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

SIP 3.1

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SIP 3.1

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About This Guide

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

The following related documents for SoundPoint IP / SoundStation IP family 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 phone systems
- Technical Bulletins, which describe workarounds to existing issues
- 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 models: _____

BootROM version: _____

SIP Application version: _____

Partner Platform: _____

Contents

1

Overview

This chapter provides an overview of the Web Server and the Microbrowser available on SoundPoint IP 330/320, 430, 501, 550, 560, 600, 601, 650, and 670 desktop phones and SoundStation IP 4000, 6000, and 7000 conference phones.

It also provides an introduction to XHTML and guidelines for the application development.

This chapter contains information on:

- What is the Microbrowser
- What is XHTML
- How to Create Applications
- New Features in SIP 3.1

To develop an application that can run on the Web Server and the Microbrowser, refer to Application Development on page 2-1. To troubleshoot any problems with your applications, refer to Troubleshooting on page 3-1.

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 keep 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:

- SoundPoint IP 330/320 — screen resolution - 102*22 pixels (3″ by 1″)
- SoundPoint IP 430 — screen resolution – 132*46 pixels (3.5″*1.5″)
- SoundPoint IP 501 — screen resolution – 160*80 pixels (4″ by 2″)
- SoundPoint IP 550/560/601/650 — screen resolution – 320*160 pixels (4″ by 2″)
- SoundPoint IP 670 — screen resolution – 320*160 pixels (4″ by 2″)
- SoundStation IP 4000/6000 — screen resolution – 240*68 pixels (2.4″ by 0.8″)
- SoundStation IP 7000 — screen resolution – 255*128 pixels (3″ by 1.5″)

What is XHTML

XHTML is the abbreviation of eXtensible HyperText Markup Language.

XHTML 1.0 is a transformation of HTML 4.01 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/1999/REC-html401-19991224
- XHTML™ 1.0—http://www.w3.org/TR/2002/REC-xhtml1-20020801
- XHTML™ Basic—http://www.w3.org/TR/2000/REC-xhtml-basic-20001219/
- XHTML™ 1.1—http://www.w3.org/TR/2001/REC-xhtml11-20010531/
- 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

You can design the following examples of applications:

- Web browser

- Company directory
- Stock ticker

Depending on the type and complexity of the application, you might use one of the following tools for creation:

- Text editor
- XML editor
- Microsoft Word

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 on page 2-1.

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

New Features in SIP 3.1

The following new features were introduced in SIP 3.1:

- SoundPoint IP/SoundStation IP XML API Application Interface—Expanded support in the Microbrowser for applications on the SoundPoint IP 320/330, 430, 501, 550, 560, 650, and 670 desktop phones, and SoundStation IP 4000, 6000, and 7000 conference phones. The SoundPoint IP/SoundStation IP XML API is intended to provide developers with flexibility in developing applications on SoundPoint IP and SoundStation IP phones, while tightly integrating into the phone's telephony capabilities and functions.

2

Application Development

This chapter presents step-by-step instructions on how to develop an XHTML application that can be run on the Web Server and Microbrowser of certain SoundPoint IP and SoundStation IP phones. It also describes the configuration parameters that can be found in the **sip.cfg** configuration file.

This chapter contains information on:

- Supported XHTML Elements
- SoundPoint IP/SoundStation IP XML API Application Interface
- HTTP Support
- Microbrowser User Interface
- Developing an XHTML Application

To troubleshoot any problems with your applications, refer to Troubleshooting on page 3-1.

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 is 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

Note

The Microbrowser supports both `http://` and `tel://` URL schemes as well as internal URIs. When a tel:// 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 tel:// URL parsing as specified in RFC 2806 will be available in a future release.

`sip://` URLs are not supported at this time.

