



Preface

November 17, 2006

This guide describes Version 2.0 of the Tool Command Language (Tcl) Interactive Voice Response (IVR) Application Programming Interface (API). The Tcl IVR API can be used to create Tcl scripts that control calls coming in to or going out of a Cisco gateway. This guide provides an annotated example of a Tcl IVR script and instructions for testing and loading a Tcl IVR script.

Revision History

Release	Modification
12.3(14)T	- Added the following commands to Tcl IVR 2.0 for the Takeback and Transfer feature: consumeDigit parameter to the leg collectdigits command. leg senddigit command. leg sendhookflash command. - Added the following to Tcl IVR 2.0 for HTTP support: - New and modified commands: command export, media play (modified), media record (modified), modulespace, param read, param register. - New information tags: ev_params, ev_module_handle, ev_module_subevent, ev_module_context. - New event: ev_synthesizer - Standard Tcl 8.3.4 commands supported are: cd, close, eof, fconfigure, file, fileevent, flush, gets, glob, open, package, pwd, read, seek. - HTTP commands supported are: config, geturl, formatQuery, reset, status, size, code, ncode, data, error, cleanup.
12.4(4)XC	Added the following commands to Tcl IVR 2.1 for the Extension Assigner feature: phone assign command. phone query command. phone unassign command.

Command History

This section provides tables of changes and applicable Cisco IOS releases.

Table 1 Feature History: Commands

Cisco IOS Release	Command
12.2(11)T	leg vxmldialog
12.2(11)T	leg vxmlsend
12.2(11)T	command terminate
12.2(11)T	aaa authentication
12.2(11)T	aaa authorization

Table 1 *Feature History: Commands (continued)*

Cisco IOS Release	Command
12.2(11)T	aaa accounting
12.2(11)T	clock
12.2(11)T	media play
12.2(11)YT	leg callerid
12.2(11)YT	leg consult abandon
12.2(11)YT	leg consult response
12.2(11)YT	leg consult request
12.2(11)YT	leg tranferdone
12.2(15)T	leg alert
12.2(15)T	leg disconnect_progind
12.2(15)T	leg setup_continue
12.2(15)T	leg progress
12.2(15)T	object create
12.2(15)T	object destroy
12.2(15)T	object append
12.2(15)T	object delete
12.2(15)T	object replace
12.2(15)T	object get
12.2(15)T	leg facility
12.2(15)T	log
12.2(15)T	media record
12.3(4)T	call close
12.3(4)T	handoff
12.3(4)T	handoff return
12.3(4)T	leg setup
12.3(4)T	sendmsg
12.3(4)T	service
12.3(4)T	set callinfo
12.3(4)T	subscription open
12.3(4)T	subscription close
12.3(4)T	subscription notify_ack
12.3(4)T	leg disconnect
12.3(4)T	call register
12.3(4)T	call unregister
12.3(4)T	call lookup
12.3(4)T	leg callerid

Table 1 *Feature History: Commands (continued)*

Cisco IOS Release	Command
12.3(4)T	leg collectdigits
12.3(4)T	aaa accounting set status
12.3(4)T	aaa accounting get status
12.3(4)T	aaa accounting probe
12.3(4)T	timer left
12.3(4)T	timer start
12.3(4)T	timer stop
12.3(14)T	leg senddigit
12.3(14)T	leg sendhookflash
12.3(14)T	command export
12.3(14)T	modulespace
12.3(14)T	param read
12.3(14)T	param register

Table 2 *Feature History: callInfo Parameters*

Cisco IOS Release	callInfo Parameters
12.2(11)T	guid
12.2(11)T	incomingGuid
12.2(11)YT	destinationNum
12.2(11)YT	originationNum
12.2(11)YT	accountNum
12.2(11)YT	redirectNum
12.2(11)YT	mode
12.2(11)YT	reroutemode
12.2(11)YT	transferConsultID
12.2(11)YT	notifyEvents
12.2(11)YT	originalDest
12.2(15)T	retryCount
12.2(15)T	interceptEvents
12.2(15)T	notifyEvents
12.2(15)T	previousCauseCode
12.3(14)T	consumeDigit

