



# **PBXpress XML-RPC Integration Guide**



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**PBXpress XML-RPC Integration Guide  
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## Preface

This document provides information on how to integrate external applications (such as CRM) with the PBXpress VoIP PBX.

### Where to Get the Latest Version of This Guide

The online copy of this guide is always up-to-date, integrating the latest changes to the product. You can access the latest copy of this guide at: [www.pbxpress.com/docs](http://www.pbxpress.com/docs).

### Conventions

This publication uses the following conventions:

- Commands and keywords are given in **boldface**
- Terminal sessions, console screens, or system file names are displayed in fixed width font



**Caution** indicates that the described action might result in program malfunction or data loss.

**NOTE:** Notes contain helpful suggestions about or references to materials not contained in this manual.



**Timesaver** means that you can save time by performing the action described in the paragraph.



**Tips** provide information that might help you solve a problem.



## Introduction

PBXpress is an IP PBX enabling users to send and receive calls from their IP phones and providing advanced features such as call hold, call transfer, voicemail and auto-attendant.

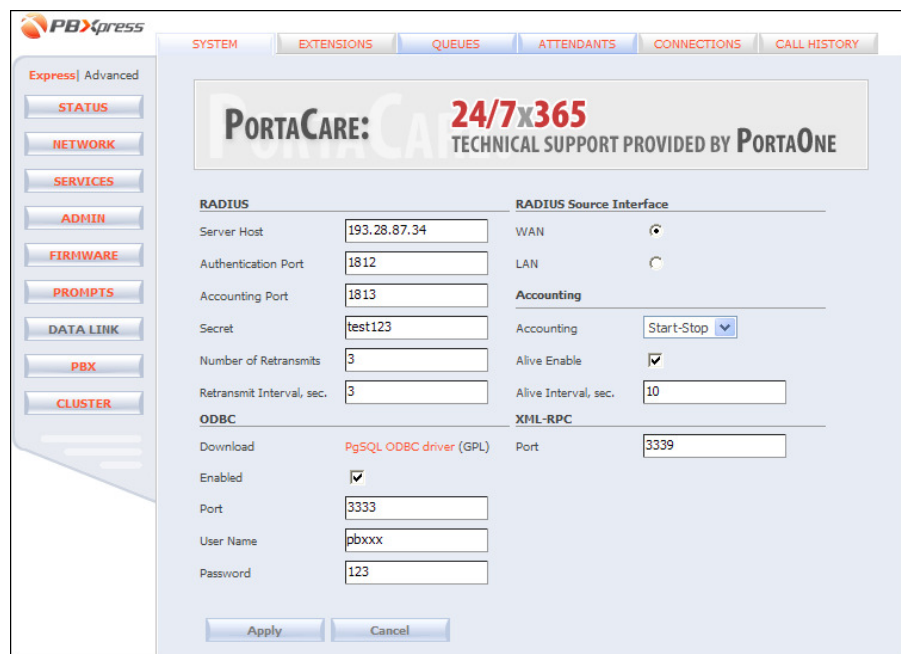
You may be interested in integrating an external application with PBXpress. For instance, when an incoming call rings on your phone, your CRM will display a pop-up with the name of the person calling you and other important information. In order to do this, the application must read certain information from PBXpress, such as your extension status or incoming call info. This is done via XML-RPC.

XML-RPC is a Remote Procedure Calling protocol that works over the Internet. An XML-RPC message is an HTTP-POST request, and the body of the request from your application is in XML. A procedure executes on the PBXpress server and returns the requested information formatted in XML. This enables you to develop your applications in any programming language and on any platform. For more information about XML-RPC, visit <http://www.xmlrpc.com/>.

# XML-RPC

## Accessing the XML-RPC Interface

Either a WAN IP or LAN IP may be used to access the XML-RPC interface. The XML-RPC port is configured on the **System/Data Link** page of the admin interface.



