CHAPTER 1

Cisco Voice Services Provisioning Tool Overview

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The Cisco PGW 2200 Softswitch provides the framework for delivering voice services over packet-based data, voice, and video networks.

The Cisco PGW 2200 Softswitch encompasses a broad range of hardware platforms and Cisco software, delivering a continuum of voice solutions from core infrastructure to enhanced services over circuit and packet networks. The Cisco PGW 2200 Softswitch is at the center of the Cisco PGW 2200 Softswitch solutions.

Provisioning a Cisco PGW 2200 Softswitch is preparing it to communicate with an SS7 network, with Cisco media gateways, and with the other components of a Cisco PGW 2200 Softswitch solution. The Cisco Voice Services Provisioning Tool (Cisco VSPT) provides an easy-to-use graphical tool for provisioning the Cisco PGW 2200 Softswitches.

Individual releases of the Cisco VSPT are designed to be used with specific releases of the Cisco PGW 2200 Softswitch software. Cisco VSPT Release 2.7(3) is designed to be used with Cisco PGW 2200 Softswitch Release 9.7(3). If you are using a different release of the Cisco PGW 2200 Softswitch software, see the "Determine the Correct Provisioning Tool Release" section on page 2-1 to identify the release of Cisco VSPT that you need.

The Cisco MGC Node Manager (MNM) provides fault and performance management for the Cisco PGW 2200 Softswitch, Cisco HSI, Cisco BAMS, Cisco Catalyst switches and Cisco IP Transfer Point LinkExtender (ITP-L). Cisco VSPT Release 2.7(3) is shipped with Cisco MNM 2.7(3). The Cisco VSPT Release 2.7(3) is no longer available as a free software for downloading. Previous versions of the Cisco VSPT and all the Cisco VSPT patches are still available for free downloading from Cisco.com to customers who have a Cisco.com subscription. See the following URL

http://www.cisco.com/cgi-bin/tablebuild.pl/vspt

Cisco VSPT Release 2.7(3) supports FlexLM license control which provides license management for the Cisco VSPT. The licenses are installed after the Cisco VSPT installation. The license installation is described in Chapter 2, "Installing Cisco VSPT".

This chapter introduces the Cisco VSPT and provides directions for obtaining and installing the software. It contains the following sections:

- Provisioning Introduction, page 1-2
- Cisco VSPT Introduction, page 1-2
- Provisioning Data in Cisco VSPT, page 1-3

Provisioning Introduction

All solutions involving the Cisco PGW 2200 Softswitch are configured through the use of one or more Cisco PGW 2200 Softswitch hosts, one or more Signaling System 7 (SS7) network signaling options, and one or more media gateways that control bearer-traffic routing.

Note In this document, a solution is a logical combination of Cisco hardware and software, configured to perform a specific network task.

Before starting a provisioning session, you must understand the network topology for your solution. Create a network drawing, and a list of the components you want to provision, including component names, IP addresses, properties, and other parameters, and refer to the drawing and the list while configuring your network.

You should also perform the following tasks before starting a provisioning session:

- Plan your network configuration. See the documentation for your solution for detailed network configuration information.
- Set up your system hardware, and install all required software. For more information, see Chapter 1 of the *Cisco PGW 2200 Softswitch Hardware Installation Guide - Releases 7 & 9* at

  http://www.cisco.com/en/US/docs/voice_ip_comm/pgw/9/installation/hardware/hrdwrnst.html

  , and the *Cisco Media Gateway Controller Software Installation and Configuration (Release 9.7)* at

  http://www.cisco.com/en/US/docs/voice_ip_comm/pgw/9/installation/software/SW1/97.html

Cisco VSPT Introduction

The Cisco VSPT allows you to import an existing configuration, modify the configuration, and export it to the original device or other devices. The Cisco VSPT can also help you to provision individual call parameters. This simplifies the provisioning of a large live network.

Using the Cisco VSPT helps avoid common errors that might arise if devices are provisioned independently. It eliminates the need to enter duplicate data, and enables you to import and export configurations.

