



Carrier VoIP

Media Server 2000 Series Basics

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Contents

New in this release	5
Features	5
IPSec Integration for MS 2000 Series	5
Support for EVRC Codec	5
Call Server Frame (CSF)	5
Other changes	5
<hr/>	
Media Server 2000 Series Overview	7
Media Server 2000 Series platform	7
MS 2010 for IP networks	7
MS 2020 for ATM networks	9
MS 2000 Series audio and conferencing functions	10
Audio Provisioning Server (APS)	12
APS hardware	12
APS software	12

4 Contents

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NN10323-111 05.02 Standard
(I)SN09U 20 October 2006

New in this release

The following sections detail what's new in *Media Server 2000 Series Basics* (NN10323-111) for release (I)SN09U.

Features

See the following section for information about feature changes:

IPSec Integration for MS 2000 Series

This feature enables IPSec and IKE parameters to be configured on the MS 2000 to allow for secure messaging between the Integrated Element Management System (IEMS) and the MS 2000 and between the MS 2000 and the Gateway Controller (GWC). MS 2000 IPSec and IKE configuration is performed through the MS 2000 Maintenance and Configuration tool of the IEMS GUI. Refer to the *Media Server 2000 Series Configuration Management* (NN10340-511) for details.

Support for EVRC Codec

A new version of the MS2010 Media Server has been created to support the Enhanced Variable Rate Codec (EVRC) in CDMA Wireless networks deploying the Transcoder Free Operation (TrFO) feature. For more information, refer to the *Packet Mobile Switching Center Configuration Management - Transcoder Free Operation* document (NN20000-310) or contact Nortel CDMA support.

Call Server Frame (CSF)

The Call Server Frame (CSF) is available in release (I)SN10. The CSF supports up to three MS 2020s or six MS 2010s.

Other changes

There are no other changes in this release.

6 New in this release

Media Server 2000 Series Overview

Use the information in this section to learn about the Media Server 2000 Series.

Media Server 2000 Series platform

As a media application server supporting audio services running on the softswitch, the Media Server 2000 Series provides an interface for features that require: prompt playback of pre-recorded announcements, collection of user input (Dual Tone MultiFrequency {DTMF} digit entry), audio conferencing, bearer channel tandeming to undetectably provide call content to authorized law enforcement agencies, and tone detection and playback for trunk testing.

MS 2010 for IP networks

The MS 2010 uses a rack mount chassis that is 1U high and 19 inches wide. The chassis contains one board, the IPM-1610 and its rear transition module, which contains the Ethernet interface for the unit. Up to six MS 2010 chassis can be configured in a SAMF or CCF frame. The Media Server 2010 is available in either a DC or an AC powered configuration.

Although the MS 2010 IPM-1610 board occupies only one slot in the Media Server 2010 chassis, it consists of either one or two separate, logical media gateway modules from an OAM&P management perspective. Each module has its own MAC address and IP address. Both modules share a redundant LAN connection through an internal Ethernet switch.

The MS 2010 Series is available in five configurations. These configurations are described in the table below.

MS2010 configurations

Services Enabled	Number of Logical IPM-1610 modules	Number of Ports
<ul style="list-style-type: none"> - Announcement Playback - Conferencing - Test Trunks - Legal Intercept (Bearer Channel Tandeming) - Packet Media Anchor 	1	120
<ul style="list-style-type: none"> - Announcement Playback - No Conferencing - Test Trunks - Legal Intercept (Bearer Channel Tandeming) - Packet Media Anchor 	1	120
<ul style="list-style-type: none"> - Announcement Playback - Conferencing - Test Trunks - Legal Intercept (Bearer Channel Tandeming) - Packet Media Anchor 	2	240
<ul style="list-style-type: none"> - Announcement Playback - No Conferencing - Test Trunks - Legal Intercept (Bearer Channel Tandeming) - Packet Media Anchor 	2	240
<ul style="list-style-type: none"> - Announcement Playback - No Conferencing - Test Trunks - No Legal Intercept (Bearer Channel Tandeming) - Packet Media Anchor 	2	240

A new version of the MS2010 Media Server has been created to support the Enhanced Variable Rate Codec (EVRC) in CDMA Wireless networks deploying the Transcoder Free Operation (TrFO) feature.

The MS 2010 with EVRC support is available with the following configuration:

MS2010 with EVRC configurations

Services Enabled	Number of Logical IPM-1610 modules	Number of Ports
<ul style="list-style-type: none"> - Announcement Playback - Conferencing - Test Trunks - Legal Intercept (Bearer Channel Tandeming) - EVRC Codec Support 	2	144

MS 2020 for ATM networks

The MS 2020 uses a rack mount chassis that is 2U high and 19 inches wide. The TP6310 chassis contains one board, the TP6310 and has ATM network interfaces and redundant Ethernet connections (for control - H.248 using IP over ethernet). Up to three MS 2020 chassis can be configured in a SAMF or CCF frame. The MS 2020 supports IP over Ethernet for call control signaling and either AAL1 or AAL2 for bearer traffic.

