PC CONNECTIVITY

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Contents

1 Introduction

Maemo PC Connectivity project aims to make easier communication between maemo device and host PC. For this, it provides tools to **simplify tasks like connection establishment, Internet sharing, remote shell, file sharing, remote desktop and file transfer**. The host PCs supported are Linux, Mac OS Leopard and Windows XP/Vista (Windows 7 under testing). It follows the list of communication tools available:

- **Connection establishment**

  By using Maemo PC Connectivity applets, it is possible to easily establish connection over Usb, Bluetooth and Wlan between maemo device and host PC

- **Internet sharing**

  By using Maemo PC Connectivity applets, it is possible to easily share Internet over Usb, Bluetooth and Wlan on both ways, from maemo device to host PC and from host PC to maemo device.

- **Remote shell**

  `SSH` (Secure Shell) allows data to be exchanged using a secure channel between two networked devices.
  `SBRSH` (Scratchbox Remote Shell) is a remote command execution system similar to rsh and ssh. It is designed with slow devices and Scratchbox's special requirements in mind.

- **File sharing**

  `SSHFS` (SSH File System) is a file system client based on the SSH protocol. It allows to mount locally a remote file system via SSH.
  `NFS` (Network File System) allows file system sharing over network.
  `SAMBA` (Server Message Block) provides shared access to files, printers, serial ports, and miscellaneous communications between nodes on a network. Most usage of SMB involves PCs running Microsoft Windows.

- **Remote desktop**

  `VNC` (Virtual Network Computing) is a graphical desktop sharing system that uses the RFB protocol to remotely control another PC.
  `RDESKTOP` is a client for remotely accessing *Windows Terminal Services* from a UNIX PC.
  `X Tunneling` over SSH allows to forward X11 GUI, that is, it is possible to display a X11 GUI from a remote PC on a local PC.

- **File transfer**

  `SFTP` (SSH File Transfer Protocol) is a network protocol that provides a secure file transfer over SSH.
  `SCP` (Secure Copy) is another way to transfer files between a local and a remote host using SSH.

> RSYNC is an utility that provides fast incremental file transfer, that is, it is sent/received only the bytes inside files that changed since the last replication.

Maemo PC Connectivity provides the meta package *maemo-pc-connectivity* which installs the necessary components on maemo device, and the package *host-pc-connectivity* which installs the components needed on host PC. For more information, see the installation instructions.

2 Installation

2.1 On Maemo Device

2.1.1 Using one-click-install

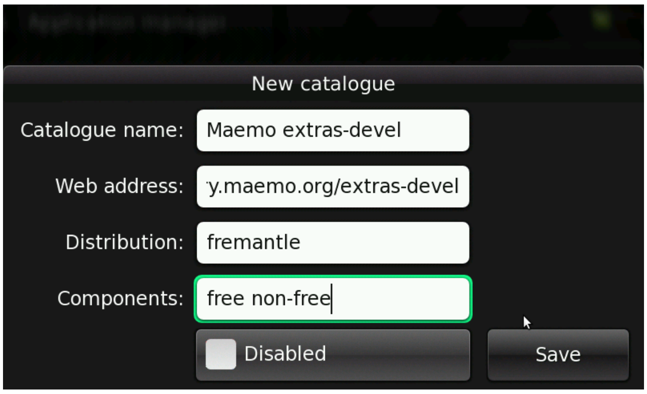
The easiest way to install maemo-pc-connectivity is to use the one-click-install file. To do this on Diablo, point the browser to this address. When the download dialog appears, choose the *Open* option. Now, the Application Manager should open and install maemo-pc-connectivity and all its dependencies. If you use Fremantle, you should use this address.

2.1.2 Using Application Manager

To install Maemo PC Connectivity on the maemo device, the Maemo extras-devel repository must be added. To do this, open the "Application Manager", then "Repository catalogs" and fill the following fields:

- **Catalogue Name:** Maemo extras-devel
- **Web Address:** http://repository.maemo.org/extras-devel
- **Distribution:** fremantle
- **Components:** free non-free

Note: if you use Diablo, replace the value of "Distribution" field from `fremantle` to `diablo`



New catalogue

Catalogue name: Maemo extras-devel

Web address: y.maemo.org/extras-devel

Distribution: fremantle

Components: free non-free

After that, install the *maemo-pc-connectivity* package. This package will install all the Maemo PC Connectivity components.

2.1.3 Installing `X11VNC` on Diablo

Note: on Fremantle, the `X11VNC` is already installed by `maemo-pc-connectivity` package.

To get `X11VNC` working properly on Diablo, you should install a modified version of `hildon-desktop` package. After that, you can install `X11VNC`. It follows the steps:

- Add the line below to `/etc/apt/sources.list` file of your maemo device:

```
deb http://pc-connectivity.garage.maemo.org/repository diablo
free
```

- Execute the following commands:

```
# apt-get update
# apt-get install x11vnc
# apt-get install hildon-desktop
```

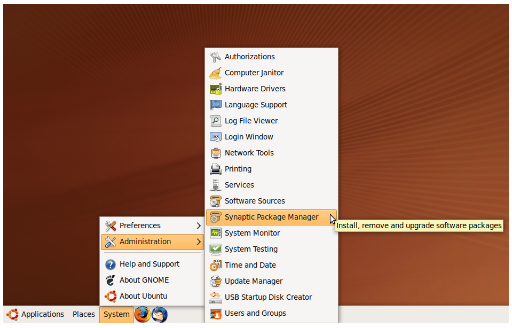
2.2 On Host PC

2.2.1 Linux - Ubuntu

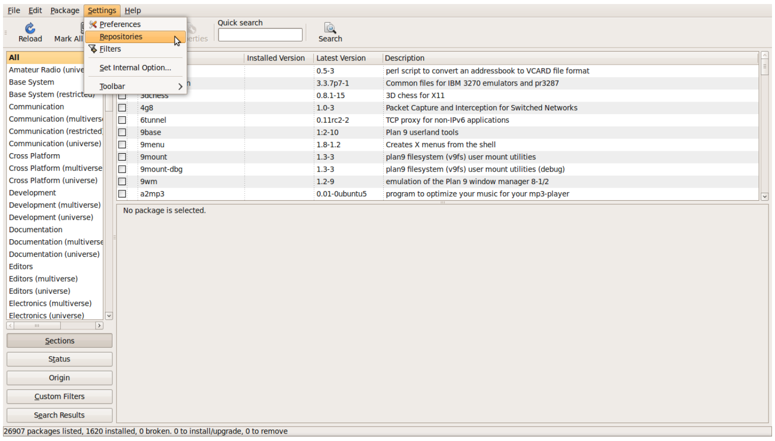
Note: The installation was tested on Intrepid system.

You should follow the next steps to get Maemo PC Connectivity installed on Ubuntu Linux:

- Open *Synaptic* application



- Under "Settings" menu, select "Repository" option



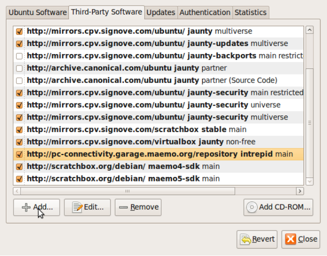
		Installed Version	Latest Version	Description
			0.5-3	perl script to convert an addressbook to VCARD file format
	n		3.3.7p7-1	Common files for IBM 3270 emulators and pr3287
□	3dchess		0.8.1-15	3D chess for X11
□	4g8		1.0-3	Packet Capture and Interception for Switched Networks
□	6tunnel		0.11rc2-2	TCP proxy for non-IPv6 applications
□	9base		1:2-10	Plan 9 userland tools
□	9menu		1.8-1.2	Creates X menus from the shell
□	9mount		1.3-3	plan9 filesystem (v9fs) user mount utilities
□	9mount-dbg		1.3-3	plan9 filesystem (v9fs) user mount utilities (debug)
□	9wm		1.2-9	emulation of the Plan 9 window manager 8-1/2
□	a2mp3		0.01-0ubuntu5	program to optimize your music for your mp3-player

No package is selected.

26907 packages listed, 1620 installed, 0 broken. 0 to install/upgrade, 0 to remove

- Click on “Add” button. You should type the following repository

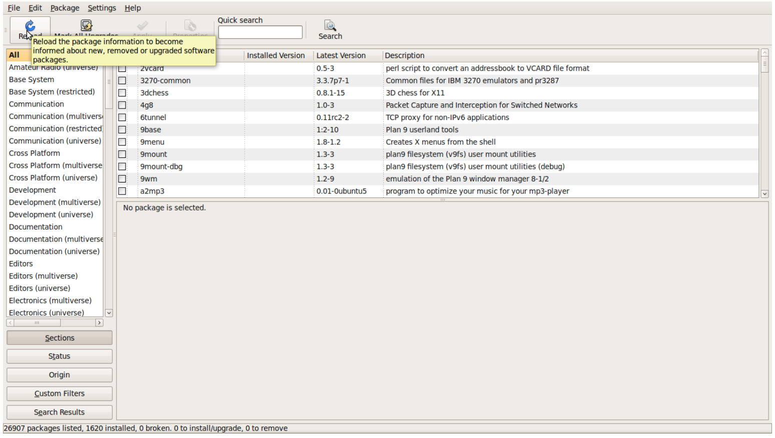
  ```
  deb http://pc-connectivity.garage.maemo.org/repository intrepid main
  ```



☑ **http://mirrors.cpv.signove.com/ubuntu/ jaunty** multiverse
☑ **http://mirrors.cpv.signove.com/ubuntu/ jaunty-updates** multiverse
□ **http://mirrors.cpv.signove.com/ubuntu/ jaunty-backports** main restrict
□ **http://archive.canonical.com/ubuntu jaunty** partner
□ **http://archive.canonical.com/ubuntu jaunty** partner (Source Code)
☑ **http://mirrors.cpv.signove.com/ubuntu/ jaunty-security** main restricted
☑ **http://mirrors.cpv.signove.com/ubuntu/ jaunty-security** universe
☑ **http://mirrors.cpv.signove.com/ubuntu/ jaunty-security** multiverse
☑ **http://mirrors.cpv.signove.com/scratchbox stable** main
☑ **http://mirrors.cpv.signove.com/virtualbox jaunty** non-free
☑ **http://pc-connectivity.garage.maemo.org/repository intrepid** main
☑ **http://scratchbox.org/debian/ maemo4-sdk** main
☑ **http://scratchbox.org/debian/ maemo5-sdk** main

- Click on “Close” button

- To get all information about the packages available on repository added, click on “Reload” button



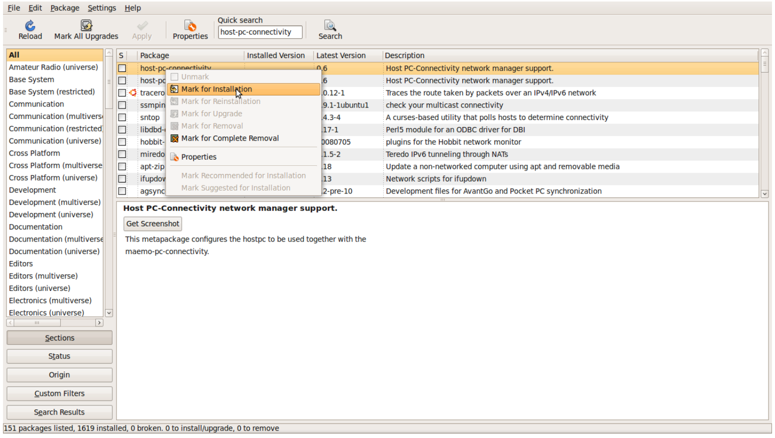
Reload the package information to become informed about new, removed or upgraded software packages.

		Installed Version	Latest Version	Description
□	2vcard		0.5-3	perl script to convert an addressbook to VCARD file format
□	3270-common		3.3.7p7-1	Common files for IBM 3270 emulators and pr3287
□	3dchess		0.8.1-15	3D chess for X11
□	4g8		1.0-3	Packet Capture and Interception for Switched Networks
□	6tunnel		0.11rc2-2	TCP proxy for non-IPv6 applications
□	9base		1:2-10	Plan 9 userland tools
□	9menu		1.8-1.2	Creates X menus from the shell
□	9mount		1.3-3	plan9 filesystem (v9fs) user mount utilities
□	9mount-dbg		1.3-3	plan9 filesystem (v9fs) user mount utilities (debug)
□	9wm		1.2-9	emulation of the Plan 9 window manager 8-1/2
□	a2mp3		0.01-0ubuntu5	program to optimize your music for your mp3-player

No package is selected.

26907 packages listed, 1620 installed, 0 broken. 0 to install/upgrade, 0 to remove

- On “Quick search” field, type `host-pc-connectivity`. The `host-pc-connectivity` package will be displayed on the list



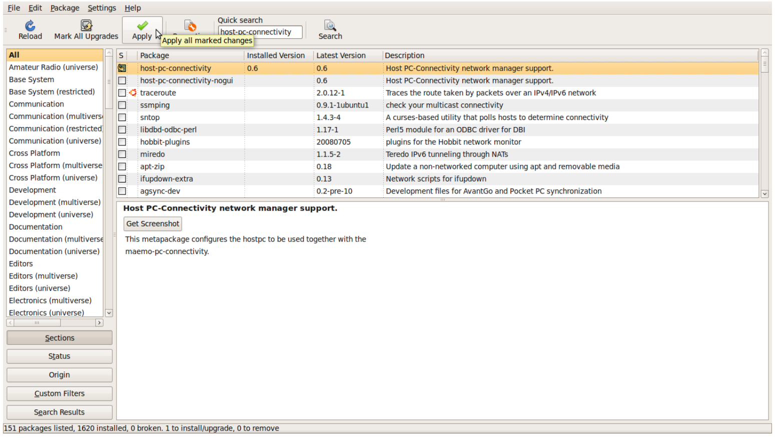
S	Package	Installed Version	Latest Version	Description
□	host-pc-connectivity		0.6	Host PC-Connectivity network manager support.
□	host-pc		6	Host PC-Connectivity network manager support.
□	tracero		0.12-1	Traces the route taken by packets over an IPv4/IPv6 network
□	ssmpin		9.1-1ubuntu1	check your multicast connectivity
□	sntop		4.3-4	A curses-based utility that polls hosts to determine connectivity
□	libdbd-		17-1	Perl5 module for an ODBC driver for DBI
□	hobbit-		0080705	plugins for the Hobbit network monitor
□	miredo		1.5-2	Teredo IPv6 tunneling through NATs
□	apt-zip		18	Update a non-networked computer using apt and removable media
□	ifupdov		13	Network scripts for ifupdown
□	agsync		2-pre-10	Development files for AvantGo and Pocket PC synchronization

Host PC-Connectivity network manager support.

