



▶ Web Application Developer's  
Guide for the Polycom®  
SoundPoint® IP/ SoundStation®  
IP/VVX™ Family

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# About This Guide

The Developer's Guide for the SoundPoint IP/SoundStation IP/VVX is for developers of applications which use the Web Server and the Microbrowser on SoundPoint IP and SoundStation IP phones and the Browser on the Polycom VVX phones.

The following related documents for SoundPoint IP/SoundStation IP/VVX phones are available:

- Quick Start Guides, which describe how to assemble the phones
- Quick User Guides, which describe the most basic features available on the phones
- User Guides, which describe the basic and advanced features available on the phones
- Administrator's Guide, which describes how to configure, customize, manage, and troubleshoot SoundPoint IP/SoundStation IP/VVX phone systems
- Technical Bulletins, which describe workarounds to existing issues and provide expanded descriptions and examples
- Release Notes, which describe the new and changed features and fixed problems in the latest version of the software

For support or service, please go to Polycom Technical Support at <http://www.polycom.com/support/voip/>.

Polycom recommends that you record the phone model numbers, software (both the bootROM and SIP), and partner platform for future reference.

SoundPoint IP/SoundStation IP/VVX models: \_\_\_\_\_

BootROM version: \_\_\_\_\_

SIP Application version: \_\_\_\_\_

Partner Platform: \_\_\_\_\_



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# Overview

Polycom has two different application development environments, the one you choose depends on the phone model and software version running on the phone. This guide is intended to provide an overview of each development environment and example applications that will run in each environment.

This chapter provides an overview of the Web Server and the Microbrowser available on certain SoundPoint IP and SoundStation IP phones, and the Polycom VVX 1500 phone running SIP 3.1.3 or earlier. It also provides an overview of the Web Server and the Browser available on the Polycom VVX 1500 phone running SIP 3.2 or later.

**Note**

When SoundPoint IP 32x/33x is used in this guide, it includes the SoundPoint IP 320, 321, 330, 331, and 335 phones.

A comparison between the Microbrowser and the Browser is shown in the following table.

	Microbrowser	Browser
<b>Supported On</b>	IP 32x/33x, IP 430, IP 450, IP 550, IP 560, IP 650, IP 670, IP 6000, IP 7000, VVX 1500 (running SIP 3.1.3 or earlier)	VVX 1500 (running SIP 3.2.2 or later)
<b>XML API</b>	programmable soft keys, telephone integration URIs, push requests, telephone notification events, phone state polling	telephone integration URIs, push requests, telephone notification events, phone state polling
<b>Capabilities</b>	HTML 4.01 XHTML 1.0	partial HTML 5.0 XHTML 1.1

This chapter contains information on:

- [What is the Microbrowser](#)
- [What is the Browser](#)
- [What is XHTML](#)
- [How to Create Applications](#)
- [New Features in SIP 3.2](#)

To develop an application that can run on the Web Server and the Microbrowser, refer to [Application Development for the Microbrowser](#) on page 3-1. To develop an application that can run on the Web Server and the Browser, refer to [Application Development for the Browser](#) on page 4-1.

To troubleshoot any problems with your applications, refer to [Troubleshooting](#) on page 5-1.

## What is the Microbrowser

The Microbrowser is like any Web browser – Microsoft Internet Explorer and Firefox, for example – but supports only a subset of XHTML features. It can connect to Web servers hosted in the Internet or intranet and download XHTML pages. The Microbrowser supports a limited number of XHTML 1.0 features – it does not have full Web browser functionality.

The Microbrowser downloads XHTML content from a Web server into the phone's memory, then parses the content to identify XHTML tags and renders these tags onto the phone's graphic display. The appearance of the rendered page depends on the graphical capabilities and display size of the device on which the browser is running. Complicated pages should be avoided on devices with very small displays.

The Microbrowser does not support scripting (such as JavaScript). All actions on data entered into forms is processed by the server using POST or GET methods.

The XHTML pages displayed on the Microbrowser can contain static or dynamic information.

**Static XHTML.** These pages are created using XHTML editors and hosted by the Web server. These pages are accessed from the Microbrowser (using HTTP protocol) by entering the URL to access the page. These XHTML pages are called static, because the information that is displayed is already coded into the XHTML pages. These pages do not include information that keeps changing or contact other services for update.



**Dynamic XHTML.** These pages involves dynamic information updates of XHTML pages by an application hosted on the Web server. The application residing on the Web server will get information from an intranet or through the Internet – data service providers like Yahoo, Exchange Server, Call Control Servers and other enterprise servers.

Users can launch the Microbrowser on a SoundPoint IP or SoundStation IP phone by pressing the **Applications** key or, if there isn't one on the phone, it can be accessed through the **Menu** key by selecting *Applications*.

#### Note

As of SIP 2.2, the **Services** key and menu entry were renamed **Applications**, however the functionality remains the same.

The Microbrowser is supported on part of the phone's total display area:

Phone	Total Screen Size	Microbrowser Screen Size
SoundPoint IP 32x/33x	102x33 pixels	88x12 pixels
SoundPoint IP 430	184x64 pixels	134x31 pixels
SoundPoint IP 450	256x116 pixels	171x72 pixels
SoundPoint IP 550/560/650/670	320x160 pixels	213x110 pixels
SoundStation IP 6000	240x68 pixels	248x32 pixels
SoundStation IP 7000	255x128 pixels	255x79 pixels
Polycom VVX 1500	800x480 pixels	562x322 pixels

For more information, refer to [Application Development for the Microbrowser](#) on page 3-1.

## What is the Browser

The Browser is also like any other major web browser. It is based on the powerful and popular open source WebKit platform. The version can be found in the user agent string. (The user agent string can be seen in network captures in the User-Agent HTTP header.)

The Browser supports true Web 2.0 applications with the following features:

- XHTML 1.1
- HTML 4.01 with partial support for HTML 5
- CCS 2.1 with partial support for CCS 3.0

- SVG 1.1 (partial support)
- JavaScript
- XMLHttpRequest
- DOM
- HTTP 1.1

As noted previously, the Browser is only available today on the Polycom VVX 1500 phone. The interactive browser window takes up the phone's full screen (800x480 pixels). The web content area is 800x395 pixels. The idle browser window is 610x360 pixels.

For more information, refer to [Application Development for the Browser](#) on page 4-1.

## What is XHTML

XHTML is the abbreviation of eXtensible HyperText Markup Language.

XHTML 1.0 is a transformation of HTML into valid XML. The use of the stricter XML syntax makes parsing of XHTML much easier for small clients, but XHTML 1.0 was also the first step towards making HTML easily extensible. Moving to XML allowed the methods used to create XML extensions to apply to HTML as well. Step two occurred with XHTML 1.1, where XHTML was divided up into 'modules', where any features above and beyond a skeleton set were grouped into individual modules. User agent (UA) developers could then decide which extensions to support. A simple user agent can be considered a fully compliant user agent by supporting only the Basic module, whereas a more powerful browser can support all the official modules, as well as those developed by third parties.

Modularization is also intended to help content creators. As more and more devices become web-enabled, the number of platforms a content creator will be asked to support will become unreasonable. By dividing HTML up into different 'building blocks' content creators can supply a minimal version of their site for user agents that only support the Basic module, a moderate version of their site for user agents who support the additional modules, and a full version of their site for user agents that support the full range of the XHTML specification.

Finally the X in XHTML was intended to help people who wish to extend HTML. The use of XML brought a standard grammar with which they could define their extension, and the modularization meant that their extension would be just another module that a user agent developer or content creator could choose to support. Additionally, since XHTML pages should state what modules are required to accurately render them, the user agent software could dynamically load a 'plug-in' that it could use to render a module that was defined after the user agent had been originally released.

For more information, go to:

- HTML 4.0 – <http://www.w3.org/TR/html401>
- HTML 5 – <http://www.w3.org/TR/html5>
- XHTML™ 1.0 – <http://www.w3.org/TR/xhtml1>
- XHTML™ Basic – <http://www.w3.org/TR/xhtml-basic>
- XHTML™ 1.1 – <http://www.w3.org/TR/xhtml11>
- XHTML Tables Module -  
XHTML™ 2.0 – <http://www.w3.org/TR/2004/WD-xhtml2-20040722/mod-tables.html>

For the purposes of this guide, it is assumed that you have experience in HTML and XHTML programming or access to someone who has such experience.

## How to Create Applications

The Polycom Software Development Kit (SDK) application environment allows developers to create full-featured, context-aware applications using familiar web technologies such as AJAX, HTML, JavaScript, and CSS.

The Polycom SDK development environment is based on the popular open source WebKit developer toolset. Combined with an Integrated Development Environment (IDE) and Polycom's rich set of XML APIs, the development of applications is easy and familiar. To develop widgets or rich, interactive applications, use the open source Web 2.0 technologies known as AJAX. These are the same technologies that allow the migration of web content out of the browser and into other environments. Using open source technologies decreases the development learning curve and increases compatibility between platforms and devices. Common IDE environments include Eclipse, NetBeans, and Microsoft Visual Studio; and form the basis for developing rich and interactive applications.

Microbrowser/Browser applications may be static in nature, but often involve two-way communication that incorporates user input, acknowledgement and interaction. The Polycom XML APIs and support interactive applications development, with access to the resources on the targeted phones.

You can design the following examples of applications:

- Text messaging application
- Company directory
- Stock ticker

Depending on the type and complexity of the application, you might use one of the following tools to assist with application development:

- Text editor
- XML editor
- Integrated Development Environment (IDE)

When designing applications, you might want to consider the following guidelines:

**Note**

These guidelines are for your information only. You are solely responsible for determining the suitability and applicability of this information to your needs.

1. Spend sufficient time designing the application by:
  - Developing a conceptual design
  - Describe all user-application interactions
  - Plan for all user types
2. Create standardized applications to assist in:
  - Lowering design time
  - Speed up debugging
  - Increasing usability
3. Promote consistent output and predictable user input.
4. Create a prototype application to test on sample users.
5. Thoroughly test your application before releasing to:
  - Identify all user interface issues
  - Verify that all error conditions are caught cleanly

For step-by-step instructions on how to develop an XHTML application that can be run on the Microbrowser of all SoundPoint IP and SoundStation IP phones, refer to [Application Development for the Microbrowser](#) on page 3-1. For step-by-step instructions on how to develop an XTML application that can be run on the Browser of the Polycom VVX 1500, refer to [Application Development for the Browser](#) on page 4-1.

**Note**

Polycom is not responsible for troubleshooting any programming that you create for the Microbrowser and/or Browser.

## New Features in SIP 3.2

The following new features were introduced in SIP 3.2.2:

- The Browser on the Polycom VVX 1500
  - [What is the Browser](#)

The following existing sections were changed in SIP 3.2.0:

- [Programmable Soft Keys](#) on page 2-1
- [Telephone Integration URIs](#) on page 2-4
- [Call Line Information](#) on page 2-17
- [HTTP Support](#) on page 3-14

The *Web Application Developer's Guide for the SoundPoint IP/SoundStation IP/VVX Family* has been reorganized:

- [SoundPoint IP/SoundStation IP/VVX XML API Application Interface](#) is now in a separate chapter, Chapter 2
- [Application Development for the Microbrowser](#) is now in a separate chapter, Chapter 3
- [Application Development for the Browser](#) is in a new chapter, Chapter 4



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# SoundPoint IP/SoundStation IP/VVX XML API Application Interface

There is XML API support for applications on the SoundPoint IP 32x/33x, 430, 450, 550, 560, 650, and 670 desktop phones, the SoundStation IP 6000 and 7000 conference phones, and the Polycom VVX 1500 phones.

The SoundPoint IP/SoundStation IP/VVX XML API is intended to provide developers with flexibility in developing applications on SoundPoint IP, SoundStation IP, and Polycom VVX 1500 phones, while tightly integrating into the phone's telephony capabilities and functions. The XML API features are supported by the Microbrowser and Browser, except where noted.

This support includes:

- [Programmable Soft Keys](#)
- [Telephone Integration URIs](#)
- [Push Requests](#)
- [Telephony Notification Events](#)
- [Phone State Polling](#)

For a discussion of the security aspects of this API, refer to [API Security](#) on page 2-22.

## Programmable Soft Keys

### Note

The programmable soft key tag is not supported in the Browser on the Polycom VVX 1500. However, the same functionality can be created through HTML button tag: `<button></button>`.

