



## Configuring the Airline Product Set

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This chapter describes how to configure the Airline Product Set (ALPS). For a complete description of the ALPS commands in this chapter, refer to the “Airline Product Set Configuration Commands” chapter in the *Cisco IOS Bridging and IBM Networking Command Reference* (Volume 1 of 2). To locate documentation of other commands that appear in this chapter, use the command reference master index or search online.

This chapter contains the following sections:

- [ALPS Overview, page 489](#)
- [ALPS Configuration Task List, page 492](#)
- [Monitoring and Maintaining ALPS, page 501](#)
- [ALPS Configuration Examples, page 501](#)

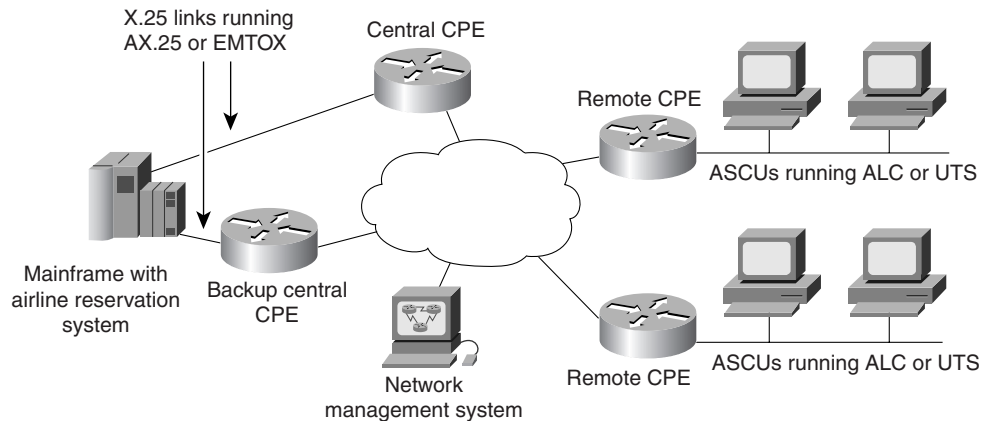
To identify the hardware platform or software image information associated with a feature, use the Feature Navigator on Cisco.com to search for information about the feature or refer to the software release notes for a specific release. For more information, see the “[Identifying Platform Support for Cisco IOS Software Features](#)” section on page li in the “Using Cisco IOS Software” chapter.

### ALPS Overview

ALPS is a tunneling mechanism that transports airline protocol data across a Cisco router-based TCP/IP network to a mainframe. This feature provides connectivity between agent set control units (ASCUs) and a mainframe host that runs the airline reservation system.

The ALPS feature was released in three phases. The first two phases of ALPS enabled the network migration to TCP/IP without requiring any changes in the hardware or software of the endstations (ASCUs and mainframes). ALPS phase I and II utilized a new protocol, ALPS Tunneling Protocol (ATP), to tunnel airline protocol traffic (P1024B Airline Control [ALC] or P1024C Universal Terminal Support [UTS] data) through the TCP/IP network between peer Cisco routers. ALPS phase I provided support for the ALC protocol and the transport of the data from the ASCUs to a reservations system on an IBM mainframe. ALPS phase II provided support for the UTS protocol and the transport of the data from the ASCUs to a reservations system on a Unisys host system.

[Figure 214](#) shows a basic ALPS topology with ALC, UTS, AX.25 and Exchange of Mixed Traffic over X.25 SVCs (EMTOX) protocols. Three major components provide the end-to-end transportation of airline protocol traffic across the network: the P1024B ALC or P1024C UTS protocol, the TCP-based transport protocol, and the AX.25/EMTOX access to the mainframe.

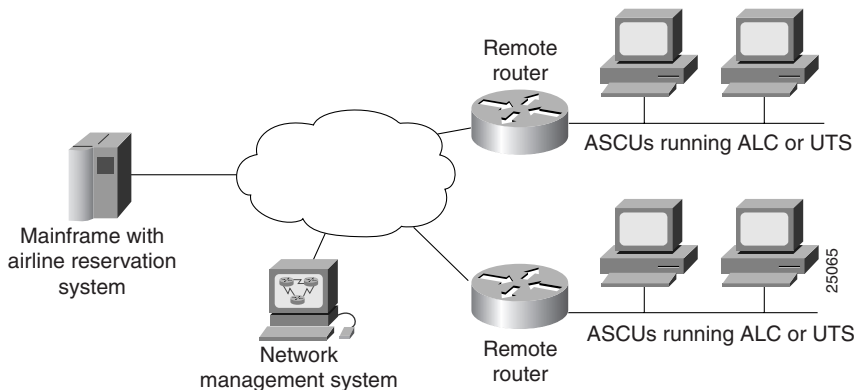
**Figure 214 ALPS with ALC and UTS Architecture**

CPE = customer premises equipment

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ALPS phase III provides support for Mapping of Airline Traffic over Internet Protocol (MATIP). MATIP is an industry standard protocol for transporting airline protocol traffic across a TCP/IP network. This enhancement enables the end-to-end delivery of ALC and UTS data streams between a Cisco router and the mainframe using TCP/IP. ALPS with MATIP removes the X.25 (AX.25 or EMTOX) requirements for communication with the host reservation system by enabling TCP/IP communication between the router and the airline host reservation system.

Figure 215 shows the basic ALPS topology and the MATIP architecture implemented in Phase III. Three major components provide the end-to-end transportation of airline protocol traffic across the network: the P1024B ALC or P1024C UTS protocol, the TCP/IP-based MATIP protocol conversion, and the TCP/IP access to the mainframe.

