Confuse Configurator
User guide

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Confuse

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0.5	06.03.2002	Antti Haapakoski	Document base
0.6	11.03.2002	Antti Haapakoski	Added install section for PDA.
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0.71	14.03.2002	Antti Haapakoski	Updated the detection Section 4.1.
0.8	15.03.2002	Antti Haapakoski	Added info about the PDA address setting (Sect 3).

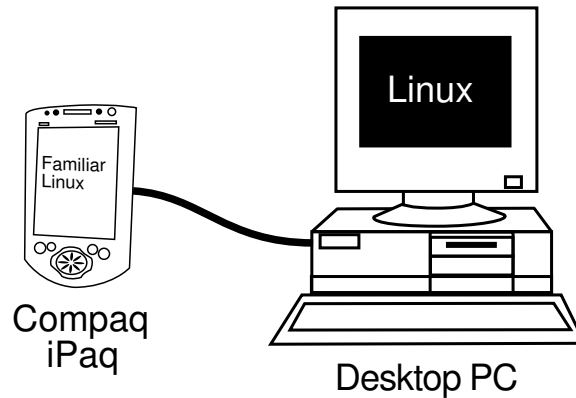# Contents

1 Introduction

Figure 1: The configuration of the PDA is modified using a PC.

Confuse Configurator is a www-based tool to manage a PDA's package configuration.

The configurator runs on a desktop PC and it can be used with a normal WWW-browser. The PDA is connected to the PC with a TCP/IP network as shown in Figure 1. Both the PC and the PDA have Linux operating systems.

The user can modify the configuration by adding/removing packages. Nothing is installed to the PDA yet: the user can make a complete configuration and finally just click "Install Configuration" to transfer the configuration to the PDA.

The motive to move the configurator outside the PDA, is that the user can **check the validity** of the configuration **before** intalling it to the PDA. The validity checking is implemented with a powerful logic programming system running on the desktop PC.

When the user has made a valid configuration, he/she can choose to install it to the PDA. The configurator compares the current PDA configuration and the new desired configuration, and installs/removes some packages to make the PDA's configuration match the new configuration.

The PC stores all the packages that can be installed to the PDA.

2 Installation

2.1 Desktop PC

(Installation instructions will be written later.)

2.2 PDA

The target PDA needs certain software and settings before the configurator can start accessing it.

First the PDA should be connected to a TCP/IP network: the configurator server (the desktop PC) must be able to access the PDA with TCP/IP. There are many ways to achieve this: serial PPP, Ethernet, WLAN, and so on. Network configuration will not be described here. When using the configurator, you'll have to know the IP-address of the PDA.

The configurator uses the command **ipkg** to install and remove packages in the PDA and **ssh** to communicate with the PDA. So ssh and ipkg must be installed on the PDA.

Both ssh and ipkg belong to the Familiar Linux distribution. But in some image versions ssh is not included, so you'll have to install it afterwards using ipkg.

The configurator must be able to access the PDA without a password. So the user the configurator runs as (the www-server user) must append his/her public identity key to the authorized keys file of the root user of the PDA.

Here is an example: the www-server of the configurator is run as the user "demo" and we decide to use DSA authentication of ssh2. The user "demo" must first create his/her authentication keys unless they are already created. See Figure 2 for an example of this.

Now that the user has DSA keys, the public key must be appended to the authorized_keys2 file of the PDA's root user. This can be done with the following command line:

```
[demo@confuse]$ ssh-keygen -t dsa
Generating public/private dsa key pair.
Enter file in which to save the key (/home/demo/.ssh/id_dsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/demo/.ssh/id_dsa.
Your public key has been saved in /home/demo/.ssh/id_dsa.pub.
The key fingerprint is:
4b:46:35:62:ae:ab:1c:7c:8d:ab:ee:9f:4c:9a:21:d5 demo@confuse.soberit.hut.fi
```

Figure 2: Creating the DSA authentication key for ssh2.

```
[demo@confuse]$ cat .ssh/id_dsa.pub | ssh root@ipaq.hut.fi "cat >>.ssh/authorized_keys2"
```

Where `ipaq.hut.fi` is the address of the PDA. The PDA's root password will be asked and it should be typed correctly.