Table 3 *Feature History: Information Tags*

Cisco IOS Release	Information Tag
12.2(11)T	leg_rgn_noa
12.2(11)T	leg_rgn_npi
12.2(11)T	leg_rgn_pi
12.2(11)T	leg_rgn_si
12.2(11)T	leg_rgn_num
12.2(11)T	leg_rni_ri
12.2(11)T	leg_rni_orr
12.2(11)T	leg_rni_rc
12.2(11)T	leg_rni_rr
12.2(11)T	leg_ocn_noa
12.2(11)T	leg_ocn_npi
12.2(11)T	leg_ocn_pi
12.2(11)T	leg_ocn_num
12.2(11)T	leg_chn_noa
12.2(11)T	leg_chn_npi
12.2(11)T	leg_chn_num
12.2(11)T	leg_rnn_noa
12.2(11)T	leg_rnn_inn
12.2(11)T	leg_rnn_npi
12.2(11)T	leg_rnn_num
12.2(11)T	leg_rnr
12.2(11)T	leg_cdi_nso
12.2(11)T	leg_cdi_rr
12.2(11)T	leg_gno_ni
12.2(11)T	leg_cnn_noa
12.2(11)T	leg_cnn_npi
12.2(11)T	leg_cnn_pi
12.2(11)T	leg_cnn_si
12.2(11)T	leg_cnn_num
12.2(11)T	leg_gea_type
12.2(11)T	leg_gea_noa
12.2(11)T	leg_gea_npi
12.2(11)T	leg_gea_cni
12.2(11)T	leg_gea_pi
12.2(11)T	leg_gea_si

Table 3 *Feature History: Information Tags (continued)*

Cisco IOS Release	Information Tag
12.2(11)T	leg_gea_num
12.2(11)T	leg_cpc
12.2(11)T	leg_oli
12.2(11)T	leg_cid_ton
12.2(11)T	leg_cid_cid
12.2(11)T	leg_tns_ton
12.2(11)T	leg_tns_nip
12.2(11)T	leg_tns_cc
12.2(11)T	leg_tns_ns
12.2(11)T	leg_pci_instr
12.2(11)T	leg_pci_tri
12.2(11)T	leg_pci_dat
12.2(11)T	leg_fdc_parm
12.2(11)T	leg_fdc_fname
12.2(11)T	leg_fdc_instr
12.2(11)T	leg_fdc_dat
12.2(11)T	ev_vxmlevent
12.2(11)T	ev_vxmlevent_params
12.2(11)T	ev_status
12.2(11)T	ev_iscommand_done
12.2(11)T	ev_legs
12.2(11)T	last_command_handle
12.2(11)T	leg_guid
12.2(11)T	leg_incoming_guid
12.2(11)T	aaa_new_guid
12.2(11)YT	evt_consult_info
12.2(11)YT	evt_feature_report
12.2(11)YT	evt_feature_type
12.2(11)YT	evt_redirect_info
12.2(11)YT	evt_transfer_info
12.2(11)YT	leg_display_info
12.2(11)YT	leg_dn_tag
12.2(15)T	evt_gtd
12.2(15)T	evt_endpoint_address
12.2(15)T	evt_service_control_count
12.2(15)T	evt_service_control

Table 3 *Feature History: Information Tags (continued)*

Cisco IOS Release	Information Tag
12.2(15)T	evt_address_resolve_reject_reason
12.2(15)T	evt_address_resolve_term_cause
12.2(15)T	evt_last_event_handle
12.2(15)T	evt_facility_id
12.2(15)T	evt_facility_report
12.2(15)T	evt_gtd
12.2(15)T	evt_progress_indication
12.2(15)T	evt_status
12.2(15)T	gtd_attr_exists
12.3(100)	leg_rni_ri (removed)
12.3(100)	leg_rni_orr (removed)
12.3(100)	leg_rni_rc (removed)
12.3(100)	leg_rni_rr (removed)
12.3(100)	leg_ocn_noa (removed)
12.3(100)	leg_ocn_npi (removed)
12.3(100)	leg_ocn_pi (removed)
12.3(100)	leg_ocn_num (removed)
12.3(100)	leg_chn_noa (removed)
12.3(100)	leg_chn_npi (removed)
12.3(100)	leg_chn_num (removed)
12.3(100)	leg_rnn_noa (removed)
12.3(100)	leg_rnn_inn (removed)
12.3(100)	leg_rnn_npi (removed)
12.3(100)	leg_rnn_num (removed)
12.3(100)	leg_rnr (removed)
12.3(100)	leg_cdi_nso (removed)
12.3(100)	leg_cdi_rr (removed)
12.3(100)	leg_gno_ni (removed)
12.3(100)	leg_cnn_noa (removed)
12.3(100)	leg_cnn_npi (removed)
12.3(100)	leg_cnn_pi (removed)
12.3(100)	leg_cnn_si (removed)
12.3(100)	leg_cnn_num (removed)
12.3(100)	leg_gea_type (removed)
12.3(100)	leg_gea_noa (removed)
12.3(100)	leg_gea_npi (removed)