**Figure 215 ALPS with MATIP Architecture**

In Cisco IOS Release 12.1(2)T and later, ALPS supports service messages additions and extensions to the ALPS P1024B ALC protocol support. The additions include customized options to configure the format, address, and sending of service messages. The ALPS ALC support is extended to be more scalable. The ALPS ASCU debug support is extended to include trace capability for the six-bit International Programmable Airline Reservation System (IPARS) format.

The Cisco ALPS feature provides the following benefits:

- Provides an end-to-end solution for airlines and central reservation systems.
- Allows airlines to replace their existing hardware and software with Cisco routers because the ALPS feature is integrated in the Cisco IOS software. For customers who already use Cisco routers, this feature allows them to consolidate networking overhead and functionality.
- Enables the end-to-end delivery of ALC and UTS data between a remote router or gateway and the mainframe using TCP/IP encapsulation.
- Eliminates network overhead for error detection and transmission logic associated with X.25 links.
- Replaces IBM front-end processors (FEPs) with Channel Interface Processors (CIPs).
- Eliminates the use of dedicated, leased, slow-speed ALC and UTS serial lines and migrates the reservation system networks to a modern networking paradigm. Once the mainframe reservation system is enabled to use TCP/IP, new applications can be written for PCs or network computers (NCs).
- Supports standards-based MATIP protocol for transporting data across the TCP/IP network.

In Cisco IOS Release 12.1(2)T and later, ALPS includes the following debug, ALC, and service message enhancements.

#### **Debug Enhancement**

The ALPS ASCU debug support additions provide new capabilities that enable you to display **debug alps ascu** command trace output in IPARS format.

#### **ALC Enhancements**

The ALPS ALC protocol stack includes the following extensions:

- Automatic ASCU reset
- T1 timer range increase
- Modification of the accepted ASCU IA value list

#### **Service Message Enhancements**

The additions to the ALPS service messages provide new capabilities that enable you to:

- Specify sita or apollo service message format
- Disable the forwarding of service messages for ALPS circuit status changes
- Specify where to retrieve the terminal address for dropped-data service messages
- Disable specific service messages
- Configure service message text with an increased character length

In Cisco IOS Release 12.1(3)T and later, ALPS includes the following ALC enhancement.

#### **ALC Enhancement**

The ALPS ALC protocol stack includes the following extensions:

- Nonpolled ALC ASCU support

The ALPS feature supports only type A conversational protocol traffic. The ALPS feature does not support MATIP type A host-to-host protocol traffic and MATIP type B messaging protocol traffic.

Remote routers must have the Cirrus Logic CD2430 chipset on a synchronous serial interface module to connect to the ALC or UTS ASCUs. The CD2430 chipset is supported on the following router platforms:

- Cisco 2520, 2521, 2522, and 2523
- Cisco 2600 series
- Cisco 3600 series
- Cisco 4500
- Cisco 4700

**Note**

The Cisco 4500 and Cisco 4700 platforms must have a high-density, low-speed serial card installed. Sixteen low-speed ports are available for performing the remote router functions.

The ALPS feature supports the following standards, MIBs and RFCs:

**Standards**

- *P1024B Communication Control Protocol Specification*, Societe Internationale de Telecommunications Aeronautiques
- *P1024C Communication Control Protocol Specification*, Societe Internationale de Telecommunications Aeronautiques
- *MATIP Implementation Guide*, Societe Internationale de Telecommunications Aeronautiques

**MIBs**

The ALPS feature supports the CISCO-ALPS-MIB and the following MIB enhancements:

- Extensions to the alpsIfP1024Table
- Extension to the alpsAscuTable
- Addition of Simple Network Management Protocol (SNMP) notifications for ALPS circuit open request failure and ALPS circuit open request with a partial rejection

For descriptions of supported MIBs and how to use them, see the Cisco MIB website on Cisco.com.

**RFCs**

- RFC 2351, *Mapping of Airline Reservation, Ticketing, and Messaging Traffic over IP*, May 1998

## ALPS Configuration Task List

See the following sections for configuration tasks for the ALPS feature. Each task in the list indicates if the task is optional or required. The tasks in the “[Configuring the Remote Routers](#)” section on page 493 are the only required tasks for ALPS with MATIP.

For a complete description of the ALPS commands in this feature module, refer to the “Airline Product Set Configuration Commands” chapter in the *Cisco IOS Bridging and IBM Networking Command Reference* (Volume 1 of 2). To locate documentation of other commands, use the command reference master index or search online.

- [Configuring the Remote Routers, page 493](#) (Required)
- [Configuring the Data Center Router, page 497](#) (Required for EMTOX and AX.25, only)
- [Customizing the Service Messages, page 498](#) (Optional)

- [Customizing the Alarm Notifications, page 499](#) (Optional)
- [Updating a Circuit, page 499](#) (Optional)
- [Verifying ALPS, page 500](#) (Required)

See the “ALPS Configuration Examples” section on page 501 for more information.

## Configuring the Remote Routers



### Note

To configure ALPS with MATIP, you must perform only the following tasks. The tasks also apply to EMTOX and AX.25, but are not required.