Now the user "demo" should be able to connect to the PDA as root without providing a password. This can be checked by trying to log on to the PDA with ssh:

```
[demo@confuse]$ ssh root@ipaq.hut.fi
```

If no password was asked and the root was logged in, the authentication worked fine.

Note that RSA based authentication protocols of ssh1 or ssh2 could have been used instead of DSA. The difference with ssh1 is that the authorized keys file is `~/.ssh/authorized_keys` and the public key file is `~/.ssh/identity.pub`.

3   Getting started

To start using the configurator, you'll need to know the www-address (url) where the configurator is running. If you are using the configurator locally, the address is typically http://localhost:8000/.

If the page cannot be loaded, the www-server may not be running or the server port is not the standard 80. In this case you'll have to contact the system administrator. Or if you have enough privileges you can start a j2ee-capable server yourself. If you are not running the www-browser in the server host (locally), you should also check that a firewall does not block the traffic to the used server port.

Also make sure the PDA is connected to the desktop PC either directly or through inter/intranet.

When starting the configurator, a screen like in Figure 3 is shown, asking for the address and the ssh-port of the PDA. The user should type the correct host name and the port and then click "OK". The host name can be given as an IP address (decimal dot notation) or as a textual host name. The ssh port is typically 22, but sometimes if the PDA is behind a firewall, the port could be different.

When the host and port are given and "OK" is clicked, the configurator will go to the main screen, that will be described in the following section.

4   Using the Graphical User Interface

When using the configurator, the main screen is visible most of the time. The main screen is shown in Figure 4. The screen lists all the available packages the system knows of.

The first column lists the package file names. The second column contains a short description of each package and the third column shows the package file size in bytes.

The fourth column shows if the package is included in the configuration the user is currently building. This column is also used to edit the configuration.

The last column shows if the package is currently installed on the PDA.

There are also a couple of buttons on the bottom of the screen: Install Configuration, Check Configuration, Save Configuration, Load Configuration and Detect configuration. These can be used to install the configuration to PDA, check for configuration validity, load/save the configuration to/from an xml-file and to detect the current configuration of the PDA.

The following sections describe these functions in detail.

Figure 3: The configurator asks first the address and ssh-port of the PDA.
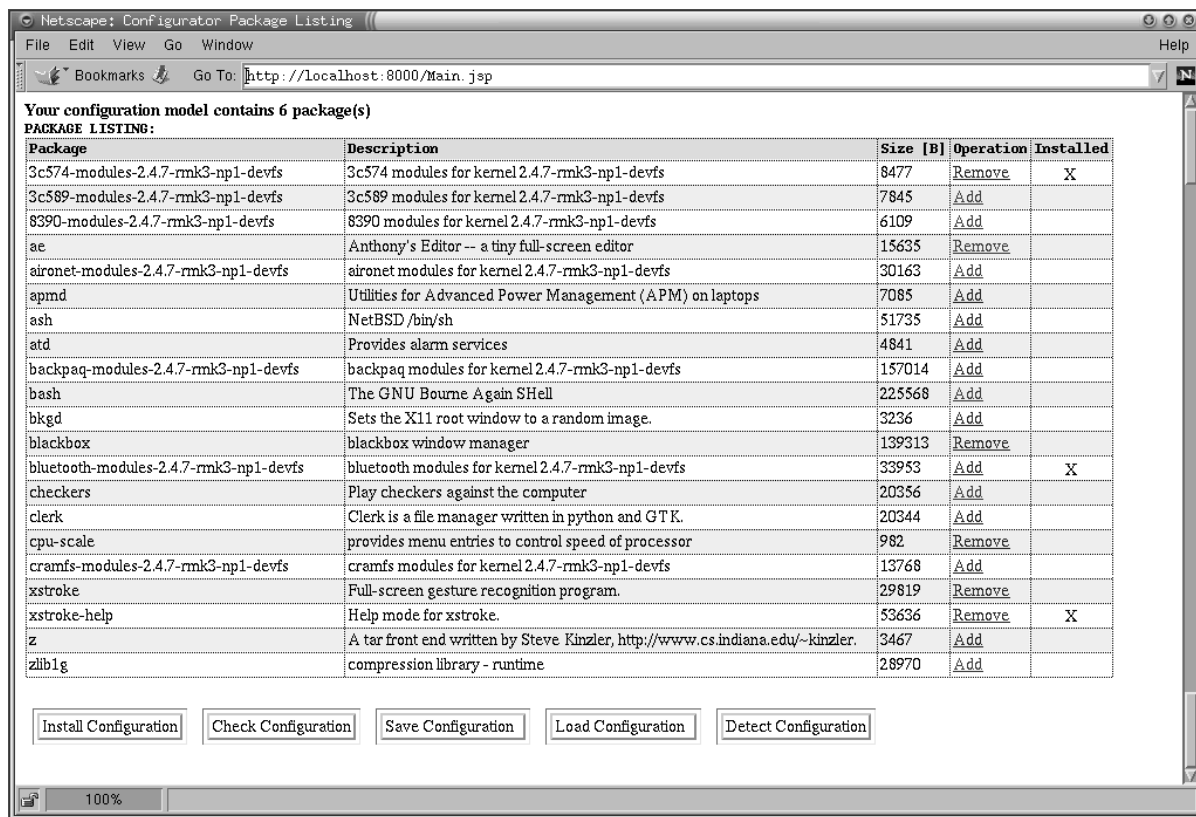