The following programmable soft key tag is supported:

- `<softkey>` – Defines a soft key

### <softkey>

The softkey element creates a soft key with a customizable label, position, and action. Users execute actions by pressing the soft key on their phone.

The soft keys are modified within the interactive Microbrowser only.

The following format is supported:

```
<softkey index="W" name="X" label="Y" action="Z" />
```

The following attributes are supported:

Attribute	Value/s	Description
index	numeric, 1 to 8	Position of the soft key.
name	string	Text displayed on soft key when Softkey:Submit action is used. It is ignored for all other actions. Use in cases where more than one Softkey:Submit action appears on a page.
label	string	Text displayed on soft key. The maximum length is 9 characters. <b>Note:</b> If empty or absent, default action name is displayed.
action	URI	Supported actions (must be one of those listed in the next table).

The supported actions are described in the following table:

Action	Default Action Name	Description
SoftKey:Home	Home	Moves to configured home page
Softkey:Back	Back	Move to previous page
SoftKey:Exit	Exit	Exits Microbrowser
SoftKey:Cancel	Cancel	Cancel action
SoftKey:Refresh	Refresh	Refreshes current page
SoftKey:Fetch; <URI>	Fetch	Fetches the page from the given URI
SoftKey:Reset	Reset	Clears all input fields in the form
SoftKey:Submit	Submit	Submits the form
Key:VolDown	VolDown	Decreases volume by 1 unit
Key:VolUp	VolUp	Increases volume by 1 unit



Action	Default Action Name	Description
Key:DoNotDisturb	Do not disturb	Enables Do Not Disturb feature
Key:Headset	Headset	Enables use of microphone
Key:Handsfree	Hands-free	Enables use of speaker
Key:Messages	Messages	Open the Messages menu
Key:Applications	Applications	Open the Applications menu
Key:MicMute	Mute	Mutes the phone when the call state
Key:Directories	Directories	Open the Directories menu
Key:Menu	Menu	Opens the main menu
Key:Setup	Setup	Opens the main menu Settings menu

Depending on the browser state, a number of predefined soft keys exist:

Action	Predefined Soft Key
Browser Active—fetching pages or rendering data	Home, Refresh, Back, Stop
Browser Stop—no longer active	Home, Refresh, Back, Exit or programmable soft key
Edit Active—when entering text	Home, A->a1, Back, Exit

**Note**

The soft keys from the “Browser Active” and “Edit Active” soft key groups override any custom soft keys defined in the current XHTML.

The soft keys from the “Browser Stop” soft key group appear if no custom soft keys are defined.

The exact soft keys that appear vary between the SoundPoint IP and SoundStation IP phones.

The following should be noted with respect to softkey tags:

- All actions are case insensitive.
- If the soft key action name is empty, the soft key tag is ignored.
- The Reset and Submit soft key tags must exist inside the <form> tag that they are to act upon.
- On the Polycom VVX 1500, the Reset and Submit soft key tags can exist inside a single form element. If there are multiple forms inside an XHTML document, the XHTML Submit and Reset input elements must be used.

- Indexes need not be sequential. A missing index will result in an empty space, no soft key displayed.
- An index greater than eight is ignored.
- By default, a **Back** soft key is placed on the graphic display (even if one is not defined).

**Note**

The **Back** soft key will not appear when `mb.main.autoBackKey` is set to 0; otherwise it will appear.

- When using more than one Submit soft key on page, use the name to distinguish between them.

For example, to create a simple page:

```
<html>
  <p> Hello World! </p><br/>
  <softkey index="1" label="Home" action="SoftKey:Home" />
  <softkey index="2" label="Refresh" action="SoftKey:Refresh" />
  <softkey index="4" label="Exit" action="SoftKey:Exit" />
  <softkey index="3" label="Back" action="SoftKey:Back" />
</html>
```

## Telephone Integration URIs

Internal URIs provide the interface to execute predefined actions on the phone. These actions are similar to the manual execution of key presses by the user.

There are three ways to execute an internal URI action:

- If the file sent to the phone contains only internal URI actions, the file content type must be "application/x-com-polycom-spipx". The internal URIs are executed in ascending order.
- If an XHTML file will include internal URI, they must be defined in (and executed from) anchor tags, in the href attribute (for example, `<a href="Key:Setup">Menu</a>`). When the user selects the anchor, the action is processed and executed.
- Use one of the following soft key actions in anchor tags:
  - SoftKey:Home
  - SoftKey:Back
  - SoftKey:Exit
  - SoftKey:Cancel
  - SoftKey:Refresh

Refer to [Programmable Soft Keys](#) on page 2-1.

**Note**

Internal URI actions contained in a file with content type “application/x-com-polycom-spipx” can be executed only through a URL push.

The following format is supported:

ActionType:Action

where:

- ActionType is a type of key or action to execute (Key, Softkey, Tel, or Play)
- Action is the name of the action to be executed.

The supported internal URIs are described in the following table:

Action Type	Action	Description
Key	Line1 to Line48	The Key URIs send the key press event to the phone. The phone processes this event as if the button had been physically pressed.
	DialPad0 to DialPad9	
	SoftKey1 to SoftKey5	
	DialPadStar	
	DialPadPound	
	VolDown	
	VolUp	
	Headset	
	Handsfree	
	MicMute	
	Menu	
	Messages	
	Applications	
	Directories	
	Setup	
	ArrowUp	
ArrowDown		
ArrowLeft		
ArrowRight		

Action Type	Action	Description
Key (Continued)	Backspace	
	DoNotDisturb	
	Select	
	Conference	
	Transfer	
	Redial	
	Hold	
SoftKey	Back	<p>The SoftKey URIs send the soft key press event to the phone. The phone processes this event as if the associated soft key had been physically pressed. These URIs function when the interactive Microbrowser is on the screen.</p> <p><b>Note:</b> <i>The programmable soft key related URIs are not supported on the Browser on the Polycom VVX 1500.</i></p>
	Cancel	
	Exit	
	Home	
	Refresh	
Tel	Number;LineIndex	<p>The Tel URI initiates a new call to the specified number on the specified line. The line number is optional (the first available line is used). The digit map rules are followed (refer to "Digit Map" in the <i>Administrator's Guide for the SoundPoint IP / SoundStation IP / VVX Family</i>).</p> <p><b>Note:</b> <i>The LineIndex value is case insensitive. The range of LineIndex is "Line1" to "Line48".</i></p> <p><b>Note:</b> <i>If the line corresponding to the LineIndex in the Tel action is busy, the existing call on that line is held and a call is placed to the number specified in the Tel URI on that given line.</i></p>

Action Type	Action	Description
Play	Play:<audiofile_path>	<p>Download and play the audio file. The supported audio formats are G.711<math>\mu</math>-law, G.711a-law, and Liner16.</p> <p>The &lt;audiofile_path&gt; is the relative path on the application server, relative to <code>apps.push.serverRootURL</code>.</p> <p>The supported maximum file size is determined by <code>res.finder.sizeLimit</code>.</p> <p>For G.711<math>\mu</math>-law and G.711a-law files:</p> <ul style="list-style-type: none"> <li>• Sample rate must be 8ksp with a sample size of 8. This is supported on all phones.</li> </ul> <p>For Liner16 files:</p> <ul style="list-style-type: none"> <li>• Sample size must 16 for all sample rates.</li> <li>• Sample rate of 16ksp is supported on SoundPoint IP 32x/33x, 430, 450, 550, 560, 650, and 670, SoundStation IP 6000 and 7000, and Polycom VVX 1500 phones.</li> <li>• Sample rate of 32ksp and 48 ksp is supported on SoundStation IP 6000 and 7000 and Polycom VVX 1500 phones.</li> <li>• Sample rate of 8ksp and 44.1 ksp is supported on Polycom VVX 1500 phones.</li> </ul> <p><b>Note:</b> An error is logged if the file is too large to play.</p>

The following should be noted with respect to internal URIs:

- The action name and key type are case insensitive.
- For non-XHTML content containing only internal URIs, the internal URIs are executed in ascending order without any delay.
- If any URI is invalid and it is in a file of only internal URIs, the entire file is rejected.

- If any invalid URI is present in a XHTML file, the execution of that URI is ignored.

For example, to create a link that behaves as if you pressed the **Do Not Disturb** key:

```
<html>
  <body> <br/>
  Click on the link to engage the DND feature
  <a href="Key:DoNotDisturb">DNDSettings</a>
  </body>
  <softkey index="1" label="Back" action="SoftKey:Back" />
  <softkey index="2" label="Exit" action="SoftKey:Exit" />
</html>
```

For example, to place a call to “\*50”:

```
<html>
  <head>
  </head>
  <body>
    <a href="Tel://*50">Push to Talk</a>
  </body>
</html>
```

## Push Requests

A push request is defined as a request that you send to a remote site asking for data to be sent to you.

### HTTP <URL> Push

The HTTP URL push allows you to send asynchronous relative URIs to a specific phone.

The following format is supported:

```
<URL priority="X" >URI path</URL>
```

The following attributes are supported:

Attribute	Value/s	Description
priority	“critical” = Accept critical priority push requests only “Normal” = accept normal priority push requests only	Priority <b>Note:</b> If attribute is absent, “normal” is used.
URI path	string	Any relative URI (or relative URI path) on the configured application server. <b>Note:</b> Currently multiple URIs in a single push request are not supported.

**Note**

This tag must be defined under a <PolycomIPPhone> root tag.

The following table describes when to use a specific priority:

Phone State	Priority	Description
Idle State	Critical	The phone will display push request immediately.
	Normal	The phone will display push request immediately.
Non-Idle State	Critical	The phone will display push request immediately.
	Normal	The phone will keep push request in push queue. Once the phone is idle, the push request will be displayed.

The following should be noted with respect to HTTP URI push:

- By default, a **Back** soft key is placed on the graphic display.  
The **Back** soft key will not appear when `mb.main.autoBackKey` is set to 0; otherwise it will appear.
- Push requests are displayed as “first-in-first-out”.
- Changes must be made in the `sip.cfg` configuration file to enable this feature. For example, the `httpd.enabled` parameter must be set to 1 (default setting). Refer to [Push Request Configuration Parameters](#) on page 2-11.

- All HTTP requests are challenged through HTTP Digest Authentication.
- If the phone cannot fetch the content from the pushed URI, the request is ignored.

For example, to push the display of soft keys that fetch pages:

```
<PolycomIPPhone>
  <URL priority="normal">/examples/media.xhtml</URL>
</PolycomIPPhone>
```

where `media.xhtml` is defined as follows:

```
<html>
<!--Data for displaying on the screen-->
Press any soft key to fetch the corresponding page
<softkey index="1" label="Top News"
action="SoftKey:Fetch;http://www.cbc.ca/news/world/top/>
<softkey index="2" label="Weather
"action="SoftKey:Fetch;http://www.theweathernetwork.com/canada/bc/burn
aby/current/" />
<softkey index="4" label="Sports"
action="SoftKey:Fetch;http://www.tsn.ca/topstory/" />
<softkey index="3" label="Back" action="SoftKey:Back" />
</html>
```

### HTML <Data> Push

The data push allows you to send messages in XHTML format to a specific phone.

The following format is supported:

```
<Data priority="X" >Y</Data>
```

The following attributes are supported:

Attribute	Value/s	Description
priority	"critical" = Accept critical priority push requests only "Normal" = accept normal priority push requests only	Priority <b>Note:</b> If attribute is absent, "normal" is used.
text	text in HTML format	Text <b>Note:</b> The maximum file size is 1KB.

#### Note

This tag must be defined under a `<PolycomIPPhone>` root tag.



For example, to push the display of an important message:

```
<PolycomIPPhone>
  <Data priority="critical"> <h1> Fire Drill at 2pm </h1> Please exit
and congregate at your appropriate location outside </Data>
</PolycomIPPhone>
```

The following should be noted with respect to HTTP data push:

- Changes must be made in the **sip.cfg** configuration file to enable this feature. For example, the `httpd.enabled` parameter must be set to 1 (default setting). Refer to [Push Request Configuration Parameters](#) on page 2-11.

