Chapter 19

Asynchronous Call Control

Introduction

This chapter describes the asynchronous call control facilities provided by the router, and how to set up and use asynchronous call control on the router.

The Asynchronous Call Control (ACC) module enables Public Switched Telephone Networks (PSTNs) and asynchronous modems to be used to interconnect routers, or to connect personal computers (PC's) running industry-standard software to the router. The asynchronous Point-to-Point Protocol (PPP) and a number of variants of the Serial Line Internet Protocol (SLIP) are supported. ACC provides low cost and convenient full network access for sites where a telephone line is the preferred or the only telecommunications medium.

The ACC module can be configured to answer calls made to a modem connected to an asynchronous port, validate the user making the call and configure the port to the mode appropriate to the desired service. ACC may also be configured to originate calls by controlling a modem attached to an asynchronous port and to switch the port to the appropriate mode once a connection to the remote device has been established.

The User Authentication Facility (See Chapter 41, User Authentication) provides authentication and security services to the ACC module to control and monitor access to services available on or via the router.

See Chapter 9, Interfaces for detailed information on managing and monitoring asynchronous ports. See Chapter 15, Point-to-Point Protocol (PPP) for detailed information about configuring asynchronous PPP. See Chapter 22, Internet Protocol (IP) for information about adding SLIP interfaces.

Call Definitions

Call definitions provide the basic mechanism for controlling access to asynchronous services provided by or through the router. A call definition specifies how the router answers an incoming call or initiates an outgoing call via a modem connected to an asynchronous port. A call definition can also control the way that a router originates a call to another router, when the two routers are interconnected via asynchronous modems.

A call definition specifies the name assigned to the call, the port or ports that are used for the call, the direction of the call (answers incoming calls, initiates outgoing calls, or both), and the encapsulation to use. For incoming calls, the call definition also specifies the method of authenticating the caller. For outgoing calls, the call definition may include scripts to be executed when dialling a remote host or when a connection has been established to a remote host.

To create a call, use the command:

```
add acc call=name asyn=asyn-number [authentication={auto|
    none|password}] [cscript=script-name] [dial=phone-number]
    [direction={answer|both|originate}] [dscript=script-name]
    [encapsulation={adaptive|auto|cslip|enquire|none|okppp|
    ppp|slip|distill}] [line={direct|modem}]
    [ppptemplate=template] [remotecall=remote-call]
    [rscript=script-name]
```

For example, to define a call that enables a remote user to call in via asynchronous port 1, be authenticated by providing a login name and password, and select an encapsulation, use the command:

```
add acc call=“Async server“ direction=answer asyn=1
    encapsulation=esnuire authentication=password
```

To modify a call definition, use the command:

```
set acc call=name [authentication={auto|none|password}]
    [cscript=script-name] [dial=phone-number]
    [direction={answer|both|originate}] [dscript=script-name]
    [encapsulation={adaptive|auto|cslip|enquire|none|okppp|
    ppp|slip|distill}] [line={direct|modem}]
    [ppptemplate=template] [remotecall=remote-call]
    [rscript=script-name]
```

To delete a call definition, use the command:

```
delete acc call=name
```

A call definition can be temporarily disabled and then re-enabled without losing the definition with the commands:

```
disable acc dall=name
enable acc call=name
```

To display details of all call definitions, use the command:

```
show acc call
```

Each port used for an asynchronous service must be associated with at least one call definition. A port may be associated with multiple call definitions. More than one port may be associated with a call definition, and the router responds in the same way to a call received at any of these ports. Additional asynchronous ports may be added to the call definition with the command:

```
add acc call=name asyn=asyn-number
```

For example, the following command adds asynchronous port 2 to the call definition “Async server”.

```
add acc call=“Async server“ asyn=2
```

To configure asynchronous ports associated with a call definition for a modem connection, use the command:

```
set asyn=asyn-number flow=hardware cdcontrol=connect
    dtrcontrol=on speed=speed
```

This configures the port to use hardware flow control, to recognise the Carrier Detect (CD) modem control signal as an indication of an incoming call, to assert the Data Terminal Ready (DTR) modem control signal while the call is active and to set the baud rate of the port to the specified speed. The baud rate of the port should be set to match that of the modem and can be selected from any of the supported baud rates. See Chapter 9, Interfaces for more information.

To configure the modem connected to an asynchronous port, use the command:

```
connect asyn=asyn
```

The manager can then configure the modem directly using modem commands.

The router supports the asynchronous PPP encapsulation, SLIP (Serial Line Internet Protocol) encapsulation, CSLIP (Compressed SLIP using Van Jacobson's header compression) or no encapsulation for remote terminal or terminal emulation access. The call may be also set up to prompt the user for the encapsulation method after the connection is made. When an incoming call is received the router displays the login and password prompts (if required). When the user has entered a valid login name and password, the router prompts for the encapsulation to be used. When a valid encapsulation is entered the router changes to the specified mode and the dialogue with the user is complete (Figure 19-1).

Figure 19-1: Dialogue between a user and the router for a call made to an asynchronous port associated with the call definition "Async server"

```
CMD login: bruce
Password:

Info (146303): ACC enquire command options are:-
none, slip, cslip, adaptive, PPP and auto.

Encap> ppp
```

For successful operation of IP over the asynchronous interface an IP address and Maximum Transmission Unit (MTU) must be assigned to the port and/or user. This information may be obtained in a number of different ways. The router uses the following procedure to determine the correct values for a particular user:

1. If an interface for the port has been added to the IP module using the **add ip interface** command on page 22-80 of Chapter 22, Internet Protocol (IP), then the IP address, network mask, and MTU are as defined for that IP interface.
2. If the user is authenticated via RADIUS, and the RADIUS response supplies an IP address, then that IP address is used.
3. If the user is authenticated using TACACS and an ACC domain name has been specified with the **add acc domainname** command on page 19-20, then the domain name is appended to the login name and a Domain Name Service (DNS) request is issued to resolve the name to an IP address.
4. If the user is authenticated by the User Authentication Database and an IP address and MTU are associated with the user's login name, then they are used for the interface.
5. If the port has been assigned a default IP address and MTU, then they are used.
6. If the ACC call has an IP pool set, and the request to the IP pool is successful, then that IP address is used. See "IP Address Pools" on page 22-52 of Chapter 22, Internet Protocol (IP) for more information about creating IP address pools.
7. If all of the above steps fail to provide the necessary information then a message is displayed and the call is dropped.

The IPX network protocol can also be used over a dial-in asynchronous port as long as PPP is used as the encapsulation protocol. For successful operation of IPX, the network number for the port must be assigned with the command:

```
set asyn=asyn-number ipxnetwork=network
```

Authenticating Incoming Calls

The call definition for an incoming call specifies the method used for authenticating the caller.

The caller may be authenticated by the User Authentication Facility (see Chapter 41, User Authentication), or by an authentication protocol. The User Authentication Facility prompts the user for a login name and password and queries the User Authentication Database and any defined RADIUS or TACACS servers to verify the response.

For calls using the asynchronous PPP encapsulation, the Password Authentication Protocol (PAP) or the Challenge Handshake Authentication Protocol (CHAP) can be used to authenticate the user. PAP and CHAP query the User Authentication Database to verify the login name and password supplied by the peer.

A call may also be set up to select the authentication method based on the first characters received at the port. If a PPP flag character is received, PAP or CHAP authentication is used. Otherwise, the user is prompted for a login name and password. A call may also be set up to use no authentication.

RADIUS Authentication

ACC supports RADIUS authentication as defined in RFC 2138, "*Remote Authentication Dial In User Service (RADIUS)*". Descriptions of RADIUS authentication attributes are in the following table.

