Cisco Unified IP Phone Services Application Development Notes for Cisco Unified Communications Manager and Multiplatform Phones

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Preface

Overview

You can use this document to develop and deploy customized client services for the phone that support Cisco Unified Phone services.

Because of the complexity of a communications network, this guide does not provide complete and detailed information for procedures that you need to perform in Cisco Unified Communications Manager, other third-party call control systems, or other network devices.

In this document, the term *call control system* means Cisco Unified Communications Manager or third-party call control systems. The term *phone* means the Cisco IP Phones, Cisco Wireless Phones, Cisco IP Conference Phones, Cisco IP Phones with Multiplatform, Cisco Video Phones, Cisco Desk Phones.

For information about how to use or administer the phones, see the appropriate phone user guide, phone administration guide, and call control system documentation.

Related Topics

Audience

This document provides the information needed for eXtensible Markup Language (XML) and X/Open System Interface (XSI) programmers and system administrators to develop and deploy new services.

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Organization

This document contains the following sections:

Chapter	Description
Custom Client Services Overview, on page 1	Provides an overview of the phone services for developers.
New and Changed Information, on page 5	Provides details on the new and changed information in the XML service interface for the call control system.
CiscoIPPhone XML Objects, on page 17	Describes the general behavior and usage of each XML object.
Component APIs, on page 51	Describes additional application programming interfaces (API) available to the phones.
Internal URI Features, on page 57	Describes how to implement embedded features on phones.
HTTP Requests and Header Settings, on page 91	Provides a procedure on handling HTTP client requests, definitions for HTTP header elements, identifies the capabilities of the requesting IP phone client, and defines the Accept header.
Troubleshooting Cisco Unified IP Phone Service Applications, on page 101	Provides troubleshooting tips, XML parsing errors, and error messages.
Cisco IP Phone Services Software Development Kit (SDK), on page 105	Provides a list of the components used in the Cisco Unified IP Services Software Development Kit (SDK) and the sample services requirements.
IP Phone Service Administration and Subscription, on page 109	Describes how to add and administer Cisco Unified IP Phone Services through Cisco Unified Communications Manager Administration.
CiscoIPPhone XML Object Quick Reference, on page 115	Provides a quick reference of the CiscoIPPhone XML objects and the definitions that are associated with each object.
Device Capability Query via CTI Feature, on page 119	Provides information on the Device Capability Query via CTI feature.

Related Documentation

Use the following sections to obtain related information.

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Cisco Desk Phone 9800 Series Documentation

Find documentation specific to your language, phone model, and call control system on the product support page for the Cisco Desk Phone 9800 Series.

- Get started with Cisco Desk Phone 9800 Series
- Help articles for administrators and end-users

  Cisco Desk Phone 9800 Series Support Page

Cisco IP Phone 6800 Series Documentation

See the publications that are specific to your language, phone model, and multiplatform firmware release. Navigate from the following Uniform Resource Locator (URL):

https://www.cisco.com/c/en/us/support/collaboration-endpoints/ip-phone-6800-series-multiplatform-firmware/tsd-products-support-series-home.html

Cisco IP Phone 7800 Series Documentation

Find documentation specific to your language, phone model, and call control system on the product support page for the Cisco IP Phone 7800 Series.

Cisco IP Conference Phone 7832 Documentation

Find documentation specific to your language, phone model, and call control system on the product support page for the Cisco IP Conference Phone 7832.

Cisco IP Phone 8800 Series Documentation

Find documentation specific to your language, phone model, and call control system on the product support page for the Cisco IP Phone 8800 Series.

For help information about Cisco Video Phone 8875, see Cisco Video Phone 8875.

Cisco Wireless Phone 800 Series Documentation

Find documentation that is specific to your phone model, call control system, and language on the product support page for the Cisco Wireless Phone 840 and 860. From these pages, you can also find the Cisco Wireless Phone 840 and 860 Deployment Guide.

Cisco Wireless IP Phone 882x Series Documentation

Find documentation that is specific to your phone model, call control system, and language on the product support page for the Cisco Wireless IP Phone 8821 and Cisco Wireless IP Phone 8821-EX. From these pages, you can also find the Cisco Wireless IP Phone 8821 and 8821-EX Wireless LAN Deployment Guide and Cisco Wireless IP Phone 8821 and 8821-EX Solution Compatibility Matrix.

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Cisco Unified IP Conference Phone 8831 Documentation

Refer to publications that are specific to your language, phone model, and call control system. Navigate from the following documentation URL:

https://www.cisco.com/c/en/us/support/collaboration-endpoints/unified-ip-phone-8800-series/tsd-products-support-series-home.html

Cisco IP Conference Phone 8832 Documentation

Find documentation specific to your language, phone model, and call control system on the product support page for the Cisco IP Conference Phone 8832.

Guide Conventions

This document uses the following conventions:

Convention	Description
boldface font	Commands and keywords are in **boldface**.
italic font	Arguments for which you supply values are in *italics*.
[ ]	Elements in square brackets are optional.
{x	y	z}	Alternative keywords are grouped in braces and separated by vertical bars.
[x	y	z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string w include the quotation marks.
screen font	Terminal sessions and information the system displays are in screen font.
input font	Information you must enter is in **input** font.
italic screen font	Arguments for which you supply values are in *italic screen* font.
^	The symbol ^ represents the key labeled Control - for example, the key combination ^D in a s display means hold down the Control key while you press the D key.
< >	Nonprinting characters such as passwords are in angle brackets.

Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the publication.

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

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Warnings use the following convention:

⚠️

Attention   IMPORTANT SAFETY INSTRUCTIONS

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device. Statement 1071

SAVE THESE INSTRUCTIONS

Cisco DevNet, Cisco TAC, and Cisco Solutions Partner Program

The Cisco DevNet portal provides access to API documentation, learning, tools, and communities across multiple Cisco product technology areas, enabling developers, customers, and partners to accelerate development of applications and integrated solutions. Free help options include knowledge bases, Webex chat, and community forums.

Cisco DevNet: https://developer.cisco.com

For break or fix service-level agreement production support of Cisco APIs, contact the Cisco Technical Assistance Center (TAC).

Cisco TAC: https://www.cisco.com/c/en/us/support/index.html

The Cisco Solutions Partner Program (SPP) is designed for businesses (IHVs and ISVs) interested in going to market with Cisco. The SPP enables members to develop compelling solutions that unify data, voice, video, and more on Cisco's powerful network platforms. The program also allows members to take advantage of Cisco's brand, market leadership position, and installed base to help drive positive business results for themselves and their customers.

Cisco Solutions Partner Program: https://www.cisco.com/c/en/us/partners/partner-with-cisco/solution-partner-program-spp.html

Cisco Product Security Overview

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer, and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute, or use encryption. Importers, exporters, distributors, and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

Further information regarding U.S. export regulations may be found at http://www.bis.doc.gov/index.php/regulations/export-administration-regulations-ear.

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Custom Client Services Overview

Services and Directories

You can use Cisco Unified IP Phones to deploy customized client services that users can interact with using the phone keypad and display. Services deploy using HTTP from standard web servers.

Users access client services using the menu options (availability varies by phone model). When a user opens the Services menu item, a menu of configured services displays. The user then chooses a service from the list, and the phone displays the service.

The following list gives typical services that might be supplied to a phone:

- Weather

- Stock information

- Contact information

- Company news

- To-do lists

- Daily schedule

The following figures shows a sample icon menu and a Directory list.

Figure 1: Icon Menu on Cisco Video Phone 8875

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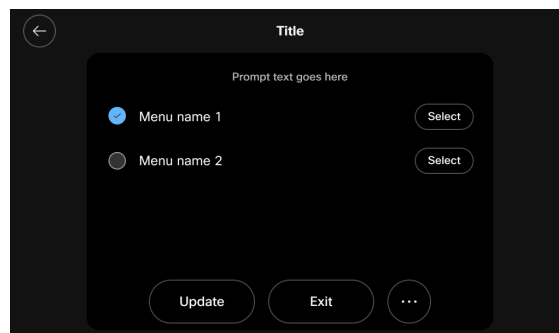
Figure 2: Directory list on Cisco Desk Phone 9851
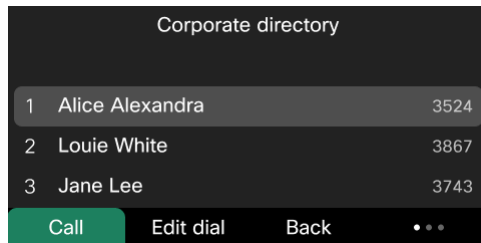
Phone users can navigate a text menu using the Navigation button followed by the Select softkey, or by using the numeric keypad to enter a selection directly.

When a menu selection is made, the Cisco IP Phone acts on it by using the HTTP client to load a specific URL. The return type from this URL can be plain text or one of the CiscoIPPhone XML objects. The object loads and the user interacts with the object.

Cisco Unified Communications Manager limits Cisco IP Phone service activity to a specific Services pane in the Cisco Unified IP Phone display. A service cannot modify the top line of the phone display, which contains the time, date, and primary extension. A service cannot overwrite the bottom line of the display, which contains softkey definitions.

Note **HTML Disclaimer**: Phone service developers must take into consideration that the phone is not a web browser and cannot parse HTML. Although content is delivered to the phone through HTTP messages using a web server, keep in mind that the content is not HTML. All content comes to the phone either as plain text or packaged in proprietary XML wrappers.

Restrictions and Limitations

Custom Application Delays

When users interact with custom phone applications, they may experience unusually long phone response delays under the following conditions:

- Heavy data usage when there are concurrent phone calls or other HTTP services (for example, Extension Mobility or Extension Mobility Cross Cluster).

- Repeated pushing of large files to the phones (for example, pushing large image files every second).

Note The response time also varies between different phone models due to internal processing limitations.

Administrators should configure the external services for the best application performance. For more information, see

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Wireless Phone Application Differences

If you created applications for the Cisco Unified Wireless IP Phone 792x Series, you may want to use them on the Cisco Wireless IP Phone 882x Series. However, the applications for the older wireless phones are not completely compatible with the newer phones.

Table 1: Wireless Phone Application Differences

Object	Cisco Unified Wireless IP Phone 792x Series	Cisco Wireless IP Phone 882x Series
SoftkeyItem	Supported <SoftKeyItems> and </SoftKeyItems> tags to group SoftKeyItem definitions.	SoftKeyItems is not supported. Remove these tags from the application.
WindowMode		Does not support WindowMode.

Cisco IP DECT 6800 Series Doesn't Support XSI

The Cisco IP DECT 6800 Series doesn't support Cisco Unified IP Phone Services Applications.

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Cisco IP DECT 6800 Series Doesn't Support XSI

Cisco IP DECT 6800 Series Doesn't Support XSI

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C H A P T E R 2

New and Changed Information

New and Changed Information for April 2024

Section	Reason
Cisco Desk Phone 9800 Series Documentation, on page xiii	Added the link of Cisco Desk Phone 9800 Series documentation

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Section	Reason
Cisco Desk Phone 9800 Series XML Object Support, on page 20 CiscoIPPhoneImageFile, on page 29 Supported Phone Models, on page 51 Supported URIs by Phone Model, on page 57 Key, on page 61 Supported IP Phones and Codecs, on page 119	Added Cisco Desk Phone 9800 Series to the supported phone list
Throughout the file	Removed End-of-Support devices: 3950, 6900,7900, 8900, 9900, SPA, and Business Edition 5000

New and Changed Information for January 2024

The following updates were made.

Section	Reason
Supported URIs by Phone Model	Added a note that Cisco Video Phone 8875 and 8875NR uses Key:Applications instead of Key:Settings.
Key	Changed Key:Settings for 8875 and 8875NR to *Not Supported*.
Settings Menu, on page 70	Added new URIs for Settings menu control on Cisco Video Phone 8875 and 8875NR

New and Changed Information October 2023

The following updates were made.

Section	Reason
Cisco Wireless Phone 800 Series Documentation	Added the link of Cisco Wireless Phone 800 Series documentation
Cisco Wireless Phone 800 Series XML Object Support	Added new section for 800 series
CiscoIPPhoneImageFile	Added a new Note specific to 840/860
CiscoIPPhoneExecute	Added a new Note specific to 840/860
Supported URIs by Phone Model	Table 23: URIs Supported by Cisco Unified IP Phone Services SDK for Cisco Unified Wireless IP Phone 7920 Series, Cisco Wireless IP Phone 8820 Series and Cisco Wireless Phone 800 Series

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Section	Reason
SoftKey URI Format	Table 35: Valid Softkey Actions for CiscoIPPhoneObject Types (Part 1)
SoftKey URI Format	Table 36: Valid Softkey Actions for CiscoIPPhoneObject Types (Part 2)
SoftKey URI Format	Table 37: Valid Softkey Actions for CiscoIPPhoneObject Types (Part 3)

New and Changed Information August 2023

The following updates were made.

Section	Reason
Cisco IP Phone 8800 Series Documentation, on page xiii	Added the link of Cisco Video Phone 8875 documentation
Cisco DevNet, Cisco TAC, and Cisco Solutions Partner Program, on page xv	Updated the technical support resources
Cisco IP Phone 8800 Series XML Object Support, on page 18 CiscoIPPhoneImageFile, on page 29 Supported Phone Models, on page 51 Supported URIs by Phone Model, on page 57 Key, on page 61 Supported IP Phones and Codecs, on page 119	Added phone 8875 and 8875NR to the supported phone list
Multiplatform Phone Support for XML Applications and Services, on page 21	Updated the supported XML objects for multiplatform phones

New and Changed Information October 2020

The following update was made.

Section	Reason
CiscoIPPhoneInput Definition, on page 24	Phones with Multiplatform Firmware don't support the InputFlag "E".

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New and Changed Information June 2020

The following updates were made.

Section	Reason
SDK Overview, on page 105	Update URL.

New and Changed May 2019

The following updates were made.

Section	Reason
Supported URIs by Phone Model, on page 57	Address the differences for the URI Key:Hold for the Cisco IP Phone 7800 and 8800 Series.
Cisco IP DECT 6800 Series Doesn't Support XSI, on page 3	The Cisco IP DECT 6800 Series doesn't support XSI.

New and Changed March 2019

The following updates were made.

Section	Reason
Create a Remote Problem Report with CiscoIPPhoneExecute, on page 41 Device	The Cisco IP Wireless Phone 8821 Firmware Release 11.0(5) introduces the ability to create a problem report with CiscoIPPhoneExecute. **Note** Only the Cisco IP Wireless Phone 8821 supports this ability. No other phones support it.

New and Changed Information August 2018

The following updates were made.

Section	Reason
SoftKey URI Format, on page 72	The Cisco IP Wireless Phone 8821 Firmware Release 11.0(4)SR1 changed the way that the Back and Exit keys function.

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New and Changed Information January 2018

The following updates were made.

Section	Reason
          	Added support for the Cisco IP Phone 6800 Series with Multiplatform Firmware. **Note** The Cisco IP Phone 6800 Series is only supported with Multiplatform Firmware.

New and Changed Information October 2017

The following updates were made.

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Section	Reason
	Added support for the Cisco IP Conference Phone 7832 and Cisco IP Conference Phone 8832. **Note** The Cisco IP Conference Phone 8832 is only supported on Cisco Unified Communications Manager.
Deprecated Phone Models for Cisco Unified Communications Manager and notes in various other sections	Updated information for Cisco Unified Communications Manager Firmware Release 12.0.
	Other sections that required clarifications.

New and Changed Information July 2017

The following updates were made.

Section	Reason
	The Small and Medium Business SPA and Multiplatform Phones also support XML. This affected the document title. Throughout the book, some references to "Cisco Unified Communications Manager" have been changed to "call control system". The Multiplatform phones do not support all API elements.
	Split this series out into its own section.

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Section	Reason
Cisco IP Phone 8800 Series XML Object Support, on page 18 CiscoIPPhoneImageFile, on page 29 Supported IP Phones and Codecs, on page 34 Dynamic Application Status Window Size, on page 38 Supported Phone Models, on page 51 Supported URIs by Phone Model, on page 57 Key, on page 61 Supported IP Phones and Codecs, on page 119	Added support for the Cisco IP Phone 8865NR.
Wireless Phone Application Differences, on page 3	This new section is to help customers migrate applications from the Cisco Unified Wireless IP Phone 792x Series to the Cisco Wireless IP Phone 882x Series.
SoftKey URI Format, on page 72	Add information about the Cisco Wireless IP Phone 882x Series use of the Back and Exit softkeys.

New Information July 2016

The following updates were made.

Section	Reason
CiscoIPPhoneInput Definition, on page 24	Updated to indicate that the Cisco IP Phone 7800 Series supports the HTTP POST method.
SoftKeyItem Definition, on page 44	Updated to give the expected contents of the Position field.
CiscoIPPhoneStatus, on page 37 CiscoIPPhoneStatusFile, on page 40	Updated to indicate the object is not supported for the Cisco Unified Wireless IP Phone 7925G, 7925G-EX, and 7926G.

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Section	Reason
Cisco Unified IP Phone 8900 and 9900 Series XML Object Support CiscoIPPhoneImage Definition, on page 27 CiscoIPPhoneImageFile, on page 29 CiscoIPPhoneGraphicFileMenu Supported IP Phones and Codecs, on page 34 CiscoIPPhoneStatus, on page 37 CiscoIPPhoneStatusFile, on page 40 SoftKeyItem Definition, on page 44 Supported Phone Models, on page 51 Supported URIs by Phone Model, on page 57 Key, on page 61 XSI Audio Path Control, on page 81 Updated XML Parser and Schema Enforcement Supported IP Phones and Codecs, on page 119	Updated for Cisco Wireless IP Phone 8821.
Deprecated Endpoints (for Cisco Unified Communications Manager 11.5).	Added list of phones deprecated for Cisco Unified Communications Manager Release 11.5. All sections in the book that mention deprecated phones were also updated.
Cisco IP Phone 7900 Series and Cisco IP Communicator XML Object	Moved the 7920 Series phone information into a new section: Cisco Unified Wireless IP Phone 7920 Series XML Object Support

New Information December 2015

The following updates were made.

- The section CiscoIPPhoneInput Definition, on page 24 was updated to indicate that the Cisco IP Phone 8800 Series support HTTP Post.

- The section Key, on page 61 was updated to indicate that the Cisco IP Phone 8800 Series supports Key:Directores starting with Firmware Release 11.0

New Information July 2015

Added information for the Cisco IP Phone 8845 and 8865 in the following sections:

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- Cisco Unified IP Phone 8900 and 9900 Series XML Object Support

- CiscoIPPhoneImageFile, on page 29

- Supported IP Phones and Codecs, on page 34

- Dynamic Application Status Window Size, on page 38

- Supported Phone Models, on page 51

- Supported URIs by Phone Model, on page 57

- Key, on page 61

- Content Expiration Header Setting, on page 95

- Supported IP Phones and Codecs, on page 119

New Information May 2015

Added information for the Cisco IP Phone 7811 and Cisco IP Phone 8851NR in the following sections:

- Cisco IP Phone 7800 Series XML Object Support, on page 17

- Cisco Unified IP Phone 8900 and 9900 Series XML Object Support

- CiscoIPPhoneImageFile, on page 29

- Supported IP Phones and Codecs, on page 34

- Dynamic Application Status Window Size, on page 38

- Supported Phone Models, on page 51

- Supported URIs by Phone Model, on page 57

- Key, on page 61

- Dial URI Format, on page 83

- Content Expiration Header Setting, on page 95

- Updated XML Parser and Schema Enforcement

- Supported IP Phones and Codecs, on page 119

New Information September 2014

Added information for the Cisco IP Phone 8811 in the following sections:

- Cisco Unified IP Phone 8900 and 9900 Series XML Object Support

- CiscoIPPhoneImageFile, on page 29

- Supported IP Phones and Codecs, on page 34

- Dynamic Application Status Window Size, on page 38

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- Supported Phone Models, on page 51

- Supported URIs by Phone Model, on page 57

- Key, on page 61

- Content Expiration Header Setting, on page 95

- Supported IP Phones and Codecs, on page 119

Updated the following sections to correct the Cisco Unified IP Phone 8941 and 8945 support:

- Cisco Unified IP Phone 8900 and 9900 Series XML Object Support

- Supported URIs by Phone Model, on page 57

New Information for Cisco Unified Communications Manager 10.5 (July 2014)

Added information on Cisco IP Phones 8841, 8851, and 8861 in the following sections:

- XML Object Support

- Cisco Unified IP Phone 8900 and 9900 Series XML Object Support

- CiscoIPPhoneImageFile, on page 29

- Dynamic Application Status Window Size, on page 38

- Supported IP Phones and Codecs, on page 34

- Supported Phone Models, on page 51

- Supported URIs by Phone Model, on page 57

- Key, on page 61

- Supported IP Phones and Codecs, on page 119

Added the following new section:

- Restrictions and Limitations, on page 2

Updated the following sections to address other deficiencies:

- Key, on page 61

- Unsupported Key UIRs and Alternate Options

- Content Expiration Header Setting, on page 95

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New Information for Cisco Unified Communications Manager 10.0

Added information on Cisco IP Phones 7821, 7841, and 7861 in the following sections:

- XML Object Support, on page 17
- CiscoIPPhoneImageFile, on page 29
- Supported Phone Models, on page 51
- Key, on page 61
- Supported IP Phones and Codecs, on page 34

New Information for Cisco Unified Communications Manager 9.1(1)

- Added information on Cisco Unified IP Phones 8941 and 8945 in the following sections:
  - Object Behavior, on page 17
  - CiscoIPPhoneImageFile, on page 29
  - Supported IP Phones and Codecs, on page 34
  - Dynamic Application Status Window Size, on page 38
  - Supported Phone Models, on page 51
  - Supported URIs by Phone Model, on page 57
  - Key, on page 61

- Added information about the "s" parameter for the RTPRx and the RTPMRx URIs.
  - RTPRx , on page 78
  - RTPMRx , on page 79

New Information for Cisco Unified Communications Manager 8.5(1)

- Added information on WindowMode attribute in the following sections:
  - CiscoIPPhoneImage, on page 27
  - CiscoIPPhoneImageFile, on page 29

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- CiscoIPPhoneGraphicMenu

- CiscoIPPhoneGraphicFileMenu

- Added information on the new Cisco Unified IP Phone 6945.

New Information for Cisco Unified Communications Manager 8.0(1)

- Added information on support for CiscoIPPhoneStatus and CiscoIPPhoneStatusFile XML objects in Object Behavior, on page 17 on Cisco Unified IP Phones 8961, 9951, and 9971.

- Added information on the new Device.

- Added information on Cisco Unified IP Phone 7937 in the following sections:
  - Object Behavior, on page 17
  - Application Event Handlers, on page 46
  - Component APIs, on page 51
  - Supported URIs by Phone Model, on page 57

- Added information on Enhanced Icon Menu Support Feature, on page 34.

- Added information on Device Capability Query via CTI Feature, on page 119

- Added information on Cisco Wireless IP Phone 7925G-EX and 7926G in the following sections:
  - Object Behavior, on page 17
  - CiscoIPPhoneImageFile, on page 29
  - Enhanced Icon Menu Support Feature, on page 34
  - Application Event Handlers, on page 46
  - Component APIs, on page 51
  - Supported URIs by Phone Model, on page 57
  - Device Control URIs, on page 61
  - Vibrate
  - Updated XML and Schema Enforcement

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CiscoIPPhone XML Objects

Object Behavior

You can create interactive service applications when you understand the XML objects that are defined for Cisco IP Phones and the behavior that each object generates.