<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:" www.polycom.com")	The target URL of the link
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. ***Note**: 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. **method="get":** This method sends the form contents in the URL: URL?name=value&name=value. ***Note:*** *If the form values contains non-ASCII characters or exceeds 100 characters you MUST use method="post".* **method="post":** 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. ***Note:*** *Used with type="checkbox" and type="radio"*
name	field_name	Defines a unique name for the input element. ***Note:*** *This attribute is required with type="button", type="checkbox", type="file", type="hidden", type="image", type="password", type="text", and type="radio"*
type	checkbox 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. ***Note:*** *Cannot be used with type="file"* ***Note:*** *This attribute is required with type="checkbox" and type="radio"*

Image Tags

The following image tag is supported:

- <img> — Defines an image

The Microbrowser supports images stored in uncompressed **.bmp** 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.

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).

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 following attributes are supported:

Attribute	Value/s	Description
src	URL (Ex: "http://www.topxml.com/images/topxml_site.gif" or "c:\images\img1.jpg")	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. ***Tip:*** *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	MB Support
align	Left right top bottom	How to align the caption. Deprecated. Use styles instead.	Need to verify
id	unique_name	Defines a unique name for the map tag.	Need to verify
class	class_rule style_rule	The class of the element	Need to verify
title	tooltip_text	A text to display in a tool tip	Need to verify
style	style_definition	An inline style definition	Need to verify
dir	ltr (left to right) rtl (left to right)	Sets the text direction	Need to verify
lang	language_code (Ex: EN, deu/ger, hin)	Sets the language code	Need to verify
xml:lang	language_code (Ex: EN, deu/ger, hin)	Sets the language code	Need to verify

<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

Attribute	Value/s	Description
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. **Note:** Only used if align="char"!
charoff	Pixels (number, EX: “30”) %	Specifies the alignment offset to the first character to align on. **Note:** Only used if align="char"!
colspan	number	Indicates the number of columns this cell should span.
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.
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.
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
valign	top middle bottom baseline	Specifies the vertical alignment of cell content
width	Pixels (number, EX: “30”) %	Specifies the width of the table cell. Deprecated. Use styles instead.
id	unique_name	Defines a unique name for the map tag.

Attribute	Value/s	Description
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

<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 foot 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 **Note:** Only used if align="char"!
charoff	Pixels (number, EX: “30”) %	Specifies the alignment offset to the first character to align on. **Note:** 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

<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 **Note:** Only used if align="char"!
charoff	Pixels (number, EX: “30”) %	Specifies the alignment offset to the first character to align on. **Note:** Only used if align="char"!
valign	top middle bottom baseline	Specifies the vertical text alignment in cells

Attribute	Value/s	Description
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

Meta Information Tags

The following meta information tags are supported:

- <head> – Defines information about the document

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.

<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.

SoundPoint IP/SoundStation IP XML API Application Interface

In SIP 3.1, there is expanded support in the Microbrowser for applications on the SoundPoint IP 320/330, 430, 501, 550, 560, 650, and 670 desktop phones, and SoundStation IP 4000, 6000, and 7000 conference phones.

The SoundPoint IP/SoundStation IP XML API is intended to provide developers with flexibility in developing applications on SoundPoint IP and SoundStation IP phones, while tightly integrating into the phone's telephony capabilities and functions.

This expanded 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 2-32.

Programmable Soft Keys

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="X" label="Y" action="Z" />
```

The following attributes are supported:

Attribute	Value/s	Description
index	numeric, 1 to 8	Position of the soft key.
label	string	Text displayed on soft key. The maximum length is 9 characters. ***Note:*** *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: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
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:Mute	Mute	Mutes the phone when the call state
Key:Directories	Directories	Open the Directories 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 softkey tags must exist inside the `<form>` tag that they are to act upon.
- 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).

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 hef="Key:Setup">Menu</a>`). When the user selects the anchor, the action is processed and executed.
- Refer to Programmable Soft Keys on page 2-14.

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 Line36	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 SoftKey4	
	DialPadStar	
	DialPadPound	
	VolDown	
	VolUp	
	Headset	
	Handsfree	
	Mute	
	Messages	
	Applications	
	Directories	
	Setup	
	ArrowUp	
	ArrowDwn	
	ArrowLeft	
	ArrowRight	
	Backspace	
	DoNotDisturb	
	Select	

Action Type	Action	Description
SoftKey	Back	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.
	Cancel	
	Exit	
	Submit	
	Reset	
	Refresh	
Tel	Number;LineIndex	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). ***Note:*** *The LineIndex value is case sensitive. The range of LineIndex is "Line1" to "Line36".* ***Note:*** *If the line corresponding to the LineIndex in the Tel action is busy, the request is ignored.*
Play	Play:<audiofile_path>	Download and play the audio file. The supported audio formats are G.711 uLaw and Liner16. The <audiofile_path> is the relative path on the application server, relative to `apps.push.serverRootURL`. The supported maximum file size is determined by `res.finder.sizeLimit`.

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>
```

