A

activated — A VTG state that indicates that the SIP (unicast) line or multicast line is fully operational. The PTT and volume indicators appear highlighted.

activating — A VTG state that becomes effective when the Activate button is clicked. The Activate button appears highlighted while the other PMC buttons remain in an inactive state as the system attempts to activate and connect.

activation button — This button toggles activate and deactivate functionality on the PMC. Click this button on the PMC to activate a channel (to call out); click it again to deactivate the channel.

active virtual talk group — A virtual talk group (VTG) becomes active when Cisco IPICS commits global resources, such as a multicast address and any necessary dial-in peers, so that the participants in the VTG can communicate with each other.

Administration Console — The graphical user interface (GUI) in the Cisco IPICS server software through which authorized Cisco IPICS users can manage and configure Cisco IPICS resources, events and VTGs.

autonomous system — A radio system under one administrative control; also known as a management domain. This system is usually mapped to an agency.

B

backward compatibility — The ability of newer radio equipment to operate within an older system infrastructure or to directly intercommunicate with an older radio unit. The term usually applies to digital radios that are also capable of analog signal transmission.

bandwidth The difference between the highest and lowest frequencies that are available for network signals. The term also describes the rated throughput capacity of a specific network medium or protocol. Bandwidth specifies the frequency range that is necessary to convey a signal measured in units of hertz (Hz). For example, voice signals typically require approximately 7 kHz of bandwidth and data traffic typically requires approximately 50 kHz of bandwidth.

base station A land station in the land mobile radio service. In the personal communication service, the common name for all the radio equipment that is located at one fixed location and used for serving one or several calls.

C

CAI common air interface. The standard for the digital wireless communications medium that is employed for P25-compliant radio systems and equipment. The standard for P25 Phase I incorporates Frequency Division Multiple Access (FDMA) technology.

call delay The delay that occurs when there is no idle channel or facility available to immediately process a call that arrives at an automatic switching device.

call setup time The time that is required to establish a circuit-switched call between users or terminals.

carrier A wave that is suitable for modulation by an information-bearing signal.

CAS channel associated signaling. The transmission of signaling information within the voice channel. CAS signaling often is referred to as robbed-bit signaling because user bandwidth is being robbed by the network for other purposes.

channel A communication path that is wide enough to permit a single RF transmission. Multiple channels can be multiplexed over a single cable in certain environments. *See* PTT channel.

channel capacity The maximum possible information transfer rate through a channel, subject to specified constraints.

channel folder A logical grouping of channels

channel spacing The distance from the center of one channel to the center of the next-adjacent-channel. Typically measured in kilohertz.

Cisco CallManager The software-based call-processing component of the Cisco IP telephony solution. Cisco CallManager extends enterprise telephony features and functions to packet telephony network devices, such as Cisco IP Phones, media processing devices, VoIP gateways, and multimedia applications.

Cisco IPICS Cisco IP Interoperability and Collaboration System. The Cisco IPICS system provides an IP standards-based solution for voice interoperability by interconnecting voice channels, talk groups, and VTGs to bridge communications amongst disparate systems.

Cisco IPICS server Provides the core functionality of the Cisco IPICS system. The Cisco IPICS server software runs on the Linux operating system on selected Cisco Media Convergence Server (MCS) platforms. The server software includes an incident management framework administration GUI that enables dynamic resource management for users, channels, and VTGs.

Cisco IP Phone A full-featured telephone that provides voice communication over an IP network. A user can participate in a PTT channel or VTG by using a Cisco IP Phone as a PTT device.

Cisco Security Agent Provides threat protection for server and desktop computing systems (endpoints) by identifying, preventing, and eliminating known and unknown security threats.

CLI command-line interface. An interface that allows the user to interact with the operating system by entering commands and optional arguments.

codec coder-decoder.

1. Integrated circuit device that typically uses pulse code modulation to transform analog signals into a digital bit stream and digital signals back into analog signals.