Perform the tasks in the following sections to configure the ALPS feature on the remote routers:

- [Specifying the ALPS Local Peer IP Address, page 493](#)
- [Specifying the ALPS Remote Peer IP Address, page 493](#)
- [Specifying the ALPS Circuit, page 494](#)
- [Specifying Each ASCU, page 495](#)

## Specifying the ALPS Local Peer IP Address

You must identify an IP address as an ALPS local peer on the remote router. Only one ALPS local peer is permitted on a router.

To specify the ALPS local peer IP address, use the following commands in global configuration mode:

	Command	Purpose
Step 1	Router(config)# <b>alps local-peer</b> <i>ipaddress</i> [ <b>promiscuous</b> ]	Specifies an IP address to use as the ALPS local peer on the remote router.
Step 2	Router(config)# <b>alps keepalive</b> [ <b>interval</b> <i>time</i> ] [ <b>retry</b> <i>count</i> ]	Enables TCP keepalives for ALPS TCP peer connections.

## Specifying the ALPS Remote Peer IP Address

You must specify a partner IP address (remote peer) on the remote router. The peer connection may be permanent or dynamic (established on demand). You can configure an ATP connection to be permanent or dynamic by configuring the optional **dynamic** keyword.



### Note

MATIP sessions are dynamic, whether or not the **dynamic** keyword is configured. To simulate a permanent connection in MATIP, configure the **dynamic** keyword with an *inact-timer* value of zero.

To specify the partner IP address for one or more TCP peer connections to the configured IP address, use the following command in global configuration mode:

Command	Purpose
Router(config)# <b>alps remote-peer</b> <i>ip-addr</i> [ <b>protocol</b> { <b>atp</b>   <b>matip-a</b> }] [ <b>status-interval</b> <i>interval</i> ] [ <b>status-retry</b> <i>retries</i> ] [ <b>dynamic</b> [ <b>inact-timer</b> ] [ <b>no-circuit</b> <i>no-circ-timer</i> ]] [ <b>tcp-qlen</b> [ <i>num</i> ]]	Specifies the partner IP address. If you select the ATP protocol, you must configure the data center routers.

## Specifying the ALPS Circuit

An ALPS circuit is a communication path across a TCP connection for one or more ASCUs. The ALPS circuit must have a configured association with an ALPS remote peer to establish a connection to the host. Additionally, an ALPS circuit configuration may specify a different remote peer as a backup peer to the host. Each MATIP circuit maps to a single TCP connection. For ATP, ALPS circuits can be multiplexed across to a single TCP connection.

To specify an ALPS circuit, use the following commands beginning in global configuration mode:

	Command	Purpose
<b>Step 1</b>	Router(config)# <b>alps circuit</b> <i>name</i>	Specifies an ALPS circuit at the remote router and enters ALPS circuit submode.
<b>Step 2</b>	Router(config-alps-circ)# <b>alps primary-peer</b> <i>ip-addr</i> [ <b>backup-peer</b> <i>ip-addr</i> ]	Specifies the primary TCP peer and an optional backup peer for this ALPS circuit.
<b>Step 3</b>	Router(config-alps-circ)# <b>alps local-hld</b> <i>loc-hld</i> <b>remote-hld</b> <i>rem-hld</i>	Specifies the local high-level designator (HLD) for this ALPS circuit. The <b>remote-hld</b> keyword is not applicable for ALPS with MATIP. The <i>loc-hld</i> is the hld of the device that is being replaced. The <i>rem-hld</i> is the hld of the host mainframe.
<b>Step 4</b>	Router(config-alps-circ)# <b>alps hostlink</b> <i>number</i> { <b>ax25</b> <i>lcn</i>   <b>emtox</b> <i>x121-addr</i> } [ <b>winout</b> <i>val1</i> ] [ <b>winin</b> <i>val2</i> ] [ <b>ops</b> <i>val3</i> ] [ <b>ips</b> <i>val4</i> ]	Specifies information required to establish an X.25 virtual circuit at the central CPE.
<b>Step 5</b>	Router(config-alps-circ)# <b>alps connection-type</b> <b>permanent</b> [ <b>retry-timer</b> ]	(Optional) Specifies that this circuit should be established when the circuit is enabled.
<b>Step 6</b>	Router(config-alps-circ)# <b>alps lifetime-timer</b> <i>timer</i>	(Optional) Specifies how long messages can be queued in the ALPS circuit queue.
<b>Step 7</b>	Router(config-alps-circ)# <b>alps service-msg-interval</b> <i>seconds</i>	(Optional) Specifies the interval between the transmission of a service message to an ASCU and the transmission of a PLEASE RETRY message. The PLEASE RETRY message is transmitted only to ASCUs that use circuits with a dynamic connection type.
<b>Step 8</b>	Router(config-alps-circ)# <b>alps service-msg-list</b> <i>list</i>	(Optional) Defines the service message list to be used for this circuit.
<b>Step 9</b>	Router(config-alps-circ)# <b>alps matip-close-delay</b> <i>time</i>	(Optional) Specifies the interval between the closing and reopening of the MATIP circuit connection.

	Command	Purpose
Step 10	Router(config-alps-circ)# <b>alps idle-timer</b> <i>timer</i>	(Optional) Specifies (for dynamic circuits) the length of time that can elapse before an idle circuit is disabled.
Step 11	Router(config-alps-circ)# <b>alps mp</b> <i>x</i> { <b>group</b>   <b>single</b> } <b>hdr</b> { <b>ala2</b>   <b>none</b> }	(Optional) Specifies the multiplexing and the ASCU identification header for this circuit.
Step 12	Router(config-alps-circ)# <b>alps enable-circuit</b>	Enables the circuit.

