



Cisco ICS 7750 Multiservice Route Processor Model 200 Configuration

This feature module describes the playout delay feature of the Multiservice Route Processor (MRP) Model 200, which is part of the Cisco Integrated Communications System 7750 (Cisco ICS 7750). It describes the benefits of the playout delay feature, supported platforms, command configuration, related documents, and provides command reference information.

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Feature Overview

The Cisco Integrated Communications System (ICS) 7750 is an IP telephony system that provides managed Web-based communications applications for transforming branch-office and mid-sized business environments into Internet e-businesses. The system is built on the open and scalable Cisco AVVID (Architecture for Voice, Video and Integrated Data).

The Cisco ICS 7750 integrates the functionality of the following voice and data network components:

- Internet Protocol (IP) routing
- Switched Ethernet LAN interface
- IP telephony
- Call processing and computer telephony applications

The Cisco ICS 7750 incorporates all of the following elements needed to deliver converged data, voice, and video:

- Multiservice router and voice gateways based on Cisco IOS technology
- Application servers running core voice applications
- Cisco CallManager software

- Integrated web-based system management in the Cisco ICS System Manager
- Data-switching interface for seamless connectivity to recommended Cisco Catalyst quality of service (QoS)-enabled switches

The Cisco ICS 7750 is a six-slot system, which houses any combination of Cisco IOS-based MRPs or System Processing Engine (SPEs). A network administrator can use various combinations of MRP and SPE cards allow a network administrator to customize the configuration to meet voice and data processing needs, such as telephony, in one integrated system. The System Alarm Processor (SAP) card provides fault management and events-driven alarms through electronic mail or paging, and the System Switch Processor (SSP) card provides Ethernet switching.

The MRP supports both digital and analog voice-trunk gateways and WAN interfaces. The MRP enables businesses to use virtual private network (VPN), firewall, IP Security (IPSec), and QoS for voice and data transmission. The Cisco ICS 7750 system uses the MRP to link to the Public Switched Telephone Network (PSTN) and existing private branch exchanges (PBXs), as well as other common analog devices, such as fax machines and teleconferencing stations. Each MRP card has two slots that accept existing Cisco voice interface cards (VICs) and WAN interface cards (WICs).

The SPE is a single-board computer that can run Cisco CallManager for intelligent call processing. A Cisco ICS 7750 network includes peripheral hardware components, such as the following:

- Ethernet switches
- Digital Cisco IP Phones
- Analog telephony devices, such as telephones and fax machines

Benefits

- Integrates telephony services into a converged business data network to deliver information more efficiently than a disparate network approach.
- Merges formerly-isolated voice and data streams of communication.
- Simplifies network management.
- Allows enterprises to project a united front to their customers, partners, and employees.

The modular MRP provides the following benefits:

- Delivers full-featured Cisco IOS capabilities for data routing and voice trunking.
- Ensures end-to-end QoS for voice and data traffic.
- Offers modular choices for WAN and PSTN connectivity.
- Leverages consolidated (shared) facilities for voice and data traffic, optimizing the use of bandwidth for reduced operating costs.

Related Documents

- *Cisco ICS 7750 Site and Network Design Guide*
- *Cisco ICS 7750 Getting Started Guide*
- *Cisco ICS 7750 Hardware Installation Guide*
- *Cisco ICS 7750 System Manager User Guide*
- *Cisco ICS 7750 Administration and Troubleshooting Guide*

- *Cisco ICS 7750 Software Configuration Guide*
- *Cisco ICS 7750 Command Reference*
- Cisco ICS 7750 Configuration Notes
- Cisco ICS 7750 Release Notes
- *Regulatory Compliance and Safety Information for the Cisco ICS 7750*

On CCO at:

- **Technical Documents: Documentation Home Page: Voice Products: Cisco Integrated Communications System 7750**

On the Documentation CD-ROM at:

- **Cisco Product Documentation: Voice Products: Cisco Integrated Communications System 7750**

Supported Platforms

Cisco ICS 7750

Configuring the Playout-Delay Feature

The following procedure provides step instructions for configuring the commands **playout-delay** and **playout-delay mode** on the Cisco ICS 7750. These commands tune the playout buffer to accommodate packet jitter caused by switches in the WAN by changing the maximum or nominal playout delay values on a voice port if the default values do not accommodate the jitter. Additional commands to configure the MRP feature are provided in the *Cisco ICS 7750 Software Configuration Guide* and the *Cisco ICS 7750 Command Reference*.



Caution

Although the Cisco ICS 7750 accepts command-line interface (CLI) input, it was intended to be configured by using the Cisco ICS System Manager software configuration tool.

playout-delay

	Command	Purpose
Step 1	router(config)# voice-port <i>slot/port</i>	Identify the voice port that you want to configure, enter voice-port configuration mode, and configure the Cisco ICS 7750 MRP analog voice ports.
Step 2	router(config)# voice-port <i>slot/port:ds0-group</i>	Identify the voice port that you want to configure, enter voice-port configuration mode, and configure the Cisco ICS 7750 MRP digital voice ports.
Step 3	router(config-voiceport)# playout-delay maximum <i>milliseconds</i>	Configure the maximum playout delay time. The range is 40 to 1700 milliseconds.
Step 4	router(config-voiceport)# playout-delay nominal <i>milliseconds</i>	Configure the nominal playout delay time. The range is 0 to 1500 milliseconds. The recommended value is 10 milliseconds.

playout-delay mode

	Command	Purpose
Step 1	router(config)# voice-port <i>slot/port</i>	Identify the voice port that you want to configure, enter voice-port configuration mode, and configure the Cisco ICS 7750 MRP analog voice ports.
Step 2	router(config)# voice-port <i>slot/port:ds0-group</i>	Identify the voice port that you want to configure, enter voice-port configuration mode, and configure the Cisco ICS 7750 MRP digital voice ports.
Step 3	router(config-voiceport)# playout-delay mode { default adaptive fixed [no-timestamps] }	Select the voice playout delay mode to accommodate packet jitter.