Table 19-1: RADIUS authentication attributes supported by Asynchronous Call Control (ACC)

Authentication Attribute	Description
User-Name	The name of the user to be authenticated.
User-Password	The password of the user to be authenticated.
CHAP-Password	The response value provided by a PPP CHAP user in response to the challenge.
NAS-IP-Address	The IP address of the NAS that authenticates the user.
NAS-Port	The physical port of the NAS that authenticates the user.
Framed-IP-Address	The address to be configured for the user.
Framed-IP-Netmask	The IP network mask to be configured for the user.
Callback-Number	A dialling string to be used for callback.
Framed-IPX-Network	The IPX network number to be configured for the user.
Idle-Timeout	The maximum number of consecutive seconds of idle connection allowed to the user before termination of the session or prompt.
NAS-Identifier	A string identifying the NAS originating the authentication request.
Framed-AppleTalk-Network	The AppleTalk network number that the NAS should probe to allocate an AppleTalk node for the user.
Framed-AppleTalk-Zone	The AppleTalk default zone to use for this user.

RADIUS Accounting

ACC supports RADIUS accounting as defined in RFC 2139, "*RADIUS Accounting*". Table 19-2 on page 19-6 details the RADIUS accounting attributes supported. When a new dial-in session is created an accounting record is opened for the session and the login name is written to the record. While the session is active, traffic statistics for the session are recorded. When the dial-in session terminates, an end-of-session message is sent to the Logging Facility, a RADIUS accounting record is sent to the RADIUS server if the user was authenticated by RADIUS, and the session's accounting record is closed and deleted.

If more than one RADIUS server is defined, and the user was authenticated using RADIUS, RADIUS accounting records are sent to each RADIUS server in turn until an *Accounting-Response* packet is received.

Table 19-2: RADIUS accounting attributes supported by Asynchronous Call Control (ACC)

Accounting Attribute	Description
Acct-Status-Type	Whether the *Accounting Request* marks the beginning or end of the user service.
Acct-Input-Octets	The number of octets received from the port over the course of this service.
Acct-Output-Octets	The number of octets sent to the port over the course of this service.
Acct-Session-Id	A unique accounting ID used to match start and stop records in a log file.
Acct-Authentic	The method that the user is authenticated.
Acct-Session-Time	The number of seconds for which the user has received this service.
Acct-Input-Packets	The number of packets received from the port in the course of delivering this service to a Framed User.
Acct-Output-Packets	The number of packets sent to the port in the course of delivering this service to a Framed User.
Acct-Terminate-Cause	The mechanism or reason for terminating the session.

Using Modem Scripts

A call definition may include the name of a modem script to be run. The *reset script* is specified with the **rscript** parameter of the **add acc call** command on page 19-17 and the **set acc call** command on page 19-28, and normally contains a sequence of commands to be sent to the modem attached to the local asynchronous port to reset it after a call has completed, or after being connected to a port to configure the modem. The *dial script* is specified with the **dscript** parameter of the **add acc call** and **set acc call** commands, and normally contains a sequence of commands to be sent to the modem to initiate a call by dialling a remote modem. The *connect script* is specified with the **cscript** parameter of the **add acc call** and **set acc call** commands, and normally contains a sequence of commands to be sent to the remote host to login, once the call has been answered by the remote modem.

A script is a text file contains send statements and wait statements. Modem script files have an MDS file extension. A send statement is in square brackets and contains commands to be sent to the modem or remote host. A wait statement is in parentheses and contains responses from the modem or remote host that the router should wait for before executing the next statement in the script. Wait statements may also include a time limit. If a response is not received within the specified time, the script is aborted and the call is disconnected.

Script files can be created using script commands from the command line, the router's built-in editor (see "Built-In Editor" on page 6-5 of Chapter 6, Managing the File System), or by loading the script file from a TFTP server using the **load** command on page 5-31 of Chapter 5, Managing Configuration Files and Software Versions.

To create a modem script from the command line, use the command:

```
add acc script=script-name [line=line-number]
    [text=script-text] [template=script-name]
```

For example to create a new modem script called **reset**, use the command:

```
add acc script=reset.mds text="[ATZ^M]"
```

This script would send the modem command "ATZ" followed by a carriage return to the modem to reset it. The carriage return that terminates the string is represented in the script by the characters "^M", as a carriage return is equivalent to the keystrokes [Ctrl/M] or [Enter]. Any control character may be included in a script by prefixing its associated printing character with the caret character "^".

Additional calls to **add acc script** add lines to the script. For example to add a second line to the **reset** script, use the command:

```
add acc script=reset.mds text="(10 OK)"
```

The wait statement "(**10 ok**)" instructs the router to wait for a maximum of 10 seconds for OK to be received from the modem.

To change a line of text or reorder the lines in an existing script, use the command:

```
set acc script=script-name line=line-number
    [text=script-text] [after=line-number]
    [before=line-number]
```

To delete a line from a script or to delete the entire script, use the command:

```
delete acc script=script-name [line=line-number]
```

To delete all the defined scripts or a single script, use the command:

```
purge acc script={script-name|all}
```

To display the list of currently defined scripts, use one of the commands:

```
show acc
show acc script
```

To display the contents of a script, use the command:

```
show acc script[=script-name]
```

For example, to display the contents of the RESET script created in the example above, use the command:

```
show acc script=reset.mds
```

When an outgoing call is made, the dial script is first executed to initiate the call. The purpose of the dial script is to make a connection to a remote host. The following commands create a script that resets the modem:

```
add acc script=dial.mds text=“[ATZ^M]“
add acc script=dial.mds text=“(10 OK)“
add acc script=dial.mds text=“[ATDT 3038303^M]“
```

The script uses the ATZ modem command, waits until the modem responds with OK, and then requests the modem to dial the phone number 3038303.

The connect script is activated once the modem has connected to the remote modem. The following commands create a script that waits for a maximum of 10 seconds for a login prompt to be displayed.

```
add acc script=dial.mds text=“(10 login)“
add acc script=dial.mds text=“[bruce^M]“
add acc script=dial.mds text=“(10 Password)“
add acc script=dial.mds text=“[password^M]“
add acc script=dial.mds text=“(10 encap)“
add acc script=dial.mds text=“[cslip^M]“
add acc script=dial.mds text=“(20 address)“
```

If it is received within the time period, the router sends the login name “bruce” and then waits a maximum of 10 seconds for a password prompt. If it is received within the time period, the router responds with “password”, then waits a maximum of 10 seconds for the “encap” string and responds with the “cslip” string. This script could be used to connect to a remote router using a call definition with **encapsulation** set to **enquire** and **authentication** set to **password**.

When the router is executing a wait statement, all input is compared, case **in**sensitively, with the specified string. There must be a space after the time period to delimit it from the string. This space is not used for matching purposes, but any subsequent spaces, before the closing “)” are considered part of the string. If the string is not received before the timeout period expires, the script terminates and the call is deactivated by negating DTR. If a string is not specified, the script waits for the specified time period. For example, “(10)” causes the router to wait 10 seconds then continue. If a time period is not specified, then the script waits indefinitely. For example, “(OK)” makes the router wait indefinitely for the string “OK”.

Once an outgoing call has been defined, a call may be initiated with the command:

```
activate acc call=name [phonenumber=phone-number]
```

To terminate an active call, use the command:

```
deactivate acc call=name
```

Bidirectional Calls

An ACC call may be defined that supports connections in either direction. A bidirectional call definition requires the same parameters as an outgoing call. Where two routers are to be linked by an asynchronous call that may be activated from either end a bidirectional call is required.

Interface with Higher Layers

The ACC module acts as an intermediary between the asynchronous port and a higher layer protocol. When an asynchronous port is used as a network interface, the higher layer protocols are PPP and IP. For a call where the encapsulation is determined by enquiry, a PPP or IP interface is created dynamically as required. For a call where the encapsulation is explicitly defined or known in advance, a permanent PPP or IP interface may be created to use the port or ports associated with the call. For a router used to provide Internet dial-in services the ACC module dynamically creates interfaces to the higher layer interfaces as required. However, when an asynchronous port is used to connect to another router, creating a permanent network layer, a predefined higher layer interface should be used.