Figure 4: The main screen of the configurator.

4.1 Detecting the configuration

The PDA's configuration is shown in the "Installed" column of the main screen. When the configurator is started, the configuration of the PDA is unknown. So when the user starts using the configurator, the first thing to do is to detect the configuration of the PDA. The detected configuration will also be used as a base for the editable configuration on the main screen (the "Operation"-column).

Also in some other cases the information in the "Installed" column does not match the configuration of the PDA. This could happen if the PDA is replaced with another PDA when running the configurator. Or the user may have

installed or removed some packages by hand to/from the PDA. In all these cases the user should click the "Detect configuration" button to update the information in the installed column.

Note that "Detect configuration" overwrites both the "Installed" -column and the current configuration (the "Operation" -column). So if you want to keep the current configuration, be sure to **save your configuration before clicking "Detect configuration"**.

4.2   Editing the Configuration

The user can edit the configuration shown on the screen by using the "Add" and "Remove"-buttons. Only one of the buttons is visible for a single package: If the package is already in the configuration, a "Remove"-button is shown, otherwise an "Add"-button is shown.

"Add" -button adds a new package to the configuration. Adding a package to the configuration does not yet install it to the PDA. The package is just added to the configuration shown on the screen.

"Remove" -button removes a package from the configuration. The package is not removed from the PDA yet, only from the configuration on the screen.

Later the whole configuration can be installed to the PDA using the "Install Configuration"-button (see Section 4.5).

4.3   Loading/saving Configurations

Creating a configuration by adding/removing single packages is slow. When a configuration is finished, it can be saved to a file for later use. This way the user does not have to add/remove single packages to get back to a certain configuration: he/she can just load the desired configuration from a file.

Saving and loading only changes the configuration shown on the screen. It does not affect the PDA: the "installed" -column is not touched in any way by a load or save.

Save configuration

When the user has made a good configuration he/she propably wants to save it for later use. The user may also want to backup the original configuration of the PDA just to be able to get it back later.

When "Save configuration" -button is clicked, a new screen asking for the file name appears. The user should write the file name to the text box. The file format is XML, so it is recommended to use the file name extension ".xml".

When the file name is written, the user can click "OK" to actually save the configuration or click "Back to main page" to cancel the save.

"Save configuration" does not affect the PDA in any way - the "Installed" column is not used and remains unchanged during save. Saving just copies the current configuration (the "Operation" column) to a file.

