Understanding FXS Voice Interface Cards

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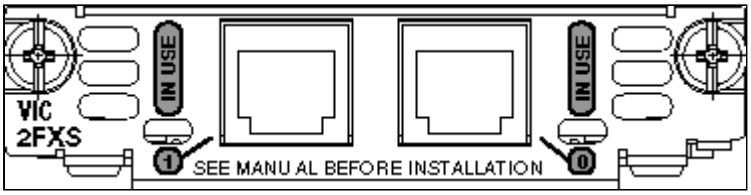
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Introduction

A Foreign Exchange Station (FXS) interface connects directly to a standard telephone, fax machine, or similar device and supplies ring, voltage, and dial tone. The Cisco FXS interface is an RJ-11 connector that allows connections to basic telephone service equipment, keysets, and private branch exchanges (PBXes).

For more information and troubleshooting, refer to the TAC Case Collection (registered customers only) tool.



Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

This document is not restricted to specific software and hardware versions.

The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command before you use it.

Conventions

For more information on document conventions, refer to the Cisco Technical Tips Conventions.

Product Numbers

Foreign eXchange Station = FXS

Direct Inward Dial = DID

Voice Interface Card = VIC

Interface Card	Description
VIC-2FXS	Two port FXS VIC
VIC2-2FXS	Two port FXS VIC
VIC-2DID	Two port DID/FXS Dual Function VIC. DID mode is default operating mode.
VIC-4FXS/DID	Four port FXS/DID Dual Function VIC. FXS mode is default operating mode.

Note: VIC2 indicates a new generation.

Features

Feature	Description
Voice Ports	Two or Four FXS ports
Connections	Connects to a telephone or fax, or to a PBX or key set that emulates a telephone. Uses RJ-11 connectors. **Note:** The end-to-end connection between the CO RJ11 jack and the router voice-port must be a straight-through connection. This means that TIP goes to TIP and RING to RING. Normally the CO provides an interface for which a standard rolled RJ11 cable can be used since the connection that results is straight. However, sometimes the CO cannot reverse the pinouts and therefore, a straight RJ11 cable is needed.

	Defintions: • Pinouts for Rolled RJ11 Cable => TIP to RING, RING to TIP • Pinouts for Straight RJ11 Cable=> TIP to TIP, RING to RING **Note:** FXS ground-start services are polarity-sensitive and undesirable behavior, such as failed calls, can occur if proper polarity conventions are not observed.
Cisco IOS® Software Feature Set	Requires a "Plus" or “IPVOICE” feature set.

Configuration

For configuration of Voice features in Cisco IOS Software, refer to Voice over IP for the Cisco 3600 Series.

Note: In Cisco IOS Software, issue the **voice-port** *<slot>/<VIC slot>/<unit>* global configuration command to configure the voice port parameters.

The commands to configure Voice over IP (VoIP) on Cisco routers are very similar on all of the router platforms shown here.

For configuration of voice features in Catalyst OS (CatOS) on a Catalyst 4000, refer to Configuring Voice Interfaces.

Platform Support

Note: The table that follows has been split due to spatial concerns.

Cisco IOS Software Support [1]	**1750**[2]	**1751**[2]**, 1760**[2]	**VG200**	**2600, 3620**	**2600XM**		
Carrier Module	**Not Required**	**Not Required**	NM-1V NM-2V	NM-1V NM-2V	NM-1V NM-2V	NM-HD-1V, NM-HD-2V, NM-HD-2VE	NM-HDV2
VIC-2FXS	All versions	All Versions	12.1(3)T, 12.1(3)T	All Versions	All Versions	Not Supported	Not Supported
VIC2-2FXS	Not Supported	12.2(15) ZL, 12.3 (4)T, 12.3(4)	Not Supported	Not Supported	Not Supported	12.2(15) ZJ, 12.3 (4)T	12.3(7)T