This metapackage configures the hostpc to be used together with the maemo-pc-connectivity.

151 packages listed, 1619 installed, 0 broken. 0 to install/upgrade, 0 to remove

- Right click on `host-pc-connectivity` package. Select "Mark for installation" option
- Click on "Apply" button



S		Package	Installed Version	Latest Version	Description
☑		host-pc-connectivity	0.6	0.6	Host PC-Connectivity network manager support.
□		host-pc-connectivity-nogui		0.6	Host PC-Connectivity network manager support.
□	●	traceroute		2.0.12-1	Traces the route taken by packets over an IPv4/IPv6 network
□		ssmping		0.9.1-1ubuntu1	check your multicast connectivity
□		sntop		1.4.3-4	A curses-based utility that polls hosts to determine connectivity
□		libdbd-odbc-perl		1.17-1	Perl5 module for an ODBC driver for DBI
□		hobbit-plugins		20080705	plugins for the Hobbit network monitor
□		miredo		1.1.5-2	Teredo IPv6 tunneling through NATs
□		apt-zip		0.18	Update a non-networked computer using apt and removable media
□		ifupdown-extra		0.13	Network scripts for ifupdown
□		agsync-dev		0.2-pre-10	Development files for AvantGo and Pocket PC synchronization

Host PC-Connectivity network manager support.

This metapackage configures the hostpc to be used together with the maemo-pc-connectivity.

151 packages listed, 1620 installed, 0 broken. 1 to install/upgrade, 0 to remove

- Follow the instructions on screen. After that, Maemo PC Connectivity is installed on your host PC

2.2.2 Linux - Fedora

Note: it is necessary to add Maemo PC Connectivity repository on *repository list* to install `host-pc-connectivity` package. As Fedora does not have any graphical application to add a new repository, all process, repository addition and `host-pc-connectivity` installation, will be described through command line.

To enable Maemo PC Connectivity repository on Fedora Linux 11, you should add the following lines at the end of */etc/yum.conf* file:

```
[pc-connectivity]
name=PC-Connectivity Fedora $releasever - $basearch
failovermethod=priority
baseurl=http://pc-connectivity.garage.maemo.org/yum/base/$releasever/$basearch
enabled=1
gpgcheck=0
```

Then, to install `host-pc-connectivity` package, you should just execute:

```
apt-get install host-pc-connectivity
```

2.2.3 Windows

To install `host-pc-connectivity` on a windows XP or Vista system, you should first install Cygwin. You can download it from here. Remember to choose a path on your system without spaces to install it. Besides the default packages of Cygwin, install also the following ones:

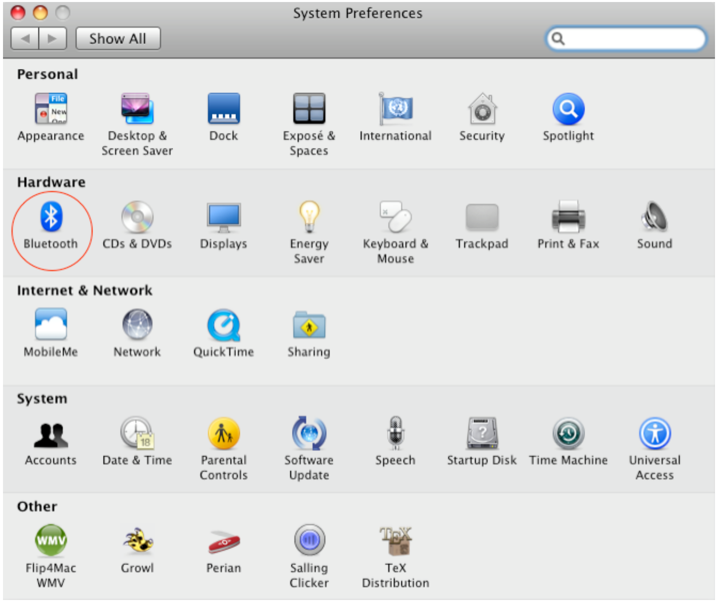
- Admin/cygrunsrv
- Net/nfs-server
- Net/openssh
- Net/rsync
- X11/xinit
- X11/xdpyinfo

After Cygwin is installed, download the `host-pc-connectivity` installer from here. Follow the on screen instructions to install it.

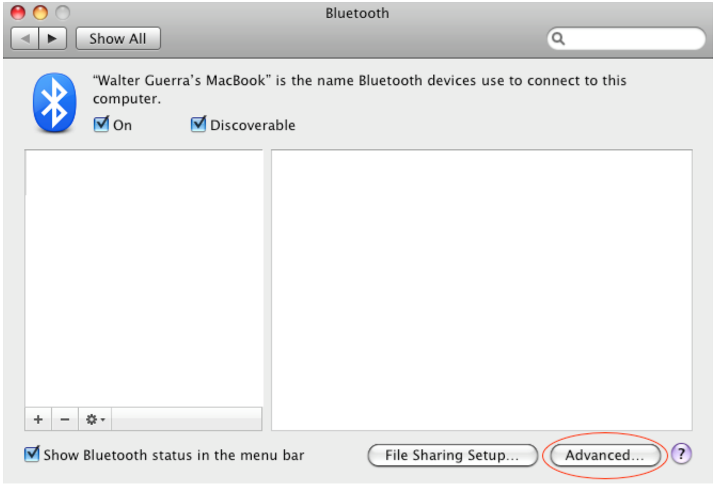
2.2.4 Mac OS

In order to install Maemo PC Connectivity on Mac OS X Leopard, you should first turn on Bluetooth network. To do this, follow the steps:

- Open the “System Preferences”
- Under “Hardware” category, select “Bluetooth” option



- Make sure Bluetooth is “On” and “Discoverable”. Then, click on “Advanced” button

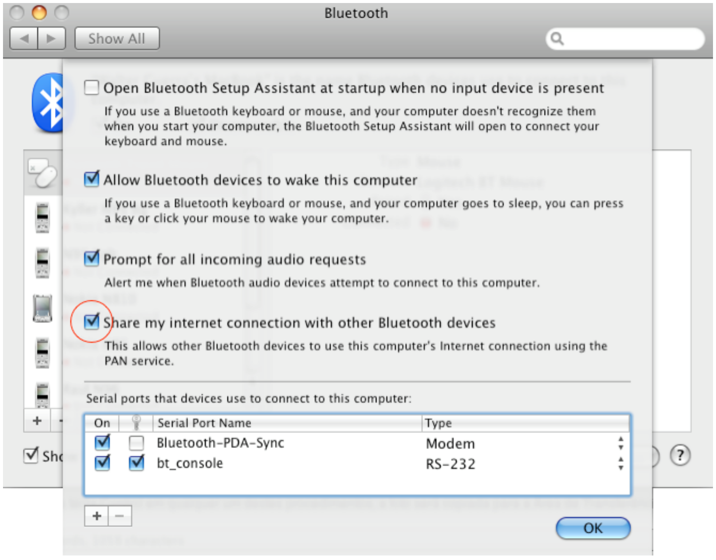


"Walter Guerra's MacBook" is the name Bluetooth devices use to connect to this computer.

☑ On ☑ Discoverable

☑ Show Bluetooth status in the menu bar

- Select "Share my Internet connection with other Bluetooth devices" option



□ Open Bluetooth Setup Assistant at startup when no input device is present

If you use a Bluetooth keyboard or mouse, and your computer doesn't recognize them when you start your computer, the Bluetooth Setup Assistant will open to connect your keyboard and mouse.

☑ Allow Bluetooth devices to wake this computer

If you use a Bluetooth keyboard or mouse, and your computer goes to sleep, you can press a key or click your mouse to wake your computer.

☑ Prompt for all incoming audio requests

Alert me when Bluetooth audio devices attempt to connect to this computer.

☑ Share my internet connection with other Bluetooth devices

This allows other Bluetooth devices to use this computer's Internet connection using the PAN service.

Serial ports that devices use to connect to this computer:

On		Serial Port Name	Type
☑	□	Bluetooth-PDA-Sync	Modem
☑	☑	bt_console	RS-232

- Click on "OK" button

Now, download `host-pc-connectivity` installer file from here. If the image does not mount automatically, double click it. Then, open the installer and follow the instructions on screen.

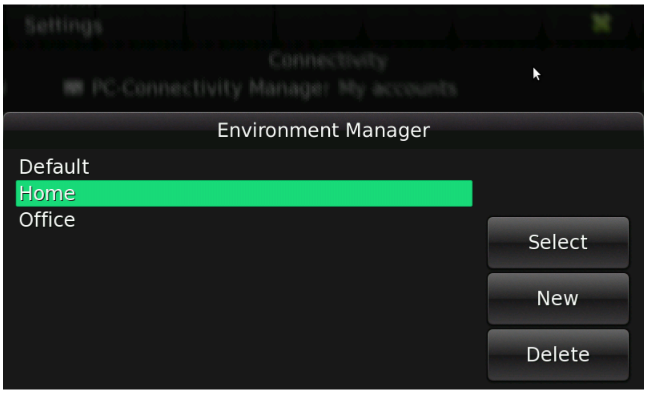
To have an environment similar to Cygwin on Windows, you can install MacPorts on Mac OS. The MacPorts Project is an open-source community initiative to design an easy-to-use system for compiling, installing, and upgrading either command-line, X11 or Aqua based open-source software on the Mac OS X operating system. You can find the instructions to install MacPorts here.

3 Creating environments

With Maemo PC Connectivity, it can be used the idea of environment to contextualize the configuration of connections and tools. For example, you can create an environment named “Home” that has the Usb connection and the NFS tool configured and an environment named “Office” that has the Wlan connection and the SBRSH tool configured. When you select an environment, all connections and tools configured are applied.

To configure an environment on maemo device, you should follow the steps:

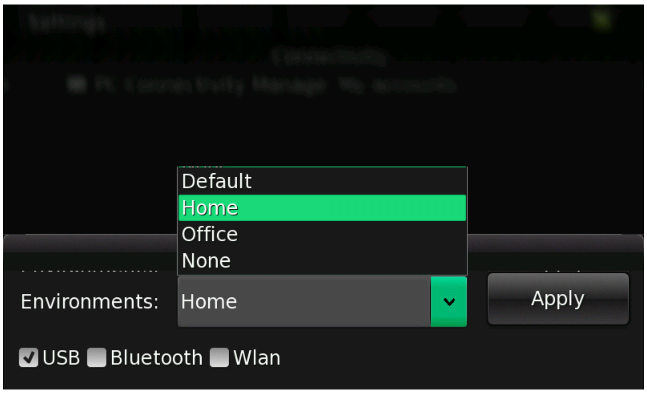
- Run *Settings - Control Panel - Connectivity - PC Connectivity Manager*
- Click on “Advanced” button
- Click on “...” button
- Click on “New” button
- Set the environment name. For example: “Home”, and click on “Ok” button



- Configure connections and/or tools to be applied in that environment. For example: Usb connection and NFS tool
- Click on “Save” button

After configure your environments, you can switch between them:

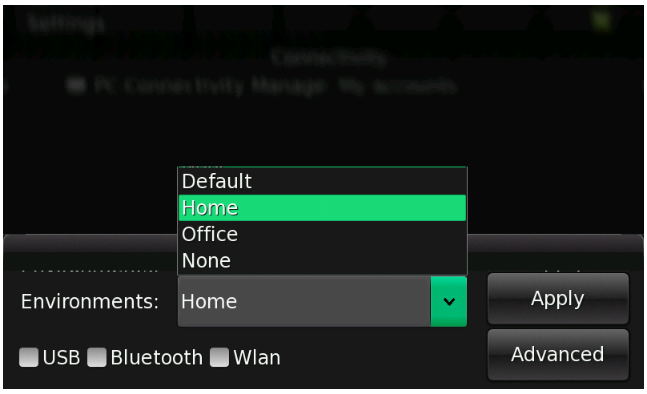
- Using *Connection Switcher* applet
  - Run *Connection Switcher* from status bar
  - Select an environment. All environment configuration will be applied



Environments: Home

☑ USB □ Bluetooth □ Wlan

- Using *PC Connectivity Manager* applet
  - Run *Settings - Control Panel - Connectivity - PC Connectivity Manager*
  - Select an environment
  - Click on "Apply" button

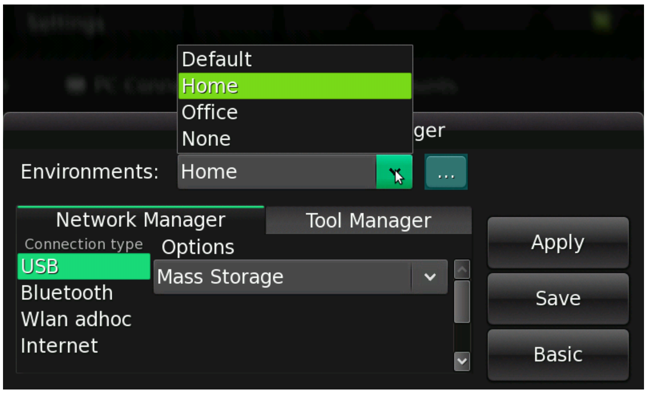


Environments: Home

□ USB □ Bluetooth □ Wlan

If you want to change an environment configuration before apply it:

- Run *Settings - Control Panel - Connectivity - PC Connectivity Manager*
- Click on "Advanced" button
- Change the environment configuration. For example: Usb connection and/or X11VNC tool
- Click on "Apply" button. All configuration, including changes, will be saved and applied



Environments: Home

Connection type: USB

Options: Mass Storage

4 Connection establishment

On maemo device, connection can be easily configured by using Maemo PC Connectivity applets. It is possible to configure the following interfaces:

- **Usb**

  `Network` - sets a Usb network over TCP/IP between maemo device and host PC
  `Mass storage` - host PC can access maemo device as memory card
  `PC Suite` - maemo device can be accessed by Nokia applications like *Nokia PC Suite*. **Diablo does not support `PC Suite` mode**
  `Host` - allows you to connect USB devices (external hard drives, digital cameras, card readers, input devices, etc.) to your maemo device just like a regular PC. **Due to a hardware limitation, Fremantle does not support `Host` mode**

- **Bluetooth** - sets a Bluetooth network over TCP/IP between maemo device and host PC
- **Wlan** - sets a Wlan ad-hoc on maemo device that can be used by host PC

On host PC side (Linux, Windows and Mac OS), it is also provided some tools to make easier connection configuration. Next, it will be described how to establish connection between maemo device and host PC through Usb, Bluetooth and Wlan.

