

Configure asynchronous calls on the AR Router

Introduction

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.

What information will you find in this document?

This document provides information on:

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What products does this information apply to?

This information applies to the following products:

- AR 300 series
- AR 400 series
- AR 700 series
- Rapier series

Static PPP Interfaces

The ACC (Asynchronous Call Control) module on the router enables you to use asynchronous PPP to communicate via the router's asynchronous interfaces.

A static PPP interface is one that is present on the router whether or not the asynchronous call is up. Obviously, data can only be transmitted when the call is up, but the PPP interface is still present in the router's configuration even when the call is down.

There are two modes in which the PPP interfaces can be created: static PPP interfaces and dynamic PPP interfaces.

There are essentially four steps to configuring a static PPP interface over an ACC call:

Step 1 **Set the parameters on the relevant asynchronous port**

The PPP interface will be attached to a particular physical asynchronous port. It is necessary to set up this port so that it will communicate correctly with the external modem via which it will send data into the telephone network.

The necessary parameters to set and command are:

Parameter	Description
DTE SPEED	Must be set to whatever speed you wish to use for communicating with the modem
FLOWCONTROL	Invariably it is best to use hardware (RTS/CTS) flow control when working with modems.
FLOWCONTROLCDCONTROL	The router must wait for CD to be asserted by the modem before it will send data out the port.
COMMAND	<pre>set asyn=number speed=speed flow=hard cdc=connect</pre> where: <ul style="list-style-type: none">• number is the number of the asynchronous port being used• speed may be one of 2400, 4800, 9600, 19200, 38400, 57600 or 115200

Step 2 **Add the ACC call definition on the port**

Adding a call definition informs the router how to behave when a call is detected on the port (i.e. CD goes high), or a call is to be made going out the port.

There are a number of parameters to be set:

Parameter	Description
AUTHENTICATION	Indicates the type of PPP authentication the router expects to receive when an incoming call is made to the port, it may be one of PAP, CHAP, NONE or AUTO (i.e. autodetect from the type of traffic being received). For a static PPP interface, this is set to NONE, which leaves the authentication up to the PPP definition
ENCAPSULATION	For a static PPP interface, this is set to PPP.

Parameter	Description
DIRECTION	May be ORIGINATE, ANSWER or BOTH. Set this according to your needs.
DSCRIPT	Specifies the script that is to be run upon activation of an outgoing call. The script must have an extension of .MDS, and contains the commands that need to be sent to the modem to get it to dial. Typically it will be of the form [ATDTnumber^M]. It may contain other commands that need to be sent to the modem
COMMAND	<code>add acc call=name asyn=number authen=none encap=PPP dscript=name.mds dir=both</code>

Step 3 **Create the PPP interface over the call**

The parameters that need to be specified for a PPP interface are:

Parameter	Description
IDLE	The number of seconds the link is idle (no traffic) before the call is taken down.
AUTHENTICATION	The type of authentication required from the device at the other end of the call - may be one of PAP, CHAP or NONE
USERNAME	The username that the router will send in response to a PAP or CHAP challenge on the PPP link.
PASSWORD	The password that the router will send in response to a PAP or CHAP challenge on the PPP link
COMMAND	<code>create ppp=0 over=acc-name idle=60 user=username pass=password authen=PAP</code>

Step 4 **Higher layers**

From there you can go on to add IP addresses and/or IPX network numbers on the PPP interface.

Dynamic PPP Interfaces

A dynamic PPP interface is one that is created when an incoming call is received. The router authenticates the incoming call (using the internal database or an external RADIUS or TACACS server), and upon receiving a positive authentication response, creates whatever IP and/or IPX interfaces that are relevant to the user that has dialled in.

The creation of an ACC call definition that will create dynamic PPP interfaces really only uses the first two steps of the static PPP creation process above, but with subtle differences.

