TB228 (Rev2) - Networking an MPU11 System for File Transfer

Introduction

This document will instruct you how to setup an MPU11 control and remote PC on a network for remote file transfer. Both DHCP and Static IP network types will be covered.

Material List

DHCP setup:

Cat 5 straight through cables and a Cable/DSL router.

Static IP setup:

Cat 5 straight through cables and a switch or hub.
Cat 5 crossover cable (straight PC to PC connection, no router)

Ethernet Configuration (Static IP vs DHCP)

Windows PC Setup Setting up a Static IP Address Network

1. Click on Start menu, Control Panel, then Network Connections. Right click on Local Area Connection, select properties, click on Internet Protocol , and click on the properties button.
2. Check the box for ?Use the following IP Address and enter the following IP Address, Subnet Mask, and Default gateway.
   IP Address : 192.168.0.2
   Subnet mask : 255.255.255.0
   Default gateway: 192.168.0.1

Note: 192.168.0.2 is an example, if it's already being used you can use any address from 192.168.0.2 to 192.168.0.254.

3. Click Ok to close TCP/IP properties window, you have the NIC configured.

CNC Linux Setup (Manual Setup)

Linux: Setting up a Static IP Address

Note: It is reccommended that you setup the control to connect to the MPU11, before configuring your second ethernet adapter for a static IP or DHCP.

1. Press**Alt+F6** to bring up a Linux prompt. There will be an ifcfg-ethx that should be setup to communicate with the MPU11 and an ifcfg-ethy that is used for networking the control, where x and y can be ifcfg-eth0, ifcfg-eth1, ifcfg-eth2, ifcfg-eth3,ifcfg-eth4,ifcfg-eth5, etc. Confirm which adapters are configured by typing "if-config" on the linux prompt.
2. Type:**edit /etc/sysconfig/network/ifcfg-ethy** (press enter). If it is already configured for static IP and the IP address is set to 10.168.41.1, you will want to change to the ifcfg-ethx file.
3. Edit your ifcfg-eth1 file to look like the example below. To do this type:**edit ifcfg-ethy** (press enter)

```
BOOTPROTO='static'
BROADCAST='192.168.0.255'
ETHTOOL_OPTIONS=''IPADDR='192.168.0.3'  ? note:
 this IP address must be different than the remote PC's IP Add.
MTU=''
NAME='Ethernet Adapter'
NETMASK='255.255.255.0'
NETWORK='192.168.0.0'
REMOTE_IPADDR=''
```

```
STARTMODE='auto'
USERCONTROL='no'
```

4. Now we need to edit the ifroute-ethy file, to do this type:**edit ifroute-ethy** (press enter).

Note: The ifroute-ethy file is located in /etc/sysconfig/network directory.

The default ifroute-eth is setup for DHCP use and looks like this:

```
# route gateway remote_network device
# = = = = = = = = = = = = = = = = = = = = = = =# default 192.168.0.1 - -
```

If the control is using static IP address 192.168.0.3 on the network 192.168.0.0 all you need to do is delete the '#' and the 'space' in front of default 192.168.0.1 - -.

5. Save and exit from the ifroute-ethy file.

6. Reboot the control.

Linux: Setting up DHCP

1. Follow the instructions for static ip address except use the following lines in ifcfg-ethy:

```
BOOTPROTO='dhcp'
BROADCAST=''
ETHTOOL_OPTIONS=''
IPADDR=''
MTU=''
NAME='MCP61 Ethernet'
NETMASK=''
NETWORK=''
REMOTE_IPADDR=''
STARTMODE='auto'
USERCONTROL='no'
PREFIXLEN='24'
```

2. Comment out the line in ifroute-ethy so that it looks like this:

```
# route gateway remote_network device
# = = = = = = = = = = = = = = = = = = = = = = =
# default 192.168.0.1 - -
3. Reboot the control
```

CNC Linux Setup (GUI setup using Yast2)

Note: It is reccommended that you setup the control to connect to the MPU11, before configuring your second ethernet adapter for static IP or DHCP.

1. Get a USB mouse and plug it into the control.

2. Click on "Programs and Settings" menu from the desktop which is located on the bottom of the screen whenever the Linux prompt is opened. If you cannot see the menu because CNC11 software or the CNC11 Start Menu is running, press Alt-F6 to bring up a command prompt. Alternatively, you can exit the CNC11 software or the CNC11 Start Menu by pressing F10(Shut Down) and F9(Exit CNC11).