4.1 Usb

On Diablo, the Usb connection of a maemo device is configured to "Mass storage" by default. That is, when connected to a host PC, the maemo device will be visible as a memory card. On Fremantle, when maemo device is connected to host PC through Usb, it shows a pop-up where the Usb mode can be selected, "Mass storage" or "PC Suite". You should just click outside the pop-up to keep the mode previously set by Maemo PC Connectivity. With Maemo PC Connectivity, the Usb connection can be used in different ways beyond "Mass storage" and "PC Suite":

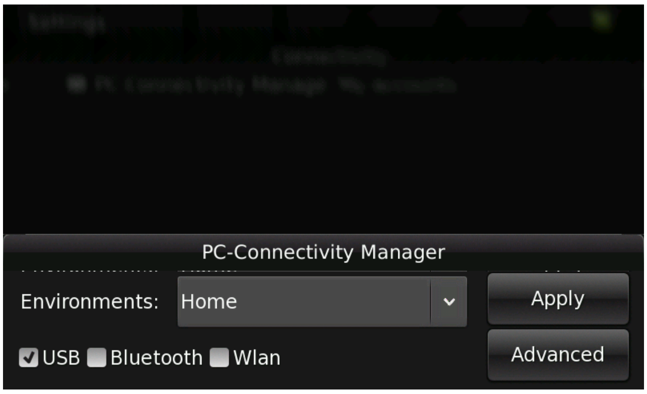
- `Network` - sets a Usb network over TCP/IP between maemo device and host PC
- `Mass storage` - host PC can access maemo device as memory card
- `PC Suite` - maemo device can be accessed by Nokia applications like *Nokia PC Suite*. **Diablo does not support `PC Suite` mode**
- `Host` - allows you to connect USB devices (external hard drives, digital cameras, card readers, input devices, etc.) to your maemo device just like a regular PC. **Due to a hardware limitation, Fremantle does not support `Host` mode**

The description how to setup a Usb connection to “Mass storage”, “PC Suite” and “Host” modes will be skipped since the configuration is just select and apply the desired mode on maemo device by using Maemo PC Connectivity. Next, it will be explained how to configure a Usb network over TCP/IP between maemo device and host PC through Maemo PC Connectivity. Before that, you have to install *maemo-pc-connectivity* meta package on maemo device and *host-pc-connectivity* package on host PC (Linux, Windows and Mac OS).

4.1.1 Configuring Maemo

In order to setup a Usb network on maemo device, you should follow the steps bellow:

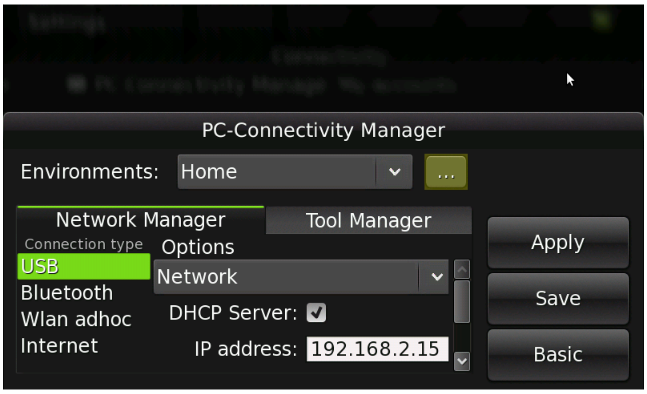
- Disconnect the Usb cable
- Run *Settings - Control Panel - Connectivity - PC Connectivity Manager*
- Check “USB” option
- Press “Apply” button



Environments: Home

☑ USB □ Bluetooth □ Wlan

- The Usb mode will be switched to Usb networking with the following values values by default:
  - **DHCP Server:** enabled
  - **IP address:** 192.168.2.15
  - **Gateway:** 192.168.2.14
  - **Netmask:** 255.255.255.0
- Connect the Usb cable to host PC
- If you want to change the default values, press “Advanced” button. *PC Connectivity Manager* will switch to advanced mode
- Change network options like DHCP Server, IP address, Gateway and Netmask



PC-Connectivity Manager

Environments: Home

Connection type: USB

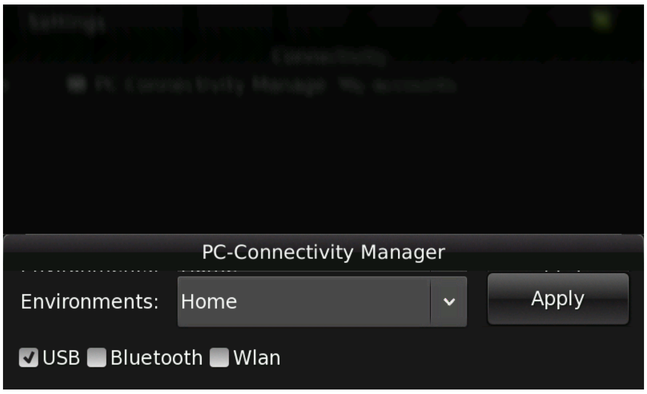
Options: Network

DHCP Server: ☑

IP address: 192.168.2.15

- Click on “Apply” button

Once you have configured your Usb network through PC Connectivity Manager applet, you can enable or disable it by using *Connection Switcher* applet from status bar.



PC-Connectivity Manager

Environments: Home

☑ USB □ Bluetooth □ Wlan

4.1.2 Configuring Linux

If you install *host-pc-connectivity* package, your Linux host PC is ready to Usb network.

4.1.3 Configuring Windows

In order to get a Usb network between a Windows host PC and a Diablo maemo device, you should replace the original Diablo kernel by a new one that fixes some Usb issues. To replace the kernel, follow the next steps:

- Download the file diablo_kernel_usbnet_windows.zip from here
- Unzip the file diablo_kernel_usbnet_patch_windows.zip
- Replace Diablo kernel by using flasher-3.5 application. It requires administrator privileges:

```
flasher-3.5 -k diablo_kernel_usbnet_windows/zImage -f -R
```

- Now, you can get a Usb network between Diablo maemo device and Windows host PC

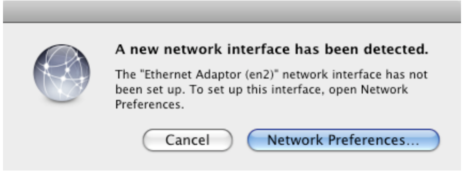
On Fremantle, the kernel is already fixed.

If you install *host-pc-connectivity* package, your Windows host PC is ready to Usb network. That is, the Windows will detect and configure the maemo device automatically when you plug it. Remember to activate Usb network on maemo device before plug it on Windows host PC.

4.1.4 Configuring Mac OS

You have to follow the next steps to get a Usb network on Mac OS:

- Activate Usb network on maemo device
- Plug the maemo device on Mac OS host PC
- The following pop-up should appear. Click on "Network Preferences" button:



A new network interface has been detected.

The "Ethernet Adaptor (en2)" network interface has not been set up. To set up this interface, open Network Preferences.

- Click on "Apply" button. Now, you should be able to connect to your maemo device

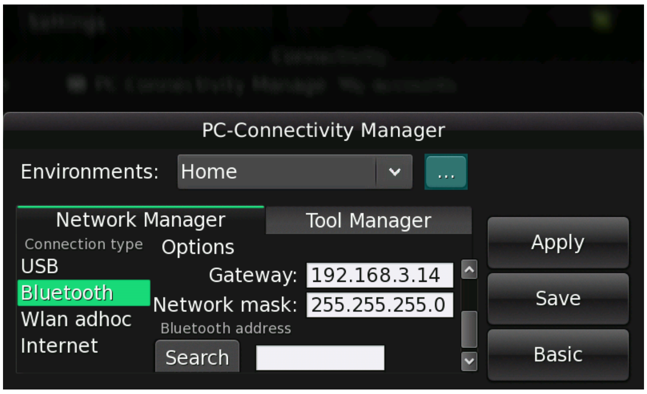
4.2 Bluetooth

By using Maemo PC Connectivity, you can configure a Bluetooth network between maemo device and host PC, that is, you can setup connection attributes like IP address, network mask, etc. For that, you have to install *maemo-pc-connectivity* meta package on maemo device and *host-pc-connectivity* package on host PC (Linux, Windows and Mac OS).

4.2.1 Configuring Maemo

In order to setup a Bluetooth network on maemo device, you should follow the steps bellow:

- Run *Settings - Control Panel - Connectivity - PC Connectivity Manager*
- Click on "Advanced" button
- Select a environment or create a new one
- Select "Bluetooth" option as shown in following picture



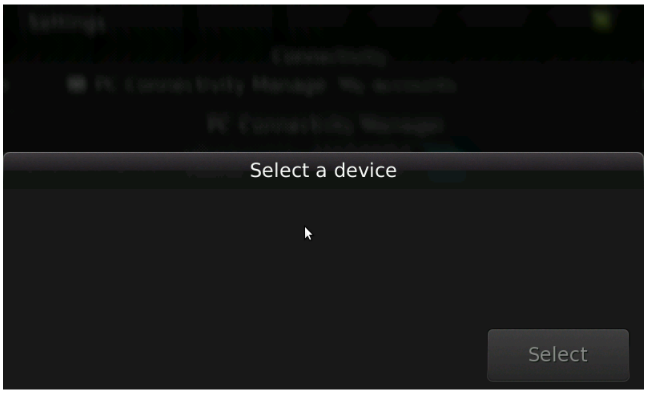
PC-Connectivity Manager

Environments: Home

Gateway: 192.168.3.14

Network mask: 255.255.255.0

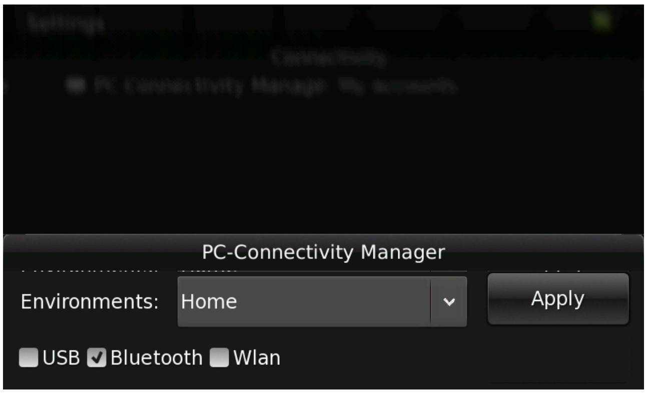
- Click on “Search” to find host PC
- Once host PC was found, mark its name and then click “Select”



Select a device

- The default settings are presented bellow, you can change them if you desire:
  - **DHCP Server:** enabled
  - **IP address:** 192.168.3.15
  - **Gateway:** 192.168.3.14
  - **Netmask:** 255.255.255.0
  - **Bluetooth address:** empty (you should search the host PC to connect to)
- Finally, click on “Apply” to enable the Bluetooth network

Once you have configured your Bluetooth network through *PC Connectivity Manager* applet, you can enable or disable it by using *Connection Switcher* applet from status bar.



PC-Connectivity Manager

Environments: Home

☐ USB ☑ Bluetooth ☐ Wlan

4.2.2 Configuring Linux

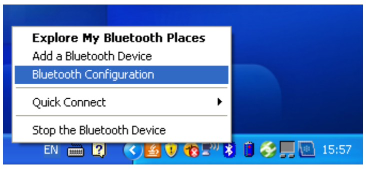
If you install *host-pc-connectivity* package, your Linux host PC is ready to Bluetooth network.

4.2.3 Configuring Windows

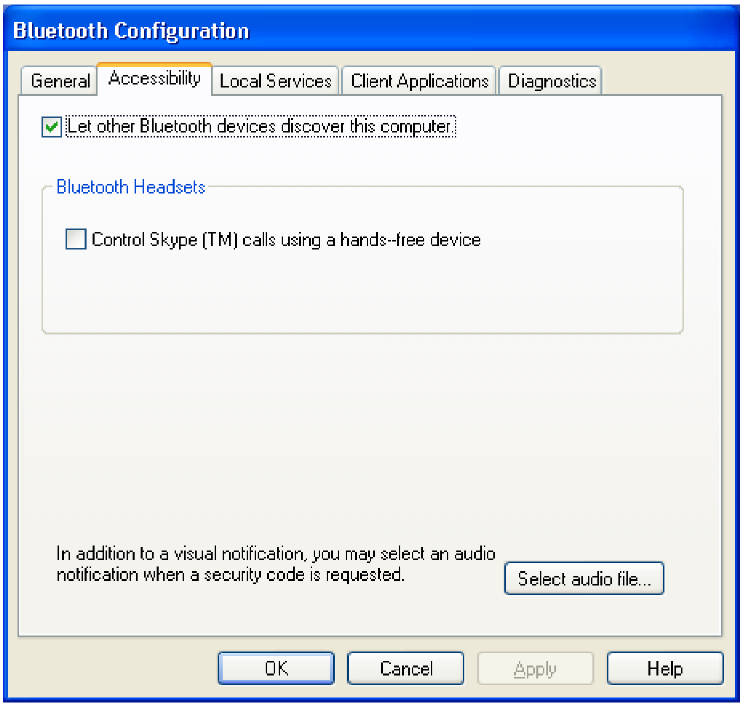
Note: the description how to configure Bluetooth on Windows host PC was based on *BlueSoleil* application. *BlueSoleil* is one of the most popular Windows Bluetooth application. If you do not use *BlueSoleil*, the screenshots bellow may differ from what you see in your host PC, but they can help to understand what you need to change on your Bluetooth application.