Table 3 *Feature History: Information Tags (continued)*

Cisco IOS Release	Information Tag
12.3(100)	leg_gea_cni (removed)
12.3(100)	leg_gea_pi (removed)
12.3(100)	leg_gea_si (removed)
12.3(100)	leg_gea_num (removed)
12.3(100)	leg_cpc (removed)
12.3(100)	leg_oli (removed)
12.3(100)	leg_cid_ton (removed)
12.3(100)	leg_cid_cid (removed)
12.3(100)	leg_tns_ton (removed)
12.3(100)	leg_tns_nip (removed)
12.3(100)	leg_tns_cc (removed)
12.3(100)	leg_tns_ns (removed)
12.3(100)	leg_pci_instr (removed)
12.3(100)	leg_pci_tri (removed)
12.3(100)	leg_pci_dat (removed)
12.3(100)	leg_fdc_parm (removed)
12.3(100)	leg_fdc_fname (removed)
12.3(100)	leg_fdc_instr (removed)
12.3(100)	leg_fdc_dat (removed)
12.3(4)T	leg_proto_headers
12.3(4)T	evt_handoff proto_headers
12.3(4)T	evt_handoff dnis
12.3(4)T	evt_handoff ani
12.3(4)T	evt_handoff argstring
12.3(4)T	evt_proto_content
12.3(4)T	evt_proto_content_type
12.3(4)T	evt_proto_headers
12.3(4)T	evt_status
12.3(4)T	evt_subscription_id
12.3(4)T	mod_all_handles
12.3(4)T	mod_handle
12.3(4)T	mod_handle_service
12.3(4)T	evt_msg
12.3(4)T	evt_msg_source
12.3(4)T	subscription_context
12.3(4)T	subscription_info

Table 3 *Feature History: Information Tags (continued)*

Cisco IOS Release	Information Tag
12.3(4)T	subscription_server_ipaddress
12.3(4)T	evt_disc_rsi
12.3(4)T	evt_disc_iec
12.3(4)T	evt_feature_report
12.3(4)T	evt_feature_param
12.3(4)T	evt_feature_type
12.3(4)T	evt_last_iec
12.3(4)T	media_timer_factor
12.3(4)T	set iec
12.3(4)T	evt_dest_handle
12.3(4)T	evt_handoff_legs
12.3(4)T	leg_type
12.3(4)T	aaa_accounting_last_sent
12.3(4)T	evt_aaa_status_info
12.3(4)T	evt_timer_name
12.3(4)T	leg_remote_media_ip_address
12.3(4)T	leg_remote_signaling_ip_address

Table 4 *Feature History: Events*

Cisco IOS Release	Events
12.2(11)T	ev_vxmldialog_done
12.2(11)T	ev_vxmldialog_event
12.2(11)T	leg_suppress_outgoing_auto_acct
12.2(11)YT	ev_consult_request
12.2(11)YT	ev_consult_response
12.2(11)YT	ev_consultation_done
12.2(11)YT	ev_transfer_request
12.2(11)YT	ev_transfer_status
12.2(15)T	ev_facility
12.2(15)T	ev_disc_prog_ind
12.2(15)T	ev_address_resolved
12.2(15)T	ev_alert
12.2(15)T	ev_connected
12.2(15)T	ev_proceeding
12.2(15)T	ev_progress
12.3(4)T	ev_accounting_status_ind

Table 4 *Feature History: Events (continued)*

Cisco IOS Release	Events
12.3(4)T	ev_named_timer
12.3(4)T	ev_feature

Table 5 *Feature History: Status Codes*

Cisco IOS Release	Status Codes
12.2(11)T	ls_016
12.2(11)T	vd_xxx—VoiceXML Dialog Completion Status
12.2(11)YT	cd_001 to cd_010
12.2(11)YT	cr_000 to cr_004
12.2(11)YT	cs_000 to cs_005
12.2(11)YT	ft_001 to ft_006
12.2(11)YT	ls_026
12.2(11)YT	ls_031 to ls_033
12.2(11)YT	ls_040 to ls_042
12.2(11)YT	ls_050 to ls_059
12.2(11)YT	ts_000 to ts_009
12.2(15)T	fa_000, fa_003, fa_007, fa_009, fa_010, fa_050 to fa_052
12.3(4)T	su_xxx, no_xxx, us_xxx, ul_xxx (000–010, 099)