To display dynamically created PPP and IP interfaces, use the commands:

```
show ppp
show ip interface
```

To create permanent PPP and IP interfaces for the respective module, use the commands:

```
create ppp=m over=acc-callname...
add ip interface=pppm...
```

For SLIP, use the command:

```
add ip interface=slipn...
```

where *n* is the number of the asynchronous port to be used for the interface. SLIP functionality is built into the ACC module so a SLIP interface does not need to be explicitly created.

If a PPP interface is defined over an ACC call, then all the features of PPP can be used, including dial on demand, leased line backup, and bandwidth on demand. Also, all higher layer protocols such as IPX that are supported by PPP can be utilised over an asynchronous link.

After a higher layer protocol (PPP or IP) has been configured to use a call, initiate a call with the command:

```
activate acc call=name
```

For a PPP link, the calls are typically automatically activated and deactivated by the PPP layer. Calls can also be activated on ports set to dynamic SLIP. With dynamic SLIP, the IP address for the port is obtained from the remote end during startup. Terminate an active call with the command:

```
deactivate acc call=name
```

Dynamic IP interfaces are purged when the IP routing module is reset by a router restart or one of the **reset ip**, **add ip interface**, **delete ip interface** or **set ip interface** commands.

Using a Domain Name Server

For calls designed to carry IP traffic, an IP address is required. A *Domain Name Server* (DNS) can be used to determine the IP address for individual users. To define a domain name, use the command:

```
add acc domainname=domain-name
```

When a user logs in to the router, the user's login name is appended to the domain name and a DNS lookup is performed using the resulting string. If the lookup is successful, the response is used as the IP address for the user.

To delete the domain name, use the command:

```
delete acc domainname
```

To display the currently assigned domain name, use the command:

```
show acc domainname
```

Appropriate entries must be created in the DNS to map entries by using the format *login-name.domain-name* to IP addresses.

Configuration Examples

Asynchronous ports may be accessed remotely by modem for a variety of purposes. See Chapter 9, Interfaces and Chapter 61, Terminal Server for a detailed description of configuring the asynchronous ports. Where asynchronous ports are accessible by modem, security is paramount. See Chapter 41, User Authentication for a complete description of the security features available on the router to support remote access via the asynchronous ports.

The following examples describe how to use asynchronous ports for dial-in PPP and SLIP serving, and for the interconnection of routers using SLIP. See "Configuration Examples" on page 61-10 of Chapter 61, Terminal Server for an example of attaching a modem to an asynchronous port and configuring the user authentication features of the router.

Defining an ACC Call

When a router is to be used as an IP server for incoming connections using PPP or SLIP, or an IPX server for incoming connections using PPP, an Asynchronous Call Control (ACC) call must be defined on the router and linked to the port where the connection is made.

Define the call with the command:

```
add acc call=dialin direction=answer asyn=asyn-number
    encapsulation=auto authentication=auto
```

The name “dialin” is used to identify the call in future commands. The **direction** parameter indicates to the router that the definition applies to incoming calls, the **encapsulation** parameter defines how the encapsulation is determined, and the **authentication** parameter defines how user authentication is performed. Specifying “auto” for these two parameters is the simplest option, and results in the following process:

1. When a call is received, the router outputs a login prompt.
2. If a PPP flag character is received, then the router assumes that PPP encapsulation is required and that PAP authentication is to be used.
3. If PAP/PPP is not to be used, the user enters their login name at the prompt and password at the subsequent password prompt.
4. The router outputs an appropriate message and waits to see a PPP flag character or a SLIP end-of-frame character, and then enters the corresponding encapsulation mode.

Most PPP/SLIP clients have some form of scripting language to facilitate connecting to the router. As every client’s scripting language has a different syntax, the contents of scripts appropriate to connecting to a router is discussed in general terms.

For a SLIP client, the process is:

1. Call the remote location.
2. Wait for the login prompt.
3. Send the login name.
4. Wait for the password prompt.
5. Send the password.
6. Enter SLIP mode.

For a PPP client without PAP, change step 6 to enter PPP mode. If the PPP client supports PAP, then PPP mode should be entered after step 2.

The encapsulation and authentication method may be set explicitly. The encapsulation may be set to **none**, **ppp**, **slip, cslip, adaptive, enquire** or **automatic**. **cslip** is **slip** with Van Jacobson’s header compression. **adaptive** causes the router to automatically select **slip** or **cslip** depending upon what characters it receives from the client. **enquire** causes the router to issue a prompt to the user so that the user can select the desired encapsulation.

The authentication method may be **none, password, pap, chap** or **automatic**. **password** is the default and prompts the user to enter a correct login name and password. **pap** and **chap** are the Password Authentication Protocol and Challenge Handshake Authentication Protocol respectively, and may be used with PPP only. **chap** is more secure because it does not involve the transmission of an unencrypted password.

Assigning IP Addresses

When router ports are used for PPP or SLIP IP serving, the IP interfaces for the ports are created dynamically when the call comes in and is destroyed when the call terminates. For the interface to be created, an IP address must be known. This information may be assigned on a port basis, assigned to a login name in the User Authentication Database, obtained from a RADIUS server by a RADIUS query, or obtained from an external Domain Name Server (DNS) by a DNS query.

If the RADIUS server supplies an IP address, then that IP address is used. Otherwise, the IP address configured for the login name is used.

If the login name is not configured with an IP address and an ACC domain name is set, then the domain name is appended to the login name and a DNS query issued.

If the IP address has not been determined and an IP address has been configured for the port, then that IP address is used.

If an IP address cannot be determined by any of the above means, the connection is rejected.

To assign an IP address for use with an ACC call, do one or more of the following:

1. **Assign an IP address and MTU to the asynchronous port accessed by the ACC call.**

   To assign an IP address and MTU to a port, use the command:

   ```
   set asyn=asyn-number ip=ipadd mtu=mtu
   ```

   To remove the IP address, specify “none” or “off” for the IP parameter.

2. **Assign an IP address and MTU to a user.**

   To configure an IP address for a user, use the command:

   ```
   set user=login-name ip=ipadd mtu=mtu
   ```

   These parameters may also be specified when the user is first added to the User Authentication Database. To remove the IP address, specify “none” or “off” for the IP parameter.

3. **Configure a Domain Name Server for DNS lookups.**

   To configure the domain name “site.company.com” to be appended to a login name for a DNS query, use the command:

   ```
   add acc doaomin=site.company.com
   ```

   Only one ACC domain name may be specified at a time. If the user “bill” logs in and there is no IP address assigned to the port he logged in over, or to his entry in the User Authentication Database, then a DNS request for bill.site.company.com is issued. To delete the domain name, use the command:

   ```
   delete acc domain
   ```

Dial-in IPX

When router ports are used for PPP serving, the IPX interfaces for the ports are created dynamically when the call comes in and destroyed when the call terminates. For the interface to be created, and IPX network address must be known. This information is assigned on a port basis, or returned from a RADIUS authentication query.

To assign an IPX network address for use with an ACC call

1. **Assign an IPX network address to the port accessed by the ACC call.**

   To assign an IPX network address to a port, use the command:

   ```
   set asyn=asyn-number ipxnetwork=network
   ```

   The IPX network address can be removed by setting it to zero (0).

Router-to-Router PPP

The following example illustrates how to configure two routers to use a dial-on-demand PPP link over an ACC call. The link is configured to carry IP traffic. The two routers at either end of the link (Router 1 and Router 2) each have a Hayes compatible modem attached to asynchronous port 2. PAP authentication is used to restrict remote access to the routers.