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 ULIs to a specific phone.

The following format is supported:

```
<URL priority=”X” >URI data</URL>
```

The following attributes are supported:

Attribute	Value/s	Description
priority	0 = Disable push functionality 1 = Accept critical priority push requests only 2 = accept normal priority push requests only, 3 = accept all push requests	Priority ***Note:*** *If set to a value other than 0 to 3 or if absent, “normal”is used.*
URI data	string	Any relative URI on the configured application server. ***Note:*** *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 phone can hold a maximum of 10 push requests at any time.
- Push requests are displayed as "first-in-first-out".
- Changes must be made in the **sip.cfg** configuration file to enable this feature. Refer to Push Request Configuration Parameters on page 2-21.
- 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>
```

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	0 = Disable push functionality 1 = Accept critical priority push requests only 2 = accept normal priority push requests only, 3 = accept all push requests	Priority ***Note:*** *If set to a value other than 0 to 3 or if absent, "normal"is used.*
text	text in HTML format	Text ***Note:*** *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>
```

Push Request Configuration Parameters

The push request configuration parameters in **sip.cfg** must be set as followed:

- 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.

Changes must be made in the **sip.cfg** configuration file to enable this feature. Refer to Telephony Event Notification Configuration Parameters on page 2-26.

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"

Attribute	Value/s	Description
CallingPartyName	name	The name displayed in phone's "From" label in screen. • 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” • 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”
CallingPartyNumber	number	The number displayed on the phone. • If the line is registered and the call is initiated from that line, the registered line number of the calling party is shown. • 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.
CalledPartyName	name	• If the call is received by registered line, the registered line display name of the called party is shown. • If the call is received on a non-registered line, the IP address of the called party is shown.
CalledPartyNumber	number	• If the call is received by registered line, the registered line number of the called party is shown. • If the call is received on a non-registered line, the IP address of the called party is shown.
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	• 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. • If the line is not registered and the call is initiated from that line, then IP address of the calling party is shown.

Attribute	Value/s	Description
CallingPartyNumber	number	• If the line is registered and the call is initiated from that line, the registered line number of the calling party is shown. • 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.
CalledPartyName	name	The name displayed at phone's "To" name. • If the call is received by registered line, the registered line display name of the called party is shown. • If the call is received on a non-registered line, the IP address of the called party is shown.
CalledPartyNumber	number	The number displayed on the phone. • If the call is received by registered line, the registered line number of the called party is shown. • If the call is received on a non-registered line, the IP address of the called party is shown.
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 of the phone to a specific URI:

- Call Line Information—The line registration and call state are requested by the call state handler (http://<Phone_IP>/callstateHandler).
- Device Information—Device- specific information is requested by the device handler (http://<Phone_IP>/deviceHandler).
- Network Configuration—Network-specific information is requested by the network handler (http://<Phone_IP>/networkHandler).

Two HTTP transactions occur here:

- The application sends an HTTP request to a particular handler
- The Microbrowser 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 2-32.

