Terratec Noxon Platform independent HOWTO

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January 3, 2005

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1.1 Summary

This howto adresses the issue of operating the Terratec Noxon Audio Player with the alternative Musicserver provided by Twonkyvision. A troubleshooting guide for all platforms is also provided.

1.2 Copyright and Licensing

1.3 Disclaimer

1.4 Feedback

Feedback is most certainly welcome for this document. Send your additions, comments and criticisms to the following email address : manfred-d (at) terratec (dot) de .

1.5 Version History

Version 1.1e — Edited Version , translated
Version 1.1 — Edited Version

- Troubleshooting hinzugefügt

- kleinere Änderungen

Version 1.0 — Release Version

- Release Version

1.6 ToDo's

- Provide Firewall-Rules (IPTABLES)

- Startupscripts for Linux

- Screenshots

Layout : LaTeX / TeTeX , Mac OS X

2 Installation

2.1 Required Software

We picked the Twonkyvision Musicserver as platform for this project because of it's stability, availability for multiple platforms and not at least for its little memory consumption. The Musicserver is obtainable free of charge at http://www.twonkyvision.com. After downloading you will find a gzip-File on your computer which contains the pre-compiled binaries for Linux (x86), Mac OS X and even Windows.

```
starxed-pbook:\$ ls -alsh
total 24
 0 drwxr-xr-x  10   340B 10 Nov 17:35 .
 0 drwxr-xr-x  5    170B 10 Nov 17:35 ..
 0 drwxr-xr-x  4    136B 10 Nov 17:35 apple
 0 drwxr-xr-x  6    204B 10 Nov 17:35 linux
24 -rwxr-xr-x  1     11K  3 Nov 10:51 readme.txt
 0 drwxr-xr-x  3    102B 10 Nov 17:35 sample.m3u
 0 drwxr-xr-x  3    102B 10 Nov 17:35 sample.radio
 0 drwxr-xr-x  6    204B 10 Nov 17:35 tools
 0 drwxr-xr-x  3    102B 10 Nov 17:35 winamp
 0 drwxr-xr-x  4    136B 10 Nov 17:35 windows
```

The musicserver can be started by simply moving it into the root of your mp3 collection and executing the binary, providing configuration by command-line parameters or meeting the recommendation by creating a configuration file.

2.2 Installation under Mac OS X

2.2.1 Here and now

A computer can be temptating, especially when it's a Powerbook G4 with Airport Card and all you'r Audio CD's on the hard drive. In our scenario the files are managed by iTunes, so they are properly sorted and organized into folders.. The only thing left to do is building a configuration file for the Musicserver and enjoy the sound.

2.2.2 Terratec Configuration Wizard

A configuration utility is available at http://www.terratec.net. When you have entered the path to your Twonkyvision folder, aswell to your iTunes Folder, you can create a StartUpItem or use the Start-Button to launch the Musicserver.
Please keep in mind that the dropdown box that selects your networking interface holds the device names eth0 for Ethernet and eth1 for the Airport Card, which is a usual configuration for many Apple Computers. If this does not apply on your system and the device name of the according network interface of the computer is not eth0 or eth1,please change the device name manually as described in the description below.

2.2.3 Manual Configuration

To install the musicserver, just copy the contents of the **apple** directory to the desired path, i.e. **"/Applications/musicserver"**.

The configuration can be written with TextEdit or, as we prefer, the Terminal. You can find it under "Applications/Utilties/Terminal" If you enter the commands below as written (just change the values printed in italics to your individual values), you will be able to start the server within 2 minutes.

```
cd /Applications/musicserver
cat > twonkyvision-mediaserver.ini
usecwd=0
contentdir=/Users/starxed/Music/iTunes/
radio=1
ignoredir=AppleDouble
nicrestart=1
ip=
dev=eth1
scantime=15
dc:title,dc:creator,upnp:artist,upnp:genre,upnp:album,dc:date,upnp:
originalTrackNumber
descriptions=0
```