When a phone loads an XML page, the phone does not have any concept of a service state. IP phones can use HTTP to load a page of content in many different places, starting when the user presses the Services button. Regardless of what causes the phone to load a page, the phone always behaves appropriately after it loads a page.

Appropriate behavior depends solely on the type of data that has been delivered in the page. The web server must deliver the XML pages with a MIME type of text/xml. However, the exact mechanism required varies according to the type of web server that you use and the server-side mechanism that you use to create your pages (for example, if you use static files, JavaScript, or CGI).

Related Topics

XML Object Support

The following sections describe the supported XML objects by phone model families. Before creating a service for a particular phone model, check to make sure that the XML object you want to use is supported.

Cisco IP Phone 7800 Series XML Object Support

This section applies to the phones when controlled by Cisco Unified Communications Manager. For information on the phones when controlled by third-party call control systems, see Multiplatform Phone Support for XML Applications and Services, on page 21.

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The following table shows the supported XML objects for the Cisco IP Phone 7800 Series and the Cisco IP Conference Phone 7832.

Table 2: XML Objects Supported by Cisco Unified IP Phone Services SDK for Cisco IP Phone 7800 Series and Cisco IP Conference Phone 7832

XML object	7811, 7821, 7841, and 7861	7832
CiscoIPPhoneMenu	Supported	Supported
CiscoIPPhoneText	Supported	Supported
CiscoIPPhoneInput	Supported	Supported
CiscoIPPhoneDirectory	Supported	Supported
CiscoIPPhoneImage	Not supported	Not supported
CiscoIPPhoneImageFile	Not supported	Not supported
CiscoIPPhoneGraphicMenu	Not supported	Not supported
CiscoIPPhoneGraphicFileMenu	Not supported	Not supported
CiscoIPPhoneIconMenu	Supported	Supported
CiscoIPPhoneIconFileMenu	Supported	Supported
CiscoIPPhoneStatus	Not supported	Not supported
CiscoIPPhoneStatusFile	Not supported	Not supported
CiscoIPPhoneExecute	Supported	Supported
CiscoIPPhoneResponse	Supported	Supported
CiscoIPPhoneError	Supported	Supported

Cisco IP Phone 8800 Series XML Object Support

This section applies to the phones when controlled by Cisco Unified Communications Manager. For information on the phones when controlled by third-party call control systems, see Multiplatform Phone Support for XML Applications and Services, on page 21.

The following table shows the supported XML objects for the Cisco IP Phone 8800 Series and Cisco IP Conference Phones 8830 Series.

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Table 3: XML Objects Supported by Cisco Unified IP Phone Services SDK for Cisco IP Phone 8800 Series and Cisco IP Conference Phone 8830 Series

XML object	8821	8831	8832	8811, 8841, 8845, 8851, 8851NR, 8861, 8865, 8865NR (see note 1)	8875, 8875NR
CiscoIPPhoneMenu	Supported	Supported	Supported	Supported	Supported
CiscoIPPhoneText	Supported	Supported	Supported	Supported	Supported
CiscoIPPhoneInput	Supported	Supported	Supported	Supported	Supported
CiscoIPPhoneDirectory	Supported	Supported	Supported	Supported	Supported
CiscoIPPhoneImage	Supported	Not supported	Supported	Supported	Supported
CiscoIPPhoneImageFile	Supported	Not supported	Supported	Supported	Supported
CiscoIPPhoneGraphicMenu	Supported	Not supported	Supported	Supported	Not supported
CiscoIPPhoneGraphicFileMenu	Not supported	Not supported	Supported	Supported	Not supported
CiscoIPPhoneIconMenu	Supported	Supported	Supported	Supported	Supported
CiscoIPPhoneIconFileMenu	Supported	Not supported	Supported	Supported	Supported
CiscoIPPhoneStatus	Not supported	Not supported	Supported	Supported	Not supported
CiscoIPPhoneStatusFile	Not supported	Not supported	Supported	Supported	Not supported
CiscoIPPhoneExecute	Supported	Supported	Supported	Supported	Supported
CiscoIPPhoneResponse	Supported	Supported	Supported	Supported	Supported
CiscoIPPhoneError	Supported	Supported	Supported	Supported	Supported

Note Check the required phone hardware and firmware versions before you configure XSI services for your phones:

- Cisco IP Phone 8811 requires Firmware Release 10.2(2) or later.

- Cisco IP Phone 8851NR requires Firmware Release 10.3(1) or later.

- Cisco IP Phone 8845 and 8865 require Firmware Release 10.3(2) or later.

- Cisco IP Phone 8865NR requires Firmware Release 11.5(1) or later.

- Cisco IP Phone 8811, 8845, 8851, and 8851NR (hardware version 08 or later) require Firmware Release 11.7(1) or later.

- Cisco Video Phone 8875 and 8875NR require PhoneOS 2.1 or later. More XML objects will be supported in the future releases of PhoneOS.

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Cisco Desk Phone 9800 Series XML Object Support

This section applies to the phones that are registered with Cisco Unified Communications Manager. The currently release doesn't support XML applications on phones that are registered with Cisco BroadWorks.

Table 4: XML Objects Supported by Cisco Desk Phone 9800 Series

XML object	9841	9851
CiscoIPPhoneMenu	Supported	Supported
CiscoIPPhoneText	Supported	Supported
CiscoIPPhoneInput	Supported	Supported
CiscoIPPhoneDirectory	Supported	Supported
CiscoIPPhoneImage	Supported	Supported
CiscoIPPhoneImageFile	Supported	Supported
CiscoIPPhoneGraphicMenu	Not supported	Not supported
CiscoIPPhoneGraphicFileMenu	Not supported	Not supported
CiscoIPPhoneIconMenu	Supported	Supported
CiscoIPPhoneIconFileMenu	Supported	Supported
CiscoIPPhoneStatus	Not supported	Not supported
CiscoIPPhoneStatusFile	Not supported	Not supported
CiscoIPPhoneExecute	Supported	Supported
CiscoIPPhoneResponse	Supported	Supported
CiscoIPPhoneError	Supported	Supported

Cisco Wireless Phone 800 Series XML Object Support

Cisco Wireless Phone 840 or 860 Release 1.10(0) supports a subset of the XSI API.

The following table shows the supported XML objects for the Cisco Wireless IP Phone 8821 and Cisco Wireless Phone 800 Series.

Table 5: XML Objects Supported by Cisco Unified IP Phone Services SDK for Cisco IP Phone 8821 and Cisco Wireless Phone 800 Series

XML object	8821	840/860
CiscoIPPhoneMenu	Supported	Supported
CiscoIPPhoneText	Supported	Supported
CiscoIPPhoneInput	Supported	Not Supported

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XML object	8821	840/860
CiscoIPPhoneDirectory	Supported	Not Supported
CiscoIPPhoneImage	Supported	Not supported
CiscoIPPhoneImageFile	Supported	Supported
CiscoIPPhoneGraphicMenu	Supported	Not supported
CiscoIPPhoneGraphicFileMenu	Not supported	Not supported
CiscoIPPhoneIconMenu	Supported	Not Supported
CiscoIPPhoneIconFileMenu	Supported	Not supported
CiscoIPPhoneStatus	Not supported	Not supported
CiscoIPPhoneStatusFile	Not supported	Not supported
CiscoIPPhoneExecute	Supported	Supported
CiscoIPPhoneResponse	Supported	Supported
CiscoIPPhoneError	Supported	Supported

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Note   Cisco Wireless Phone 840 or 860 support these objects only when they are in a file downloaded by retrieving a URI that is supplied as a CiscoIPPhoneExecuteItem in a CiscoIPPhoneExecute object.

Multiplatform Phone Support for XML Applications and Services

The Cisco Small and Medium Business portfolio support Multiplatform phones. These phones are connected to a third-party call control system and support a subset of the CiscoIPPhone XML Objects. The following table shows the supported XML objects.

Table 6: XML Objects Supported by Multiplatform Phones

XML object	Multiplatform6800 Series	Multiplatform 7800 Series	Multiplatform 7832	Multiplatform 8800 Series (Except 8875)
CiscoIPPhoneMenu	Supported	Supported	Supported	Supported
CiscoIPPhoneText	Supported	Supported	Supported	Supported
CiscoIPPhoneInput	Supported	Supported	Supported	Supported
CiscoIPPhoneDirectory	Supported	Supported	Supported	Supported
CiscoIPPhoneImage	Supported	Supported	Supported	Supported

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XML object	Multiplatform6800 Series	Multiplatform 7800 Series	Multiplatform 7832	Multiplatform 8800 Series (Except 8875)
CiscoIPPhoneImageFile	Not supported	Not supported	Not supported	Supported
CiscoIPPhoneGraphicMenu	Not supported	Not supported	Not supported	Not supported
CiscoIPPhoneGraphicFileMenu	Not supported	Not supported	Not supported	Not supported
CiscoIPPhoneIconMenu	Supported	Supported	Supported	Supported
CiscoIPPhoneIconFileMenu	Supported	Supported	Supported	Supported
CiscoIPPhoneStatus	Supported (Except 6841, 6821)	Supported (Except 7811, 7832)	Supported	Supported (Except 8832)
CiscoIPPhoneStatusFile	Supported (Except 6841, 6821)	Supported (Except 7811, 7832)	Supported	Supported (Except 8832)
CiscoIPPhoneExecute	Supported	Supported	Supported	Supported
CiscoIPPhoneResponse	Not supported	Not supported	Not supported	Not supported
CiscoIPPhoneError	Not supported	Not supported	Not supported	Not supported

XML Object Definitions

The following sections provide definitions and descriptions of each CiscoIPPhone XML object.

CiscoIPPhoneMenu

A menu on the phone contains a list of text items, one per line. Users choose individual menu items using the same mechanisms that are used for built-in menus in the phone.

When a menu loads, the phone behaves the same as for built-in phone menus. The user navigates through the list of menu items and eventually chooses one using either the Select softkey or the DTMF keys.

After the user chooses a menu option, the phone generates an HTTP request for the page with the URL or executes the uniform resource identifiers (URIs) that are associated with the menu item.

Related Topics

CiscoIPPhoneMenu Definition

```
<CiscoIPPhoneMenu>
<Title>Title text goes here</Title>
<Prompt>Prompt text goes here</Prompt>
<MenuItem>
<Name>The name of each menu item</Name>
```

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```
<URL>The URL associated with the menu item</URL>
</MenuItem>
</CiscoIPPhoneMenu>
```

Note The *Name* field under the *<MenuItem>* supports a maximum of 64 characters. This field can also accept two carriage returns to allow the MenuItem name to span three lines on the display.

The XML format allows you to specify a *Title* and *Prompt* that are used for the entire menu, followed by a sequence of *<MenuItem>* objects. IP phones allow a maximum of 100 MenuItems. Each *<MenuItem>* includes a *Name* and an associated *URL*.

CiscoIPPhoneText

The *CiscoIPPhoneText* XML object displays ordinary 8-bit ASCII text on the phone display. The *<Text>* message must not contain any control characters, except for carriage returns, line feeds, and tabs. The IP phone firmware controls all other pagination and word wrap issues.

Figure 3: Example of text message display on Cisco Video Phone 8875
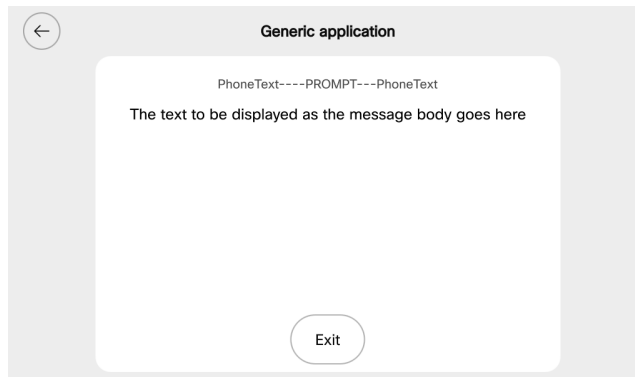
CiscoIPPhoneText Definition

```
<CiscoIPPhoneText>
<Title>Title text goes here</Title>
<Prompt>The prompt text goes here</Prompt>
<Text>The text to be displayed as the message body goes here</Text>
</CiscoIPPhoneText>
```

Two optional fields can appear in the XML message:

- The first optional field, *Title*, defines text that displays at the top of the display page. If a *Title* is not specified, the *Name* field of the last chosen *MenuItem* displays in the *Title* field.

- The second optional field, *Prompt*, defines text that displays at the bottom of the display page. If a *Prompt* is not specified, Cisco Unified Communications Manager clears the prompt area of the display pane.

Many XML objects that are described in this document also have *Title* and *Prompt* fields. These fields normally behave identically to behavior described in this section.

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CiscoIPPhoneInput

When an IP phone receives an XML object of type *CiscoIPPhoneInput*, it constructs an input form and displays it. The user enters data into each input item and sends the parameters to the target URL. The following figure shows a sample display that is receiving input from a user.

Figure 4: Example of CiscoIPPhoneInput Object Display on Cisco Video Phone 8875
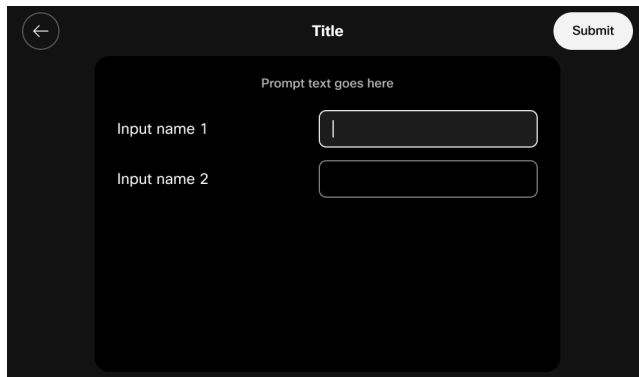
Many XML objects that are described in this document also have *Title* and *Prompt* fields. These fields normally behave identically to behavior described in this section.

Note	**Non-XML Text**: This document only describes the supported CiscoIPPhone XML objects. You can also deliver plain text using HTTP. Pages that are delivered as MIME type text/html behave exactly the same as XML pages of type *CiscoIPPhoneText*. One important difference is that you cannot include a title or prompt.

Note	**Keypad navigation**: IP phones allow navigation to a specific line in a menu by pressing numeric DTMF keys. When a menu is on the display, the number for selecting the menu is on the left.

When normal text displays, the numbers do not display on the left side of the screen, but the navigation capability still exists. A carefully written text service display can take advantage of this capability.

During text entry, the phones display softkeys to assist users with text entry. Users can navigate between fields with the vertical scroll button that is used to navigate menus.

CiscoIPPhoneInput Definition

```
<CiscoIPPhoneInput>
<Title>Directory title goes here</Title>
<Prompt>Prompt text goes here</Prompt>
<URL method="post">The target URL for the completed input goes here</URL>
<InputItem>
<DisplayName>Name of the input field to display</DisplayName>
<QueryStringParam>The parameter to be added to the target URL</QueryStringParam>
<DefaultValue>The default display name</DefaultValue>
<InputFlags>The flag specifying the type of allowable input</InputFlags>
</InputItem>
</CiscoIPPhoneInput>
```

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The *Title* and *Prompt* tags in the object define text that are used in the same way as the identical fields in the other CiscoIPPhone XML objects.

The *URL* tag defines the URL to which the input results are sent. The actual HTTP request sent to this server specifies the URL with a list of parameters that are appended to it as a query string. The parameters include Name/Value pairs, one for each input item.

Note   The Cisco IP Phone 7800 and 8800 Series, Cisco IP Conference Phone 7832, and Cisco IP Conference Phone 8832 are the only phones that support the HTTP POST method.

The *InputItem* tag defines each item in the list. The number of *InputItems* must not exceed five. Each input item includes a *DisplayName*, which is the prompt that is written to the display for that particular item. Each item also has a *QueryStringParam*, which is the name of the parameter that is appended to the URL when it is sent out after input is complete. Each input item can also use the *DefaultValue* tag to set the default value to be displayed.

The final attribute for each input item comprises a set of *InputFlags*. The following table describes the input types that are currently defined.

Table 7: InputFlag Definitions

InputFlag	Description	Notes
A	Plain ASCII text	Use the DTMF keypad to enter text that consists of uppercase and lowercase letters, numbers, and special characters.
T	Telephone number	Enter only DTMF digits for this field. The acceptable input includes numbers, #, and *.
N	Numeric	Enter numbers as the only acceptable input.
E	Equation	Enter numbers and special math symbols. **Note** Not supported on the phones with Multiplatform Firmware.
U	Uppercase	Enter uppercase letters as the only acceptable input.
L	Lowercase	Enter lowercase letters as the only acceptable input.

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InputFlag	Description	Notes
P	Password field	Enter individual characters using the standard keypad-repeat entry mode. The system automatically converts accepted characters into an asterisk, keeping the entered value private.
		Note P specifies the only *InputFlag* that works as a modifier. For example, specify a value of "AP" in the *InputFlag* field to use plain ASCII as the input type and to mask the input as a password by using an asterisk (*).

CiscoIPPhoneDirectory

The *CiscoIPPhoneDirectory* XML object supports the Directory operation of IP phones. The following figure shows how an XML *CiscoIPPhoneDirectory* object displays on the phone.

Figure 5: Example of CiscoIPPhoneDirectory Object Display on Cisco Video Phone 8875
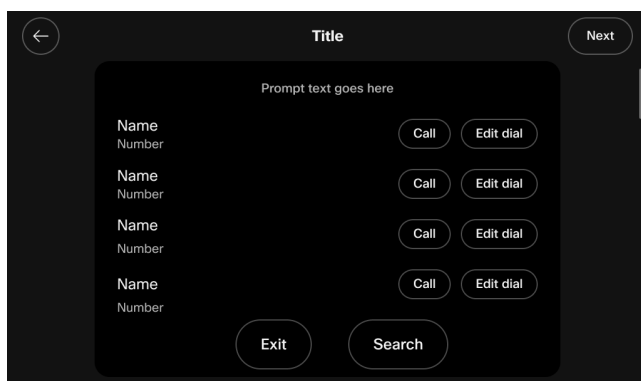
CiscoIPPhoneDirectory Definition

```
<CiscoIPPhoneDirectory>
<Title>Directory title goes here</Title>
<Prompt>Prompt text goes here</Prompt>
<DirectoryEntry>
<Name>The name of the directory entry</Name>
<Telephone>The telephone number for the entry</Telephone>
</DirectoryEntry>
</CiscoIPPhoneDirectory>
```

Note For the directory listing, the IP phone displays the appropriate softkeys that are needed to dial the numbers that are listed on the display. The softkeys include the Edit Dial softkey, which allows users to insert access codes or other necessary items before dialing.

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The *Title* and *Prompt* tags in the XML object have the usual semantics. A single *CiscoIPPhoneDirectory* object can contain a maximum of 32 *DirectoryEntry* objects. If more than 32 entries must be returned, use multiple *CiscoIPPhoneDirectory* objects in subsequent HTTP requests.

Custom Directories

You can use the Cisco Unified Communications Manager enterprise URL Directories parameter and CiscoIPPhone XML objects to display custom directories. The URL Directories parameter points to a URL that returns a *CiscoIPPhoneMenu* object to extend the directories menu. The request for URL Directories must return a valid *CiscoIPPhoneMenu* object, even if the object has no *DirectoryEntry* objects.

To create a custom directory, use the following optional objects in the order in which they are listed:

1. Use the *CiscoIPPhoneInput* XML object to collect search criteria.

2. Use the *CiscoIPPhoneText* XML object to display status messages or errors.

3. Use the *CiscoIPPhoneDirectory* XML object to return a list of directory entries that can be dialed.

You can omit the *CiscoIPPhoneInput* or *CiscoIPPhoneText* objects. You can display multiple *CiscoIPPhoneDirectory* objects by specifying an HTTP refresh header that points to the URL of the next individual directory object, which the user accesses by pressing the Next softkey on the phone.

CiscoIPPhoneImage

The *CiscoIPPhoneImage* provides a bitmap display with a 133 x 65 pixel pane (irrespective of the window mode being normal width or wide width), that is available to access services. Each pixel includes four grayscale settings. A value of three (3) displays as black, and a value of zero (0) displays as white.

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Note The phone uses an LCD display, which inverts the palette.

The *CiscoIPPhoneImage* XML type lets you use the IP phone display to present graphics to the user.

Figure 6: Example of CiscoIPPhoneImage Object Display on Cisco Video Phone 8875
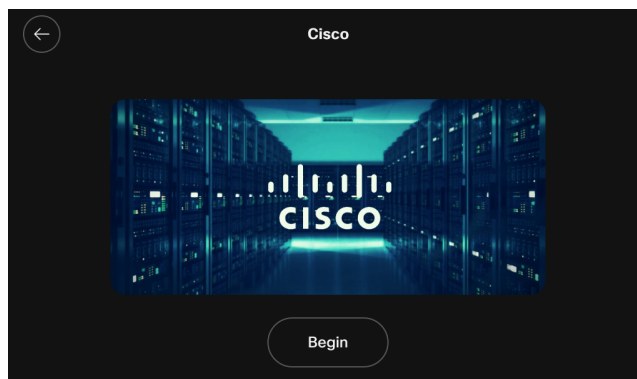
CiscoIPPhoneImage Definition

```
<CiscoIPPhoneImage>
<Title>Image title goes here</Title>
```

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```
<Prompt>Prompt text goes here</Prompt>
<LocationX>Position information of graphic</LocationX>
<LocationY>Position information of graphic</LocationY>
<Width>Size information for the graphic</Width>
<Height>Size information for the graphic</Height>
<Depth>Number of bits per pixel</Depth>
<Data>Packed Pixel Data</Data>
<SoftKeyItem>
<Name>Name of the soft key</Name>
<URL>URL of soft key</URL>
<Position>Numerical position of the soft key</Position>
</SoftKeyItem>
</CiscoIPPhoneImage>
```

The *Title* and *Prompt* elements serve the same purpose as they do in the other CiscoIPPhone XML objects. The *Title* displays at the top of the page, and the *Prompt* displays at the bottom.

Use *LocationX* and *LocationY* to position the graphic on the phone display. Position the upper, left corner of the graphic at the pixel defined by these two parameters. Setting the X and Y location values to (0, 0) positions the graphic at the upper, left corner of the display. Setting the X and Y location values to (-1, -1) centers the graphic in the services pane of the phone display.

When you use CiscoIPPhoneImage with the Cisco Wireless IP Phone 8821, the phone ignores LocationX and LocationY. The image will always be placed in the center.

Use *Width* and *Height* to size the graphic. If the values do not match with the pixel stream specified in the *Data* field, results will be unpredictable or incorrect.

Depth specifies the number of bits per pixel. IP phones support a maximum value of 2 bits per pixel. A bit depth of 1 is black and white.

The *Data* tag delimits a string of hexadecimal digits that contain the packed value of the pixels in the display. In the IP phone, each pixel has only four possible values, which means that you can pack four pixels into a single byte. A pair of hexadecimal digits represents each byte.

