresses that will be associated with the CTP device. To do so, select **Node > Maintenance > Configure CTP Device Virtual IPs**, and follow the instructions on the pane. You can create up to 100 virtual IP addresses (IPv4 only).

When you submit your new configuration, the CTP device reboots.

- Connect the CTPView server to the CTP device for which you want to configure bundles.

To configure virtual IP parameters for CESoPSN bundles using CTPView:

1. In the side pane, select **Bundle > Configuration**.
2. Run your mouse over the **Display and Select an Existing Bundle** bar.
3. In the table of bundles, select the bundle that you want to modify.
4. Under **Bundle Options**, place a check mark in the Advanced Options show check box to display advanced parameters, and configure the parameters described in [Table 21 on page 61](#).

5. Click **Click to Submit Bundle AND Port Changes**.

Table 21: CESoPSN Bundle Virtual IP Parameter Settings in CTPView

Field	Function	Your Action
Use Virtual IP	<p>Specifies whether or not the bundle uses an address that is different from the IP address of the CTP device.</p> <p>The virtual IP address is used in the IP packet's Origination Address field, and is used for the circuit's data and OAM flow.</p>	<p>Select one:</p> <ul style="list-style-type: none"> • DISABLED—Circuits created by this bundle use the IP address of the CTP device. • ENABLED—Circuits created by this bundle use an address that is different from the CTP device.
Virtual IP [IPv4 only]	Specifies the virtual IP address for circuits created by this bundle.	<p>Enter the virtual IP address.</p> <p>At the remote end of the bundle, specify this IP address as the Remote Address of the bundle.</p>

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Configuring the Missing Packet Fill Pattern for CESoPSN Bundles on CTP150 Devices (CTPView)

This topic describes how to specify the fill pattern that the CPT device inserts when IP packets are dropped.

Before you begin:

- Log in to the CTPView software at least at the Net_Admin level.
- Connect the CTPView server to the CTP device for which you want to configure bundles.

To configure missing packet fill pattern for CESoPSN bundles using CTPView:

1. In the side pane, select **Bundle > Configuration**.
2. Run your mouse over the **Display and Select an Existing Bundle** bar.
3. In the table of bundles, select the bundle that you want to modify.

4. Under **Bundle Options**, place a check mark in the **Advanced Options** show check box to display advanced parameters, configure the parameters described in [Table 22 on page 62](#), and click **Click to Submit Bundle AND Port Changes**.

Table 22: CESoPSN Bundle Missing Packet Fill Pattern Parameter Setting in CTPView

Field	Function	Your Action
Missing Packet Fill Pattern	<p>Specifies the data that the CTP device inserts into the circuit bit stream when an IP packet is dropped. The number of bits inserted is equal to the number of bits in the missed packet.</p> <p>This data insertion method prevents a loss of bit count integrity to attached circuit devices and encryptors.</p>	<p>Enter two hexadecimal digits. You must enter a value other than ff. This field does not require the 0x characters.</p>

Configuring Circuit Restart Parameters for CESoPSN Bundles on CTP150 Devices (CTPView)

This topic describes how to configure advanced options that are related to circuit restart. Set these parameters to the same values on the local and remote CTP devices.

Before you begin:

- Log in to the CTPView software at least at the Net_Admin level.
- Connect the CTPView server to the CTP device for which you want to configure bundles.

To configure missing packet fill pattern for CESoPSN bundles using CTPView:

1. In the side pane, select **Bundle > Configuration**.
2. Run your mouse over the **Display and Select an Existing Bundle** bar.
3. In the table of bundles, select the bundle that you want to modify.
4. Under **Bundle Options**, place a check mark in the **Advanced Options** show check box to display advanced parameters, and configure the parameters described in [Table 23 on page 63](#), and click **Click to Submit Bundle AND Port Changes**.

Table 23: CESoPSN Bundle Advanced Options Parameter Settings for Circuit Startup in the CTPView

Field	Function	Your Action
Consecutive Pkt Loss To Starvation	<p>Specifies how many consecutive circuit packets the IP network must drop before the CTP device restarts the circuit.</p> <p>We recommend that you set the parameter to a larger value when the IP network uses packet-encrypting devices. These devices cause momentary interruption in packet flows when encryption keys are updated.</p>	Enter a number from 1 through 64.
InSync Pkts After Starvation	Specifies the number of in-sequence packets the CTP device must receive after a starvation before the circuit transitions from in-sync to running.	Enter a number from 1 through 64.