RADIUS		RADIUS Source Interface	
Server Host	193.28.87.34	WAN	<input checked="" type="radio"/>
Authentication Port	1812	LAN	<input type="radio"/>
Accounting Port	1813	<b>Accounting</b>	
Secret	test123	Accounting	Start-Stop
Number of Retransmits	3	Alive Enable	<input checked="" type="checkbox"/>
Retransmit Interval, sec.	3	Alive Interval, sec.	10
<b>ODBC</b>		<b>XML-RPC</b>	
Download	PgSQL ODBC driver (GPL)	Port	3339
Enabled	<input checked="" type="checkbox"/>		
Port	3333		
User Name	pbxxx		
Password	123		

Sample URL:

<http://192.168.0.123:3339/RPC2>

The access credentials for the XML-RPC interface are the same as those used for self-care interface access. Some limitations apply to the management of extensions, favorites and calls:

- Users can access favorites from their own admin group.
- Users can get information about extensions from their own admin group.
- Users can manage calls from their own admin group only.

## Data Structures

### Extension Information

The extension record is an associative array, i.e. a set of attributes represented by key/value pairs. The following attributes are found:

Key	Description
<b>id</b>	Internal id (integer)
<b>type</b>	Describes the type of extension; can have one of three values: <ul style="list-style-type: none"><li>• <b>extension</b></li><li>• <b>queue</b></li><li>• <b>attendant</b></li></ul>
<b>abbreviated</b>	Extension number
<b>callerid</b>	Structure with two fields: <ul style="list-style-type: none"><li>• <b>phone</b> – complete phone number</li><li>• <b>name</b> – display name (caller info) for this extension</li></ul>
<b>voicemail</b>	0 or 1; indicates whether or not voicemail is enabled
<b>email</b>	External email address associated with this extension
<b>state</b>	One of two possible values ( <b>online</b> or <b>offline</b> ) indicating the following: <ul style="list-style-type: none"><li>• for extensions – whether the IP phone with this extension is currently connected to PBXpress;</li><li>• for queues – whether at least one of the phones registered in the queue is currently online and available;</li><li>• for attendants – whether the attendant is currently active, according to its activity period definition.</li></ul>

Each entity (e.g. extension or queue) is uniquely identified by a combination of two parameters: id and type.

### Call Information

The call record is an associative array, i.e. set of attributes represented by key/value pairs. The following attributes are found:

Key	Description
<b>id</b>	Call identifier (string)

<b>state</b>	Current call state; can have one of these values: <b>setup, connected, onhold, ringing, parked, unknown</b>
<b>from</b>	Structure with the following fields: <ul style="list-style-type: none"> <li>• <b>id</b> – ID of extension record</li> <li>• <b>number</b> – phone number</li> <li>• <b>name</b> – display name (caller info) associated with this phone number</li> <li>• <b>type</b> – one of the following: <b>extension, queue, attendant, vm, unknown</b></li> </ul>
<b>to</b>	Structure with the following fields: <ul style="list-style-type: none"> <li>• <b>id</b> – ID of extension record</li> <li>• <b>number</b> – phone number</li> <li>• <b>name</b> – display name (caller info) associated with this phone number</li> <li>• <b>type</b> – one of the following: <b>extension, queue, attendant, vm, unknown</b></li> </ul>
<b>duration</b>	Elapsed call duration in seconds
<b>via</b>	Name of connection used to transport this call (empty for calls between two extensions within PBXpress)
<b>qcall</b>	0 denotes a normal call, 1 indicates a call to a queue; a call to a queue is reported via several call records: one (incoming) call to the queue and a multiple outgoing call, i.e. one for each ringing extension

## Favorites Information

A “favorites” entry is an associative array, i.e. a set of attributes represented by key/value pairs. The following attributes are found:

Key	Description
<b>id</b>	Internal ID (integer)
<b>slot</b>	Slot number
<b>size</b>	Whether this favorite occupies a standard space ( <b>single</b> ) or larger area ( <b>double</b> ) on the operator console screen
<b>type</b>	Describes the type of entity; can have one of three values: <ul style="list-style-type: none"> <li>• <b>extension</b></li> <li>• <b>queue</b></li> <li>• <b>attendant</b></li> </ul>



## XML-RPC Calls

### Operator Plug-in Methods

#### **get\_calls()**

Returns a list of current calls on PBXpress.