### Push Request Configuration Parameters

The push request configuration parameters in **sip.cfg** must be set as follows to enable push requests:

- Set `apps.push.messageType` to the appropriate display priority.  
For example, `apps.push.messageType=2`
- Set `apps.push.serverRootURL` to the application server root relative URL.  
For example, `apps.push.serverRootURL=/sampleapps`
- Set `apps.push.username` to the appropriate username.  
For example, `apps.push.username=bob`  
The username and password are required to authenticate incoming push requests to the phone.
- Set `apps.push.password` to the appropriate password.  
For example, `apps.push.password=1234`

## Telephony Notification Events

The phone can be configured to send information to a specific URI if one of the following telephony notification events occurs:

- [Incoming Call Event](#)
- [Outgoing Call Event](#)
- [Offhook Event](#)
- [Onhook Event](#)

These events are XML data posted to web server by the phone's Microbrowser or Browser.

Changes must be made in the **sip.cfg** configuration file to enable this feature. Refer to [Telephony Event Notification Configuration Parameters](#) on page 2-16.

### Incoming Call Event

The following format is supported:

```
<IncomingCallEvent>
  <PhoneIP> </PhoneIP>
  <MACAddress> </MACAddress>
  <CallingPartyName> </CallingPartyName>
  <CallingPartyNumber> </CallingPartyNumber>
  <CalledPartyName> </CalledPartyName>
  <CalledPartyNumber> </CalledPartyNumber>
  <TimeStamp> </TimeStamp>
</IncomingCallEvent>
```

The following attributes are supported:

Attribute	Value/s	Description
Phone IP	IP address	IP address of the phone. For example, "172.24.128.160"
MACAddress	MAC address	MAC address of the phone. For example, "0004f214b8e7"
CallingPartyName	name	The name displayed in phone's "From" label in screen. <ul style="list-style-type: none"> <li>If the line is registered and the call is initiated from that line, then the registered line display name of the calling party is shown. For example, "SoundPoint IP"</li> <li>If the line is not registered and the call is initiated from that line, then IP address of the calling party is shown. For example, "sip:172.24.128.160"</li> </ul>

Attribute	Value/s	Description
CallingPartyNumber	number	The number displayed on the phone. <ul style="list-style-type: none"> <li>If the line is registered and the call is initiated from that line, the registered line number of the calling party is shown.</li> <li>If the line is not registered and the call is initiated using IP address from that line, the IP address of the calling party is shown.</li> </ul>
CalledPartyName	name	<ul style="list-style-type: none"> <li>If the call is received by registered line, the registered line display name of the called party is shown.</li> <li>If the call is received on a non-registered line, the IP address of the called party is shown.</li> </ul>
CalledPartyNumber	number	<ul style="list-style-type: none"> <li>If the call is received by registered line, the registered line number of the called party is shown.</li> <li>If the call is received on a non-registered line, the IP address of the called party is shown.</li> </ul>
TimeStamp	time	The date and time that the event occurred on the phone. For example, "2008-07-11T13:19:53-08:00"

When the telephone notification URI is set and the incoming call event is enabled to gather information, the following example shows the transmitted data for a call between two registered lines:

```
<PolycomIPPhone>
  <IncomingCallEvent>
    <PhoneIP>172.24.132.135</PhoneIP>
    <MACAddress>0004F214b89e</MACAddress>
    <CallingPartyName>20701</CallingPartyName>
    <CallingPartyNumber>20701@172.18.186.94</CallingPartyNumber>
    <CalledPartyName>20300</CalledPartyName>
    <CalledPartyNumber>20300</CalledPartyNumber>
    <TimeStamp>2008-07-11T13:19:53-08:00</TimeStamp>
  </IncomingCallEvent>
</PolycomIPPhone>
```

## Outgoing Call Event

The following format is supported:

```
<OutgoingCallEvent>
  <PhoneIP> </PhoneIP>
  <MACAddress> </MACAddress>
  <CallingPartyName> </CallingPartyName>
  <CallingPartyNumber> </CallingPartyNumber>
  <CalledPartyName> </CalledPartyName>
  <CalledPartyNumber> </CalledPartyNumber>
  <TimeStamp> </TimeStamp>
</OutgoingCallEvent>
```

The following attributes are supported:

Attribute	Value/s	Description
Phone IP	IP address	IP address of the phone. For example, "172.24.128.160"
MACAddress	MAC address	MAC address of the phone. For example, "0004f214b8e7"
CallingPartyName	name	<ul style="list-style-type: none"> <li>If the line is registered and the call is initiated from that line, then the registered line display name of the calling party is shown.</li> <li>If the line is not registered and the call is initiated from that line, then IP address of the calling party is shown.</li> </ul>
CallingPartyNumber	number	<ul style="list-style-type: none"> <li>If the line is registered and the call is initiated from that line, the registered line number of the calling party is shown.</li> <li>If the line is not registered and the call is initiated using IP address from that line, the IP address of the calling party is shown.</li> </ul>
CalledPartyName	name	<p>The name displayed at phone's "To" name.</p> <ul style="list-style-type: none"> <li>If the call is received by registered line, the registered line display name of the called party is shown.</li> <li>If the call is received on a non-registered line, the IP address of the called party is shown.</li> </ul>

Attribute	Value/s	Description
CalledPartyNumber	number	The number displayed on the phone. <ul style="list-style-type: none"> <li>If the call is received by registered line, the registered line number of the called party is shown.</li> <li>If the call is received on a non-registered line, the IP address of the called party is shown.</li> </ul>
TimeStamp	time	The date and time that the event occurred on the phone. For example, "2008-07-11T13:19:53-08:00"

### Offhook Event

The following format is supported:

```
<OffHookEvent>
  <PhoneIP> </PhoneIP>
  <MACAddress> </MACAddress>
  <TimeStamp> </TimeStamp>
</OffHookEvent>
```

The following attributes are supported:

Attribute	Value/s	Description
Phone IP	IP address	IP address of the phone. For example, "172.24.128.160"
MACAddress	MAC address	MAC address of the phone. For example, "0004f214b8e7"
TimeStamp	time	The date and time that the event occurred on the phone. For example, "2008-07-11T13:19:53-08:00"

### Onhook Event

The following format is supported:

```
<OnHookEvent>
  <PhoneIP> </PhoneIP>
  <MACAddress> </MACAddress>
  <TimeStamp> </TimeStamp>
</OnHookEvent>
```

The following attributes are supported:

Attribute	Value/s	Description
Phone IP	IP address	IP address of the phone. For example, "172.24.128.160"
MACAddress	MAC address	MAC address of the phone. For example, "0004f214b8e7"
TimeStamp	time	The date and time that the event occurred on the phone. For example, "2008-07-11T13:19:53-08:00"

### Telephony Event Notification Configuration Parameters

The telephone event notification configuration parameters in **sip.cfg** must be set as followed:

- Set `apps.telNotification.URL` to the location where notifications should be sent.  
For example, `apps.telNotification.URL=http://172.24.128.85:8080`  
If this URL is set to Null, the notifications events will not be sent.
- Set `apps.telNotification.incomingEvent` to 1 or 0 (for Enable or Disable respectively).  
For example, `apps.telNotification.incomingEvent=1`
- Set `apps.telNotification.outgoingEvent` to 1 or 0 (for Enable or Disable respectively).  
For example, `apps.telNotification.outgoingEvent=1`
- Set `apps.telNotification.offhookEvent` to 1 or 0 (for Enable or Disable respectively).  
For example, `apps.telNotification.offhookEvent=1`
- Set `apps.telNotification.onhookEvent` to 1 or 0 (for Enable or Disable respectively).  
For example, `apps.telNotification.onhookEvent=1`

## Phone State Polling

The phone can be configured to send the current state information to a specific URI upon receipt of an HTTP request. The following types of information can be sent:

- **Call Line Information** – The line registration and call state will be sent upon receipt of an HTTP request to the call state handler ([http://<Phone\\_IP>/callstateHandler](http://<Phone_IP>/callstateHandler)).
- **Device Information** – Device-specific information will be sent upon receipt of an HTTP request to the device handler ([http://<Phone\\_IP>/deviceHandler](http://<Phone_IP>/deviceHandler)).
- **Network Configuration** – Network-specific information will be sent upon receipt of an HTTP request to the network handler ([http://<Phone\\_IP>/networkHandler](http://<Phone_IP>/networkHandler)).

Two HTTP transactions occur here:

- The application sends an HTTP request to a particular handler in the phone
- The Microbrowser or Browser posts the state, in XML format, to a preconfigured web server.

Changes must be made in the **sip.cfg** configuration file to enable this feature. Refer to [Phone State Polling Configuration Parameters](#) on page 2-22.

### Call Line Information

The following format is supported:

```
<CallLineInfo>
  <LineKeyNum> </LineKeyNum>
  <LineDirNum> </LineDirNum>
  <LineState>Active</LineState>
  <CallInfo>
    <CallState> </CallState>
    <CallType> </CallType>
    <UIAppearanceIndex> </UIAppearanceIndex>
    <CalledPartyName> </CalledPartyName>
    <CalledPartyDirNum> </CalledPartyDirNum>
    <CallingPartyName> </CallingPartyName>
    <CallingPartyDirNum> </CallingPartyDirNum>
    <CallReference> </CallReference>
    <CallDuration> </CallDuration>
  </CallInfo>
</CallLineInfo>
```

#### Note

The `<CallInfo>` block is included if and only if `<LineState>` is "Active". Otherwise it is not included.

The following attributes are supported:

Attribute	Value/s	Description
LineKeyNum	number	Registered phone line key number.
LineDirNum	number	Registered line directory number.
LineState	Active, Inactive	Line state.
CallState	Outgoing call states: Dialtone, Setup, RingBack Incoming call states: Offering Outgoing/Incoming call states: Connected, CallConference, CallHold, CallHeld, CallConfHold, CallConfHeld Shared line states: CallRemoteActive	Call state.
CallType	Incoming, Outgoing	Call type.
UIAppearance Index	string	Call appearance index. The call appearance index for the active call is denoted by a * character suffix.
CallingPartyName	number	If the line is registered, the value is the registered line display name. If the line is not registered, the value is the IP address of the calling party.
CallingPartyDirNum	number	If the line is registered, the value is the registered line number. If the line is not registered, the value is the IP address of the calling party.
CalledPartyName	name	If the line is registered, the value is the registered line display name. If the line is not registered, the value is the IP address of the called party.



Attribute	Value/s	Description
CalledPartyDirNum	number	If the line is registered, the value is the registered line number. If the line is not registered, the value is the IP address of the called party.
CallReference	number	An internal identifier for the call.
CallDuration	number in seconds	Duration of the call in seconds.

When the phone state polling URL is set and the phone receives a Call Line Information Request, the following example shows the transmitted data:

```

<PolycomIPPhone>
  <CallLineInfo>
    <LineKeyNum>1</LineKeyNum>
    <LineDirNum>10</LineDirNum>
    <LineState>Connected</LineState>
    <CallInfo>
      <CallState>Offering</CallState>
      <CallType>Incoming</CallType>
      <CalledPartyName>10</CalledPartyName>
      <CalledPartyNumber>10</CalledPartyNumber>
      <CallingPartyName>21</CallingPartyName>
      <CallingPartyNumber>21@172.24.128.61</CallingPartyNumber>
      <CallReference>0</CallReference>
      <CallDuration>0</CallDuration>
    </CallInfo>
  </CallLineInfo>
  <CallLineInfo>
    <LineKeyNum>2</LineKeyNum>
    <LineDirNum>35</LineDirNum>
    <LineState>NotConnected</LineState>
  </CallLineInfo>
  <CallLineInfo>
    <LineKeyNum>3</LineKeyNum>
    <LineDirNum>36</LineDirNum>
    <LineState>NotConnected</LineState>
  </CallLineInfo>
</PolycomIPPhone>

```

## Device Information

The following format is supported:

```
<DeviceInformation>
  <MACAddress> </MACAddress>
  <PhoneDN> </PhoneDN>
  <AppLoadID> </AppLoadID>
  <BootROMID> </BootROMID>
  <ModelNumber> </ModelNumber>
  <TimeStamp> </TimeStamp>
</DeviceInformation>
```

The following attributes are supported:

Attribute	Value/s	Description
MACAddress	MAC address	MAC address of the phone.
PhoneDN	string	List of all registered lines, including expansion modules, and their directory numbers delimited by commas. For example, "Line1:1,Line2:2,Line3:3"
AppLoadID	string	Application load ID on the phone. For example, "Tip 27-Feb-08 20:07"
BootROMID	string	BootROM on the phone. For example, "4.1.0.0213"
ModelNumber	string	Phone's model number. For example, "SoundPoint IP 650"
TimeStamp	time	The date and time that the event occurred on the phone.