3. Go to "Settings" and then "Yast".

4. Choose "Network Devices" from the left side of the menu.

5. Then choose "Network Settings" from the right side of the menu.
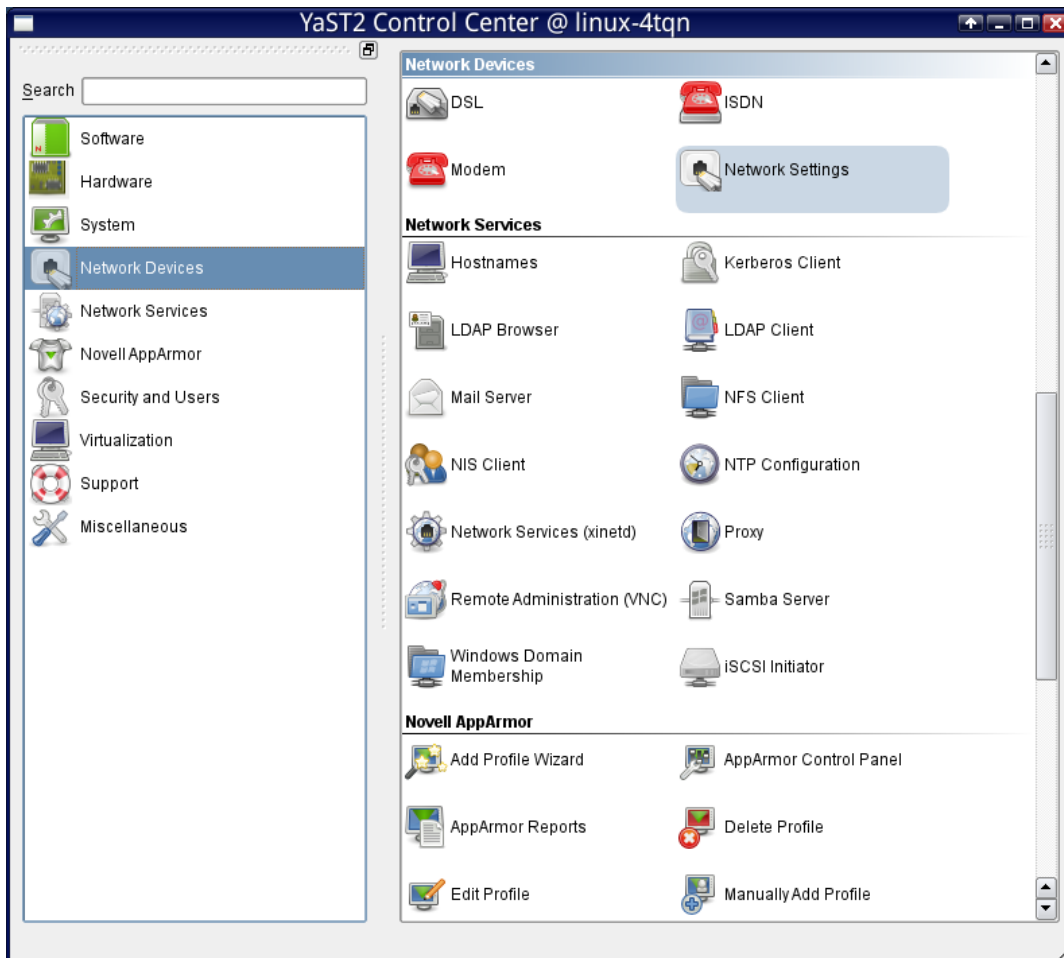
6, The Network Settings menu should open.   One of your ethernet adapters should be configured to connect to the MPU11. It will have a static IP address of 10.168.41.1 Do not change this one. Highlight the other ethernet adapter by clicking on it. Then click on the "Edit" button towards the bottom of the menu.
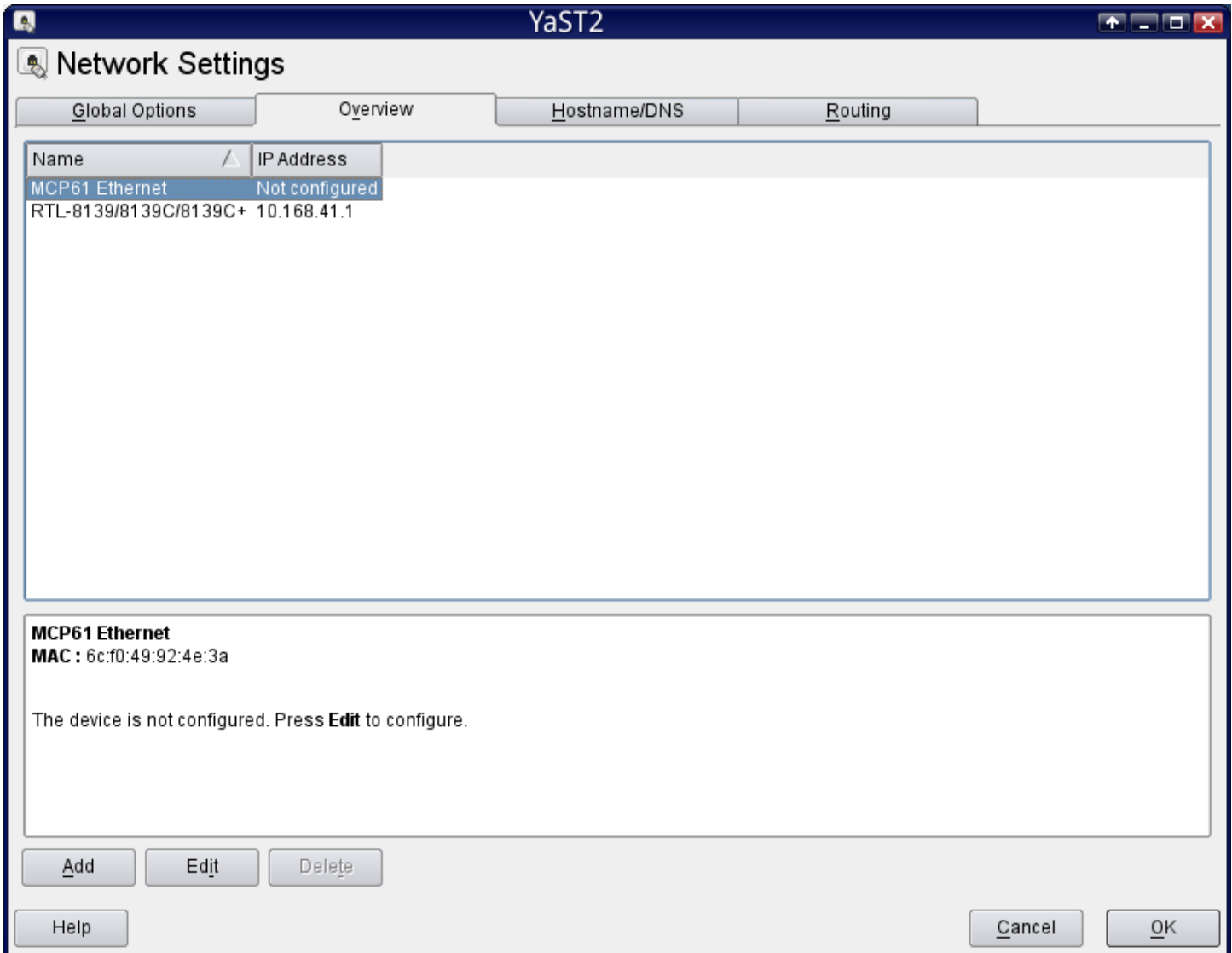

7. The Network Card Setup menu should open.

DHCP Setup

For DHCP

- Choose Dynamic Address
- DHCP both version 4 and 6.
- Then click on "Next" at the bottom right corner of the menu. The Network Card menu will close and you will return to the Network Settings Menu.
- Choose "Ok" from the bottom right of the Network Settings Menu. After it shuts down, your network card should be configured. If your network is connected to the internet you should be able to access it with Mozilla Firefox.

Note: The window will probably open with these setttings already chosen if you have never configured this card before.
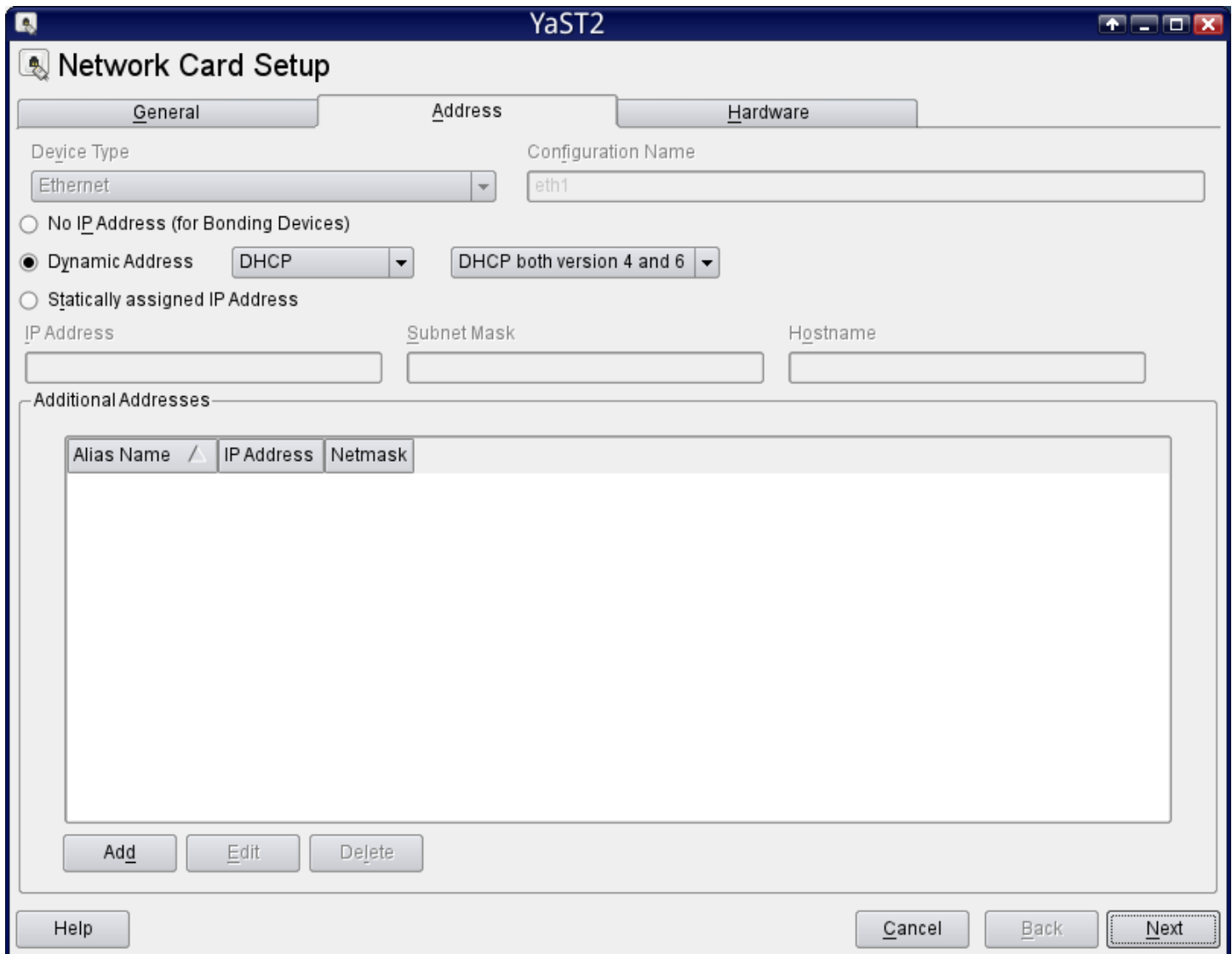
Static IP address setup