You should follow the next steps to get Bluetooth network configured in your Windows host PC (*BlueSoleil*):

- On “System tray”, right click on Bluetooth icon
- Select “Bluetooth Configuration” option



- On “Bluetooth Configuration” dialog, select “Accessibility” tab
- Check “Let other Bluetooth devices discover this computer” option



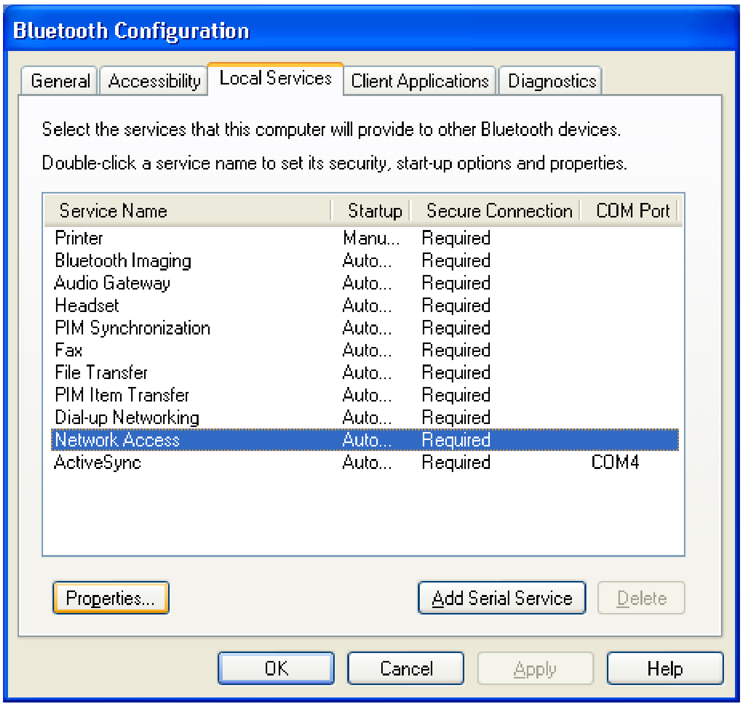
☑ Let other Bluetooth devices discover this computer

Bluetooth Headsets

□ Control Skype (TM) calls using a hands--free device

In addition to a visual notification, you may select an audio notification when a security code is requested.

- On “Bluetooth Configuration” dialog, select “Local Services” tab
- Mark “Network Access” service and click “Properties...” button



Select the services that this computer will provide to other Bluetooth devices.

Double-click a service name to set its security, start-up options and properties.

Service Name	Startup	Secure Connection	COM Port
Printer	Manu...	Required	
Bluetooth Imaging	Auto...	Required	
Audio Gateway	Auto...	Required	
Headset	Auto...	Required	
PIM Synchronization	Auto...	Required	
Fax	Auto...	Required	
File Transfer	Auto...	Required	
PIM Item Transfer	Auto...	Required	
Dial-up Networking	Auto...	Required	
Network Access	Auto...	Required	
ActiveSync	Auto...	Required	COM4

- If you want to share Internet over Bluetooth, select “Allow other devices to access the Internet/LAN via this computer” on “Select the type of the service to offer remote devices” option
- For all opened dialogs, press “OK” button

4.2.4 Configuring Mac OS

If you install *host-pc-connectivity* package, your Mac OS host PC is ready to Bluetooth network.

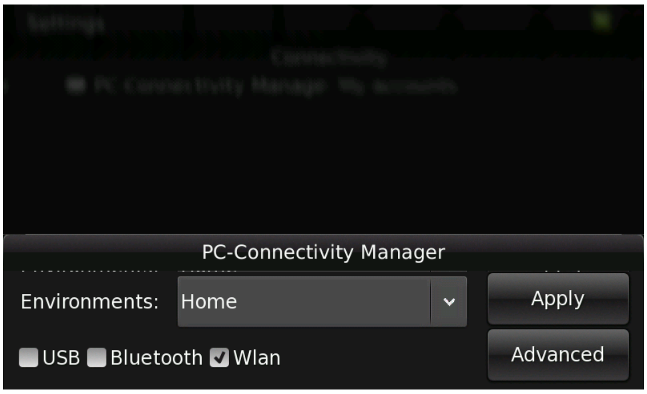
4.3 Wlan ad-hoc

By using Maemo PC Connectivity, you can configure a Wlan ad-hoc network on your maemo device, that is, you can setup connection attributes like IP address, network mask, etc. For that, you have to install *maemo-pc-connectivity* meta package on your maemo device.

4.3.1 Configuring Maemo

To setup a Wlan ad-hoc on maemo device, proceed as follows:

- On control panel, open *PC Connectivity Manager* applet



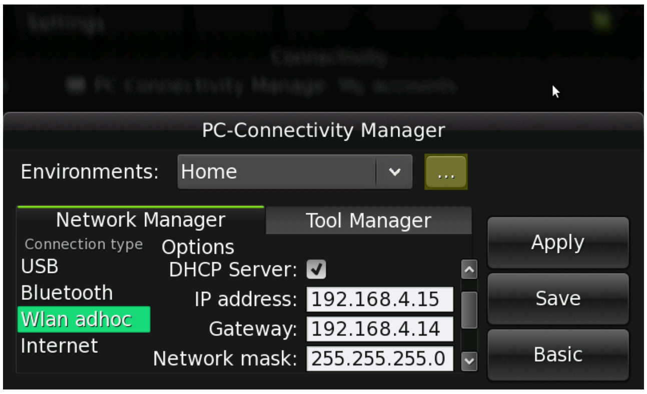
PC-Connectivity Manager

Environments: Home

□ USB □ Bluetooth ☑ Wlan

- Select the Wlan check-box and press “Apply” button. A new Wlan ad-hoc connection will be created with the following configuration:
  - *DHCP Server:* Enabled
  - *IP Address:* 192.168.4.14
  - *Gateway:* 192.168.4.15
  - *Netmask:* 255.255.255.0
  - *Essid:* devel_adhoc
  - *WEP:* key empty
- If you want to change these default values, press “Advanced” button, go to *Wlan ad-hoc* session and change the values. Then, press “Apply” button

  Note: the WEP key should have 5, 10 or 13 characters (Example: `aaaaa`)



PC-Connectivity Manager

Environments: Home

Connection type: Wlan adhoc

Options

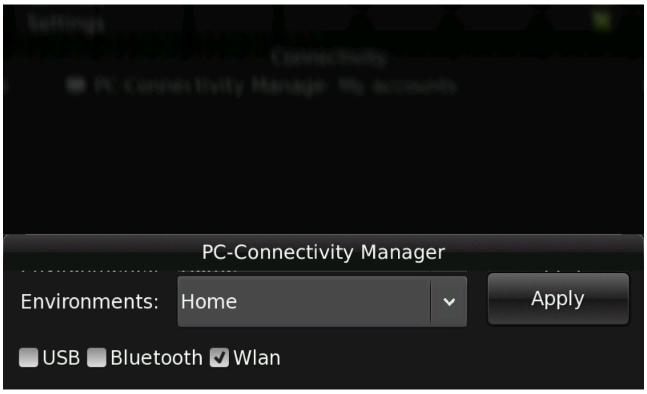
DHCP Server: ☑

IP address: 192.168.4.15

Gateway: 192.168.4.14

Network mask: 255.255.255.0

Once the Wlan network was configured, you can easily switch it on or off by using *Connection Switcher* applet from status bar.



PC-Connectivity Manager

Environments: Home

□ USB □ Bluetooth ☑ Wlan

4.3.2 Configuring Linux

The `iwconfig` command is the configuration utility in Linux for Wlan interfaces. It is used to set the parameters of the network interface which are specific to the wireless operation. The `iwconfig` command may also be used to display the parameters and the wireless statistics. It extracts these information from `/proc/net/wireless` file. By typing `iwconfig` command without any arguments, it will be displayed the current status of all wireless interfaces on the system. But for configuring your host PC to connect with your maemo device, you should execute the following steps as `root` user:

```
ifconfig wlan0 up
iwconfig wlan0 mode Ad-Hoc
iwconfig wlan0 essid devel_adhoc
iwconfig wlan0 key off
```

It is recommended you set the wireless key to avoid unexpected remote connections. In this case, you should replace the last command by:

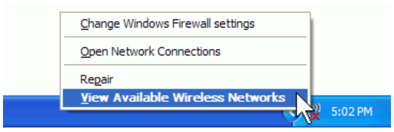
Note: you should type the same WEP key used on maemo device in hexadecimal digits (Example: `aaaaa` is `6161616161` in hexadecimal)

```
iwconfig wlan0 key 6161616161
```

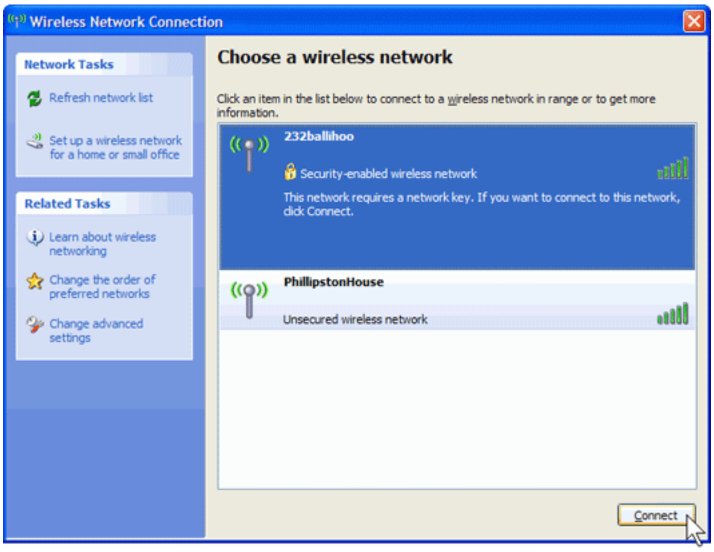
4.3.3 Configuring Windows

To setup a Wlan ad-hoc network that allows others computers to connect to your Windows host PC, follow the next steps.

- Connect your maemo device to *devel_adhoc*
- On "System Tray", right click on wireless icon. Select "View Available Wireless Networks" option


Change Windows Firewall settings
Open Network Connections
Repair
View Available Wireless Networks
5:02 PM

- The "Wireless Network Connection" window will display *devel_adhoc* network on the list. If you do not see *devel_adhoc*, click "Refresh network list" in the upper left corner


Wireless Network Connection
Network Tasks
Refresh network list
Set up a wireless network for a home or small office
Related Tasks
Learn about wireless networking
Change the order of preferred networks
Change advanced settings
Connect

Choose a wireless network

Click an item in the list below to connect to a wireless network in range or to get more information.

232ballihoo

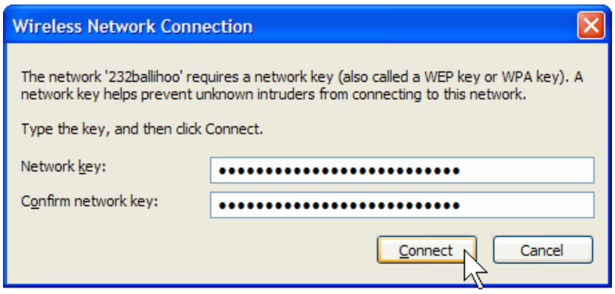
Security-enabled wireless network

This network requires a network key. If you want to connect to this network, click Connect.

PhillipstonHouse

Unsecured wireless network

- Select *devel_adhoc*, and then click on "Connect" button
- **If you choose an non empty "WEP Key" on maemo device**, the Windows will request it at this point



The network '232ballihoo' requires a network key (also called a WEP key or WPA key). A network key helps prevent unknown intruders from connecting to this network.

Type the key, and then click Connect.

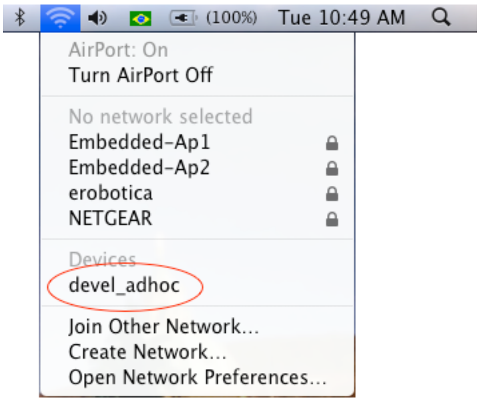
Network key: ••••••••••••••••••••••••••

Confirm network key: ••••••••••••••••••••••••••

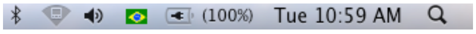
4.3.4 Configuring Mac OS

To configure a Wlan ad-hoc network on your Mac host PC, follow the steps:

- Connect your maemo device to *devel_adhoc*
- At the Menu Bar, click on wireless icon and select the *devel_adhoc* network. **If you choose a non empty "WEP Key" on maemo device**, the Mac OS will request it at this point



- The icon should change to inform that it is connected



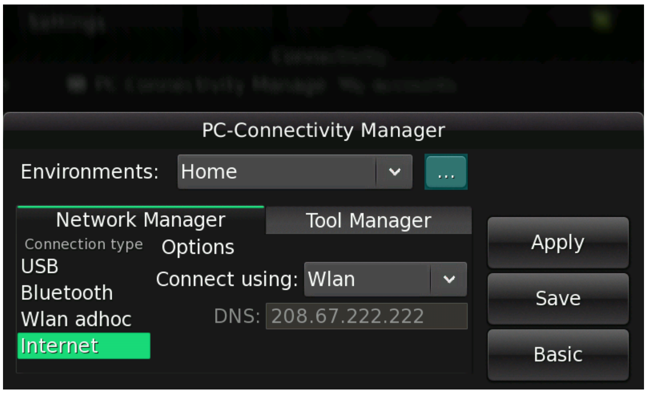
5 Internet sharing

With Maemo PC Connectivity, you can easily setup Internet connection and share it from maemo device to host PC. For that, you should setup from which interface (Wlan, Usb or Bluetooth) maemo device accesses Internet and share it with other interfaces (Wlan, Usb and/or Bluetooth). Also, you can share Internet from host PC (Linux, Windows or Mac OS) to maemo device as described in the following documentation.