		XG, 12.3(5)					
VIC-2DID[4]	Not Supported	12.2(2) X*, 12.2 (4)X*, 12.2(4) Y*, 12.2 (8)Y*, 12.2(11) Y*, 12.2 (13)T, 12.2(13) Z*, 12.2 (15)Z*	12.1(5) XM1, 12.2(2)T, 12.2(2) XT, 12.3 (1)	12.1(5) XM1, 12.2(2)T, 12.2(2) XT, 12.2 (11)YT, 12.3(1)	All Versions	12.2(15) ZJ, 12.3 (4)T	12.3(7)T
VIC-4FXS/DID[5]	Not Supported	12.2(15) ZL, 12.2 (8)YN, 12.3(2) T, 12.3 (4)XG, 12.3(5)	Not Supported	Not Supported	Not Supported	12.2(15) ZJ, 12.3 (4)T	12.3(7)T

Cisco IOS Software Support [1]	**3640[3]**		**3660[3]**		**2691, 3700**			**IAD IAD**
Carrier Module	NM-1V NM-2V	NM-HD-1V, NM-HD-2V, NM-HD-2VE	NM-1V NM-2V	NM-HD-1V, NM-HD-2V, NM-HD-2VE	NM-1V NM-2V	NM-HD-1V, NM-HD-2V, NM-HD-2VE	NM-HDV2	**Not Requ**
VIC-2FXS	11.3(1)T, all 12.x	Not Supported	All Versions	Not Supported	All Versions	Not Supported	Not Supported	Not Supp
VIC2-2FXS	Not Supported	12.2(15) ZJ, 12.3 (4)T	Not Supported	12.2(15) ZJ, 12.3 (4)T	Not Supported	12.2(15) ZJ, 12.3 (4)T	12.3(7)T	12.3(XD, (7)T
VIC-2DID[4]	12.1(5) XM1, 12.2(2)T, 12.2(2) XT, 12.2 (11)YT, 12.3(1), 12.3(2)T	12.2(15) ZJ, 12.3 (4)T	12.1(5) XM1, 12.2(2)T, 12.2(2) XT, 12.2 (11)YT, 12.3(1), 12.3(2)T	12.2(15) ZJ, 12.3 (4)T	All Versions	12.2(15) ZJ, 12.3 (4)T	12.3(7)T	Not Supp

VIC-4FXS/DID[5]	Not Supported	12.2(15) ZJ, 12.3 (4)T	Not Supported	12.2(15) ZJ, 12.3 (4)T	Not Supported	12.2(15) ZJ, 12.3 (4)T	12.3(7)T	12.3(XD, (7)T

[1] Voice requires a Cisco IOS Software Voice feature set on Cisco 1700 series routers, and a Cisco IOS Software Plus feature set on the Cisco 2600, 3600, and 3700 series routers.

[2] On the Cisco 1700 voice platforms, one or more packet voice and data modules (PVDMs) are needed to support Voice interface card (VICs,) or voice ports may be missing in the active configuration. The PVDMs hold digital signal processors (DSPs) that make the VICs fully functional, and are installed on the motherboard of the Cisco 1700 series. For more information, refer to Troubleshooting Unrecognized Voice Interface Cards on Cisco 1750, 1751, and 1760 Routers. On the Cisco VG200, 2600, 2600XM, 2691, 3600, and 3700 series routers, the carrier network modules (NM-1V, NM-2V, NM-HD-1V, NM-HD-2V, NM-HD-2VE, NM-HDV2) come with the DSPs installed on the module.

[3] Voice is not supported on Cisco 3631 series router.

[4] The VIC-2DID card can operate in both DID (default setting) and FXS modes on the Cisco 1751 and 1760, and when installed in the NM-1V and NM-2V on other voice platforms. When installed in a NM-HD-1V, NM-HD-2V, NM-HD-2VE, and NM-HDV2, the VIC-2DID card only operates in DID mode until the IOS 12.4(3) release when both DID and FXS modes are supported.