## Network Configuration

The following format is supported:

```
<NetworkConfiguration>
  <DHCPServer></DHCPServer>
  <MACAddress>0004f214b8e7</MACAddress>
  <DNSSuffix></DNSSuffix>
  <IPAddress>172.24.128.160</IPAddress>
  <SubnetMask>255.255.255.0</SubnetMask>
  <ProvServer></ProvServer>
  <DefaultRouter>172.24.128.1</DefaultRouter>
  <DNSServer1>172.21.6.218</DNSServer1>
  <DNSServer2>0.0.0.0</DNSServer2>
  <VLANID></VLANID>
  <DHCPEnabled>0</DHCPEnabled>
</Networkconfiguration>
```

The following attributes are supported:

Attribute	Value/s	Description
DHCPServer	IP address	DHCP server IP address.
MACAddress	MAC address	MAC address of the phone.
DNSSuffix	host name	DNS domain suffix.
IPAddress	IP address	IP address of the phone.
SubnetMask	IP address	IP address of the subnet.
ProvServer	IP address	Provisioning server.
DefaultRouter	IP address	IP address of default router (or IP gateway).
DNSServer1	IP address	Configured IP address of DNS Server 1.
DNSServer2	IP address	Configured IP address of DNS Server 2.
VLANID	Null, 0 through 4094	Phone's 802.1Q VLAN identifier.
DHCPEnabled	Yes, No	If DHCP is enabled, set to "Yes".

### Phone State Polling Configuration Parameters

The phone state polling configuration parameters in `sip.cfg` must be set as followed:

- Set `apps.statePolling.URL` to the location where requested information should be sent.

For example, `apps.statePolling.URL=http://172.24.128.85:8080`

If this URL is set to Null, the requested information will not be sent.

- Set `apps.statePolling.username` to the appropriate username.

For example, `apps.statePolling.username=bob`

The username and password are required to authenticate incoming polling requests to the phone.

- Set `apps.statePolling.password` to the appropriate password.

For example, `apps.statePolling.password=1234`

## API Security

With respect to the security of the SoundPoint IP/SoundStation IP/VVX XML API, the following should be noted:

- Authenticating remote control and monitoring – The execution of each of each HTTP GET/POST request requires an MD5 digest authentication. The execution of each HTTP PUSH request supports MD5 digest authentication as well as TLS and HTTPS. All pushed URLs are relative URLs with the root specified in the `sip.cfg` configuration file.
- Achieving confidentiality of executed content – The phone's HTTP client supports TLS, so any data retrieved from the URL can be protected. Make sure of the confidentiality of all traffic past the initial push request by specifying a root URL that uses https.
- Event reporting – The confidentiality of all events reported by the phone can be also be protected by TLS in the same way that push content is.
- Direct data push – When direct data push is enabled – disabled by default – small amounts of content (1KB) can be sent directly to the phone by the application server. The request will still be authenticated through HTTP digest, but all content will be in clear text on the network. Polycom recommends that you only use unencrypted data push for broadcast type alerts that do not pose any confidentiality risks.

#### Note

Both `apps.push.username` and `apps.push.password` must be set for data push to be enabled.

---

# Application Development for the Microbrowser

This chapter presents an overview on how to develop an XHTML application that can be run on the Web Server and Microbrowser available on certain SoundPoint IP and SoundStation IP phones (refer to the table in [Overview](#) on page 1-1). It also describes the relevant configuration parameters that can be found in the `sip.cfg` configuration file.

This chapter contains information on:

- [Supported XHTML Elements](#)
- [HTTP Support](#)
- [Microbrowser User Interface](#)
- [Developing an XHTML Application](#)

To troubleshoot any problems with your applications, refer to [Troubleshooting](#) on page 5-1.

## Note

Polycom is not responsible for troubleshooting any programming that you create for the Microbrowser.

## Supported XHTML Elements

The Microbrowser supports a subset of XHTML elements. Most are derived from HTML 4.01.

The supported elements and attributes are:

- [Basic Tags](#)
- [Link Tags](#)
- [Input Tags](#)
- [Image Tags](#)

- [Table Tags](#)
- [Meta Information Tags](#)

Unsupported elements and attributes are described in [Unsupported XHTML Elements](#) on page [A-1](#).

## Basic Tags

The following basic tags are supported:

- `<!DOCTYPE>` – Defines the document type
- `<!--...-->` – Defines a comment

### `<!DOCTYPE>`

The `<!DOCTYPE>` declaration should be the very first thing in your document, before the `<html>` tag. This tag tells the browser which XHTML specification the document uses. XHTML 1.0 specifies three XML document types: Strict, Transitional, and Frameset.

- XHTML Strict
  - Use this DTD when you want clean markup, free of presentational clutter.
  - For example,

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
```
- XHTML Transitional
  - Use this DTD when you need to use XHTML's presentational features.
  - For example,

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0
Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
```
- XHTML Frameset
  - Use this DTD when you want to use frames.
  - For example,

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0
Frameset//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-frameset.dtd">
```

XHTML 1.1 specifies one XML document type: Strict. For example,

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.1//EN"
"http://www.w3.org/TR/xhtml11/DTD/xhtml11.dtd">
```

This tag does not have any attributes.

`<!--...-->`

The comment tag is used to insert a comment in the source code. A comment will be ignored by the browser. You can use comments to explain your code, which can help you when you edit the source code at a later date.

This tag does not have any attributes.

## Link Tags

The following link tag is supported:

- `<a>` – Defines an anchor

`<a>`

The `<a>` tag defines an anchor. An anchor can be used to create a link to another document by using the `href` attribute.

The following attributes are supported:

Attribute	Value/s	Description
href	URL (Ex: "http://www.polycom.com")	The target URL of the link <b>Note:</b> The Microbrowser supports both <code>http://</code> and <code>tel://</code> URL schemes as well as internal URIs. When a <code>tel://</code> URL is selected, the phone switches to the telephony application and dials the number specified in the URL. Currently the number is dialed as-is, however, full support for <code>tel://</code> URL parsing as specified in RFC 2806 will be available in a future release. <code>sip://</code> URLs are not supported at this time.
name	section_name	Names an anchor. Use this attribute to create a bookmark in a document. In future versions of XHTML the name attribute will be replaced by the id attribute. <b>Note:</b> This attribute is parsed, but not used.

## Input Tags

The following input tags are supported:

- `<form>` – Defines a form
- `<input>` – Defines an input field

**Note**

The Microbrowser supports both the GET and POST methods for submitting forms. Nesting forms within tables is supported. However, nesting of one form tag within another is not supported and may lead to unexpected results.

### `<form>`

The form element creates a form for user input. A form can contain text fields, check boxes, radio buttons and more. Forms are used to pass user data to a specified URL.

The following attributes are supported:

Attribute	Value/s	Description
action	URL Ex: "http://www.google.com"	A URL that defines where to send the data when the submit button is pushed
method	get post	The HTTP method for sending data to the action URL. Default is get. <b>method="get"</b> : This method sends the form contents in the URL: URL?name=value&name=value. <b>Note:</b> <i>If the form values contains non-ASCII characters or exceeds 100 characters you MUST use method="post".</i> <b>method="post"</b> : This method sends the form contents in the body of the request.
name	form_name	Defines a unique name for the form



**<input>**

The <input> tag defines the start of an input field where the user can enter data. In XHTML the <input> tag must be properly closed.

The following attributes are supported:

Attribute	Value/s	Description
checked	checked	Indicates that the input element should be checked when it first loads. <b>Note:</b> Used with <code>type="checkbox"</code> and <code>type="radio"</code>
name	field_name	Defines a unique name for the input element. <b>Note:</b> This attribute is required with <code>type="button"</code> , <code>type="checkbox"</code> , <code>type="file"</code> , <code>type="hidden"</code> , <code>type="image"</code> , <code>type="password"</code> , <code>type="text"</code> , and <code>type="radio"</code>
type	checkbox file hidden password radio reset submit text	Indicates the type of the input element. The default value is "text".
value	value	For buttons, reset buttons and submit buttons: Defines the text on the button. For image buttons: Defines the symbolic result of the field passed to a script. For checkboxes and radio buttons: Defines the result of the input element when clicked. The result is sent to the form's action URL. For hidden, password, and text fields: Defines the default value of the element. <b>Note:</b> Cannot be used with <code>type="file"</code> <b>Note:</b> This attribute is required with <code>type="checkbox"</code> and <code>type="radio"</code>

## Image Tags

The following image tag is supported:

- `<img>` – Defines an image

The Microbrowser supports images stored in uncompressed **.bmp** or in **.jpg** format.

- While all BMP bit depths will be displayed to the best of the phone's ability, it is recommended that the image format most suitable for the target platform be chosen. For example:
  - The SoundPoint IP 601 LCD supports four levels of grey, so a 16-color BMP format would be most appropriate.
  - The SoundPoint IP 670 LCD supports 12-bit color.
- JPEG images are supported on SoundPoint IP / SoundStation IP phones except for SoundPoint IP 32x/33x, 430, 450, 550, 560, 650, and 670 desktop phones, SoundStation IP 6000 and 7000 conference phones.

Images can be scrolled up and down, however images that are too wide will be truncated.

Various platforms have differing limits due to memory. There are also differing pixel limits for devices of differing pixel depth. A 1 bit per pixel image 160x80 requires only 1600 bytes. For a 24 bit picture, the memory requirement is 38400 bytes.

There are several limits depending on the source data (this involves the cache limits in configuration) and the display converted data, which is dependant on available RAM (and is limited in the code depending on platform).

### `<img>`

The `img` element defines an image.

#### Note

The "align", "border", "hspace", and "vspace" attributes of the image element are not supported in XHTML 1.0 Strict DTD.

The image is not scaled—up or down—when only one of "width" or "height" is used; however, scaling works when both are used together.

The following attributes are supported:

Attribute	Value/s	Description
src	URL (Ex: "http://www.topxml.com/images/to pxml_site.gif")	The URL of the image to display
height	Pixels (number, EX: "30" ) %	Specifies the height of the image in pixel or percent.
width	Pixels (number, EX: "30" ) %	Specifies the width of the image in pixel or percent.

## Table Tags

The following table tags are supported:

- `<table>` – Defines a table
- `<caption>` – Defines a table caption
- `<th>` – Defines a table header
- `<tr>` – Defines a table row
- `<td>` – Defines a table cell
- `<thead>` – Defines a table header
- `<tbody>` – Defines a table body
- `<tfoot>` – Defines a table footer

### Note

XHTML tables must be properly formatted (should include `<tbody>` and `</tbody>` tags).

### `<table>`

The `<table>` tag defines a table. Inside a `<table>` tag you can put table headers, table rows, table cells, and other tables.

The following attributes are supported:

Attribute	Value/s	Description
align	left center right	Aligns the table. Deprecated. Use styles instead.
border	Pixels (number, EX: "30" )	Specifies the border width. <b>Tip:</b> Set border="0" to display tables with no borders!
cellpadding	Pixels (number, EX: "30" ) %	Specifies the space between the cell walls and contents
cellspacing	Pixels (number, EX: "30" ) %	Specifies the space between cells.
width	% Pixels (number, EX: "30" )	Specifies the width of the table

### <caption>

This element defines a table caption. The <caption> tag must be inserted immediately after the <table> tag. You can specify only one caption per table. Usually the caption will be centered above the table. The "align" attribute of the caption element is not supported in XHTML 1.0 Strict DTD.

The following attributes are supported:

Attribute	Value/s	Description
align	left right top bottom	How to align the caption. Deprecated. Use styles instead.
id	unique_name	Defines a unique name for the map tag.
class	class_rule style_rule	The class of the element
title	tooltip_text	A text to display in a tooltip
style	style_definition	An inline style definition

Attribute	Value/s	Description
dir	ltr (left to right) rtl (left to right)	Sets the text direction
lang	language_code (Ex: EN, deu/ger, hin)	Sets the language code
xml:lang	language_code (Ex: EN, deu/ger, hin)	Sets the language code

### <th>

This tag defines a table header cell in a table. The text within the <th> element usually renders in bold. The “bgcolor”, “height”, “width”, and “nowrap” attributes of the <th> element are not supported in XHTML 1.0 Strict DTD.