Remarks : You must not copy the bracket (...), it just means that there is no line-break.
Remember that you have to point to you'r own audio folder in the **contentdir=** statement. The **ip=** statement can be left blank, if you use a network without DHCP Server you should enter your current IP here. If you don't know you'r IP, you can find it under "Networking" in your control panel or by simply entering **ifconfig -a** in the terminal.
The **dev=** statement usually is eth0 for the wired ethernet and eth1 for wireless lan. If you are not sure if this also applies on your Mac, **ifconfig -a** will tell you everything you need to know here.
After pressing CTRL-D the file will be saved, you are finished!
If you don't want to type down the configuration file, you can start the musicserver without parameters, after terminating with CTRL-C it will leave a default configuration file that can be customized afterwards.

```
cd /Applications/musicserver
./musicserver
(CTRL-C)
pico twonkyvision-mediaserver.ini
```

You can start your musicserver now by typing **./musicserver** (ENTER) at the console.

```
Starxed-pbook:~/Applications/musicserver/ starxed\$ ./musicserver
TwonkyVision Music Server Version 2.4
```

When everything went ok, your mac will appear in the server list of the noxon player within up to 15 secounds. If this does not occour, please proceed to the troubleshooting guide.

2.2.4 Local "Firewall"

To avoid problems with uPNP Audio Streaming technology, you have to shut down the local firewall or provide exception rules (aka. Trusted Hosts) for the Noxon.

2.3 Installation under Linux

2.3.1 Here and now

As Twonkyvision is obtailable only as a pre-compiled binary, the Linux version is limited to x86-based platforms, like the Intel Pentium, AMD K, AMD Athlon, Via C3, various cyrix CPU's or XBox consoles which are running Linux.
The Server has been tested with Kernel 2.4.26 on Debian/Xebian and various other distributions.

2.3.2 Installation

The installation is almost equal to the Mac OS X Installation, which is basically a BSD/NextStep Unix with some Mac-Beauty on the top. In this example we copied the linux folder of the gzip into /var/musicserver and configured it as written below :

```
cd  /var/musicserver
cat > twonkyvision-mediaserver.ini
usecwd=0
contentdir=/home/starxed/iTunes
nicrestart=1
ip=
dev=eth0
scantime=15
dc:title,dc:creator,upnp:artist,upnp:genre,upnp:album,dc:date,upnp
kein Umbruch>>originalTrackNumber
descriptions=0
```

Please keep in mind that you have to change the values printed in italics to the values that apply on your system. If you need information about you'r network connectivity, enter **ifconfig -a** at the console.

After saving the file with CTRL-D you can launch the Musicserver with **./musicserver**, the startup can also be included into a init.d shellscript.

2.3.3 Firewall Configuration

uPNP does not play well with Firewall enviroments, so we can only recommend to disable local packet filtering for the source-ip of the noxon client.

2.4 Installation under Windows :-)

The Server can also be run under Windows. The configuration is equal to the Linux version.

3 Reference

3.1 The Noxon musicserver Menu

Shortly after the connection between Server and Noxon has been established, you will see the following menu:

Albums	Shows all Albums
All Tracks	Show just all tracks (large!)
Artists	Show all Titles of one specific Artists
Folders	Browse through you'r own folder Structure
Genres	Filters by Genres

3.2 Links

The following links might be of particular interest for Noxon users :
Terratec Electronic GmbH
http://www.terratec.de
Manufacturer of the Musicserver

Twonkyvision Musicserver
http://www.twonkyvision.com
free Musicserver für Linux, for Mac OS and Windows

XBox-Linux
http://www.xbox-linux.org
How to install Linux on your XBox

4 Troubleshooting

4.1 Notice about the Troubleshooting section

The following hints apply on Linux, Mac OS X and even Windows.