The following figure provides an example of the mechanics of pixel packing. Scanning from left to right in the display, the illustration shows the process for packing consecutive pixel values of 1, 3, 2, and 0. First, the pixels get converted to 2-bit binary numbers. Then, the binary pairs get reordered in sets of four to create a single reordered byte, which the two hexadecimal digits represent.

Figure 7: Packed Pixel Translation Example
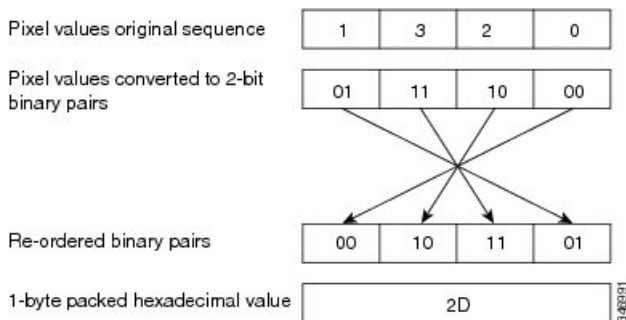
CiscoIPPhoneImage Example

The following XML code defines a *CiscoIPPhoneImage* object that displays the sequence of pixels shown in the above figure as a graphic positioned at the center of the phone display.

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```
<CiscoIPPhoneImage>
  <Title/>
   <LocationX>-1</LocationX>
   <LocationY>-1</LocationY>
   <Width>4</Width>
   <Height>1</Height>
   <Depth>2</Depth>
   <Data>2D</Data>
   <Prompt/>
</CiscoIPPhoneImage>
```

The graphic display comprises a contiguous stream of hexadecimal digits, with no spaces or other separators. If the number of pixels to be displayed does not represent an even multiple of four, pad the end of the pixel data with blank (zero value) pixels, so the data is packed correctly. The phone ignores the padded data.

Note Before displaying a graphic image on an IP phone, the software clears the pane dedicated to services. If a service has text or other information that must be preserved (including the title area), the information must get redrawn as part of the graphic. If the title is to be hidden, the graphic must be large enough to cover it.

CiscoIPPhoneImageFile

To support these more advanced displays, the XML object allows the use of color PNG images in addition to the grayscale *CiscoIPPhoneImage* objects. The *CiscoIPPhoneImageFile* object behaves like the *CiscoIPPhoneImage* object, except for the image data. Instead of using the `<Data>` tag to embed the image data, the `<URL>` tag points to the PNG image file.

The web server must deliver the PNG image to the phone with an appropriate MIME Content-Type header, such as image/png, so that the phone recognizes the content as a compressed, binary PNG image. The PNG image can be either palettized or RGB, and the maximum image size and color depth are model dependent (see the following table).

In the following table, the specifications are the same for On-Premise and Multiplatform phone firmware.

Model	Resolution (see note 1) (width x height)	Resolution in wide mode (width x height)	Color, Grayscale, Monochrome	Color depth (bits)
Cisco IP Phone 6800 Series	N/A	N/A	Grayscale	—
Cisco IP Phones 7811, 7821, 7841, 7861 (see Note 3)	N/A	N/A	Monochrome	—
Cisco IP Conference Phone 7832 (see Note 3)	N/A	N/A	Grayscale	—
Cisco IP Phone 8811	559 x 265	N/A	Monochrome	0-10

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Model	Resolution (see note 1) (width x height)	Resolution in wide mode (width x height)	Color, Grayscale, Monochrome	Color depth (bits)
Cisco Unified IP Conference Station 8831	396 x 162	N/A	Monochrome	—
Cisco IP Conference Phone 8832	480x128	N/A	Color	24
Cisco IP Phone 8841, 8845, 8851, 8851NR, 8861, 8865, and 8865NR	559 x 265	N/A	Color	24
Cisco Video Phone 8875, 8875NR	696x312	696x 456	Color	24
Cisco Wireless IP Phone 8821	240 x 215	N/A	Color	24
Cisco Desk Phone 9841 (On-Premise Only)	320 x 108	320 x 144	Grayscale	—
Cisco Desk Phone 9851 (On-Premise Only)	600 x 280	600 x 328	Color	24

Note

1. Resolution represents the size of the display that is accessible by Services; not the full resolution of the physical display.

2. The Cisco IP Phone 7800 Series and Cisco IP Conference Phone 7832 do not support CiscoIPPhoneImageFile.

If the number of colors in the image is not reduced to match the phone capabilities, the image will be dithered by the phone and yield less than desirable results in most cases. To reduce the number of colors in a graphics editing program, such as Adobe Photoshop, use the *Posterize* command. The Posterize command takes one value as input for the number of color tones per color channel.

The following figure shows a CiscoIPPhoneImageFile object on phone display.

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Figure 8: Example of CiscoIPPhoneImageFile Object Display on Cisco Video Phone 8875

> **Note** For Cisco Wireless phone 840/860, <LocationX> and <LocationY> attributes are ignored. The image is centered on the display.

CiscoIPPhoneImageFile Definition

```
<CiscoIPPhoneImageFile>
  <Title>Image Title goes here</Title>
  <Prompt>Prompt text goes here</Prompt>
  <LocationX>Horizontal position of graphic</LocationX>
  <LocationY>Vertical position of graphic</LocationY>
  <URL>Points to the PNG image</URL>
</CiscoIPPhoneImageFile>
```

CiscoIPPhoneIconMenu

Icon menus serve the same purpose as text menus: they allow a user to select a URL from a list. Use icon menus in situations when you want to provide additional visual information to the user to show the state or category of an item. For example, you include a read and unread icon in a mail viewer. You can use the icons can to convey the message state.

Icons in the *CiscoIPPhoneIconMenu* object have a maximum width of 16 pixels and a maximum height of 10 pixels.

The following figure shows an IconMenu on an IP phone.

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Figure 9: Example of CiscoIPPhoneIconMenu on Cisco Video Phone 8875
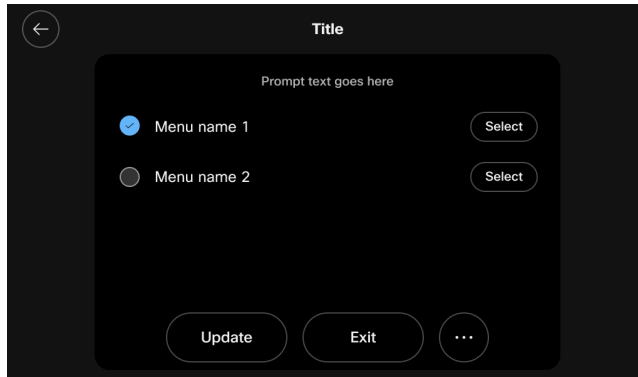
The system presents the information as a bitmap graphic to the left of the menu item text. The user selects menu items in the same way as a *CiscoIPPhoneMenu* object.

Related Topics

CiscoIPPhoneIconMenu Definition

```
<CiscoIPPhoneIconMenu>
  <Title>Title text goes here</Title>
  <Prompt>Prompt text goes here</Prompt>
  <MenuItem>
    <IconIndex>Indicates what IconItem to display</IconIndex>
    <Name>The name of each menu item</Name>
    <URL>The URL associated with the menu item</URL>
  </MenuItem>
  <SoftKeyItem>
    <Name>Name of softkey</Name>
    <URL>URL or URI of softkey</URL>
    <Position>Position information of the softkey</Position>
  </SoftKeyItem>
  <IconItem>
    <Index>A unique index from 0 to 9</Index>
    <Height>Size information for the icon</Height>
    <Width>Size information for the icon</Width>
    <Depth>Number of bits per pixel</Depth>
    <Data>Packed Pixel Data</Data>
  </IconItem>
</CiscoIPPhoneIconMenu>
```

The XML tags in *CiscoIPPhoneIconMenu* use the tag definitions for *CiscoIPPhoneImage* and *CiscoIPPhoneMenu*. Although the semantics of the tags are identical, you can have only 32 *MenuItem* objects in a *CiscoIPPhoneIconMenu* object.

Related Topics

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CiscoIPPhoneIconFileMenu

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>
> **Note** The *CiscoIPPhoneIconFileMenu* object is updated to support new attributes. For details, see Enhanced Icon Menu Support Feature, on page 34.

This icon menu is similar to *CiscoIPPhoneMenu*, but it uses color PNG icons rather than grayscale CIP icons. Use icon menus in situations when you want to provide additional visual information to the user to show the state or category of an item. For example, you can use icons to indicate priority (see the following figure).

Icons in the *CiscoIPPhoneIconFileMenu* object have a maximum width of 18 pixels and a maximum height of 18 pixels. Instead of using the *<Data>* tag to embed the image data into the *<IconItem>* tag, this object uses a *<URL>* tag to point to the PNG image file to be used for that icon.

Figure 10: Example of CiscoIPPhoneIconFileMenu Object Display on Cisco Video Phone 8875
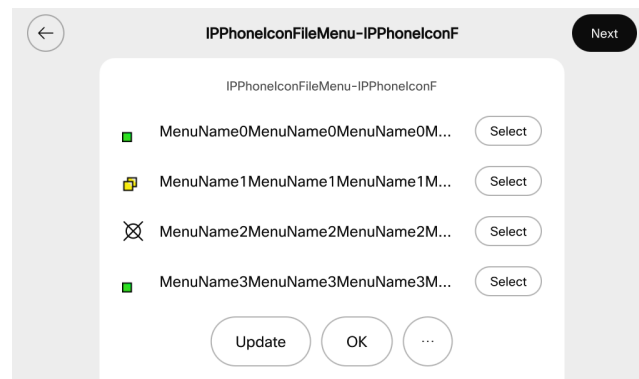
CiscoIPPhoneIconFileMenu Definition

```
<CiscoIPPhoneIconFileMenu>
  <Title>Title text goes here</Title>
  <Prompt>Prompt text goes here</Prompt>
  <MenuItem>
    <IconIndex>Indicates what IconItem to display</IconIndex>
    <Name>The name of each menu item</Name>
    <URL>The URL associated with the menu item</URL>
  </MenuItem>
  <IconItem>
    <Index>A unique index from 0 to 9</Index>
    <URL>location of the PNG icon image</URL>
  </IconItem>
</CiscoIPPhoneIconFileMenu>
```

> ✎
>
> **Note** The Cisco Unified IP Phone 6900 Series do not display the *Title* and *Prompt* menu fields at the same time. If both *Title* and *Prompt* fields are defined at the same time, then these phones display only the *Prompt* field.

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Enhanced Icon Menu Support Feature

The Enhanced Icon Menu Support feature extends the existing *CiscoIPPhoneIconFileMenu* XML object by allowing:

- An icon in its *<Title>* element.

- Internal phone firmware icons, like security state or call state icons, in its *<MenuItems>* and *<Title>* elements.

Supported IP Phones and Codecs

The following table lists the IP phone models that support the Enhanced Icon Menu Support feature.

Phone model	Support	Firmware supported
Cisco Unified IP Phone 9900 Series		
9971	Supported	9.0(1) and later
9951	Supported	9.0(1) and later
Cisco IP Phone 8800 Series (On-premise and Multiplatform Phones)		
8811	Not supported	—
8841	Not supported	—
8845	Not supported	—
8851	Not supported	—
8851NR	Not supported	—
8861	Not supported	—
8865	Not supported	—
8865NR	Not supported	—
Cisco Video Phone 8875 (On-premise and Multiplatform Phones)		
8875	Not supported	—
8875NR	Not supported	—
Cisco IP Conference Phones 8830 Series (On-premise and Multiplatform Phones)		
8831	Not supported	—
8832	Not supported	—
Cisco Wireless IP Phone 8820 Series		
8821	Not supported	—
Cisco IP Phone 7800 Series (On-premise and Multiplatform Phones)		

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Phone model	Support	Firmware supported
7811	Not supported	—
7821	Not supported	—
7841	Not supported	—
7861	Not supported	—
Cisco IP Conference Phone 7830 Series (On-premise and Multiplatform Phones)		
7832	Not supported	—
Cisco IP Phone 6800 Series (Multiplatform Phones)		
6841	Not supported	—
6851	Not supported	—

Note Cisco recommends the use of latest firmware. The firmware can be downloaded from the following location (requires login or service contract):

http://software.cisco.com/download/navigator.html?i=!mmd

CiscoIPPhoneIconFileMenu XML Object Changes

The following changes have been made in the CiscoIPPhoneIconFileMenu XML object for the Enhanced Icon Menu Support feature:

- The CiscoIPPhoneIconFileMenu schema is updated to allow an *IconIndex* attribute in the *<Title>* element.

- A Resource URI attribute is available for the *<URL>* element of the *<IconItem>* element. This Resource URI can be used in place of the HTTP URL.

- The Resource URI identifies the icons in the *<IconItems>*. When a phone parses the <URL> element in *<IconItem>*, the phone looks for the Resource URI.

    - If the Resource URI is present, the phone validates the URI against the valid Resource Icon values. If the validation is successful, the phone uses the icon specified by the Resource URI.

    - If the Resource URI is not present or if the URI fails the validation against a recognized Icon value, then a default unknown-icon image displays.

Related Topics

Schema Definition

The definition of the CiscoIPPhoneIconFileMenu schema remains the same except for the *<Title>* element and the *IconIndex* attribute specified as follows:

```
<xsd:complexType name="Title">
  <xsd:attribute name="IconIndex"
```

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```
 type="xsd:unsignedShort"
 use="optional"/>
</xsd:complexType>
```

CiscoIPPhoneIconFileMenu Example

The following is an example of the CiscoIPPhoneIconFileMenu object with IconIndex attribute in *<Title>* element and Resource URI attribute in *<IconItem>* element:

```
<CiscoIPPhoneIconFileMenu>
  <Title IconIndex="2">Conference List</Title>
  <IconItem>
    <Index>1</Index>
    <URL>Resource:Icon.SecureCall</URL>
  </IconItem>
  <IconItem>
    <Index>2</Index>
    <URL>Resource:Icon.Connected</URL>
  </IconItem>
  <IconItem>
    <Index>3</Index>
    <URL>Resource:AnimatedIcon.Ringin</URL>
  </IconItem>
  <MenuItem>
    <Name>Schmo, Joe</Name>
    <IconIndex>1</IconIndex>
    <URL>http://192.168.1.12:8080/details?user=jschmo</URL>
  </MenuItem>
  <MenuItem>
    <Name>Blow, Joe</Name>
    <IconIndex>2</IconIndex>
    <URL>http://192.168.1.12:8080/details?user=jblow</URL>
  </MenuItem>
  <MenuItem>
    <Name>Joining, Just Now</Name>
    <IconIndex>3</IconIndex>
    <URL>http://192.168.1.12:8080/details?user=jjoining</URL>
  </MenuItem>
</CiscoIPPhoneIconFileMenu>
```

Valid Resource Icon Names

The following are the valid Resource Icon names:

- Icon.Connected

- Icon.AuthenticatedCall

- Icon.SecureCall

- Icon.OnHook

- Icon.OffHook

- Icon.Messages

- Icon.InUse

- Icon.Headset

- Icon.Handset

- Icon.Speaker

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- Icon.Locked

- Icon.UnLocked

- Icon.Checked

- Icon.UnChecked

- Icon.RadioButtonOn

- Icon.RadioButtonOff

- AnimatedIcon.Ringin

- AnimatedIcon.Hold

- AnimatedIcon.MessageWaiting

- AnimatedIcon.StreamingRx

- AnimatedIcon.StreamingTx

- AnimatedIcon.StreamRxTx

- AnimatedIcon.Throbber

Troubleshooting CiscoIPPhoneIconFileMenu XML Objects Using Enhanced Icon Menu Support Feature

The following errors and conditions may occur in the Enhanced Icon Menu Support feature:

- If the CiscoIPPhoneIconFileMenu object is invalid, a parsing error is generated and a CiscoIPPhoneError object (with Number="1") is returned as the response.

- If the Resource URI does not specify a recognized Icon resource, then a default unknown-icon image is displayed.

Error Handling

Standard XML services debugging techniques are applied to the Enhanced Icon Menu Support feature. The root cause for any parsing errors displays in the phone console logs. For HTTP requests and responses, sniffer traces and web server debug can be used to examine the CiscoIPPhoneIconFileMenu object to ensure that the object conforms to the schema.

CiscoIPPhoneStatus

The *CiscoIPPhoneStatus* object is also a displayable object, but differs from other objects in that it displays on the Call plane of the phone rather than the Services plane. The CiscoIPPhoneStatus object hovers above the Call plane and is typically used in conjunction with CTI applications to present application status to the user.

The Status object cannot be closed or cleared by the user (for example, by pressing Services) because the Status object is only present on the Call plane. In order to clear the object, the phone must execute the Init:AppStatus URI. This would typically occur as the result of an application server pushing an Execute object to the phone that contains the Init:AppStatus URI.

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Note   The CiscoIPPhoneStatus object can only be pushed (HTTP POST) to the phone; the object cannot be pulled (HTTP GET).

The *CiscoIPPhoneStatus* object can be refreshed or replaced at any time. It is not necessary to clear an existing Status object before sending a new Status object. The new object simply replaces the old object.

The following figure shows the CiscoIPPhoneStatus object that contains the following visual elements:

- 106 x 21 graphics area for displaying CIP images (same image format as CiscoIPPhoneImage)

- Seedable, free-running timer (optional)

- Single-line text area (optional)

Note   The Cisco Video Phone 8875, Cisco Desk Phone 9800 Series, and the Cisco IP Phone 8821 do not support CiscoIPPhoneStatus.

CiscoIPPhoneStatus Definition

```
<CiscoIPPhoneStatus>
  <Text>This is the text area</Text>
  <Timer>Timer seed value in seconds</Timer>
  <LocationX>Horizontal alignment</LocationX>
  <LocationY>Vertical alignment</LocationY>
  <Width>Pixel width of graphic</Width>
  <Height>Pixel height of graphic</Height>
  <Depth>Color depth in bits</Depth>
  <Data>Hex binary image data</Data>
</CiscoIPPhoneStatus>
```

Dynamic Application Status Window Size

You can enable applications to dynamically adjust their window sizes based on the displayed content. The minimum size requirements limit the windows size so that it is large enough to stand out from the Overview content. For example, using a smaller window for an application allows more content from the Overview to be displayed. Sizing the window occurs when the phone receives a CiscoIPPhoneStatus or CiscoIPPhoneStatusFile object with its associated PNG file.

The following phones do not support the Application Status window:

- Cisco IP Phone 6800 Series (Multiplatform Phones)

- Cisco IP Phone 7800 Series (On-premise and Multiplatform Phones)

- Cisco IP Conference Phone 7832 (On-premise and Multiplatform Phones)

- Cisco Wireless IP Phone 8821 and 8821-EX

- Cisco Unified IP Conference Phone 8831 (On-premise and Multiplatform Phones)

- Cisco Video Phone 8875 (On-premise and Multiplatform Phones)

- Cisco Desk Phone 9800 Series (On-premise and Multiplatform Phones)

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The Application Status window contains three main areas (see the following figure):

- Text Area

- Timer Area

- Image Area

Figure 11: Application Status Window Elements
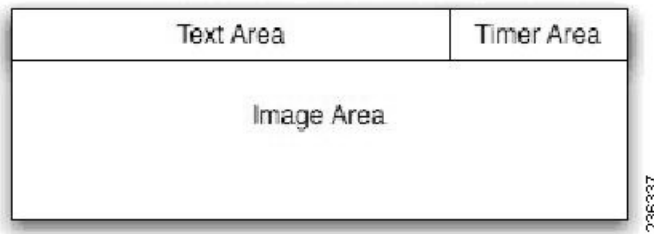
Note Self terminating XML elements, undeclared or missing elements, and elements with the default values are all considered unconfigured elements.

To allow dynamic sizing, do not configure the Text and Timer areas with any value other than the default used by the XML parser. If both elements are not configured, you can proceed, but must follow these rules:

- Do not display the Text Area and Timer Area sections of the Application Status window.

- If the LocationX element is not configured or is set to centered, and the image provided is less than the maximum width allowed, the Image Area can be resized.

- If the image provided is smaller than the minimum width, the minimum allowed window width should be used.

- If the width of the image provided is between the minimum and maximum sizes of the window, the window should be sized to display the image as well as the standard surrounding borders.

- The image height should never change.

See the following table for an overview of the maximum and minimum image area sizes by phone model. Most phone models support all sizes between the minimum and maximum.

Table 8: Application Status Window Allowable Image Sizes

Phone models	Maximum image area width	Minimum image area width	Maximum image area height
8811, 8841, 8845, 8851, 8851NR, 8861, 8865, 8865NR	414	70	70

The following table shows an overview of the text and timer area sizes by phone model.

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Table 9: Application Status Window Allowable Text and Timer Sizes

Phone models	Text area size (WxH)	Timer area size (WxH)	Text area size No timer (WxH)
8811, 8841, 8845, 8851, 8851NR, 8861, 8865, 8865NR	300x36	100x36	414x36

CiscoIPPhoneStatusFile

The behavior of this object is identical to the *CiscoIPPhoneStatus* object, except it uses a color PNG image instead of a grayscale CIP image for the graphics area.

The Cisco Video Phone 8875, Cisco Desk Phone 9800 Series, and the Cisco IP Phone 8821 do not support CiscoIPPhoneStatusFile.

Related Topics

CiscoIPPhoneStatus, on page 37

CiscoIPPhoneStatusFile Definition

```
<CiscoIPPhoneStatusFile>
<Text>This is the text area</Text>
<Timer>Timer seed value in seconds</Timer>
<LocationX>Horizontal alignment</LocationX>
<LocationY>Vertical alignment</LocationY>
<URL>location of the PNG image</URL>
</CiscoIPPhoneStatusFile>
```

Note that instead of using the *<Data>* tag to embed the image data, this object uses a *<URL>* tag to point to the PNG image file to be used for the graphics area.

Related Topics

Dynamic Application Status Window Size, on page 38

CiscoIPPhoneExecute

The *CiscoIPPhoneExecute* object differs from the other CiscoIPPhone objects. It is not a displayable object for providing user interaction. The purpose of this object is to deliver (potentially multiple) execution requests to the phone.

Like the other XML objects, the CiscoIPPhoneExecute can be either pushed (HTTP POST) or pulled (HTTP GET). Upon receiving a CiscoIPPhoneExecute object, the phone begins executing the specified ExecuteItems. Order of execution is not guaranteed, so ExecuteItems will likely not execute in the order in which they are listed in the CiscoIPPhoneExecute object.

Note   Limit the requests to three ExecuteItems: only one can be a URL and two URIs per *CiscoIPPhoneExecute* object, or you can send three URIs with no URL.

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Note	For Cisco Wireless Phone 840/860
	If the phone is locked, the notification is displayed. If the phone is unlocked or has not been unlocked after a reboot, the phone display a notification that does not interrupt the user when they receive a request. The user can choose when to run the request. In case of Unicast/Multicast RTP requests, the request runs if the phone is idle and otherwise the user will have the opportunity to play the request or ignore it.