The Cisco VSPT generates configuration files that you need to provision the Cisco PGW 2200 Softswitch, including the following provisioning information:

- Signaling
- Trunk groups
- Trunks
- Routes
- Dial plans

During a provisioning session, the Cisco VSPT automatically generates the Man Machine Language (MML) or command line interface (CLI) scripts used for configuring network elements. It assembles these commands into a batch file and deploys the file to the appropriate network device.

The Cisco VSPT allows scheduled backups and restores of configurations on the following devices:

- Cisco PGW 2200 Softswitch host—Active configuration or entire Cisco PGW 2200 Softswitch system

- Catalyst 2900XL—Running-config and image in Flash
- Catalyst 5500—For switch module and Route Switch Module (RSM), configuration and image in Flash
- Catalyst 6509—For switch module and Multilayer Switch Feature Card (MSFC), configuration and image in Flash
- Cisco ITP-L 2600—Running-config and image in Flash
- Cisco BAMS Phase 3—Active configuration
- Cisco HSI Adjunct Server 4.3—Active configuration

Cisco VSPT can support secure communications to SSH-enabled devices, the Cisco PGW 2200 Softswitch host, the Cisco BAMS server, or the Cisco HSI server.

The following operations can use SSH:

- Provisioning of an SSH-enabled Cisco PGW 2200 Softswitch.
- Launching of SSH rather than Telnet for communicating with SSH-enabled network devices through a CLI.
- Use of SSH to secure X windows communications with the end-user display device.
- Use of SSH in place of Telnet for the initial step (logging in to the component to be backed up and getting the configuration) in a backup and restore operation. TFTP is used for MML configuration backup and restore. FTP is used for system backup and restore.

The Cisco VSPT can be deployed as an integrated component of the Cisco MNM or as a standalone application. If it is installed on the Cisco PGW 2200 Softswitch, call throughput might be diminished when the Cisco VSPT is active.

Cisco VSPT typically runs on a standalone UNIX server that is also running the Cisco MNM and supports multiple users and provisioning sessions.

You can launch the Cisco VSPT from the managed object icon in the Cisco MNM Map Viewer. For information about Cisco MNM, see the *Cisco MGC Node Manager User Guide* at

http://www.cisco.com/en/US/products/sw/netmgtsw/ps1912/products_user_guide_list.html

This document is designed to help you get started using the Cisco VSPT and does not include complete provisioning instructions, which are found in Chapter 3, Provisioning with VSPT, in the *Cisco Media Gateway Controller Software Release 9 Provisioning Guide* at

http://www.cisco.com/en/US/docs/voice_ip_comm/pgw/9/provisioning/guide/R9GUI.html

Provisioning with the Voice Services Provisioning Tool is at

http://www.cisco.com/en/US/products/sw/netmgtsw/ps2272/products_user_guide_list.html

Detailed instructions for provisioning dial plans are covered in Chapter 3, Provisioning Dial Plans with VSPT, in the *Cisco Media Gateway Controller Software Release 9 Dial Plan Guide* at

http://www.cisco.com/en/US/docs/voice_ip_comm/pgw/9/dial_plan/guide/DP_VSPT.html

Provisioning Data in Cisco VSPT

This section describes the requirements for entering provisioning data using the Cisco VSPT.

Cisco VSPT Field Descriptions

Table 1-1 lists Cisco VSPT field names that correspond to system components in the Cisco PGW 2200 Softswitch, and their descriptions. When you use Cisco VSPT to provision the Cisco PGW 2200 Softswitch, you can find useful information in this table. For more information about system components, see the Cisco *Media Gateway Controller Software Version 9 Provisioning Guide.*

This table is not a comprehensive list of provisioning components. It is a description of the major fields displayed in the MGC Config window. The fields are displayed using indents to show the subordination that you can see in the MGC Config window.