Call Line Information

The following format is supported:

```
<CallLineInfo>
    <LineKeyNum> </LineKeyNum>
    <LineDirNum> </LineDirNum>
    <LineState>Active</LineState>
    <CallInfo>
        <CallState> </CallState>
        <CallType> </CallType>
        <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.

Attribute	Value/s	Description
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.
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 Processing 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 registsred 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 XML API, the following should be noted:

- Authenticating remote control and monitoring— There is no support of TLS on the phone's web server. The execution of each of each HTTP GET/POST request requires an MD5 digest authentication. 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.
- Unsolicted 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 executable 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 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.

HTTP Support

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

- It supports:
  - Cookies

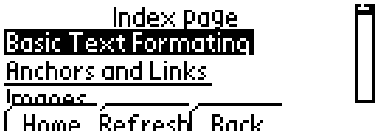
Note Cookies are stored in RAM, therefore they are not are not preserved when the phone reboots or is reconfigured. Cookies are not shared between the idle display Microbrowser and the main Microbrowser.

  - Refresh headers
  - HTTP proxies
  - HTTP over SSL/TLS
  - Self-signed or 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.

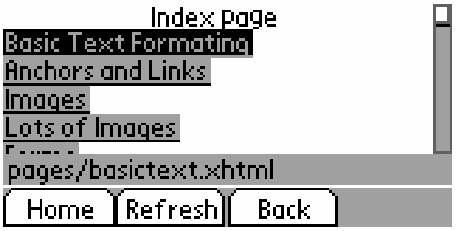
Microbrowser User Interface

Two instances of the Microbrowser may run concurrently:

- An instance with standard interactive user interface

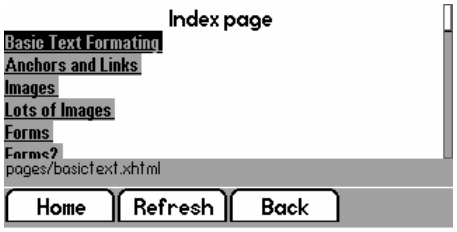


SoundPoint IP 430



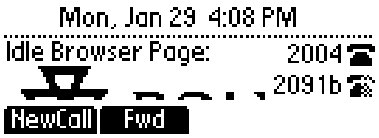
SoundPoint IP 650

SoundPoint IP 501

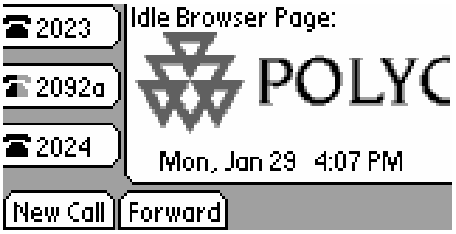


SoundStation IP 4000

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

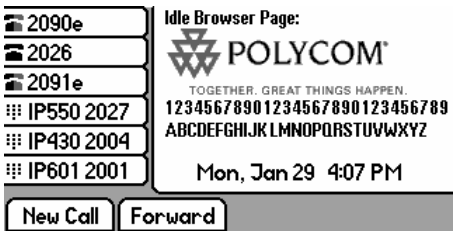


SoundPoint IP 430



SoundPoint IP 650

SoundPoint IP 501



SoundStation IP 4000

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 returning to the user'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

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/ .

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.

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 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`

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=****`

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.

    Since the files are processed left to right, any parameter which appears in first file will override the same parameter in later files.

For more information on configuration parameters, refer to the latest *Administrator's Guide for the SoundPoint IP / SoundStation IP 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 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).

```
<?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 -->
<img src="quote.bmp"/>
<!-- 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

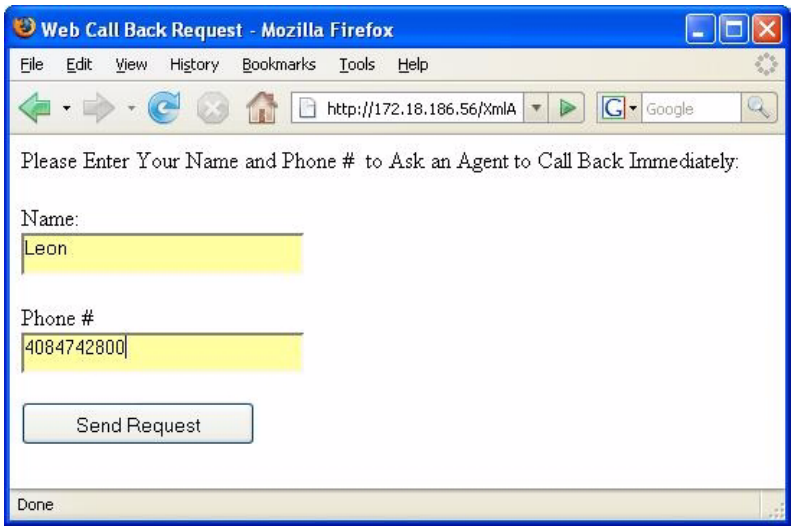
Dynamic XHTML applications can be developed using any Web server. Even though Tomcat is used in the example, the developer is free to use any Web server.

