

Special-Purpose Connections

Connection Commands

This topic identifies different special-purpose connection commands.

Special-Purpose Connection Commands

- **connection plar**
Associates a voice port directly with a dial peer
- **connection plar-opx**
Extends a PBX connection to a remote location
- **connection trunk**
Emulates a permanent trunk connection to a PBX
- **connection tie-line**
Emulates a temporary tie-line trunk to a PBX

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You can configure voice ports to support special connection requirements. These requirements usually reflect the needs of a specific business environment that must connect to the network in a special way. The following is a list of available connection commands and their application:

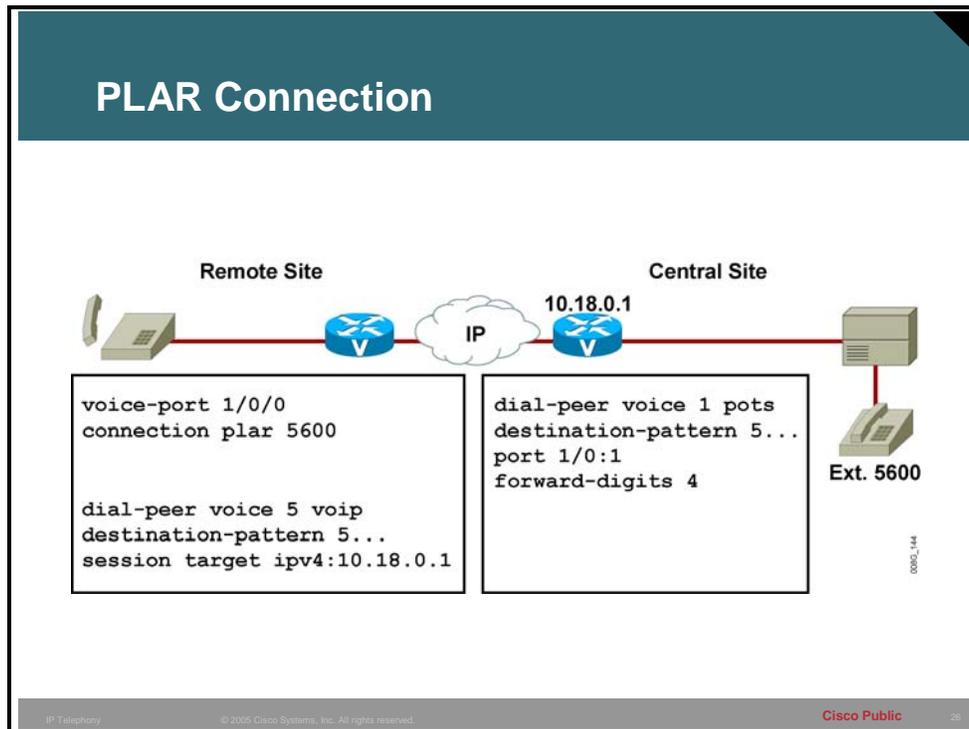
- **connection plar:** Private line, automatic ringdown (PLAR) is an autodialing mechanism that permanently associates a voice port with a far-end voice port, allowing call completion to a specific telephone number or PBX. When the calling telephone goes off hook, a predefined network dial peer is automatically matched, which sets up a call to the destination telephone or PBX. The caller does not hear a dial tone and does not have to dial a number. PLAR connections are widely used in the business world. One common use is to connect stockbrokers with trading floors. Timing is critical when dealing with stock transactions—the amount of time it may take to dial a number and get a connection can be costly in some cases. Another common use is in the travel sector, directly connecting travelers with services. Often, at places like airports, the traveler will see display boards advertising taxi companies, car rental companies, and local hotels. These displays often have telephones that will connect the traveler directly with the service of choice; the device is preconfigured with the telephone number of the desired service. One obvious difference between these telephones and a normal telephone is that they do not have a dial mechanism.
- **connection plar-opx:** Most frequently, a PLAR-Off Premises eXtension (OPX) is a PBX extension that is not located on the business site even though it operates as though it is