The following attributes are supported:

Attribute	Value/s	Description
abbr	abbr_text	Specifies an abbreviated version of the content in a cell
align	left right center justify char	Specifies the horizontal alignment of cell content
axis	category_names	Defines a name for a cell
bgcolor	rgb(x,x,x) #xxxxxx colorname	Specifies the background color of the table cell. Deprecated. Use styles instead.
char	character	Specifies which character to align text on. <b>Note:</b> Only used if align="char"
charoff	Pixels (number, EX: "30" ) %	Specifies the alignment offset to the first character to align on, in pixels or a percentage. <b>Note:</b> Only used if align="char"
class	class_rule style_rule	The class of the element
colspan	number	Indicates the number of columns this cell should span.
dir	ltr (left to right) rtl (left to right)	Sets the text direction

Attribute	Value/s	Description
headers	header_cells'_id	A space-separated list of cell IDs that supply header information for the cell. This attribute allows text-only browsers to render the header information for a given cell.
height	Pixels (number, EX: "30" )	Specifies the height of the table cell. Deprecated. Use styles instead.
id	unique_name	Defines a unique name for the map tag.
lang	language_code (Ex: EN, deu/ger, hin)	Sets the language code
nowrap	nowrap	Whether to disable or enable automatic text wrapping in this cell. Deprecated. Use styles instead.
rowspan	number	Indicates the number of rows this cell should span.
title	tooltip_text	A text to display in a tool tip
scope	col colgroup row rowgroup	Specifies if this cell provides header information for the rest of the row that contains it (row), or for the rest of the column (col), or for the rest of the row group that contains it (rowgroup), or for the rest of the column group that contains it
style	style_definition	An inline style definition
valign	top middle bottom baseline	Specifies the vertical alignment of cell content
width	Pixels (number, EX: "30" ) %	Specifies the width of the table cell in pixels or a percentage. Deprecated. Use styles instead.
xml:lang	language_code (Ex: EN, deu/ger, hin)	Sets the language code

**<tr>**

This tag defines a row in a table.

The following attributes are supported:

Attribute	Value/s	Description
align	right left center justify char	Defines the text alignment in cells.

**<td>**

This tag defines a cell in a table.

The following attributes are supported:

Attribute	Value/s	Description
align	left right center justify char	Specifies the horizontal alignment of cell content
colspan	number	Indicates the number of columns this cell should span.
rowspan	number	Indicates the number of rows this cell should span.

**<thead>**

This tag defines a table header. The `<thead>`, `<tfoot>` and `<tbody>` elements enable you to group rows in a table. When you create a table, you might want to have a header row, some rows with data, and a row with totals at bottom. This division enables browsers to support scrolling of table bodies independently of the table header and footer. When long tables are printed, the table header and footer information may be repeated on each page that contains table data.

**Note**

The `<thead>` must have a `<tr>` tag inside. If you use the `thead`, `tfoot` and `tbody` elements, you must use every element. They should appear in this order: `<thead>`, `<tfoot>` and `<tbody>`, so that browsers can render the footer before receiving all the data. You must use these tags within the table element.

The following attributes are supported:

Attribute	Value/s	Description
align	right left center justify char	Defines the text alignment in cells.
char.	character	Specifies which character to align text on. <b>Note:</b> Only used if align="char"
charoff	Pixels (number, EX: "30" ) %	Specifies the alignment offset to the first character to align on, in pixels or a percentage. <b>Note:</b> Only used if align="char"
valign	top middle bottom baseline	Specifies the vertical text alignment in cells
id	unique_name	Defines a unique name for the map tag.
class	class_rule style_rule	The class of the element
title	tooltip_text	A text to display in a tool tip
style	style_definition	An inline style definition
dir	ltr (left to right) rtl (left to right)	Sets the text direction
lang	language_code (Ex: EN, deu/ger, hin)	Sets the language code
xml:lang	language_code (Ex: EN, deu/ger, hin)	Sets the language code



**<tbody>**

This tag defines a table body. The <thead>, <tfoot> and <tbody> elements enable you to group rows in a table.

The following attributes are supported:

Attribute	Value/s	Description
align	right left center	Defines the text alignment in cells.

**<tfoot>**

This tag defines a table footer. The <thead>, <tfoot> and <tbody> elements enable you to group rows in a table.

The following attributes are supported:

Attribute	Value/s	Description
align	right left center justify char	Defines the text alignment in cells.
char.	character	Specifies which character to align text on. <b>Note:</b> Only used if align="char"
charoff	Pixels (number, EX: "30" ) %	Specifies the alignment offset to the first character to align on, in pixels or a percentage. <b>Note:</b> Only used if align="char"
valign	top middle bottom baseline	Specifies the vertical text alignment in cells
id	unique_name	Defines a unique name for the map tag.
class	class_rule style_rule	The class of the element
title	tooltip_text	A text to display in a tool tip
style	style_definition	An inline style definition

Attribute	Value/s	Description
dir	ltr (left to right) rtl (left to right)	Sets the text direction
lang	language_code (Ex: EN, deu/ger, hin)	Sets the language code
xml:lang	language_code (Ex: EN, deu/ger, hin)	Sets the language code

## Meta Information Tags

The following meta information tags are supported:

- `<head>` – Defines information about the document

### `<head>`

The head element can contain information about the document. The browser does not display the “head information” to the user. The following tag can be in the head section: `<title>`.

No attributes are supported.

#### Note

Due to space constraints, there isn't a static title bar at the top of the Microbrowser window, as there is in most other browsers. The title is displayed in large bold text in the first line of the page, and is scrolled off the screen as the focus is moved down the page.

## HTTP Support

The Microbrowser is a fully compliant HTTP/1.1 user agent:

- It supports:
  - Cookies

#### Note

Cookies are stored in the flash file system; they are preserved when the phone reboots or is reconfigured. Cookies are shared between the idle display Microbrowser and the main Microbrowser.

- Refresh headers
- HTTP proxies
- HTTPS over SSL/TLS
- Custom CA certificates

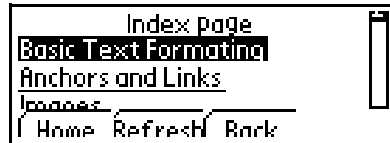
- There are the following exceptions:
  - There is no sophisticated caching. The HTML cache refresh META tag is not supported.
  - Any images in the body of a document with the same URL are assumed to be the same image. The image is loaded from the Microbrowser's memory instead of making another request to the server.
  - When a new page is requested, the Microbrowser's internal memory is cleared and all components of the new page are downloaded from the server.

For more information on CA certificates, refer to "Technical Bulletin 17877: Using Custom Certificates With SoundPoint IP Phones" at [http://www.polycom.com/usa/en/support/voice/soundpoint\\_ip/VoIP\\_Technical\\_Bulletins\\_pub.html](http://www.polycom.com/usa/en/support/voice/soundpoint_ip/VoIP_Technical_Bulletins_pub.html).

## Microbrowser User Interface

Two instances of the Microbrowser may run concurrently:

- An instance with standard interactive user interface

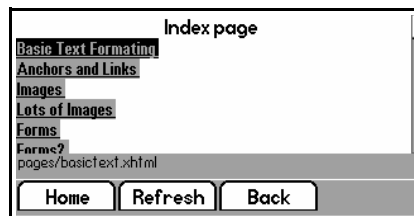


SoundPoint IP 430

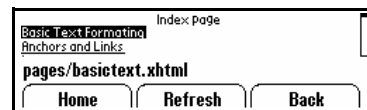


SoundPoint IP 450

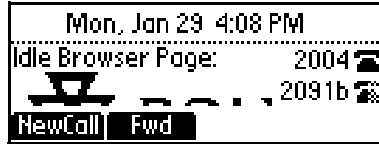
SoundPoint IP 650



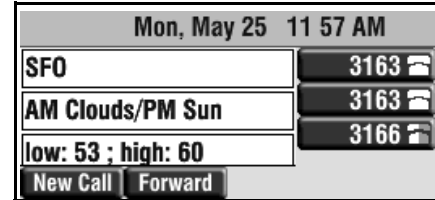
SoundStation IP 4000



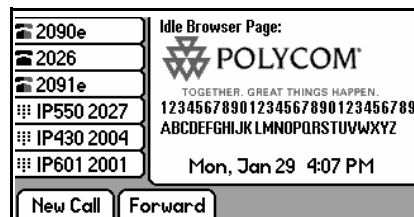
- An instance that does not support user input, but appears in a window on the idle display



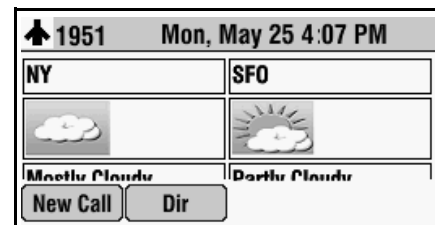
SoundPoint IP 430



SoundPoint IP 450



SoundPoint IP 650



SoundStation IP 7000

## Launching the Microbrowser

The first time the **Applications** key is pressed, the main Microbrowser loads the home page specified in the `mb.main.home` configuration parameter. Subsequent presses of the **Applications** key simply toggle between the Microbrowser and SIP telephony applications. The active page remains loaded in memory when you toggle.

Whenever there is an event in the telephony application that requires the user's attention, the telephony application is brought to the foreground automatically.

The Microbrowser can be displayed again by simply pushing the **Applications** key. While the Microbrowser application is not displayed, it is still active and pending transactions will complete in the background and be immediately visible when the browser is brought to the foreground.

## Navigation and Form Editing

The user navigates through pages by moving the focus among the focusable items with the up and down arrow keys. Focusable items include links, form elements, and buttons. The focus moves between all focusable items on a page in the order that they appear in the XHTML source, including tables. For newly displayed pages, the focus will automatically move to the first focusable item visible on the current page.

When the user has focused on a link that they would like to follow, or a form element they would like to toggle, they press the **Select** key. This will either generate a request for the linked page or toggle the selection of an element in the form. When the focus moves to fields which are editable, the user may simply enter text at will, then move the focus to the next selectable item when complete using the up and down arrow keys. If there is a large area of the page without a focusable element, the page is only scrolled by one screen for each push of the arrow key.

To submit form data, navigate to and select a submit button on the page or press the **Submit** soft key when available.

The **Back** soft key takes the user to the previous page viewed. The left arrow key performs a similar function unless the user is editing a text field. The **Refresh** and **Home** soft keys behave in the expected manner, reloading the current page and reloading to the phone's home page respectively.

Text is entered into text boxes using the dial pad through the same entry method used elsewhere on the phone. When editing text, a soft key allows the user to cycle through uppercase letter, lowercase letter or numeric entry modes. A **Cancel** soft key is available to undo the current edits.

## Idle Display Microbrowser

The idle display Microbrowser is independent of the main Microbrowser, but is capable of rendering the same content. Its home page is configured via the `mb.idleDisplay.home` configuration parameter. The idle display Microbrowser does not accept any user input and will only appear when the user has no phone calls in progress and the phone is in the idle user interface state. The idle display Microbrowser can update its content based on a configurable refresh timer or by honoring the value of the Refresh header.

## Developing an XHTML Application

This section provides information on:

- [Changing Configuration Parameters](#)
- [Sample Applications](#)

## Changing Configuration Parameters

Create a new configuration file in the style of **sip.cfg** so that users will connect to your application when they press the **Application** key (or select the **Application** feature item).

### Note

For more information on why to create another configuration file, refer to the "Configuration File Management on SoundPoint IP Phones" whitepaper at [www.polycom.com/support/voice/](http://www.polycom.com/support/voice/).