Table 1-1 Field Descriptions for Entries in the MGC Config Window

Field Name	Description
MGC Host	Basic information for Cisco PGW 2200 Softswitch and Cisco BAMS, for example, hostname, IP addresses, Cisco PGW 2200 Softswitch mode, and so forth.
Point Codes	
Originating Point Code (OPC)	The address for the Cisco PGW 2200 Softswitch.
Adjacent Point Code (APC)	Address of an STP[1] that sends and receives signaling messages to and from the Cisco PGW 2200 Softswitch.
Destination Point Code (DPC)	Address of an endpoint, such as a PSTN[2] switch that carries the bearer traffic.
Routing Keys	
M3UA Route Key	Transpath NE component that represents the M3UA Routing key, a child of an OPC.
SUA Route Key	Transpath NE component that represents an SUA Routing key, a child of an OPC.
Location Label	Call limiting value settings.
LinkSet	Set of links from the Cisco PGW 2200 Softswitch to an endpoint, such as an adjacent STP.
SS7 Subsystem	Logical connection between a pair of mated STPs that allows the Cisco PGW 2200 Softswitch to route through either STP to an endpoint.
ISUP Timer Profile	ISDN User Part (ISUP) timer profile provisioned for signaling service.
Inservice	Intelligent network services table that can be changed at any time and is dynamically reconfigurable.
SS7 Path (SS7 Signaling Service)	Connection between the Cisco PGW 2200 Softswitch and a specified point code.
SS7 Route	Route for each signaling path from the Cisco PGW 2200 Softswitch to the PSTN switch through the linksets you have created to the STPs.
IP Route	Static IP route.
M3UA Route	This field contains routes using M3UA for each signaling path from the Cisco PGW 2200 Softswitch to the PSTN switch through the SG node. On Release 2.7(3) Patch 3, external node type VXSM support is added.

Table 1-1 Field Descriptions for Entries in the MGC Config Window (continued)

Field Name	Description
SUA Route	This field contains routes using SUA for each signaling path from the Cisco PGW 2200 Softswitch to the PSTN switch through the SG node.
SS7 Signaling Gateway	
SS7 SG Nodes	SS7 signaling gateway nodes.
SS7 SG Pairs	SS7 signaling gateway pair.
SS7 SG Subsystem	SS7 signaling gateway subsystem.
SS7 SG Sigpaths	SS7 service to a signaling gateway.
Line Number Translation	Line number translation represents a line number and internal number translation and is dynamically reconfigurable.
SIP	
DNS	DNS server-related information, including IP address, cache size, and other parameters.
SIP Links	IP Links for the SIP signaling service.
SIP Port	Added in Release 2.7(3) Patch 3. This field contains SIP ports on an existing siplnk.
Auto Congestion Ctrl	
Response Category	Auto Congestion Control response categories that can be associated with a trunk group or a signaling path.
MCL Threshold	Definition of onset and abate values of different contributing factors for Machine Congestion Level (MCL).
MCL Callreject	The definition of call reject percentage in different MCLs.
Advice of Charge	
Holiday	Holiday table allows you to distinguish specific days of the year and charge them differently from the actual day of the week that the holiday falls on.
Charge	Charge table defines the tariff rates (table index key for tariff.dat) and their durations.
Tariff	Tariff table contains tariff rates and scale factors. Each row is referenced by a tariff ID that call processing obtains by accessing the Charge table.
Meter Tariff	Meter Tariff table is indexed by the tariff identifier retrieved from the charge table. The charge result type from generic analysis indicates which type of tariff table is accessed.
Pricharge	Pricharge table stores the charge information retrieved from the charge table. It is also used to generate AOC charge information for the subscribing user.
Pritariff	Pritariff table stores the tariff information retrieved from tariff table. It is also used to generate AOC charge information for the subscribing user.
GTD Parameters	GTD (generic transparency descriptor) transports ISUP messages and parameters, using a generic format, between the ingress and egress Cisco PGW 2200 Softswitch Signaling Controllers.
TOS	Type of service.