## Specifying Each ASCU

You must configure each ASCU within the context of the serial interface configuration. You must configure ASCU addressing information and association with an ASCU. You can configure the timers, maximum frame sizes, retry values, and polling mode optional configuration parameters for each ASCU. Appropriate default parameters are used for unspecified parameters. Once you configure the first ASCU, you can configure additional ASCUs using only Steps 8 through 14.

To specify an ASCU, use the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# <b>interface</b> <i>type number</i>	Configures an interface and enters interface configuration mode.
Step 2	Router(config-if)# <b>encapsulation</b> [ <b>alc</b>   <b>uts</b> ]	Specifies the protocol to be used on the serial interface.
Step 3	Router(config-if)# <b>alps t1</b> <i>delay</i>	(Optional) Specifies the timeout delay between the transmission of an ALC poll message and the receipt of the first character of the poll message response.
Step 4	Router(config-if)# <b>alps t2</b> <i>delay</i>	(Optional—ALC only) Specifies the timeout delay between receipt of the first character of the response to a poll message and the receipt of a Go Ahead message. Applies to ALC, only.
Step 5	Router(config-if)# <b>alps n1</b> <i>errors</i>	(Optional) Specifies the threshold of consecutive errors logged before an ASCU is declared down.
Step 6	Router(config-if)# <b>alps n2</b> <i>polls</i>	(Optional) Specifies the number of polls that must be correctly replied to before an ASCU is declared up.
Step 7	Router(config-if)# <b>alps n3</b> <i>value</i>	(Optional—UTS only) Specifies the maximum number of retransmissions of an unacknowledged output data message to an ASCU. Applies only to UTS.
Step 8	Router(config-if)# <b>alps servlim</b> <i>polls</i>	(Optional) Specifies the number of cycles of the active poll list to execute before polling the next ASCU on the inactive poll list.
Step 9	Router(config-if)# <b>transmitter-delay</b> <i>delay</i>	Specifies number of padding characters added to the end of the frame (minimum dead-time after transmitting a packet).

	Command	Purpose
Step 10	Router(config-if)# <b>half-duplex</b>	<p>Specifies half-duplex mode on a serial interface.</p> <p>This command specifies whether hardware flow control (constant or switched Request to Send [RTS]) is to be used between a DTE and DCE device.</p> <ul style="list-style-type: none"> <li>• If half-duplex is specified for a DTE, the DTE raises RTS and waits for the DCE to raise Clear to Send (CTS) before sending.</li> <li>• If half-duplex is specified for a DCE, the DCE waits for the DTE to raise RTS, then the DCE raises CTS to allow the DTE to send.</li> <li>• If full-duplex is specified, RTS is assumed and CTS is not monitored.</li> </ul> <p><b>Note</b> ALPS supports the serial interface commands that are available if half-duplex mode is specified. This support applies to an interface that is configured as data circuit-terminating equipment (DCE) and data terminal equipment (DTE).</p>
Step 11	Router(config-if)# <b>alps poll-pause msec</b>	(Optional) Specifies the minimum interval, in milliseconds, between initiations of the polling cycle.
Step 12	Router(config-if)# <b>alps service-msg data-drop {msg-term   config-term}</b>	(Optional) Specifies where to retrieve the terminal address to use when a service message is sent to an ASCU as a result of a dropped data message from a terminal.
Step 13	Router(config-if)# <b>alps service-msg format {sita   apollo}</b>	(Optional) Specifies the protocol format of service messages sent from the router to an ASCU.
Step 14	Router(config-if)# <b>alps service-msg status-change</b>	(Optional) Specifies that service messages for ALPS circuit status changes will be sent to ASCUs on the serial interface.
Step 15	Router(config-if)# <b>alps ascu id</b>	Specifies a physical ASCU identity (the ASCU interchange address value for ALC) and enters ALPS ASCU submode.
Step 16	Router(config-alps-ascu)# <b>alps default-circuit name</b>	Specifies the ALPS circuit that this ASCU uses.
Step 17	Router(config-alps-ascu)# <b>alps a1-map a1-value a2-map a2-value</b>	Specifies the A1 and A2 logical ASCU identification information.
Step 18	Router(config-alps-ascu)# <b>alps retry-option [resend   reenter]</b>	(Optional) Specifies the retry option when an ALC message with a bad cyclic check character (CCC) is received.
Step 19	Router(config-alps-ascu)# <b>alps max-msg-length value</b>	(Optional) Specifies maximum input message length.

	Command	Purpose
Step 20	Router(config-als-ascu)# <b>alps error-display</b> <i>number1 number2</i>	(Optional) Specifies where error messages are displayed: <ul style="list-style-type: none"> <li>For P1024B ALC, the <i>number1</i> argument specifies the terminal address (TA) where these service messages are sent and the <i>number2</i> argument specifies the screen line number where service messages are displayed.</li> <li>For P1024C UTS, the <i>number1</i> argument specifies the screen line number where service messages are displayed and <i>number2</i> argument specifies the column number where service messages are displayed.</li> </ul>
Step 21	Router(config-als-ascu)# <b>alps auto-reset</b>	(Optional) Automatically resets non-responsive ALC ASCUs in the DOWN state.
Step 22	Router(config-als-ascu)# <b>alps alias</b> <i>alias-interchange-address</i>	(Optional) Specifies that an ALC ASCU is to operate in nonpolling mode and specifies the parent ASCU interchange address to which this ASCU is aliased.
Step 23	Router(config-als-ascu)# <b>alps enable-ascu</b>	Polls the ASCU.