Configuring UDP Source and Destination Port Matching for CESoPSN Bundles (CTPView)

The UDP source and destination port matching feature allows the CTP to use a CESoPSN packet format which is compatible with third-party vendor equipment.

The CESoPSN standard supports multiple packet formats. When this feature is disabled for CTP CESoPSN bundles, the supported CESoPSN packet format uses a fixed destination UDP port of 2142, and a user-selected source UDP port is in the range from 1 through 65535 (0x1 through 0xFFFF).

When this feature is enabled, the packet format changes so that both the source and destination UDP ports use the same user-selected value that is restricted to the range from 49152 through 65535 (0xC000 through 0xFFFF). If the existing configured bundle source UDP port (with this feature flag set) is not within the valid range, then both the source and destination UDP ports will automatically be modified to a default value of 49152 (0xC000). CESoPSN bundles between CTPs will not function properly unless this feature flag is set identically at both ends of the bundle.

To enable the configured source UDP port to be used for both the source and the destination for CESoPSN bundles:

1. In the side pane, select **Bundle > Configuration**.
2. Run your mouse over the **Display and Select an Existing Bundle** bar.
3. In the table of bundles, select the bundle that you want to modify

4. Under **Bundle Options**, place a check mark in the **Advanced Options** show check box to display advanced parameters, configure the parameters described in [Table 24 on page 64](#), and click **Click to Submit Bundle AND Port Changes**.

Table 24: CESoPSN Bundle UDP Source and Destination Port Matching in the CTPView

Field	Function	Your Action
UDP src / dst port matching	<p>Enables you to use the configured source UDP port for both the source and the destination.</p> <p>The configured source UDP port number must be in the range from 49152 through 65535 while enabling this option. If not, the CTP system displays the following warning message and the source UDP port will be set to the default value 49152.</p> <p>Source UDP Port not in the range 49152-65535. Please re-configure Source UDP Port. Setting the Source UDP Port to default value 49152.</p>	<p>Select one:</p> <ul style="list-style-type: none"> • Yes • No <p>Default value is No.</p>

Configuring Multiservice 4WTO Mode Port Parameters for CESoPSN Bundles on CTP150 and CTP151 Devices (CTPView)

Before you begin:

- Log in to the CTPView software at least at the Net_Admin level.
- Connect the CTPView server to the CTP device for which you want to configure CESoPSN bundles.

To configure Multiservice 4WTO mode port parameters using CTPView:

1. In the side pane, select **Bundle > Configuration**.
2. Run your mouse over the **Display and Select an Existing Bundle** bar.
3. In the table of bundles, select the bundle that you want to modify.
4. Under **Bundle Options**, configure the parameters as described in [Table 25 on page 65](#).
5. Click **Click to Submit Bundle AND Port Changes**.

Table 25: CESoPSN Bundle Multiservice 4WTO Mode Port Parameter Settings in CTPView

Field	Function	Your Action
Port Description	Specifies a description for the port.	Enter a description of up to 64 alphanumeric characters. Do not use the following characters: (; ' ")]
I/F Type	Specifies the daughter card as the interface type.	Select MultiSVC.
Multi-Service Mode	Specifies that the bundle will run in 4WTO mode.	Select 4WTO
4WTO Mode	Specifies whether this end of the circuit provides clocking or uses adaptive clocking. If the CTP devices at both ends of the circuit are synchronized, you can configure both ends as Master.	Select one: <ul style="list-style-type: none"> • Master—This end of the circuit provides clocking. • Slave—This end of the circuit uses adaptive clocking.
4WTO Channel	Specifies the channel or channels to enable. Each CESoPSN bundle can support either one or two channels.	Select one: <ul style="list-style-type: none"> • Channel 0—Enables only channel 0. • Dual Channel—Enables both channel 0 and channel 1.
4WTO Sample Rate [KHz]	Sample rate for audio circuits in kilohertz. The sample rate determines the audio quality and the network bandwidth needed.	Sample rate is fixed at 8 KHz, which corresponds to standard toll quality voice.
4WTO μ -law Encoding	4WTO μ -law encoding is not configurable.	4WTO μ -law encoding is fixed at DISABLED.