For a static IP address:

- Choose Statically assigned IP Address.
- Enter the ip address you want assigned to the cnc control. Example : 192.168.0.3 Note: It must be different from the IP address that you used for the Windows PC setup. (It must be a unique ip address for your network)
- Enter the Subnet Mask 255.255.255.0
- Click on "Next" at the bottom right of the menu. The Network Card menu will close and you will return to the Network Settings Menu.
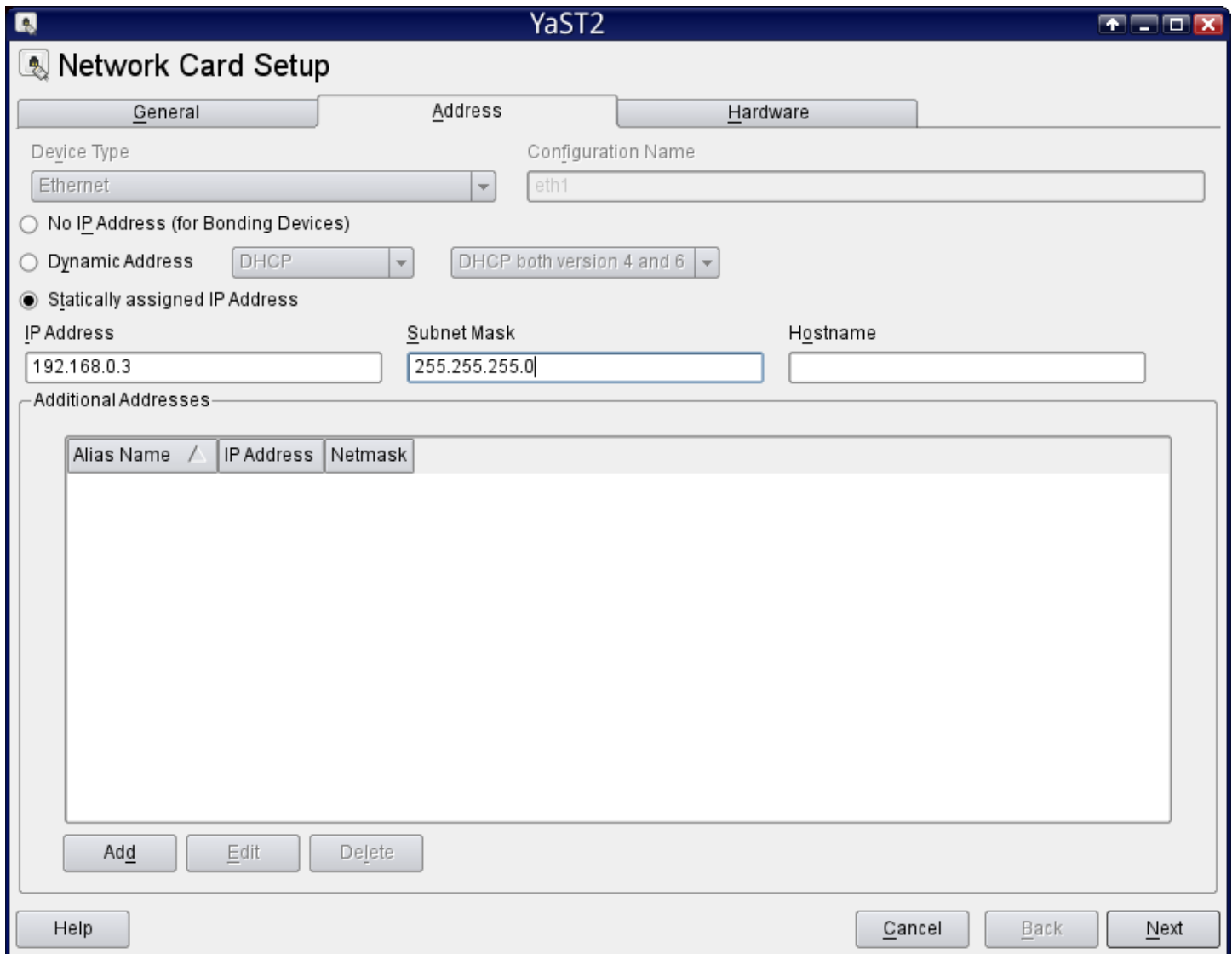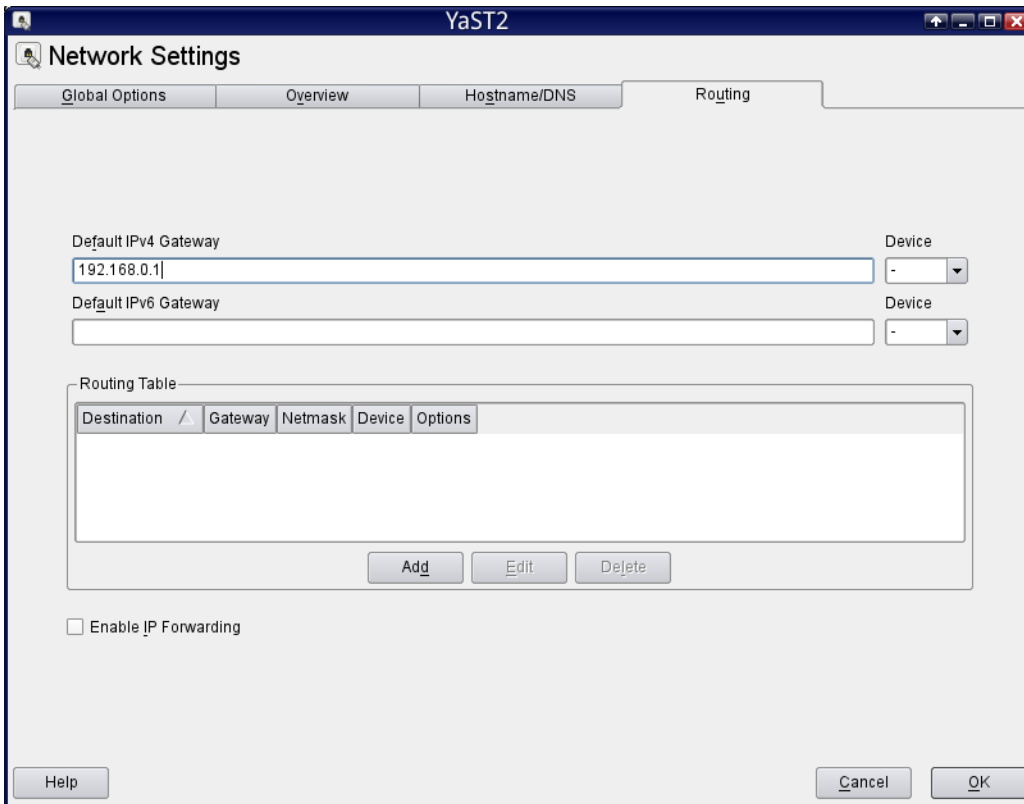
Static IP configuration Default Gateway:

In order to access the Internet with a static IP configuration you will have to setup the Default Gateway
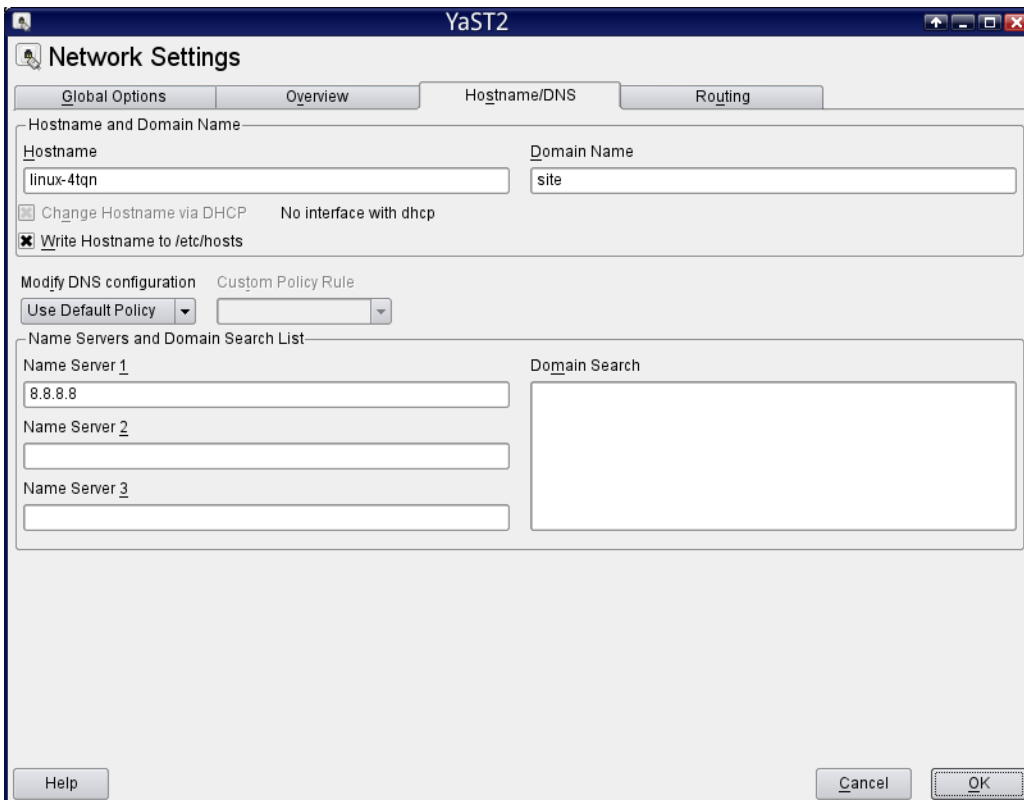
- In the Network Settings menu choose the Routing tab
- Enter the default gateway in Default IPv4 Gateway (your default gateway should probably be the ip address of your router on your local area network, eg 192.168.0.1)

Static IP configuration DNS:

In order for web browsers to resolve internet host names into ip addresses you will have to setup your DNS servers.

- If you don't have a name server try using 8.8.8.8

After you are done configuring your ethernet device, choose "Ok" from the bottom right of the Network Settings Menu. After it shuts down, your network card should be configured. If your network is connected to the internet you should be able to access it with Mozilla

Firefox.

Networking Instructions (Sharing folders from your Windows PC to your CNC control)

Windows PC Setup

1. To get started click on the Start Menu then Control Panel. If your in category view click on ?Network and Internet Connections? and then on ? Setup or change your home or small office network?. If your in Classic view click on ?Network Connections? and then on ?Set up a home or small office network? on the left side of the window.
2. Click ?Next? and answer the questions about your network. All scenarios listed in the Network Setup Wizard are compatible with the Centroid control. If you do not have a internet connection through your PC or another PC on your network or you are connecting directly to a laptop select ?Other? when asked to describe your network.
3. When the screen appears that asked for the computer description and name, you can put whatever you want for the description. However the computer name is important, stay away for non-alpha numeric characters and take note to upper and lower case use as Linux is case sensitive.
4. Work group name is not important so you can leave it at it's default setting.
5. When the ?File and printer Sharing? screen comes up be sure you check on the box to turn it on.
6. Skip the ?Network setup disk? as you typically won't have multiple remote PC's on your network. You will be required to restart your computer after the Network Setup Wizard has finished.
7. Once the computer has booted back up into Windows click on the Start menu, then My Computer. Right click on ?Shared Documents? folder and select ? Sharing and Security?, now check the box ? Share this folder on the network?. You will also want to check ?Allow network users to change my files? if you want the control to be able to save files to this folder.
8. Write down the share name (i.e. SharedDocs) because you will need it when it comes time to setup the control. If you want to change it go ahead but remember to write it down.

Linux Setup

1. Press**Alt+F6** from the main screen of the CNC11 software to bring up a Linux prompt.
2. From the CNCM directory type:**edit cnc.net** (press enter)
(Absolute path is ?/cncroot/c/cncm/cnc.net?)
Note: If a message appears that the file does not exist, just select ?New File?.

3. This is where you will need the computer name and the shared documents folder name. Add lines for each share, each line must contain:

```
//computer-name/share-name drive letter ?options?
```

computer-name = the computer name specified in the windows network setup wizard. (i.e. winxp1)
share-name = the shared documents folder name, typically ?SharedDocs?.
drive letter = assign a drive letter to the remote PC that is not being used by the Centroid control. (i.e. default is ?G?)
?options? = windows login username and password. Easiest thing to do is enable the guest account in Windows, then set your options like this: ?username=guest? (no password)

example:

```
//winxp1/SharedDocs g "username=guest?
```

or

```
//winserver/cnc g ?username=joe,password=?
```

Note: you can add more shares by following the same pattern on the next line

example:

```
//winxp1
```

```
/SharedDocs g "username=guest,password="//winxp2
/SharedDocs h "username=guest,password="
```

4. Save the cnc.net file and close the edit window. Now type:

exit

(press enter) to close the Linux prompt.5. Reboot the control and the shares will be available at power up. Once machine is powered up and homed you should now be able to access the files in the shared folder of your remote PC.

Trouble Shooting Guide

- Make sure you are using the right type of cabling and equipment for the type of network you are trying to setup.
- Verify all cables are connected and green LED above connector on NIC is flashing.
- Check for case sensitivity on computer name and shared documents folder as Linux is very case sensitive.
- Use **ipconfig** command from command prompt on Windows PC to find IP address and then try to ping that address from a Linux prompt on the control (i.e. /cncroot/c/cncm/ping 192.168.0.2). Use **Ctrl+C** to stop ping command.
- Check firewall settings. (linux and windows)

CNC11 Settings

F4 From Lan: How to setup the remote drive and directory in CNC11

For samba network shares, the remote drive and directory is used by CNC11's simplified file load menu. It is used whenever the user navigates to F2 Floppy/USB/Lan -> F4 From Lan. Note that only one remote directory can be specified. The advanced menu will show all available shares and does not use the remote drive and directory setting. The simplified load menu is enabled by default. To enable the advanced menu by default add 4 to parameter 4.