## Configuring the Data Center Router



### Note

These tasks apply to EMTOX and AX.25, only.

Perform the tasks in the following sections to configure the ALPS feature on the data center router:

- [Specifying the ALPS Host Local Peer Address, page 497](#)
- [Specifying AX.25, page 498](#)
- [Specifying EMTOX, page 498](#)

## Specifying the ALPS Host Local Peer Address

You must identify an IP address to use as the ALPS local peer IP address. Only one ALPS host local peer is permitted on a router. The promiscuous option, which allows any remote router to connect, is recommended at the central CPE.

To specify the ALPS host local peer address, use the following command in global configuration mode:

Command	Purpose
Router(config)# <b>alps local-peer</b> <i>ip-address</i> [ <b>promiscuous</b> ]	Specifies the IP address of the local peer.

## Specifying AX.25

To enable AX.25 on an X.25 interface, the ALPS host HLD and hostlink number must be configured and AX.25 must be specified on an X.25 serial interface. At circuit-establishment time, the remote router forwards the host HLD, the logical channel number (LCN), and the hostlink number for the permanent virtual circuit (PVC), to be used for the ASCU group.

To configure AX.25 on an X.25 interface, use the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# <b>interface</b> <i>type number</i>	Configures an interface and enters interface configuration mode.
Step 2	Router(config-if)# <b>encapsulation x25</b>	Specifies a serial interface as an X.25 device.
Step 3	Router(config-if)# <b>alps host-hld</b> <i>hld</i> <b>host-link</b> <i>num</i> <b>{{ax25 [damp-tmr value]   {emtox x.121 [pseudo-conv]}}</b> <b>[life-tmr value]</b>	Enables ALPS on the X.25 interface.

## Specifying EMTOX

To enable EMTOX on an X.25 interface, the host HLD and the hostlink number must be configured and EMTOX must be specified on an X.25 serial interface. At circuit-establishment time, the remote router forwards the X.121 address to be used as the calling address in the X.25 call and the host HLD and the hostlink number. If the host performs a call out, a correlation between the X.121 called address and a remote router peer IP address must be configured.

To configure EMTOX on an X.25 interface, use the following commands beginning in global configuration mode:

	Command	Purpose
Step 1	Router(config)# <b>interface</b> <i>type number</i>	Configures an interface and enters interface configuration mode.
Step 2	Router(config-if)# <b>encapsulation x25</b>	Specifies a serial interface as an X.25 device.
Step 3	Router(config-if)# <b>alps host-hld</b> <i>hld</i> <b>host-link</b> <i>num</i> <b>{{ax25 [damp-tmr value]   {emtox x.121 [pseudo-conv]}}</b> <b>[life-tmr value]</b>	Enables ALPS on the X.25 interface.
Step 4	Router(config-if)# <b>alps translate</b> <i>x.121-addr</i> <i>ip-addr</i>	Maps an X.121 address to an IP address on a remote peer.

## Customizing the Service Messages

You can customize the contents of the service messages and service message list. To specify the service message number and the content of the message, use the following command in global configuration mode:

Command	Purpose
Router(config)# <b>alps service-msg-list</b> <i>list number number msg</i>	Specifies service message numbers and content.

**Note**

The default service message is used if no service message list number is specified. If you configure a particular service message on a list, the default service message still is used for the rest of the messages on that list.

**Note**

Once the **alps service-msg-list number** command has been configured, you can define the service message list to be used on the circuit by configuring the **alps service-msg-list** command.

**Note**

You can configure the handling of service messages using the **alps service-msg data-drop**, **alps service-msg format**, and **alps service-msg status-change** interface configuration-level commands.

Table 8 shows the default service message text strings:

**Table 8** Service Message Default Text Strings

Message Number	Event	Text String
1	ALPS circuit to host is opened.	CONNECTION UP
2	X.25 virtual circuit at the host has been cleared.	DISC BY THE HOST
3	X.25 interface at the host is down.	HOST ISOLATED
4	No response from the host router when trying to establish a connection.	NETWORK PROBLEM
5	Connection to host was disconnected because of inactivity.	READY TO CONNECT
6	Network is congested.	CONGESTION
7	Network congestion has cleared.	PLEASE PROCEED
8	Network operator has disabled the path to the host.	DISC BY NET OPERAT

## Customizing the Alarm Notifications

You can enable and customize alarms (error messages) and SNMP traps. To enable and customize alarms for the ALPS ASCUs, circuits, or peers, use the following commands in global configuration mode:

Command	Purpose
Router(config)# <b>alps enable-alarms ascu</b> [ <i>interface id</i> ]	Enables alarms for the ALPS ASCUs.
Router(config)# <b>alps enable-alarms circuit</b> [ <i>name</i> ]	Enables alarms for the ALPS circuits.
Router(config)# <b>alps enable-alarms peer</b> [ <i>ip-address</i> ]	Enables alarms for the ALPS peers.

## Updating a Circuit

You can clear or update the circuits on the ALPS network. If a specific name is entered, the update action will be executed only on a configured circuit with that name; otherwise, the action will be performed on all configured circuits. If the circuit uses the ATP protocol, an update consists of a closing and reopening

of the ALPS circuit (the same action performed when clearing the circuit). If the circuit is a MATIP circuit, the update results in the sending of a configuration update (in the form of a MATIP Session Open command). You can update the circuit only on enabled or active (opened or opening state) ALPS circuits.

