Fine−Tuning Modems

Document ID: 14283

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Introduction

This document briefly explains the basics of how to fine tune modems. For more information on how to configure specific modems, refer to the modem documentation links on 808hi.com .

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

This document is not restricted to specific software and hardware versions.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Modem Firmware

This section discusses modem firmware.

When you deal with modem issues, always ensure that you do not encounter any known problems already resolved in the latest firmware. You can load new modem firmware into the FLASH memory of most modems to upgrade them. However, some older modems do not provide this facility and you need to replace the modem or the chipset. Modem manufacturers continually improve the modem code. As part of this process, manufacturers address modem inter−operability issues, and this results in recommendations from vendors to end users to upgrade to the latest release of firmware in order to resolve any issues. You can also try to

upgrade firmware in the internal modems of Cisco access servers.

Note: An upgrade does not help if the problem is in the line or with the client modem.

For software download details, refer to the links in this section. In order to access these links, you must be a registered user, and you must be logged in.

Check the IOS software and firmware product compatibility tables to ensure that this new firmware does not require an upgrade of Cisco IOS® software.

For the latest recommendations for client modems, check the vendor website. In order to determine which NextPort Software Port Entity (SPE) and NextPort Firmware/i960 versions the Cisco IOS software releases include, check the NextPort SPE and IOS Software Version Reference Table.

For further information, refer to:

- Understanding HSP and Controllerless WinModems
- Configuring Client Modems to Work with Cisco Access Servers
- 808hi.com ⬈
- Modem FAQ ⬈ by John Navas

Transmit Level

Usually measured in dBmV (decibel of a 1 mV signal), Transmit Level is the most delicate parameter. A high level is most likely to add too much noise in the line, but a low level too can make it difficult to tell the signal from the line noise. However, Cisco recommends that you fine tune this parameter because this parameter does not incur any explicit limitations on the connect speed or other modem functionality. As a best practice, try to find the lowest value still loud enough for the first Telco exchange to hear. Normally, the default value is –9 or –13 dBmV and the range is 0 (for physically leased lines) to –15 or less. For more information, refer to Understanding Transmit and Receive Levels on Modems.

Support for Proprietary Protocols

As new modem technology evolves into an international recommendation or protocol, modem vendors introduce proprietary solutions. Disable the options specific to this legacy. For example, V.8bis tones are the first signals sent to the line when an access server answers the call. Legacy Flex 56 Kbps modem protocols require support for V.8bis, but V.90 leaves V.8bis optional, and requires only V.8 signaling, which comes after V.8bis in the startup sequence. Cisco Microcom modems support legacy modulation 56Kflex Plus. Cisco Mica modems support the final version of the Rockwell K56Flex modulation known as KFlex 1.1. The Mica modem uses V.8bis to indicate both K56Flex and V.90 capabilities to the calling modem. V.8bis signaling can confuse non–V.8bis modems, and lead to impaired connect rates or immediate disconnects.

Maximum Connection Speed

The general rule is that the lower the speed, the less the modem is prone to errors. There can be rare exceptions to this rule. Sometimes, you must trade off between higher speeds with more delays for recovery (retrains) and lower speeds with less retrains.

For Cisco product modems, you can also try aggressive modem capping. For more information refer to:

- AT Command Set and Register Summary for Cisco MICA Six–Port Modules (See: Mica modems register S54).

• NextPort AT Commands and S Registers Reference (See: Nextport modems register S76)

Protocol

Modem protocols have evolved to become very complex and fast. Most modems have retained support for legacy protocols. Therefore, Cisco recommends that you use a less complex protocol, even if this means a lower maximum connection speed.

Information on commands to set these (as well as other) parameters in Cisco Systems internal modems are available in these documents:

- NextPort AT Commands and S Registers Reference (for Nextport modems)
- AT Command Set and Register Summary for Cisco MICA Six–Port Modules (for Mica and Microcom modems)
- AT Command Set and Register Summary for V.34, 56K, and V.90 12–Port Module (for Microcom modems)

Cisco IOS software can apply the changes to the modems through modem capping, as explained in Modem Management Operations.

Related Information

- **Recommended Modemcaps for Internal Digital and Analog Modems on Cisco Access Servers**
- **Understanding NextPort SPE Versions**
- **Access Technology Support Pages**
- **Technical Support & Documentation – Cisco Systems**