

Accessing Catalyst 5000 Series Switches Remotely Using a Modem



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Introduction

This document provides a procedure for dialing into a Catalyst 5000 series. It also describes the limitations and problems associated with this method.

Before beginning this procedure, you should realize that the Catalyst 5000 is set up for quick and easy access via any standard RS-232 data terminal equipment (DTE) device. It was not originally designed for remote accessibility to the console.

Limitations and Requirements

- The Catalyst 5000 will accept dial-in connections, but the phone call can only be dropped by the caller. You can not force the Catalyst 5000 to hang up the phone.
- The Catalyst 5000 is a data circuit-terminating equipment (DCE) device that holds the DSR signal high (instead of the DCD signal). When asserting DSR, be careful with the pinouts of the RS-232 cable to the modem.
- Since a modem is also DCE device, you need a serial cable between the Catalyst 5000 and the modem. At a minimum, the cable should flip transmit and receive and offer a common ground.

Configuration Scenarios

While there are actually a couple of ways of cabling a null modem, the "standard" null modem is meant to couple a DTE to a DTE. In this situation, you will be coupling DCE (the Catalyst 5000) to another DCE (the modem).

A "standard" null modem ties two pins together which, in a DCE-DCE scenario, can overdrive the voltage and possibly damage the Universal Asynchronous Receiver/Transmitter (UART) chip of one of the devices.

The Catalyst 5000 console port uses the following pins:

CAT5000 console (DB-25 DCE) (Supervisor I or II)

PIN	SIGNAL	DIRECTION
2	TxD	Input
3	RxD	Output
4	RTS	Input
5	CTS	Output
6	DSR	Output
7	GND	reference
8	DCD	Output
20	DTR	Input

A null-modem typically uses the following:

1-1
 2-3
 3-2
 4-5
 5-4
 6,8 - 20
 20 - 6,8
 7 -7

A modem using the above pinout will, once connected, hold both DCD and DSR high. This overdrives the voltage that the Catalyst 5000 receives on its DTR pin 20.

Recommended Cable Pinout Configuration

The following cable configuration will make the modem "look like a terminal" to the Catalyst 5000.

Standard DCE to DCE

Below is the recommended cable pinout configuration.

CAT5000 console (DB-25 DCE)				Standard DB-25 DCE	
PIN	SIGNAL	DIRECTION		PIN	SIGNAL
2	TxD	Input	-----	3	RxD
3	RxD	Output	-----	2	TxD
4	RTS	Input	-----	5	CTS
5	CTS	Output	-----	4	RTS
7	GND	reference	-----	7	GND
8	CD	Output	-----	20	DTR
20	DTR	Input	-----	6	DSR

Supervisor III Module

The Supervisor III uses an RJ-45 EIA/TIA-232 DTE port with the following pinouts.

CAT5000 Console RJ-45 DTE (Supervisor III *only*)

PIN	SIGNAL	DIRECTION
1	CTS	Output
2	DSR	Output
3	RxD	Output
4	GND	
5	GND	
6	TxD	Input
7	DTR	Input
8	RTS	Input

Since this console is a DTE, it will *not* hold DSR high, and the resulting cable pinout should be as follows.

PIN	SIGNAL	DIRECTION	Standard DB-25 DCE		
1	CTS	Output	-----	4	RTS
2	DSR	Output	-----	8	DCD
3	RxD	Output	-----	2	TxD
4	GND	Reference	-----	7	GND

5	GND				
6	TxD	Input	-----	3	RxD
7	DTR	Input	-----	6	DSR
8	RTS	Input	-----	5	CTS

The Cisco Console Cable kit provides an RJ-45/DB-25 plug labeled "modem" which will provide this pinout for you.

Modem Settings

After you make the recommended cable pinout adjustments, you can configure the modem to even more closely resemble a terminal. Follow the steps below.

1. Set the modem to *ignore DTR* and assert *Auto-Answer*. The associated Hayes-compatible commands are **AT&D0** and **ATS0=1**, respectively.
2. Silence the modem. This eliminates result codes and locals echo that confuse the Catalyst 5000. The associated Hayes-compatible commands are **ATQ1** and **ATE0** respectively.
3. If possible, lock the modem at 9600 baud rate (turn off negotiation). For older modems, adjust speed levels by using DIP switches or your command set (see your modem's manual). Modern modems, such as the Hayes Optima 288 V.FC, do not have this setting. In this case, you should hard-set the modem's speed to 9600.
4. Perform a register dump. With these settings, the modem should have a register dump similar to the following:

```
ACTIVE PROFILE: B1 B16 B30 B41 B52 B60 B70 B75 B80 E0 L2 M1 N1 P Q2 V1 W0
Y0 &A0 &B1 &C1 &D0 &G0 &K0 &L0 &Q5 &R0 &S0 &T4 &U0 &X0 &Y0          S00:001 S
S03:013 S04:010 S05:008 S06:002 S07:050 S08:002 S09:006 S10:014 S11:095 S
S25:005 S26:001 S36:007 S37:000 S38:020 S46:002 S48:007
```

5. Store these setting using an **AT&W** command. This will ensure that the settings are preserved (written into the registers) when the modem is power-cycled.
6. At this point the Catalyst 5000 should be dial-accessible.

Uploading a System File Into the Catalyst 5000

To upload a system file into the Catalyst 5000 via the **download serial** command, use *flow control*. Flow control is not required for dialing in and running commands because you can't overrun the

UART buffers.

On the Catalyst 5000 use the command **set system modem enable** to enable hardware flow control (request to send (RTS)/clear to send (CTS)). The modem should then be set for hardware flow control, **AT&K3**, in the Hayes command set. In the register dump shown above, **&K0** is set. This indicates that there is no flow control. The above dump output was taken from a modem attached to a Catalyst 5000. The **set system modem enable** command was not configured for this modem..

Summary of Steps

In summary, to dial into the Catalyst 5000:

1. Use a modified null-modem cable.
2. Set modem to ignore DTR.
3. Set modem to auto-answer.
4. Set speed locked to 9600 if possible.
5. Suppress local echo.
6. Suppress result codes.
7. Suppress error codes if possible.
8. Set flow control to hardware (RTS/CTS).
9. Use the **set system modem enable** command to enable RTS/CTS hardware flow control on the Catalyst 5000.
10. Set (software) the modem to connect at 9600 baud without negotiation.
11. The modem must disconnect the phone call.

Related Information

- [Catalyst 5000 and 5505 and Quick Installation](#)
- [Catalyst 5000 Switching System Technical Information](#)
- [LAN Technologies Technical Tips](#)
- [LAN Technologies Top Issues](#)

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