Table 25: CESoPSN Bundle Multiservice 4WTO Mode Port Parameter Settings in CTPView *(Continued)*

Field	Function	Your Action
4WTO Squelch	<p>Enables or disables the active squelch function on the circuit.</p> <p>If enabled, specifies whether the squelch is active or inactive.</p> <p>The squelch function gates local audio output when DSR-A (channel 0) or RTS-A (channel 1) inputs are active or inactive.</p>	<p>Select one:</p> <ul style="list-style-type: none"> • DISABLED—Disables the active squelch function on the circuit • ENABLED/ACTIVE—Squelch input is grounded and analog output is disabled. • ENABLED/INACTIVE—No signal is applied to the squelch input. Input is open and analog output is possible.
4WTO Channel 0 Output Level	<p>Specifies the output level for channel 0.</p> <p>Note the following information about the values:</p> <ul style="list-style-type: none"> • 0—There is no output. • 128—Unity gain, which means there is no attenuation or gain. • 255—Gain is 2:1. 	Enter a number from 0 through 255.
4WTO Channel 1 Output Level	<p>Specifies the output level for channel 1.</p> <p>Note the following information about the values:</p> <ul style="list-style-type: none"> • 0—There is no output. • 128—Unity gain, which means there is no attenuation or gain. • 255—Gain is 2:1. 	Enter a number from 0 through 255.

Table 25: CESoPSN Bundle Multiservice 4WTO Mode Port Parameter Settings in CTPView *(Continued)*

Field	Function	Your Action
<p>4WTO input gain (+10dB)</p> <p>NOTE: This parameter:</p> <ul style="list-style-type: none"> Is available only in CTPOS Release 10.0R1 and later releases. Is available only for CTP151 platform. Works only on CESoPSN bundles and has no effect on a CTP bundle. 	<p>Activates a 10 dB gain on Audio input.</p>	<ul style="list-style-type: none"> Select one from the drop down menu in Port Options section: <ul style="list-style-type: none"> Disabled—Disables a 10 dB gain on input. Enabled—Enables a 10 dB gain on input. Default value is Disabled.

RELATED DOCUMENTATION

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PART

Administration

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CHAPTER 6

Diagnostic Testing for CESoPSN Bundles Overview

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Serial Loops for CESoPSN Bundles Overview

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You can use serial loops to diagnose issues in your network. You set up serial loops in the following directions:

- Toward the serial interface and the attached customer device.
- Toward the IP network and the remote customer device.

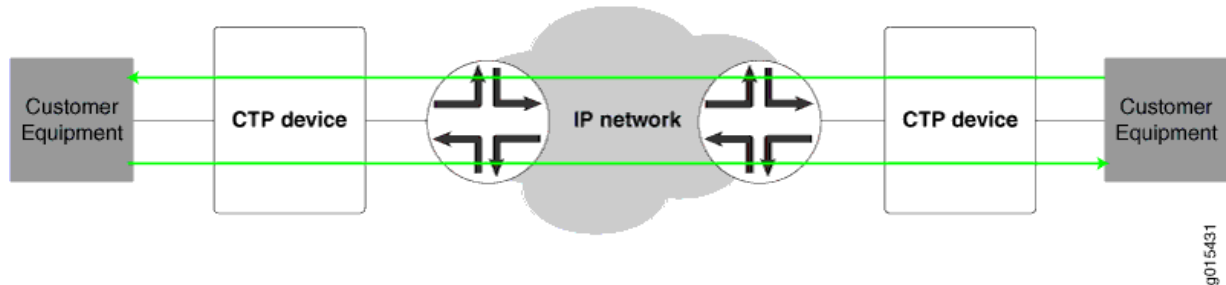
Serial loops may not run on transparent circuits. The serial loop function connects the SD and RD signals of the interface (in the direction specified), and will work only if a transparent circuit uses the SD and RD signals to transport data.

NOTE: Runtime diagnostics is not supported for CESoPSN bundles configured over analog ports.

Normal Data Flow in the CTP Network

Figure 1 on page 70 shows the normal data flow through the network.