To configure Router 1

1. **Define the ACC call.**

   The call direction is set to **both** so that the call can either call or answer the remote router on demand:

   ```
   add acc call=primary asyn=2 direction=both
      authentication=pap encapsulation=ppp
   ```

2. **Define the dial script.**

   The dial script sets the modem into command echo mode and requests that result codes be displayed. The script waits for the modem to return “OK”, which indicates that it has responded. The modem is then requested to dial the remote router:

   ```
   add acc script=dial.mds text=″[ATE1Q0^M]″

   add acc script=dial.mds text=″(10 OK)″

   add acc script=dial.mds text=″[ATDT 3789398^M]″
   ```

3. **Define the reset script.**

   The reset script puts the modem into a mode that answers incoming calls. The script sets the modem to disable command mode and suppress result codes. This is required to stop the modem from interpreting the data from an incoming connection as modem commands. The modem is set into auto answer mode by setting the S0 register to 2, i.e. answer the remote modem after two rings:

   ```
   add acc script=reset.mds text=″[ATE0Q1S0=2^M]″
   ```

4. **Modify the ACC call to use the scripts.**

   The defined scripts are associated with the **rscript**, **dscript** and **cscript** parameters for the ACC call:

   ```
   set acc call=primary rscript=reset.mds dscript=dial.mds
   ```

5. **Create the PPP link over the ACC call.**

   The PPP link is created over the ACC call, and the **idle** parameter is on. This has the effect of deactivating the call after a defined period of inactivity on the PPP link:

   ```
   create ppp=0 over=acc-primary idle=on
   ```

   The PPP link is set to PAP authentication, and the password is set so that it is passed along with the system name to the remote router to authenticate the local router:

   ```
   set ppp=0 over=acc-primary authentication=pap user=router1
      password=password1
   ```

   Set the system name for the router:

   ```
   set system name=Router1
   ```

   Add an entry to the User Authentication Database with the remote router’s system name and the password it is going to use:

   ```
   add user=Router2 password=password2
   ```

   The IP address is defined for the link:

   ```
   enable ip
   ```

   ```
   add ip interface=ppp0 ip=192.168.104.1
   ```

To configure Router 2

1. **Define the ACC call.**

   The call direction is set so that the call can either call or answer the remote router on demand:

   ```
   add acc call=primary asyn=2 direction=both
      authentication=pap encapsulation=ppp
   ```

2. **Define the dial script.**

   The dial script sets the modem into command echo mode and requests that result codes be displayed. The script waits for the modem to return “OK”, which indicates that it has responded. The modem is then requested to dial the remote router:

   ```
   add acc script=dial.mds text=”[ATE1Q0^M]”
   ```

   ```
   add acc script=dial.mds text=”(10 OK)”
   ```

   ```
   add acc script=dial.mds text=”[ATDT 3781261^M]”
   ```

3. **Define the reset script.**

   The reset script puts the modem into a mode that answers incoming calls. The script sets the modem to disable command mode and suppress result codes. This is required to stop the modem from interpreting the data from an incoming connection as modem commands. The modem is set into auto answer mode by setting the S0 register to 2, i.e. answer the remote modem after two rings:

   ```
   add acc script=reset.mds text=”[ATE0Q1S0=2^M]”
   ```

4. **Modify the ACC call to use the scripts.**

   Associate the defined scripts with the **rscript**, **dscript** and **cscript** parameters for the ACC call:

   ```
   set acc call=primary rscript=reset.mds dscript=dial.mds
   ```

5. **Create the PPP link over the ACC call.**

   The PPP link is created over the ACC call, and the **idle** parameter is set to **on**. This has the effect of deactivating the call after a defined period of inactivity on the PPP link:

   ```
   create ppp=0 over=acc-primary idle=on
   ```

   The PPP link is set to PAP authentication, and the password is set so that it is passed along with the system name to the remote router to authenticate the local router:

   ```
   set ppp=0 over=acc-primary authentication=pap user=router2
      password=password2
   ```

   Set the system name for the router:

   ```
   set system name=router2
   ```

   Add an entry to the User Authentication Database with the remote router's system name and the password it is going to use:

   ```
   add user=router1 password=password1
   ```

   The IP address is defined for the link:

   ```
   enable ip
   ```

   ```
   add ip interface=ppp0 ip=192.168.104.2
   ```

Command Reference

This section describes the commands available on the router to configure and manage asynchronous call control. Before an asynchronous call control can dynamically use the IP and/or IPX protocols the appropriate modules must be enabled and configured correctly. See Chapter 22, Internet Protocol (IP) for detailed descriptions of the commands required to enable and configure IP. See Chapter 36, Novell IPX for a detailed descriptions of the commands required to enable and configure IPX.

The shortest valid command is denoted by capital letters in the Syntax section. See "Conventions" on page lxv of About this Software Reference in the front of this manual for details of the conventions used to describe command syntax. Note that the = sign is required in the command syntax.

See Appendix A, Messages for a complete list of messages and their meanings.

activate acc call

Syntax

```
ACTivate ACC CAll=name [PHONEnumber=phone-number]
```

where:

- *name* is the name of an ACC call 1 to 15 characters long. It is not case-sensitive. If *name* contains spaces, it must be in double quotes.
- *phone-number* is a character string 1 to 31 characters long. Valid characters are any printable characters.

Description

This command activates a previously defined outgoing or bidirectional call. The scripts specified in the call definition are executed to bring up a call to a remote system.

The **call** parameter specifies the name of the call to activate. The call definition must already exist.

The **phonenumber** parameter specifies the number of the destination to call. The value is assumed to be a valid sequence of dialling digits, and is passed to the dial script specified by the **dscript** parameter in the call definition. The value replaces the **%1** parameter in the dial script, if present. The **phonenumber** parameter overrides the **dial** parameter in the call definition.

Examples

To activate the ACC call named "remote", use the command:

```
act acc ca=remote
```

Related Commands

deactivate acc call
show acc call

add acc call

Syntax

```
ADD ACC CAll=name ASYn=asyn-number [AUthentication={AUto|
    NOne|PAssword}] [CScript=script-name]
    [DIAL=phone-number] [DIrection={ANswer|BOth|ORiginate}]
    [DScript=script-name] [ENcapsulation={ADaptive|AUto|
    CSlip|ENquire|NOne|OKPpp|PPp|SLip|DIStill}]
    [IPPool={pool-name|NONE}] [LIne={DIrect|MOdem}]
    [PPPTemplate=template] [REMotecall=remote-call]
    [RScript=script-name]
```

where:

- *name* is the name of the ACC call and may be from 1 to 15 characters long. It is not case-sensitive. If *name* contains spaces, it must be in double quotes.
- *asyn-number* is the number of one of the router's asynchronous ports.
- *script-name* is the file name of a modem script 4 to 20 characters long. It is not case-sensitive. The file name must have a file type of ".MDS".
- *phone-number* is a character string 1 to 31 characters long. Valid characters are any printable characters.
- *pool-name* is a character string 1 to 15 characters long. Valid characters are any printable characters. If *pool-name* contains spaces, it must be in double quotes.
- *template* is a number from 0 to 31.
- *remote-call* is the name of an ACC or ISDN call and may be from 1 to 15 characters long. It is not case-sensitive. If *remote-call* contains spaces, it must be in double quotes.

Description

This command defines a new ACC call or associates additional asynchronous ports with an existing call. When a new call is being defined, the **call**, **asyn**, and **direction** parameters are required. Other parameters are optional. When an additional port is being added to an existing call, the **call** and **asyn** parameters are required.

The **asyn** parameter specifies an asynchronous port on the router where the call is assigned. Incoming calls to the port are associated with this call definition. Outgoing calls using this call definition use the specified port.

The **authentication** parameter specifies the type of user authentication to perform before accepting a call. If **password** is specified, then authentication is handled by the User Authentication Facility that prompts for a login name and password and verifies the response against the User Authentication Database or any defined TACACS servers. If **auto** is specified, then **password** authentication proceeds unless a PPP flag character is detected. If a PPP flag character is detected, the **password** authentication is aborted, PPP negotiation is carried out, and the authentication method used is determined by the specified PPP template. If **none** is specified, then the authentication method is determined by the specified PPP template. The default is **password**.