### To allow an application to be run from the Microbrowser:

1. Open a new configuration file in an XML editor.
2. Add the Microbrowser `<mb>` parameter.
3. Set `mb.proxy` to the address of the desired HTTP proxy to be used by the Microbrowser.  
For example, `mb.proxy=10.11.32.103:8080`  
where 10.11.32.103 is proxy server IP address and 8080 is the port number.
4. Set `mb.idleDisplay.home` to the URL used for Microbrowser idle display home page.  
For example,  
`mb.idleDisplay.home=http://10.11.32.128:8080/sampleapps/idle`
5. Set `mb.idleDisplay.refresh` to the period in seconds between refreshes of the idle display Microbrowser's content.  
For example, `mb.idleDisplay.refresh=10`
6. Set `mb.main.home` to the URL used for Microbrowser home page.  
For example,  
`mb.main.home=http://10.11.32.128:8080/sampleapps/login`
7. Set `mb.limits.nodes` to the maximum number of tags that the XML parser will handle.  
For example, `mb.limits.nodes= 256`
8. Set `mb.limits.cache` to the maximum total size of objects (KB) downloaded for each page (both XHTML and images).  
For example, `mb.limits.cache= 200`
9. (Optional.) If you are including HTTP URL push messages in your application, do the following:
  - a Set `apps.push.messageType` to the appropriate display priority.  
For example, `apps.push.messageType=3`

- b** Set `apps.push.serverRootURL` to the application server root URL.  
For example,  
`apps.push.serverRootURL=http://172.24.128.85:8080/sampleapps`
  - c** Set `apps.push.username` to the appropriate username.  
For example, `apps.push.username=bob`  
The username and password are required to authenticate incoming push requests to the phone.
  - d** Set `apps.push.password` to the appropriate password.  
For example, `apps.push.password=1234`
  - e** Verify that `httpd.enabled` is set to 1 (the web server is enabled).
- 10.** (Optional.) If you are including telephone event notifications in your application, do the following:
- a** Set `apps.telNotification.URL` to the location where notifications should be sent.  
For example,  
`apps.telNotification.URL=http://172.24.128.85:8080`  
If this URL is set to Null, the notifications events will not be sent.
  - b** Set `apps.telNotification.incomingEvent` to 1 or 0 (for Enable or Disable respectively).  
For example, `apps.telNotification.incomingEvent=1`
  - c** Set `apps.telNotification.outgoingEvent` to 1 or 0 (for Enable or Disable respectively).  
For example, `apps.telNotification.outgoingEvent=1`
  - d** Set `apps.telNotification.offhookEvent` to 1 or 0 (for Enable or Disable respectively).  
For example, `apps.telNotification.offhookEvent=1`
  - e** Set `apps.telNotification.onhookEvent` to 1 or 0 (for Enable or Disable respectively).  
For example, `apps.telNotification.onhookEvent=1`
- 11.** (Optional.) If you are including phone state polling requests in your application, do the following:
- a** Set `apps.statePolling.URL` to the location where requested information should be sent.  
For example, `apps.statePolling.URL=http://172.24.128.85:8080`  
If this URL is set to Null, the requested information will not be sent.

- b** Set `apps.statePolling.username` to the appropriate username.

For example, `apps.statePolling.username=bob`

The username and password are required to authenticate incoming polling requests to the phone.

- c** Set `apps.statePolling.password` to the appropriate password.

For example, `apps.statePolling.password=****`

#### Note

Setting `sec.tagSerialNo` in `sip.cfg` will cause the phone to append its MAC address to the user agent header field in all HTTP messages sent by the phone.

**12.** Save your changes and close the XML editor.

**13.** Add the new file to the master configuration file's `CONFIG_FILES` list in the appropriate order. (The files are processed in the order listed – left to right. The parameter found first in the list of files will be the one that is effective.)

For more information on configuration parameters, refer to the latest *Administrator's Guide for the SoundPoint IP / SoundStation IP / VVX Family* at <http://www.polycom.com/support/voicedocumentation/>.

## Sample Applications

This section presents three sample applications that you can use as a starting point for writing your own application.

- [Static XHTML Application](#)
- [Dynamic XHTML Application](#)
- [SoundPoint IP/SoundStation IP/VVX XML API Application](#)

### Static XHTML Application

**To develop a static XHTML application:**

- 1.** Create a `Sample.xhtml` page with static information to be displayed.

In this case, the static information will be "Hello World!".

```
<html>
<head>
<title>Sample Application</title>
</head>
<body>
<p>HelloWorld!</p>
</body>
```



```
</html>
```

2. Configure the Web server to serve the above XHTML file.

For example, if you are using Apache Tomcat to try this example, then put this file into the `webapps\PLCM` folder of Tomcat.

3. Configure SoundPoint IP and SoundStation IP phones to point to the XHTML file in the `sip.cfg` configuration file.

For this example, change `mb.main.home` to `http://<WEBSERVER_ADDRESS:PORT>/PLCM/Sample.xhtml` .

4. Reboot the phones.
5. On a SoundPoint IP phone, press the **Applications** (or **Services**) key.  
The text "Hello World!" appears on the graphic display.

#### Note

Static XHTML applications can be developed using any Web server. Even though Tomcat is used in the example, the developer is free to use any Web server.

## Dynamic XHTML Application

### To develop a dynamic XHTML application:

1. Create a `AddStock.xhtml` page.

This XHTML page is designed for getting a stock symbol as input from the SoundPoint IP or SoundStation IP phone, then retrieve the information for this stock symbol.

```
<html xmlns="http://www.w3.org/1999/xhtml">
<!-- HEADER START -->
<head>
<title>Stocks</title>
</head>
<!-- HEADER END -->
<!-- BODY START -->
<body>
<!-- ADD STOCK FORM START -->
<form method="POST" action="GetQuote.jsp">
<p>Symbol<input type="text" name="stockname"/>
<input type="submit" value="Get Quote"/></p>
</form>
<!-- ADD STOCK FORM END -->
</body>
<!-- BODY END -->
</html>
```

## 2. Configure the Web server to serve the above XHTML file.

For example, if you are using Apache Tomcat to try this example, put this file into the webapps\PLCM folder of Tomcat.

## 3. Write an application that is going to retrieve the stock information from a data service provider.

For this example, this application will be retrieving stock information from Yahoo and will send it to the Microbrowser. This application is written using a Java Server Page (JSP). Name the file **GetQuote.jsp**.

### Note

Care should be taken as the lines of code shown below may have wrapped. If you cut and paste these lines, they may contain new-lines where there should not be. Check for valid code before executing.

```
<?xml version="1.0" encoding="iso-8859-1"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<%@page
import="java.io.File,java.io.IOException,java.net.URL,java.awt.image.B
ufferedImage,javax.imageio.ImageIO"%>
<html>
<head>
<title>Stock Quote</title>
</head>
<body>
<%
// GETTING THE PATH WHERE BMP FILE HAS TO BE SAVED
String bmpFilePath = application.getRealPath(File.separator) +
"quote.bmp";
// DEFINE URL FROM WHERE CONTENT TO BE RETRIEVED
String stockUrl = "http://ichart.yahoo.com/t?s=";
// RETRIEVE THE STOCK SYMBOL FROM REQUEST
String stockSymbol = "PLCM"; // DEFAULT TO PLCM
if ( request.getParameter("stockname") != null ) {
stockSymbol = request.getParameter("stockname");
}
readAndConvertContentToBmp(stockUrl + stockSymbol, bmpFilePath,
stockSymbol);
%>
<%!
// READ THE CONTENT FROM GIVEN URL AND THEN CONVERT THE CONTENT TO A
BMP FILE
private void readAndConvertContentToBmp(String a_stockUrl, String
a_filePath, String a_name) throws IOException {
try {
BufferedImage stockImage = ImageIO.read(new URL(a_stockUrl));
ImageIO.write(stockImage, "bmp", new File(a_filePath));
}
}
```

```

catch (IOException ex) {    throw ex;}
}
%>
<!-- START DISPLAY BMP FILE -->

<!-- END DISPLAY BMP FILE -->
</body>
</html>

```

**4.** Configure the Web server to deploy the above JSP file.

For example, if you are using Apache Tomcat to try this example, put this file into the `webapps\PLCM` folder of Tomcat.

**5.** Configure SoundPoint IP and SoundStation IP phones to point to the XHTML file in the `sip.cfg` configuration file.

For this example, change `mb.main.home` to `http://<WEBSERVER_ADDRESS:PORT>/PLCM/AddStock.xhtml` .

**6.** Reboot the phones.

**7.** On a SoundPoint IP phone, press the **Applications** (or **Services**) key.

The `AddStock.xhtml` appears on the graphic display.

**8.** Enter a stock symbol, then select the **Get Quote** soft key.

The stock quote for the entered stock symbol appears on the graphic display.

**Note**

Dynamic XHTML applications can be developed using any Web server. Even though Tomcat is used in the example, the developer is free to use any Web server.

Dynamic XHTML applications can be developed using any Web technologies—for example, ASP.net, Java Servlets, Java Server Pages, CGI-PERL, and PHP.

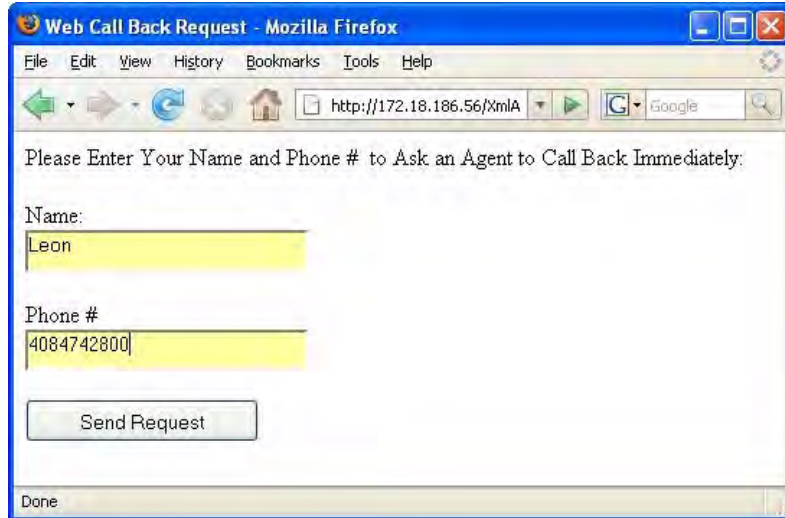
### SoundPoint IP/SoundStation IP/VVX XML API Application

Refer to [SoundPoint IP/SoundStation IP/VVX XML API Application Interface](#) on page 2-1.

This example uses a Telephone Integration URI:

- This is an ASP.NET sample for an IIS Server.

- A customer is browsing a company's web site on the internet. They come upon this web page ([http://A\\_Web\\_Site/WebCallback.aspx](http://A_Web_Site/WebCallback.aspx)), and enter their name and phone number as shown below.



- After the customer clicks **Send Request**, the page shown below is pushed to the customer support agent's phone.



The customer support agent can call the customer by just pressing the **Select** key, because the highlighted link contains a Tel URI with the customer's phone number.

### To develop an XML API application:

1. Using an integrated development environment (IDE) of your choice, create a file called `webcallback.aspx`.

```
<%@ Page Language="C#" AutoEventWireup="true"
CodeFile="WebCallback.aspx.cs" Inherits="WebCallback" %>
```

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
```

```

<html xmlns="http://www.w3.org/1999/xhtml" >
<head runat="server">
  <title>Web Call Back Request</title>
</head>
<body>
  <form id="form1" runat="server">
    <div>
      Please Enter Your Name and Phone # &nbsp;   to Ask an Agent to Call
      Back Immediately:<br />
      <br />
      Name:<br />
      <asp:TextBox ID="BoxName" runat="server" Height="23px"
      Width="192px"></asp:TextBox><br />
      <br />
      Phone #<br />
      <asp:TextBox ID="BoxNumber" runat="server" Height="22px"
      Width="192px"></asp:TextBox><br />
      <br />
      <asp:Button ID="Button1" runat="server" Height="30px"
      OnClick="Button1_Click" Text="Send Request"
      Width="162px" /></div>
    </form>
  </body>
</html>

```

## 2. Using the IDE of your choice, create a file called webcallback.aspx.cs.