4.2 Networking in Brief

Problems during the connection between Server and noxon are reported to us frequently. Often they are easy to find, but to understand the process of bug-hunting in a local area network some basic networking skills are required.
Wir unterscheiden im momentan aktuellen IPv4-Networking zwischen A,B,C, und BC-Netzwerken. Diese sind, mit Ausnahme des BC-Netzes technisch hochverwandt und stellen einfach die Ausmaße eines Netzes im Verhältnis von Servern und Clients dar. Zum Beispiel liegt auf der Hand, daß ein Heimnetz aus sehr wenigen Rechnern besteht, 254 Rechner werden selbst mit dem größten Hobbykeller wohl nie erreicht, dagegen besteht bei Firmen wie z.B. Sun sicherlich Bedarf nach mehr Clients.
The IPv4 Standard basically defines four network types, the A,B,C and MC types. The only differnce between A,B, and C is the theoretical maximum size of the network when the standard-mask comes into place (which actually does

apple on every home network). Home Networks usually operate within the C-Area, 192.168.xxx.xxx is a common range. When you have a home network with the network adress 192.168.0.0, you will also receive a standard broadcasting adress 192.168.0.255. All communication within that network should be possible without problems when no special filters are installed.
Communication and routing to other networks are up to routers and firewalls.

4.3 How a connection is established

When you start you'r musicserver, the following steps happen before the music plays :

1. Der **Musicserver** startet und sendet einen **Broadcast** (After startup the musicserver sends a **Broadcast** (Hello, here I am and that's my name!) to the BC-Class Broadcasting Adress **239.255.255.250**, Destination Port **1900** (Streaming Server Discovery Protocol) . This adress resides outside your network, so your router or networking driver in cases of Ad-Hoc connections could reject the communication.

2. Noxon replies to port **8080** (HTTP) of the Server, a **clientdescription** which describes the capabilities of the Noxon is also submitted.

3. The **Server** does the same, he actually informs the noxon about the services and filter rules he provides.

4. The Noxon sends a **DirectoryRequest** to the server. For example, it could be "Send me a list of all songs made by the Artist "Halou".

5. The Server sends the **Directory Content** to the Noxon

6. After selecting a music file, the server starts to stream. The streaming begins at a client port which is subject to change frequently during playback.

4.4 Known Problems

4.4.1 Server is not found by Noxon at all

Before we begin to search for an error in the system, it is advisable to check if basic communication, for example over ICMP, is possible. This is done by executing a PING on the Noxon's IP Address. If you dont know which IP has been assigned to the Noxon, open the configuration menu, check Status and browse through the menu till you found the "IP" Page. If you read "configuring", something went wrong. If a ping to this address also didnt succeed, there is a networking problem. In this case you have to check the basic connection, i.e. a WEP-Key was mistyped, the MAC of the Noxon is not included in your trusted interfaces or something else caused the problem. You dont have to read on before ICMP communication works properly.

The most vulnerable step during the connection process is the first broadcast of the mediaserver, telling all clients that it is up and ready for operation. According to uPNP Standards, a MC-Class Broadcast Address is used instead of the normal Broadcast address of your network. This especially is a problem

when dealing with Ad-Hoc connections, as BC Range does not make sense in that scenario. Many networking drivers and also the implementation of the operating systems consider that communication as evil and tend to drop it. In this case the Noxon will never know that a Musicserver is up and no connection will be established.

Normally, this should not happen within an infrastructure network with disabled packet filtering (aka "local firewall") for the IP Address of the Noxon. In this case it is recommended not to use DHCP for the server and the Noxon (so the IP Address remains static) to make the firewall configuration a bit easier. For sure this leaves a number of security issues open, but we wont discuss that matter in this place.

So this summarizes in the following checklist :

- **Does the Noxon respont to PINGs ?**

- **Is the musicserver up and running ?**

- **Is there a conflict with firewall rules ?**

- **Does your network adapter and operating system support MC-Class Broadcasts ?**

4.4.2 Everything works, but playback stops after some secounds

This is a weakness of uPNP, too. The streaming source ports change frequently, if any local firewall is up, the traffic may be intercepted or rejected. Disabling the local firewall for the Noxon will solve the issue.