Centrality PA1688

Company Name & Details here

PA1688 Automatic Provisioning Technical Description

"Making Mass Market Broadband Telephony Easy & Secure"

INTERNAL WORKING DOCUMENT

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Notes on the new FTP auto upgrade feature

Introduction

IP Voice Telephony systems are complicated devices. To make them simple to use, automatic provisioning needs to be implemented. This automatic provisioning needs to perform 2 functions –

1. Automatically upgrade the device firmware
2. Automatically update the device configuration

The Centrality system also has a 3rd file called the "digimap" file. Please see the MGCP standard however this is essentially a map of phone numbers the device uses to map numbers when dialing.

This system also needs to

- Scale to large telephony systems where millions of IPT[1] devices are connected
- Be secure so that hacking & user information & accounts cannot be stolen.

Centrality works with an open community to address these issues & to implement new features & services.

This document describes the on-going development of the auto-provisioning system of the Centrality PA1688 SOC[2] & reference designs.

The Old Method

Starting from firmware version 1.34[3], we support FTP auto upgrade function in PA1688 phones, but there are several problems in the old method, i.e.:

1. The old naming rule was considered too complicated, the version number had to be maintained manually. Some service provider customers think it is so inconvenient.
2. In the old method, one needed to get all files name from the FTP server, and then analyze them to judge if there is newer version need to upgrade. If there are 2000 files in the root folder of FTP server, the phone will get those 2000 files names. They are hundreds of kilobytes and so generates lots of useless traffic.
3. The TFTP only supports manual upgrade, but not auto upgrade, since TFTP can not get the file name of the server.

To fix this problem, a new way to make the FTP auto upgrade was created. At the same time, this new method also supports TFTP auto upgrade.

This new method is described in the following section

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[1] IPT = IP Telephony

[2] SOC = System On Chip

[3] As of 6/6/2005, the present firmware version is 1.43. Version 1.44 is due out on the 20th June 2005.

New Method For Auto Configuration - FTP

The new method uses the SET command for FTP upgrades. We use .SET file to index the file name to upgrade.

Auto-provisioning is usually initiated when the phone is powered-up or reset.

When the phone begins the auto upgrade process, it –

1. Gets the corresponding .SET file in the FTP server
2. Analyzes this file to know if it needs to upgrade and what is the file name for upgrading
3. Then gets this file from FTP server and
4. Finally upgrades its firmware and/or configuration.

The upgrade process has several ways to identify itself with the FTP server. They are –

- **Disable** - no auto upgrade is initiated
- **ALL** - uses the generic hardware type to identification itself. (e.g. PA1688F)
- **MAC** - use the device MAC address to authenticate itself. (e.g. 00-09-45-64-07-3c.set)
- **PPP id** - uses PPP account details to authenticate itself. This is the "pppid" parameter in the device configuration.
- **Account** - VoIP uses the account details to authenticate itself. This is the "account" parameter the device configuration.
- **Phonenumber** - uses the devices phone number to authenticate itself. This is the "phonenumber" parameter in the device configuration.

Finally the FTP server can be entered as –

- IP address, e.g. 192.168.0.1
- DNS name, e.g. ftp.centrality.net

Example

Now let's give an example to illustrate this process. Let us say that the **MAC** address of the phone is 00-09-45-64-07-3c, and the upgrade type is MAC.

The corresponding .SET file is 00-09-45-64-07-3c.set

The contents of this file should be:

BIN pa168s.bin:144

CFG 00-09-45-64-07-3c.dat:144

MAP stdmap.txt:144

END

The filename behind BIN indicates the version number (in this case 144 means version 1.44) and filename of the firmware.

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The filename behind CFG indicates version number and filename of phone configuration file

The filename behind MAP indicates version number and filename of digitmap file.

The END indicates the end of .SET file.

After the phone gets the .SET file, it will check the version number in the file and compare this with the current version in the phone. If the version number in .SET file is higher, then it will upgrade the corresponding file.

If BIN, CFG and MAP are all new versions, then the device will upgrade MAP first, then CFG and BIN last. In the previous example, after it has analyzed the .SET file, if the current versions in the device are all 1.43 it will read 144 & see that all files need to be upgraded (144 is greater then 143). The device will upgrade “stdmap.txt” first. It will then reboot. Now the MAP version will be same. Next the device will upgrade “00-09-45-64-07-3c.dat”. Again it will reboot and now the CFG version is the same. Finally the device will upgrade “pa168s.bin” and reboot for the final time. The auto upgrade process is now finished.

In this way, we need 4 files to do a full auto upgrade. They are:

- 00-09-45-64-07-3c.set
- 00-09-45-64-07-3c.dat
- stdmap.txt
- pa168s.bin

These 4 files should all be placed on FTP server.

Note:

- f the device doesn’t need to upgrade MAP file, one can delete the MAP line in .SET file. Similarly for CFG, and BIN.
- If two devices use the same firmware, but different configuration files, then we only need set the CFG line in the .SET files.
- One should only maintain one version of the pa168s.bin in the FTP server. This way one reduces the number of files in FTP server and makes it easier to maintain.

By this way, we finish the new FTP auto upgrade. If the upgrade type is other value, the corresponding naming rules are:

TFTP Upgrade

Starting from firmware version 1.43, TFTP is also supported and use the same .SET file and naming rules.

Manual Upgrade

The device also supports manual FTP upgrades via the keypad on phones If the service provider decides to use this feature, the following files also need to be uploaded:

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- **HardwareTag.bin** firmware binary
- **HardwareTag.dat** phone settings
- **HardwareTag.txt** digit map

In this case, **HardwareTag** is phone's hardware type, as in item 2 above.

A manual firmware upgrade is performed by

1. picking up the handset
2. typing in the Phone Password (default: 1234) + n + LocalIP_Key

where

- If n = 5, the phone settings are upgraded
- If n = 6, the digit map is upgraded
- If n = 8, the firmware is upgraded

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