To update one or more ALPS circuits, use the following command in EXEC mode:

Command	Purpose
Router# <b>alps update-circuit</b> <i>[name]</i>	Specifies name of circuit to update.

## Verifying ALPS

Perform the tasks in the following steps to verify the components of the ALPS network:

- Step 1** Verify that the connection between the router and the ASCU is up by polling the ASCU. Enter the **show alps ascu** command and check the state field. UP indicates that the ASCU is responding to the polling. DOWN indicates that the connection is not responding to the polling.

```
router# show alps ascu
```

interface	dlc	id	a1	a2	circuit	pkt_tx	pkt_rx	state
Serial6	ALC	42	60	70	CKT_ALC_1	416	416	UP
Serial6	ALC	45	60	72	CKT_ALC_1	600	600	UP
Serial6	ALC	48	62	78	CKT_ALC_2	0	0	DOWN
Serial7	UTS	21	22	13	CKT_UTS	4830	4830	UP

- Step 2** Verify that the peer between the router and the host is connected. Enter the **show alps peer** command and check the state field. OPENED indicates that the circuit is connected. DISCONN indicates that the circuit is disconnected.

```
router# show alps peers
```

```
local_peer : ip_address = 192.168.25.2
```

ip_address	conn_id	state	pkt_t	pkt_rx
192.168.20.3	MATIP_A_CKT_UTS	OPENED	1023	1023
192.168.70.2	MATIP_A_CKT_ALC_1	OPENED	4852	4757
192.168.70.2	MATIP_A_CKT_ALC_2	OPENED	1	1
192.168.70.3	MATIP_A_CKT_ALC_1	DISCONN	0	0
192.168.70.3	MATIP_A_CKT_ALC_2	DISCONN	0	0

- Step 3** Verify that the ALPS circuit to the peer host is open and connected. Enter the **show alps circuits** command and check the state field. OPEN indicates that the circuit is connected. INOP indicates that the circuit is disconnected.

```
router# show alps circuits
```

name	pri_peer	curr_peer	dlc	state	pkt_tx	pkt_rx
ALC_EMTOX	192.168.45.2	192.168.45.2	ALC	OPEN	944	944
UTS_AX25	192.168.45.2	192.168.45.2	UTS	OPEN	425	425

# Monitoring and Maintaining ALPS

To monitor the status of the ALPS feature, use the following commands in EXEC mode:

Command	Purpose
Router# <b>show alps ascu</b> [ <i>interface</i> ] [ <i>id</i> ] [ <b>detail</b> ]	Displays the status of the ALPS ASCU.
Router# <b>show alps circuits</b> [ <b>peer ip address</b> ] [ <b>name name</b> ] [ <b>detail</b> ]	Displays the status of the ALPS circuits.
Router# <b>show alps peers</b> [ <b>ipaddress addr</b> ] [ <b>detail</b> ]	Displays the status of the ALPS remote peers.

## ALPS Configuration Examples

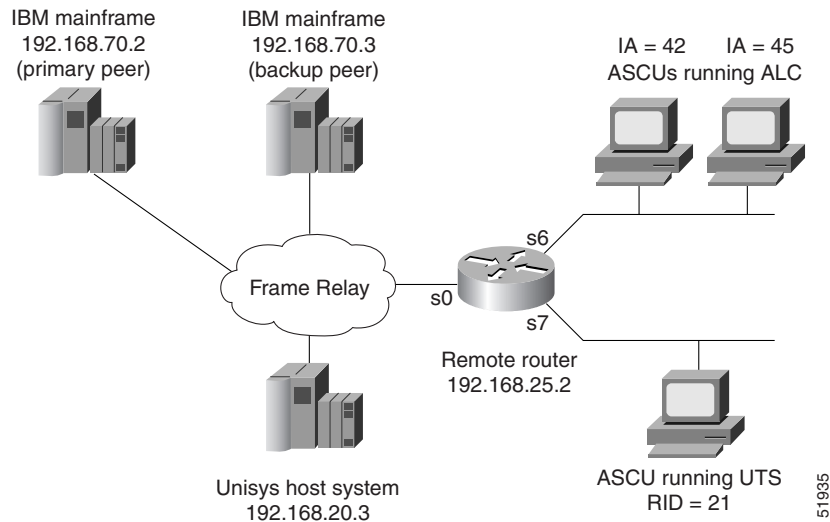
This section provides the following configuration examples:

- [ALPS with MATIP Configuration for ALC and UTS Example, page 502](#)
- [ALPS Configuration for ALC and AX.25 Example, page 504](#)
- [ALPS Configuration for UTS and EMTOX Example, page 506](#)

## ALPS with MATIP Configuration for ALC and UTS Example

Figure 216 shows a simple example of a router topology for the ALPS with MATIP feature. The configuration corresponding to this topology follows.