2. In Voice over IP, Voice over Frame Relay, and Voice over ATM, a DSP software algorithm that is used to compress/decompress speech or audio signals.

conference of conferences A conference that consists of two or more VTGs.

conventional radio system A non-trunked system that is similar to telephone party-line in that the user determines availability by listening for an open channel.

COR carrier operated relay. A signal from a receiver that indicates that the receiver is receiving a signal and that the receiver is not squelched.

coverage In radio communications, the geographical area that is within the range of, or that is covered by, a wireless radio system to enable service for radio communications. Also referred to as service delivery area.

D

delay time The sum of waiting time and service time in a queue.

decrypt Cryptographically restore ciphertext to the plaintext form it had before encryption.

decryption Reverse application of an encryption algorithm to encrypted data, thereby restoring that data to its original, unencrypted state.

dial peer Addressable call endpoint. In Voice over IP, there are two kinds of dial peers: POTS and VoIP.

digital ID A numeric identifier that is chosen by a Cisco IPICS user and stored in the user profile. Cisco IPICS uses this ID and a numeric password to authenticate a Cisco IP Phone user.

digital modulation technique A technique for placing a digital data sequence on a carrier signal for subsequent transmission through a channel.

dispatcher The Cisco IPICS dispatcher is responsible for setting up the VTG templates, activating the VTGs to begin conferences, and adding and/or removing participants in VTG templates and active VTGs. The dispatcher also monitors the active VTGs and events, can mute and unmute users, as necessary, and sets up system policies.

DS0 digital service zero (0). Single timeslot on a DS1 (also known as T1) digital interface—that is, a 64-kbps, synchronous, full-duplex data channel, typically used for a single voice connection on a PBX.

dynamic regrouping A trunking system feature that allows multiple radios to be placed upon a specific talk group without manual manipulation of the programming of the radios. Dynamic regrouping is initiated through a system control console and transmitted to the radio via the trunking systems control channel.

E

E & M recEive and transMit (or ear and mouth). The E&M interface provides voice signals from radio channels, which are then mapped to IP multicast or unicast. The E&M interface provides the most common form of analog trunking.

1. Trunking arrangement that is generally used for two-way switch-to-switch or switch-to-network connections. Cisco's analog E&M interface is an RJ-48 connector that allows connections to PBX trunk lines (tie lines). E&M also is available on E1 and T1 digital interfaces.

2. A type of signaling that is traditionally used in the telecommunications industry. Indicates the use of a handset that corresponds to the ear (receiving) and mouth (transmitting) component of a telephone.

encipher To convert plain text into an unintelligible form by using a cipher.

encode To modify information into the required transmission format.

encryption Application of a specific algorithm so as to alter the appearance of data and make it incomprehensible to unauthorized users.

event An active VTG in the Cisco IPICS solution.

F

FDM frequency-division multiplexing. Technique whereby information from multiple channels can be allocated bandwidth on a single wire based on frequency.

FDMA frequency-division multiple access. A a channel access method in which different conversations are separated onto different frequencies. FDMA is employed in narrowest bandwidth and multiple-licensed channel operations.

FLEXlm Cisco software that enforces licensing on certain systems; FLEXlm ensures that Cisco IPICS software will work only on the supported and licensed hardware.

floor control The standard mechanism for Push-to-Talk speaker arbitration.

frame A logical grouping of information sent as a data link layer unit over a transmission medium. Often refers to the header and the trailer, used for synchronization and error control, that surround the user data contained in the unit. The terms cell, datagram, message, packet, and segment also describe logical information groupings at various layers of the OSI reference model.

frequency For a periodic function, frequency represents the number of cycles or events per unit of time.

frequency assignment Assignment that is given to a radio station to use a radio frequency or radio frequency channel under specified conditions.

frequency hopping The repeated switching of frequencies during radio transmission according to a specified algorithm, intended to minimize unauthorized interception or jamming of telecommunications.

frequency modulation Modulation technique in which signals of different frequencies represent different data values.

frequency sharing The assignment to or use of the same radio frequency by two or more stations that are separated geographically or that use the frequency at different times.