CiscoIPPhoneExecute Definition

```
<CiscoIPPhoneExecute>
    <ExecuteItem URL="the URL or URI to be executed"/>
</CiscoIPPhoneExecute>
```

The *<ExecuteItem>* tag of the *CiscoIPPhoneExecute* object includes an optional attribute called *Priority*. The Priority attribute is used to inform the phone of the urgency of the execute request and to indicate whether the phone should be interrupted to perform the request. The Priority levels determine whether the phone must be idle to perform the requested action. The Idle Timer (along with an optional Idle URL) is defined globally in the Cisco Unified Communications Manager Administration Enterprise Parameters and can be overridden on an individual phone basis in the Cisco Unified Communications Manager Device configuration.

The following table lists the Priority levels and their behavior.

Priority	Behavior	Description
0	Execute Immediately	The URL executes regardless of the state of the phone. If the Priority attribute does not get specified in the *<ExecuteItem>*, the default priority gets set to zero for backward compatibility.
1	Execute When Idle	The URL gets delayed until the phone goes idle, then it executes.
2	Execute If Idle	The URL executes on an idle phone; otherwise, it does not get executed (it does not get delayed).

Note	The Priority attribute is only used for HTTP URLs. Internal URIs always execute immediately.

CiscoIPPhoneExecute Example

The following CiscoIPPhoneExecute object results in the phone playing an alert chime, regardless of the state of the phone, but waits until the phone goes idle before displaying the specified XML page.

```
<CiscoIPPhoneExecute>
 <ExecuteItem Priority="0" URL="Play:chime.raw"/>
 <ExecuteItem Priority="1" URL="http://server/textmessage.xml"/>
</CiscoIPPhoneExecute>
```

Create a Remote Problem Report with CiscoIPPhoneExecute

You can use the CiscoIPPhoneExecute object to generate a problem report. This report has the same content as the report generated by the Problem Report Tool (PRT).

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| Note | Only the Cisco IP Wireless Phone 8821 supports this function. |

Procedure

Step 1 Push the following XML to the phone to generate the problem report.

```
<CiscoIPPhoneExecute>
<ExecuteItem Priority="0" URL="Device:GeneratePRT"/>
</CiscoIPPhoneExecute>
```

The phone returns one of these responses:

- ```
  <CiscoIPPhoneResponse>
  <ResponseItem URL="Device:GeneratePRT" Data="Success" Status="0"/>
  </CiscoIPPhoneResponse>
  ```

  This means that the request was successful, and the Device:GeneratePRT command has been accepted.

- ```
  <CiscoIPPhoneResponse>
  <ResponseItem URL="Device:GeneratePRT" Data="There is pending PRT" Status="6"/>
  </CiscoIPPhoneResponse>
  ```

  This means that the request failed because there is pending problem report request, likely requested from the phone.

Step 2 If the phone returns a Success message, then poll the problem report creation with this XML:

```
<CiscoIPPhoneExecute>
<ExecuteItem Priority="0" URL="Device:PRTStatus"/>
</CiscoIPPhoneExecute>
```

The phone returns one of these responses:

- ```
  <CiscoIPPhoneResponse>
  <ResponseItem URL="Device:PRTStatus" Data="Generating PRT" Status="0"/>
  </CiscoIPPhoneResponse>
  ```

  This means that the problem report creation is in progress.

- ```
  <CiscoIPPhoneResponse>
  <ResponseItem URL="Device:PRTStatus" Data="There is no pending PRT invoked from XSI"
  Status="6"/>
  </CiscoIPPhoneResponse>
  ```

  This means that the phone didn't receive the problem report request.

Step 3 Continue polling until you get the message:

```
<CiscoIPPhoneResponse>
<ResponseItem URL="Device:PRTStatus" Data="Generated PRT at
https://xx.xx.xx.xx/FS/prt-yyyymmdd-hhmmss-xxxxxxxxxxxx.tar.gz"
Status="0"/>
</CiscoIPPhoneResponse>
```

Where:

- xx.xx.xx.xx is the IP address of the phone.

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- `prt-yyyymmdd-hhmmss-xxxxxxxxxxxx` of the date (yyyymdd), time (hhmmss), and MAC address (xxxxxxxxxxxx) of the phone.

Step 4   Access the URL and download the problem report.

CiscoIPPhoneResponse

The *CiscoIPPhoneResponse* objects provide messages and information resulting from a *CiscoIPPhoneExecute*. As a result, a *ResponseItem* exists for each *ExecuteItems* that you send. The order differs based on completion time, and the execution order is not guaranteed.

> **Note**   The Cisco IP Phone 6800 Series, Cisco IP Phone 7800 Series, and Cisco IP Phone 8800 Series Multiplatform Phones do not support CiscoIPPhoneResponse.

The URL attribute specifies the URL or URI that was sent with the request. The Data attribute contains any special data for the item. The Status attribute specifies a status code. Zero indicates that no error occurred during processing of the ExecuteItem. If an error occurred, the phone returns a *CiscoIPPhoneError* object.

CiscoIPPhoneResponse Definition

```
<CiscoIPPhoneResponse>
 <ResponseItem Status="the success or failure of the action"
 Data="the information returned with the response"
 URL="the URL or URI specified in the Execute object"/>
</CiscoIPPhoneResponse>
```

CiscoIPPhoneError

The following list gives possible CiscoIPPhoneError codes:

- Error 1 = Error parsing CiscoIPPhoneExecute object

- Error 2 = Error framing CiscoIPPhoneResponse object

- Error 3 = Internal file error

- Error 4 = Authentication error

CiscoIPPhoneError Definition

```
<CiscoIPPhoneError Number="x"/> optional error message <CiscoIPPhoneError>
```

The text value of the *CiscoIPPhoneError* object may contain an optional error message to further describe the nature of the error condition.

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Custom Softkeys

IP Phones can use custom softkeys with any of the displayable CiscoIPPhone XML objects, with the following exceptions:

- *CiscoIPPhoneStatus* object, which cannot control softkeys

- *CiscoIPPhoneExecute* object, which is not displayable

Softkeys can have either URL or URI actions associated with them. The *SoftkeyItem* can define separate actions to be taken when the softkey is pressed and released. The standard UI behavior is to execute an action when a key is released, and this action is defined by the *<URL>* tag. An action can also be taken when the softkey is initially pressed by including the optional *<URLDown>* tag. For example, you might use *<URLDown>* for a press-to-talk application in which pressing the button starts audio streaming and releasing the button stops it.

> **Note** The *<URLDown>* tag can only contain Internal URIs: it cannot contain an HTTP URL. The "URL" in the name "URLDown" does not signify that an HTTP URL can be used.

The API does not support the use of *SoftKeyItems* to enclose multiple *SoftKeyItem* entries.

SoftKeyItem Definition

```
<SoftKeyItem>
 <Name>Displayed sofkey label</Name>
 <URL>URL or URI action for softkey RELEASE event</URL>
 <URLDown>URL or URI action for softkey PRESS event</URLDown>
 <Position>position of softkey</Position>
</SoftKeyItem>
```

Position

- -1 designates the Application/Settings button

- Cisco Wireless Phone 8821: 1 to 8 designates the softkeys

- Other phones: 1 to 16 designates the softkeys

The SoftKeyItem in the -1 position does not display on the phone screen. If the user pressed the Application or Settings button while in an XSI application, the action associated with the -1 position executes.

For the Cisco Wireless IP Phone 8821, the softkey position 1 corresponds to the right softkey. All the other positions correspond to the left softkey.

SoftKeyItem Example 1

In this example, a *CiscoIPPhoneText* object has a single custom softkey defined.

```
<CiscoIPPhoneText>
 <Text>This object has one softkey named "Custom"</Text>
 <SoftKeyItem>
  <Name>Custom</Name>
```

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```
  <URL>http://someserver/somepage</URL>
  <Position>4</Position>
 </SoftKeyItem>
</CiscoIPPhoneText>
```

If any custom softkeys are defined in the XML object, then all default softkeys are removed from that object. To retain default softkey behavior, you must explicitly define the softkeys in the XML object using a *<SoftKeyItem>* tag. The internal Softkey URIs can be used in the *<URL>* tag of *<SoftKeyItem>* to invoke default softkey actions from custom softkeys.

Note If there are no custom softkeys and there is no default softkey placed in position 1, either a Next or Update softkey is assigned automatically. If the URL is a Refresh URL, the Next softkey is assigned. If not, the Update softkey is assigned.

Related Topics

SoftKeyItem Example 2

The following softkey definitions would provide the Custom softkey, without losing the default Select softkey behavior.

```
<SoftKeyItem>
 <Name>Select</Name>
 <URL>SoftKey:Select</URL>
 <Position>1</Position>
</SoftKeyItem>
<SoftKeyItem>
```

XML Considerations

The XML parser in the IP Phones does not function as a fully-capable XML parser. Do not include any tags other than those defined in your XML display definitions.

Note All CiscoIPPhone element names and attribute names are case sensitive.

Mandatory Escape Sequences

By XML convention, the XML parser also requires that you provide escape values for a few special characters. The following table lists characters and their escape values.

Table 10: Escape Sequences for Special Characters

Character	Name	Escape sequence
&	Ampersand	&
"	Quote	"

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Character	Name	Escape sequence
'	Apostrophe	'
<	Left angle bracket	<
>	Right angle bracket	>

Escaping text can be tedious, but some authoring tools or scripting languages can automate this task.

XML Encoding

Because the phone firmware can support multiple encodings, the XML encoding should always be set in the XML header.

If the XML encoding header is not specified, the phone will default to the encoding specified by the current user locale.

Note This behavior is NOT compliant with XML standards, which specify UTF-8 as the default encoding, so any UTF-8 encoded XML object must have the encoding explicitly set for the phone to parse it correctly.

The encoding value specified in the XML header must match one of the encodings provided by the IP Phone in its Accept-Charset HTTP request header, as shown in

XML Encoding Example

The following examples illustrate UTF-8 and ISO-8859-1 encoding, respectively:

```
<?xml version="1.0" encoding="utf-8" ?>
```

```
<?xml version="1.0" encoding="iso-8859-1" ?>
```

Related Topics

Application Event Handlers

The Application Manager API includes an Application Management Event Handler, which is supported by any displayable object, as noted in the following table. The unsupported objects are not contained in a standard application context and are handled differently by the Application Manager API.

Note The Multiplatform phones do not support the Application Event Handlers.

Table 11: Application Event Handler Support

Supported	Unsupported
CiscoIPPhoneMenu	CiscoIPPhoneStatus

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Supported	Unsupported
CiscoIPPhoneText	CiscoIPPhoneStatusFile
CiscoIPPhoneInput	
CiscoIPPhoneDirectory	
CiscoIPPhoneImage	
CiscoIPPhoneImageFile	
CiscoIPPhoneGraphicMenu	
CiscoIPPhoneGraphicFileMenu	
CiscoIPPhoneIconMenu	
CiscoIPPhoneIconFileMenu	

Note   Support for the Application Event Handlers requires an updated XML Parser.

Related Topics

Application, on page 88

Supported Phone Models, on page 51

Updated XML Parser and Schema Enforcement

Application Event Handler Attributes

The Application Event Handlers can be attached to a supported object by specifying the attributes described in the following table.

Note   An Application URI with Priority=0 is not allowed in the Application Event Handlers.

Table 12: Application Event Handler Attributes

Attribute	Description
appID	Identifies the application to which this displayable object belongs. The format of the appID attribute should be in the format vendor/product, such as Cisco/Unity, but this syntax is not enforced, and the application can assign any unique identifier.

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Attribute	Description
onAppFocusLost	Invoked when the application loses focus, if one of the following conditions occurs: • The application context loses focus • The application was navigated away from, either directly by the user, or programmatically by a refresh header or HTTP push **Note** If a Notify URI is used as the event handler, a notification is sent with this default data: `<notifyApplicationEvent appId="appId" type="focusLost"/>`
onAppFocusGained	Invoked when the application gains focus, if one of the following conditions occurs: • The application is Active and the application context gains focus • The application was navigated to, either directly by the user, or by a refresh header or HTTP push If a Notify URI is used as the event handler, a notification is sent with this default data: `<notifyApplicationEvent appId="appId" type="focusGained"/>`
onAppMinimized	Invoked when the application is minimized. An application can only be minimized in a program by a call to App:Minimize, but this invocation could occur by direct action of the user (for example, from a softkey invocation) or from the application using a push request. `<notifyApplicationEvent appId="appId" type="minimized"/>`
onAppClosed	Invoked when the application closes, if one of the following conditions occur: • The application context is closed which will, in turn, close all applications in its stack • The application no longer exists on the context URL stack because it was navigated away from, or because it was pruned from the URL stack (stack size exceeded) **Note** This event handler cannot contain HTTP or HTTPS URLs. **Note** If a Notify URI is used as the event handler, a notification is sent with this default data: `<notifyApplicationEvent appId="appId" type="closed"/>`

Related Topics

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Event Handler Schema

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified"
attributeFormDefault="unqualified">
  <xs:element name="notifyApplicationEvent">
    <xs:complexType>
      <xs:attribute name="appId" use="required">
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:minLength value="1"/>
            <xs:maxLength value="64"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
      <xs:attribute name="type" use="required">
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:enumeration value="closed"/>
            <xs:enumeration value="minimized"/>
            <xs:enumeration value="focusLost"/>
            <xs:enumeration value="focusGained"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:attribute>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

Event Handler Example

```xml
<CiscoIPPhoneImage appId="Cisco/Unity"
  onAppFocusLost="RTPRx:Stop; RTPTx:Stop; Notify:http:server:80:path"
  onAppFocusGained="http://server/mainpage/updateUI"
  onAppClosed="Notify:http:server:80:eventlistener/appClosed">
  ...
</CiscoIPPhoneImage>
```

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CHAPTER 4

Component APIs

- Component API Overview, on page 51
- Supported Phone Models, on page 51
- Application Management API, on page 53
- RTP Streaming API, on page 53
- Errors and Responses, on page 55

Component API Overview

In addition to the primary phone XSI API, the following two additional component APIs are available:

- Application Management API

- RTP Streaming API

Supported Phone Models

The following table lists the Cisco Unified IP Phone models that support the component APIs

Table 13: Phone Models that Support the Component APIs

Phone model	Supported, not supported	Firmware supported (see note 1)
Cisco Desk Phone 9800 Series		
9841	Supported	PhoneOS 3.0(1) or later
9851	Supported	PhoneOS 3.0(1) or later
9861	Supported	PhoneOS 3.0(1) or later
Cisco IP Phone 8800 Series		
8811	Supported	10.2(2) or later
8841	Supported	10.2(1) or later
8845	Supported	10.3(2) or later

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Phone model	Supported, not supported	Firmware supported (see note 1)
8851	Supported	10.2(1) or later
8851NR	Supported	10.3(1) or later
8861	Supported	10.2(1) or later
8865	Supported	10.3(2) or later
8865NR	Supported	11.7(1) or later
Cisco IP Phone 8800 Series Multiplatform Phones	Supported	11.0(0) or later
Cisco Video Phone 8875 and 8875NR	Supported	PhoneOS 2.1 and later
Cisco IP Conference Phones		
7832	Not supported	—
8831	Not supported	—
8832	Supported	12.0(1) or later
Cisco Wireless IP Phone 8820 Series		
8821	Not supported	—
Cisco IP Phone 7800 Series		
7811	Not supported	—
7821	Not supported	—
7841	Not supported	—
7861	Not supported	—
Cisco IP Phone 7800 Series Multiplatform Phones	Not supported	—
Cisco IP Phone 6800 Series		
Cisco IP Phone 6800 Series with Multiplatform Firmware	Not supported	—

Note   Cisco recommends the use of latest firmware. The firmware can be downloaded from the following location (requires login or service contract):

http://software.cisco.com/download/navigator.html?i=!mmd

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Application Management API

To address the limited application management, the Application Management API provides a smoother handoff between the call mode and the application mode. The Application API consists of two primary components:

- Application URI

- Application Event Handlers

Note Support for the Application Management API requires an updated XML Parser.

The Multiplatform phones do not support the Application Management API.

Related Topics

RTP Streaming API

This XML-based RTP Streaming API allows applications to initiate and observe RTP audio streams. This API extends capabilities beyond the legacy RTP streaming URIs by providing support for stream start and stop event listeners and the ability to specify other extended stream attributes, such as codec type.

Note Support for the RTP Streaming API requires an updated XML Parser.

The Multiplatform phones doe not support the RTP Streaming API.

The event handlers typically use the standard Notification framework, but they can also invoke most other URIs, with the exception of HTTP URLs.

Interaction Rules with Legacy RTP URI Streams

The RTP Streaming API allows a full-duplex stream (mode=sendReceive) to be set up as a single stream request, which simplifies the usage of the API. However, in some cases, this API creates some interoperability issues with the legacy RTP URIs because the legacy RTP URIs send and receive streams separately. The interaction rules between legacy RTP URI streams and the new RTP Streaming API are:

- If an RTP Stop URI is invoked, and an RTP Streaming API stream is currently streaming in that same direction, then the entire RTP Streaming API stream is stopped.

  For example, if a full-duplex stream is set up through the RTP Streaming API (mode=sendReceive) and then an RTPTx:Stop URI is invoked, the stream will be stopped in both the send and receive directions (and the onStopped event handler will be called, if present).

- If the stopMedia request (from the RTP Streaming API) does not specify a stream ID, then the request will stop all services RTP streams, in any direction (send or receive) and of any type (multicast and

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unicast). This allows applications using the RTP Streaming API to stop media streams which may have been started by the legacy RTP URIs or by other applications for which a stream ID is not known.

Error Schema

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified"
attributeFormDefault="unqualified">
  <xs:element name="errorResponse">
    <xs:complexType>
      <xs:all>
        <xs:element name="type">
          <xs:simpleType>
            <xs:restriction base="xs:string">
              <xs:enumeration value="InvalidURL"/>
              <xs:enumeration value="InvalidResource"/>
              <xs:enumeration value="InvalidResourceID"/>
              <xs:enumeration value="UnavailableResource"/>
              <xs:enumeration value="InvalidXML"/>
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
        <xs:element name="data" nillable="true">
          <xs:simpleType>
            <xs:restriction base="xs:string"/>
          </xs:simpleType>
        </xs:element>
      </xs:all>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

RTP Streaming API Examples

The following examples show how to work with the RTP Streaming API.

Start Media Example

- Request

```
HTTP POST /CGI/Execute
<startMedia>
  <mediaStream
      onStopped="Notify:http:server:80:path/page"
      receiveVolume="50">
        <type>audio</type>
        <codec>G.729</codec>
        <mode>sendReceive</mode>
        <address>239.1.2.3</address>
        <port>20480</port>
  </mediaStream>
</startMedia>
```

- Response

```
HTTP200 OK
<mediaStream id="abc123"/>
```

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Stop Media Example

- Request

```
HTTP POST CGI/Execute
<stopMedia>
  <mediaStream id="abc123"/>
</stopMedia>
```

- Response

```
HTTP 200 OK
```

If the user terminates the media stream by placing the active audio path on-hook, the following notification is sent:

```
HTTP POST /server/path/page
DATA=<notifyMediaEvent type="stopped" origin="user">
    <mediaStream id="abc123"/>
</notifyMediaEvent>
```

Errors and Responses

The following table describes error conditions and responses for the RTP Streaming API.

Table 14: RTP Streaming API Error Conditions and Responses

Condition	Applicable method	HTTP result code	Type	Data
Authorization failed	all	401 (Authorization Failed)	N/A	N/A
Request object does not comply with the API's XML schema	all	400 (BadRequest)	InvalidXML	<parser error description>
Media cannot be started because no DSP resources is available to handle the media	startMedia	400 (BadRequest)	Unavailable Resource	No Media Resource Available
Media cannot be stopped because the specified stream ID does not exist	stopMedia	400 (BadRequest)	InvalidResourceID	Unknown Media Stream ID: <streamID>

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Internal URI Features

Internal URI Overview

Internal uniform resource identifiers (URIs) provide access to embedded phone features such as placing calls, playing audio files, and invoking built-in object features.

Supported URIs by Phone Model

The following tables list the URIs. The notes mentioned in the tables follow the final table. For SPA and Multiplatform phones, see the final table.

Table 15: URIs Supported by Cisco IP Phone Services SDK for Cisco IP Phone 7800 Series (On-Premise)

URI	7811, 7821, 7841, 7861 **On-Premise**	7832 **On-Premise**
Key (See Note 6)	Supported	Supported
Softkey	Supported	Supported
Init	Supported	Supported
Dial, EditDial	Supported	Supported
Play	Supported	Supported

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| URI | 7811, 7821, 7841, 7861 | 7832 |
	On-Premise	On-Premise
QueryStringParam	Supported	Supported
Unicast RTP	Supported	Supported
Multicast RTP	Supported	Supported
Display	Not supported	Not supported
Vibrate	Not supported	Not supported
Notify (See Note 2)	Not supported	Not supported
SendDigits (See Note 2)	Not supported	Not supported
Application (See Note 2)	Not supported	Not supported
Device	Not supported	Not supported

Table 16: URIs Supported by Cisco Unified IP Phone Services SDK for Cisco IP Phone 8800 Series and Cisco IP Conference Phones (On-Premise)

URI	8811, 8841, 8845, 8851, 8851NR, 8861, 8865, 8865NR, 8875, 8875NR	8831	8832
Key	Supported	Supported	Supported
Softkey	Supported (Except for 8875 and 8875NR)	Supported	Supported
Init	Supported	Supported	Supported
Dial, EditDial	Supported	Supported	Supported
Play	Supported	Supported	Supported
QueryStringParam	Supported	Supported	Supported
Unicast RTP	Supported	Supported	Supported
Multicast RTP	Supported	Supported	Supported
Display	Supported	Supported	Supported
Vibrate	Not supported	Not supported	Not supported
Notify (See Note 2)	Supported	Supported	Supported

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URI	8811, 8841, 8845, 8851, 8851NR, 8861, 8865, 8865NR, 8875, 8875NR	8831	8832
SendDigits (See Note 2)	Supported	Supported	Supported
Application (See Note 2)	Supported	Not supported	Supported
Device	Supported	Not supported	Supported

Table 17: URIs Supported by Cisco Unified IP Phone Services SDK for Cisco Wireless IP Phone 8820 Series and Cisco Wireless Phone 800 Series

URI	8821	840/860
Key	Supported	Not Supported
Softkey	Supported	Supported
Init	Supported	Not Supported
Dial, EditDial	Supported (See Note 1)	Not Supported
Play	Supported	Not Supported
QueryStringParam	Supported	Not Supported
Unicast RTP	Supported	Supported
Multicast RTP	Supported	Supported
Display	Supported	Not Supported
Vibrate	Supported	Not Supported
Notify (See Note 2)	Not supported	Not Supported
SendDigits (See Note 2)	Not supported	Not Supported
Application (See Note 2)	Not supported	Not Supported
Device	Supported	Not Supported

Table 18: URIs Supported by Multiplatform Phones

URI	6800 Series	7800 Series	7832	8800 Series
Key (See Note 3 and Note 6)	Supported	Supported	Supported	Supported

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URI	6800 Series	7800 Series	7832	8800 Series
Softkey	Supported	Supported	Supported	Supported
Init (See Note 4)	Supported	Supported	Supported	Supported
Dial	Supported	Supported	Supported	Supported
EditDial	Supported	Supported	Supported	Supported
Play	Supported (See Note 5)	Supported (See Note 5)	Supported (See Note 5)	Supported (See Note 5)
QueryStringParam	Not supported	Not supported	Not supported	Not supported
Unicast RTP	Not supported	Not supported	Not supported	Not supported
Multicast RTP	Not supported	Not supported	Not supported	Not supported
Display	Not supported	Not supported	Not supported	Not supported
Vibrate	Not supported	Not supported	Not supported	Not supported
Notify	Not supported	Not supported	Not supported	Not supported
SendDigits	Not supported	Not supported	Not supported	Not supported
Application	Not supported	Not supported	Not supported	Not supported
Device	Supported	Supported	Supported	Supported

Table 19: URIs Supported by Cisco Desk Phone 9800 Series

URI	9841 and 9851
Key	Supported
Softkey	Supported
Init	Supported
Dial, EditDial	Supported
Play	Supported
QueryStringParam	Supported
Unicast RTP	Supported
Multicast RTP	Supported
Display	Supported
Vibrate	Not supported

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URI	9841 and 9851
Notify	Supported
SendDigits	Supported
Application	Supported
Device	Supported

Note
1. Cisco Wireless IP Phone 8821 support only the Dial:N format.

2. Requires Cisco Unified IP Phone firmware version 8.3(2) or later, which contains an updated XML parser.

3. Only Key:Headset supported.

4. Only Init:Call History supported.

5. Multiplatform phones support Play, but only for ringtones.

6. The Cisco IP Phone 7800 Series uses Key:Hold.

   The Cisco IP Phone 8800 Series uses Key:FixedFeature3 instead of Key:Hold.

Device Control URIs

These sections describe the device control URIs.

Key

The *Key* URI allows a program to send an event that a key has been pressed. The system initiates the event as if the button was physically pressed.

Note that when buttons are pressed with this method, if the button is not present on the phone (hard button) or not available (softkey) when the URI is processed, the event is discarded.

If the softkey set is changing and disabled while the event is being processed, the request is discarded.

The following tables list the *Key* URIs and the phone models in which these softkeys are supported.

Supported Key UIRs for 7800 Series

Table 20: Key URIs for Cisco IP Phone 7800 Series (Unified CM)

Key URIs	7811, 7821, 7841, 7861	7832
Key:Applications	Supported	Not supported
Key:AppMenu	Not supported	Not supported
Key:Contacts	Not supported	Not supported

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Key URIs	7811, 7821, 7841, 7861	7832
Key:Directories	Supported	Not supported
Key:Feature1 to Key:Feature120	Not supported	Not supported
Key:FixedFeature1 to Key:FixedFeature3	Not supported	Not supported
Key:Headset	Supported	Not supported
Key:Hold	Supported	Not supported
Key:Info	Supported	Not supported
Key:KEMPage	Not supported	Not supported
Key:KeyPad 0 to Key:KeyPad9	Supported	Supported
Key:KeyPadPound	Supported	Supported
Key:KeyPadStar	Supported	Supported
Key:Line1 to Key:Line120	Supported	Not supported
Key:Messages	Supported	Not supported
Key:Mute	Supported	Supported
Key:NavBack	Not supported	Not supported
Key:NavDwn	Supported	Supported
Key:NavLeft	Not supported	Not supported
Key:NavRight	Not supported	Not supported
Key:NavSelect	Supported	Supported
Key:NavUp	Supported	Supported
Key:NavOffhook	Not supported	Not supported
Key:NavOnhook	Not supported	Not supported
Key:PTT	Not supported	Not supported
Key:Release	Not supported	Not supported
Key:Services	Supported	Not supported
Key:Session1 to Session6	Not supported	Not supported
Key:Settings	Supported	Not supported
Key: Soft1 to Soft4	Supported	Supported

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Key URIs	7811, 7821, 7841, 7861	7832
Key:Speaker	Supported	Supported
Key:VolDown	Supported	Supported
Key:VolUp	Supported	Supported

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Note   The Cisco IP Phone 7811 supports 1 line. It does not have feature buttons.

Supported Key URIs for 8800 Series

Table 21: Key URIs for Cisco IP Phone 8800 Series and Cisco IP Conference Phone 8830 Series (Unified CM))

Key URIs	8811, 8841, 8845, 8851, 8851NR, 8861, 8865, 8865NR	8875, 8875NR	8831	8832
Key:Applications	Supported	Supported	Not supported	Not supported
Key:AppMenu	Not supported	Not supported	Not supported	Not supported
Key:Contacts	Supported	Supported	Not supported	Not supported
Key:Directories	Supported	Supported	Not supported	Not supported
Key:Feature1 to Key:Feature120	Supported	Not supported	Not supported	Not supported
Key:FixedFeature1 to 3	Supported	Not supported	Not supported	Not supported
Key:Headset	Supported	Supported	Not supported	Not supported
Key:Hold	Supported	Supported	Not supported	Not supported
Key:Info	Not supported	Not supported	Not supported	Not supported
Key:KemPage	Supported	Not supported	Not supported	Not supported
Key:KeyPad0 to Key:KeyPad9	Supported	Supported	Supported	Supported
Key:KeyPadPound	Supported	Supported	Supported	Supported
Key:KeyPadStar	Supported	Supported	Supported	Supported
Key:Line1 to Key:Line120	Supported	Not supported	Not supported	Not supported
Key:Messages	Supported	Supported	Not supported	Not supported

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Key URIs	8811, 8841, 8845, 8851, 8851NR, 8861, 8865, 8865NR	8875, 8875NR	8831	8832
Key:Mute	Supported	Supported	Not supported	Not supported
Key:NavBack	Not supported	Not supported	Not supported	Not supported
Key:NavDwn	Supported	Not supported	Not supported	Supported
Key:NavLeft	Supported	Not supported	Not supported	Not supported
Key:NavRight	Supported	Not supported	Not supported	Not supported
Key:NavSelect	Supported	Not supported	Not supported	Supported
Key:NavUp	Supported	Not supported	Not supported	Supported
Key:Offhook	Not supported	Not supported	Not supported	Not supported
Key:Onhook	Not supported	Not supported	Not supported	Not supported
Key:PTT	Not supported	Not supported	Not supported	Not supported
Key:Release	Supported	Supported	Not supported	Not supported
Key:Services	Supported	Supported	Not supported	Not supported
Key:Session1 to Key:Session6	Supported	Not supported	Not supported	Not supported
Key:Settings	Supported	Not supported	Not supported	Not supported
Key:Soft1 to Key:Soft5	Supported	Not supported	Supported	Supported
Key:Speaker	Supported	Supported	Supported	Supported
Key:VolDwn	Supported	Supported	Supported	Supported
Key:VolUp	Supported	Supported	Supported	Supported

Note

- The Cisco IP Phone 8811, 8841, and 8845 support 5 lines, 5 sessions, and 5 features. The Cisco IP Phones 8851 and 8851NR support 77 lines, 5 sessions, and 77 features. The Cisco IP Phone 8861, 8865, and 8865NR supports 113 lines, 5 sessions, and 113 features.

- Key:Directories is supported on the Cisco IP Phone 8800 series starting with Firmware Release 11.0

- Cisco Video Phone 8875 and 8875NR don't have the Navigation keys and don't support the navigation key URIs.

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Supported Key URIs for 9800 Series

Table 22: Key URIs for Cisco Desk Phone 9800 Series (Unified CM)

Key URIs	9841 and 9851
Key:Applications	Supported
Key:AppMenu	Not supported
Key:Contacts	Supported
Key:Directories	Supported
Key:Feature1 to Key:Feature120	Supported
Key:FixedFeature1 to Key:FixedFeature3	Supported
Key:Headset	Supported
Key:Hold	Supported
Key:Info	Not supported
Key:KEMPage	Not supported
Key:KeyPad 0 to Key:KeyPad9	Supported
Key:KeyPadPound	Supported
Key:KeyPadStar	Supported
Key:Line1 to Key:Line120	Supported
Key:Messages	Not supported
Key:Mute	Supported
Key:NavBack	Not supported
Key:NavDwn	Supported
Key:NavLeft	Supported
Key:NavRight	Supported
Key:NavSelect	Supported
Key:NavUp	Supported
Key:NavOffhook	Not supported
Key:NavOnhook	Not supported
Key:PTT	Not supported
Key:Release	Supported

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Key URIs	9841 and 9851
Key:Services	Supported
Key:Session1 to Session6	Not supported
Key:Settings	Supported
Key: Soft1 to Soft4	Supported
Key:Speaker	Supported
Key:VolDown	Supported
Key:VolUp	Supported

Supported Key URIs for Multiplatform Phones

Table 23: Key URIs Supported by Multiplatform Phones

Key URIs	6800 Series	7800 Series	7832	8800 Series
Key:Applications	Not supported	Not supported	Not supported	Not supported
Key:AppMenu	Not supported	Not supported	Not supported	Not supported
Key:Contacts	Not supported	Not supported	Not supported	Not supported
Key:Directories	Supported	Supported	Supported	Supported
Key:Feature1 to Key:Feature120	Not supported	Not supported	Not supported	Not supported
Key:FixedFeature1 to 3	Not supported	Not supported	Not supported	Not supported
Key:Headset	Supported	Supported	Not supported	Supported
Key:Hold	Supported	Supported	Supported	Supported
Key:Info	Supported	Supported	Supported	Supported
Key:KemPage	Not supported	Not supported	Not supported	Not supported
Key:KeyPad0 to Key:KeyPad9	Supported	Supported	Supported	Supported
Key:KeyPadPound	Supported	Supported	Supported	Supported
Key:KeyPadStar	Supported	Supported	Supported	Supported
Key:Line1 to Key:Line120	Supported	Supported	Not supported	Supported
Key:Messages	Supported	Supported	Not supported	Supported

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Key URIs	6800 Series	7800 Series	7832	8800 Series
Key:Mute	Supported	Supported	Not supported	Supported
Key:NavBack	Not supported	Not supported	Not supported	Supported (Except 8875)
Key:NavDwn	Supported	Supported	Supported	Supported (Except 8875)
Key:NavLeft	Not supported	Not supported	Not supported	Supported (Except 8875)
Key:NavRight	Not supported	Not supported	Not supported	Supported (Except 8875)
Key:NavSelect	Supported	Supported	Supported	Supported (Except 8875)
Key:NavUp	Supported	Supported	Supported	Supported (Except 8875)
Key:Offhook	Not supported	Not supported	Not supported	Not supported
Key:Onhook	Not supported	Not supported	Not supported	Not supported
Key:PTT	Not supported	Not supported	Not supported	Not supported
Key:Release	Not supported	Not supported	Not supported	Not supported
Key:Services	Not supported	Not supported	Not supported	Not supported
Key:Session1 to Key:Session6	Not supported	Not supported	Not supported	Not supported
Key:Settings	Not supported	Not supported	Not supported	Not supported
Key:Soft1 to Key:Soft4	Supported	Supported	Supported	Supported
Key:Speaker	Supported	Supported	Not supported	Supported
Key:VolDwn	Supported	Supported	Supported	Supported
Key:VolUp	Supported	Supported	Supported	Supported

Note

- The Cisco IP Phone 7811 supports 1 line. It does not have feature buttons.

- Cisco Multiplatform Phones support four softkeys.

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Supported Key URIs for Wireless Phones

Table 24: Key URIs with Supported by Cisco Wireless Phone 8820 Series

Key URIs	8821
Key:Applications	Not supported
Key:AppMenu	Not supported
Key:Contacts	Not supported
Key:Directories	Not supported
Key:Feature1 to Key:Feature120	Not supported
Key:FixedFeature1 to 3	Not supported
Key:Headset	Not supported
Key:Hold	Supported
Key:Info	Supported
Key:KemPage	Not supported
Key:KeyPad0 to Key:KeyPad9	Supported
Key:KeyPadPound	Supported
Key:KeyPadStar	Supported
Key:Line1 to Key:Line120	Not supported
Key:Messages	Not supported
Key:Mute	Supported
Key:NavBack	Not supported
Key:NavDwn	Supported
Key:NavLeft	Supported
Key:NavRight	Supported
Key:NavSelect	Supported
Key:NavUp	Supported
Key:Offhook	Supported
Key:Onhook	Supported
Key:PTT	Supported
Key:Release	Not supported

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Key URIs	8821
Key:Services	Not supported
Key:Session1 to Key:Session6	Not supported
Key:Settings	Not supported
Key:Soft1 to Key:Soft2	Supported
Key:Speaker	Supported
Key:VolDwn	Supported
Key:VolUp	Supported

Key URI Format

Key:n

Where

n = a Key name

Display

The *Display* URI is available only on those Cisco Unified IP Phones that have a color backlight on the phone display. Using the *Display* URI, you can control how long the backlight remains on or off.

Note, however, that other administrator-controlled or user-indicated display settings take precedence over the *Display* URI. Therefore, various phone states (such as phone startup, incoming and active calls, or other user input states) override the *Display* URI settings.

Display URI Format

Display:State:Interval

Where

State = whether the phone display is turned on or off, or set to default to return the display to its specified state.

Interval = duration (in minutes) in which the phone state remains in the specified state (unless activated by automated or user input). Value must be an integer ranging from 0-1440 minutes. If the value is set to 0, the display remains in the indicated state indefinitely (unless activated by automated or user input).

Examples

Display:Off:60 turns the phone display off for 1 hour (60 minutes).

Display:On:10 turns the phone display on for 10 minutes.

Display:Off:0 turns off the display off until activated.

Display:Default returns the display to its specified state for that time.

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Settings Menu

With Settings Menu URIs, you can remotely interact with the **Settings** menu on the phone.

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Note Settings Menu URIs are available only on Cisco Video Phone 8875 and 8875NR deployed on Cisco Unified Communications Manager.

URI Format

Cisco Video Phone 8875 supports three types of URIs: SettingsMenu, Button, and Key.

SettingsMenu URI Format

`SettingsMenu:<menu name>`

SettingsMenu URIs enable you to remotely open the menu and submenu items in the **Settings** menu. Ensure that the <menu name> matches the exact display name of the corresponding menu item on the phone screen. Before accessing a menu, open the **Settings** menu with the URI `Key:Applications`.

Here are some examples:

- `SettingsMenu:Bluetooth`— Open the **Bluetooth** menu when in the **Settings** menu

- `SettingsMenu:About this device`—

  Open the **About this device** menu when in the **Settings** menu

- `SettingsMenu:Network settings`—

  Open the **Network settings** menu when in the **Network connection** menu

- `SettingsMenu:Alternate TFTP`— Toggle on or off the **Alternate TFTP** option when in the **Network settings** menu

- `SettingsMenu:TFTP server1`— Put the focus in the **TFTP server1** field when in the **Network settings** menu

Button URI Format

`Button:<button name>`

Button URIs allow you to remotely interacts with the soft buttons in the **Settings** menu.

Here are some examples:

- `Button:Back`— Go back to the previous menu page

- `Button:Backspace`— Delete the input by one character to the left

- `Button:Apply/Submit`— Submit the changes that you've made, such as TFTP server address

Key URI Format

`Key:<key name>`

The Key URI enables you to remotely enter digits and the characters *****, **.**, and **#** in the phone menu.

Here are some examples:

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- `Key:Key_0`— Enter the digit 0

- `Key:Key_6`— Enter the digit 6

- `Key:Key_Asterisk`— Enters the star character (*)

- `Key:Key_Period`— Enters a dot (.) for IP addresses

- `Key:Key_NumberSign`— Enters the pound character (#)

Example

This example is for remotely entering the alternate TFTP server address in the phone menu.

1. Open the **Settings** menu with the following command:

```
<CiscoIPPhoneExecute>
    <ExecuteItem Priority="o"> URL="Key:Applications"/>
</CiscoIPPhoneExecute>
```

2. Run the following commands to open the **Network connection** > **Network settings** menu, toggle on Alternate TFTP, enter the TFTP server address, and apply the setting.

    For example, the TFTP server address is **100.7.34.1**.

```
<CiscoIPPhoneExecute>
    <ExecuteItem Priority="o"> URL="SettingsMenu:Network connection"/>
    <ExecuteItem Priority="o"> URL="SettingsMenu:Network settings"/>
    <ExecuteItem Priority="o"> URL="SettingsMenu:Alternate TFTP"/>
    <ExecuteItem Priority="o"> URL="SettingsMenu:TFTP server1"/>
    <ExecuteItem Priority="o"> URL="Key:Key_1"/>
    <ExecuteItem Priority="o"> URL="Key:Key_Period"/>
    <ExecuteItem Priority="o"> URL="Key:Key_0"/>
    <ExecuteItem Priority="o"> URL="Key:Key_0"/>
    <ExecuteItem Priority="o"> URL="Key:Key_Period"/>
    <ExecuteItem Priority="o"> URL="Key:Key_7"/>
    <ExecuteItem Priority="o"> URL="Key:Key_Period"/>
    <ExecuteItem Priority="o"> URL="Key:Key_3"/>
    <ExecuteItem Priority="o"> URL="Key:Key_4"/>
    <ExecuteItem Priority="o"> URL="Key:Key_Period"/>
    <ExecuteItem Priority="o"> URL="Key:Key_1"/>
    <ExecuteItem Priority="o"> URL="Button:Apply"/>
</CiscoIPPhoneExecute>
```

    If you have entered a wrong number, run the following command to delete your input by one character to the left:

```
<CiscoIPPhoneExecute>
    <ExecuteItem Priority="o"> URL="Button:Backspace"/>
</CiscoIPPhoneExecute>
```

3. Run the following command repetitively until you exit the **Settings** menu.

```
<CiscoIPPhoneExecute>
    <ExecuteItem Priority="o"> URL="Button:Back"/>
</CiscoIPPhoneExecute>
```

XML Displayable Object URIs

These sections describe the XML displayable object URIs.

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SoftKey

You can execute native softkey functionality when the phone executes a *SoftKey* URI. The *SoftKey* URI allows developers to customize softkey names and layout in the Services and Directories windows while retaining the functionality that the softkeys provide.

SoftKey URIs work in menu items and in softkey items in the XML objects for which they natively occur on the phone.

Note   The Softkey URI is not supported in the Execute object.

SoftKey URI Format

SoftKey:n

Where

n = one of the following softkey names:

- Back
- Cancel
- Exit
- Next
- Search
- Select
- Submit
- Update
- Dial
- EditDial
- <<

The following table contains valid softkey actions for each XSI object type follow. The URI invokes the native functionality that each key possesses in the given object context.

Table 25: Valid Softkey Actions for CiscoIPPhoneObject Types (Part 1)

IPPhoneObject (see note 1)	Back (See note 2)	Select	Exit (See note 2)	Update	Submit
CiscoIPPhoneMenu	X	X	X		
CiscoIPPhoneIconMenu	X	X	X		
CiscoIPPhoneText	X		X	X	

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IPPhoneObject (see note 1)	Back (See note 2)	Select	Exit (See note 2)	Update	Submit
CiscoIPPhoneImage	X		X	X	
CiscoIPPhoneGrapphicMenu	X		X	X	
CiscoIPPhoneInput	X				X
CiscoIPPPhoneDirectory	X				

Table 26: Valid Softkey Actions for CiscoIPPhoneObject Types (Part 2)

IPPhoneObject (see note 1)	Search	<<	Cancel	Next	Dial	EditDial
CiscoIPPhoneMenu						
CiscoIPPhoneIconMenu						
CiscoIPPhoneText						
CiscoIPPhoneImage						
CiscoIPPhoneGrapphicMenu						
CiscoIPPhoneInput	X (see note 3)	X	X			
CiscoIPPPhoneDirectory			X	X	X (see note 4)	X (see note 4)

✎

Note

1. The *SoftKey* URI is not allowed in an Execute object, except for the Cisco Wireless IP Phone 8821 and 8821-EX.

2. For the Cisco Wireless IP Phone 8821 and 8821-EX Firmware Release 11.0(4) and previous, the Softkey:Back button takes the user up one screen level and the Softkey:Exit closes all open applications.

   For the Cisco Wireless IP Phone 8821 and 8821-EX Firmware Release 11.0(4)SR1 and later, the Softkey:Back and Softkey:Exit buttons take the user up one screen level.

3. Only when used under the Directories button.

4. The *SoftKey:Dial* and *SoftKey:EditDial* URIs can be used only for Directory objects, but the *Dial:xxx* and *EditDial:xxx* URIs can be used as the URL of any *SoftKeyItem* or *MenuItem.*

The following table shows this table from the document and denotes the Cisco Wireless Phone 840 or 860 behavior:

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Table 27: Valid Softkey Actions for CiscoIPPhoneObject Types (Part 1)

IPPhoneObject	Select 8821	Select 840/860	Exit 8821	Exit 840/860	Update 8821	Update 840/860	Submit 8821	Submit 840/860
CiscoIPPhoneMenu	X	X	X	X				
CiscoIPPhoneIconMenu	X	N/A	X	N/A				
CiscoIPPhoneText			X	X	X	X		
CiscoIPPhoneImage			X	N/A	X	N/A		
CiscoIPPhoneGrapphicMenu				X		X		
CiscoIPPhoneInput			X	N/A	X	N/A		
CiscoIPPPhoneDirectory							X	N/A

Table 28: Valid Softkey Actions for CiscoIPPhoneObject Types (Part 2)

IPPhoneObject (see note 1)	Search 8821	Search 840/860	<< 8821	<< 840/860	Cancel 8821	Cancel 840/860	Next 8821	Next 840/860
CiscoIPPhoneMenu								
CiscoIPPhoneIconMenu								
CiscoIPPhoneText								
CiscoIPPhoneImage								
CiscoIPPhoneGrapphicMenu								
CiscoIPPhoneInput	X	N/A	X	N/A	X	N/A		
CiscoIPPPhoneDirectory					X	N/A	X	N/A

Table 29: Valid Softkey Actions for CiscoIPPhoneObject Types (Part 3)

IPPhoneObject (see note 1)	Dial 8821	Dial 840/860	EditDial 8821	EditDial 840/860
CiscoIPPhoneMenu				
CiscoIPPhoneIconMenu				
CiscoIPPhoneText				
CiscoIPPhoneImage				
CiscoIPPhoneGrapphicMenu				

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IPPhoneObject (see note 1)	Dial 8821	Dial 840/860	EditDial 8821	EditDial 840/860
CiscoIPPhoneInput				
CiscoIPPPhoneDirectory	X	N/A	X	N/A

✎

Note Cisco Wireless Phone 840/860 support for CiscoIPPhoneInput and CiscoIPPhoneDirectory will be added in future releases.

Related Topics

Telephony URIs, on page 83

QueryStringParam

The *QueryStringParam* URI allows an application developer to collect more information from the user with less interaction. When the user performs an action with a softkey, you can either append a query string parameter to the URL of the highlighted *MenuItem* or append the query string parameter from the *MenuItem* to the URL of the softkey.

QueryStringParam URI Format

QueryStringParam:d

Where

d = the data to be appended to a corresponding URL.

Example: QueryStringParam URI in CiscoIPPhoneMenu Object