Figure 1: Normal Data Flow

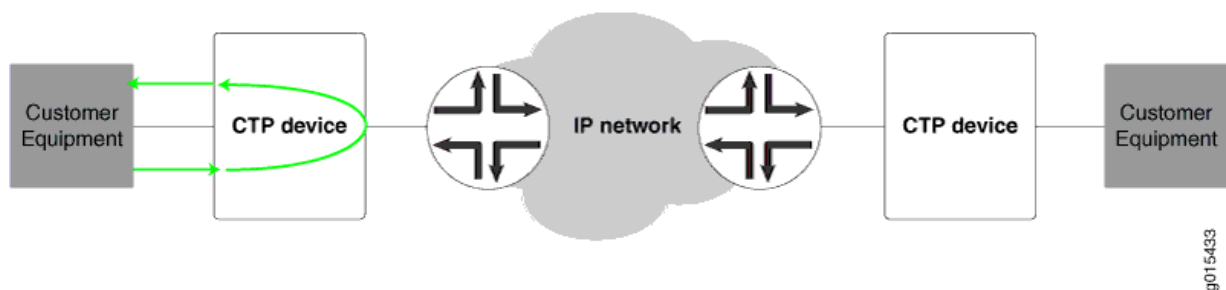


Serial Loop to the Serial Interface

Figure 2 on page 70 shows the data flow for a serial loop to the interface and the local customer device.

The serial loop toward the interface loops data arriving from the serial interface that is destined for the IP network back to the serial interface. The data is still transmitted from the serial interface to the IP network, but data from the IP network to the serial interface is blocked.

Figure 2: Serial Loop to the Interface



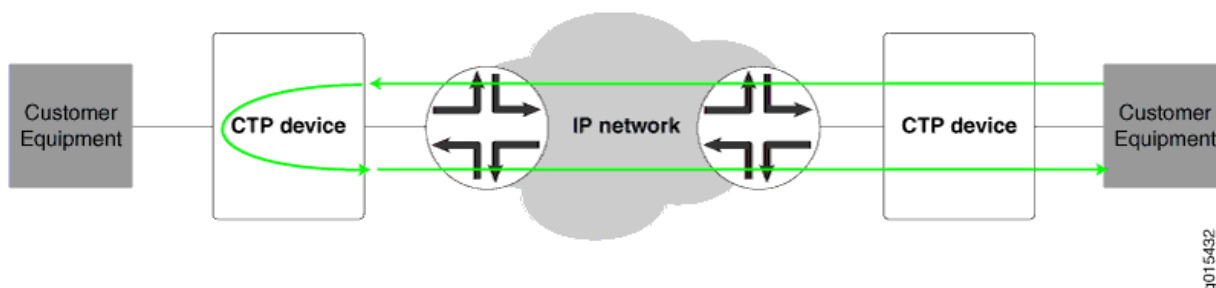
Serial Loop to the Network

Figure 3 on page 71 shows the data flow for a serial loop toward the network.

Serial loops toward the IP network loops data arriving from the IP network that is destined for the serial interface back to the IP network and the remote customer device. The data is still transmitted from the

IP network to the serial interface, but data from the serial interface to the IP network and the remote customer device is blocked.

Figure 3: Serial Loop to the Network



RELATED DOCUMENTATION

[Configuring Serial Loops for CESoPSN Bundles \(CTP Menu\) | 74](#)

[Configuring Serial Loops for CESoPSN Bundles \(CTPView\) | 75](#)

BERT Testing for CESoPSN Bundles Overview

The CTP series provides Bit Error Rate Tests (BERT) for bundles. Each bundle can have a BERT transmitter and receiver that can transmit and receive a pseudorandom sequence of data using a pattern that you specify. You can set up the BERT to transmit the data sequence toward the serial interface or toward the IP network. User data is replaced with the data sequence in the direction that you select.

You can set up BERTs in the following directions:

- Toward the serial interface and the attached customer device.
- Toward the IP network and the remote customer device. This configuration is called end-to-end BERT.

BERTs do not run on bundles that use transparent encoding or on fractional T1/E1 bundles.