G

gateway Device that performs an application-layer conversion of information from one protocol stack to another. In Cisco IPICS, the gateway component includes LMR gateways, which functionality is usually installed as an additional feature in a supported Cisco router. LMR gateways provide voice interoperability between radio and non-radio networks by bridging radio frequencies to IP multicast streams.

GRE generic routing encapsulation. Tunneling protocol that can encapsulate a wide variety of protocol packet types inside IP tunnels, creating a virtual point-to-point link to Cisco routers at remote points over an IP internetwork. By connecting multiprotocol subnetworks in a single-protocol backbone environment, IP tunneling that uses GRE allows network expansion across a single-protocol backbone environment. GRE is generally used to route multicast traffic between routers.

H

H.323 Defines a common set of codecs, call setup and negotiating procedures, and basic data transport methods to allow dissimilar communication devices to communicate with each other by using a standardized communication protocol.

high-band frequency Refers to the higher frequency levels in the VHF band, typically 138-222 MHz.

Hoot ‘n’ Holler (Hootie) A communications system where the loudest and most recent talker or talkers are mixed into one multicast output stream. Also known as hootie, these networks provide “always on” multiuser conferences without requiring that users dial in to a conference.

i

I

inactive VTG A VTG that is stored for use. The Cisco IPICS server stores inactive VTGs so that they can be automatically activated by a policy or manually activated by a dispatcher.

incident management framework A software framework that includes an adaptable GUI to facilitate resources, such as users, radio channels, cameras, and sensor information, for delivery that is based upon policy or incident needs.

interference The effect of unwanted energy due to one or a combination of emissions, radiation, or inductions upon reception in a radio communication system, manifested by any performance degradation, misinterpretation, or loss of information, which could be extracted in the absence of such unwanted energy.

interoperability The capability of equipment manufactured by different vendors to communicate with each other successfully over a network.

IPSec IP Security. A framework of open standards that provides data confidentiality, data integrity, and data authentication between participating peers. IPSec provides these security services at the IP layer. IPSec uses IKE to handle the negotiation of protocols and algorithms based on local policy and to generate the encryption and authentication keys to be used by IPSec. IPSec can protect one or more data flows between a pair of hosts, between a pair of security gateways, or between a security gateway and a host.

K

keepalive A message that is sent by one network device to inform another network device that the virtual circuit between the two devices is still active.

key The parameter that defines an encryption code or method.

kilohertz (kHz) A unit of frequency that denotes one thousand Hz.

L

latch The PMC functionality that allows a Cisco IPICS user to lock in a PTT channel.

linear modulation A radio frequency transmission technique that provides the physical transport layer of a radio system. This technology is compatible in digital and analog system environments and supports channel bandwidths of 5 kHz to 50 kHz.

LMR Land Mobile Radio. A Land Mobile Radio (LMR) system is a collection of portable and stationary radio units that are designed to communicate with each other over predefined frequencies. They are deployed wherever organizations need to have instant communication between geographically dispersed and mobile personnel.

location In Cisco IPICS, location signifies reachability; meaning, channels or users who are associated with the same location can communicate with each other without additional network configuration. Location may refer to a physical or virtual location, as defined in the server.

low-band frequency Lower frequency levels in the VHF band, typically 25–50 MHz.

M

megahertz (MHz) A unit of frequency denoting one million Hz.

modulation The process, or result of the process, of varying a characteristic of a carrier in accordance with an information-bearing signal.

multicast Single packets that are copied by the network and sent to a specific subset of network addresses. Multicast refers to communications that are sent between a single sender and multiple recipients on a network.

multicast address A single address that may refer to multiple network devices.

multicast address/port Cisco IPICS uses this type of connection to enable the PMC to directly tune in to the multicast channel.

multicast pool Multicast IP addresses that are defined as part of a multicast pool. Cisco IPICS allocates a multicast address from this pool of resources when a dispatcher activates a VTG.

multiplexing The combination of two or more information channels on to a common transmission medium. In electrical communications, the two basic forms of multiplexing are time-division multiplexing (TDM) and frequency-division multiplexing (FDM).

mute This functionality that enables a dispatcher to mute a PMC user from talking or transmitting voice on one or more channels. The dispatcher can mute the microphone of the user or both the microphone and the speaker.

mutual aid channel A national or regional channel that has been set aside for use only in mutual aid interoperability situations. Restrictions and guidelines governing usage usually apply.