```
<CiscoIPPhoneMenu>
 <Title>Message List</Title>
 <Prompt>Two Messages</Prompt>
 <MenuItem>
  <Name>Message One</Name>
  <URL>QueryStringParam:message=1</URL>
 </MenuItem>
 <MenuItem>
  <Name>Message Two</Name>
  <URL>QueryStringParam:message=2</URL>
 </MenuItem>
 <SoftKeyItem>
  <Name>Read</Name>
  <URL>http://server/read.asp</URL>
 </SoftKeyItem>
 <SoftKeyItem>
  <Name>Delete</Name>
  <URL>http://server/delete.asp</URL>
 </SoftKeyItem>
</CiscoIPPhoneMenu>
```

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Example: Item Selection with Numeric Keypad Calls URI

The following example shows how to use the *QueryStringParam* URI in a *CiscoIPPhoneMenu* object. The *CiscoIPPhoneMenu* object includes two *MenuItems* with *QueryStringParam* URIs. If the user chooses the *MenuItems* with the numeric keypad, the cursor moves to that entry, but nothing executes because the values are *QueryStringParam* URIs.

If the user presses either custom softkey, the currently highlighted *MenuItem* URI value gets appended to the softkey URL that was pressed and requested from the web server.

If the user highlights the first *MenuItem* and press the Read softkey, the phone generates the following URL:

http://server//read.asp?message=1

```
<CiscoIPPhoneMenu>
 <Title>Message List</Title>
 <Prompt>Two Messages</Prompt>
 <MenuItem>
  <Name>Message One</Name>
  <URL>http://server/messages.asp?message=1</URL>
 </MenuItem>
 <MenuItem>
  <Name>Message Two</Name>
  <URL>http://server/messages.asp?message=2</URL>
 </MenuItem>
 <SoftKeyItem>
  <Name>Read</Name>
  <Position>1</Position><URL>QueryStringParam:action=read</URL>
 </SoftKeyItem>
 <SoftKeyItem>
  <Name>Delete</Name>
  <Position>2</Position><URL>QueryStringParam:action=delete</URL>
 </SoftKeyItem>
</CiscoIPPhoneMenu>
```

QueryStringParam URI Example Discussion

The Cisco Unified IP Phones allow you to implement the *QueryStringParam* URI in either manner although Example: Item Selection with Numeric Keypad Calls URI, on page 76 is not as efficient as Example: QueryStringParam URI in CiscoIPPhoneMenu Object, on page 75. Choose the best way to perform the action based on your applications needs.

The Item selection example has a slight advantage in that if the user chooses an item with the numeric keypad, the URL gets called. This action would allow you to invoke some default behavior, such as to read the message in the example. By highlighting the first message and pressing the Read softkey, the phone creates the following URL: *http://server/messages.asp?message=1&action=read*

Using the *QueryStringParam* URI reduces the size of the XML objects that you generate by removing redundant portions of a URL in every *MenuItem*.

Multimedia URIs

These sections describe the multimedia URIs.

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RTP Streaming

You can invoke RTP streaming using URIs in services. You can instruct the phone to transmit or receive an RTP stream with the following specifications:

- RTPRx

- RTPTx

- RTPMRx

- RTPMTx

Note For some Cisco Unified IP Phone models, the RTP Streaming URIs have been deprecated by the RTP Streaming API.

The supported format of the RTP stream is:

- The codec is G.711 mu-law.

- The packet size is 20 ms.

The possible CiscoIPPhoneError codes are:

- Error 1 = Error parsing CiscoIPPhoneExecute object

- Error 2 = Error framing CiscoIPPhoneResponse object

- Error 3 = Internal file error

- Error 4 = Authentication error

Related Topics

Interaction with Call Streaming

- Existing Tx or MTx URI streams are terminated if a new call begins or an existing call resumes.

- Tx or MTx URI stream requests received when a call is active are rejected with an errorNo=4 unauthorized. If a call is in a Held state (connected but not actively streaming), the Tx or MTx URI request is accepted, but will terminate if the call resumes.

Note Returning errorNo=4 allows the application to distinguish this error from the normal errorNo=1 busy response.

- Existing Rx or MRx URI streams are terminated if a new call begins or an existing call resumes.

The user has no explicit mechanism for terminating the Rx or MRx URI stream independent of the call. Thus, if the Rx or MRx stream is not terminated automatically, it would continue to play. For example, a user is listening to Internet radio feed and gets an incoming call. The user answers the call, which either

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closes or minimizes the Internet radio XSI application. Otherwise, the user has no intuitive way to stop the music stream.

- New Rx or MRx URI stream requests received during an active call are accepted (whisper), but the volume parameter of the URI is ignored.

  If the Rx or MRx URI request was done using push, then the associated application is responsible for using push Priority attributes and for stopping and starting the stream.

  If the user initiates the Rx or MRx URI using an application, then the user likely is not concerned about having the audio mixed with the current call. However, the user should also be presented with an option to stop the application, when needed.

- For the Rx or MRx URI, the Mute indicator light is only lit when both these conditions are met:

  - There are no active transmit streams from either a call or an XML services stream.

  - There is at least one active receive stream.

  For example, if an active call is ended or put on hold while a Rx or MRx URI stream is active, the Mute indicator will light.

- If a Rx or MRx or Tx or MTx URI request is received and there is already an active XML services stream in that direction, then a response with errorNo=1 Tx/Rx is already active is returned. The previous stream must be terminated (either by the user or by an RTP Stop URI) before a new stream can be started.

  This response provides visibility to the application if the phone is currently busy. It then allows the application to decide whether or not to terminate the existing stream and start a new one, rather than being controlled by the phone firmware.

RTPRx

The *RTPRx* URI instructs the phone to receive a Unicast RTP stream or to stop receiving Unicast or Multicast RTP streams.

RTPRx URI Formats

RTPRx:i:p:v

RTPRx:Stop

Where

i = the IP Address from which the stream is coming.

p = the UDP port on which to receive the RTP stream. Ensure that this is an even port number within the decimal range of 20480 to 32768. If no port is specified, the phone chooses a port and returns it when initiated by a push request.

Stop = the parameter that will stop any active RTP stream from being received on channel one

v = the optional volume setting that controls the volume of stream play out. The supplied value is a percentage of the maximum volume level of the device and must be in the range 0-100. The phone converts the specified percentage into the closest device-supported volume level setting and uses it. After the initial volume level gets set and the stream starts, you can manually change the volume level as needed. If the optional volume parameter does not get included, the current volume setting on the phone gets used as the default.

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RTPTx

Use the *RTPTx* URI to instruct the phone to transmit a Unicast RTP stream or to stop transmitting Unicast or Multicast RTP streams.

RTPTx URI Formats

RTPTx:i:p

RTPTx:Stop

Where

i = the IP Address to which an RTP stream is transmited.

p = the UDP port on which to transmit the RTP stream. Ensure that this is an even port number within the decimal range of 20480 to 32768.

Stop = the parameter that will stop any active RTP stream from being received on channel one

RTPMRx

The *RTPMRx* URI instructs the phone to receive a Multicast RTP.

RTPMRx URI Format

RTPMRx:i:p:v

Where

i = the Multicast IP Address from which to receive an RTP stream. For information on selecting a Multicast IP Address, see the *Cisco Unified Communications System SRND*, the *IANA guidelines*, and your local network administration policies.

p = the Multicast UDP port from which to receive the RTP stream. Ensure that this is an even port number within the decimal range of 20480 to 32768.

v = the optional volume setting that controls the volume of stream play out. The supplied value is a percentage of the maximum volume level of the device and must be in the range 0-100. The phone converts the specified percentage into the closest device-supported volume level setting and uses it. After the initial volume level gets set and the stream starts, you can manually change the volume level as needed. If the optional volume parameter does not get included, the current volume setting on the phone gets used as the default.

RTPMTx

The *RTPMTx* URI instructs the phone to transmit a Multicast RTP stream.

RTPMTx URI Formats

RTPMTx:i:p

Where

i = the Multicast IP Address to which an RTP stream is transmitted. For information on selecting a Multicast IP Address, see the Cisco Unified Communications System SRND, the IANA guidelines, and your local network administration policies.

p = the Multicast UDP port on which to transmit the RTP stream. Ensure that this is an even port number within the decimal range of 20480 to 32768.

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Play

The *Play* URI downloads an audio file from the TFTP server and plays through the phone speaker. This same mechanism also plays ring files, and the format of the files is the same. You could use the *Play* URI to play files that are in the Ringlist.xml or those that are not. If the phone is equipped with an message waiting light, the light will flash while the audio file is playing, providing a visual alert as well.

Note The *Play* URI is a synchronous request. If the request is pushed to the phone using HTTP, the HTTP response (*CiscoIPPhoneResponse* object) is not returned until after the playback has completed.

Play URI Interaction with Incoming Calls

The *Play* URI and incoming calls (ringing) have equal priority access to the DSP ringer resources resulting in the following interactions:

- If a *Play* URI is currently playing, an incoming call (ringing) will not preempt the *Play* URI; the *Play* URI will finish playing first.

- If the phone is ringing and a *Play* URI request is sent to the phone, the execution of the *Play* URI defers until the phone stops ringing (the DSP ringer resource becomes available) and then the *Play* URI will play.

Play URI Format

Play:f

Where

f = the filename of a raw audio file in the TFTP path (such as Play:Classic2.raw).

The audio files for the rings must meet the following requirements for proper playback on Cisco Unified IP Phones:

- Raw PCM (no header)

- 8000 samples per second

- 8 bits per sample

- uLaw compression

- Maximum ring size: 16080 samples

- Minimum ring size: 240 samples

- Number of samples in the ring is evenly divisible by 240.

- Ring starts and ends at the zero crossing.

To create PCM files for custom phone rings, you can use any standard audio editing packages that support these file format requirements.

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XSI Audio Path Control

The XSI Audio Path Control feature enables XSI calls to specify if the audio is played on the speakerphone or handset speaker of the phone.

Note The feature is available on Cisco Wireless IP Phone 8821.

The XSI Audio Path Control feature utilizes the RTP URI which has been extended to give the administrator this option to specify whether audio received via XSI is played through the speaker phone or handset speaker of the Cisco IP Phone.

RTP URI Format

RTPRx:i:p:v:s or RTPMRx:i:p:v:s

Where

i = equals IP address (x.x.x.x).

p = equals UDP port (20480-32768).

v = volume (0-100).

s = specifies where the audio for an XSI call should be played.

- If s = 0, then the audio for the XSI call will be played to the speaker phone.
- If s = 1, then the audio for the XSI call will be played to the handset speaker or headset.
- If s = 2, then the audio for the XSI call will be played to the current audio path.
- If s is not present, then the audio for the XSI call is played to the speaker phone.

Examples

XSI Audio Path	Stream Type	RTP URI Example
Speakerphone	Unicast	RTPRx:10.0.0.10:20500 RTPRx:10.0.0.10:20500::0 RTPRx:10.0.0.10:20500:100:0
Handset/Headset	Unicast	RTPRx:10.0.0.10:20500::1 RTPRx:10.0.0.10:20500:100:1
Speakerphone	Multicast	RTPMRx:10.0.0.10:20500 RTPMRx:10.0.0.10:20500::0 RTPMRx:10.0.0.10:20500:100:0
Handset/Headset	Multicast	RTPMRx:10.0.0.10:20500::1 RTPMRx:10.0.0.10:20500:100:1

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Device

The *Device* URI instructs the device to automatically unlock the input or display interface without the user unlocking the device manually.

The *Device* URI accepts these commands:

- (All phones) Unlock: If the device is configured to automatically lock the input or display interface, the normal idle timeout behavior applies and the device is automatically locked again.

- (8821 only) GeneratePRT and PRTStatus: See Create a Remote Problem Report with CiscoIPPhoneExecute, on page 41.

Device URI Format

Device:{command}

Where

command = The command the device follows:

- Type: Enum

- Valid Value: Unlock

- Default-value: N/A

Device URI Example

This alert example performs the following actions:

1. Plays a tone on the phone

2. Unlocks the phone

3. Displays an alarm message on the phone

```
<CiscoIPPhoneExecute>
  <ExecuteItem URL="Device:Unlock"/>
  <ExecuteItem URL="Play:alert.wav"/>
</CiscoIPPhoneExecute>
```

On processing the above command, the following response is sent:

```
<CiscoIPPhoneText>
<Title>Alert</Title>
<Prompt>Urgent</Prompt>
<Text>
Please go to room 1234.
</Text>
<SoftKeyItem>
<Name>Accept</Name>
<URL>http://<ip>/AlertResponse.jsp?reason=accept</URL>
</SoftKeyItem>
<SoftKeyItem>
<Name>Busy</Name>
<URL>http://<ip>/AlertResponse.jsp?reason=busy</URL>
</SoftKeyItem>
</CiscoIPPhoneText>
```

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Device URI Error and Response

When the *Device* URI is invoked from an Execute object, it uses the standard URI Status and Data values in the *ResponseItems*.

Condition	Status	Data
Executed successfully	0 (Success)	Success
URI syntax is invalid	1 (Parse error)	Invalid URI
URI is not supported	6 (Internal error)	URI not found

Telephony URIs

These sections describe the telephony URIs.

Dial

The *Dial* URI initiates a new call to a specified number. The *Dial* URI invokes when it is contained in a menu item, the menu item is highlighted, and the device is taken off hook.

Activate the *Dial* URI by one of the following methods:

- Line button

- Speaker button

- Headset button

- Handset hook switch

- Normal menu item

- Softkey item selection

Dial URI Format

Dial:{dialSequence}[:{useAppUI}:{applicationId}[:audibleFeedback]]

Where

dialSequence = The sequence of DTMF digits to be dialed. Commas represent 1 second pauses.

- Value Type: String

- Values: minLength=0, no maxLength, can only contain 0123456789#*ABCD and comma (,)

- Default value: N/A

useAppUI = Specifies whether or not this application will be used as the user interface for this call. A value of true will cause the application to keep UI focus when the call is made instead of switching to the Call UI application. The *appId* must be specified or this parameter will have no effect: it will always be false. This optional field is supported only on the Cisco IP Phone 8800 Series.

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- Value Type: boolean

- Values: 0 or 1 (0=false 1=true)

- Default value: 0

applicationId = The unique name of the XSI web application requesting this call. This optional field is supported only on the Cisco Unified IP Phone 7900, 8800, 8900, and 9900 Series.

- Value Type: String

- Values: minLength=1, no maxLength, cannot contain semicolons – should be in the format Company/Product.

- Default value: Nil, which means this dial request will not be associated with any application

audibleFeedback = Whether or not to provide audible feedback to the user when the DTMF digits are dialed. This optional field is supported only on the Cisco Unified IP Phone 8800 Series.

- Value Type: Boolean

- Values: 0, 1 (0=false 1=true)

- Default value: 1

EditDial

The *EditDial* URI initiates a new call to a specified number. The *EditDial* URI invokes when it is contained in a menu item and the menu item is highlighted.

Activate the *EditDial* URI by one of the following methods:

- Line button

- Speaker button

- Headset button

- Handset hook switch

- Normal menu item

- Softkey item selection

EditDial URI Format

EditDial:n

Where

n = the number dialed

Example

EditDial:1000 initiates a call to the phone with DN 1000.

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SendDigits

The *SendDigits* URI instructs the phone to send a specified sequence of DTMF digits in-band within the media stream of the current active (streaming) call.

Audible feedback to the user can be enabled or disabled and an optional application ID can be specified to ensure that the DTMF digits will only be sent to the call which is associated with a specific application.

SendDigits URI Format

SendDigits:dtmfSequence:audibleFeedback::applicationId

Where

dtmfSequence = the sequence of DTMF digits to be sent. Value must contain only 0123456789#*ABCD and comma (,). The comma represents a one second pause.

audibleFeedback = indicates whether to provide audible feedback to the user as the DTMF digits are entered. Values can be 0 (false) or 1 (true).

applicationId = optional identifier of the application associated with the call which must receive the DTMF digits. Value must be 0-64 and cannot contain colons. The default value is null indicating that the active call should receive the DTMF digits, regardless of any application association.

Example

Make a call using a calling card service that implements these steps:

1. Connects to a 800 calling card service (using the *Dial* URI).

2. Application waits to give call time to connect.

3. Dials the destination number, ensuring that the digits can only be dialed from this application.

4. Pauses 2 seconds.

5. Dials the calling card number.

6. Pauses 1 second.

7. Dials the pin number.

```
<CiscoIPPhoneExecute>
  <ExecuteItem URL="Dial:918005551212:1:Cisco/Dialer"/>
</CiscoIPPhoneExecute>
<CiscoIPPhoneExecute>
  <ExecuteItem URL="SendDigits:6185551212,,987654321,1234:1:Cisco/Dialer"/>
</CiscoIPPhoneExecute>
```

SendDigits Error and Response

When the *SendDigits* URI is invoked from an *Execute* object, it uses the standard URI Status and Data values in *ResponseItems*.

Condition	Status	Data
Executed successfully	0 (Success)	Success
URI syntax is invalid	1 (Parse error)	Invalid URI

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Condition	Status	Data
URI is not supported	6 (Internal error)	URI not found
Unable to execute URI because there currently is no active (streaming) call	6 (Internal error)	No Active Call
Unable to execute URI because the current active (streaming) call is not associated with the specified application	6 (Internal error)	No Active Call for Application
Phone is temporarily unable to execute URI due to some other transient issue	6 (Internal error)	<Failure>

Application Management URIs

These sections describe the application management URIs.

Init

The *Init* URI allows an application to initialize a feature or data with the argument that is passed with the URI.

Init URI Format

Init:o

Where

o = the Object name.

Valid object name:

- *CallHistory*: When the phone encounters an *Init:CallHistory* URI, it clears the internal call history logs that are stored in the phone. This action initializes Missed Calls, Received Calls, and Placed Calls.

- *Services*: When the phone encounters an *Init:SERVICES* URI, it closes the Services application. If Services is not currently open, it has no effect.

- *Messages*: When the phone encounters an *Init:Messages* URI, it closes the Messages application. If Messages is not currently open, it has no effect.

- *Directories*: When the phone encounters an *Init:Directories* URI, it closes the Directories application. If Directories is not currently open, it has no effect.

Notify

The *Notify* URI generates network notifications to back-end applications. This feature is most useful for XSI objects that support action handlers (such as displayable XSI objects and RTP streams). For example, use the

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Notify URI to deliver notifications to back-end applications when an XSI application is closed or when an RTP stream is terminated.

You can also specify the *Notify* URI in place of most fields that accept a generic URI, including softkeys and menu items. For example, you can call the *Notify* URI from a softkey or menu item to trigger a back-end event that does not require an interface change, such as manipulating the state of audio streams or other non-visual resources. The *Notify* URI also works in conjunction with the *QueryStringParam* URI, such that the exact contents of the *QueryStringParam* data will be used as the *Notify* URI data.

The *Notify* URI is not made in the context of an XSI application session and does not contain any HTTP cookie or session information. Thus, the back-end application cannot rely on HTTP cookies or session information to uniquely identify the client or application. Instead, the application must embed any necessary information in the *Notify* path and data fields, or leave the data field empty and rely on any default information provided by the specific event handler.

✎

Note   The *Notify* URI is not supported in the *Execute* object.

Notify URI Format

Notify:protocol:host:port:path:credentials:data

Where

protocol = network protocol to use for the *Notify* connection; http is the only supported protocol.

host = network host designated to receive the notification. Value must be entered as a hostname or IP address.

port = network port to use for the *Notify* connection. Value must be a number from 1-65535.

path = protocol-specific information. Value cannot contain colons or semicolons.

credentials = optional protocol-specific credentials used to authenticate to the server. For HTTP, this is a base64-encoded version of *userid:password*. Value cannot contain colors or semicolons. If the credentials parameter is not specified or if it is null, no Authorization header will be included in the request. The HTTP notification service will retry the request 3 times before failing and logging an error message.

data = optional application-specific event data. Value cannot contain semicolons.

Notify URI Examples

- Called from RTP *onStreamStopped* Event Handler, no credentials, with data:

```
Notify:http:myserver:8080:path/streamhandler?event=stopped:
:myStreamStoppedData
HTTP POST /path/streamhandler?event=stopped HTTP/1.1
Accept: */*
Content-Type: application/x-www-form-urlencoded; charset="UTF-8"
Host: myserver:8080
Content-Length: 23
DATA=myStreamStoppedData
```

- Called from RTP *onStreamStopped* Event Handler, no credentials, no data:

```
Notify:http:server:8080:path/streamhandler?event=stopped
HTTP POST /path/streamhandler?event=stopped HTTP/1.1
Accept: */*
Content-Type: application/x-www-form-urlencoded; charset="UTF-8"
Host: myserver:8080
```

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```
Content-Length: 40
DATA=<notifyStreamStopped id="stream1"/>
```

• Called from *SoftKey*, with credentials, with data:

```
Notify:http:myserver:8080:path/streamhandler?event=stopped:
8fh4hf7s7dhf :myStreamStoppedData
HTTP POST /path/streamhandler?event=stopped HTTP/1.1
Accept: */*
Authorization: Basic 8fh4hf7s7dhf
Content-Type: application/x-www-form-urlencoded; charset="UTF-8"
Host: myserver:8080
Content-Length: 23=
```

• Called from *SoftKey*, no credentials, no data

```
Notify:http:server:8080:path/streamhandler?event=stopped
HTTP POST /path/streamhandler?event=stopped HTTP/1.1
Accept: */*
Content-Type: application/x-www-form-urlencoded; charset="UTF-8"
Host: myserver:8080
Content-Length: 5
```

• Called from *SoftKey* with *QueryStringParam* URI:

```
<CiscoIPPhoneMenu>
  <MenuItem>
    <Name>Voicemail1</Name>
    <URL>QueryStringParam:id=1</URL>
  </MenuItem>
  <MenuItem>
    <Name>Voicemail2</Name>
    <URL>QueryStringParam:id=2</URL>
  </MenuItem>
  <SoftKeyItem>
    <Name>Play</Name>
    <URL>Notify:http:vmailSrvr:8080:path/play</URL>
  </SoftKeyItem>
</CiscoIPPhoneMenu>
```

If the Voicemail2 menu item was selected when the Play softkey was pressed, the following notification would be sent:

```
HTTP POST /path/play HTTP/1.1
Accept: */*
Content-Type: application/x-www-form-urlencoded; charset="UTF-8"
Host: vmailSrvr:8080
Content-Length: 9
DATA=id=2
```

Application

The *Application* URI is a component of the Application Management API, which provides an improved hand-off between call mode and application mode. The *Application* URI allows applications to request changes to their application or window state. Applications can request to change focus, to be minimized, or to be closed.

Note The other component of the Application Management API is the Application Management Event Handler.

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When an *Application* URI request is made, it has a specific application associated with it (not just the application context) and that action can only be taken on that specific application. The application specified in the *appId* parameter (of the displayable XML object) must be active at the time the action is requested, or an error will be returned.

This prevents open, but not active, applications which are buried on the application "stack" from closing the entire application context which would also close the active application, potentially disrupting the user's interaction with the application. This also means that if an application closes or becomes non-active (for example, if user navigates out of an application, or a new application is pushed to the context) any pending *Application* URI requests are immediately cancelled.

Related Topics

App URI Format

App:action:priority:idleTimer:applicationId

Where

action = action to be taken with the application. Values include:

- *RequestFocus*: Makes a request to the application manager to bring the application context (window) containing this application into focus (maximize). This is a request, not a demand, as higher priority applications may prevent the application from actually gaining focus. Applications must use *onAppFocusGained* event handlers to know when focus is actually gained.

    - If the requested application is Open, but not currently Active, this request will not succeed (error response).

    - If the application already has focus, the request has no effect.