```

using System;
using System.IO;
using System.Text;
using System.Data;
using System.Configuration;
using System.Net;
using System.Web;
using System.Web.Security;
using System.Web.UI;
using System.Web.UI.WebControls;
using System.Web.UI.WebControls.WebParts;
using System.Web.UI.HtmlControls;
using System.Threading;

public partial class WebCallback : System.Web.UI.Page
{
  public static ManualResetEvent allDone = new
  ManualResetEvent(false);
  protected void Page_Load(object sender, EventArgs e)
  {

  }

  protected void Button1_Click(object sender, EventArgs e)

```

```

    {
        String phoneNum = BoxNumber.Text ;
        String name = BoxName.Text;

        //send a push request to the phone with the IP address
        //NOTE: Change this hardcoded IP address
        callbackReq("172.18.103.32", phoneNum, name);
    }

private void callbackReq(String phoneIP, String phoneNum, String
name)
{
    String strLoc = "http://" + phoneIP + "/push";
    String[] cred = { "Polycom", "456" };

    NetworkCredential myCred = new NetworkCredential(cred[0],
cred[1]);

    CredentialCache myCache = new CredentialCache();

    myCache.Add(new Uri(strLoc), "Digest", myCred);

    string result = "";

    // Create the web request
    HttpWebRequest request =
(HttpWebRequest)WebRequest.Create(strLoc);

    WebRequestState myRequestState = new WebRequestState();
    myRequestState.request = request;

    request.Method = "POST";
    request.Credentials = myCache;

    myRequestState.createPostData(phoneNum, name);

    IAsyncResult r = (IAsyncResult)request.BeginGetRequestStream(
        new AsyncCallback(ReadCallback), myRequestState);

    allDone.WaitOne();

    // Get response
    HttpWebResponse response =
(HttpWebResponse)request.GetResponse();

    // Get the response stream
    StreamReader reader = new
StreamReader(response.GetResponseStream());

```

```
        // Read the whole contents and return as a string
        result = reader.ReadToEnd();

        reader.Close();
        response.Close();
    }

    private static void ReadCallback(IAsyncResult asynchronousResult)
    {
        WebRequestState myRequestState =
        (WebRequestState)asynchronousResult.AsyncState;
        WebRequest myWebRequest = myRequestState.request;

        // End the Asynchronous request.
        Stream streamResponse =
        myWebRequest.EndGetRequestStream(asynchronousResult);

        byte[] byteArray =
        Encoding.UTF8.GetBytes(myRequestState.getPostData());

        // Write the data to the stream.
        streamResponse.Write(byteArray, 0, byteArray.Length);
        streamResponse.Close();
        allDone.Set();
    }
}

public class WebRequestState
{
    public String postData = null;

    public WebRequest request;
    public WebRequestState()
    {
        request = null;
    }

    public String getPostData()
    {
        return postData;
    }

    public void createPostData(String phoneNum, String name)
    {
        postData =
            "<PolycomIPPhone><Data Priority=\"critical\"> " +
```

```
        "<title>Customer Web Call Back Request</title>" +  
        " <h1>Customer Name : " + name + " </h1> <br></br>" +  
        "<a href=\"tel://\" + phoneNum + ";Line1\">Callback to  
Customer</a>" +  
        "</Data></PolycomIPPhone>";  
  