directly connected to the PBX. Company staff can dial an extension and reach the remote telephone as though it were on site. The remote telephone has access to PBX services such as voice mail and extension dialing. This functionality is most often used when onsite staff turns into telecommuters. Many companies are cutting back on office space in expensive locations and are setting up their staff with home offices. A PLAR-OPX connection is configured between the office and the remote site so that the telecommuter can continue to access all the corporate telephony services in the same manner as before. This allows the telecommuter to dial the same extensions to reach other staff, and to have access to long-distance dialing and other voice services via the same calling codes. From the office perspective, onsite staff can reach the telecommuter by dialing the same extension as before. One OPX connection feature is that when a call is being attempted, the voice-enabled router or gateway that takes the call from the PBX or Cisco CallManager will not report a call completion until the far end has answered the call. Without the OPX configuration, the PBX or Cisco CallManager passes the call to the local gateway or router. Then, the gateway or router routes the call to the PSTN. After the PSTN sends ringing to the telephone, the router will report call completion back to the PBX or Cisco CallManager. At this point, the call is completed. The problem is that if the call is not answered, there is no way to reroute the call to the corporate voice-mail server. From the PBX or Cisco CallManager perspective, the call is completed. When you configure the OPX, however, the gateway or router will not report call completion unless the telephone is actually answered.

- **connection trunk:** The **connection trunk** command specifies a connection that emulates a permanent trunk connection between two PBXs, a PBX and a local extension, or some combination of telephony interfaces with signaling passed transparently through the packet data network. A trunk connection remains permanent in the absence of active calls and is established immediately after configuration. The ports on either end of the connection are dedicated until you disable trunking for that connection. If, for some reason, the link between the two voice ports goes down, the virtual trunk reestablishes itself after the link comes back up. This configuration is useful when a permanent connection is desired between two devices. In this scenario, a caller at one end of the trunk connection can pick up the telephone and speak into it without dialing any digits or waiting for call setup. This is analogous to the red telephone to the Kremlin that is depicted in vintage movies. With a trunk connection, there is no digit manipulation performed by the gateway or router. Because this is a permanent connection, digit manipulation is not necessary.
- **connection tie-line:** The **connection tie-line** command specifies a connection that emulates a temporary tie-line trunk to a PBX. Although a tie-line connection is similar to a trunk connection, it is automatically set up for each call and torn down when the call ends. Another difference is that digits are added to the dial string *before* matching an outbound dial peer; for example, if a user were to dial extension 8000, which terminates at a remote office, the voice port is configured with an identifying number for that remote office. If that office ID is the number 7, then the digits that are sent to be matched against the outbound dial peer would be 78000. This new five-digit number would be carried across the network to the remote site. At the remote site, the number 7 can be stripped off or, if necessary, passed to the destination device.

PLAR and PLAR-OPX

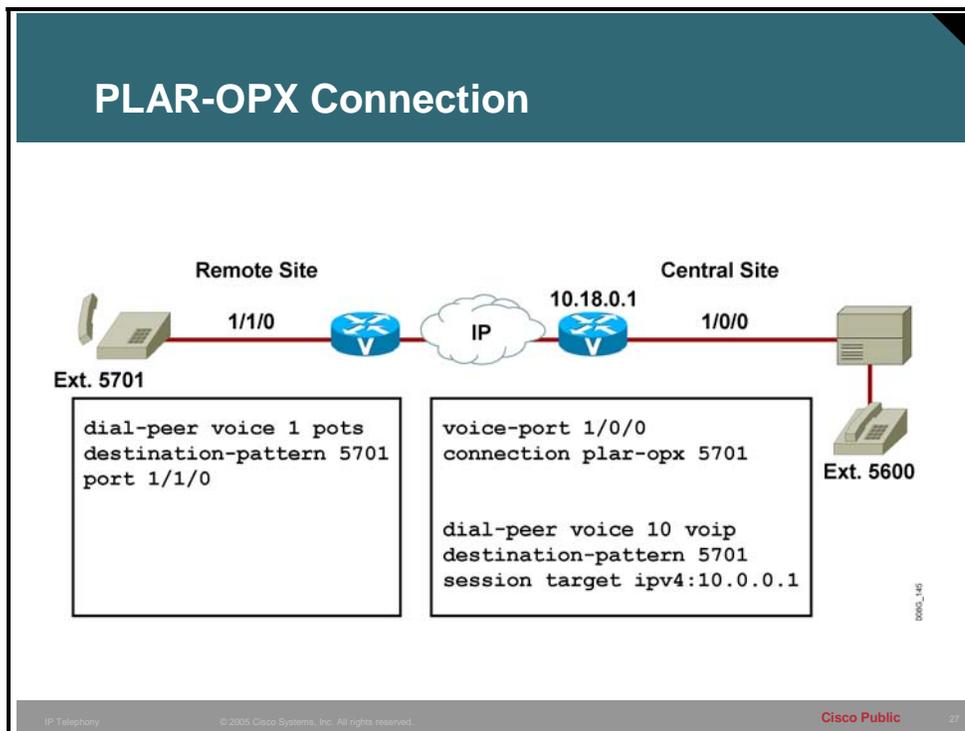
This topic describes the use of PLAR and PLAR-OPX connections.