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 XML API Application

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), 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 Microsoft Visual Studio, 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 #  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 Microsoft Visual Studio, 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
        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 Asynchronus 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.
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 **172.18.103.32** .

3

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.

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Appendix

This appendix provides information on unsupported XHTML elements.

Unsupported XHTML Elements

The unsupported elements and attributes are:

Tag Type	Tag Description
Basic Tags	<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.
Character Format Tags	<b>—Defines bold text.
	<font>—Deprecated. Defines text font, size, and color.
	<i>—Defines italic text.
	—Defines emphasized text.
	<big>—Defines big text.
	—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.

Tag Type	Tag Description
Output Tags	<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.
Block Tags	<acronym>—Defines an acronym.
	<abbr>—Defines an abbreviation.
	<address>—Defines an address element.
	<blockquote>—Defines a long quotation.
	—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.
Link Tags	<a>—Defines an anchor. 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.
	<link>—Defines a resource reference.
Frame Tags	<frame>—Defines a sub window (frame).
	<frameset>—Defines a set of frames.
	<noframes>—Defines a noframe section.
	<iframe>—Defines an inline sub window (frame).

Tag Type	Tag Description
Input Tags	<form>—Defines a form. The following attributes are not supported: accept, accept charset, enctype, target, class, id, style, title, dir, lang, and accesskey.
	<input>—Defines an input field. 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.
	<textarea>—Defines a text area.
	<button>—Defines a push button.
	<select>—Defines a selectable list.
	<optgroup>—Defines an option group.
	<option>—Defines an item in a list box.
	<label>—Defines a label for a form control.
	<fieldset>—Defines a fieldset.
	<legend>—Defines a title in a fieldset.
	<isindex>—Deprecated. Defines a single-line input field.
List Tags	—Defines an unordered list.
	—Defines an ordered list.
	—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.
Image Tags	<img>-Defines an image. The following attributes are not supported: alt, align, border, hspace, ismap, longdesc, usemap, vspace, id, class, title, style, xml:lang, and lang
	<map>—Defines an image map.
	<area>—Defines an area inside an image map.

Tag Type	Tag Description
Table Tags	<table>—Defines a table. The following atrributes are not supported: bgcolor, frame, rules, summary, id, class, title, style, dir, lang, and xml:lang.
	<col>—Defines attributes for table columns.
	<tr>—Defines a table row. The following attributes are not supported: bgcolor, cahr, charoff, valign, id, class, title, style, dir, lang, and xml:lang.
	<td>—Defines a table cell. 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.
	<tbody>—Defines a table body. The following attributes are not supported: align:justify, align:char, char, charoff, valign, id, class, title, style, dir, lang, and xml:lang.
	<colgroup>—Defines groups of table columns.
Style Tags	<style>—Defines a style definition.
	—Defines a section in a document.
	—Defines a section in a document.
Meta Information Tags	<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
Programming Tags	<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

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9.1. Governing Law. This Agreement shall be governed by the laws of the State of California as such laws are applied to agreements entered into and to be performed entirely within California between California residents, and by the laws of the United States. The United Nations Convention on Contracts for the International Sale of Goods (1980) is hereby excluded in its entirety from application to this Agreement.

9.2. Venue for Resolving Disputes. Any disputes relating to this Agreement will be resolved only in the state or federal courts located in Santa Clara County, California. Each of the parties agrees to the exercise over them of the personal jurisdiction of such courts for such purpose.

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