The **call** parameter specifies the name of the call to create or where an additional port is to be added. If the call is being created, a call definition with the specified name must not already exist. If a port is being added to the call, a call definition with the specified name must already exist.

The **cscript** parameter specifies a connect script to execute once a connection has been made to a remote host, and normally contains a sequence of commands to be sent to the remote host to login, set session parameters or execute a host command. The **cscript** parameter is valid when **direction** is set to **originate** or **both**.

The **dial** parameter specifies the number of the destination to call. The value is assumed to be a valid sequence of dialling digits, and is passed to the dial script specified by the **dscript** parameter. The value replaces the **%1** parameter in the dial script, if present. The **dial** parameter may be overriden by the **phonenumber** parameter in the **activate acc call** command on page 19-16. The **dial** parameter is valid when **direction** is set to **originate** or **both**.

The **direction** parameter specifies whether the call definition applies to incoming calls, outgoing calls, or both. If **answer** is specified, the call definition defines the way the router handles an incoming call on the port. If **originate** is specified, the call definition defines the way that an outgoing call is made over the port. If **both** is specified, the call definition defines the behaviour for both incoming and outgoing calls.

The **dscript** parameter specifies a script to execute to initiate a call. The script normally contains a sequence of commands to be sent to the modem that is attached to the local asynchronous port, to dial the modem at the remote end of the link. The **dscript** parameter is valid when the **direction** is set to **originate** or **both**.

The **encapsulation** parameter specifies the encapsulation to be used for the call. If **adaptive** is specified, the encapsulation is adapted automatically to one of the SLIP variants. If **auto** is specified, the type of encapsulation required is automatically selected. If **cslip** is specified, the Compressed SLIP encapsulation is used (Van Jacobson's TCP header compression). If **enquire** is specified, the user is prompted for the type of encapsulation to be used for the connection. If **none** is specified, no encapsulation of the data is expected. **none** is suitable for remote terminal or terminal emulation access. If **okppp** is specified, the router mimics a Hayes-compatible modem until a valid PPP frame is seen, then asynchronous PPP encapsulation is used. If **ppp** is specified, asynchronous PPP encapsulation is used. If **slip** is specified, the SLIP encapsulation is used. The option **distill** should not normally be used because this encapsulation is used for a specific application. The default is **enquire**.

The **ippool** parameter specifies the IP pool to use to allocate IP addresses for dynamic dial-in SLIP sessions. If **none** is specified, IP addresses are not allocated from an IP pool. The default is **none**. See "IP Address Pools" on page 22-52 of Chapter 22, Internet Protocol (IP) for more information about creating IP address pools.

The **line** parameter specifies how control signals are handled by the port. If **direct** is specified, the control signals are managed to suit a direct connection to an asynchronous port on another router. This option is required when the ACC call is used to connect two routers back-to-back without modems. If **modem** is specified the control signals on the port are managed to suit a connection to a modem. The default is **modem**.

The **ppptemplate** parameter specifies the PPP template to use when creating a dynamic PPP interface for this call. The specified template must exist. This parameter is valid if encapsulation is set to **auto**, **okppp** or **ppp**. See "Templates" on page 15-18 of Chapter 15, Point-to-Point Protocol (PPP) for more information about creating PPP templates.

The **remote** parameter specifies the name of an ISDN or ACC call on a remote router. When this ACC call triggers the creation of an L2TP tunnel the value of the **remote** parameter is passed across the tunnel to identify the call that the remote router should use to make the final connection to the remote destination of the L2TP tunnel. See Chapter 20, Layer Two Tunnelling Protocol (L2TP) for more information about the use of this parameter.

The **rscript** parameter specifies the name of a script to execute when the CD line for the asynchronous port drops low.

When a call definition is successfully added, the router displays the details of the new call definition (Figure 19-2 below). See the **show acc call** command on page 19-35 for a detailed description of the parameters.

Figure 19-2: Example output from the **add acc call** command

```
Info (146268): Call successfully added.

ACC call details

Name: test
  State ............. Enabled
  Direction ......... Answer
  Line .............. Modem
  PPP Template ...... 1
  IP Pool ........... Not set
  Remote Call ....... Not set
  Encapsulation ..... Enquire
  Authentication .... Password
  Reset Script ...... Not set
  Accounting ........ Disabled
  Debug ............. Disabled

  Port(s):
    Port5:
      Number activations ........... 0
      Start time last activation ... Unused
      End time last activation ..... Unused
      Last user .................... Unused
```

Examples

To add an ACC call named "dialup" to use asynchronous port 2 as a SLIP server port, use the command:

```
add acc ca=dialup di=answer asy=2 en=slip
```

To add asynchronous port 3 to this call, use the command:

```
add acc ca=dialup asy=3
```

Related Commands

delete acc call
show acc call

add acc domainname

Syntax

```
ADD ACC DOmainname=domain-name
```

where *domain-name* is a domain name

Description

This command defines a domain name to be appended to a login name for a DNS lookup to determine the IP address to be used for an asynchronous call. Only one domain name may be defined.

Examples

To specify the domain name “acc.newco.co.nz” for use with DNS lookups, use the command:

```
add acc do=acc.newco.co.nz
```

Related Commands

delete acc domainname
show acc domainname

add acc script

Syntax

```
ADD ACC SCript=script-name [LIne=line-number]
   [TEXt=script-text] [TEMplate=script-name]
```

where:

- *script-name* is the file name of a modem script 4 to 20 characters long. It is not case-sensitive. The file name must have an MDS file type.
- *line-number* is a line number in the script. If *line-number* is greater than the number of lines in the script, the text is added to the end of the script
- *script-text* is the line of text to add to the script. If *script-text* contains spaces, it must be in double quotes.

Description

This command adds a line of modem commands to a modem script, or creates a new script.

The **line** parameter specifies the position of the new text in the script. If no line number is specified then the line is added at the end of the script. If the line number is specified then the new line is inserted in the script before the existing line with that line number. Lines with the same number or higher in the script are moved down to make room for the new line.

The **text** parameter specifies the text to be used to create the script or to be added to the existing script.

The **template** parameter specifies the name of an existing script to be copied to create the new script. The new script can then be edited. The **template** parameter allows many similar scripts to be created easily from a master or template script.

Scripts consists of one or more send statements and wait statements. A send statement contains a command to be sent to the modem or remote host, in square brackets, and separated from the next statement by one or more spaces. Modems and remote hosts normally expect commands to be terminated with a carriage return, which is represented in a script by the characters “^M”, equivalent to the [Enter] or [Ctrl/M] keystrokes. Any control character may be included in a statement by entering the caret character (“^”) followed by the appropriate printing character. For example, “^A” represents the ASCII character code 001, equivalent to the keystroke [Ctrl/A]. For example, the sequence of commands and responses (commands are in bold text, responses from the modem are in plain text):

```
ATZ
OK
ATDT 3038303
```

can be represented by the dial script:

```
"[ATZ^M] (5 OK) [ATDT 3038303^M]"
```

A script may also include wait statements that contain expected responses from the modem or remote host that the router should wait for before executing the next script statement. A wait statement consists of a timeout period (in seconds) and/or a character string to look for, in parentheses, and separated from the next statement by one or more spaces. If the character string is not received within the specified time period, the script is aborted and the call dropped, by negating the DTR signal at the port. If a string is not specified, the router waits the specified time before proceeding. For example, the following login dialogue (prompts from the remote host are in plain text, input from the user is in bold text):

```
Login: bruce
Password: brg2far
```

can be represented by the connect script:

```
"(10 Login) [bruce^M] (10 Password) [brg2far^M]"
```

The router waits up to 10 seconds for each response from the remote host before proceeding with the script.