RELATED DOCUMENTATION

[Configuring BERT Testing for CESoPSN Bundles \(CTPView\) | 78](#)

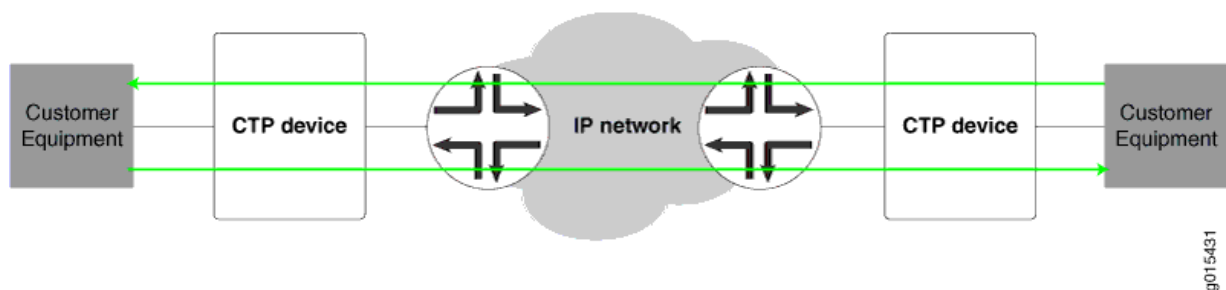
[Configuring BERT Testing for CESoPSN Bundles \(CTP Menu\) | 76](#)

End-to-End BERT for CESoPSN Bundles Overview

This topic provides an overview of how to set up end-to-end BERT for CESoPSN bundles.

[Figure 4 on page 72](#) shows the normal data flow through the network. BERT is disabled.

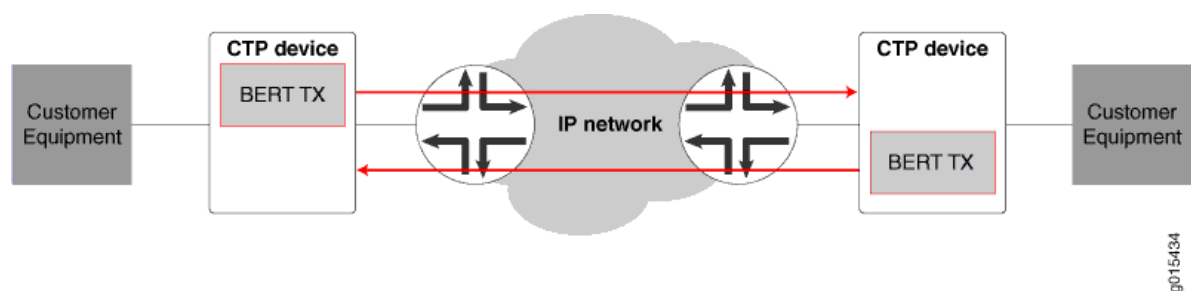
Figure 4: Normal Data Flow



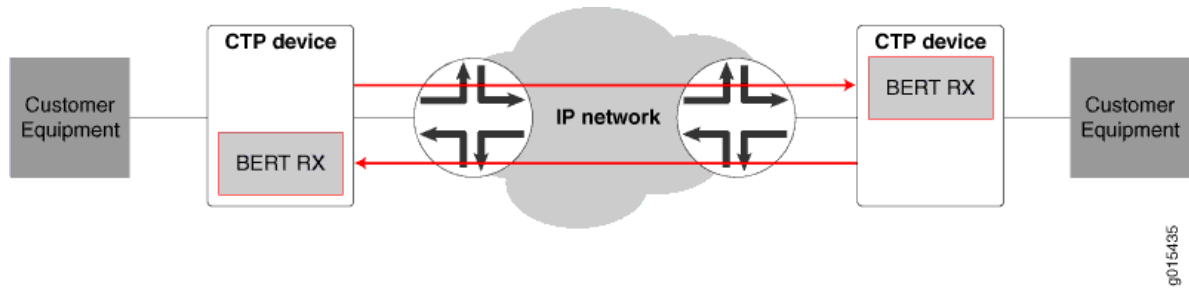
To set up end-to-end BERTS for CESoPSN bundles:

1. To send BERT transmissions to the network, start BERT injection on each CESoPSN bundle toward the IP network as shown in [Figure 5 on page 72](#).