5.1 Maemo

Next, it will be described how to get Internet shared from maemo device to host PC:

- Run *Settings - Control Panel - Connectivity - PC Connectivity Manager*
- Click on "Advanced" button
- As shown in the next picture, select "Internet" option



PC-Connectivity Manager

Environments: Home

Connect using: Wlan

DNS: 208.67.222.222

- Under "Connect Using" option, you can choose from which interface (Wlan, Wlan adhoc, Usb or Bluetooth) the maemo device accesses Internet
- Under "Share internet connection with" option, you can check the interfaces (Usb, Bluetooth and/or Wlan) to share Internet with
- Click on "Apply" button

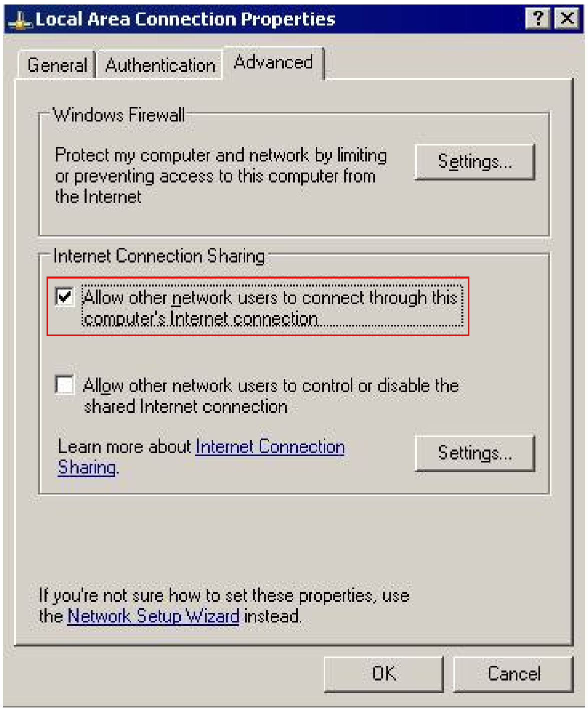
5.2 Linux

Once you installed `host-pc-connectivity` package, you automatically shared Internet connection from your Linux host PC to maemo device.

5.3 Windows

To share the Internet of your Windows host PC, you should follow the next steps:

- Open *Start - Control Panel - Network and Internet Connections - Network Connections* option
- Right click the interface you access Internet from
- Select “Properties” option
- Select “Advanced” tab



Protect my computer and network by limiting or preventing access to this computer from the Internet

☑ Allow other network users to connect through this computer's Internet connection

☐ Allow other network users to control or disable the shared Internet connection

Learn more about Internet Connection Sharing.

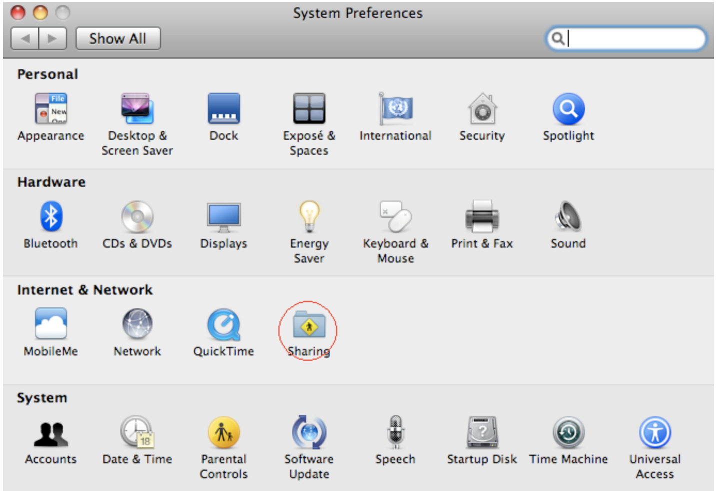
If you're not sure how to set these properties, use the Network Setup Wizard instead.

- Under “Internet Connection Sharing”, select “Allow other network users to connect through this computer’s Internet connection” check-box
- Click on “Ok” button

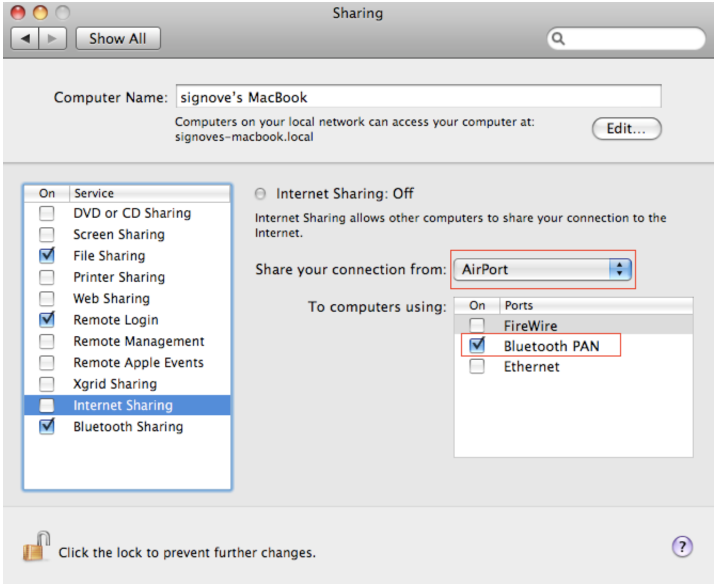
5.4 Mac OS

Follow the next steps to share Internet on Mac OS:

- Go to “System Preferences” and click on “Sharing” icon



- Select "Internet Sharing" service
- Under "Share your connection from", select the interface that has Internet connection. For example: *AirPort*
- Under "To computers using", check the interfaces you want to share Internet with. For example: *Bluetooth PAN*



Computer Name: signove's MacBook

Computers on your local network can access your computer at: signoves-macbook.local

On	Service
□	DVD or CD Sharing
□	Screen Sharing
☑	File Sharing
□	Printer Sharing
□	Web Sharing
☑	Remote Login
□	Remote Management
□	Remote Apple Events
□	Xgrid Sharing
□	Internet Sharing
☑	Bluetooth Sharing

○ Internet Sharing: Off

Internet Sharing allows other computers to share your connection to the Internet.

Share your connection from: AirPort

To computers using:

On	Ports
□	FireWire
☑	Bluetooth PAN
□	Ethernet

Click the lock to prevent further changes.

- Mark "Internet Sharing" check-box

6 Remote shell

With Maemo PC Connectivity, it is possible to execute shell commands on another computer across network. That is, you can remotely execute shell commands on maemo device from your host PC and vice-versa. For that, you have to install *maemo-pc-connectivity* meta package on maemo device and *host-pc-connectivity* package on host PC (Linux, Windows and Mac OS). Next, it will be described how to use the remote shell tools available on Maemo PC Connectivity. To simplify, it is assumed that you already have a Usb network between maemo device and host PC.

Note: on host PC, you should type the commands bellow at terminal on Linux and Mac OS and at Cygwin shell on Windows.

6.1 SSH

Secure Shell (SSH) is a network protocol that allows data to be exchanged using a secure channel between two networked devices. It was designed as a replacement for Telnet and other insecure remote shells, which send information, notably passwords, in plain text, leaving them open for interception. With SSH, you can remotely execute programs on maemo device from your host PC and vice-versa. Next, it will be described the steps to access your maemo device from host PC.

- Connect to maemo device from host PC by using SSH

  ```
  ssh root@192.168.2.15
  ```

  Here, *root* is the user name on 192.168.2.15 (network address of maemo device). If it is your first connection attempt to maemo device, you will be asked to verify the connection:

  ```
  The authenticity of host 'host (192.168.2.15)' can't be established.
  RSA key fingerprint is ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff:ff.
  Are you sure you want to continue connecting (yes/no)? yes
  Warning: Permanently added 'host,192.168.2.15' (RSA) to the list of known hosts.
  ```

- After that, it will be asked the root password. The root password is the same you set during *maemo-pc-connectivity* installation on maemo device:

  ```
  ssh root@192.168.2.15's password:
  ```

  Note: the root password is requested when you install `openssh`. `maemo-pc-connectivity` installs `openssh` if it is not installed yet. If you installed `openssh` before, the root password will not be requested on `maemo-pc-connectivity` installation.

- Then, you should be presented to a remote shell (the following text depends on maemo OS image):

```
BusyBox v1.6.1 (2007-09-27 18:08:59 EEST) Built-in shell (ash)
Enter 'help' for a list of built-in commands.
Nokia-Nxxx:~#
```

On `host-pc-connectivity` package, it is provided a tool named **ssh-key-exchange** that exchanges SSH public keys automatically. Thus, `SSH` **will not ask password every time**. For that, you should execute the following command:

```
ssh-key-exchange -l local_ip_address -r remote_ip_address
-u remote_username
```

- `local_ip_address:` IP address of host PC
- `remote_ip_address:` IP address of maemo device
- `remote_username:` username of maemo device you want to exchange SSH keys, normally `root`

After exchanging keys, the next SSH connections will not require password.

6.2 SBRSH

Scratchbox Remote Shell (SBRSH) is a remote shell solution such as SSH. It allows you to execute programs on maemo device from host PC, but using the host PC file system, instead of maemo device file system. The following steps show how SBRSH works:

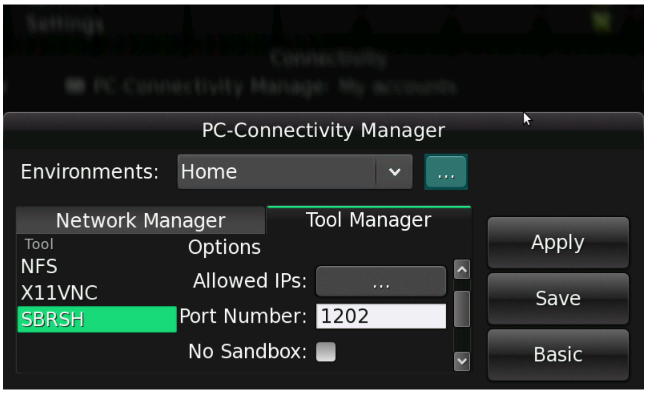
1. The user configures SBRSH client on host PC giving the folders to be remotely mounted on maemo device, usually home folder
2. The user executes `sbrsh my_app` on host PC to test if the application is working properly on maemo device
3. SBRSH client (on host PC) sends the request to SBRSH server (on maemo device)
4. SBRSH server mounts host PC folders on maemo device according to SBRSH configuration files (defined on step 1)
5. SBRSH server (on maemo device) executes the command (in this example, `my_app`) and redirects the standard output to SBRSH client (on host PC)
6. SBRSH client (on host PC) receives and shows the output to user

6.2.1 Configuring Maemo

It follows the steps to configure SBRSH through Maemo PC Connectivity:

- Run *Settings - Control Panel - Connectivity - PC Connectivity Manager*
- Press "Advanced" button

- Switch to “Tool Manager” tab
- Select ”SBRSH” option



PC-Connectivity Manager

Environments: Home

Tool: NFS, X11VNC, SBRSH

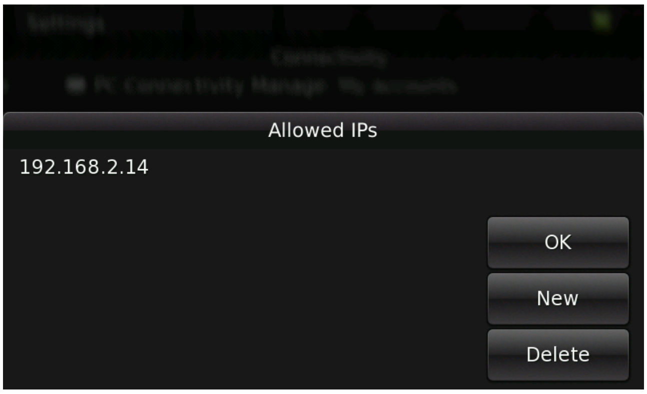
Options

Allowed IPs: ...

Port Number: 1202

No Sandbox: □

- Click on “Allowed IPs” button.
- Click on “New” button. Add the IP address of host PC
- Click on “OK” button



Allowed IPs

192.168.2.14

- Click on “Apply” button. Now, the host PC has permission to access maemo device through SBRSH

6.2.2 Configuring Host PC

In this example, SSH will be used to configure SBRSH client. So, you can use `ssh-key-exchange` as described in section 6.1 to avoid SSH requiring password every time.

In order to use SBRSH client, you need a configuration file to select the targets of the devices and which file systems they export from host. By default, the file used is `/.sbrsh`, but you may override it by using the following command `sbrsh -c <file_name>`. The first target defined on configuration file is used by default, but you may override it by using the following command `sbrsh -t <target_name>`. Next, it will be explained the SBRSH configuration file format

- SBRSH configuration file format

  You need to edit SBRSH configuration file to setup which host PC folders will be mounted on maemo device. The configuration file format is:

  ```
  # <target_name> <host_name>[:<port>]
  # nfs|bind|sshfs <host_filesystem> <target_mountpoint> [<options>]
  # ...
  ```

  A blank line separates entries. Since SBRSH client 7.6, a hash mark "#" denotes commented lines.

  As you can see, SBRSH uses SSHFS or NFS in background to mount host PC file system on maemo device. For new users, it is recommended SSHFS since you just need to edit SBRSH configuration file. With NFS, you need to edit NFS configuration as well. Also, the mounts should appear in order of increasing depth. For example: the root (/) must be mounted first, then the folders inside it (/home) and so on.

  The `bind` lines overrides portions of of the target file system with the host file system. This is essential for file systems which contain maemo device specific files and/or folders. For instance: /tmp, /var, /sys, /dev, /proc, etc. See more details on example below.

  It is recommended to unmount SBRSH (`sbrsh [-c <file_name> -t <target_name>] --umount`) before editing SBRSH configuration file. SBRSH commands read the current configuration file. If you first changed the configuration file, SBRSH will not remember the old configuration. Thus, SBRSH will not unmount the old configuration correctly.