Table 1-1 Field Descriptions for Entries in the MGC Config Window (continued)

Field Name	Description
External [3]Nodes	
Association	An SCTP association represents the connection between the Cisco PGW 2200 Softswitch and a Cisco access server.
Association for H.248	Added in Release 2.7(3) Patch 2. An SCTP[4] link for H.248 signaling service.
BRI	A QSIG/Q.931 over BRI backhaul signaling service
C7 IP Link	Links to the SS7 network (for example, an SSP[5] or STP) from the Cisco PGW 2200 Softswitch through a Cisco ITP-L.
CTI	CTI signal path.
DPNSS	DPNSS[6] signaling path is backhauled over IP to/from a Network Access Server (destination).
EISUP	EISUP signaling service or signaling path. The signaling path to an externally located Cisco PGW 2200 Softswitch (destination).
H.248 Signaling Service	Added in Release 2.7(3) Patch 2. Another signaling service (in addition to MGCP) between the Cisco PGW 2200 Softswitch and the VXSM media gateways.
IPFAS	An IPFAS signaling service.
IP Link for H.248	Added in Release 2.7(3) Patch 2. A UDP[7] link for H.248 signaling service.
IP Link for MGCP	Links for the MGCP signaling services.
ITP	Internet Protocol Transfer Point (ITP) is a signaling gateway to the SS7 network.
LI	Lawful Intercept (LI) mediation device signal path.
MGCP[8] Signaling Service	Signaling service between the Cisco PGW 2200 Softswitch and a media gateway.
NASPath	Network access server (NAS) signaling path. The Q.931 protocol path between the Cisco PGW 2200 Softswitch and the media gateway.
Rapath	RADIUS[9] accounting server signal path.
Raserver	RADIUS accounting server.
Sessionset	A pair of backhaul IP links used on the Cisco PGW 2200 Softswitch to communicate with external nodes that support IPFAS or BSMV0.
SGP	Signaling gateway process.
CTI Manager	CTI manager details, including IP addresses, ports and other parameters.
AXL Server	AXL server details, including IP addresses, ports and other parameters.

1. STP = signal transfer point.
2. PSTN = public switched telephone network.
3. External nodes = Any object in the network that is connected to the 12. For example, media gateways (Cisco MGWs) and associated Broadband Service Cards (BSCs).
4. SCTP = Stream Control Transmission Protocol.
5. SSP = service switching point.
6. DPNSS = Digital Private Network Signaling System.

7. UDP = User Datagram Protocol.
8. MGCP = Media Gateway Control Protocol.
9. RADIUS = Remote Authentication Dial-in User Service.

Table 1-2 describes the major fields displayed in the Traffic window when the Cisco PGW 2200 Softswitch is in switched mode. Table 1-3 describes the major fields displayed in the Traffic window for nailed-mode Cisco PGW 2200 Softswitches.

Table 1-2 Field Descriptions for Entries in the Traffic Window (Switched-mode Cisco PGW 2200 Softswitch)

Field Name	Description
Profiles	A trunk group profile allows you to define a collection of trunk group properties and associate trunk groups with those properties.
Trunk Groups	A trunk group is a collection of DS0 circuits arranged so that dialing a single trunk number provides access to the entire trunk group.
Trunks	A trunk is an individual circuit (DS0) on a T1/E1.
Ipinmapping	Added in Release 2.7(3) Patch 3. This is an IP IN Trunk mapping which maps an inbound SIP or H.323 call to a trunk group.
CodecString	A series of codec choices separated by semicolons
BearerCap	Bearer capability is a string of Transmission Medium Requirement (TMR) values less than or equal to 96 characters (0 through 9 and "only") that are separated by semicolons.Users can define a required bearer capability (ies) and include the definitions. The Cisco PGW 2200 Softswitch can preferentially route calls with a specific bearer capability.
ATMProfiles	ATM profiles are used on the Cisco PGW 2200 Softswitch to change the network Service Level Agreement.
Routing	
Routes	A route is a collection of trunk groups associated with the same set of dialed digits. The route is a communication path identified for a particular destination.
Route Lists	A route list is a collection of names of routes/trunk groups that go to the same endpoint.
Descriptions	Conditional route description is used in the time-of-day routing, which provides the capability for the user to select a route list or an entry point into the percentage based routing based on the time of day, and day of week.Users can add time conditional routing descriptions to connect the entries of the conditional route description to route list names or percentage based routing names.
Conditional Routing	Conditional routing allows the Cisco PGW 2200 Softswitch to use different conditional route descriptions for weekdays and holidays. Users apply the descriptions to distribute the traffic load on Monday through Sunday and other specified holidays.
Percentage Routing	The percentage routing permits the user to distribute the traffic load across route lists based on assigned percentage values.