From the main menu goto F1 Setup -> F3 Config -> F1 Contrl

>   If you are prompted for a password when entering the Config menu the default is 137.

- For "Remote Drive & Directory", Enter the remote drive letter followed by a colon (g:), or a drive letter, colon, backslash, and a subdirectory (g:\sub_folder).
- Press F10 "Save", That's it. If the shared folder is available it will shown when the user presses "From Lan" in the simplified load menu.
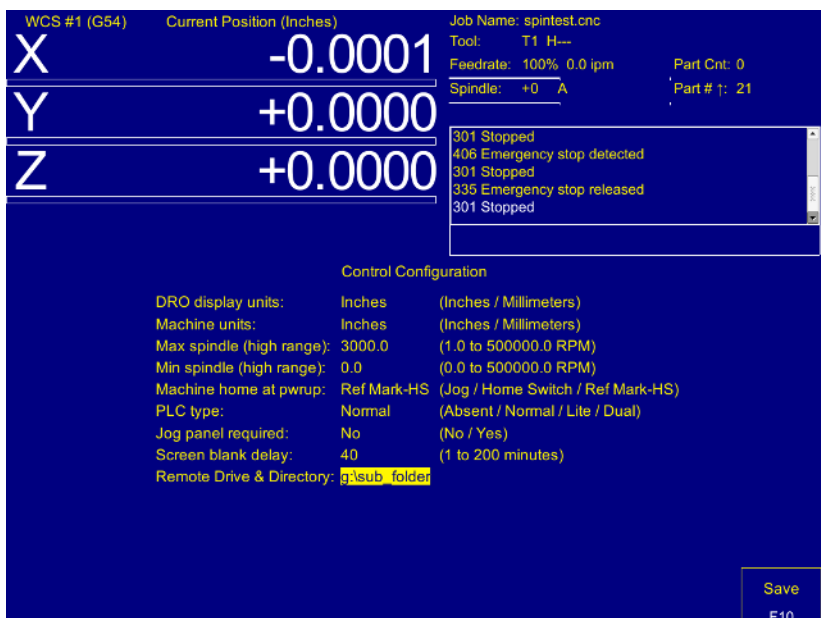
# Networking Instructions (Sharing folders from your CNC control to your Windows PC)

Linux Setup the Samba server

The samba server will allow you to share files on your control with a windows network. The following is a guide on how to configure the samba server on your cnc control. It is meant to work for typical networks, however depending on your network environment you may need different settings.

Note: The latest CNC11 update should come with most of these settings already. You should only have to set startup at boot and set the password. You may want to customize workgroup, shares, and netbios name. However, it is a good idea to verify the settings. All tabs for the samba configuration menu are shown for completeness and trouble shooting.

1) Goto the "Programs and Settings" menu from the desktop. If you cannot see the menu because CNC11 or the CNC11 Start Menu is running, press Alt-F6 to bring up a command prompt. Then using ALT-TAB cycle through the windows until the "Programs and Settings" menu is visible. Alternatively, you can exit CNC11 and exit the CNC11 Start Menu using the "F9" Exit key.

2) Goto Settings->Yast.
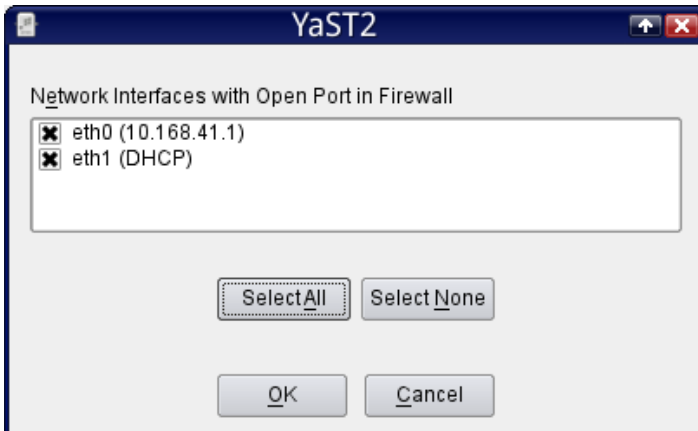
3) Choose Network Services and choose Samba Server
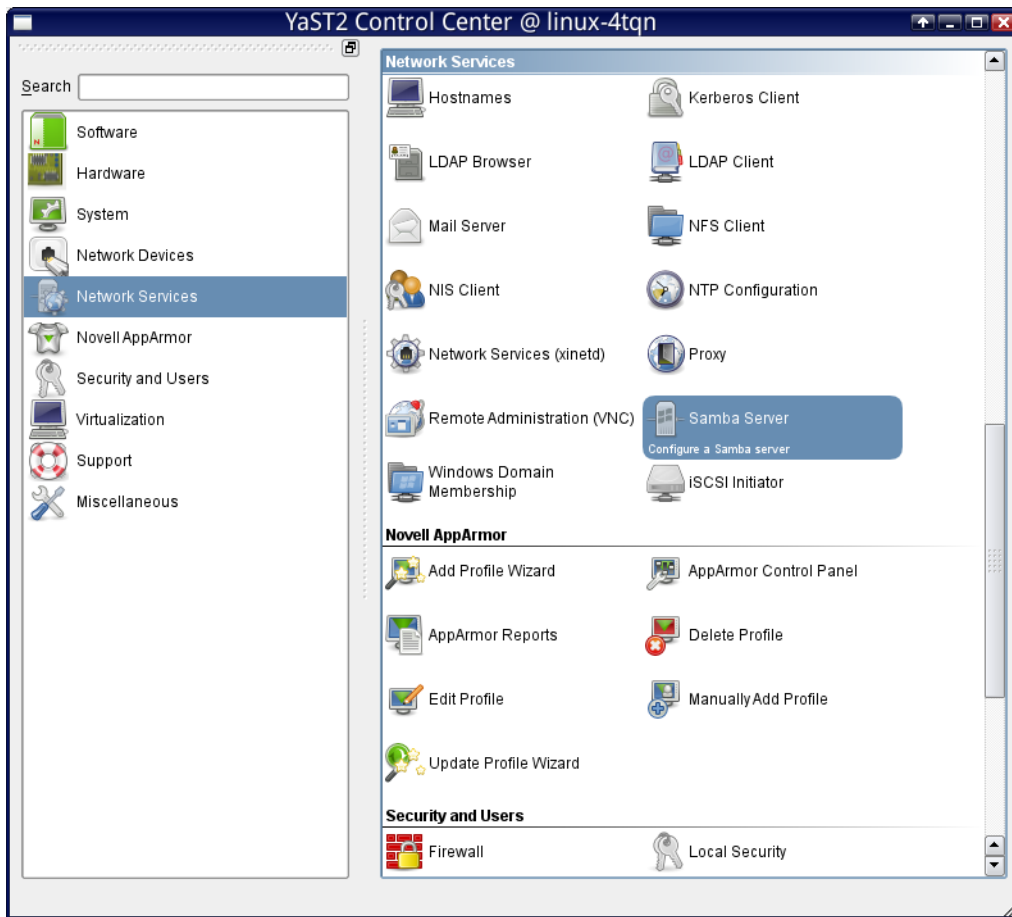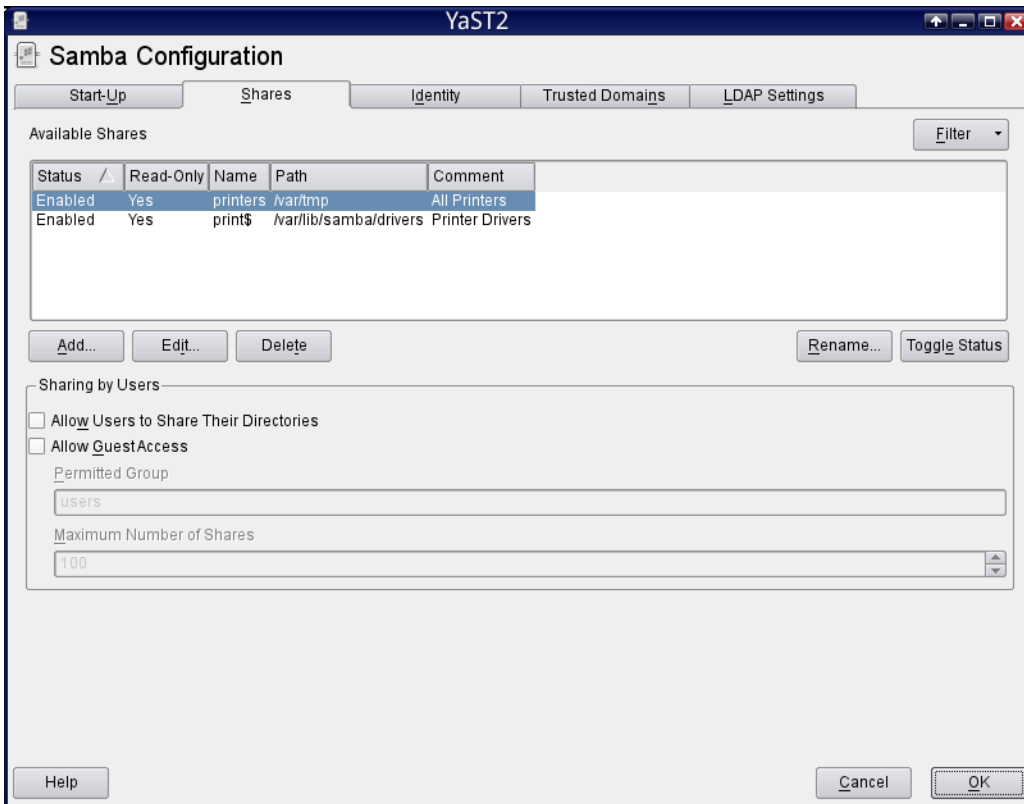
4) Goto the "Start-Up" tab