Load configuration

Sometimes the user may want to get back a configuration he/she has made earlier. For example the user may have installed many unnecessary packages to the PDA and wants to revert back to the original configuration. This is where "Load configuration" -feature is useful: it replaces the current configuration with the configuration loaded from the given file.
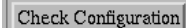
When "Load configuration" -button is clicked, a new screen asking for the file name appears. The user must know the file name - there is no directory listing available with the current version of the configurator. The file format is xml, so the file name extension will propably be ".xml".

When the file name is written, the user can click "OK" to actually load the configuration or click "Back to main page" to cancel the load.

"Load configuration" does not affect the PDA in any way - the "Installed" column remains unchanged.

Only if "Install Configuration" -button is clicked in the main screen, the configuration will be installed to the PDA. See Section 4.5 for more information on installing.

4.4 Testing the Validity of the Configuration

Before installing the configuration to the PDA, the validity of the configuration must be checked.

There are many dependencies between the packages: some packages are needed by the others and some packages may conflict one another. For example the package "ftp" depends on the packages "libc6", "libncurses5" and "libreadline4". On the other hand the package "ssh" conflicts with the package "ssh2".
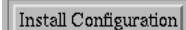
The validity checking ensures the configuration will work on the PDA after installation.

The validity can be checked at any time by clicking the "Check Configuration" -button. This starts a logic programming system that calculates the validity of the configuration.

After validity checking, the configurator either tells that the configuration was valid, or shows a list of packages that were missing from the configuration. The configurator also asks if the user wants to add these missing packages to the configuration.

There may also be some conflicts in the configuration. Sometimes the logic programming system cannot resolve these conflicts. Then the configurator just says the configuration is not valid, but does not tell what is wrong with it. The user must try to remove packages until the configuration becomes valid again.

4.5 Installing the configuration

After the configuration has been proved to be valid, it can be installed to the PDA.

When "Install Configuration"-button is clicked, the configurator asks if the user really wants to install the configuration. If the user answers "Yes", the installation procedure starts.

Warning! Installing a configuration could make the PDA useless. So be careful when you remove important packages from the configuration. Always keep the packages "ssh" and "ipkg" in the configuration to ensure the configurator system works. Although the validity checking should ensure that the configuration will work on the PDA, don't blindly trust it - the package dependecy tree is not always complete.

After a successful installation, the "Installed" column will match the "Operation" column. That is the configuration shown on the main screen matches that of the PDA.

The installation procedure is fairly simple, it

- Uninstalls any packages that are in the PDA but not in the new configuration.

- Installs any packages that are in the new configuration but not in the PDA.

The installation procedure may take a while, like 10 minutes. The current version of the configurator does not show any progress bar during the installation. It just seems to be "jammed". The user must just wait patiently. Finally the configurator will tell if the installation succeeded and the user can return to the main screen.

5 Importing new packages to the system

If new packages become available, they must be imported to the system before they can be added to the configuration in the main screen. If the system does not know of a package, that package will not shown on the main screen although it may be installed in the PDA.

Especially if a new version of Familiar Linux is installed to the PDA, it is recommended that the whole package data in the desktop PC is updated. This data includes information about the available packages: package names, sizes, descriptions and the dependencies between the packages.

A tool called **mapper** is used to import new packages to the system. Mapper is a command line tool and takes one or more packege files as arguments. Here is an example command line of mapper:

```
[demo@confuse ipkgs]$ mapper bash_2.03-6-fam2_arm.ipk ssh_2.5.2p2-2-fam4_arm.ipk
```

This adds the package information about the packages "bash" and "ssh" to the system.

Some Familiar Linux distributions also include a text file called Packages that contains all the package information in one place. This file can also be fed to the mapper via standard input by giving the command line option -s like this:

```
[demo@confuse ipkgs]$ cat Packages | mapper -s
```

Currently mapper cannot overwrite package information, so if the the whole package information needs a rebuild or just single packages need to be updated, the **allpackages.xml** and **packages.rl** files must be deleted or modified by hand. Allpackages.xml contains general information about the packages and packages.rl contains the package dependencies.

If the packages.rl file is rebuilt from scratch, it must propably be modified by hand to fix any wrong dependencies. For example a package may depend on another package that does not exist. If packages.rl is not fixed, the configurator's "Check Configuration" will not validate any configuration.