**Figure 216 Router Topology for the ALPS with MATIP Configuration Example**



IA = interchange address  
RID = remote identifier

### ALC/UTS Router Configuration

```
(config)# hostname alps-rcpe
(config)# alps local-peer 192.168.25.2
(config)# alps keepalive interval 45 retry 2
(config)# alps remote-peer 192.168.20.3 protocol matip-a dynamic status-interval 60
(config)# alps remote-peer 192.168.70.2 protocol matip-a dynamic 0 no-circuit 10
(config)# alps remote-peer 192.168.70.3 protocol matip-a dynamic 45
(config)# alps enable-alarms peer 192.168.70.2
(config)# alps enable-alarms ascu
!
(config)# alps circuit CKT_ALC_1
(config-alps-circ)# alps primary-peer 192.168.70.2 backup-peer 192.168.70.3
(config-alps-circ)# alps connection-type permanent
(config-alps-circ)# alps local-hld 2525
(config-alps-circ)# alps enable-circuit
!
(config)# alps circuit CKT_UTS
(config-alps-circ)# alps primary-peer 192.168.20.3
(config-alps-circ)# alps mpx single
(config-alps-circ)# alps idle-timer 90
(config-alps-circ)# alps local-hld 2527
(config-alps-circ)# alps enable-circuit
(config-alps-circ)# alps service-msg-interval 2
!
(config)# interface Loopback0
(config-if)# ip address 192.168.25.2 255.255.255.0

(config)# interface Serial0
(config-if)# ip address 210.100.50.2 255.255.255.0
```

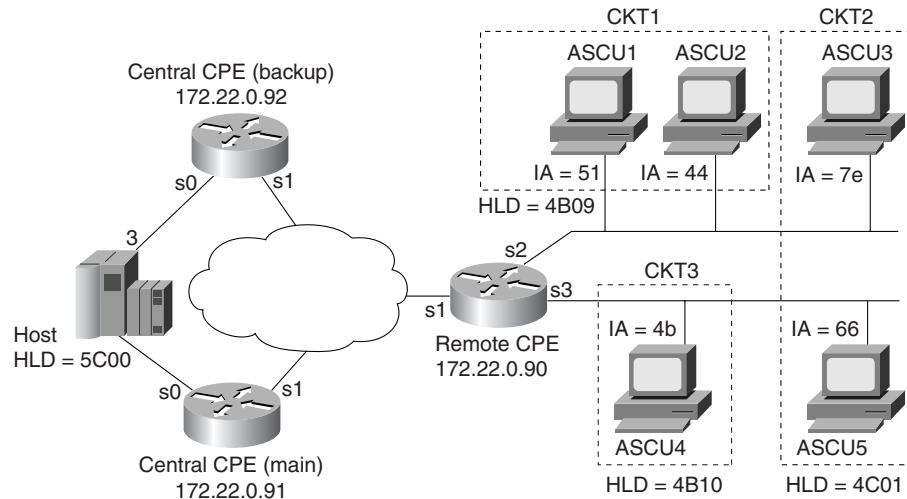
51935

```
(config-if)# encapsulation frame-relay IETF
(config-if)# frame-relay map ip 210.100.60.2 40
(config-if)# frame-relay map ip 210.100.70.2 50
!
(config)# interface Serial6
(config-if)# encapsulation alc
(config-if)# alps t1 6
(config-if)# alps t2 8
(config-if)# alps poll-pause 100
(config-if)# clockrate 9600
!
(config-if)# alps ascu 42
(config-alps-ascu)# alps default-circuit CKT_ALC_1
(config-alps-ascu)# alps a1-map 60 a2-map 70
(config-alps-ascu)# alps enable-ascu
!
(config-if)# alps ascu 45
(config-alps-ascu)# alps default-circuit CKT_ALC_1
(config-alps-ascu)# alps a1-map 60 a2-map 72
(config-alps-ascu)# alps enable-ascu
!
(config)# interface Serial7
(config-if)# encapsulation uts
(config-if)# alps n3 4
(config-if)# alps poll-pause 125
(config-if)# clockrate 4800
!
(config-if)# alps ascu 21
(config-alps-ascu)# alps default-circuit CKT_UTS
(config-alps-ascu)# alps a1-map 22 a2-map 13
(config-alps-ascu)# alps enable-ascu
!
```

## ALPS Configuration for ALC and AX.25 Example

Figure 217 shows a simple router topology for the ALPS feature with ALC encapsulation. The configuration for this topology follows.

Figure 217 Router Topology for the ALPS Configuration for ALC Encapsulation Example