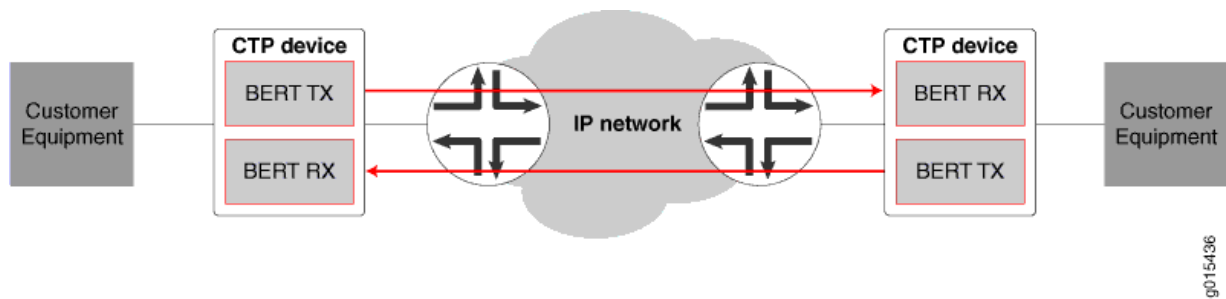
Figure 5: BERT Transmission to the Network



2. To receive BERT reception from the network, start BERT reception on each bundle from the IP network as shown in [Figure 6 on page 73](#).

Figure 6: End-to-End BERT Reception

The result is that end-to-end BERT transmission and reception are running as shown in [Figure 7 on page 73](#).

Figure 7: End-to-End BERT Transmission and Reception

Configuring Diagnostic Testing for CESoPSN Bundles

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- Configuring Serial Loops for CESoPSN Bundles (CTP Menu) | 74
- Configuring Serial Loops for CESoPSN Bundles (CTPView) | 75
- Configuring BERT Testing for CESoPSN Bundles (CTP Menu) | 76
- Configuring BERT Testing for CESoPSN Bundles (CTPView) | 78

Configuring Serial Loops for CESoPSN Bundles (CTP Menu)

Serial loops will run on transparent circuits only if the transparent circuits use the SD and RD signals to transport data.

To configure serial loops with the CTP Menu:

1. From the CTP Main Menu, select **1) Bundle Operations**.
2. Select **1) CTP**.
3. Select a bundle from the list.
4. Select **8) Runtime Diags**.
5. Select **1) Serial Loop**.
6. Configure the Serial Loop option as described in [Table 26 on page 75](#).

Table 26: Serial Loop Parameter Settings in the CTP Menu

Field	Function	Your Action
Serial Loop	Specifies the direction of the serial loop or removes the serial loop.	<p>Select one:</p> <ul style="list-style-type: none"> • None—Removes the serial loop. • To NET—Creates a loop toward the network. Data arriving from the IP network destined for the serial interface is looped back to the IP network and remote customer device. The data is still transmitted from the IP network to the serial interface, but data from the serial interface to the IP network and remote device is blocked. • To I/F—Creates a loop toward the customer device attached to the serial interface. Data arriving from the serial interface that is destined for the IP network is looped back to the serial interface. The data is still transmitted from the serial interface to the IP network, but data from the IP network to the serial interface is blocked.

RELATED DOCUMENTATION

[Serial Loops for CESoPSN Bundles Overview](#) | 69

Configuring Serial Loops for CESoPSN Bundles (CTPView)

Serial loops will run on transparent circuits only if the transparent circuits use the SD and RD signals to transport data.

To configure serial loops using CTPView:

1. In the side pane, select **Bundle > Diagnostics**.
2. Click **Bit Error Rate Tester**.
3. Run your mouse over the **MouseOver to Select a Port to Display** bar.
A list of bundles configured on the CTP device appears.
4. In the table of bundles, select the bundle for which you want to configure a serial loop.
5. Configure the serial loop as described in [Table 27 on page 76](#).

Table 27: Serial Loop Parameter Settings in CTPView

Field	Function	Your Action
Serial Loop	Specifies the direction of the serial loop or removes the serial loop.	<p>Select one:</p> <ul style="list-style-type: none"> • None—Removes the serial loop. • To Net—Creates a loop toward the network. Data arriving from the IP network destined for the serial interface is looped back to the IP network and remote customer device. The data is still transmitted from the IP network to the serial interface, but data from the serial interface to the IP network and remote device is blocked. • To I/F—Creates a loop toward the customer device attached to the serial interface. Data arriving from the serial interface that is destined for the IP network is looped back to the serial interface. The data is still transmitted from the serial interface to the IP network, but data from the IP network to the serial interface is blocked.