The checking of packages.rl by hand is slow, so perhaps a diagnostic logic program could be written to automate the work. This could also be used to find out the causes of a conflict (see Section 4.4).

6 Glossary

BLUETOOTH	A Technology that implements small range radio link between computers, celluler phones, PDAs etc. Teknologia joka toteuttaa radioyhteyden tietokoneiden, matkapuhelimien, taskutietokoneiden yms. välille lyhyillä matkoilla.
Bootloader	Program that boots computer. Tietokoneen käynnistävä ohjelma.
Burana	Bug Report And Nag Application. Bugiraportointi ja versionhallintajärjestelmä.
CCCC	C and C++ Code Counter, A free software tool for measurement of source code related metrics by Tim Littlefair. Ilmainen koodirivien laskentaohjelma.
CF-card	Compact Flash Card, Memory card for handhelds, mp3 players and digital cameras. Muistikortti kämmentietokoneille, mp3 soittimille ja digitaalikameroille
configuration	A set of components or packages forming a system. In this context a list of packages to be installed in the PDA. Systeemin muodostava joukko komponentteja tai paketteja. Tässä yhteydessä lista paketeista, jotka asennetaan PDA:han.
configurator	A program that helps the user to make a valid configuration and possibly use that configuration. Ohjelma, joka helpottaa kelvollisen konfiguraation luomisessa.
deb	extension for Debian Linux packages. Debian Linuxin pakettien tarkenne.
Debian GNU/Linux	Free UNIX like operating system. Vapaa UNIX-tyyppinen käyttöjärjestelmä.
Delphi method	A method for combining several estimations. Menetelmä useiden arvioiden yhdistämiseksi.
Ethernet	Typical method of implementation for local LANs. Tyypillinen paikallisverkon toteutustapa.
Ethernet frame	Packet that is directed trough ethernet network. This packet can carry for example IP packets. Ethernet-verkossa kuljetettava paketti. Tämä paketti voi kuljettaa esim. IP paketteja.
Familiar Linux	Linux distribution for handheld computers using StrongArm 110 Processor. Kämmentietokoneelle tarkoitettu Linux-jakelu.
firewall	Limits accessibility between local and public network. Rajoittaa liikennettä paikallisen ja julkisen verkon välillä.
Flash	Non-volatile Random Access Memory. Haihtumaton luku ja kirjoitusoperaatiot salliva muisti.
Gb	Gigabit. Gigabitti
GB	Gigatavu. Gigatavu
GPRS	General Packet Radio System. A new nonvoice value added service that allows information to be sent and received across a mobile telephone network. Uusi palvelu datan siirtoon matkapuhelinverkossa.
HUT	See TKK.
IP	Internet Protocol. A connectionless network level protocol layer of the TCP/IP. Yhteydetön TCP/IP:n verkkokerros.
iPAQ	A handheld pen operated computer by Compaq. Compaqin tekemä kynäohjattu taskutietokone.
iPKG	Itsy Package Management System. A lightweight configuration system for Familiar Linux. Kevyt konfiguraationhallintasysteemi Familiar Linuxille.
ISO 8601	International Standard for numeric representations of date and time. Kansainvälinen standardi päiväyksen esittämiseen numeerisessa muodossa.
Java	Object-oriented programming language. Olio-ohjelmointikieli.
JSP	JavaServer Pages, technology for creating WWW-pages. Teknologia www-sivujen rakentamiseen.
LAN	Local Area Network, infrastructure of physical connections between computers. Allows data transfers. Tiedonsiirron mahdollistava infrastruktuuri tietokoneiden välillä.
lparse	Front end for smodels. Esiprosessori smodelssiin.
Mb	Megabit. Megabitti.
MB	Megabyte. Megatavu.
NFS	Network File System, Filesystem that allows the use of remote harddisks. Tiedostojärjestelmä joka sallii kovalevyjen etäkäytön.