Audience

This document is a reference guide for developers writing voice application software for Cisco voice interfaces, such as the Cisco AS5x00 series universal access servers. Voice application developers may include:

- Independent software vendors (ISVs)
- Corporate developers
- System integrators
- Original equipment manufacturers (OEMs)

This document presumes:

- Tcl programming knowledge and experience

Although examples of how to create and use Tcl IVR scripts are provided in this document, this document is not intended to be a tutorial on how to write Tcl scripts.

Structure of This Guide

This guide contains the following chapters and appendixes:

- [Chapter 1, “Overview”](#) provides an overview of Interactive Voice Response (IVR), the Tool Command Language (Tcl), and version 2.0 of the Tcl IVR Application Programming Interface (API).
- [Chapter 2, “Using Tcl IVR Scripts”](#) contains information on how to create and use Tcl IVR scripts.
- [Chapter 3, “Tcl IVR API Command Reference”](#) provides an alphabetical listing of the Tcl IVR API commands.
- [Chapter 4, “Information Tags”](#) discusses identifiers that can be used to retrieve information about call legs, events, the script itself, the current configuration, and values returned from RADIUS.
- [Chapter 5, “Events and Status Codes,”](#) describes events received and status codes returned by Tcl IVR scripts.
- [Appendix A, “Sample Scripts,”](#) provides some sample Tcl scripts.
- [Glossary](#), presents an alphabetical listing of common terms used throughout this document.

Related Documents

- *Configuring Interactive Voice Response for Cisco Access Platforms:*
http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pull_ivr.htm
- *Service Provider Features for Voice over IP:*
<http://www.cisco.com/univercd/cc/td/doc/product/software/ios120/120newft/120t/120t3/voip1203.htm>
- *Voice over IP for the Cisco AS5300:*
<http://www.cisco.com/univercd/cc/td/doc/product/access/nubuvoip/voip5300/index.htm>
- *Voice over IP for the Cisco AS5800:*
<http://www.cisco.com/univercd/cc/td/doc/product/access/nubuvoip/voip5800/index.htm>
- *Voice over IP for the Cisco 2600/Cisco 3600 Series:*
<http://www.cisco.com/univercd/cc/td/doc/product/access/nubuvoip/voip3600/index.htm>
- *Configuring H.323 VoIP Gateway for Cisco Access Platforms:*
http://www.cisco.com/univercd/cc/td/doc/product/software/ios121/121cgcr/multi_c/mcprt1/mcdvoip.htm
- *Prepaid Distributed Calling Card via Packet Telephony:*
http://www.cisco.com/univercd/cc/td/doc/product/access/acs_serv/as5400/sw_conf/ios_121/pull0134.htm
- *RADIUS Vendor-Specific Attributes Implementation Guide:*
http://cco/univercd/cc/td/doc/product/access/acs_serv/vapp_dev/vsaig3.htm
- *Tcl IVR API Version 1.0 Programmer's Guide:*
http://cco/univercd/cc/td/doc/product/access/acs_serv/vapp_dev/tclivrpg.htm

- *Interactive Voice Response Version 2.0 on Cisco VoIP Gateways:*
http://www.cisco.com/en/US/docs/ios/12_1t/12_1t3/feature/guide/dt_skyn.html
- *Enhanced Multilanguage Guide:*
<http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122t/122t2/ftmultil.htm>
- *Cisco IOS Security Configuration Guide, Release 12.2:*
http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122cgcr/fsecur_c/index.htm
- *Cisco IOS Tcl and VoiceXML Application Guide*
<http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122t/122t11/ivrapp/index.htm>
- *Cisco VoiceXML Programmer's Guide*
http://www.cisco.com/univercd/cc/td/doc/product/software/ios122/rel_docs/vxmlprg/index.htm
- *Introduction to writing Tcl scripts: Tcl and the TK Toolkit, by John Ousterhout (published by Addison Wesley Longman, Inc)*
- *Developer Support Agreement:*
<http://www.cisco.com/warp/public/779/servpro/programs/ecosystem/devsup>

Conventions

This guide uses the following conventions to convey instructions and information.