Configuration Examples

See the “Examples” headings in the section “Command Reference” for command samples.

Command Reference

This section documents Cisco IOS commands for configuring the MRP feature that were developed after the completion of the *Cisco ICS 7750 Software Configuration Guide* and *Cisco ICS 7750 Command Reference* publications. All other commands used to configure the MRP feature are documented in the *Cisco ICS 7750 Software Configuration Guide*, the *Cisco ICS 7750 Command Reference*, and the Cisco IOS Release 12.1 command-reference publications.

This section describes in detail the Cisco IOS commands for configuring the following commands on the Cisco ICS 7750:

- **playout delay**
- **playout-delay mode**

playout delay

To tune the playout buffer to accommodate packet jitter, use the **playout-delay** voice-port configuration command. Use the **no** form of this command to restore the default value.

playout-delay { **maximum** | **nominal** } *milliseconds*

no playout-delay { **maximum** | **nominal** }

Syntax Description

Command Elements	Description
maximum	The delay time the Digital Signal Processor (DSP) allows before starting to discard voice packets.
nominal	The initial (and minimum allowed) delay time the DSP inserts before playing out voice packets.
<i>milliseconds</i>	Playout-delay value in milliseconds. The range for maximum playout delay is 40 to 1700, and the range for nominal playout delay is 0 to 1500.

Defaults

- The default maximum delay time is 200 milliseconds.
- The default nominal delay time is 60 milliseconds.



Note

Cisco suggests a nominal delay of 10 milliseconds for better voice quality.

Command Modes

Voice-port configuration.

Command History

Release	Modification
11.3 MA	This command was introduced on the Cisco MC3810.
12.0(7)XK	This command was introduced on the Cisco 2600 and 3600 series routers.
12.1(3)XI	This command was introduced on the Cisco ICS 7750.
12.1(5)T	This command was released on the Cisco ICS 7750 in an early deployment release (T train release).

Usage Guidelines

- If jitter causes excessive voice break-up with the default playout delay settings, increase the delay times. If your network is small and jitter is minimal, decrease the delay times to reduce delay.
- If you run multiple voice calls over a single DSP on an MRP card that is configured for an echo cancellation coverage of 32 milliseconds on its voice ports, limit the echo-coverage setting to 16 milliseconds in the voice-port configuration to prevent voice quality degradation. For example, enter the command **echo {coverage} 16ms voice-port**.
- Cisco suggests a nominal delay of 10 milliseconds for better voice quality.
- Cisco suggests a music on-hold threshold of -45 db to prevent audio clipping.

Examples

The following example configures a nominal playout delay of 10 milliseconds and a maximum playout delay of 160 milliseconds on voice-port 0/0:0 on the Cisco ICS 7750 MRP:

```
router(config)# voice-port 0/0:0
router(config-voiceport)# echo-cancel coverage 16
router(config-voiceport)# playout-delay nominal 10
router(config-voiceport)# playout-delay maximum 160
router(config-voiceport)# music-threshold -45
router(config-voiceport)#
```

Related Commands

Command	Description
vad	Enable voice activity detection.

playout-delay mode

To set the voice playout delay mode used by DSP firmware to accommodate packet jitter, use the **playout-delay mode** voice-port configuration command. Use the **no** form of this command to restore the default mode.

playout-delay mode { **default** | **adaptive** | **fixed** [**no-timestamps**] }

no playout-delay mode { **default** | **adaptive** | **fixed** [**no-timestamps**] }

Syntax Description

Command Elements	Description
default	Set the playout-delay mode in DSP firmware to the default mode.
adaptive	Set the DSP to adapt the jitter buffer to network conditions.
fixed	Set the jitter buffer at a constant delay.
no-timestamps	Set the jitter buffer at a constant delay without time stamps.

Defaults

- The default mode is **default**.
- The default maximum delay time is 200 milliseconds.
- The default nominal delay time is 60 milliseconds.



Note

Cisco suggests a nominal delay of 10 milliseconds for better voice quality.

Command Modes

Voice-port configuration.

Command History

Release	Modification
Cisco IOS Release 12.1(3)XI	The commands playout-delay was introduced on the Cisco ICS 7750.
12.1(5)T	This command was released on the Cisco ICS 7750 in an early deployment release (T train release).

Usage Guidelines

If jitter causes excessive voice break-up with the default playout delay settings, increase the delay times. If your network is small and jitter is minimal, decrease the delay times to reduce delay.

■ **playout-delay mode**

Examples

The following example sets the jitter buffer to a constant delay without time stamps:

```
router(config)# voice-port 0/0:0  
router(config-voiceport)# playout-delay mode fixed no-timestamps  
router(config-voiceport)#
```

Related Commands

Command	Description
playout delay	Tune the playout buffer to accommodate packet jitter.