Table 1-3 Field Descriptions for Entries in the Traffic Window (Nailed-mode Cisco PGW 2200 Softswitch)

Field Name	Description
Trunks	A trunk is an individual circuit (DS0) on a T1/E1.

Table 1-4 describes the major fields displayed in the Number Analysis window.

Table 1-4 Field Descriptions for Entries in the Number Analysis Window

Field Name	Description
Dial Plans	
Customer Group ID	A unique four-character alphanumeric identifier for the dial plan.
Results	
Digmodstring	The digit modification string is used to modify numbers in either the A-number (calling party number) or the B-number (called party number).
BC	When you change the BC information elements (IEs) in the outgoing Initial Address Message (IAM), an ISUP call from the PSTN can be translated to a fax call in the Global System for Mobile Communications (GSM) network based on the dialed called party number. You need to create the BC table and add a BCMOD result in order to change the BC IEs in the outgoing IAM.
HLC	When you change the High Layer Compatibility IE in the outgoing IAM, the Cisco PGW 2200 Softswitch translates an ISUP call from the PSTN to a data call in the GSM network. You need to create the HLC table and add the HLCMOD result in order to change the HLC IEs in the outgoing IAM.
Customervpnid	The customer VPN ID overwrites the configured VPN ID in the incoming trunk groups or sigPaths.
Resultset	The result of analysis might require that an action be taken. A result set defines that action or a set of actions.
DefResultset	Defines a default result set to be used when a digit string is not configured in the B digit tree.
Screening	Call screening is a type of analysis done on the digit string to determine if the call is to be accepted or rejected.
Service	The service names in the Service table are defined by the users to indicate services for screening that are available to the users. You must define a service before you add a B-number-triggered call screening.
Triggers	
Achgorigin	The Cisco PGW 2200 Softswitch returns a result with CHARGEORIGIN result type during the A-number analysis if the Advice of Charge (AOC) feature is enabled on the ingress trunk group or sigpath. You need to add A-number charge origin data before you add a result with CHARGEORIGIN result type.
Adigtree	The Adigtree table is the analysis table for calling numbers (A-numbers). You add data to it by defining an entry for each digit in the digit string.

Table 1-4 Field Descriptions for Entries in the Number Analysis Window (continued)

Field Name	Description
A-Num Dp Selection	A-number dial plan selection. The dial plan selection table provides the functionality to select a new dial plan based on the customer group ID and the full A-number.
Bdigtree	The Bdigtree table is the analysis table for called numbers. You add data to it by defining an entry for each digit in the digit string.
Cause	The Cause table lists the cause codes generated when a call is either rejected or cleared by the system. The cause for release can be either a result type (from either B-number analysis or cause analysis) or a failure (generated during call processing).
Cliprefix	Advanced screening on the Cisco PGW 2200 Softswitch requires the provisioning of the calling line identification prefix table. The CLI prefix parameter allows you to associate a CLI prefix with a specific customer group. If an incoming call matches the CLI prefix parameter, you can apply certain dial plan functions to it.
CliIpAddr	The advanced screening and modification on CLI IP address parameter allows you to associate an IP address with a CLI set name. If the source IP address of the incoming call message matches the provisioned IP address, the Cisco PGW 2200 Softswitch selects the CLI set. If that incoming call matches a CLI prefix defined in that cliset, the Cisco PGW 2200 Softswitch selects the customer group ID of that CLI prefix entry to continue the number analysis.
CPC	Pre-analysis is the first phase in the Cisco PGW 2200 Softswitch number analysis. CPC analysis is the first stage of the pre-analysis. Users configure a CPC table so that it links CPC values received from the incoming call setup message to a result.
DP Selection	The dial plan selection functionality enables the Cisco PGW 2200 Softswitch to go from one dial plan to another one under specific conditions. You need to add dial plan selection data before you use this function.
H323iddivfrom	The h323iddivfrom parameter allows you to associate an H.323 ID with a specific customer group. If an incoming call matches the H.323 ID parameter, you can apply certain dial plan functions to it.
Location	The Location table is used to identify an associated result set. This table is accessed from the cause table through the location index. The location index is used to refer to a block of 16 entries in the location table. The location value is used as an offset into the location block. An action can be associated with a specific location value by associating a result set with the value in the location block.
Anoa	The NOA table is used to define actions to be taken, based on the incoming A-number NOA.
Bnoa	The NOA table is used to define actions to be taken, based on the incoming B-number NOA.
Anpi	The A-number NPI table is used to identify an associated result set. This table is accessed from the A-number NOA table through the NPI block.