    }  
}
```

**3.** Configure the IIS Web server to deploy the above files.

**4.** Change the **sip.cfg** configuration file as follows:

**a** Set `apps.push.username` to **Polycom**.

**b** Set `apps.push.password` to **456**.

The phone's IP address is hardcoded in `webcallback.aspx.cs` to **172.18.103.32** for this example. You must change this to another value. Refer to note in code.

**5.** Reboot the phone.

After a customer enters their name and phone number on the web page, the Customer Web Call Back Request page appears on the phone with IP address hardcoded in the **webcallback.aspx.cs** file.



---

# Application Development for the Browser

This chapter presents an overview on how to develop an XHTML application that can be run on the Web Server and the Browser of the Polycom VVX 1500 phone. It also describes the relevant configuration parameters that can be found in the `sip.cfg` configuration file.

This chapter contains information on:

- [Supported Standards](#)
- [HTTP Support](#)
- [Browser User Interface](#)
- [Setting Up the Polycom SDK](#)
- [Developing an XHTML Application](#)

To troubleshoot any problems with your applications, refer to [Troubleshooting](#) on page 5-1.

## Note

Polycom is not responsible for troubleshooting any programming that you create for the Browser.

## Supported Standards

The Browser supports true Web 2.0 applications with the following features:

- XHTML 1.1. (XHTML 1.0 is supported but not recommended.)
- HTML 4.01 with partial support for HTML 5. No support for media player.
- CCS 2.1 with partial support for CCS 3.0. No support for the new white-space values pre-wrap and pre-line.

- SVG 1.1 (partial support)
- **JavaScript.** Supports ECMA-262 with extensions.
- XMLHttpRequest
- DOM
- HTTP 1.1

## HTTP Support

The Browser is a fully compliant HTTP/1.1 user agent as described in RFC 2616. For more information, refer to <http://www.ietf.org/rfc/rfc2616.txt?number=2616>.

- It supports:
  - Cookies

### Note

Cookies are stored in the flash file system; they are preserved when the phone reboots or is reconfigured. Cookies are shared between the idle display Browser and the main Browser.

- Refresh headers
- HTTP proxies
- HTTP by HTTP over TLS

### Note

The Browser will support the TLS protocol v1 only. It is not backward compatible with SSL v2 or SSL v3.

- Custom CA certificates

For more information on CA certificates, refer to “Technical Bulletin 17877: Using Custom Certificates With SoundPoint IP Phones” at [http://www.polycom.com/usa/en/support/voice/soundpoint\\_ip/VoIP\\_Technical\\_Bulletins\\_pub.html](http://www.polycom.com/usa/en/support/voice/soundpoint_ip/VoIP_Technical_Bulletins_pub.html).

## Browser User Interface

### Note

The screenshots of the Polycom VVX 1500 phone shown below display Polycom's **My Info Portal**.

Two instances of the Browser may run concurrently:

- An instance with standard interactive user interface



#### Note

The interactive browser runs in full screen mode only.

- An instance that does not support user input, but appears in a window on the idle display



## Launching the Browser

By default, when you press the **App** key on the Polycom VVX 1500, the Application Launch Pad appears. You must add a new Launch Pad item to the microbrowser configuration parameters — `mb.main.x.url`, `mb.main.x.icon`, and `mb.main.x.text` — for the main Browser to be loaded.

If the Application Launch Pad is disabled — `mb.LaunchPad.enabled` is set — and you press the **App** key on the Polycom VVX 1500, the main Browser loads the home page specified in the `mb.main.home` configuration parameter. Subsequent presses of the **App** key simply toggle between the Browser and SIP telephony applications. The browser title bar shows a progress indicator when the page is loading.

Whenever there is an event in the telephony application that requires the user's attention, the telephony application is brought to the foreground automatically.

The Browser can be displayed again by simply pushing the **App** key. While the Browser application is not displayed, it is still active and pending transactions will complete in the background and be immediately visible when the browser is brought to the foreground.

## Navigation and Form Editing

The user navigates in the Browser as they would in any major web browser. The navigation keys on the Polycom VVX 1500 can be used to scroll the web page up, down, left, and right. There is an on-screen navigation cluster that performs in the same manner.

The toolbar shows the following buttons:

- Home
- Stop/Refresh (depending on whether the page has completely downloaded yet)
- Keyboard pop-up (when focus is on an input widget)
- Navigation (Up, down, left, and right buttons appear only if scrolling is available in those directions)

### Note

Holding down the navigation keys speeds up scrolling.

- Exit
- Encoding (Ascii, Cyrillic, Katakana, Latin, and Unicode)
- Text entry mode (123, ABC, abc, and Abc)

Form editing in the Browser is performed as in any major web browser. When the focus is on an input field and the keyboard is invoked such that the input field is vertically centered in the top portion of the screen, the keyboard widget displays in the lower portion of the screen. The keyboard is removed from the screen once the user “clicks” on the screen. This allows the user to click the Submit button next to the entry field without closing the keyboard widget.

## Idle Display Browser

The idle display browser is independent of the main Browser, but is capable of rendering the same content. Its home page is configured via the `mb.idleDisplay.home` configuration parameter. The idle display browser does not accept any user input and will only appear when the user has no phone calls in progress and the phone is in the idle user interface state.

## Setting Up the Polycom SDK

The Polycom SDK 1.0 is set of tools to assist you in developing XML API/XHTML applications for the Polycom VVX 1500 phone, providing a simulation of a Polycom VVX 1500 with both the main and idle browsers. It can be used to test basic call functionality (by using SIP signalling). (Audio/video support (RTP functionality) is not supported.)

The Polycom SDK 1.0 is available from <http://www.polycom.com/support/voice/sdk> and can be installed in on any computer running Microsoft® Windows® XP Professional, SP3 and Microsoft Windows Server 2003 Standard edition, SP2.

### Note

If the computer where the SDK is to be run is already running a web server, it should be shut down before using the SDK.

The VVX 1500 simulator uses port 80. If any existing applications on the computer are using port 80, they should be shut down.

The **setup.exe** executable will install three components:

- The VVX 1500 simulator
- The XML API Web Testing Tool (optional)
- The XML API Standalone Testing tool (optional)

To start using the SDK, start the VVX 1500 simulator by selecting **Start > Polycom > SDK > VVX 1500 Simulator > Start**.

For more information, refer to the documentation provided with the Polycom SDK installation.

## Developing an XHTML Application

This section provides information on:

- [Changing Configuration Parameters](#)
- [Sample Applications](#)

## Changing Configuration Parameters

Create a new configuration file in the style of `sip.cfg` so that users will connect to your application when they press the **Application** key (or select the **Application** feature item).

### Note

For more information on why to create another configuration file, refer to the "Configuration File Management on SoundPoint IP Phones" whitepaper at [www.polycom.com/support/voice/](http://www.polycom.com/support/voice/).

### To allow an application to be run from the Browser:

1. Open a new configuration file in an XML editor.
2. Add the Microbrowser `<mb>` parameter.
3. Set `mb.proxy` to the address of the desired HTTP proxy to be used by the Browser.  
For example, `mb.proxy=10.11.32.103:8080`  
where 10.11.32.103 is proxy server IP address and 8080 is the port number.
4. Set `mb.idleDisplay.home` to the URL used for the Browser idle display home page.  
For example,  
`mb.idleDisplay.home=http://10.11.32.128:8080/sampleapps/idle`
5. Set `mb.idleDisplay.refresh` to the period in seconds between refreshes of the idle display Browser's content.  
For example, `mb.idleDisplay.refresh=10`
6. Set `mb.main.home` to the URL used for the Browser home page.  
For example,  
`mb.main.home=http://10.11.32.128:8080/sampleapps/login`
7. Set `mb.limits.nodes` to the maximum number of tags that the XML parser will handle.  
For example, `mb.limits.nodes= 256`
8. Set `mb.limits.cache` to the maximum total size of objects (KB) downloaded for each page (both XHTML and images).  
For example, `mb.limits.cache= 200`
9. (Optional.) If you are including HTTP URL push messages in your application, do the following:
  - a Set `apps.push.messageType` to the appropriate display priority.  
For example, `apps.push.messageType=3`

- b** Set `apps.push.serverRootURL` to the application server root URL.  
For example,  
`apps.push.serverRootURL=http://172.24.128.85:8080/sampleapps`
  - c** Set `apps.push.username` to the appropriate username.  
For example, `apps.push.username=bob`  
The username and password are required to authenticate incoming push requests to the phone.
  - d** Set `apps.push.password` to the appropriate password.  
For example, `apps.push.password=1234`
  - e** Verify that `httpd.enabled` is set to 1 (the web server is enabled).
- 10.** (Optional.) If you are including telephone event notifications in your application, do the following:
- a** Set `apps.telNotification.URL` to the location where notifications should be sent.  
For example,  
`apps.telNotification.URL=http://172.24.128.85:8080`  
If this URL is set to Null, the notifications events will not be sent.
  - b** Set `apps.telNotification.incomingEvent` to 1 or 0 (for Enable or Disable respectively).  
For example, `apps.telNotification.incomingEvent=1`
  - c** Set `apps.telNotification.outgoingEvent` to 1 or 0 (for Enable or Disable respectively).  
For example, `apps.telNotification.outgoingEvent=1`
  - d** Set `apps.telNotification.offhookEvent` to 1 or 0 (for Enable or Disable respectively).  
For example, `apps.telNotification.offhookEvent=1`
  - e** Set `apps.telNotification.onhookEvent` to 1 or 0 (for Enable or Disable respectively).  
For example, `apps.telNotification.onhookEvent=1`
- 11.** (Optional.) If you are including phone state polling requests in your application, do the following:
- a** Set `apps.statePolling.URL` to the location where requested information should be sent.  
For example, `apps.statePolling.URL=http://172.24.128.85:8080`  
If this URL is set to Null, the requested information will not be sent.

- b** Set `apps.statePolling.username` to the appropriate username.

For example, `apps.statePolling.username=bob`

The username and password are required to authenticate incoming polling requests to the phone.

- c** Set `apps.statePolling.password` to the appropriate password.

For example, `apps.statePolling.password=****`

**Note**

Setting `sec.tagSerialNo` in `sip.cfg` will cause the phone to append its MAC address to the user agent header field in all HTTP messages sent by the phone.

- 12.** Save your changes and close the XML editor.

- 13.** Add the new file to the master configuration file's `CONFIG_FILES` list in the appropriate order. (The files are processed in the order listed – left to right. The parameter found first in the list of files will be the one that is effective.)

For more information on configuration parameters, refer to the latest *Administrator's Guide for the SoundPoint IP / SoundStation IP / VVX Family* at <http://www.polycom.com/support/voicedocumentation/>.

## Sample Applications

Refer to [SoundPoint IP/SoundStation IP/VVX XML API Application Interface](#) on page 2-1.

This section presents a sample application (PDF attachment **mip3.zip**) that you can use as a starting point for writing your own application.

**Note**

Polycom recommends that you use Adobe Reader 8 or 9 to view this guide and the attachments. Click on the paperclip icon on the left-hand side to view the attachment **mip3.zip**.



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# Troubleshooting

This chapter presents problems, likely causes, and corrective actions. Problems are grouped as follows:

- [XML Errors](#)

If you still need assistance, contact your system administrator.

## XML Errors

Symptom	Problem	Corrective Action
Improperly formatted tables could cause the phone to stop and restart or display the error "XML Error (17,75) mismatched tag".	A table tag was improperly formatted.	Correct the improperly formatted table.



---

# Appendix

This appendix provides information on XHTML elements that are not supported by the Microbrowser.

## Unsupported XHTML Elements

The unsupported elements and attributes are:

Tag Type	Tag Description
<b>Basic Tags</b>	<html>—Defines HTML document.
	<body>—Defines documents' body.
	<h1> to <h6>—Defines header 1 to header 6.
	<p>—Defines a paragraph.
	 —Inserts a single line break.
	<hr>—Defines a horizontal rule.

Tag Type	Tag Description
<b>Character Format Tags</b>	<b>—Defines bold text.
	<font>—Deprecated. Defines text font, size, and color.
	<i>—Defines italic text.
	<em>—Defines emphasized text.
	<big>—Defines big text.
	<strong>—Defines strong text.
	<small>—Defines small text.
	<sup>—Defines superscripted text.
	<sub>—Defines subscripted text.
	<bdo>—Defines the direction of text display.
	<u>—Deprecated. Defines underlined text.
<b>Output Tags</b>	<pre>—Defines preformatted text.
	<code>—Defines computer code text.
	<tt>—Defines teletype text.
	<kbd>—Defines keyboard text.
	<var>—Defines a variable.
	<dfn>—Defines a definition term.
	<samp>—Defines sample computer code.
	<xmp>—Deprecated. Defines preformatted text.
<b>Block Tags</b>	<acronym>—Defines an acronym.
	<abbr>—Defines an abbreviation.
	<address>—Defines an address element.
	<blockquote>—Defines a long quotation.
	<center>—Deprecated. Defines centered text.
	<q>—Defines a short quotation.
	<cite>—Defines a citation.
	<ins>—Defines inserted text.
	<del>—Defines deleted text.
	<s>—Deprecated. Defines strikethrough text.
	<strike>—Deprecated. Defines strikethrough text.

Tag Type	Tag Description
<b>Link Tags</b>	<p><code>&lt;a&gt;</code>—Defines an anchor.</p> <p>The following attributes are not supported: charset, coords, hreflang, rel, rev, shape, target, type, id, class, title, style, dir, lang, xml:lang, tabindex, and accesskey.</p>
	<p><code>&lt;link&gt;</code>—Defines a resource reference.</p>
<b>Frame Tags</b>	<p><code>&lt;frame&gt;</code>—Defines a sub window (frame).</p>
	<p><code>&lt;frameset&gt;</code>—Defines a set of frames.</p>
	<p><code>&lt;noframes&gt;</code>—Defines a noframe section.</p>
	<p><code>&lt;iframe&gt;</code>—Defines an inline sub window (frame).</p>
<b>Input Tags</b>	<p><code>&lt;form&gt;</code>—Defines a form.</p> <p>The following attributes are not supported: accept, accept charset, enctype, target, class, id, style, title, dir, lang, and accesskey.</p>
	<p><code>&lt;input&gt;</code>—Defines an input field.</p> <p>The following attributes are not supported: accept, align, alt, disabled, maxlength, readonly, size, arc, type:button, type:file, type:image, class, is, style, title, dir, lang, accesskey.</p>
	<p><code>&lt;textarea&gt;</code>—Defines a text area.</p>
	<p><code>&lt;button&gt;</code>—Defines a push button.</p>
	<p><code>&lt;select&gt;</code>—Defines a selectable list.</p>
	<p><code>&lt;optgroup&gt;</code>—Defines an option group.</p>
	<p><code>&lt;option&gt;</code>—Defines an item in a list box.</p>
	<p><code>&lt;label&gt;</code>—Defines a label for a form control.</p>
	<p><code>&lt;fieldset&gt;</code>—Defines a fieldset.</p>
	<p><code>&lt;legend&gt;</code>—Defines a title in a fieldset.</p> <p><code>&lt;isindex&gt;</code>—Deprecated. Defines a single-line input field.</p>

Tag Type	Tag Description
<b>List Tags</b>	<ul>—Defines an unordered list.
	<ol>—Defines an ordered list.
	<li>—Defines a list item.
	<dir>—Deprecated. Defines a directory list.
	<dl>—Defines a definition list.
	<dt>—Defines a definition term.
	<dd>—Defines a definition description.
	<menu>—Deprecated. Defines a menu list.
<b>Image Tags</b>	<p data-bbox="824 726 1092 758">&lt;img&gt;-Defines an image.</p> <p data-bbox="824 764 1398 852">The following attributes are not supported: alt, align, border, hspace, ismap, longdesc, usemap, vspace, id, class, title, style, xml:lang, and lang</p>
	<map>—Defines an image map.
	<area>—Defines an area inside an image map.
<b>Table Tags</b>	<p data-bbox="824 972 1092 1003">&lt;table&gt;—Defines a table.</p> <p data-bbox="824 1010 1377 1098">The following attributes are not supported: bgcolor, frame, rules, summary, id, class, title, style, dir, lang, and xml:lang.</p>
	<col>—Defines attributes for table columns.
	<p data-bbox="824 1171 1101 1203">&lt;tr&gt;—Defines a table row.</p> <p data-bbox="824 1209 1398 1297">The following attributes are not supported: bgcolor, cahr, charoff, valign, id, class, title, style, dir, lang, and xml:lang.</p>
	<p data-bbox="824 1318 1105 1350">&lt;td&gt;—Defines a table cell.</p> <p data-bbox="824 1356 1398 1472">The following attributes are not supported: abbr, axis, bgcolor, char, charoff, headers, height, nowrap, scope, valign, width, id, class, title, style, dir, lang, and xml:lang.</p>
	<p data-bbox="824 1486 1157 1518">&lt;tbody&gt;—Defines a table body.</p> <p data-bbox="824 1524 1398 1619">The following attributes are not supported: align:justify, align:char, char, charoff, valign, id, class, title, style, dir, lang, and xml:lang.</p>
	<colgroup>—Defines groups of table columns.
<b>Style Tags</b>	<style>—Defines a style definition.
	<div>—Defines a section in a document.
	<span>—Defines a section in a document.

---

Tag Type	Tag Description
<b>Meta Information Tags</b>	<head>—Defines information about the document. No attributes are supported.
	<title>—Defines the document title.
	<meta>—Defines meta information
	<base>—Defines a base URL for all the links in a page
	<basefont>—Deprecated. Defines a base font
<b>Programming Tags</b>	<script>—Defines a script
	<noscript>—Defines a noscript section
	<applet>—Deprecated. Defines an applet
	<object>—Defines an embedded object
	<param>—Defines a parameter for an object





# Third Party Software

This appendix provides the copyright statements for third party software products that are part of the application programs that run on Polycom SoundPoint IP, SoundStation IP, and VVX 1500 phones.

Product	License Location
c-ares	<a href="#">c-ares</a> on page D-2
curl	<a href="#">curl</a> on page D-3
eXpat	<a href="#">eXpat</a> on page D-9
ILG JPEG	<a href="#">IJG JPEG</a> on page D-9
libMng	<a href="#">libMng</a> on page D-10
libPng	<a href="#">libPng</a> on page D-11
libSRTP	<a href="#">libSRTP</a> on page D-13
libssh2	<a href="#">libssh2</a> on page D-13
OpenLDAP	<a href="#">OpenLDAP</a> on page D-14
OpenSSL	<a href="#">OpenSSL</a> on page D-15
zlib	<a href="#">zlib</a> on page D-18

This appendix provides the copyright statements for third party software products that are part of the application programs that run on Polycom VVX 1500 phones only.

Product	License Location
BusyBox	Refer to the "Polycom Voice OFFER of Source for GPL and LGPL Software"
dhcp	<a href="#">dhcp 4.0.0-14</a> on page D-3
droidfonts	<a href="#">droidfonts</a> on page D-5
Dropbear	<a href="#">Dropbear</a> on page D-4

Product	License Location
glibc	Refer to the "Polycom Voice OFFER of Source for GPL and LGPL Software"
libstdc++	Refer to the "Polycom Voice OFFER of Source for GPL and LGPL Software"
Linux kernel	Refer to the "Polycom Voice OFFER of Source for GPL and LGPL Software"
module-init-tools	Refer to the "Polycom Voice OFFER of Source for GPL and LGPL Software"
mtt-utils	Refer to the "Polycom Voice OFFER of Source for GPL and LGPL Software"
ncurses	<a href="#">ncurses</a> on page D-14
pmap	<a href="#">pmap-29092002</a> on page D-17
procps	Refer to the "Polycom Voice OFFER of Source for GPL and LGPL Software"
tsattach	Refer to the "Polycom Voice OFFER of Source for GPL and LGPL Software"
tslib	Refer to the "Polycom Voice OFFER of Source for GPL and LGPL Software"
udev	Refer to the "Polycom Voice OFFER of Source for GPL and LGPL Software"
Webkit	Refer to the "Polycom Voice OFFER of Source for GPL and LGPL Software"
wrsv-ltt	Refer to the "Polycom Voice OFFER of Source for GPL and LGPL Software"

The "Polycom Voice OFFER of Source for GPL and LGPL Software" is available at <http://downloads.polycom.com/voice/voip/offerForSourceVoiceProducts.html>.

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=====

loginrec.c

loginrec.h

atomicio.h

atomicio.c

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For more information, contact [jpeg-info@jpegclub.org](mailto:jpeg-info@jpegclub.org).

Contents of this directory

`jpegsrc.vN.tar.gz` contains source code, documentation, and test files for release N in Unix format.

`jpegsrN.zip` contains source code, documentation, and test files for release N in Windows format.

jpegaltui.vN.tar.gz contains source code for an alternate user interface for cjpeg/djpeg in Unix format.

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wallace.ps.gz is a PostScript file of Greg Wallace's introductory article about JPEG. This is an update of the article that appeared in the April 1991 Communications of the ACM.

jpeg.documents.gz tells where to obtain the JPEG standard and documents about JPEG-related file formats.

jfif.ps.gz is a PostScript file of the JFIF (JPEG File Interchange Format) format specification.

jfif.txt.gz is a plain text transcription of the JFIF specification; it's missing a figure, so use the PostScript version if you can.

TIFFTechNote2.txt.gz is a draft of the proposed revisions to TIFF 6.0's JPEG support.

pm.errata.gz is the errata list for the first printing of the textbook "JPEG Still Image Data Compression Standard" by Pennebaker and Mitchell.

jdosaobj.zip contains pre-assembled object files for JMEMDOS.ASM.

If you want to compile the IJG code for MS-DOS, but don't have an assembler, these files may be helpful.

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### **zlib**

version 1.2.3, July 18th, 2005

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