Support is provided for AAL2 PVCs and SVCs to interconnect the MS 2020 to the Media Gateway 7480/15000. For AAL1 networks, SVCs are provided to interconnect the MG9000 and MG4000 for AAL1 to the MS 2020. The physical connection in both cases is done over Single Mode Fiber using either OC-3c or STM-1 interface speeds. Also in both cases, the control signaling between the MS 2000 and Call Agent is done with H.248. OAM&P (by way of an SNMP interface), and Audio Provisioning Service (APS) interfaces are accomplished through the use of IP over Ethernet.

The MS 2020 Series is available in four configurations. These configurations are described in the table below.

MS 2020 configurations

Services Enabled	Number of Logical TP-6310 modules	Number of Ports
<ul style="list-style-type: none"> - Announcement Playback - Conferencing - Test Trunks - Legal Intercept (Bearer Channel Tandeming) 	1	240
<ul style="list-style-type: none"> - Announcement Playback - No Conferencing - Test Trunks - Legal Intercept (Bearer Channel Tandeming) 	1	240

Services Enabled	Number of Logical TP-6310 modules	Number of Ports
- Announcement Playback - Conferencing - Test Trunks - Legal Intercept (Bearer Channel Tandeming)	1	480
- Announcement Playback - No Conferencing - Test Trunks - Legal Intercept (Bearer Channel Tandeming)	1	480

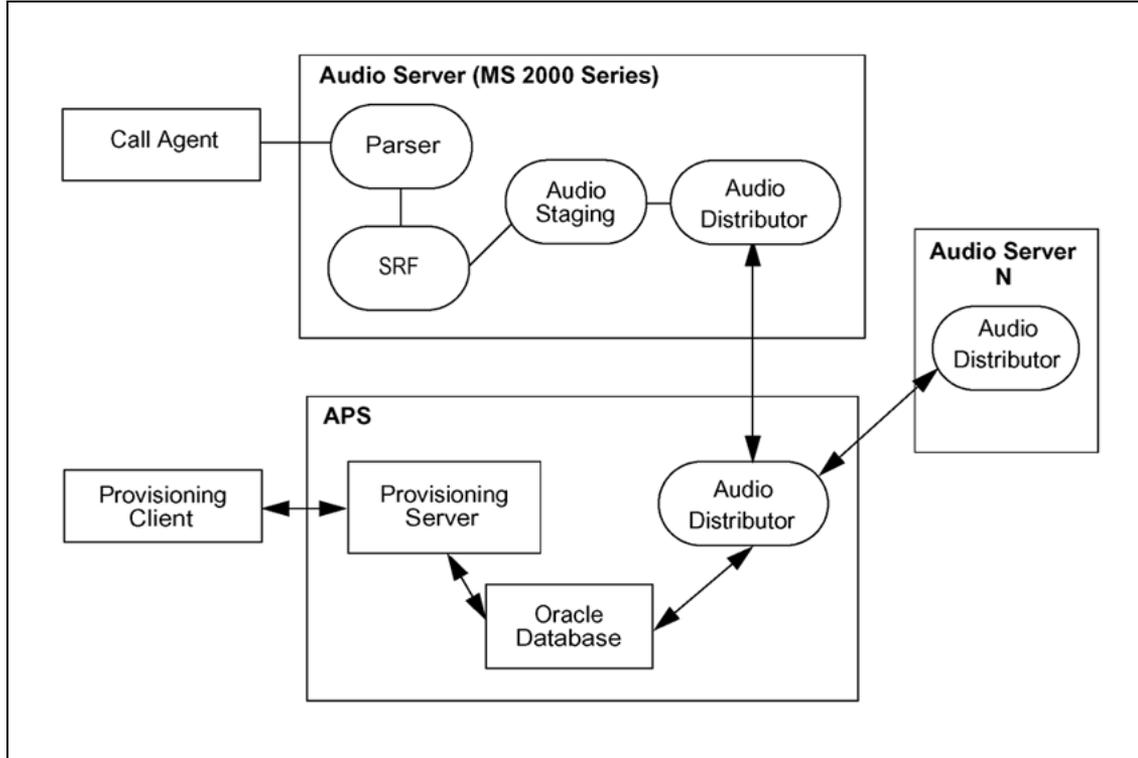
MS 2000 Series audio and conferencing functions

This section describes the audio and conferencing functions of the MS 2000 Series.

Audio access

The basic relationship between the parts of the audio access process is shown in the following illustration. In its basic operation, the Call Agent sends messages to the MS 2000 with instructions to play an audio segment or to provide conferencing resources. The Parser in the Media Server interprets the messages sent by the Call Agent and perform the action requested by the Call Agent. If audio is to be played, the audio is retrieved from audio staging.