Table 1-4 Field Descriptions for Entries in the Number Analysis Window (continued)

Field Name	Description
Bnpi	The B-number NPI table is used to identify an associated result set. This table is accessed from the B-number NOA table through the NPI block.
RTE Holiday	The holiday table allows you to select specific days of the year to be routed differently from the actual day of the week that a holiday occurs on.
TMR	The TMR analysis is the second stage in Pre-analysis that enables analyzing the TMR value in the IAM or Setup message. For example, this would allow the Cisco PGW 2200 Softswitch to set different media gateway bearer capabilities within the network.
TNS	The TNS analysis is the fourth stage in Pre-analysis that enables analyzing the transit network selection parameter information (or the Carrier Selection parameter information) as received in the incoming message.
Global Items	
Announcement	The ToneAndAnnouncement database table contains all the announcement details. An announcement ID identifies the announcement.
Porttbl (Moved to Tools> Advanced Number Editor in Release 2.7(3))	The ported number table determines if the B-number has been ported to another network. If the presented B-number is found in this table, the call is rerouted to the recipient network.
Script	To support the MGCP scripting feature on the Cisco PGW 2200 Softswitch, you need to provision a script table.
FullNumberTrans	The full number translation table is used for the result type NUM_TRANS. The NUM_TRANS result type is returned from A-number (the calling number) or B-number analysis (the called number), indicating that one or more numbers encountered require full replacement. The full number translation table contains all the replacement information.
Crptmesg	Added in Release 2.7(3) Patch 5. Call reporting messages are customized data that can be included in a call detail record through the provisioning of the CALL_REPORT result type.
Termtbl (Moved to Tools> Advanced Number Editor in Release 2.7(3))	The number termination table contains B-numbers. If the presented B-number is found in this list, the call is routed to the RouteID associated with the corresponding digit string.
Testline	The test line table is used to specify the delay, loop requirement, duration, and other parameters for test calls.

Cisco VSPT Data Entry Requirements

When you are entering data into the Cisco VSPT windows, follow standard MML conventions for names and descriptions. Each MML name must have the following characteristics:

- A maximum of 20 alphanumeric characters, including dashes
- No space, underscore, or special characters

- Must start with an alphabetic character

For example: **`name="dpc1"`**

MML descriptions can be as many as 128 characters and can include spaces and symbols. You should use a description that helps to identify the component or link that you are provisioning.

For example, for an SS7 route, which indicates the signaling path from the Cisco PGW 2200 Softswitch to a switch through a linkset, you could say, "SS7 Route to PSTN Switch A through Linkset 1."

For more information about MML, see the Cisco *Media Gateway Controller Software Release 9 MML Command Reference Guide*.

The Cisco VSPT GUI enables you to go through the provisioning process in sequence. The sequence of steps is described in the Cisco *Media Gateway Controller Software Release 9 Provisioning Guide*.