Step 1 Set the parameters on the relevant asynchronous ports

Typically, there will be a number of asynchronous ports attached to modems. The desire is that a dynamic PPP interface will be created when a call is received on any of the ports. So all the ports that are to be included in the process need to have their parameters set up:

Parameter	Description
DTE SPEED	Must be set to whatever speed you wish to use for communicating with the modem.
FLOWCONTROL	Invariably it is best to use hardware (RTS/CTS) flow control when working with modems.
CDCONTROL	The router must wait for CD to be asserted by the modem before it will send data out the port.
COMMANDS	<pre>set asyn=number speed=speed flow=hard cdc=connect set asyn=next-number speed=speed flow=hard cdc=connect set asyn=another-number speed=speed flow=hard cdc=connect</pre> <p>where:</p> <ul style="list-style-type: none">• number, next-number and another-number are the numbers of the asynchronous ports being used.• speed may be one of 2400, 4800, 9600, 19200, 38400, 57600 or 115200.

Step 2 Add the ACC call definition on the ports

Adding a call definition informs the router how to behave when a call is detected on the port (i.e. CD goes high), or a call is to be made going out the port. There are a number of parameters to be set:

Parameter	Description
AUTHENTICATION	Indicates the type of PPP authentication the router expects to receive when an incoming call is made to the port---may be one of PAP, CHAP, NONE or AUTO (i.e. autodetect from the type of traffic being received). For a static PPP interface, it is best to set this to AUTO.
ENCAPSULATION	For a dynamic PPP interface, it is best to set this to AUTO as this will allow the router to detect what sort of traffic is being sent down the call. If it is PPP traffic then the router will create a PPP interface. If it is SLIP or plain asynchronous traffic the router will respond appropriately. This is particularly useful if you wish to remotely manage the router. If you call in to one of the asynchronous ports from a standard terminal emulator, the router will detect that it is receiving plain asynchronous traffic and the port will behave like a console port.
DIRECTION	May be ORIGINATE, ANSWER or BOTH. For a setup where interfaces are to be created upon receipt of incoming calls, this will be set to ANSWER.
COMMANDS	<p>The call definition is created and added to the first port with the command:</p> <pre>add acc call=name port=number authen=auto encap=auto dir=answer</pre> <p>It can then be added to the rest of the ports with the commands:</p> <pre>add acc call=name asyn=next-number add acc call=name asyn=another-number</pre>

Authentication Servers

As mentioned above, the router has three sources it can use for authenticating incoming username/passwords:

1. Users can be added to the router's own user database:

```
add user=name password=password
```

2. The router can be informed of the address of one or more TACACS servers:

```
add tacacs server=ip-address-1
add tacacs server=ip-address-2
add tacacs server=ip-address-3
```

3. The router can be informed of the address of one or more RADIUS servers:

```
add radius server=ip-address-1 secret=secret
add radius server=ip-address-2 secret=secret
add radius server=ip-address-3 secret=secret
```

The router can use all three types of authentication simultaneously. When it receives a username/password, it searches in the following order:

- Internal database
- Each configured RADIUS server in turn
- Each configured TACACS server in turn

until it receives a positive authentication response. If the whole list has been passed through, and no positive response has been received, the authentication is deemed to have failed, and the call is rejected

Configuring Modems

Probably the most difficult aspect of getting asynchronous calls to work properly is configuring the modems to work with the routers. The problem is that the factory default settings on modems are typically set such that the modem will work well when being used for dialing out from a PC. The requirements for a modem being used to answer calls coming into a router are a little different. In particular, there are two cardinal requirements when configuring a modem to interoperate with a router:

1. The DTE speed on the modem (i.e. the baud rate at which it communicates with the router) must be fixed to the port speed that has been set on the router.
2. The modem must be set to not send RING or Connect messages to the router (as they will be interpreted as authentication attempts).

The vast majority of problems encountered by people setting up asynchronous calls on routers are due to a failure to configure one of these requirements on the modems.