[5]The VIC-4FXS/DID card can operate in both FXS (default setting) and DID modes on the Cisco 1751 and 1760. On other voice platforms the VIC-4FXS/DID card only operates in FXS mode when installed in a NM-HD-1V, NM-HD-2V, NM-HD-2VE, and NM-HDV2 until the IOS 12.3(14)T release where both modes of operation are available.

Cisco IOS Software Support[1]	**2801[2]**	**2811, 2821, 2851[2]**				**3825, 3845[2]**		
Carrier Module	**Not Required**	**Chassis Slot**	NM-1V NM-2V	NM-HD-1V, NM-HD-2V, NM-HD-2VE	NM-HDV2	**Chassis Slot**	NM-1V NM-2V	NM- 1V, N HD-2 NM- 2VE
VIC-2FXS	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supported	Not Supp
VIC2-2FXS	12.3(8)T4	12.3(8)T4	Not Supported	12.3(8)T4	12.3(8)T4	12.3(11)T	Not Supported	12.3(
VIC-2DID[3]	12.3(8)T4	12.3(8)T4	Not Supported	12.3(8)T4	12.3(8)T4	12.3(11)T	Not Supported	12.3(
VIC-4FXS/DID[4]	12.3(8)T4	12.3(8)T4	Not Supported	12.3(8)T4	12.3(8)T4	12.3(11)T	Not Supported	12.3(

[1]Voice requires a minimum of a Cisco IOS Software IPVOICE feature set on the Cisco Integrated Services Router (ISR) platforms.

[2]On the Cisco 2801, 2811, 2821, 2851, 3825, and 3845 voice platforms, one or more PVDM2 DSP cards are needed to support VIC and VWICs if they are installed on the chasis WIC slots, or voice ports may be missing in the running configuration. The PVDM2 DSP cards hold DSPs that make the VICs fully functional, and are installed on the motherboard of these ISR platforms. If VICs and VWICs are installed in a Network Module, the Module itself must have some DSPs.

[3]The VIC-2DID card can operate in both DID (default setting) and FXS modes on the Cisco 2801. DID mode is supported from IOS 12.3(8)T4 onwards, while FXS mode is supported in IOS 12.3(11) T onwards. On other ISR platforms, the VIC-2DID card only operates in DID mode until the IOS 12.4(3) release where both DID and FXS modes are supported.

[4]The VIC-4FXS/DID card can operate in both FXS (default setting) and DID modes on the Cisco 2801. On other ISR platforms, the VIC-4FXS/DID card only operates in FXS mode until the IOS 12.3(14)T release where both modes of operation are available for the VIC-4FXS/DID card on the Cisco 2811, 2821, 2851, 3825, and 3845 ISR platforms.

Pinout Information

Port zero on the VIC-2FXS card is designed to accommodate a United States style two-line phone, instead of the usual European style one-line phone.

This means that in addition to pins three and four in use, pins two and five are also monitored. In some handsets it is possible that pins two and five are wired up to allow last-number recall or call-forwarding. If this is the case, port zero on the VIC assumes you have a two-line phone, and port 1 is shutdown.

In order to check this, use only two wires in the cable from the VIC to the phone and verify that port 1 becomes active again.

- Pin 1—No Connection
- Pin 2—line two tip
- Pin 3—line—one ring
- Pin 4—line—one tip
- Pin 5—line—two ring
- Pin 6—line—No Connection

Note: The Cisco IOS Software versions provided are typically the minimum version required to support the platform, module, or feature in question. In order to find a complete list of Cisco IOS Software versions a feature, module, interface card, or chassis is supported in, use the Software Advisor (registered customers only) tool.

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Related Information

- **Voice Hardware Compatibility Matrix for Cisco 1750, 2600, 3600 and VG200 Routers and Catalyst 4000, 5000 and 6000 Switches**

- **Voice Technology Support**
- **Voice and Unified Communications Product Support**
- **Recommended Reading: Troubleshooting Cisco IP Telephony**
- **Technical Support - Cisco Systems**

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