package	One component of a configuration. Package can be for example a file containing some program or library. Konfiguraation osa, joka voi sisältää esim. ohjelman tai kirjaston.
PC	Personal Computer, a desktop computer with x86 compatible processor. Tavallinen x86-yhteensopiva pöytäkone.
PC-Card	See PCMCIA.
PCMCIA	Personal Computer Memory Card International Association, An accessory bus used in laptops and handhelds. Salkku- ja kämmenmikrojen yleinen oheislaiteliitäntä.
PDA	Personal Digital Assistant, A mobile, handheld computer with software like calendar, contacts, calculator and more. Kannettava tietokone, jossa on ohjelmia kuten kalenteri, yhteystiedot, laskin yms.
Perl	Powerful high-level interpretable programming language. Korkeantason tulkattava ohjelmointikieli.
porting	Modifying the code to work in some other environment. Porttaaminen, koodin muokkaaminen toisessa ympäristössä toimivaksi.
PPP	Point to Point Protocol, Protocol for serial lines. Protokolla sarjayhteyksille.
Processor	An integrated chip that makes arithmetic and memory operations. Integroitu piiri, joka suorittaa aritmeettisia- ja muistioperaatioita.
RAM	Random Access Memory, usually volatile. Luku- ja kirjoitusoperaatiot salliva muisti, ei pysyvä.
Redhat Linux	Free UNIX like operating system. Vapaa UNIX-tyyppinen käyttöjärjestelmä.
RL	Rule based Language. A language for representing configuration knowledge. Kieli konfiguraatiotiedon esittämiseen.
ROM	Read Only Memory. Vain luettavissa oleva muisti.
RPM	Extension for RedHat Linux packages. RedHat Linuxin pakettien tarkenne.
SoberIT	Software Business and Engineering Institute (in HUT). Ohjelmistoliiketoiminnan ja -tuotannon instituutti (TKK:lla).
SSH	Secure Shell, Secure replacement for Telnet. Turvallinen Telnetin korvike.
SCP	Secure CoPy, Secure replacement for FTP. Turvallinen FTPn korvike.
SSHD	Secure Shell Daemon, SSH Server. SSH-palvelin.
SSL	Secure Sockets Layer, security protocol that provides communications privacy over the Internet. Protokolla, joka turvaa datan luottamuksellisuuden siirrettäessä Internetin yli.
smodels	An implementation of the stable model semantics for logic programs. Logiikkaohjelmatulkki joka etsii syötteelle vakaan mallin.
TCP/IP	Transmission Control Protocol, a connection-oriented internet protocol. Yhteydellinen internetprotokolla.
Tirana	Work raporting system. Tuntiraportointijärjestelmä.
TKK	Helsinki University of Technology, Teknillinen Korkeakoulu.
UMTS	Universal Mobile Telecommunications System, Third-generation (3G) mobile communications system. Kolmannen sukupolven matkapuhelinjärjestelmä.
USB	Universal Serial Bus, Serial interface that is used in computers and accessories. Sarjaväylä jota käytetään tietokoneissa ja oheislaitteissa.
USDP	Unified Software Development Process, Generic context for a software project. Ohjelmistoprosessin yleinen viitekehys.
UML	Unified Modeling Language, a standard for visualization and specification of a software system. Standardi ohjelmiston visualisointiin ja määrittelyyn.
ViCa	Visualization Client Application. Visualisointi ohjelma.
WinCE	Windows CE, Microsoft's operating system for handhelds. Microsoftin käyttöjärjestelmä käsimikroille.
Wireless Ethernet	802.11b Wireless Ethernet, See WLAN.
WLAN	Wireless Local Area Network. Computer network that uses radio waves to transmit data. Langaton verkko tietokoneiden välillä.
WWW	World Wide Web. Maailmanlaajuinen tietoliikenneverkko.
XML	Extensible Markup Language. A markup language for documents containing structured information. Kieli rakenteisten dokumenttien kirjoittamiseen.

xmodem A file transfer protocol for serial connections. Tiedostonsiirtoprotokolla sarjayhteyksille.
X environment Graphical window system for UNIX. Graafinen ikkunajärjestelmä UNIXille.