- *ReleaseFocus*: Makes a request to the application manager to relinquish focus to another application context (essentially, a "move-to-back" request). Applications must use *onAppFocusLost* event handlers to know when focus is actually lost.

    - If the application does not have focus, the request has no effect.

    - If there are no other applications open (available to receive focus) then this application will retain focus.

- *Minimize*: Makes a request to the application manager to minimize the application context containing this application. This request always results in the application (eventually) being minimized. If the application has focus when this URI executes, the *onAppFocusLost* event handler will be invoked first, then the *onAppMinimize* handler.

    - If the requested application is Open, but not currently Active, this request will not succeed (error response).

    - If the application is already minimized, the request has no effect.

- *Close*: Makes a request to the application manager to close the application context containing this application.

    - If the requested application is open, but not currently active, this request will not succeed (error response). This request will result in the application context (and all applications within that context) being closed.

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• If the application has focus when this URI executes, the *onAppFocusLost* event handler will be invoked prior to the *onAppClosed* event handler (which will always be invoked).

priority = priority at which the action should be take. Values include:

• 0: Do immediately, even if user is interacting with the phone. This priority is unavailable if the *Application* URI is contained within an Application Management Event Handler.

• 1: Do when user is done interacting with the phone.

• 2: Do only if the user is not interacting with the phone.

idleTimer = duration of time (in seconds) the phone or application must be idle before the action should be taken. Values must range from 10-86400 (seconds); default is 60 seconds. The *idleTimer* value has no effect on priority=0 requests. Any pending timers are automatically cancelled when the displayable object changes for an application context.

applicationId = optional identifier of the application on which the action should be taken. Values must range in length from 1-64 string characters and cannot contain colons. The default value is the application of the displayable object in which the URI is defined.

Note   If the *Application* URI is used in an ExecuteItem, you must specify the *applicationId* because the application context of the request cannot be inferred.

App URI Error and Response

All *Application* URI requests are asynchronous, so the only return value indicates that the URI was successfully parsed and that the specified application was valid and currently active in its context. The application is notified of the actual state change asynchronously using the event handlers.

Condition	Status	Data
Executed successfully	0 (Success)	Success
URI syntax is invalid	1 (Parse error)	Invalid URI
Unknown application ID	6 (Internal error)	Unknown Application ID
Request made to change state of an application that is not current active	6 (Internal error)	Application is not Active

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CHAPTER 6

HTTP Requests and Header Settings

HTTP Requests and Header Settings Overview

Cisco Unified IP Phones use HTTP to communicate to external applications. The phone firmware includes an HTTP client for making requests and an HTTP server for receiving requests. This chapter describes the capabilities of the HTTP interface.

HTTP Client Requests (HTTP GET)

The following description designates how HTTP client requests are handled:

1. The phone HTTP client performs an HTTP GET for a specified URL.

2. The HTTP server processes request and returns an XML object or plain text.

3. The phone processes the supported HTTP headers.

4. The phone parses the XML object if *ContentType* is text/xml.

5. The phone presents data and options to the user, or in the case of a *CiscoIPPhoneExecute* object, begins executing the URIs.

HTTP Server Requests (HTTP POST)

The following description designates how an HTTP server request is made to the phone using an HTTP POST operation:

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1. The server performs an HTTP POST in response to a case-sensitive URL of the phone with this format: *http://x.x.x.x/CGI/Execute*, where *x.x.x.x* represents the IP address of the destination Cisco Unified IP Phone.

    The form that is posted should have a case-sensitive form field name called "XML" that contains the desired XML object. For any HTTP POST operation, the server must provide basic HTTP authentication information with the POST. The provided credentials must be of a user in the global directory with a device association with the target phone.

    If the credentials are invalid, or the Authentication URL is not set properly in the Cisco Unified Communications Manager Administration, the phone will return a CiscoIPPhoneError with a value of 4 (Authentication Error) and processing will stop.

2. The phone processes the supported HTTP headers

3. The phone parses and validates the XML object

4. The phone presents data and options to the user, or in the case of a *CiscoIPPhoneExecute* object, begins executing the URIs.

Any HTTP POST object is limited to 40 Kbytes in size. Larger objects (such as images) can only be delivered to the phone using HTTP GET. To push large objects to the phone, the server application must take an indirect approach, by pushing an Execute object to the phone that contains an *ExecuteItem* that points to the URL of the large object.

> **Note**   JTAPI can push an XML object directly to an IP phone, with the added benefit of not requiring authentication (because the JTAPI connection itself is already authenticated). This option works particularly well for adding XML services interfaces to existing CTI applications (where the overhead of the CTI connection is already a requirement). Objects pushed using JTAPI are also limited to a maximum size of 512 bytes. For more information, see the *Cisco Unified Communications Manager JTAPI Developer Guide*.

HTTP Header Settings

The following list provides definitions for HTTP header elements for Cisco Unified IP Phone Services:

*   Refresh: sets the refresh time (in seconds) and URL

    *   If no time is set or it is zero, the refresh gets set to manual.

    *   If no URL is set, the current URL gets used.

*   ContentType: notifies the phone of the MIME type that was sent.

*   Expires: sets the Date/Time in GMT when the page is to expire.

    Pages that have expired before being loaded do not get added to the URL stack in the phone. The phone does not cache content.

*   Set Cookie

*   HTTP encoding header

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HTTP Refresh Setting

The HTTP headers that are sent with any page from an HTTP server can include a Refresh setting. This setting comprises two parameters: a time in seconds and a URL. These two parameters direct the recipient to wait the time given in the seconds parameter and then get the data to which the URL points.

The Cisco Unified IP Phone HTTP client properly supports this setting, which gives a great deal of power to service developers. It means that a new page can replace any XML object that displays after a fixed time.

The following figure shows an example of how to use the refresh setting. This sample page shows the user the current value of Cisco stock.

- A splash screen that displays the Yahoo logo.

- After a very short time, the screen displays the numeric Cisco stock parameters.

- Finally, the screen shows a graph of Cisco intraday stock performance. The display repeatedly cycles between the final two views.

Figure 12: Refresh Display Sample
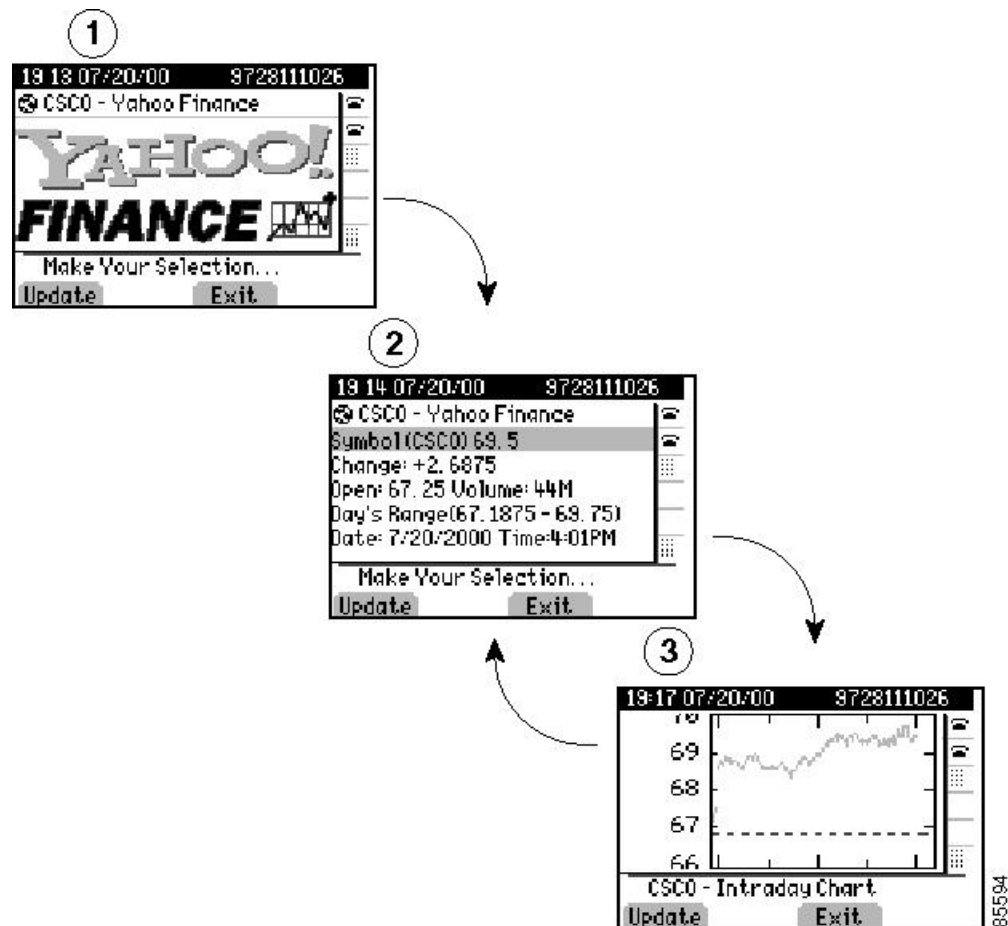
Refreshing the display can occur without user intervention, because the display automatically cycles if a timer parameter is specified. On any given screen, however, the user can force an immediate reload by pressing the Update softkey. Also, if a timer parameter of 0 was sent in the header, the page never automatically reloads.

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In this case, the display will move to the next page only when the Update softkey is pressed. If no refresh URL is specified, the current page gets reloaded.

MIME Type and Other HTTP Headers

Although delivering pages with the proper MIME type and other formatting items is not difficult, you require a moderately in-depth knowledge of your web server. The following code excerpt, written in JavaScript and used with Microsoft IIS and ASP, sets these values in a few lines:

```
<%@ Language=JavaScript %>
<%
Response.AddHeader( "Refresh",
                    "3; url=http://services.cisco.com/s/q.asp");
Response.ContentType = "text/xml";
//
// Additional page content here
//
%>
```

Usually, you can set the MIME type for pages in any web server by simply performing an association to the .xml file extension. Your web server documentation should explain how to accomplish this association. This action allows you to serve static pages without the need for writing script.

If you want to deliver dynamic content by using the other supported HTTP headers, you need to understand how to generate the HTTP headers using the desired programming language and have common gateway interface (CGI) or script access on the target web server.

Audio Clips

You can serve audio clips to the phone from a web server by using the "audio/basic" MIME type setting. When this MIME type is used, the body of the response should contain raw audio data in the same format that is used for custom IP phone rings. For more information, see the "Custom Phone Rings" chapter in the *Cisco Unified Communications Manager System Guide* (also available in the online help) and the phone administration guide.

Note The audio file should not be longer than five seconds.

Use the following ASP sample script to set the MIME type and to serve the file that is specified in the #include command:

```
<%@ Language=JavaScript%>
<%
Response.ContentType = "audio/basic";
%><!--#include file="filename.raw" --><% Response.End();%>
```

Using a script to generate the MIME header when playing a sound provides an advantage because you may also include a refresh header to take the phone to a subsequent URL. Usually, you can set the MIME type for pages in any web server by simply performing an association to the .xml or .raw file extension. Your web server documentation should explain how to accomplish this. This action allows you to serve static pages without the need for writing script.

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Content Expiration Header Setting

The expiration header can control which URLs are added to the phone URL history. This behavior differs slightly from traditional web browsers but is implemented to perform the same function. Disable the Back button functionality to avoid calling a URL twice.

This functionality allows you to expire the content of any page that is sent to the phone. When a user presses the Exit softkey, the user goes back to the last URL that did not expire when it was loaded. This action differs from traditional browsers by not considering the current freshness of the data but the freshness of the data when the URL was requested. This functionality requires you to have a page expire when it is first loaded and to not set a time and date in the future.

The following example shows how to have content on IIS expire by using Active Server Page (ASP):

```
<%@ Language=JavaScript %>
<%
   Response.ContentType = "text/xml";
   Response.Expires = -1;
%>
```

The "Expires" property specifies the number of minutes to wait for the content to expire. Setting this value to -1 subtracts 1 minute from the request time and returns a date and time that have already passed.

Note   The Cisco IP Phone 8800 Series requires that the expire date be after 1970/1/1.

Set-Cookie Header Setting

A *cookie* is the term for a mechanism that the Web server uses to give the client a piece of data and have the client return the data with each request. The two traditional uses for cookies are:

For Web sites to store a unique identifier or other information on the client's file system. The information is available to the Web server on subsequent visits.

To track a unique identifier for state management. The client returns the cookie with each request and the server uses this identifier to index information about the current session. The identifier is commonly referred to as a session ID. Most Web servers have a built-in session management layer that uses this second type of cookie, which is commonly referred to as a session cookie.

The following example shows the Set-Cookie header that is returned to the browser when a request method is used:

```
Set-Cookie: ASPSESSIONIDGQGQGRLS=OCPNMLFDBJIPNIOOKFNFMOAL; path=/
```

The Cisco Unified IP Phone can receive and use a total of four cookies per host per session and can store information for up to eight sessions at once. Each cookie can be up to 255 bytes in size. These cookies are available until the server terminates the session or the client session has been idle for more than 30 minutes. On many phones which are capable of running multiple applications concurrently, the session state is also cleared when the application window closes. This behavior is consistent with PC-based browsers and provides better security because anyone attempting to reopen a secure application would be forced to authenticate. If the client is connecting to a new server and all session resources are in use, the client clears and reuses the session with the longest inactivity time.

When using ASP on IIS, the default server configuration automatically generates a session cookie and sends the cookie to the client using the Set-Cookie header. This cookie enables you to use the Session object from

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within ASP to store and retrieve data spanning multiple requests for the life of the session. When using JSP on Tomcat, the default configuration generates and issues a session cookie.

HTTP Encoding Header Setting

The encoding header controls language and character settings related to localization.

Accept Language

Cisco Unified IP Phones populate the Accept-Language HTTP request header in compliance with the HTTP specification.

For example, the Accept-Language value advertised by a phone configured for the English_United_States user locale would look like:

```
Accept-Language: en-US
```

Accept Charset

The phones are capable of handling UTF-8 encoding and, depending on phone model, some degree of Unicode support.

In addition to the character set for the currently configured user locale, the phones also support ISO-8859-1 characters in their font files.

All phones advertise their supported encodings using the standard HTTP Accept-Charset header. According to the HTTP standard, q-values are used to specify preferred encodings. The older phone models, with more limited UTF-8 support, specify a lower q-value for UTF-8 than the default user locale encoding.

For example, an older phone model configured with the English_United_States user locale would include an Accept-Charset header similar to the following:

```
Accept-Charset: iso-8859-1, utf-8;q=0.8
```

A newer phone model with Unicode support would advertise an Accept-Charset similar to the following:

```
Accept-Charset: utf-8,iso-8859-1;q=0.8
```

HTTP Response Headers: Content-Type

Because the phones are capable of supporting multiple character encodings, HTTP responses returned to the phones should include the charset parameter on the HTTP Content-Type header. The following are examples of responses including the charset parameter:

```
Content-Type: text/xml; charset=ISO-8859-1
Content-Type: text/xml; charset=UTF-8
Content-Type: text/plain; charset=Shift_JIS
```

HTTP standards state that if the encoding is not explicitly specified, ISO-8859-1 is the default. Cisco Unified IP Phones are typically compatible with this spec, but not fully compliant.

If charset is not specified, the phones use the default encoding for the currently configured user locale. To avoid possible problems where the default encoding may not be ISO-8859-1, the web server should explicitly set the Content-Type charset to match one of the Accept-Charset values specified by the phone.

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IP Phone Client Capability Identification

XML services are supported on many Cisco IP Phones, so web application servers must identify the capabilities of the requesting IP phone to optimize the content returned to the phone. For example, if the requesting phone is a Cisco IP Phone 7841, which cannot support color PNG images, the application server must be able to identify this limitation and return a gray scale CIP image instead.

The IP phone client request to send the relevant information from the IP phone to the web server application includes these HTTP headers:

- x-CiscoIPPhoneModelName

- x-CiscoIPPhoneDisplay

- x-CiscoIPPhoneSDKVersion

x-CiscoIPPhoneModelName

This Cisco-proprietary header contains the Cisco manufacturing Model Name of the device, which can typically be found by going to the Settings menu on the phone. The navigation path vary from models. Here are some examples:

- On Cisco IP Phones with Multiplatform Firmware:

  Settings > **Status** > **Product**

- On Cisco IP Phones On-Premises:

  Settings > **System Information** > **Phone Information**

  On Cisco Video Phone 8875 and Cisco Desk Phone 9800 Series:

  Settings > **About this device**

Some examples of manufacturing Model Names are CP-7861, CP-8875, CP-8845, and DP-9841.

x-CiscoIPPhoneDisplay

This Cisco-proprietary header contains the display capabilities of the requesting device with the following parameters (listed in the order in which they appear):

- Width (in pixels)

- Height (in pixels)

- Color depth (in bits)

- A single character indicating whether the display is color ("C") or gray scale ("G")

These parameters get separated by commas as shown in the following example header:

```
x-CiscoIPPhoneDisplay: 298, 168, 12, C
```

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Note   The pixel resolutions advertised by the device define the area of the display accessible by the phone services; not the actual resolution of the display.

x-CiscoIPPhoneSDKVersion

This Cisco-proprietary header contains the version of the IP Phone Services SDK that the requesting phone supports. The HTTP header does not specify which URIs are supported. Therefore, you must check the Supported URIs matrix in the IP Phone Services SDK to determine which URIs are supported based on the Phone Model Name and supported SDK version.

Note   Beginning with the IP Phone Services SDK 3.3(3), the SDK version number matches the minimum Cisco Unified Communications Manager software that is required to support it. For example, SDK version 3.3(4) gets supported only on Cisco Unified Communications Manager version 3.3(4) or later.

Related Topics

Accept Header

The Accept header represents a standard HTTP header that is used to inform web servers about the content-handling capabilities of the client.

Cisco Unified IP Phones include proprietary content-types to indicate which XML objects are supported. These proprietary content-types all begin with x-CiscoIPPhone, to indicate Cisco Unified IP Phone XML objects, followed by a slash "/", followed by either a specific XML object or a "*" to indicate all objects.

For example, x-CiscoIPPhone/* indicates that all XML objects defined in the specified version of the SDK are supported, and x-CiscoIPPhone/Menu specifies that the **<CiscoIPPhoneMenu>** object gets supported.

As the Menu example illustrates, the name of the XML object can be derived directly from the content-type by appending the sub-type (the part after the slash) onto CiscoIPPhone. The content-type can also include an optional version to indicate support for a particular SDK version of that object. If a version is not specified, then the x-CiscoIPPhoneSDKVersion is implied. The syntax of the version number may vary, but, in general, will be as follows:

```
<major version>.<minor version>.<maintenance version>
```

Here are some examples of typical content-types:

- x-CiscoIPPhone/*;version=3.3.3

- x-CiscoIPPhone/Text

- x-CiscoIPPhone/Menu;version=3.3.4

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IP Phone Information Access

Cisco Unified IP Phones have an embedded web server to provide a programming interface for external applications, and a debugging and management interface for system administrators.

You can access the administrative pages using a standard web browser and pointing to the IP address of the phone with: **/http://<phoneIP>/**, where **phoneIP** is the IP address of the specific phone.

These device information pages are available in either HTML format for manual debugging purposes, or in XML format for automation purposes. The following table lists the available URLs and their purpose.

Table 30: Device Information URLs

HTML URL	XML URL	Description
/DeviceInformation	/DeviceInformationX	General device information
/NetworkConfiguration	/NetworkConfigurationX	Network configuration information
/EthernetInformation	/EthernetInformationX	Ethernet counters
/PortInformation?n	/PortInformationX?n	Detailed port information, where *n* is a model-specific ethernet port identifier, typically in the range 1-3.
/DeviceLog?n	/DeviceLogX?n	Device logging, debug, and error messages, where *n* is a model-specific log number, typically in the range 0 - 2.
/StreamingStatistics?n	/StreamingStatisticsX?n	Current RTP streaming stats, where *n* is model-specific RTP stream identifier, typically in the range 1-3.
/CGI/Execute (password-protected CGI script)		The target URL of a phone push (HTTP POST) request.
/CGI/Screenshot (password-protected CGI script)		Returns an exact snapshot of the current phone display. The size and format of the image returned is model-specific

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Troubleshooting Cisco Unified IP Phone Service Applications

Troubleshooting Tips

The following tips apply to troubleshooting Cisco Unified IP Phone service applications:

- Microsoft Internet Explorer 5 or higher can display the XML source with its default style sheet.

- Understand that standard IP troubleshooting techniques are important for HTTP errors.

- Externally verify name resolution (Phone has DNS set).

- If DNS is suspected, use IP addresses in URLs.

- Browse the URL in question with Microsoft Internet Explorer or download and verify with another web browser.

- Use a logged telnet session to verify that the desired HTTP headers are returned (telnet to the server on port 80, and then enter: get /path/page).

Related Topics

Troubleshooting CiscoIPPhoneIconFileMenu XML Objects Using Enhanced Icon Menu Support Feature, on page 37

XML Parsing Errors

The following tips apply to troubleshooting XML parsing errors in Cisco Unified IP Phone services applications:

- Verify the object tags (the object tags are case sensitive).

- Verify that "&" and the other four special characters are used according to the restrictions while inside the XML objects.

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- Validate XML applications developed prior to Cisco Unified IP Phone Firmware Release 8.3(2) against the more recent XML parser. Some of examples of the types of errors you might encounter include:

  - CiscoIPPhoneMenu Object: If the field `<Name>` is missing for a `<MenuItem>`, the original parser would stop rendering from that `<MenuItem>` onwards. The new parser will display a blank line in the menu list and continue to render any subsequent `<MenuItem>` definitions.

  - CiscoIPPhoneDirectory Object: If the field `<Name>` is not present, the old original parser would not display the directory entry, the new parser will display the directory entry, but there will be no `<Name>` associated with it.

  - CiscoIPPhoneInput Object: The `URL` and `QueryStringParam` fields are mandatory. The original parser would not report an error on the missing URL and on submit request would display a "Host not Found" message. If the `QueryStringParam` field is missing, the updated parser will report an error.

  - SoftKeyItem: The `Position` field is mandatory. If the `Position` field is not present, the updated XML parser will report an error.

Related Topics

Error Messages

The following error messages may appear on the prompt line of the Cisco Unified IP Phone display:

- `XML Error[4] = XML Parser error (Invalid Object)`

- `XML Error[5] = Unsupported XML Object (not supported by this phone model)`

- `HTTP Error[8] = Unknown HTTP Error`

- `HTTP Error[10] = HTTP Connection Failed`

The Cisco Unified IP Phone 6900 Series supports the following error messages:

Text	Description
Services Unavailable	cfg file directoryURL or servicesURL is empty
Host Not Found	DNS query fails
Server Busy!	Server response 503
Connection failed	Socket cannot be created or the connection fails
XML Error [4]: Parse Error	Does not match XML schema
Data too large!	Downloaded content is over 196608 bytes
No services configured	HTTP message body is empty

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Text	Description
Filename too long!	file name length is over 127 characters.
File Not Found	Server response 404
HTTP connection failed	Server response 500
Unknown Error	Other errors

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Cisco IP Phone Services Software Development Kit (SDK)

SDK Overview

The Cisco IP Phone Services Software Development Kit (SDK) contains everything that you require to create XML applications, including necessary documentation and sample applications. Contact Cisco DevNet to obtain the SDK at:

https://developer.cisco.com/site/ip-phone-services/documentation/

SDK Components

The SDK contains the following components.