Input: none

Output: array of call records

#### **get\_extensions()**

Returns a list of currently configured extensions (including queues and attendants).

Input: none

Output: array of extension records

#### **get\_favorites()**

Returns a list of currently defined favorites for the operator console.

Input: none

Output: array of favorites

#### **set\_favorites()**

Updates the list of favorites for the operator console.

Input: array of favorites

Output: none

#### **transfer()**

Performs a call transfer to a new destination for a specific call.

Input: callid, destination number (in vm-abbreviated form for vm box destination numbers)

Output: none

#### **drop()**

Disconnects a specific call.

Input: callid

Output: none

### Call Parking Methods

#### **get\_parking\_info()**

Returns a list of currently parked calls.

Input: none

Output: <parking\_extension, slots, parked\_calls> (parking\_extension: the number of the first extension number allocated for parked calls; slots: maximum number of parked calls; parked\_calls: currently parked calls)

The information is passed as an associated array, with parked slot numbers as keys and callids as values.

**park()**

Parks a specific call.

Input: callid, slot (optional)

Output: slot taken

## Storage Plug-in Methods

The purpose of the following methods is to allow users' personal settings to be stored on PBXpress.

**dict\_set()**

Stores a single configuration value.

Input: key, value (both are strings)

Output: none

**dict\_set\_many()**

Stores a set of configuration values.

Input: associated array of <key, value> pairs to be saved

Output: none

**dict\_get()**

Retrieves a configuration value.

Input: key

Output: value

**dict\_set\_serialized()**

Input: key, obj (key is a string, obj is either an array or associated array)

Output: none

**dict\_get\_serialized()**

Input: key

Output: obj

**dict\_delete()**

Deletes a configuration value.

Input: key

Output: none

# Appendices

## Sample Program for XML-RPC Communication

```
#!/usr/local/bin/python
# vim:et:ts=4 sw=4:
# $Id: sample.py,v 1.1 2007/06/06 14:35:34 gonzo Exp $

import getopt
import httplib
import logging
import os
import socket
import string
import sys
import time
import xmlrpclib

from base64 import encodestring
from logging import FileHandler

class BasicAuthTransport(xmlrpclib.Transport):
    def __init__(self, username=None, password=None):
        self.username = username
        self.password = password
        self.verbose = 0

    def request(self, host, handler, request_body, verbose=0):
        # issue XML-RPC request

        h = httplib.HTTP(host)
        h.putrequest("POST", handler)

        # required by HTTP/1.1
        h.putheader("Host", host)

        # required by XML-RPC
        h.putheader("User-Agent", self.user_agent)
        h.putheader("Content-Type", "text/xml")
        h.putheader("Content-Length", str(len(request_body)))

        # basic auth
        if self.username is not None and self.password is not None:
            h.putheader("Authorization", "Basic %s" % string.replace(
                encodestring("%s:%s" % (self.username,
self.password)),
                "\012", ""))
        h.endheaders()

        if request_body:
            h.send(request_body)

        errcode, errmsg, headers = h.getreply()

        if errcode != 200:
            raise xmlrpclib.ProtocolError(
                host + handler,
```

```
        errcode, errmsg,
        headers
    )

    return self.parse_response(h.getfile())

def handle_server_exception(action, em):
    """Handle server-side exception. action is performed action and em
    is a Fault instance"""
    reason = em.faultString.decode('string-escape')
    if em.faultCode > 0:
        print 'Internal Server Error: %s' % reason
    else:
        print '%s' % reason
    print "%s failed: internal server error: %s\n" % (action, reason)

if __name__ == "__main__":
    server = xmlrpclib.Server("http://testpbx.portaone.com:8080/RPC2",
    \
        BasicAuthTransport('203', '203'))

    try:
        print "Extensions:"
        print server.get_extensions()
        print "Calls:"
        print server.get_calls()
        print "Favorites:"
        print server.get_favorites()
        print "keys/values:"
        print server.get_all()
    except socket.error, (err, errstr):
        print errstr
        sys.exit(1)
    except Exception, em:
        print em
        handle_server_exception("xml-rpc sample", em)
        sys.exit(1)
```