N

narrowband channels Channels that occupy less than 20 kHz.

National Public Safety Planning Advisory Committee The committee that was established to conduct nationwide planning and allocation for the 821–824 MHz and 866–869 MHz bands.

National Telecommunications and Information Administration The United States executive branch agency that serves as the principal advisor to the president on telecommunications and information policies and that is responsible for managing the federal government's use of the radio spectrum.

network An interconnection of communications entities.

NAT Network Address Translation. Provides a mechanism for translating addresses that are not globally unique into globally routable addresses for connection to the Internet.

not activated A VTG state that becomes effective when the Activate button is clicked a second time (to deactivate the channel) or if the connection terminates. No PMC buttons appear highlighted.

O

offline mode When the connection to the server goes offline, the PMC enters offline mode. Offline mode enables continuous communication during periods of server downtime. Using offline mode requires at least one successful login to the server.

operator The Cisco IPICS operator is responsible for setting up and managing users, configuring access privileges, and assigning user roles and ops views.

ops view operational view. A Cisco IPICS feature that provides the ability to organize users, user groups, channels, channel groups, VTGs, and policies into different user-definable views. While ops views are maintained separately by the Cisco IPICS system administrator, this functionality also allows multiple entities to use one Cisco IPICS server to enable resource sharing across multiple ops views, according to business need.

OTAR over-the-air re-keying. Provides the ability to update or modify over radio frequency the encryption keys that are programmed in a mobile or portable radio.

P

packet A logical grouping of information that includes a header that contains control information. Usually also includes user data.

packet switching The process of routing and transferring data by using addressed packets so that a channel is occupied during the transmission of the packet only. Upon completion of the transmission, the channel is made available for the transfer of other traffic.

PIM Protocol Independent Multicast. Multicast routing architecture that allows the addition of IP multicast routing on existing IP networks. PIM is unicast routing protocol independent and can be operated in two modes: PIM dense mode and PIM sparse mode.

PIM dense mode One of the two PIM operational modes. PIM dense mode is data-driven and resembles typical multicast routing protocols. Packets are forwarded on all outgoing interfaces until pruning and truncation occurs. In dense mode, receivers are densely populated, and it is assumed that the downstream networks want to receive and will probably use the datagrams that are forwarded to them. The cost of using dense mode is its default flooding behavior. Sometimes called dense mode PIM or PIM DM.

PIM sparse mode One of the two PIM operational modes. PIM sparse mode tries to constrain data distribution so that a minimal number of routers in the network receive it. Packets are sent only if they are explicitly requested at the RP (rendezvous point). In sparse mode, receivers are widely distributed, and the assumption is that downstream networks will not necessarily use the datagrams that are sent to them. The cost of using sparse mode is its reliance on the periodic refreshing of explicit join messages and its need for RPs. Sometimes called sparse mode PIM or PIM SM.

PMC Push-to-Talk Management Center. A standalone PC-based software application that simulates a handheld radio to enable PTT functionality for PC users. This application enables Cisco IPICS PMC end-users, dispatch personnel, and administrators to participate in one or more VTGs at the same time.

PMC ID The unique ID that the Cisco IPICS server generates for each PMC to track requests between the PMC and the server and to verify and manage concurrent PMC usage for licensing requirements.

policy An association of events or triggers to an action. Policies can include a set sequence of actions, such as activating VTGs.

policy channel A channel that can be set up by the dispatcher and configured as a designated channel; that is, a channel that is always open to enable your interaction with the dispatcher.

portalization A web programming paradigm for customizing the interface and functionality of a client application.

protocol A set of unique rules that specify a sequence of actions that are necessary to perform a communications function.

PTT Push-to-talk. A signal to a radio transmitter that causes the transmission of radio frequency energy.