Examples To insert a line at the start of a modem script to reset a Hayes-compatible modem, use the command:

```
add sc=h-reset.mds li=1 tex="[AT&F&G2&P1^M]"
```

To create a new script and specify its first line, use the command:

```
add sc=reset.mds tex="[ATZ^M]"
```

To create a new script that is a copy of an existing script, use the command:

```
add sc=myreset.mds tem=reset.mds
```

Related Commands
delete acc script
set acc script
purge acc script
show acc script

deactivate acc call

Syntax `DEACTivate ACC CAll=name`

where *name* is the name of an ACC call and may be from 1 to 15 characters long. It is not case-sensitive. If *name* contains spaces, it must be in double quotes.

Description This command deactivates a call to a remote system. The router drops the DTR signal to the modem being used for the call, which terminates the phone call. Any dynamic higher layer interfaces created for the call are destroyed.

Examples To deactivate the ACC call named "remote", use the command:

```
deact add ca=remote
```

Related Commands
activate acc call
show acc call

delete acc call

Syntax

```
DELete ACC CAll=name [ASYn=asyn-number]
```

where:

- *name* is the name of an ACC call and may be from 1 to 15 characters long. It is not case-sensitive. If *name* contains spaces it must be in double quotes.
- *asyn-number* is the number of one of the router's asynchronous ports.

Description

This command deletes an ACC call definition or removes an asynchronous a port from a defined call. If **asyn** is specified, the specified port is deleted from the call, but the call itself is not deleted. Deleting all ports from a call is not permitted; a call must have at least one port. If a call is deleted, all ports associated with the call cease to be attached to the ACC module and become terminal server ports.

Examples

To delete port 3 from the call "dialup" but not the call itself, use the command:

```
del acc da=dialup asy=3
```

To delete the call called "dialup", use the command:

```
del acc ca=dialup
```

Related Commands

add acc call
purge acc
show acc call

delete acc domainname

Syntax

```
DELete ACC DOmainname[=domain-name]
```

where *domain-name* is a domain name

Description

This command deletes the ACC domain name definition used for DNS lookups. Only one domain name may be defined.

Examples

To delete the ACC domain name, use the command:

```
del acc do
```

Related Commands

add acc domainname
purge acc
show acc domainname

delete acc script

Syntax

```
DELete ACC SCript=script-name [LIne=line-number]
```

where:

- *script-name* is the file name of a modem script 4 to 20 characters long. It is not case-sensitive. The file name must have a file type of ".MDS".
- *line-number* is a line number in the script. If *line-number* is greater than the number of lines in the script, then no line is deleted.

Description This command deletes a line of modem commands in a modem script, or deletes the modem script entirely. Predefined system scripts are read only and cannot be deleted.

Examples To delete line 1 from the RESET modem script, use the command:

```
del acc sc=reset.mds li=1
```

Related Commands

add acc script
set acc script
purge acc script
show acc script

disable acc call

Syntax

```
DISable ACC CAll=name
```

where *name* is the name of an ACC call and may be from 1 to 15 characters long. It is not case-sensitive. If *name* contains spaces, it must be in double quotes.

Description This command disables an ACC call. Outgoing calls may not be made over ports associated with this call, nor are incoming calls accepted. Ports associated with the call are still attached to ACC while the call is disabled.

Examples To disable the ACC call named "dialup", use the command:

```
dis acc ca=dialup
```

Related Commands

enable acc call
show acc call

disable acc call debug

Syntax

```
DISable ACC CAll=name DEbug={UTILisation|DEMand|PAcket|
    PKT|ASYn|SCRipts|DIAlin|ALL}
```

where *name* is the name of an ACC call 1 to 15 characters long. It is not case-sensitive. If *name* contains spaces, it must be in double quotes.

Description

This command disables the display of extra diagnostic messages about a particular ACC call. Any of the categories of debug message can be disabled independently of the rest.

Examples

To disable dial-in debugging messages, use the command:

```
dis acc ca=dia de=dialin
```

Related Commands

enable acc call debug
show acc call

enable acc call

Syntax

```
ENAble ACC CAll=name
```

where *name* is the name of an ACC call and may be from 1 to 15 characters long. It is not case-sensitive. If *name* contains spaces, it must be in double quotes.

Description

This command enables an ACC call that has been disabled. When an ACC call is defined it is enabled by default.

Examples

To enable the ACC call named “dialup”, use the command:

```
ena acc ca=dialup
```

Related Commands

disable acc call
show acc call

enable acc call debug

Syntax

```
ENAble ACC CAll=name DEbug={UTILisation|DEMand|PAcket|PKT|
   ASYn|SCRipts|DIAlin|ALL} [ASYn=asyn-number]
```

where:

- *name* is the name of an ACC call 1 to 15 characters long. It is not case-sensitive. If *name* contains spaces, it must be in double quotes.
- *asyn-number* is the number of one of the router's asynchronous ports.

Description

This command enables the display of extra diagnostic messages about a particular ACC call. Any of the categories of debug message can be enabled independently of the rest.

The **asyn** parameter specifies the asynchronous port where output is to be directed and allows debugging to be enabled in a script.

Examples

To enable dial-in debugging messages, use the command:

```
ena acc ca=dia de=dialin
```

Related Commands

disable acc call debug
show acc call

purge acc

Syntax

```
PURge ACC
```

Description

This command purges the ACC database, deleting all ACC calls, scripts and the ACC domain name. All ACC call definitions are lost.

Examples

To purge the ACC database, use the command:

```
pur acc
```

Related Commands

delete acc call
delete acc domainname

purge acc script

Syntax

```
PURge ACC SCript={script-name|ALL}
```

where *script-name* is the file name of a modem script 4 to 20 characters long. It is not case-sensitive. The file name must have an MDS file type.

Description

This command deletes either the specified script or all user defined scripts. Predefined system scripts are read only and cannot be deleted.

Examples

To purge the modem script called “reset”, use the command:

```
pur acc sc=reset.mds
```

Related Commands

add acc script
set acc script
delete acc script
show acc script

set acc call

Syntax

```
SET ACC CAll=name [AUthentication={AUto|NOne|PAssword}]
   [CScript=script-name] [DIAL=phone-number]
   [DIrection={ANswer|BOth|ORiginate}]
   [DScript=script-name] [ENcapsulation={ADaptive|AUto|
   CSlip|ENquire|NOne|OKPPp|PPP|SLip|DIStill}]
   [IPPool={pool-name|NOne}] [LIne={DIrect|MOdem}]
   [PPPTemplate=template] [REMotecall=remote-call]
   [RScript=script-name]
```

where:

- *name* is the name of the ACC call and may be from 1 to 15 characters long. It is not case-sensitive. If *name* contains spaces it must be in double quotes.
- *script-name* is the file name of a modem script 4 to 20 characters long. It is not case-sensitive. The file name must have an MDS file type.
- *phone-number* is a character string 1 to 31 characters long. Valid characters are any printable characters.
- *pool-name* is a character string 1 to 15 characters long. Valid characters are any printable characters. If *pool-name* contains spaces, it must be in double quotes.
- *template* is a number from 0 to 31.
- *remote-call* is the name of an ACC or ISDN call and may be from 1 to 15 characters long. It is not case-sensitive. If *remote-call* contains spaces, it must be in double quotes.

Description

This command modifies an existing ACC call. The **call** parameter specifies the name of the call to modify. The specified call must already exist.

The **asyn** parameter specifies an asynchronous port on the router where the call is to be assigned. Incoming calls to the port are associated with this call definition. Outgoing calls using this call definition use the specified port.

The **authentication** parameter specifies the type of user authentication to perform before accepting a call. If **password** is specified authentication is handled by the User Authentication Facility that prompts for a login name and password and verifies the response against the User Authentication Database or any defined TACACS servers. If **auto** is specified, then **password** authentication proceeds unless a PPP flag character is detected. If a PPP flag character is detected, the **password** authentication is aborted, PPP negotiation is carried out, and the authentication method used is determined by the specified PPP template. If **none** is specified, then the authentication method is determined by the specified PPP template. The default is **password**.

The **call** parameter specifies the name of the call to modify. The specified call definition must already exist.

