Direct inward dialing (DID) is a service offered by telephone companies that enables callers to dial directly to an extension on a PBX without the assistance of an operator or automated call attendant. This service makes use of DID trunks, which forward only the last three to five digits of a phone number to the PBX. The DID state machine is identical to the E&M state machine.

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DID Topology

Figure: DID Support for Cisco 2600 and Cisco 3600 Series Routers shows a hypothetical topology in which a user connected to the PSTN (User A) dials various numbers and is connected to the appropriate extensions on a PBX.



Figure: DID Support for Cisco 2600 and Cisco 3600 Series Routers

Cisco_IOS_Voice_Troubleshooting_and_Monitoring_--_Analog_DID_Interfaces

Number Dialed by User A	Number Received by Router	Extension Receiving Call
555-1234	234	User C
555-1345	345	User D
555-1456	456	User B
555-1678	678	No dial-peer match found; fast busy tone is played

DID Hardware Troubleshooting

A DID voice interface connects directly to a standard telephone, fax machine, or similar device and supplies ring, voltage, and dial tone.

Troubleshoot DID hardware by checking the following sections:

- <u>Software Compatibility</u>
- <u>Cabling</u>
- Shutdown Port

Software Compatibility

Cisco interface cards are often supported on multiple Cisco IOS releases. Cisco IOS release information is documented in the product data sheet and in Feature Navigator II.

To determine which Cisco IOS releases support your particular router and combination of cards and modules, go to the Software Advisor at <u>http://tools.cisco.com/Support/Fusion/</u>.

You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click Cancel at the login dialog box and follow the instructions that appear.

Cabling

The two-port and four-port DID interface cards support the RJ-11 connector. Illustrations of the connector ports are shown in <u>Figure: Two-Port Analog DID Voice Interface Card</u> and <u>Figure: Four-Port Analog FXS/DID Voice Interface Card</u>. Information about LEDs can be found in the <u>Voice Interface Cards</u> document.

Figure: Two-Port Analog DID Voice Interface Card



Figure: Four-Port Analog FXS/DID Voice Interface Card



For more information about the VIC-2DID interface card, refer to <u>Understanding 2 Port Direct Inward Dial</u> (2 DID) Voice Interface Cards, document ID 15268.

Shutdown Port

Check to make sure that the port is not shut down. Enter the **show voice port** command with the voice port number that you are troubleshooting, which will tell you:

- If the voice port is up. If it is not, use the **no shutdown** command to make it active.
- What parameter values have been set for the voice port, including default values (these do not appear in the output from **the** '*show running-config*' **command**). If these values do not match those of the telephony connection you are making, reconfigure the voice port.

Verifying Direct Inward Dialing Voice-Port Configuration

To verify voice-port configuration, enter the **show voice port** command. You can specify a voice port or view the status of all configured voice ports. In the following example, the specified port is configured for DID.

```
Router# show voice port 1/1/0
Foreign Exchange Station with Direct Inward Dialing (FXS-DID) 1/1/0 Slot is 1, Sub-unit is 1,
Port is 0
  Type of VoicePort is DID-IN
 Operation State is DORMANT
 Administrative State is UP
 No Interface Down Failure
 Description is not set
 Noise Regeneration is enabled
 Non Linear Processing is enabled
 Music On Hold Threshold is Set to -38 dBm
 In Gain is Set to 0 dB
 Out Attenuation is Set to 0 dB
 Echo Cancellation is enabled
 Echo Cancel Coverage is set to 8 ms
 Playout-delay Mode is set to default
 Playout-delay Nominal is set to 60 ms
 Playout-delay Maximum is set to 200 ms
 Playout-delay Minimum mode is set to default, value 4 ms
 Playout-delay Fax is set to 300 ms
 Connection Mode is normal
 Connection Number is not set
 Initial Time Out is set to 10 s
 Interdigit Time Out is set to 10 s
 Call Disconnect Time Out is set to 3 s
 Ringing Time Out is set to 180 s
 Wait Release Time Out is set to 3 s
 Companding Type is u-law
 Region Tone is set for US
 Analog Info Follows:
 Currently processing none
 Maintenance Mode Set to None (not in mtc mode)
```

Number of signaling protocol errors are 0 Impedance is set to 600r Ohm Station name Chalil Mohanan, Station number 1234567 Voice card specific Info Follows: Signal Type is wink-start Dial Type is dtmf In Seizure is inactive Out Seizure is inactive Digit Duration Timing is set to 100 ms InterDigit Duration Timing is set to 100 ms Pulse Rate Timing is set to 10 pulses/second InterDigit Pulse Duration Timing is set to 750 ms Clear Wait Duration Timing is set to 400 ms Wink Wait Duration Timing is set to 200 ms Wait Wink Duration Timing is set to 550 ms Wink Duration Timing is set to 200 ms Delay Start Timing is set to 300 ms Delay Duration Timing is set to 2000 ms Dial Pulse Min. Delay is set to 140 ms Percent Break of Pulse is 60 percent Auto Cut-through is disabled Dialout Delay for immediate start is 300 ms