RELATED DOCUMENTATION

[Serial Loops for CESoPSN Bundles Overview](#) | 69

Configuring BERT Testing for CESoPSN Bundles (CTP Menu)

BERTs do not run on bundles that use transparent encoding or on fractional T1/E1 bundles. On CESoPSN bundles, you can configure BERTs only for Serial interfaces on CTP150 devices.

To configure BERTs with the CTP Menu:

1. From the CTP Main Menu, select **1) Bundle Operations**.
2. Select **1) CTP**.
3. Select a bundle from the list.
4. Select **8) Runtime Diags**.
5. Configure the BERT options as described in [Table 28 on page 77](#).

Table 28: BERT Parameter Settings in the CTP Menu

Field	Function	Your Action
BERT Injection	Specifies whether this bundle acts as the BERT transmitter. If the bundle is the BERT transmitter, specifies the direction in which it transmits test data.	<p>Select one:</p> <ul style="list-style-type: none"> Disabled—Disables BERT transmission on this bundle. Tx to NET—BERT pattern is injected toward the IP network. User data transmitted in the direction of the IP network is replaced with the BERT pattern. Tx to I/F—BERT pattern is injected toward the serial interface. User data transmitted toward the serial interface is replaced with the BERT pattern.
BERT Reception	<p>Specifies whether this bundle acts as the BERT receiver. If the bundle is the BERT receiver, specifies the direction from which it receives test data.</p> <p>The BERT receiver does not disrupt the existing data flow in either direction.</p>	<p>Select one:</p> <ul style="list-style-type: none"> Disabled—Disables BERT reception on this bundle. Rx from NET—BERT pattern is received from the network. Rx from I/F—BERT pattern is received from the interface.
BERT Pattern	<p>Specifies the type of BERT pattern.</p> <p>BERT patterns are compatible with the external BERT equipment that you are using. All patterns except 2³¹-1 are compatible with the Fireberd 6000.</p> <p>When you set up a bidirectional end-to-end BERT, you must configure the same pattern on both bundles.</p>	<p>Select one:</p> <ul style="list-style-type: none"> MARK ALT 511 2047 2¹⁵-1 2²⁰-1

Table 28: BERT Parameter Settings in the CTP Menu *(Continued)*

Field	Function	Your Action
BERT Error Inject	The BERT transmitter injects an error into the pattern to verify that an end-to-end BERT has been established.	Enter 5) BERT Error Inject to inject an error into the pattern.

RELATED DOCUMENTATION

[BERT Testing for CESoPSN Bundles Overview | 71](#)

[Displaying BERT Status and Counters for CESoPSN Bundles \(CTP Menu\) | 81](#)

Configuring BERT Testing for CESoPSN Bundles (CTPView)

BERTs do not run on bundles that use transparent encoding or on fractional T1/E1 bundles. On CESoPSN bundles, you can configure BERTs only for Serial interfaces on CTP150 devices.

To configure BERTs with CTPView:

1. In the side pane, select **Bundle > Diagnostics**.
2. Click **Bit Error Rate Tester**.
3. Run your mouse over the **MouseOver to Select a Port to Display** bar.
A list of bundles configured on the CTP device appears.
4. In the table of bundles, select the bundle for which you want to configure BERTs.
5. Configure the BERT parameters as described in [Table 29 on page 79](#).

Table 29: BERT Parameter Settings in CTPView

Field	Function	Your Action
BERT Injection	Specifies whether this bundle acts as the BERT transmitter. If the bundle is the BERT transmitter, specifies the direction in which it transmits test data.	<p>Select one:</p> <ul style="list-style-type: none"> Disabled—Disables BERT transmission on this bundle. Tx to Net—BERT pattern is injected toward the IP network. User data transmitted in the direction of the IP network is replaced with the BERT pattern. Tx to I/F—BERT pattern is injected toward the serial interface. User data transmitted in the direction of the IP network is replaced with the BERT pattern.
BERT Reception	<p>Specifies whether this bundle acts as the BERT receiver. If the bundle is the BERT receiver, specifies the direction from which it receives test data.</p> <p>The BERT receiver does not disrupt the existing data flow in either direction.</p>	<p>Select one:</p> <ul style="list-style-type: none"> Disabled—Disables BERT reception on this bundle. Rx from Net—BERT pattern is received from the network. Rx from I/F—BERT pattern is received from the interface.
Patterns	<p>Specifies the type of BERT pattern.</p> <p>BERT patterns are compatible with the external BERT equipment that you are using. All patterns except $2^{31}-1$ are compatible with the Fireberd 6000.</p> <p>When you set up a bidirectional end-to-end BERT, you must configure the same pattern on both bundles.</p>	<p>Select one:</p> <ul style="list-style-type: none"> MARK ALT 511 2047 $2^{15}-1$ $2^{20}-1$