As demonstrated in the figure, the following actions must occur to establish a PLAR connection:

1. A user at the remote site lifts the handset.
2. A voice port at the remote site router automatically generates digits 5600 for a dial-peer lookup.
3. The router at the remote site matches digits 5600 to VoIP dial peer 5 and sends the setup message with the digits 5600 to IP address 10.18.0.1 as designated in the **session target** statement.
4. The router at the central site matches received digits 5600 to POTS dial peer 1 and forwards digits 5600 out voice port 1/0:1. At the same time, it sends a call-complete setup message to the router at the remote site because both the inbound and outbound call legs on the central-site router were processed correctly.
5. The PBX receives digits 5600 and rings the appropriate telephone.

PLAR-OPX Connection

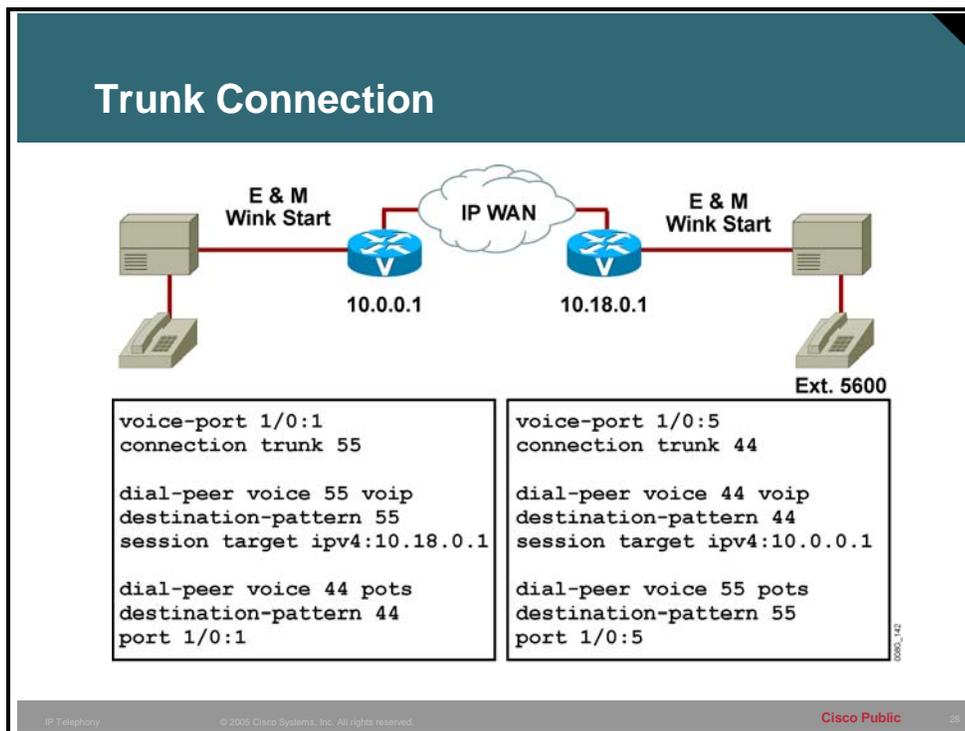


As demonstrated in the figure, the following actions must occur to establish a PLAR-OPX connection:

1. A user at the central site calls a user at a remote site using the extension 5701.
2. PBX routes the call to the central-site router port 1/0/0, which is configured for PLAR-OPX and pointing to extension 5701.
3. The central-site router matches VoIP dial peer 10 and sends a setup message to the corresponding IP address. In the meantime, port 1/0/0 does not respond immediately to the PBX with a seizure or off hook indication, but waits for the remote site call setup complete message.
4. After the remote router sends the call setup complete message, the central-site router sends a trunk seizure indication to the PBX and opens a voice path.

Configuring Trunk Connections

This topic describes how to configure trunk connections.



As demonstrated in the figure, the following must occur to establish a trunk connection:

1. Use the **connection trunk** command to establish a two-way permanent connection between two voice ports across the IP network.
2. Configure the **connection trunk** parameter on the voice ports connecting the two PBXs and configure the session target for each IP address.