Documentation

- *Cisco IP Services Development Notes* (PDF format)

- *Cisco URL Proxy Guide* (Rich Text Format)

- *Cisco LDAP Programming Guide* (Microsoft Word format)

- *Cisco CIP Image Release Notes* (Microsoft Word format)

- *Cisco IP Applications Samples* (Microsoft Word format)

Development Tools

- Cip.8bi: Adobe Photoshop plug-in that allows .cip extensions to be viewed and saved.

- Cip2Gif.exe: DOS-based program that converts .cip files to .gif.

- Gif2Cip.exe: DOS-based program that converts .gif files to .cip.

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- ImageViewer.exe: Windows application that displays .cip graphic files.

- Cisco CIPImage: used for converting images to and from CIP images (automatically installed)

- Cisco URL Proxy: Proxy server that is needed to use the sample services (automatically installed).

- Cisco LDAP Search: Service that is installed to do LDAP searches (automatically installed).

- Microsoft XML Parser (MXSML) 3.0: Used for parsing XML data (automatically installed)

- Cisco Unified IP Phone Services ASP/Javascript Library (automatically installed)

- Cisco Unified IP Phone Services Java Library: Used by the JSP apps (manually installed; see *JSP Install* readme)

- CallManager Simulator: Used for developing Phone Services without a Cisco Unified Communications Manager server

- Cisco Unified IP Phone XML Schema (.xsd) file: Used with an XML editor to validate XML syntax

Sample Services

- Weather forecast lookup for any city (ASP)

- Currency Exchange Rates and Converter (ASP)

- UPS Rates & tracking (ASP)

- World Clock (ASP)

- Measurement conversions (ASP)

- US White pages/Yellow Pages search (ASP)

- Calendar (ASP)

- Stock Ticker (ASP)

- Stock Chart (ASP)

- Push2Phone (ASP and JSP)

- Click2Dial (ASP and JSP)

- IdleURL (ASP) - Not supported on Cisco Unified IP Phones 7905G and 7912G

- MConference (JSP)

- Hootie (ASP)

- InterCom (ASP)

- JPEGViewer (ASP)

- Logo (ASP)

- Clock (ASP)

- Personal Service (ASP)

- WaterMark (ASP)

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  - Extension Mobility Controller (JSP)

  - Speed Dials (JSP)

  - Group MWI (JSP)

  - AutoDialer (JSP)

  - PhotoDirectory (JSP)

  - CallerInfo (JSP)

  - PushAuthenticate (ASP)

  - ScreenShot (ASP)

  - Integrating RS-232 devices with IP Telephony Applications (OtherApps)

  - PNGViewer (ASP)

  - Keyboard (ASP)

  - MultiDirectory (ASP)

  - Phone Push Step and Subsystem (Cisco Unified Contact Center Express / CRS)

Sample Services Requirements

The following list contains the items that are required for the sample services to work properly:

  - Microsoft IIS 4.0 or later (for ASP sample services)

  - Sun J2SE 1.4.2 or later and Tomcat 4.0 or later (for JSP sample services)

  - Internet Connection to external websites like Yahoo.com, Cnn.com etc.

  - Cisco Unified Communications Manager 4.1(2) or later.

  - PhoneOS 2.1(1) or later (Only for Cisco Video Phone 8875 and Cisco Desk Phone 9800 Series)

  - Cisco IP Phones or Wireless Phones that supports XML services

The setup program installs a CiscoServices web project to c:\CiscoIpServices directory. The sample services are copied to c:\CiscoIpServices\Services subdirectory, and IIS and WSH example codes are provided. The web server already senses these services and you do not require further administration. You can view or edit all the source code with any text editor. For additional documentation, go to this directory: c:\CiscoIpServices\Documentation. Find tools to help develop services in c:\CiscoIpServices\Tools.

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CHAPTER 9

IP Phone Service Administration and Subscription

Administration and Subscription Overview

Cisco Unified Communications Manager administrators maintain the list of services to which users can subscribe. Administrators must use Cisco Unified Communications Manager Administration to add and administer Cisco Unified IP Phone services.

Note This chapter provides a brief overview about managing IP Phone services. For detailed up-to-date instructions, refer to the *Cisco Unified Communications Manager Administration Guide* available at the following URL:

http://www.cisco.com/c/en/us/support/unified-communications/unified-communications-manager-callmanager/products-maintenance-guides-list.html

Phone Service Administration Access

To access phone service administration, open Cisco Unified Communications Manager Administration and choose **Device** > **Device Settings** > **Phone Services**:

- Phone services can have any number of parameters associated with them.

- You can specify phone service parameters as optional or required, depending on how the phone service application defines them.

- Users can subscribe to any service configured in their cluster, using their User Options web pages.

- Service subscriptions currently occur on a device basis.

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A URL constitutes the core of each service. When a service is chosen from the menu, the URL gets requested using HTTP, and a server somewhere provides the content. The Service URL field shows this URL entry. For the services to be available, the phones in the Cisco Unified Communications Manager cluster must have network connectivity to the server.

Example

http://<servername>/ccmuser/sample/sample.asp

Where

<servername> designates a fully qualified domain name or an IP address.

Phone Service Addition

To access phone service administration, open Cisco Unified Communications Manager Administration and choose **Device** > **Device Settings** > **Phone Services**:

The Cisco Unified Services Configuration page in Cisco Unified Communications Manager Administration contains the fields as shown in the following table.

Table 31: IP Phone Service Configuration Settings

Field	Description
Service Information	
Service Name	Enter the name of the service as it will display on the menu of available services in Cisco Unified CM User Options. Enter up to 32 characters for the service name.
ASCII Service Name	Enter the name of the service to display if the phone cannot display Unicode.
Service Description	Enter a description of the content that the service provides.

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Field	Description
Service URL	Enter the URL of the server where the IP phone services application is located. Make sure that this server remains independent of the servers in your Cisco Unified Communications Manager cluster. Do not specify a Cisco Unified Communications Manager server or any server that is associated with Cisco Unified Communications Manager (such as a TFTP server or directory database publisher server).
	For the services to be available, the phones in the Cisco Unified Communications Manager cluster must have network connectivity to the server.
	When defining the service URL, you can embed a special #DEVICENAME# substitution tag within the URL. This tag provides a convenient method for IP phones to pass their device name to a web application server. For example, if a service URL was defined in Cisco Unified Communications Manager Administration as: http://myserver/myscript?name=#DEVICENAME#, when a phone actually makes the HTTP request for the service, the requested URL will appear as: http://myserver/myscript?name=SEP000123456789
Secure-Service URL	Enter the secure URL of the server where the Cisco Unified IP Phone services application is located. Make sure that this server remains independent of the servers in your Cisco Unified Communications Manager cluster. Do not specify a Cisco Unified Communications Manager server or any server that is associated with Cisco Unified Communications Manager (such as a TFTP server or publisher database server).
	For the services to be available, the phones in the Cisco Unified Communications Manager cluster must have network connectivity to the server.
	Note If you do not provide a Secure-Service URL, the device uses the nonsecure URL. If you provide both a secure URL and a nonsecure URL, the device chooses the appropriate URL, based on its capabilities.
Service Category	Select a service application type.
Service Type	Select whether the service will be provisioned to the Services, Directories, or Messages button.
Service Vendor	For XML services, you can leave this field blank.
Service Version	For XML services, you can leave this field blank.
Enable	Select this check box to enable the service, or clear the check box to disable the service without deleting it.
	Note You cannot delete default services. Use this field if a default service exists, but you do not want to make it available for subscription.

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Field	Description
Enterprise Subscriptions	Select this check box to automatically provision the new service to all devices in the enterprise without requiring individual subscription. If this option is selected, the service automatically gets provisioned and does not get presented for user subscription. **Note** Be aware that this check box is available for selection only when the service is created. You cannot modify it.

IP Phone Service Parameters Definition

Each service can have a list of parameters. You can use these parameters, which are appended to the URL when they are sent to the server, to personalize a service for an individual user. Examples of parameters include stock ticker symbols, city names, or user IDs. The service provider defines the semantics of a parameter.

The Cisco Unified IP Phone Service Parameter Configuration page in Cisco Unified Communications Manager Administration contains the fields as described in the following table.

Table 32: IP Phone Service Parameter Settings

Field	Description
Service Parameter Information	
Parameter Name	Enter the exact query string parameter to use when you build the subscription URL; for example, symbol.
Parameter Display Name	Enter a descriptive parameter name to display to the user in Cisco Unified CM User Options; for example, Ticker Symbol.
Default Value	Enter the default value for the parameter. This value displays to the user when a service is being subscribed to for the first time; for example, CSCO.
Parameter Description	Enter a description of the parameter. The user can access the text that is entered here while the user is subscribing to the service. The parameter description should provide information or examples to help users input the correct value for the parameter.
Parameter is Required	If the user must enter data for this parameter before the subscription can be saved, check the Parameter is Required check box.

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Field	Description
Parameter is a Password (mask contents)	You can mask entries in Cisco Unified CM User Options, so asterisks display rather than the actual user entry. You may want to do this for parameters such as passwords that you do not want others to be able to view. To mask parameter entry, select the Parameter is a Password (mask contents) check box in the Configure IP phone service Parameter window in Cisco Unified Communications Manager Administration.

Note If you change the service URL, remove a Cisco Unified IP Phone service parameter, or change the Parameter Name of a phone service parameter for a phone service to which users are already subscribed, be sure to click Update Subscriptions to update all currently subscribed users with the changes. If you do not update subscriptions, users must resubscribe to the service to rebuild the URL correctly.

User Service Subscription

End users can configure service subscriptions using the Cisco Unified CM User Options pages. After users log in and choose a device, a list of services that are assigned to the phone display. The user can configure these services, adding additional ones or removing unused services. These password-protected windows are authenticated using the LDAP directory.

Users can personalize their services using the User Options pages to:

- Customize the name of the service.

- Enter any available service parameters.

- Review the description of each parameter.

After all the required fields are set, the user clicks Subscribe to add the services. A custom URL gets built and stored in the database for this subscription. The service then appears on the device services list.

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CiscoIPPhone XML Object Quick Reference

The following sections provide a quick reference of the CiscoIPPhone XML objects and the definitions that are associated with each object.

CiscoIPPhoneMenu

```
<CiscoIPPhoneMenu>
  <Title>Title text goes here</Title>
  <Prompt>Prompt text goes here</Prompt>
  <MenuItem>
    <Name>The name of each menu item</Name>
    <URL>The URL associated with the menu item</URL>
  </MenuItem>
</CiscoIPPhoneMenu>
```

CiscoIPPhoneText

```
<CiscoIPPhoneText>
  <Title>Title text goes here</Title>
  <Prompt>The prompt text goes here</Prompt>
  <Text>Text to display as the message body goes here</Text>
</CiscoIPPhoneText>
```

CiscoIPPhoneInput

```
<CiscoIPPhoneInput>
  <Title>Directory title goes here</Title>
  <Prompt>Prompt text goes here</Prompt>
  <URL>The target URL for the completed input goes here</URL>
  <InputItem>
    <DisplayName>Name of input field to display</DisplayName>
    <QueryStringParam>The parameter to be added to the target URL</QueryStringParam>
    <DefaultValue>Value</DefaultValue>
    <InputFlags>The flag specifying the type of allowable input</InputFlags>
  </InputItem>
</CiscoIPPhoneInput>
```

CiscoIPPhoneDirectory

```
<CiscoIPPhoneDirectory>
  <Title>Directory title goes here</Title>
  <Prompt>Prompt text goes here</Prompt>
  <DirectoryEntry>
    <Name>The name of the directory entry</Name>
    <Telephone>The telephone number for the entry</Telephone>
```

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```
    </DirectoryEntry>
</CiscoIPPhoneDirectory>
```

CiscoIPPhoneImage

```
<CiscoIPPhoneImage WindowMode="XSI window width mode">
  <Title>Image title goes here</Title>
  <Prompt>Prompt text goes here</Prompt>
  <LocationX>Position information of graphic</LocationX>
  <LocationY>Position information of graphic</LocationY>
  <Width>Size information for the graphic</Width>
  <Height>Size information for the graphic</Height>
  <Depth>Number of bits per pixel</Depth>
  <Data>Packed Pixel Data</Data>
   <SoftKeyItem>
    <Name>Name of the soft key</Name>
    <URL>URL of soft key</Name>
    <Position>Numerical position of the soft key</Position>
   </SoftKeyItem>
</CiscoIPPhoneImage>
```

CiscoIPPhoneImageFile

```
<CiscoIPPhoneImageFile WindowMode="Width Mode of XSI window">
  <Title>Image Title goes here</Title>
  <Prompt>Prompt text goes here</Prompt>
  <LocationX>Horizontal position of graphic</LocationX>
  <LocationY>Vertical position of graphic</LocationY>
  <URL>Points to the PNG image</URL>
</CiscoIPPhoneImageFile>
```

CiscoIPPhoneGraphicMenu

```
<CiscoIPPhoneGraphicMenu WindowMode="Width Mode of XSI window">
  <Title>Menu title goes here</Title>
  <Prompt>Prompt text goes here</Prompt>
  <LocationX>Position information of graphic</LocationX>
  <LocationY>Position information of graphic</LocationY>
  <Width>Size information for the graphic</Width>
  <Height>Size information for the graphic</Height>
  <Depth>Number of bits per pixel</Depth>
  <Data>Packed Pixel Data</Data>
  <MenuItem>
    <Name>The name of each menu item</Name>
    <URL>The URL associated with the menu item</URL>
  </MenuItem>
</CiscoIPPhoneGraphicMenu>
```

CiscoIPPhoneGraphicFileMenu

```
<CiscoIPPhoneGraphicFileMenu WindowMode="Width Mode of XSI window">
  <Title>Image Title goes here</Title>
  <Prompt>Prompt text goes here</Prompt>
  <LocationX>Horizontal position of graphic</LocationX>
  <LocationY>Vertical position of graphic</LocationY>
  <URL>Points to the PNG background image</URL>
  <MenuItem>
    <Name>Same as CiscoIPPhoneGraphicMenu</Name>
    <URL>Invoked when the TouchArea is touched</URL>
    <TouchArea X1="left edge" Y1="top edge" X2="right edge" Y2="bottom edge"/>
  </MenuItem>
</CiscoIPPhoneGraphicFileMenu>
```

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CiscoIPPhoneIconMenu

```
<CiscoIPPhoneIconMenu>
  <Title>Title text goes here</Title>
  <Prompt>Prompt text goes here</Prompt>
  <MenuItem>
    <IconIndex>Indicates what IconItem to display</IconIndex>
    <Name>The name of each menu item</Name>
    <URL>The URL associated with the menu item</URL>
  </MenuItem>
  <SoftKeyItem>
    <Name>Name of softkey</Name>
    <URL>URL or URI of softkey</URL>
    <Position>Position information of the softkey</Position>
  </SoftKeyItem>
  <IconItem>
    <Index>A unique index from 0 to 9</Index>
    <Height>Size information for the icon</Height>
    <Width>Size information for the icon</Width>
    <Depth>Number of bits per pixel</Depth>
    <Data>Packed Pixel Data</Data>
  </IconItem>
</CiscoIPPhoneIconMenu>
```

CiscoIPPhoneIconFileMenu

```
<CiscoIPPhoneIconFileMenu>
  <Title>Title text goes here</Title>
  <Prompt>Prompt text goes here</Prompt>
  <MenuItem>
    <IconIndex>Indicates what IconItem to display</IconIndex>
    <Name>The name of each menu item</Name>
    <URL>The URL associated with the menu item</URL>
  </MenuItem>
  <IconItem>
    <Index>A unique index from 0 to 9</Index>
    <URL>location of the PNG icon image</URL>
  </IconItem>
</CiscoIPPhoneIconFileMenu>
```

CiscoIPPhoneStatus

```
<CiscoIPPhoneStatus>
  <Text>This is the text area</Text>
  <Timer>Timer seed value in seconds</Timer>
  <LocationX>Horizontal alignment</LocationX>
  <LocationY>Vertical alignment</LocationY>
  <Width>Pixel width of graphic</Width>
  <Height>Pixel height of graphic</Height>
  <Depth>Color depth in bits</Depth>
  <Data>Hex binary image data</Data>
</CiscoIPPhoneStatus>
```

CiscoIPPhoneStatusFile

```
<CiscoIPPhoneStatusFile>
<Text>This is the text area</Text>
<Timer>Timer seed value in seconds</Timer>
<LocationX>Horizontal alignment</LocationX>
<LocationY>Vertical alignment</LocationY>
<URL>location of the PNG image</URL>
</CiscoIPPhoneStatusFile
```

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CiscoIPPhoneExecute

```
<CiscoIPPhoneExecute>
  <ExecuteItem URL="The URL or URI to be executed"/>
</CiscoIPPhoneExecute>
```

CiscoIPPhoneError

```
<CiscoIPPhoneError Number="x"/>
```

CiscoIPPhoneResponse

```
<CiscoIPPhoneResponse>
  <ResponseItem Status"the success or failure of the action"Data="the information associated
 with the request" URL="the URL or URI specified in the Execute object"/>
</CiscoIPPhoneResponse>
```

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APPENDIX **B**

Device Capability Query via CTI Feature

Feature Description

The Device Capability Query via CTI feature was added for Cisco Unified Communications Manager Release 8.0(1).

A backend CTI application that communicates with the phone using the UserData tunnel cannot retrieve information on device capabilities such as XSI feature support on a phone. Due to this lack of information, and to ensure compatibility, only a minimum set of features were generally configured.

The Device Capability Query via CTI feature overcomes this limitation. This feature allows a CTI-based application or a Cisco Unified Communications Manager application to query a registered phone for device capabilities using the UserData tunnel interface of the phone (over SCCP or SIP and RemoteCC).

Applications that have an HTTP interface with a phone do not have this limitation. The HTTP request from such phones include XSI capabilities header, and the DeviceInformationX servlet of such phones can be accessed to retrieve other device information.

Although designed to work using CTI over the UserData tunnel, this feature can also work over HTTP using the POST method.

Supported IP Phones and Codecs

The following table lists the Cisco Unified IP Phone models that support the Device Capability Query via CTI feature.

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Table 33: Phone Models that Support the Device Capability Query via CTI Feature

Phone model	Supported, Not supported	Firmware supported (see note)
Cisco Desk Phone 9800 series **Note** Not supported on all Multiplatform phones		
9841	Supported	PhongOS 3.0(1) and later
9851	Supported	PhongOS 3.0(1) and later
Cisco IP Phone 8800 Series **Note** Not supported on all Multiplatform phones		
8811	Supported	10.2(2) and later
8841, 8851, 8861	Supported	10.2(1) and later
8851NR	Supported	10.3(1) and later
8845, 8865	Supported	10.3(2) and later
8865NR	Supported	11.7(1) and later
8875, 8875NR	Supported	PhoneOS 2.1 and later
Cisco IP Conference Phones **Note** Not supported on all Multiplatform phones		
8831	Supported	9.3(3) and later
8832	Supported	12.0(1) and later
7832	Supported	12.0(1) and later
Cisco Wireless IP Phone 8820 series		
8821	Supported	11.0(1) and later
Cisco IP Phone 7800 Series **Note** Not supported on all Multiplatform phones		
7811	Supported	10.3(1) and later
7821	Supported	9.1(1) and later
7841	Supported	9.1(1) and later
7861	Supported	9.1(1) and later

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Note   Cisco recommends the use of latest firmware. The firmware can be downloaded from the following location (requires login or service contract):

http://software.cisco.com/download/navigator.html?i=!mmd

Although several codecs are listed within the schema, only the codecs G711, G729, and G722 are currently supported.

XML Object Changes

To support this feature, new request and response objects are created. The `<getDeviceCaps>` is the request object and the `<getDeviceCapsResponse>` is the response object.

On receiving the `<getDeviceCaps>` object, the phone returns the `<getDeviceCapsResponse>` object. All elements in the `<getDeviceCapsResponse>` object are required and must not be null.

Schema Definition

The getDeviceCapsResponse XML schema is as follows:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<schema targetNamespace="http://www.example.org/devicecaps"
xmlns:tns="http://www.example.org/devicecaps" xmlns="http://www.w3.org/2001/XMLSchema">
 <element name="getDeviceCapsResponse" type="tns:deviceCapType" nillable="true"/>
 <complexType name="deviceCapType">
  <all>
   <element name="physical" type="tns:physicalCapType" nillable="true"/>
   <element name="services" nillable="true">
    <complexType>
     <complexContent>
      <extension base="tns:servicesCapType">
       <attribute name="sdkVersion" type="string" use="required"/>
      </extension>
     </complexContent>
    </complexType>
   </element>
  </all>
 </complexType>
 <complexType name="physicalCapType">
  <all>
   <element name="modelNumber" nillable="false">
    <simpleType>
     <restriction base="string">
      <maxLength value="32"/>
      <minLength value="1"/>
     </restriction>
    </simpleType>
   </element>
   <element name="display" nillable="true">
    <complexType>
     <attribute name="width" type="unsignedShort" use="required"/>
     <attribute name="height" type="unsignedShort" use="required"/>
     <attribute name="bitDepth" type="unsignedShort" use="required"/>
     <attribute name="isColor" type="boolean" use="required"/>
    </complexType>
```

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```
       </element>
      </all>
    </complexType>
    <complexType name="servicesCapType">
     <all>
      <element name="browser" type="tns:browserCapType" nillable="true"/>
     </all>
    </complexType>
    <complexType name="browserCapType">
     <all>
      <element name="accept" nillable="false"/>
      <element name="acceptLanguage" nillable="false"/>
      <element name="acceptCharset" nillable="false"/>
     </all>
    </complexType>
   </schema>
```

Request and Response Examples for getDeviceCaps

The following are the request and response examples for a getDeviceCaps object:

Request sent to the phone:

```
<getDeviceCaps/>
```

Response returned from the phone:

```
<getDeviceCapsResponse>
  <physical>
    <modelNumber>CP-7970</modelNumber>
    <display width="298" height="168" bitDepth="12" isColor="true"/>
  </physical>
   <services sdkVersion="5.0.3">
     <browser>
  </services>
</getDeviceCapsResponse>
```

Troubleshooting

The following error may occur in this feature:

- If the getDeviceCaps object is invalid (misspelled), a parsing error is generated and a CiscoIPPhoneError object (with Number="1") is returned as the response.

Error Handling

Standard XML services debugging techniques are applied to this feature.

The root cause for any parsing errors is displayed in the phone console logs. For HTTP requests and responses, sniffer traces and web server debug can be used to examine the getDeviceCaps object to ensure that it conforms to the schema.

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I N D E X

Cisco Unified IP Phone Services Application Development Notes for Cisco Unified Communications Manager and Multiplatform Phones

IN-1

Cisco Unified IP Phone Services Application Development Notes for Cisco Unified Communications Manager and Multiplatform Phones

IN-2

Cisco Unified IP Phone Services Application Development Notes for Cisco Unified Communications Manager and Multiplatform Phones

IN-3

Cisco Unified IP Phone Services Application Development Notes for Cisco Unified Communications Manager and Multiplatform Phones

IN-4