The **cscript** parameter specifies a connect script to execute once a connection has been made to a remote host, and normally contains a sequence of commands to be sent to the remote host to login, set session parameters, or execute a host command. The **cscript** parameter is valid when the **direction** is set to **originate** or **both**.

The **dial** parameter specifies the number of the destination to call. The value is assumed to be a valid sequence of dialling digits, and is passed to the dial script specified by the **dscript** parameter. The value replaces the%1 parameter in the dial script, if present. The **dial** parameter may be overriden by the **phonenumber** parameter in the **activate acc call** command on page 19-16. The **dial** parameter is valid when **direction** is set to **originate** or **both**.

The **direction** parameter specifies whether the call definition applies to incoming calls, outgoing calls, or both. If **answer** is specified, the call definition defines the way the router handles an incoming call on the port. If **originate** is specified, the call definition defines the way that an outgoing call is made over the port. If **both** is specified, the call definition defines the behaviour for both incoming and outgoing calls.

The **dscript** parameter specifies a script to execute to initiate a call, and normally contains a sequence of commands to be sent to the modem attached to the local asynchronous port to dial the modem at the remote end of the link, and expected responses. The **dscript** parameter is valid when the **direction** is set to **originate** or **both**.

The **encapsulation** parameter specifies the encapsulation to be used for the call. If **adaptive** is specified the encapsulation is adapted automatically to one of the SLIP variants. If **auto** is specified the type of encapsulation required is automatically selected. If **cslip** is specified the Compressed SLIP encapsulation is used (Van Jacobson's TCP header compression). If **enquire** is specified the user is prompted for the type of encapsulation to be used for the connection. If **none** is specified, no encapsulation of the data is expected. This is suitable for remote terminal or terminal emulation access. If **okppp** is specified the router mimics a Hayes-compatible modem until a valid PPP frame is seen, then asynchronous PPP encapsulation is used. If **ppp** is specified asynchronous PPP encapsulation is used. If **slip** is specified the SLIP encapsulation is used. The default is **enquire**.

The **ippool** parameter specifies the IP pool to use to allocate IP addresses for dynamic dial-in SLIP sessions. If **none** is specified, IP addresses are not allocated from an IP pool. The default is **none**. See "IP Address Pools" on page 22-52 of Chapter 22, Internet Protocol (IP) for more information about creating IP address pools.

The **line** parameter specifies how control signals are handled by the port. If **direct** is specified, the control signals are managed to suit a direct connection to an asynchronous port on another router. This option is required when the ACC call is used to connect two routers back-to-back without modems. If **modem** is specified the control signals on the port are managed to suit a connection to a modem. The default is **modem**.

The **ppptemplate** parameter specifies the PPP template to use when creating a dynamic PPP interface for this call. The specified template must exist. This parameter is valid if encapsulation is set to **auto**, **okppp** or **ppp**. See "Templates" on page 15-18 of Chapter 15, Point-to-Point Protocol (PPP) for more information about creating PPP templates.

The **remote** parameter specifies the name of an ISDN or ACC call on a remote router. When this ACC call triggers the creation of an L2TP tunnel the value of the **remote** parameter is passed across the tunnel to identify the call that the remote router should use to make the final connection to the remote destination of the L2TP tunnel. See Chapter 20, Layer Two Tunnelling Protocol (L2TP) for more information about the use of this parameter.

The **rscript** parameter specifies the name of a script to execute when the CD line for the asynchronous port drops low.

When a call definition is successfully modified, the router displays the details of the updated call definition (Figure 19-3 on page 19-30). See the description of the **show acc call** command on page 19-35 for the meanings of the parameters.

Figure 19-3: Example output from the **set acc call** command

```
Info (146269): Call successfully updated.
Name: test
  State ............. Enabled
  Direction ......... Answer
  Line .............. Modem
  PPP Template ...... 1
  IP Pool ........... Not set
  Remote Call ....... Not set
  Encapsulation ..... Auto
  Authentication .... Password
  Reset Script ...... Not set
  Accounting ........ Enabled
  Debug ............. Disabled

  Port(s):
    Port5:
      Number activations ........... 0
      Start time last activation ... Unused
      End time last activation ..... Unused
      Last user .................... Unused
```

Examples To change the encapsulation for the ACC call named “dialup” to **enquire**, use the command:

```
set acc ca=dialup en=en
```

Related Commands

add acc call
show acc call

set acc call asyn

Syntax

```
SET ACC CAll=name ASYn=asyn-number
   PHONEnumber=phone-number
```

where:

- *name* is the name of the ACC call and may be from 1 to 15 characters long. It is not case-sensitive. If *name* contains spaces, it must be in double quotes.
- *asyn-number* is the number of one of the router's asynchronous ports.
- *phone-number* is a character string 1 to 31 characters long. Valid characters are any printable characters.

Description

This command assigns a phone number to an asynchronous port for use by the PPP callback function in BAP (*Bandwidth Allocation Protocol*). See Chapter 15, Point-to-Point Protocol (PPP) for more information about the Bandwidth Allocation Protocol. The phone number is assumed to be the phone number for a modem directly connected to the asynchronous port. When this call is used to create a PPP interface with the PPP callback function enabled, the phone number is passed to the router at the remote end of the PPP link. The remote router disconnects the PPP link and calls back using the assigned phone number, establishing a connection to the asynchronous port and activating the ACC call associated with the port.

The **call** parameter specifies the name of the ACC call that is to be activated by the incoming PPP callback. The call definition must already exist.

The **asyn** parameter specifies an asynchronous port on the router that has already been assigned to the specified ACC call.

The **phonenumber** parameter specifies the number of the modem directly attached to the asynchronous port. A call to this number is answered by the modem that triggers the incoming ACC call on the port.

Examples

To assign the number 7654321 to asynchronous port 1 for the ACC call named "callback1", use the command:

```
set acc ca=callback1 asy=1 phon=7654321
```

Related Commands

add acc call
set acc call
show acc call

set acc script

Syntax

```
SET ACC SCript=script-name LIne=line-number
   [TExt=script-text] [AFter=line-number]
   [BEfore=line-number]
```

where:

- *script-name* is the file name of a modem script 4 to 20 characters long. It is not case-sensitive. The file name must have an MDS file type.
- *line-number* is the number of the line in the script.
- *script-text* is the line of text to add to the script. If *script-text* contains spaces, it must be in double quotes.

Description

This command changes a line of modem commands in a modem script or moves a line in the modem script.

The **text** parameter specifies the text to be used to replace the current contents of the line.

The **after** and **before** parameters specify a new location for the (modified) line, immediately after or before the specified line, respectively.

To modify a line use the **text** parameter to specify the new text. The **after** and **before** parameters may also be used to specify a new location of the modified line.

To move a line without changing its contents, use the **after** or **before** parameter to specify the new position of the line in the script. The **text** parameter should not be specified.

Scripts consists of one or more send statements and wait statements. A send statement contains a command to be sent to the modem or remote host, in square brackets, and separated from the next statement by one or more spaces. Modems and remote hosts normally expect commands to be terminated with a carriage return, which is represented in a script by the characters “^M”, equivalent to the [Enter] or [Ctrl/M] keystrokes. Any control character may be included in a statement by entering the caret character (“^”) followed by the appropriate print character. For example, “^A” represents the ASCII character code 001, equivalent to the keystroke [Ctrl/A]. For example, the sequence of commands and responses (commands are in bold text, responses from the modem are in plain text):

```
ATZ
OK
ATDT 3038303
```

can be represented by the dial script:

```
"[ATZ^M] (10 OK) [ATDT 3038303^M]"
```

A script may also include wait statements that contain expected responses from the modem or remote host for which the router should wait before executing the next script statement. A wait statement consists of a timeout period (in seconds) and/or a character string to look for, in parentheses, and separated from the next statement by one or more spaces. If the character string is not received within the specified time period, the script is aborted and the call dropped, by negating the DTR signal at the port. If a string is not specified, the router waits the specified time before proceeding. For example, the following login dialogue (prompts from the remote host are in plain text, input from the user is in bold text):

```
Login: bruce
Password: brg2far
```

can be represented by the connect script:

```
"(10 Login) [bruce^M] (10 Password) [brg2far^M]"
```

The router waits up to 10 seconds for each response from the remote host before proceeding with the script.