HLD = high-level designator  
IA = interchange address

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### Remote CPE Configuration

```
(config)# alps local-peer 172.22.0.90
(config)# alps keepalive interval 60
(config)# alps remote-peer 172.22.0.91
(config)# alps remote-peer 172.22.0.92 dynamic 60
(config)# alps service-msg-list 1 number 2 TERMINAL OFF
!
(config)# alps circuit CKT1
(config-alps-circ)# alps primary-peer 172.22.0.91 backup-peer 172.22.0.92
(config-alps-circ)# alps local-hld 4B09 remote-hld 5C00
(config-alps-circ)# alps connection-type permanent 30
(config-alps-circ)# alps lifetime-timer 3
(config-alps-circ)# alps hostlink 3 ax25 120 winout 3 winin 3
(config-alps-circ)# alps service-msg-interval 3
(config-alps-circ)# alps service-msg-list 1
(config-alps-circ)# alps enable-circuit
!
(config)# alps circuit CKT2
(config-alps-circ)# alps primary-peer 172.22.0.91 backup-peer 172.22.0.92
(config-alps-circ)# alps local-hld 4C01 remote-hld 5C00
(config-alps-circ)# alps hostlink 3 ax25 1500 winout 4 winin 5
(config-alps-circ)# alps enable-circuit
!
(config)# alps circuit CKT3
(config-alps-circ)# alps primary-peer 172.22.0.91
(config-alps-circ)# alps local-hld 4B10 remote-hld 5C00
(config-alps-circ)# alps connection-type permanent 30
(config-alps-circ)# alps lifetime-timer 6
```

```
(config-alps-circ)# alps hostlink 3 ax25 905
(config-alps-circ)# alps enable-circuit
!
(config)# interface serial 1
(config-if)# ip address 172.22.0.90 255.255.255.0
!
(config)# interface serial 2
(config-if)# encapsulation alc
(config-if)# alps t1 3
(config-if)# alps t2 6
(config-if)# alps n1 3
(config-if)# alps n2 2
(config-if)# alps servlim 20
!
(config-if)# alps ascu 51
(config-alps-ascu)# alps default-circuit CKT1
(config-alps-ascu)# alps a1-map 40 a2-map 2D
(config-alps-ascu)# alps retry-option resend
(config-alps-ascu)# alps max-msg-length 1950
(config-alps-ascu)# alps error-display 6d 78
(config-alps-ascu)# alps enable-ascu
!
(config-if)# alps ascu 44
(config-alps-ascu)# alps default-circuit CKT1
(config-alps-ascu)# alps a1-map 40 a2-map 2E
(config-alps-ascu)# alps max-msg-length 590
(config-alps-ascu)# alps error-display 6d 78
(config-alps-ascu)# alps enable-ascu
!
(config-if)# alps ascu 7E
(config-alps-ascu)# alps default-circuit CKT2
(config-alps-ascu)# alps a1-map 40 a2-map 2F
(config-alps-ascu)# alps retry-option re-send
(config-alps-ascu)# alps max-msg-length 2000
(config-alps-ascu)# alps error-display 6d 78
(config-alps-ascu)# alps enable-ascu

(config)# interface serial 3
(config-if)# encapsulation alc
(config-if)# alps t1 5
(config-if)# alps t2 6
(config-if)# alps n1 1
(config-if)# alps n2 2
(config-if)# alps servlim 20
!
(config-if)# alps ascu 4B
(config-alps-ascu)# alps default-circuit CKT3
(config-alps-ascu)# alps a1-map 63 a2-map 41
(config-alps-ascu)# alps retry-option re-send
(config-alps-ascu)# alps max-msg-length 1960
(config-alps-ascu)# alps error-display 6d 78
(config-alps-ascu)# alps enable-ascu

(config-if)# alps ascu 66
(config-alps-ascu)# alps default-circuit CKT2
(config-alps-ascu)# alps a1-map 71 a2-map 21
(config-alps-ascu)# alps max-msg-length 3800
(config-alps-ascu)# alps error-display 6d 78
(config-alps-ascu)# alps enable-ascu
```

**Central CPE Configuration (Main)****AX.25 Host**

```
(config)# alps local-peer 172.22.0.91 promiscuous
(config)# interface serial 0
(config-if)# encapsulation x25 ax25
(config-if)# x25 ltc 1024
(config-if)# alps host-hld 5C00 host-link 3 ax25
```

**Central CPE Configuration (Backup)****AX.25 Host**

```
(config)# alps local-peer 172.22.0.92 promiscuous
(config)# interface serial 0
(config-if)# encapsulation x25 ax25
(config-if)# x25 ltc 1024
(config-if)# alps host-hld 5C00 host-link 3 ax25
```

## ALPS Configuration for UTS and EMTOX Example

The following configuration is an example of routing P1024C UTS data frames across the network between central and remote equipment.

**Remote Router Configuration**

```
(config)# hostname alps-rcpe
(config)# alps local-peer 200.100.25.2
(config)# alps keepalive interval 45 retry 5
(config)# alps remote-peer 200.100.40.2
(config)# alps enable-alarms peer 200.100.40.2
(config)# alps enable-alarms ascu

(config)# alps circuit UTS_EMTOX
(config-alps-circ)# alps primary-peer 200.100.40.2
(config-alps-circ)# alps idle-timer 90
(config-alps-circ)# alps local-hld 2525 remote-hld 5050
(config-alps-circ)# alps mpx single
(config-alps-circ)# alps hostlink 6 emtox 1100 ops 512 ips 512
(config-alps-circ)# alps service-msg-interval 2
(config-alps-circ)# alps enable-circuit

(config)# interface Loopback0
(config-if)# ip address 200.100.25.2 255.255.255.0

(config)# interface Serial0
(config-if)# ip address 200.100.50.2 255.255.255.0
(config-if)# encapsulation frame-relay IETF
(config-if)# frame-relay map ip 200.100.50.3 20

(config)# interface Serial1
(config-if)# encapsulation uts
(config-if)# alps n1 5
(config-if)# alps n3 4
(config-if)# alps poll-pause 200
(config-if)# clockrate 4800
!
(config-if)# alps ascu 21
(config-alps-ascu)# alps default-circuit UTS_EMTOX
(config-alps-ascu)# alps a1-map 22 a2-map 13
```

```
(config-alps-ascu)# alps enable-ascu
!
```

### Central CPE Configuration

```
(config)# hostname alps-ccpe
(config)# alps local-peer 200.100.40.2 promiscuous
(config)# alps enable-alarms circuit
!
(config)# interface Loopback0
(config-if)# ip address 200.100.40.2 255.255.255.0
!
(config)# interface Serial0
(config-if)# ip address 200.100.50.3 255.255.255.0
(config-if)# encapsulation frame-relay IETF
(config-if)# clockrate 56000
(config-if)# frame-relay map ip 200.100.50.2 20
!
(config)# interface Serial2
(config-if)# encapsulation x25 dce
(config-if)# alps host-hld 5050 host-link 6 emtox 2222
(config-if)# alps translate 110* 200.100.25.2
(config-if)# clockrate 64000
```