- Choose "During Boot" for Service Start
- Choose "Open Port in Firewall" for Firewall settings.
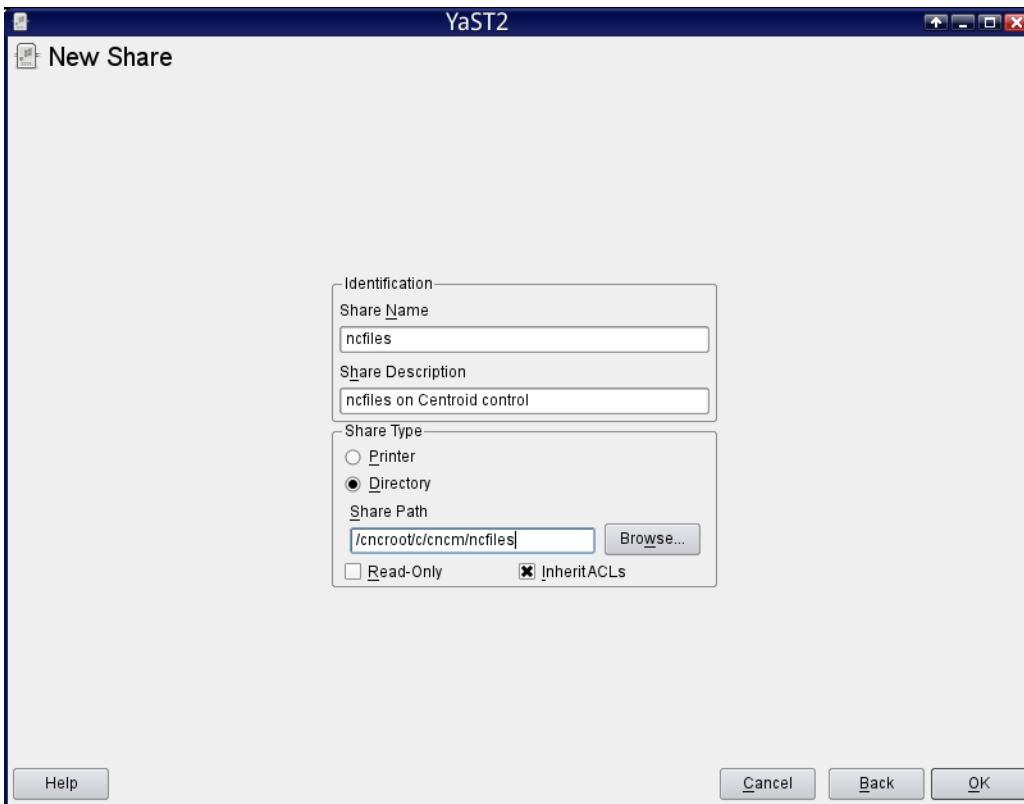- Click the "Firewall Details" button.
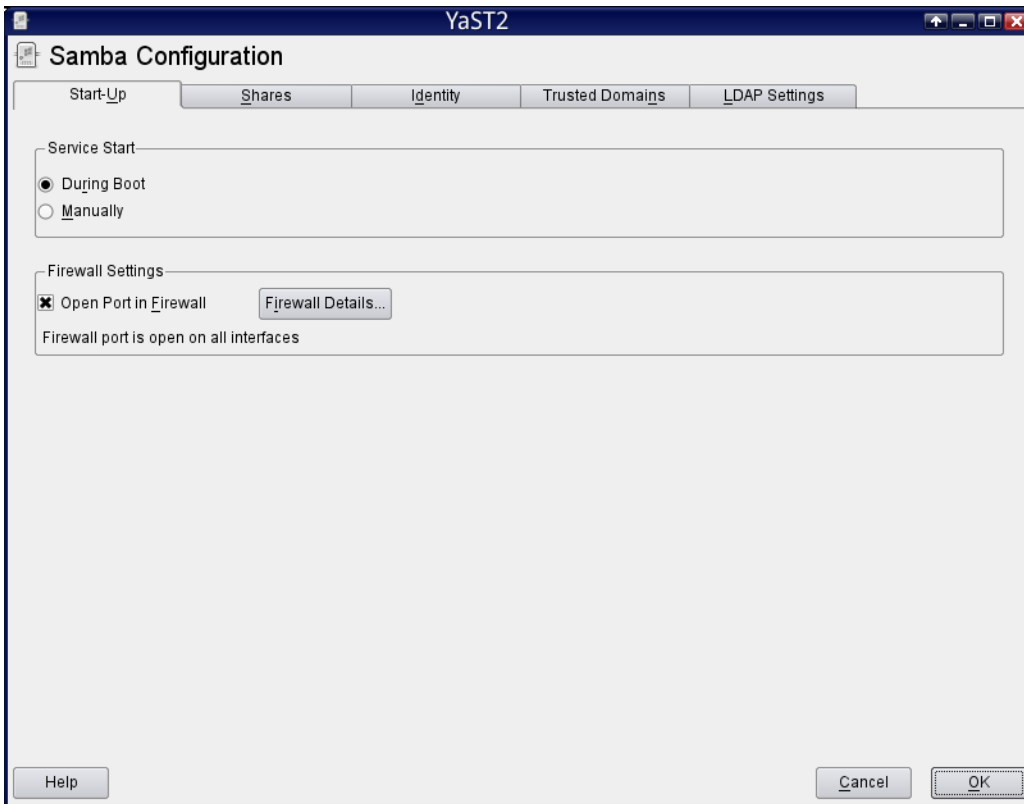
5) After Clicking the Firewall Details button ensure that all interfaces are selected. Click Select All then OK.