Examples To move a line in a modem script from line 1 to after line 2 in the script (as it stands before the move is made), use the command.

```
set acc sc=dial.mds li=1 af=2
```

Related Commands

add acc script
delete acc script
purge acc script
show acc script

show acc

Syntax `SHow ACC`

Description This command displays a summary of all defined ACC calls, scripts and the domain name (Figure 19-4 on page 19-34, Table 19-3 on page 19-34).

Figure 19-4: Example output from the **show acc** command

```
ACC details

  Calls:
    primary
    dialin
    dialup

  Scripts:
    flash:dial.mds
    reset.mds
    connect.mds

  Domain name:
    Not currently set.
```

Table 19-3: Parameters in the output of the **show acc** command

Parameter	Meaning
Calls	A list of the names of all defined calls.
Scripts	A list of the names of all defined scripts.
Domain name	The domain name used for DNS lookups if one has been defined.

Related Commands

add acc call
add acc script
delete acc call
delete acc script
purge acc
purge acc script

show acc call

Syntax `SHow ACC CAll[=`*`name`*`]`

where *name* is the name of an ACC call and may be from 1 to 15 characters long. It is not case-sensitive. If *name* contains spaces, it must be in double quotes.

Description This command displays ACC call definitions. If a call name is specified, the definition for the specified call is displayed. If a call name is not specified, then all call definitions are displayed (Figure 19-5 on page 19-35, Table 19-4 on page 19-35).

Figure 19-5: Example output from the **show acc call** command

```
ACC call details

Name: dialin
  State ............. Enabled
  Direction ......... Both
  Line .............. Modem
  PPP Template ...... 2
  IP Pool ........... Not set
  Remote Call ....... Not set
  Encapsulation ..... Enquire
  Authentication .... Auto
  Dial Number ....... Not set
  Reset Script ...... reset.mds
  Dial Script ....... flash:dial.mds
  Connect Script .... connect.mds
  Active ............ No
  Accounting ........ Disabled
  Debug ............. Disabled

  Port(s):
    Port3:
      Port State ................... idle
      Number activations ........... 2
      Start time last activation ... 06-Mar-1996 13:36:49
      End time last activation ..... 06-Mar-1996 13:40:18
      Last user .................... joeb
```

Table 19-4: Parameters in the output of the **show acc call** command

Parameter	Meaning
Name	The name of the call.
State	Whether the call state is enabled” or disabled.
Direction	The direction of the call; either Answer, Both, or Originate.
Line	Whether the control signalling used by the port is direct or modem.
PPP Template	The PPP template to use when creating dynamic PPP interfaces using this call if one is set.
IP Pool	The name of the IP address pool used to assign IP addresses when this call is used for dial-in SLIP sessions if one is assigned.
Remote Call	The name of an ISDN or ACC call to pass over an L2TP tunnel for the connection from the remote router to the remote destination.

Table 19-4: Parameters in the output of the **show acc call** command (cont.)

Parameter	Meaning
Encapsulation	The encapsulation to be used for the call: Adaptive Auto CSlip Enquire None OKPPP PPP Slip
Authentication	The authentication to be used for the call: Auto Chap None Pap Password
Dial Number	The number to dial when making a call using this call definition if one is set. This field is displayed if *Direction* is set to Originate or Both.
Reset Script	Name of the reset script to be run when the CD signal is dropped.
Dial Script	Name of the dial script to be run on activation of a call. This field is displayed if *Direction* is set to Originate or Both.
Connect Script	Name of the connect script to be run on successfully connecting to a remote modem. This field is displayed if *Direction* is set to Originate or Both.
Active	Whether the call is currently active on a port. This field is displayed when *Direction* is set to *Originate* or *Both*.
Accounting	Whether accounting for the call is enabled or disabled.
Debug	Whether debugging for the call is enabled or disabled.
Port(s)	The asynchronous port(s) to use for the call.
Port number	The phone number assigned to the port. This field is displayed if the port has been assigned a phone number.
Port State	The state of the port; one of the values listed in Table 19-5 on page 19-37.
Number of activations	The number of times the call has been activated or has answered an incoming call.
Start time last activation	The time stamp for the start of the last call activation or answering of an incoming call, or “Unused” if this call definition has not yet been used for a call.
End time last activation	The time stamp for the end of the last call activation or answering of an incoming call, or “Unused” if this call definition has not yet been used for a call, or “Still active” if a call is still active on the port.
Current user	The username of the current user, if a call is currently active on the port. This field is displayed if the port is currently active.
In payload packets	The number of data packets received via the port for the currently active call. This field is displayed if the port is currently active.

Table 19-4: Parameters in the output of the **show acc call** command (cont.)

Parameter	Meaning
In payload bytes	The number of bytes of data received via the port for the currently active call. This field is displayed if the port is currently active.
Out payload packets	The number of data packets transmitted via the port for the currently active call. This field is displayed if the port is currently active.
Out payload bytes	The number of bytes of data transmitted via the port for the currently active call. This field is displayed if the port is currently active.
Last user	Last user name presented to the system to attempt a login on the port, or "Unused" if this call definition has not yet been used for a call.

Table 19-5: ACC asynchronous port states

State	Description
Idle	Port is not active.
Dialing	Port is running a dial script.
Connecting	Port is running a connect script.
Open	Port is connected to a remote system.
Waiting	Port is waiting in a connect script to receive the specified input.
Sending	Port is sending a text line from a connect script to the modem
Connect wait	Port has dialled the remote end and is waiting for the remote end to answer.
Deactivate	Port is currently hanging up the current call.
DTR drop	Port has dropped the DTR line to the port to hang-up the call.
Dial sending	Port is sending a text line from a dial script to the modem.
Dial waiting	Port is waiting in a dial script to receive the specified input.
Reset	Port is currently being reset.
Reset start	Port is starting the reset process.
Reset waiting	Port is waiting in a reset script to receive the specified input.
Reset sending	Port is sending a text line from a reset script to the modem.
Reset wait done	Port is waiting a short period for the modem to settle after sending the reset script.
Reset done	Port reset is complete.
Dial backoff	Port has backed off dialing the remote end as it detected the remote end was busy.

Related Commands

add acc call
delete acc call
set acc call

show acc domainname

Syntax `SHow ACC DOmainname`

Description This command shows the domain name to use for ACC DNS lookups. Only one ACC domain name may be defined (Figure 19-6 on page 19-38).

Figure 19-6: Example output from the **show acc domainname** command

```
Info. ACC the default domain name is acc.newco.co.nz
```

Related Commands

add acc domainname
delete acc domainname

show acc script

Syntax `SHow ACC SCript[=`*`script-name`*`]`

where *script-name* is the file name of a modem script 4 to 20 characters long. It is not case-sensitive. The file name must have an MDS file type.

Description This command displays a list of the names of all the defined modem scripts, or if a script name is specified, the contents of the script (Figure 19-7 on page 19-38, Table 19-6 on page 19-38).

Figure 19-7: Example output from the **show acc script** command

```
Filename                Device       Size     Created                Locks
------------------------------------------------------------------------------
dial.mds                flash        24       30-May-96 15:10:12     0
sixteenalongfile.mds    flash        24       30-May-96 15:10:12     0
------------------------------------------------------------------------------
```

Table 19-6: Parameters in the output of the **show acc script** command

Parameter	Meaning
Name	Name of the script.
Device	Device where the modem script file is stored.
Size	Size of the file in bytes.
Created	Date and time the modem script file was created.
Locks	Number of concurrent processes using the file.

Related Commands

add acc script
set acc script
delete acc script
purge acc script