PTT channel A channel consists of a single unidirectional or bidirectional path for sending and/or receiving signals. In the Cisco IPICS solution, a channel represents one LMR gateway port that maps to a conventional radio physical radio frequency (RF) channel.

PTT channel button The button on the PMC that you click with your mouse, or push, and hold to talk. You can use the latch functionality on this button to talk on one or more channels at the same time.

PTT channel group A logical grouping of available PTT channels that can be used for categorization.

Q

QoS quality of service. A measurement of performance for a transmission system, including transmission quality and service availability.

queue Represents a set of items that are arranged in sequence. Queues are used to store events occurring at random times and to service them according to a prescribed discipline that may be fixed or adaptive.

queuing delay In a radio communication system, the queuing delay specifies the time between the completion of signaling by the call originator and the arrival of a permission to transmit to the call originator.

R

radio channel Represents an assigned band of frequencies sufficient for radio communication. The bandwidth of a radio channel depends upon the type of transmission and its frequency tolerance.

radio equipment Any equipment or interconnected system or subsystem of equipment (both transmission and reception) that is used to communicate over a distance by modulating and radiating electromagnetic waves in space without artificial guide. This equipment does not include microwave, satellite, or cellular telephone equipment.

receive indicator The indicator on the PMC that blinks green when traffic is being received.

remote connection Cisco IPICS uses this type of connection to provide SIP-based trunking into the RMS component, which is directly tuned into the multicast channel.

RF radio frequency. Any frequency within the electromagnetic spectrum that is normally associated with radio wave propagation. RF generally refers to wireless communications with frequencies below 300 GHz.

RF repeater An analog device that amplifies an input signal regardless of its nature (analog or digital). Also, a digital device that amplifies, reshapes, retimes, or performs a combination of any of these functions on a digital input signal for retransmission.

RMS router media service. Component that enables the Cisco IPICS PMC to remotely attach to a VTG. It also provides support for remotely attaching (combining) two or more VTGs through its loopback functionality. The RMS mixes multicast channels in support of VTGs and it mixes remote PMC SIP-based (unicast) connections to a multicast channel or VTG. The RMS can be installed as a stand-alone component (RMS router) or as an additional feature that is installed in the LMR gateway.

RTP Real-Time Transport Procotol. Commonly used with IP networks to provide end-to-end network transport functions for applications transmitting real-time data, such as audio, video, or simulation data, over multicast or unicast network services.

S

scanning A subscriber unit feature that automatically allows a radio to change channels or talk groups to enable a user to listen to conversations that are occurring on different channels or talk groups.

SDM Security Device Manager. A web-based integrated router application, provides a user-friendly GUI for configuring security features in Cisco routers. Cisco IPICS uses SDM to configure voice ports and LMR functions on LMR gateways.

secure flag A PTT channel indicator that identities a channel as a secure PTT channel.

service delivery area *See* coverage.

signal The detectable transmitted energy that carries information from a transmitter to a receiver.

skin Skins form the appearance of the PMC. In Cisco IPICS, skins are customizable and available in various options, including 4-channel and 8-channel mouse and touch screen formats.

speaker arbitration The procedure that is used to determine the active audio stream in a Push-to-Talk system.

spectrum The usable radio frequencies in the electromagnetic distribution. The following frequencies have been allocated to the public safety community:

High HF 25–29.99 MHz
Low VHF 30–50 MHz
High VHF 150–174 MHz
Low UHF 406.1–420/450–470 MHz
UHF TV Sharing 470–512 MHz
700 MHz 764–776/794–806 MHz
800 MHz 806–824/851–869 MHz.

squelch An electric circuit that stops input to a radio receiver when the signal being received is too weak to be anything but noise.

stored VTG Also referred to as inactive VTG.

subscriber unit A mobile or portable radio unit that is used in a radio system.

system administrator The Cisco IPICS system administrator is responsible for installing and setting up Cisco IPICS resources, such as servers, routers, multicast addresses, locations, and PTT channels. The system administrator also creates ops views, manages the Cisco IPICS licenses and PMC versions, and monitors the status of the system and its users via the activity log files.

system architecture The design principles, physical structure, and functional organization of a land mobile radio system. Architectures may include single site, multi-site, simulcast, multicast, or voting receiver systems.