One of the primary roles of the MS 2000 Series is to play audio as directed by a Call Agent. The Call Agent can specify that a single piece of audio be played, or it can specify a more complex audio assemblage be played, such as the current date in Spanish.

Audio access

Audio is added to the system through the Provisioning Client. The new audio is sent from the Provisioning Client to the Provisioning Server, which, in turn, forwards the audio to the Oracle database in the APS. After the audio has been added to the database, the Audio Distributor can forward it on to other Media Server nodes in the system. Audio is normally automatically distributed by the Audio Distributor to other Media Server nodes in the system on a scheduled periodic basis.

Audio distribution

Audio is distributed as required to the MS 2000 Series on start-up as well as on a periodic basis.

Upon start-up, the MS 2000 Series node sends a "heartbeat" to the APS, which causes the audio distribution process to begin. The MS 2000 Series audio distributor first checks to determine whether the node is defined in the APS database. If the node is defined, the distribution process starts; if the node is not defined, the audio distribution does not occur.

Periodic updates can be made either manually or through an automatic provisioning session that occurs hourly for all nodes. In either event, the APS, rather than the MS 2000 Series node, initiates the audio distribution process. The audio distributor first determines whether there is sufficient memory in the node to store the audio being distributed to it. This is

calculated by subtracting the amount of memory required for storing audio currently active in the node from the total memory allocated to the node. If there is not enough memory, an error log is generated on the APS and audio distribution to that node does not occur.

The MS 2000 Series can store audio for a maximum of two languages. Before distributing audio to an MS 2000 Series node, the audio distributor determines whether primary and secondary languages have been defined for the node. If either a primary or secondary language has not been defined, audio variables in the missing language cannot be distributed to the node. If neither primary nor secondary languages have been defined, no audio can be distributed to the node.

At distribution time, the audio distributor checks to determine whether language audio files for the node have been imported into the APS database. If the language audio files have not been imported into the APS database, a log is issued. Without these language audio files, any requests sent to the MS 2000 Series node to play variables requiring these audio segments will fail.

Conferencing

The conferencing capacity of the MS 2000 Series is based on the total number of conferences and the total number of participants in all of the conferences that are occurring simultaneously. An MS 2000 Series node supporting 120 channels can support 120 conference participants. Each conference can accommodate from 3 through 64 participants. Therefore, the maximum number of simultaneous conferences that can be supported, for example on the MS 2010, is 40.

Audio Provisioning Server (APS)

The G.711 encoded mulaw and alaw announcements that the MS 2000 Series plays are provisioned using the Audio Provisioning Server (APS). The APS provides a centralized location and Web-based Generic User Interface (GUI) (through Internet Explorer 5.0 or higher, or through Netscape Navigator 4.5 or higher) for uploading announcement files from a client machine to the APS, where the files can be prepared for use by a gateway.

APS hardware

The APS server is configured on a server that also hosts the CS 2000 Management Tools. For information about the server on which the APS resides, see your solution's Basics document.

APS software

The following list shows the layered software architecture elements of the APS:

- Java Applet on client workstation

- Remote database proxy on client workstation
- HTTP/ftp communication over Inter/Intra-net between APS and Client(s)
- Web server (Database Servlets)
- IPS base (Audits, Permissions)
- SPFS (Installs, Job Scheduler, System Admin)
- DMP (MBrow, Apache, JDBC)
- Database (Oracle 9i)
- Operating System (Solaris 9 JRE 1.4.2)

**CAUTION**

Use extreme care when manually disabling NFS, Telnet, HTTP and/or HTTPS, and FTP services. Disabling these services will disrupt the APS functionality. The APS relies on NFS, Telnet, HTTP and/or HTTPS, and FTP services being enabled on the CS 2000 Management Tools server to perform audio provisioning, the distribution of the audio files to the MS 2000, and general administration and maintenance functions. These services are enabled by default.

The *applets* provide the client interface to the database. The applets gather information from the APS GUI that is sent to the servlet in the form of a request. The applets communicate with the database servlets through the network using the hypertext transport protocol (HTTP).

For the audio management GUI, the *servlets* act as a request and response handler between the applets and the database server application. The servlets use the remote method invocation (RMI) capabilities provided by the Java class libraries to communicate with the database server application. For the administrative GUI, the servlets communicate directly with the IPS database using the Java Database Connectivity (JDBC) interface.

The *database server application* communicates with the IPS database using the JDBC interface. The database server application translates servlet requests into database operations. It provides a response back to the servlet, which includes a success or failure of the database's ability to process the request.

The *Interactive Provisioning System (IPS)* relational database stores the actual physical audio segments and the properties or the relationships that have been defined for physical segments, packages, sequences, sets and variables. It interacts with the MS 2000 Series runtime database hourly to provide update audio management data.

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