  It follows a example of SBRSH configuration file:
  `User name:` you
  `Target:` DIABLO_ARMEL

  ```
  sshfs-target 192.168.2.15
  ssh you @192.168.2.14:/scratchbox/users/you /targets/DIABLO_ARMEL/ /
  rw,nonempty,allow_other
  ssh you @192.168.2.14:/scratchbox/users/you /home/you / /home/you
  rw,nonempty,allow_other
  bind /tmp /tmp
  bind /dev /dev
  bind /dev/pts /dev/pts
  bind /proc /proc
  bind /sys /sys
  bind /var /var
  ```

6.2.3 CPU Transparency

In CPU transparency mode, the SBRSH configuration file is determined by SDK target location and the first target is used by default. You can follow the next steps to use SBRSH in CPU transparency mode on scratchbox:

- Place `.sbrsh` configuration on */scratchbox/users/you/targets/DIABLO_ARMEL.sbrsh*
- Maemo PC Connectivity provides a new version of SBRSH client. You should replace the SBRSH client shipped with scratchbox by the version shipped on Maemo PC Connectivity. So, execute inside scratchbox:

  ```
  cd /scratchbox/devkits/cputransp/bin/
  mv sbrsh sbrsh.old
  cp <pc_connectivity_sbrsh_client_binary> sbrsh
  ```

- Edit DIABLO_ARMEL target configuration at */scratchbox/users/you/-targets/DIABLO_ARMEL.config* file. That is, change `SBOX_CPUTRANSPARENCY_METHOD` to:

  ```
  SBOX_CPUTRANSPARENCY_METHOD=/scratchbox/devkits/cputransp/bin/sbrsh
  ```

  You can also do this by creating a new target or by editing your current one through sb-menu command.
- You will not be able to exchange SSH keys by using `ssh-key-exchange` application. For this case, you will need to do it by hand following the instructions available at section 6.1
- The new SBRSH client provided by Maemo PC Connectivity allows you to set extra arguments:
  - `-r`, to specify the remote user to be used
  - `-s`, to turn on sandbox on server
  - `-n`, to turn off sandbox on server

  You can export SBOX_CPUTRANSPARENCY_EXTRA_ARGS variable to pass the additional parameters to new SBRSH client. If you want to turn off sandbox on server and want to use `root` user to execute the remote commands, you should execute the following line before SBRSH client:

  ```
  export SBOX_CPUTRANSPARENCY_EXTRA_ARGS="-n -r 0,0,root"
  ```

6.2.4 Testing

If you changed SSH keys with `root` user on maemo device, you need to specify this on command line. Run the following command on host PC to see if the mount works:

```
$ sbrsh -r 0,0,root ls /
  bin cdrom etc home lib mnt proc sbin sys usr
  boot dev floppy initrd media opt root srv tmp var
```

Also, you can use `-s` or `-n` option to turn on/off sandbox mode on server, respectively:

```
$ sbrsh -n -r 0,0,root ls /
  bin cdrom etc home lib mnt proc sbin sys usr
  boot dev floppy initrd media opt root srv tmp var

$ sbrsh -s -r 0,0,root ls /
  bin cdrom etc home lib mnt proc sbin sys usr
  boot dev floppy initrd media opt root srv tmp var
```

6.2.5 Troubleshoot

You can get some errors while using SBRSH. Next, it will be described some of them:

- **Authentication failed**

  ```
  $ sbrsh /bin/sh
    sbrsh: authentication failed
  ```

  It means that you forgot to add the IP address of your host PC on `/etc/sbrsh.conf` file of your maemo device.

- **Connection reset by peer**

  ```
  $ sbrsh /bin/sh
    sbrsh server: read: Connection reset by peer
    sbrsh server: Can’t mount to point: /var/sbrshd/you@192.168.2.14/sshfs-target/
  ```

  It happens because you do not have the same user on both machines (maemo device and host PC). Use the option `-r` to specify the user you will use to run the command on maemo device. For example: ”-r 0,0,root”. Also, be sure your SSH keys have been successfully exchanged between your user (host PC) and the `root` user of your maemo device. You can test trying SSH in both directions. No password should be required.

- **Permission denied**

  ```
  $ sbrsh /bin/sh
    sbrsh server: Can’t execute command: /bin/sh (Permission denied)
  ```

  This error is misleading. It usually means that you are missing a mount for the root directory on maemo device, when *sandbox* mode is enabled (the default). The error comes from `chroot()`.

- **No such file or directory**

  ```
  $ sbrsh my_app
    sbrsh server: Can't execute command: mu_app (No such file or directory)
  ```

  Be sure that *my_app* path is visible from maemo device or specify a full path. For example: if you map "/scratchbox/users/you/home/you /" to "/home/you /", you should execute `sbrsh /home/you /my_app` instead.

- **Osso initialize failed**

  ```
  $ sbrsh maemoapp
    maemoapp[2096]: GLIB ERROR ** default  file ... assertion failed:
  (result->osso)

  $ sbrsh maemoapp
    maemoapp[2096]: osso_initialize() failed
  ```

  OSSO applications initialize the DBUS connection very early. So, DBUS problems are probably the cause. When launching OSSO applications, you must override the `DBUS_SESSION_BUS_ADDRESS` environment variable. The `DBUS_SESSION_BUS_ADDRESS` value of your host system is probably completely incorrect, since `/tmp` is bind-mounted to the target. Try the following command instead:

  ```
   $ DBUS_SESSION_BUS_ADDRESS=unix:path=/tmp/session_bus_socket sbrsh maemoapp
  ```

7 File sharing

Maemo PC Connectivity provides some tools to easily share files between maemo device and host PC. That is, you can can mount the file system of maemo device on host PC over a network and interact with it as though it is mounted locally. Also, it is possible to mount a file system of host PC on maemo device. For that, you have to install *maemo-pc-connectivity* meta package on maemo device and *host-pc-connectivity* package on host PC (Linux, Windows and Mac OS). Next, it will be described how to use the file sharing tools available on Maemo PC Connectivity. To simplify, it is assumed that you already have a Usb network between maemo device and host PC.

If follows the recommended tools to mount the file system of a maemo device on host PC:

	Linux	Windows	Mac OS
SSHFS	X		X
NFS	X		X
SAMBA	X	X	X

To mount the file system of a host PC on maemo device, it is recommended the following tools:

	Linux	Windows	Mac OS
SSHFS	X		X
NFS	X	X	
SAMBA	X	X	X

Note: on host PC, you should type the commands bellow at terminal on Linux and Mac OS and at Cygwin shell on Windows.

7.1 SSHFS

Note: SSHFS does not work on Windows host PC.

SSHFS (SSH File System) is a file system client based on the SSH protocol. It allows to mount locally a remote file system via SSH. With SSHFS, you can remotely access maemo device file system from host PC and vice-versa. If you want to mount maemo device file system on your host PC, you can execute the following commands:

```
$ mkdir ~/maemo
$ sshfs user@192.168.2.15:/ ~/maemo -o rw,nonempty
  user@192.168.2.15's password: <type user password here>
```

If you did not set the SSH password for “user” yet, you can use the “root” account. You should setup the password for “user” account following the next steps:

```
$ ssh root@192.168.2.15
  root@192.168.2.15's password: <type root password here>
  Nokia-810:~# passwd user
  Changing password for user
  Enter the new password (minimum of 5, maximum of 8 characters)
  Please use a combination of upper and lower case letters and numbers.
  New password: <type new user password here>
  Re-enter new password: <retype user password>
  Password changed
```

If you want to mount host PC file system on your maemo device, you can execute the following commands:

```
$ mkdir ~/hostpc
$ sshfs <host_pc_user>@<host_pc_ip>:/ ~/hostpc -o rw,nonempty
  <host_pc_user>@<host_pc_ip>'s password: <type user password here>
```

As SSFH is a user file system, you can not use *mount* directly. For example, you should execute the following command to unmount maemo device file system on host PC:

```
$ fusermount -u ~/maemo
```

You can avoid SSH asking password every time by exchanging the SSH keys as described in section 6.1.

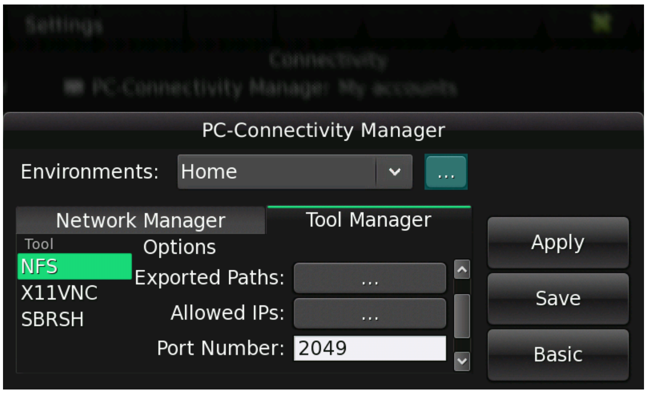
7.2 NFS

With NFS (Network File System), you can share folders of your maemo device or host PC over network. Next, it will be described how to share a folder of maemo device by using NFS.

7.2.1 Configuring Maemo Device

You should follow the next steps to share a folder of your maemo device through NFS by using Maemo PC Connectivity:

- Run *Settings - Control Panel - Connectivity - PC Connectivity Manager*
- Click on "Advanced" button
- Go to "Tool Manager" tab
- Select "NFS" option. After that, change the options according to your needs



PC-Connectivity Manager

Environments: Home

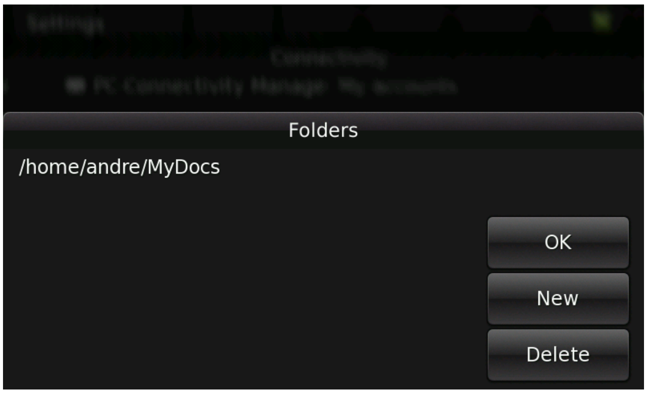
Tool: NFS

Exported Paths: ...

Allowed IPs: ...

Port Number: 2049

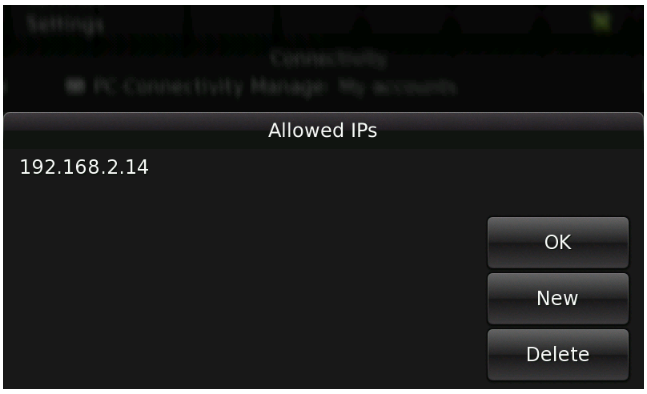
- Click on “Exported Paths” button. Then, add the folders to be shared



Folders

/home/andre/MyDocs

- Click on “Allowed IPs” button. Then, add the host PCs (IP addresses) that can access the shared folders



Allowed IPs

192.168.2.14

- Click on “Apply” button

7.2.2 Configuring Host PC

It follows the steps to share a folder of a host PC over network by giving access to maemo device IP address (*192.168.2.15*):

- Edit the file */etc/exports*. For that, you should add the folder you want to share and set the permissions of your host PC (IP address):

  ```
  /home/<host_pc_user> 192.168.2.15(rw,no_root_squash,async,no_subtree_check)
  ```

- After, restart the `NFS` server:

  ```
  sudo /etc/init.d/unfs3 restart
  ```

7.2.3 Accessing Maemo Device

Once you configured `NFS` on your maemo device, you can access the shared folders from your host PC over network. Next, it is described how to access the shared folders on host PC:

- On host PC, run `showmount` command to check if `NFS` sharing is working:

  ```
  $ showmount -e <device_ip>
    Export list for 192.168.2.15:
    /home/user/MyDocs 192.168.2.14
  ```

- Now, mount the maemo device folder on host PC:

  ```
  $ mkdir /tmp/MyDocs
  $ sudo mount -t nfs <device_ip>:/home/user/MyDocs /tmp/MyDocs
  ```

- You can unmount the folder with the following command:

  ```
  $ sudo umount /tmp/MyDocs
  ```

7.2.4 Accessing Host PC

Once you configured `NFS` on your host PC, you can access the shared folders from your maemo device over network. Next, it is described how to access the shared folders on maemo device:

- Mount the host PC folder on maemo device:

  ```
  mkdir ~/hostpc
  mount -t nfs <host_pc_ip>:/home/<host_pc_user> ~/hostpc
  ```

- You can unmount the folder with the following command:

  ```
  sudo umount ~/hostpc
  ```

7.3 SAMBA

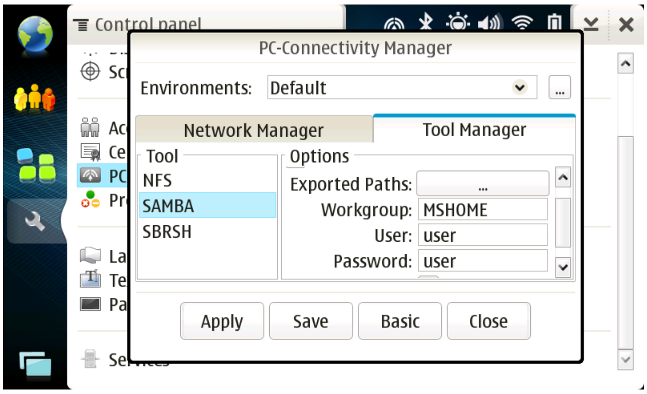
`Samba` (Server Message Block) allows file sharing between computers over the network. With `Samba`, you can remotely access maemo device file system from host PC and vice-versa. Once you shared your file system through *Samba*, it will be available every time you reconnect to the network.

Note: for while `Samba` is not working on Fremantle

7.3.1 Maemo

In order to share a folder of your maemo device, you should follow the next steps:

- Run *Settings - Control Panel - Connectivity - PC Connectivity Manager*
- Click on "Advanced" button
- Go to "Tool Manager" tab
- Select "Samba" option. After that, change the options according to your needs (Workgroup, User and Password)



PC-Connectivity Manager

Environments: Default

Tool

NFS

SAMBA

SBRSH

Options

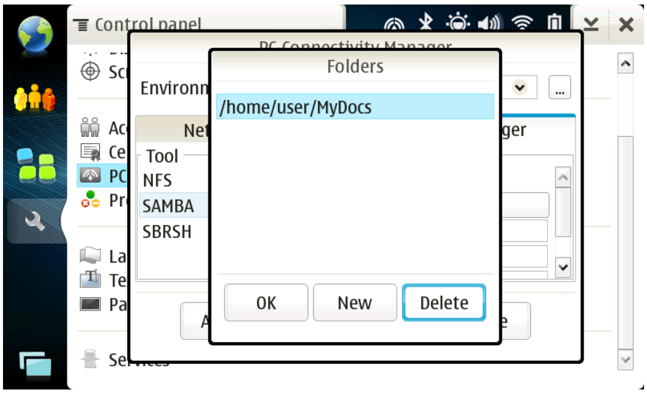
Exported Paths: ...

