



Asynchronous Point of Sale-to-IP Conversion

The Asynchronous Point of Sale-to-IP Conversion feature modifies the Cisco IOS implementation of block serial tunnel (BSTUN) to support asynchronous point of sale (APOS) to IP conversion of credit and debit card authorization traffic to a LAN-attached host.

Feature History for the Asynchronous Point of Sale-to-IP Conversion Feature

Release	Modification
12.3(2)T	This feature was introduced.

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at <http://www.cisco.com/go/fn>. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

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Prerequisites for Asynchronous Point of Sale-to-IP Conversion

The router always functions as a data circuit-terminating equipment (DCE) device when controlling the connection, regardless of the cabling; therefore, a DCE cable or Data Terminal Equipment (DTE) cable with an external null modem connector is required.



Information About Asynchronous Point of Sale-to-IP Conversion

To configure the Asynchronous Point of Sale-to-IP Conversion feature, you must understand the following concept:

- [Asynchronous Point of Sale-to-IP Conversion, page 2](#)

Asynchronous Point of Sale-to-IP Conversion

The APOS protocol utilizes asynchronous communications. The APOS connection to the terminal will always be over an asynchronous leased line. The serial interface controlling the POS device is mapped to the host device by the bstun route (APIP) command. APOS to IP conversion (APIP) supports only active (outbound) activation sequences to the host device specified by the bstun route (APIP) command.

Although the connection between the terminal and the router is a leased line, the terminal believes it is still connected to a modem. The terminal sends Hayes AT messages to the router. In this situation, the peer connection follows the state of the asynchronous dial connection. The tunnel is non-persistent and will only be active during the transaction. For terminals that do not send Hayes AT messages on the leased line, the router can be configured for direct mode. In this situation, the peer connection still follows the state of the asynchronous connection. Because the connection is permanent, the tunnel will be persistent.

Because there is only one POS terminal for each asynchronous line, addressing and polling need not be performed. A basic APOS call flow is conducted as follows:

1. The terminal sends a Hayes AT initialization string.
2. The router acknowledges with a numeric okay.
3. The terminal sends a dial string to the router.
4. The router processes the dial string and activates the peer connection.
5. If the peer successfully connects, the router sends a connect message for the appropriate line speed. If the peer does not connect, a “no carrier” or “no dial tone” message is sent.
6. If the peer connects, the router then sends an ENQ(0x05) message requesting data from the terminal.
7. The terminal starts the communication session by sending a data request.
8. The host responds to the terminal's data request.
9. When the terminal has finished sending data, it sends an ACK(0x06) message to the router.
10. The router ends the session with an EOT(0x04) message.

In direct mode, Hayes AT messages are not sent. The router continuously sends ENQ(0x05) messages requesting any data from the terminal.

How to Configure Asynchronous Point of Sale-to-IP Conversion

The following tasks must be completed to configure APOS:

- [Configuring BSTUN, page 3](#) (Required)
- [Configuring APOS on the Serial Interface, page 4](#) (Required)
- [Configuring the Line Interface, page 6](#) (Required)

Configuring BSTUN

In this task, you configure basic BSTUN.

SUMMARY STEPS

1. **enable**
2. **configure**
3. **bstun peer-name** *ip-address*
4. **bstun protocol-group** *group-number* **apos**
5. **bstun remote-peer-keepalive** *seconds*
6. **bstun keepalive-count** *count*

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enters privileged EXEC mode. Enter your password if prompted.
Step 2	configure { terminal memory network } Example: Router# configure terminal	Enters global configuration mode.
Step 3	bstun peer-name <i>ip-address</i> Example: Router(config)# bstun peer-name 10.100.10.1	Enables BSTUN.
Step 4	bstun protocol-group <i>group-number</i> <i>protocol</i> Example: Router(config)# protocol-group 1 apos	Defines a BSTUN group that will use the APOS protocol.
Step 5	bstun remote-peer-keepalive <i>seconds</i> Example: Router(config)# bstun remote-peer-keepalive 100	Enables detection of the loss of a peer. <ul style="list-style-type: none"> • This command should only be enabled if the host has the parameter enabled. Because connections in dial mode are not persistent, it is not necessary to run keepalives on the tunnel. The host timer will detect if the connection to the host is lost.
Step 6	bstun keepalive-count <i>count</i> Example: Router(config)# bstun keepalive-count 5	Defines the number of times to attempt a peer connection before declaring the peer connection to be down.

Configuring APOS on the Serial Interface

In this task, you configure BSTUN and APOS on the serial interface.

SUMMARY STEPS

1. **interface serial** *number*
2. **physical-layer async**
3. **no ip address**
4. **encapsulation bstun**
5. **bstun group** *number*
6. **bstun route all apip** *ip-address* [**fport** *port*] [**tcp-queue-max** *size*] [**header** {**vo** | **v1** | **v2**}]
7. **asp role primary** {**primary** | **secondary**}
8. **asp dcd** **always**
9. **asp direct**
10. **asp enq** {**disable** | **delay** *milliseconds*}
11. **asp retries** *number*
12. **asp send ack**
13. **asp timer** {**rsp** *rsp-time* | **rx** *rx-time* | **host** *host-time* | **connect** *connect-time*}

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enters privileged EXEC mode. Enter your password if prompted.
Step 2	configure { terminal memory network } Example: Router# configure terminal	Enters global configuration mode.
Step 3	interface serial <i>number</i> Example: Router(config)# interface serial 1	Enters interface configuration mode.
Step 4	physical-layer async Example: Router(config-if)# physical-layer async	Specifies the mode of a slow-speed serial interface on a router as asynchronous.
Step 5	no ip address Example: Router(config-if)# no ip address	Specifies that the interface will not use an IP address.