Convention	Description
boldface font	Commands and keywords.
<i>italic font</i>	Variables for which you supply values.
[]	Keywords or arguments that appear within square brackets are optional.
{ x y z }	A choice of required keywords appears in braces separated by vertical bars. You must select one.
screen font	Examples of information displayed on the screen.
boldface screen font	Examples of information you must enter.
< >	Nonprinting characters, for example passwords, appear in angle brackets in contexts where italic font is not available.
[]	Default responses to system prompts appear in square brackets.



Note

Means *reader take note*. Notes contain helpful suggestions or references to additional information and material.

**Timesaver**

This symbol means *the described action saves time*. You can save time by performing the action described in the paragraph.

**Caution**

This symbol means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

**Tip**

This symbol means *the following information will help you solve a problem*. The tips information might not be troubleshooting or even an action, but could be useful information, similar to a Timesaver.

Obtaining Documentation

The following sections provide sources for obtaining documentation from Cisco Systems.

World Wide Web

You can access the most current Cisco documentation on the World Wide Web at the following URL:

<http://www.cisco.com>

Translated documentation is available at the following URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which is shipped with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual subscription.

Ordering Documentation

Cisco documentation is available in the following ways:

- Registered Cisco Direct Customers can order Cisco Product documentation from the Networking Products MarketPlace:
http://www.cisco.com/cgi-bin/order/order_root.pl
- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:
<http://www.cisco.com/go/subscription>
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco corporate headquarters (California, USA) at 408 526-7208 or, in North America, by calling 800 553-NETS (6387).

Documentation Feedback

If you are reading Cisco product documentation on Cisco.com, you can submit technical comments electronically. Click the **Fax** or **Email** option under the “Leave Feedback” at the bottom of the Cisco Documentation home page.

You can e-mail your comments to bug-doc@cisco.com.

To submit your comments by mail, use the response card behind the front cover of your document, or write to the following address:

Cisco Systems
Attn: Document Resource Connection
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools by using the Cisco Technical Assistance Center (TAC) Web Site. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC Web Site.

Cisco.com

Cisco.com is the foundation of a suite of interactive, networked services that provides immediate, open access to Cisco information, networking solutions, services, programs, and resources at any time, from anywhere in the world.

Cisco.com is a highly integrated Internet application and a powerful, easy-to-use tool that provides a broad range of features and services to help you to

- Streamline business processes and improve productivity
- Resolve technical issues with online support
- Download and test software packages
- Order Cisco learning materials and merchandise
- Register for online skill assessment, training, and certification programs

You can self-register on Cisco.com to obtain customized information and service. To access Cisco.com, go to the following URL:

<http://www.cisco.com>

Technical Assistance Center

The Cisco TAC is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two types of support are available through the Cisco TAC: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

Inquiries to Cisco TAC are categorized according to the urgency of the issue:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

Which Cisco TAC resource you choose is based on the priority of the problem and the conditions of service contracts, when applicable.

Cisco TAC Web Site

The Cisco TAC Web Site allows you to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC Web Site, go to the following URL:

<http://www.cisco.com/tac>

All customers, partners, and resellers who have a valid Cisco services contract have complete access to the technical support resources on the Cisco TAC Web Site. The Cisco TAC Web Site requires a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to the following URL to register:

<http://www.cisco.com/register/>

If you cannot resolve your technical issues by using the Cisco TAC Web Site, and you are a Cisco.com registered user, you can open a case online by using the TAC Case Open tool at the following URL:

<http://www.cisco.com/tac/caseopen>

If you have Internet access, it is recommended that you open P3 and P4 cases through the Cisco TAC Web Site.

Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses issues that are classified as priority level 1 or priority level 2; these classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer will automatically open a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to the following URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

Before calling, please check with your network operations center to determine the level of Cisco support services to which your company is entitled; for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). In addition, please have available your service agreement number and your product serial number.

Developer Support

Developers using this guide may be interested in joining the Cisco Developer Support Program. This program was created to provide you with a consistent level of support that you can depend on while leveraging Cisco interfaces in your development projects.

**Tip**

A signed Developer Support Agreement is required to participate in this program. For more details go to <http://www.cisco.com/go/developersupport> or contact developer-support@cisco.com.