Workgroup: MSHOME

User: user

Password: user

- Click on "Exported Paths" button. Then, add the folders to be shared



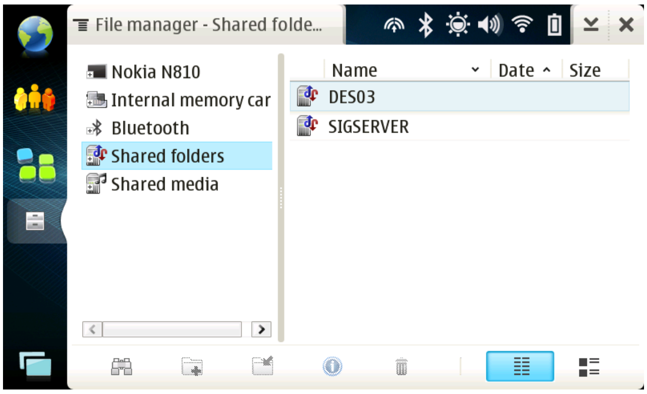
Folders

/home/user/MyDocs

- Click on "Apply" button

Also, you can access your host PC shared folder from maemo device:

- Open "Utilities - File Manager" application
- Click on "Shared folders" option



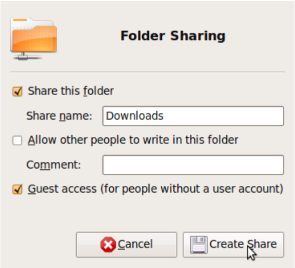
Name	Date	Size
DES03		
SIGSERVER		

- Select the desired shared folder

7.3.2 Linux - Ubuntu

It follows the steps to share a folder of your Linux host PC:

- Open the File Manager ("Nautilus")
- Right click the folder you want to share, and select "Sharing options"
- Type the "Share name" and check "Guest access" option



☑ Share this folder

Share name: Downloads

☐ Allow other people to write in this folder

Comment:

☑ Guest access (for people without a user account)

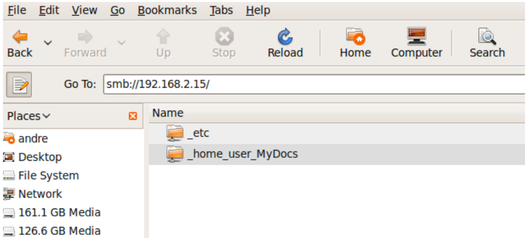
- Click on "Create share" button. If `samba` is not installed, Ubuntu will request the installation at this point. Otherwise, you can install `samba` manually:

```
sudo apt-get install samba
```

To access a folder shared on your maemo device:

- Open the File Manager ("Nautilus") and type:

```
smb://<maemo_device_ip>
```



Go To: smb://192.168.2.15/

_etc
_home_user_MyDocs

- Press "Enter"

7.3.3 Windows

It follows the steps to share a folder of your Windows host PC:

- Open the File Manager ("Windows Explorer")
- Right click the appropriate folder, and then click Sharing
- In the folder's properties, click "Share this folder". Use the default name for the share.
- Click "Permissions" button to change permissions according to your needs

To access a folder shared on your maemo device:

- Click "Start", and then click "Run"
- Type your maemo device address as follows:

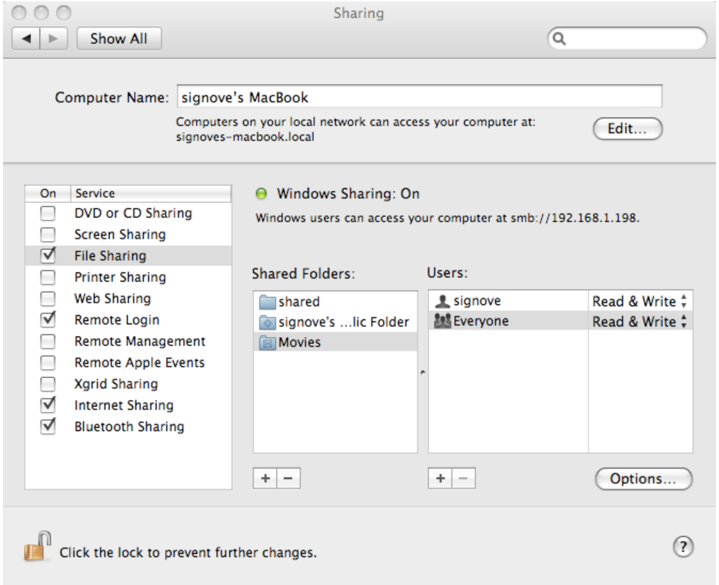
```
\\<maemo_device_ip>
```

- The shared folders of your maemo device will be shown

7.3.4 Mac OS

It follows the steps to share a folder of your Mac OS host PC:

- Go to "System Preferences" and click on "Sharing" icon
- Select "File Sharing" service
- Add a folder you want to share, and then set the permissions to it



Computer Name: signove's MacBook

Computers on your local network can access your computer at:
signoves-macbook.local

On	Service
□	DVD or CD Sharing
□	Screen Sharing
☑	File Sharing
□	Printer Sharing
□	Web Sharing
☑	Remote Login
□	Remote Management
□	Remote Apple Events
□	Xgrid Sharing
☑	Internet Sharing
☑	Bluetooth Sharing

● Windows Sharing: On

Windows users can access your computer at smb://192.168.1.198.

Shared Folders:

- shared
- signove's …lic Folder
- Movies

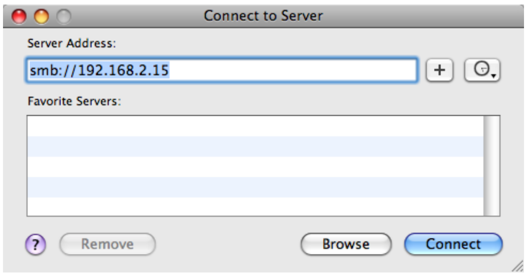
Users:

signove	Read & Write
Everyone	Read & Write

To access a folder shared on your maemo device:

- Go to the File Manager application ("Finder")
- With the "Finder" open, click on "Go" menu and select "Connect to Server" option
- Type your maemo device address as follows:

```
smb://<maemo_device_ip>
```



Server Address: smb://192.168.2.15

- Click on "Connect" button

8 Remote desktop

Maemo PC Connectivity provides tools to access the desktop of a remote machine from a local machine over network. That is, you can get the desktop GUI of your maemo device displayed at your host PC and vice-versa. For that, you need to install `maemo-pc-connectivity` meta package on maemo device and `host-pc-connectivity` package on host PC (Linux, Windows and Mac OS). Bellow, it will be described how to use the remote desktop tools available on Maemo PC Connectivity. To simplify, it is assumed that you already have a Usb network between maemo device and host PC.

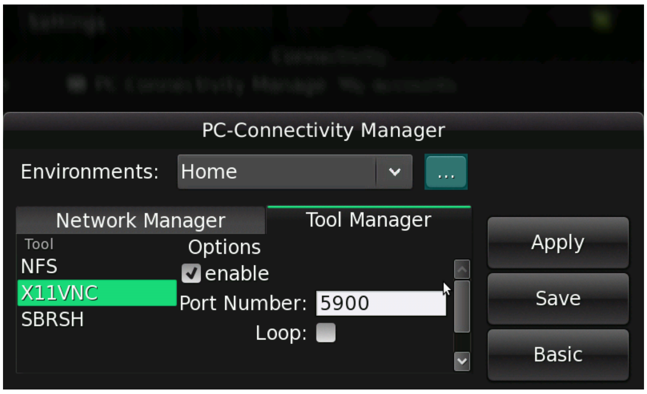
8.1 X11VNC

With `X11VNC` server, it is possible to share the GUI (Graphical User Interface) of your maemo device with your host PC. That is, you can access the desktop of your maemo device remotely (from host PC) as you were physically in front of it. Bellow, it will be described how to configure your maemo device and host PC.

8.1.1 Configuring Maemo

You can configure `X11VNC` server through *PC Connectivity Manager* applet, as described:

- Run *Settings - Control Panel - Connectivity - PC Connectivity Manager*
- Click on "Advanced" button
- Select "Tool Manager" tab
- Now, you can enable/disable `X11VNC` server, change *UDP port* and set the *loop* mode



PC-Connectivity Manager

Environments: Home

Tool: X11VNC

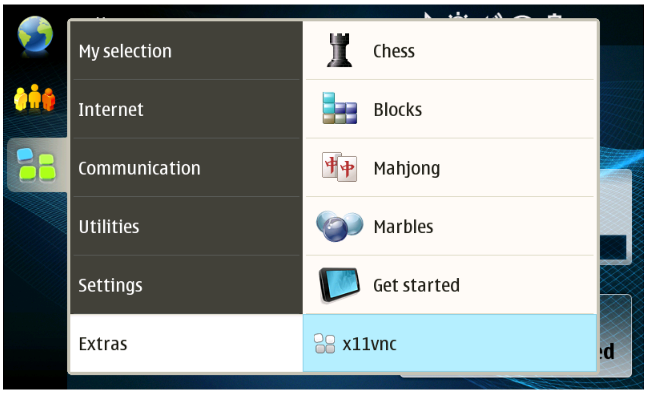
☑ enable

Port Number: 5900

Loop: □

- Click on "Apply" button

Also, you can start `X11VNC` server manually from "Extras" menu.



As X11VNC server is not launched automatically when you turn the maemo device on, you need to start it following the steps above. You can use *PC Connectivity Manager* applet or X11VNC shortcut from "Extras" menu.

8.1.2 Configuring Linux

If you installed `host-pc-connectivity` package, your Linux host PC already has a VNC client.

You can launch your maemo device through `xtightvncviewer` application giving its IP address:

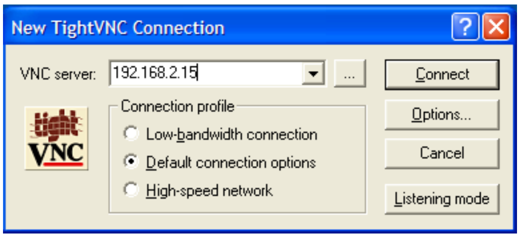
```
$ xtightvncviewer 192.168.2.15
```

8.1.3 Configuring Windows

If you installed `host-pc-connectivity` package, your Windows host PC already has a VNC client.

You can launch your maemo device as described bellow:

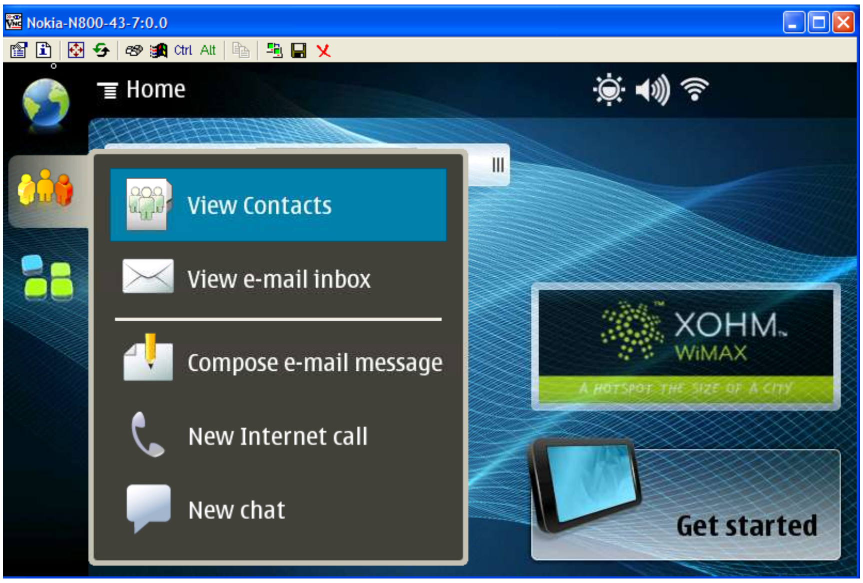
- Run *Start - Programs - TightVNC - TigthtVNC Viewer*



VNC server: 192.168.2.15

Connection profile
○ Low-bandwidth connection
● Default connection options
○ High-speed network

- Type the IP address of your maemo device and press "Connect" button
- Now, you should see the desktop of your maemo device on host PC screen

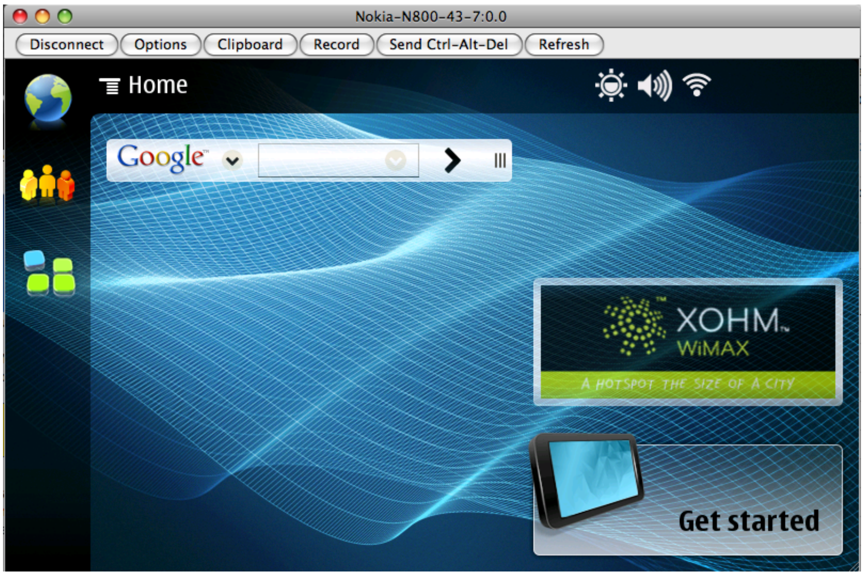


8.1.4 Configuring Mac OS

The `host-pc-connectivity` package already installs a VNC client on your Mac OS host PC. So, your host PC is ready.