	Command or Action	Purpose
Step 6	encapsulation bstun Example: Router(config-if)# encapsulation bstun	Enables BSTUN encapsulation.
Step 7	bstun-group number Example: Router(config-if)# bstun-group 1	Specifies the BSTUN group to which the interface belongs.
Step 8	bstun route all apip ip-address [fport port] [tcp-queue-max size] [header {vo v1 v2}] Example: Router(config-if)# bstun route all apip 10.9.8.7	Defines how APIP frames will be forwarded from a BSTUN interface to a remote BSTUN peer.
Step 9	asp role {primary secondary} Example: Router(config-if)# asp role primary	Specifies whether the router is acting as the primary end of the polled asynchronous link or as the secondary end of the polled asynchronous link connected to the serial interface. This command starts the serial interface.
Step 10	asp dcd always Example: Router(config)# asp direct always	(Optional) Specifies that both data set ready (DSR) and data carrier detect (DCD) are to be asserted when traffic starts to the serial interface.
Step 11	asp direct Example: Router(config)# asp direct	(Optional) Disables dial mode and automatically activate the peer connection.
Step 12	asp enq {disable delay milliseconds} Example: Router(config)# asp enq disable	(Optional) Configures how the router sends ENQ(0x05) messages to the terminal.
Step 13	asp retries number Example: Router(config)# asp retries	(Optional) Specifies the number of times a packet will be resent before the connection with the terminal is disconnected.
Step 14	asp send ack Example: Router(config)# asp send ack	(Optional) Enables the sending of ACK(0x06) messages to the terminal to acknowledge terminal requests.
Step 15	asp timer {rsp rsp-time rx rx-time host host-time connect connect-time} Example: Router(config)# asp timer rsp 29 Router(config)# asp timer rx-time 30 Router(config)# asp timer host 120 Router(config)# asp timer connect-time 30	(Optional) Customizes the ASP timers.

Configuring the Line Interface

In this task, you configure the line interface to support APOS. The settings configured must match those configured on the POS device.

SUMMARY STEPS

1. **enable**
2. **configure**
3. **line number**
4. **databits {5 | 6 | 7 | 8}**
5. **parity {none | even | odd | space | mark}**
6. **stopbits {1 | 1.5 | 2}**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enters privileged EXEC mode. Enter your password if prompted.
Step 2	configure {terminal memory network} Example: Router# configure terminal	Enters global configuration mode.
Step 3	line number Example: Router(config)# line 1	Enters line configuration mode.
Step 4	databits {5 6 7 8} Example: Router(config-line)# databits 7	Sets the number of data bits per character that are interpreted and generated by the router hardware.
Step 5	parity {none even odd space mark} Example: Router(config)# parity even	Defines generation of a parity bit.
Step 6	stopbits {1 1.5 2} Example: Router(config-line)# stopbits 1	Sets the number of the stop bits sent per byte.

Configuration Examples for Asynchronous Point of Sale-to-IP Conversion

This sections provide the following configuration example:

- [APOS Configuration: Example, page 7](#)

APOS Configuration: Example

The following example shows a complete APOS configuration:

```
bstun peer-name 10.122.2.10
bstun protocol-group 20 apos
bstun remote-peer-keepalive 100
bstun keepalive-count 5
!
interface serial 1
  physical-layer async
  no ip address
  encapsulation bstun
  bstun group 20
  bstun route all apip 10.122.2.1
  asp role primary
  asp dcd always
!
line 1
  databits 7
  parity even
  stopbits 1
```

Additional References

The following section provides references related to APIP.

Related Documents

Related Topic	Document Title
IBM Networking	<i>Cisco IOS Bridging and IBM Networking Configuration Guide, Release 12.3</i>
IBM Networking	<i>Cisco IOS Bridging and IBM Networking Command Reference, Volume 2 of 2: IBM Networking, Release 12.3</i>

MIBs

MIBs	MIBs Link
<ul style="list-style-type: none"> • CISCO-BSTUN-MIB • CISCO-ASPP-MIB 	<p>To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:</p> <p>http://www.cisco.com/go/mibs</p>

Technical Assistance

Description	Link
<p>Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.</p>	<p>http://www.cisco.com/public/support/tac/home.shtml</p>

Command Reference

The following commands are introduced or modified in the feature or features documented in this module. For information about these commands, see the *Cisco IOS Bridging Command Reference* at http://www.cisco.com/en/US/docs/ios/bridging/command/reference/br_book.html or the *Cisco IOS IBM Networking Command Reference* at http://www.cisco.com/en/US/docs/ios/ibm/command/reference/ibm_book.html. For information about all Cisco IOS commands, go to the Command Lookup Tool at <http://tools.cisco.com/Support/CLILookup> or to the *Cisco IOS Master Commands List*.

- **asp dcd always**
- **asp direct**
- **asp enq**
- **asp retries**
- **asp send ack**
- **asp timer**
- **bstun route all apip**
- **debug aspp event**
- **debug aspp packet**
- **bstun protocol-group**
- **show bstun**

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