T

T1 Digital WAN carrier facility. T1 transmits DS-1-formatted data at 1.544 Mbps through the telephone-switching network, using alternate mark inversion (AMI) or binary 8 zero suppression (B8ZS) coding.

T1 loopback Allows mapping from multicast to unicast so that unicast phone calls can be patched into an LMR or into other multicast audio streams. A loopback is composed of two of the available T1 interfaces.

talk group A subgroup of radio users who share a common functional responsibility and, under normal circumstances, only coordinate actions among themselves and do not require radio interface with other subgroups.

TCP Transmission Control Protocol. A connection-oriented transport layer protocol that provides reliable full-duplex data transmission. TCP is part of the TCP/IP protocol stack.

TDMA time division multiple access. Type of multiplexing where two or more channels of information are transmitted over the same link by allocating a different time interval (“slot” or “slice”) for the transmission of each channel; that is, the channels take turns to use the link.

terminal A device capable of sending, receiving, or sending and receiving information over a communications channel.

throughput The number of bits, characters, or blocks passing through a data communications system, or a portion of that system.

TIA/EIA-102 standards A joint effort between government and industry to develop voice and data technical standards for the next generation of public safety radios.

tone control The process of sending a 2175 Hz inband tone with voice transmission to control receiving radios remotely. An inband tone can be used to control functions such as frequency selection and channel monitoring.

transmit indicator The indicator on the PMC that blinks red when traffic is being transmitted.

trunk A physical and logical connection between two switches across which network traffic travels. In telephony, a trunk is a phone line between two central offices (COs) or between a CO and a PBX.

trunked (system) Systems with full feature sets in which all aspects of radio operation, including RF channel selection and access, are centrally managed.

trunked radio system Integrates multiple channel pairs into a single system. When a user wants to transmit a message, the trunked system automatically selects a currently unused channel pair and assigns it to the user, decreasing the probability of having to wait for a free channel.

U

user The Cisco IPICS user may set up personal login information, download the PMC application, customize the PMC skin, and specify communication preferences that are used to configure audio devices. By using a predefined user ID and profile, the user can participate in PTT channels and VTGs by using the PMC or a supported Cisco IP Phone model. Users may have one or more Cisco IPICS roles, such as system administrator, operator or dispatcher.

unicast Specifies point-to-point transmission, or a message sent to a single network destination.

V

VAD Voice Activity Detection. When VAD is enabled on a voice port or on a dial peer, only audible speech is transmitted over the network. When VAD is enabled on Cisco IPICS, the PMC only sends voice traffic when it detects your voice.

virtual channel A virtual channel is similar to a channel but a radio system may not be attached. By creating a virtual channel, participants who do not use physical handheld radios to call into a VTG become enabled by using the PMC application or Cisco IP Phone 7960 or Cisco IP Phone 7970.

voice interoperability Voice interoperability enables disparate equipment and networks to successfully communicate with each other.

VoIP Voice over Internet Protocol. By digitalizing and packetizing voice streams, VoIP provides the capability to carry voice calls over an IP network with POTS-like functionality, reliability, and voice quality.

volume indicator The volume indicator on the PMC that shows the current volume level on the channel in a graphical format.

volume up/down buttons The buttons on the PMC that let you control the volume level.

VOX Voice-operated transmit. A keying relay that is actuated by sound or voice energy above a certain threshold and sensed by a connected acousto-electric transducer. VOX uses voice energy to key a transmitter, eliminating the need for push-to-talk operation.

VTG virtual talk group. A VTG can contain any combination of channels, channel groups, users, and user groups. A VTG can also contain other VTGs.

VTG template Before becoming active, a VTG is in an inactive state as a VTG template. The server stores VTG templates so that they can be automatically activated by a policy or manually activated by a dispatcher. Also known as a preconfigured VTG.

W

wavelength The representation of a signal as a plot of amplitude versus time.

wideband channel Channels that occupy more than 20 kHz.