You can launch your maemo device through `TightVNC` application giving its IP address and port:

```
$ java VncViewer HOST 192.168.2.15 PORT 5900
```



8.1.5 Troubleshoot

The current X11VNC server (0.9.3-maemo4) available on **Diablo** may crash if a key is pressed on host PC keyboard and there is no mapping for that key on maemo device. A workaround is to add manually missing key mappings as described below:

- You should install `xev` application on host PC to discover the key code which is crashing the maemo device:

  ```
  $ sudo apt-get install x11-utils
  ```

- Execute `xev` application on host PC:

  ```
  $ xev
  ```

- Type the key is crashing the maemo device on host PC. You will get something like this on `xev` output:

  ```
  KeyPress event, serial 31, synthetic NO, window 0x2000001,
  root 0x3f, subw 0x0, time 2488134890, (-257,171), root:(294,445),
  state 0x10, keycode 48 (keysym 0xfe51, dead_acute), same_screen YES,
  XLookupString gives 2 bytes: (c2 b4) ""
  XmbLookupString gives 0 bytes:
  XFilterEvent returns: True
  ```

- Get the key code name. In this example, it is "dead_acute"
- On maemo device, map this key to "None" in "/usr/share/applications/hildon/x11vnc.desktop" file. Add the key map "dead_acute-None" as described bellow:

  ```
  Exec=/usr/bin/x11vnc -display :0 -nowf -noxdamage -noscr -remap
  dead_acute-None,<key_name_1>-None,<key_name_N>-None
  ```

- On maemo device, restart `X11VNC` server and check if the problem is fixed

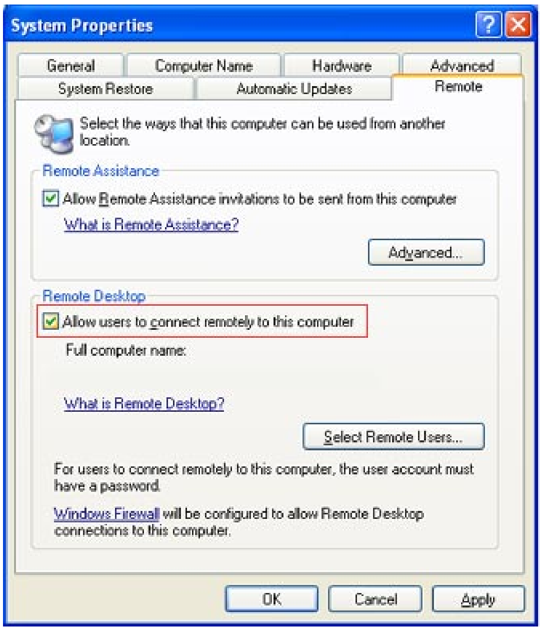
8.2 RDESKTOP

`RDESKTOP` is a client for remotely accessing your Windows host PC from your maemo device. Bellow, it will described how to enable *Remote Desktop* on your Windows host PC and how to use your maemo device to access the desktop of your Windows host PC.

8.2.1 Configuring Windows

You must enable the *Remote Desktop* feature on your Windows host PC so that you can control it remotely from maemo device. For that, you must be logged on as an administrator or a member of the Administrators group to enable *Remote Desktop* on your Windows host PC. To setup your Windows host PC:

- Click “Start”, point to “Settings”, click “Control Panel”, and then double-click the “System” icon
- On the “Remote” tab, select the “Allow users to connect remotely to this computer” check-box, as shown below



Select the ways that this computer can be used from another location.

☑ Allow Remote Assistance invitations to be sent from this computer

☑ Allow users to connect remotely to this computer

Full computer name:

For users to connect remotely to this computer, the user account must have a password.

Windows Firewall will be configured to allow Remote Desktop connections to this computer.

- Ensure that you have the proper permissions to connect to your host PC remotely. For that, click “Select Remote Users...” button to give access to your user account
- Click “OK” button
- Leave your host PC running and connected to the network with Internet access

Note: if you are running Windows XP Service Pack 2 (SP2) and you enable *Remote Desktop*, Windows Firewall will be automatically configured to allow *Remote Desktop* connections to your host PC. However, *Remote Desktop* will not work if you have Windows Firewall configured to allow no exceptions. To allow exceptions in Windows Firewall, in the control panel open the “Security Center”, click “Windows Firewall” and clear the check-box next to “Don’t allow exceptions”.

8.2.2 Configuring Maemo

Once you installed `maemo-pc-connectivity` meta package, the maemo device is ready to access your Windows host PC through `RDESKTOP` application:

- Open *Utilities - X Terminal*
- Execute `RDESKTOP` application:

  ```
  $ rdesktop-cli -u <windows_user> -p <windows_password> <windows_ip_address>
  ```

  You should pass the *user name* and *password* to access the given Windows host PC
- Now, you will see the desktop of your Windows host PC on the screen of your maemo device

8.3 X Tunneling

With `X Tunneling`, it is possible to execute an application on your maemo device and display its GUI on your host PC over `SSH` and vice-versa. Next, it will be described how to forward X11 GUI in both ways:

- You should follow the next steps to display the GUI of your maemo device on your host PC. It works with Linux and Mac OS

  On host PC:

  ```
  $ Xephyr :3 -ac -dpi 96 -screen 800x480x16  -host-cursor &
  $ ssh -l <maemo_device_user> -R 6002:<host_pc_ip>:6003  <maemo_device_ip>
  $ export DISPLAY=:2
  $ /usr/lib/sapwood/sapwood-server &
  $ <run_application>
  ```

- You should follow the next steps to display the GUI of your host PC on your maemo device. It works only with Linux

  On maemo device:

  ```
  $ ssh -l <host_pc_user> -R 6000:<maemo_device_ip>:6000 -X <host_pc_ip>
  $ <run_application>
  ```

9 File transfer

You have several ways to transfer files between maemo device and host PC through Maemo PC Connectivity. First, you have to install *maemo-pc-connectivity* meta package on maemo device and *host-pc-connectivity* package on host PC (Linux, Windows and Mac OS). Bellow, it will be described how to use the file transfer tools available on Maemo PC Connectivity. To simplify, it is assumed that you already have a Usb network between maemo device and host PC.

Note: on host PC, you should type the commands bellow at terminal on Linux and Mac OS and at Cygwin shell on Windows.

9.1 SCP

With `SCP` (Secure Copy), you can securely transfer files between a local and a remote host or between two remote hosts, using the SSH protocol. Next, it will described how to transfer files between maemo device and host PC through `SCP`:

- You should follow the next `SCP` command format to transfer a file from a local to a remote host:

  ```
  scp <source_file> <user>@<host_name>:<path>/<target_file>
  ```

  For example, if you want to transfer a file from host PC to maemo device:

  ```
  scp file.txt root@192.168.2.15:/etc/file.txt
  ```

- You should follow the next `SCP` command format to transfer a file from a remote to a local host:

  ```
  scp <user>@<host_name>:<path>/<source_file> <target_file>
  ```

  For example, if you want to transfer a file from maemo device to host PC:

  ```
  scp root@192.168.2.15:/etc/file.txt file.txt
  ```

You can use `ssh-key-exchange` as described in section 6.1 to avoid `SSH` requiring password every time.

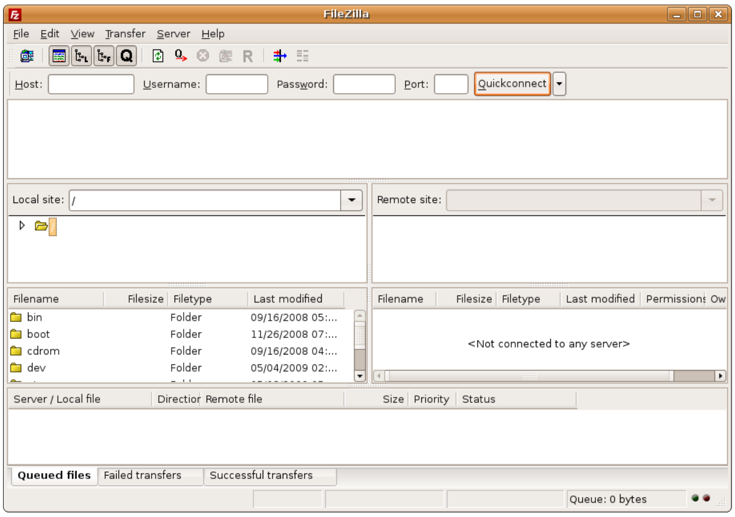
9.2 SFTP

Once you installed `maemo-pc-connectivity` meta package, your maemo device folders can be accessed by your host PC through a `SFTP` client. If you also installed `host-pc-connectivity` package, your host PC already has a `SFTP` client, FileZilla. So, you are ready to access your maemo device folders from host PC through `SFTP`. Just follow the next steps:

- Run FileZilla

- Linux - Ubuntu: *Applications - Internet - FileZilla FTP Client*
- Windows: *Start - Programs - FileZilla FTP Client - FileZilla*
- Mac OS: */Applications/FileZilla*

- Type the IP address of your maemo device on “Host” field


FileZilla
File Edit View Transfer Server Help
Host: Username: Password: Port: Quickconnect
Local site: /
Remote site:
Server / Local file Direction Remote file Size Priority Status
Queued files Failed transfers Successful transfers
Queue: 0 bytes

Filename	Filesize	Filetype	Last modified
bin		Folder	09/16/2008 05:...
boot		Folder	11/26/2008 07:...
cdrom		Folder	09/16/2008 04:...
dev		Folder	05/04/2009 02:...

Filename	Filesize	Filetype	Last modified	Permissions	Ow

<Not connected to any server>

- Type the “Username” and “Password” to connect via SSH to your maemo device

- Type 22 (SSH) on “Port” field

- Click on “Quickconnect” button. Your maemo device folders will appear on “Remote Site” area

9.3 RSYNC

As `maemo-pc-connectivity` meta package installs `RSYNC`, you can incrementally transfer files and directories between maemo device and host PC. That is, you can send/receive only the bytes inside files that changed since the last replication, and remove files on the destination host if those files were deleted on the source host to keep both hosts in sync. You can find examples and documentation at Rsync Web Page.

10 Service announcement

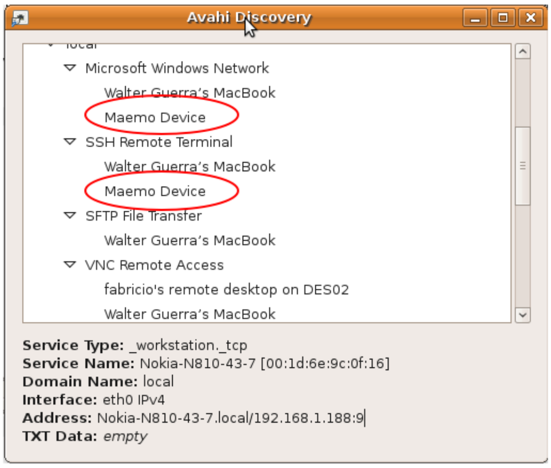
Maemo PC Connectivity automatically announces *Samba* shares, *NFS* shares, *SSH*, *X11VNC* and *SBRSH* through Avahi. Thus, host PCs can easily find the services available on maemo device. Avahi is an open-source implementation of the Bonjour protocol. It is used to facilitate the discovery of services on a local network.

10.1 Linux

First, you should install *avahi-discover* by executing the following command:

```
sudo apt-get install avahi-discover
```

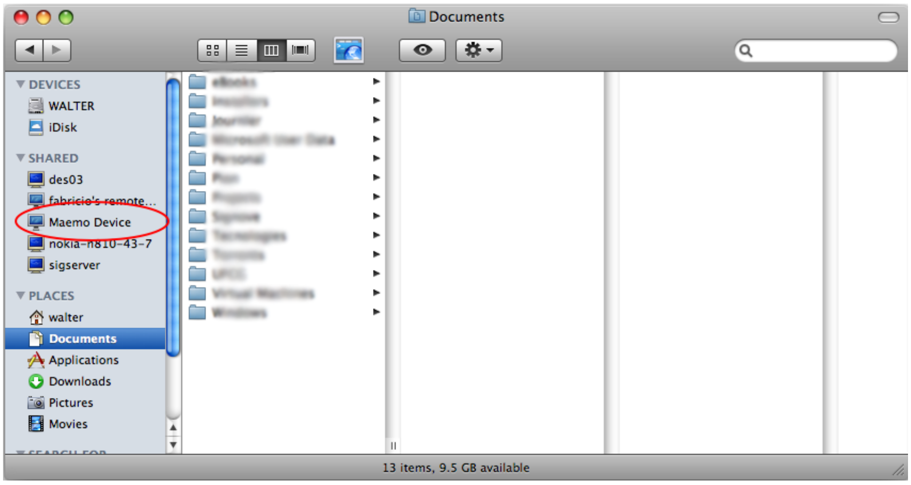
Next, you can use the *avahi-discover* utility to see all services announced by maemo device:



Service Type: _workstation._tcp
Service Name: Nokia-N810-43-7 [00:1d:6e:9c:0f:16]
Domain Name: local
Interface: eth0 IPv4
Address: Nokia-N810-43-7.local/192.168.1.188:9
TXT Data: *empty*

10.2 Mac OS

Samba and NFS shares are automatically shown on “SHARED” section of the “Finder” application:


Documents
DEVICES
WALTER
iDisk
SHARED
des03
fabricio's remote...
Maemo Device
nokia-n810-43-7
sigserver
PLACES
walter
Documents
Applications
Downloads
Pictures
Movies
13 items, 9.5 GB available

11 Backing up configuration

You can use the *maemo backup* tool to backup the Maemo PC Connectivity configuration on your maemo device, that is, the environments and the configuration of connections and tools. Following the steps bellow, you can upgrade the OS of your maemo device and keep all Maemo PC Connectivity configuration:

- Open the *backup tool* at *Settings - Backup/Restore* menu options
- Create a backup configuration selecting at least the "Settings" option. If, besides the configuration, you want the software list to be in the backup, you can also select the "Applications" option.

Your backup is now created. This backup can updated anytime you want. When you upgrade the OS of your maemo device or reflash it, you should simply go to the *backup tool* again, then *Settings - Backup/Restore* menu option and restore the backup previously created.

This may reboot your maemo device. After that, all your Maemo PC Connectivity configuration should be restored.