Troubleshooting modems

If you are experiencing difficulties, the best ways to determine whether or not it is a failure to configure one of these requirements are:

1. If the DTE speed on the modem is not fixed to the port speed on the router, then the command: **show port=n count** will show a large number of framing errors:

```
Manager > sh asyn=1 count

Port 1:          20335 seconds   Last change at:   0 seconds

RS-232 MIB Counters
  Receive:
ParityErrs          0
FramingErrs       2352
OverrunErrs        0

Diagnostic Counters
Receive:
InCharacters        521
inBuffers           316
fcsErrors           0
pppErrors           0
slipErrors          0
  General:
disconnects        0
Transmit:
outCharacters       22314
outBuffers          364
droppedBuffers     364
droppedBuffers      0
```

2. If the modem has not been configured to suppress its RING and Connect messages, the command: **show log** will show a number of unknown command messages of the form:

```
12 14:42:33 4 CH  MSG  ERROR Unknown command "NO"
12 14:42:33 4 CH  MSG  ERROR Unknown command "RING"
```

Commands for Configuring Modems

Although there is ostensibly a universal command set that is adhered to by all modems that claim to be "Hayes compatible", in reality it seems that the command set on every brand of modem is slightly different to every other brand.

So it is not possible here to provide a set of instructions that will work with every possible modem, but at least we can provide guidelines that should work with most modems.

I. Fixing the DTE speed

Unfortunately, one aspect of the modem command set that varies wildly from brand to brand is the command for fixing the modem's DTE speed. In fact, there are some brands of modem on which it is simply not possible to fix the DTE speed.

However, for those modems that can have a fixed DTE speed, the procedure for fixing the speed is as follows:

1. 'Train' the modem to a particular DTE speed. To do this, connect the modem to a terminal or terminal emulator that has its port speed set to the desired speed, then type AT. This will cause the modem to lock onto the port speed of the terminal.

This can also be done from the router: connect the modem to an asynchronous port of the router (which has had its port speed set to the desired speed), and connect a terminal to another asynchronous port of the router. Log into the router, then "connect" your terminal session to the port to which the modem is attached, using the command:

```
connect port=port-number
```

Then type AT to train the modem's DTE speed.

2. Enter the command to inform the modem to lock its DTE speed. The syntax of this command varies from modem to modem. The syntax for a number of common modems are given in the table below:

Brand	Command
Codex 3260	AT*SC I
USR Courier, USR Sportster	AT&BI
Global Village Teleport Gold	AT\J0
Hayes Accura/Optima	AT&Q6
Microcom QX4232 series	AT\J0
Motorola UDS, FastTalk II	AT\J0
Multitech MT1432, MT932	AT\$BA0
ZyXel U-1496E	AT&Q6
Megahertz	AT\J0

Tell the modem to store this setting, using AT&W.

2. Turning off messages

The commands for turning off messages from the modem are fairly universally adhered to:

```
atq1
```

informs the modem not to send RING, etc. to the router

```
ate0
```

informs the modem not to echo back characters sent to the modem.

3. Other settings

It is usually desirable to have the modem reload its settings every time a call finishes. The router drops DTR for a few seconds at the end of each call, so if the modem is set to reload on loss of DTR, then that will have the affect that the modem reloads after every call. Again, the syntax for this command is almost universally adhered to:

```
AT&D3
```

Also, if the modem is to automatically answer incoming calls, the command (again, almost universally adhered to) is:

```
ATS0=1
```

Connecting the Modem to the Router

The router's asynchronous ports have RJ45 or DB9 connectors. Modems' DTE ports typically have DB25 connectors. So to connect the router to the modem, a DB25-to-RJ45 or DB25-to-DB9 adaptor is required. Allied Telesyn can provide the necessary adaptors as a stock item.

It should be emphasised that:

1. Modem adaptors that work with some other brand of router will not necessarily work with an Allied Telesyn router.
2. Taking the standard Allied Telesyn terminal adaptor and putting a male-male gender changer on it will not turn it into a modem adaptor



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