Table 29: BERT Parameter Settings in CTPView *(Continued)*

Field	Function	Your Action
Update Rate	Specifies the rate at which CTPView checks the status of the BERT and updates the synchronization status and counters.	Select the number of seconds.
Inject Error	The BERT transmitter injects an error into the pattern to verify that an end-to-end BERT has been established.	Click the button to inject an error into the pattern. The Error Cnt should increment by one.

RELATED DOCUMENTATION

[BERT Testing for CESoPSN Bundles Overview | 71](#)

[Displaying BERT Status and Counters for CESoPSN Bundles \(CTPView\) | 82](#)

Displaying BERT Status and Counters for CESoPSN Bundles

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- [Displaying BERT Status and Counters for CESoPSN Bundles \(CTP Menu\) | 81](#)
- [Displaying BERT Status and Counters for CESoPSN Bundles \(CTPView\) | 82](#)

Displaying BERT Status and Counters for CESoPSN Bundles (CTP Menu)

To display BERT status and counters with the CTP Menu:

1. From the CTP Main Menu, select **1) Bundle Operations**.
2. Select the type of bundle.
3. Select a bundle from the list.
4. Select **8) Runtime Diags**.
5. Select **6) BERT counts**.
6. [Table 30 on page 81](#) describes the BERT status and counters.

Table 30: BERT Status and Counters in the CTP Menu

Field Name	Description
BERT Running time	Number of seconds the test has been running since BERT statistics were cleared.
Sync Seconds	Number of seconds that the local CTP device has been in sync with the remote CTP device.
Errored Seconds	Number of seconds during which there were errors.
Error Count	Number of errors found since BERT statistics were cleared.

Table 30: BERT Status and Counters in the CTP Menu *(Continued)*

Field Name	Description
Sync Loss Count	Number of times synchronization was lost.
Currently in SYNC	Shows whether the local CTP device is currently in sync with the remote device. <ul style="list-style-type: none"> • YES—The local CTP device is in sync with the remote device. • NO—The local CTP device is not in sync with the remote device.

RELATED DOCUMENTATION

[BERT Testing for CESoPSN Bundles Overview | 71](#)

[Configuring BERT Testing for CESoPSN Bundles \(CTP Menu\) | 76](#)

Displaying BERT Status and Counters for CESoPSN Bundles (CTPView)

This topic describes how to display BERT status and counters.

Before you begin:

- Log in to the CTPView software at least at the Net_Admin level.
- Connect the CTPView server to the CTP device for which you want to change the status of the bundles.

To view BERT status and counters:

1. In the side pane, select **Bundle > Diagnostics**.
2. Click **Bit Error Rate Tester**.
3. Run your mouse over the **MouseOver to Select a Port to Display** bar.

A list of bundles configured on the CTP device appears.

4. In the table of bundles, select the bundle that you want to view.

The BERT configuration and counters page appears. [Table 31 on page 83](#) describes the status and the counter fields.

Table 31: BERT Status and Counters in CTPView

Field Name	Field Description
Sync or Lost	Shows whether the local CTP device is currently in sync with the remote device. <ul style="list-style-type: none"> • If the Sync indicator is green, the local CTP device is in sync with the remote device. • If the Lost indicator is red, the local CTP device is not in sync with the remote device.
Error Free %	Percentage of time since BERT statistics were cleared that there were no errors.
Error Cnt	Number of errors found since BERT statistics were cleared.
Error Sec	Number of seconds during which there were errors.
Sync Sec	Number of seconds that the local CTP device has been in sync with the remote CTP device.
Availability%	Percentage of time since BERT statistics were cleared that the circuit has been available.
Run Sec	Number of seconds the current update has been running.
SLoss Cnt:	Number of times synchronization was lost.
Last Clr	Time since the BERT counters were cleared.

RELATED DOCUMENTATION
[BERT Testing for CESoPSN Bundles Overview | 71](#)
[Configuring BERT Testing for CESoPSN Bundles \(CTPView\) | 78](#)