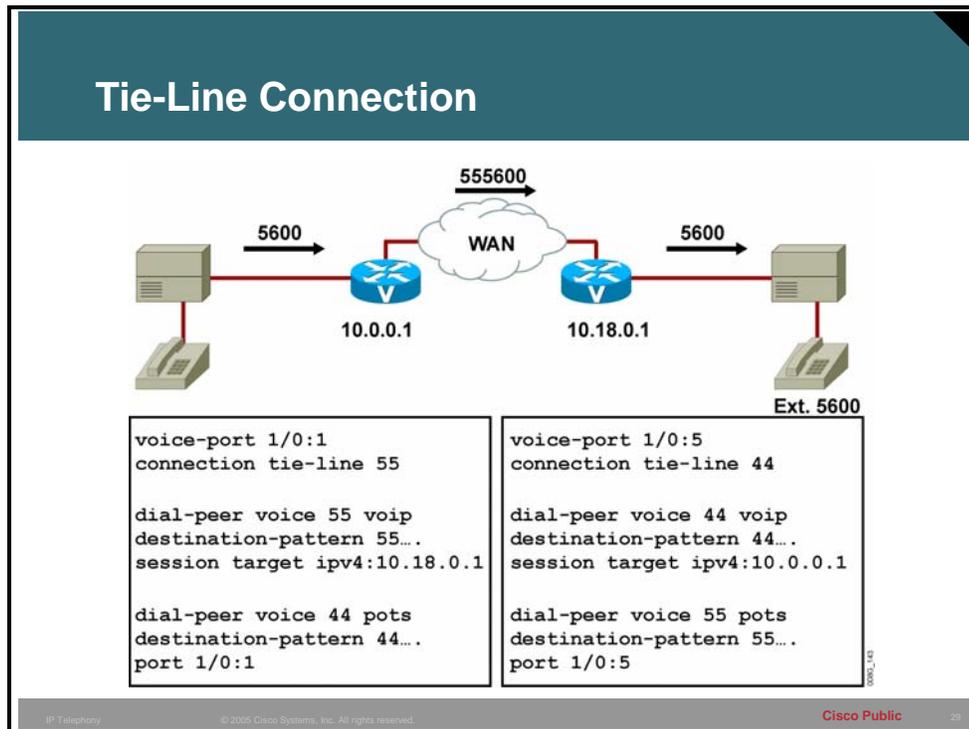
In the example, the router on the left is configured to set up a trunk connection from voice port 1/0:1 to a remote voice-enabled router with the IP address of 10.18.0.1 (the router on the right). This is done by specifying the same number in the **connection trunk** voice port command as in the appropriate dial peer **destination-pattern** command. In this example, the router on the left uses **connection trunk 55**, which matches VoIP dial peer 55. The call is routed to the router on the right, which matches the 55 in a POTS dial peer. The router on the right is also configured to set up a trunk connection from its voice port 1/0:5 to a remote voice-enabled router with the IP address of 10.0.0.1 (the router on the left). The router on the right uses 44 as its connection trunk number. These trunk connections are set up when the routers power on and remain up until the router is powered down or the ports are shut down.

The following conditions must be met for VoIP to support virtual trunk connections:

- You must use the following voice port combinations:
 - receive and transmit or ear and mouth (E&M) to E&M (same type)
 - FXS to Foreign Exchange Office (FXO)
 - FXS to FXS (with no signaling)
- You must not perform number expansion on the destination-pattern telephone numbers configured for trunk connection.
- You must configure both end routers for trunk connections.

Tie-Line Connections

This topic describes the use and application of tie-lines.



In traditional telephony networks, companies often had dedicated circuits called tie-lines connecting two PBXs. This, in effect, allowed callers at one site to reach callers at the remote site only through that tie-line connection. Now that the IP network is replacing the traditional telephony connection, the two sites are logically “tied” together through the use of the **connection tie-line** command at both sites. Callers at one site can still reach callers at the remote site only, but the call goes over the IP network. The **connection tie-line** command emulates tie-lines between PBXs.

As demonstrated in the figure, you must complete the following procedure to establish a tie-line connection:

1. Use the **connection tie-line** command when the dial plan requires the addition of digits in front of any digits dialed by the PBX.
2. Use the combined set of digits to route the call onto the network.
3. The tie-line port waits to collect digits from the PBX.
4. The terminating router automatically strips the tie-line digits.

In the figure, the caller on the left picks up the telephone and dials the four-digit extension, 5600. Because the voice port on the left router is configured for **connection tie-line**, the router collects the four digits and prepends the tie-line digits “55” to make a six-digit number, 555600. That number is then matched to a VoIP dial peer and sent to the appropriate IP address. After the call reaches the far-end router, it is matched against a POTS dial peer with the destination pattern “55....”. Because POTS dial peers, by default, forward only wildcard digits, only the four-digit extension 5600 is passed to the PBX.