6) Next, choose which directories you want to share. In the "Shares" tab, click "Add" to add a new share.

7) Enter the share name, description, and share path as shown in the example below.

8) You can add more than one shared folder if you would like.

9) Goto the "Identity" tab.

- Enter your workgroup name. If you are unsure about this you can just set it to WORKGROUP.
- Domain Controller should be set to Not a DC

- WINS Server Support Should NOT be checked
- Name under Remote WINS Server should be blank. (Unless you actually do have a WINS server, most home or small office networks do not)
- Check Use WINS for Hostname Resolution
- Enter your desired NetBIOS Hostname. This will be your server name in the windows network. It should be unique for your local network.
- If you get a warning message about changing the NetBIOS Hostname just say OK.
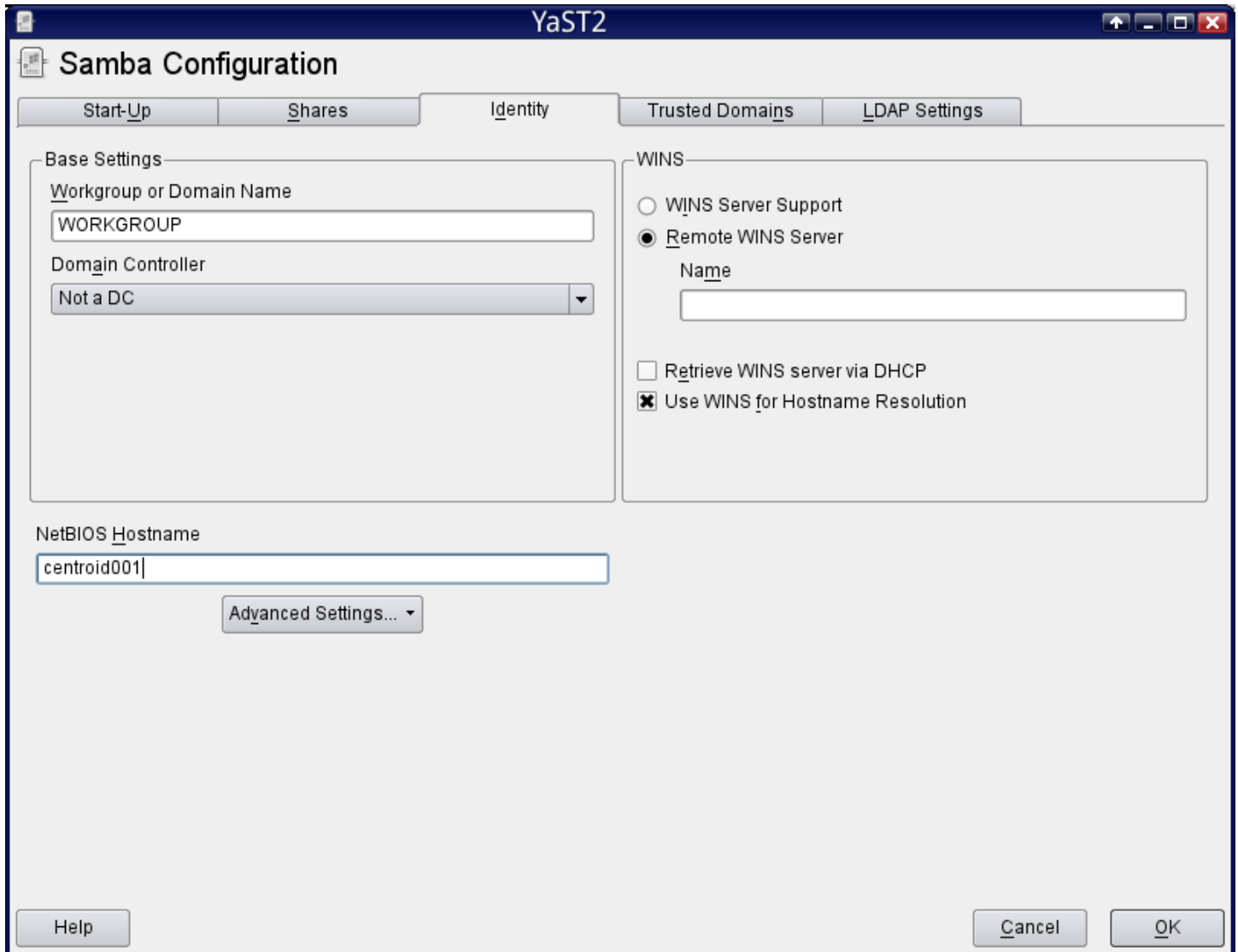
10) The "Trusted Domains" tab should be as follows
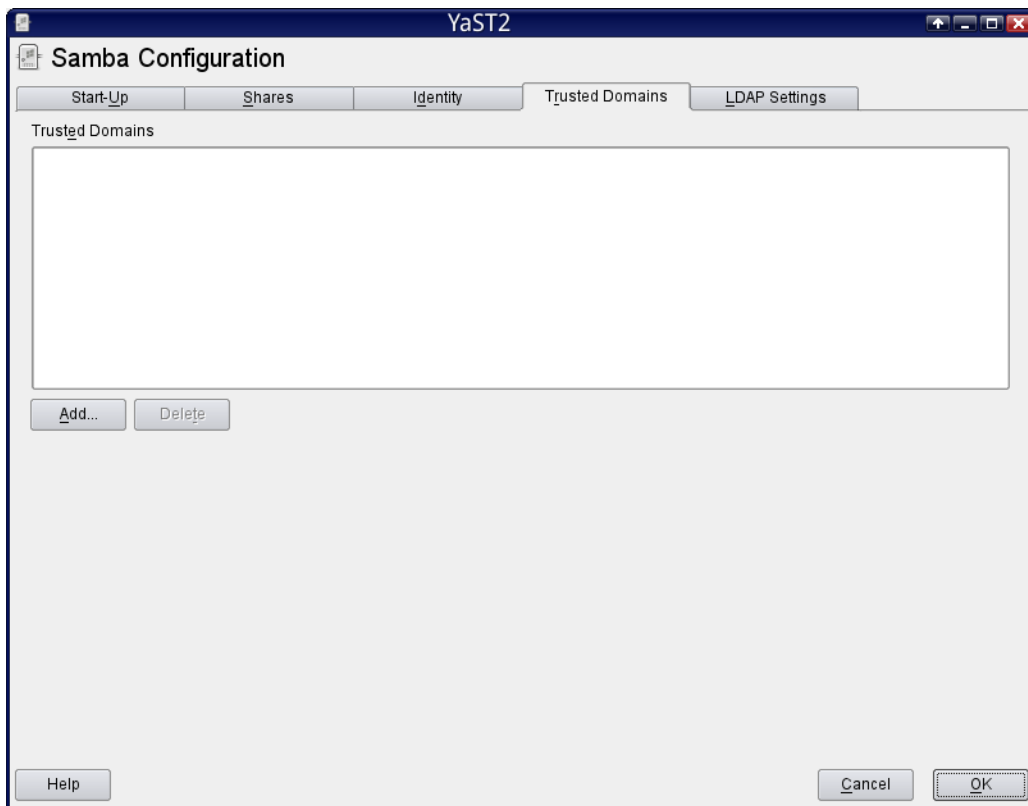
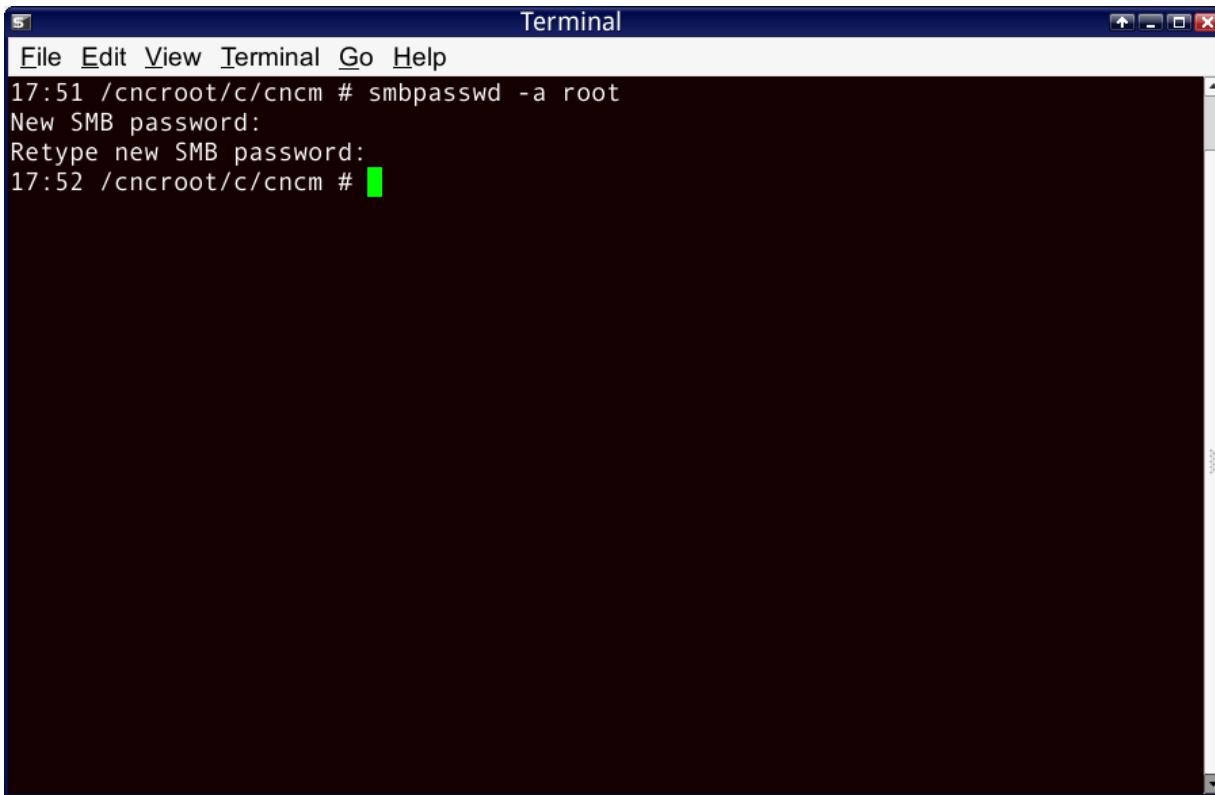11) The "LDAP Settings" tab should be as follows.
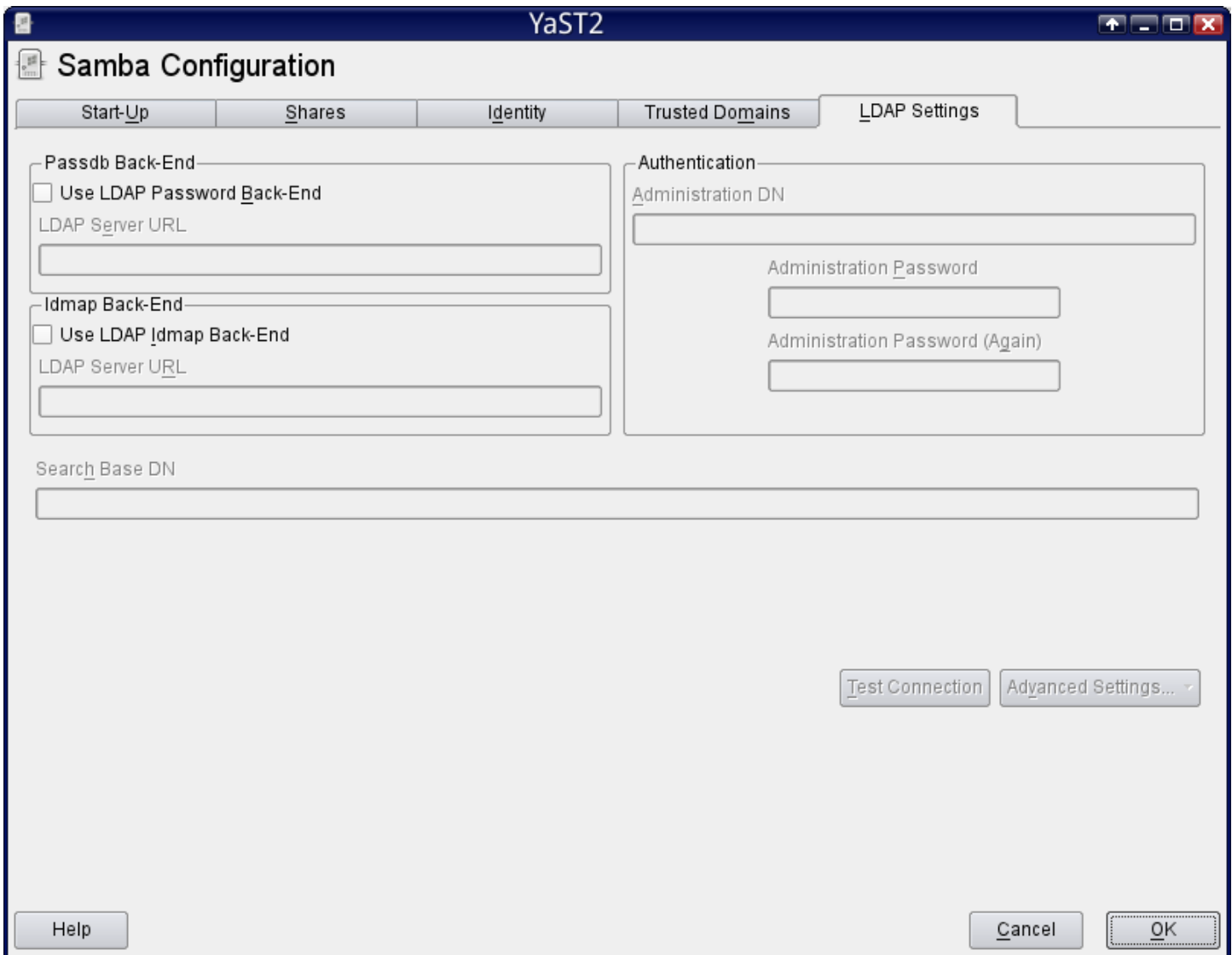
12) Press "OK" at the bottom right corner of the menu to save your samba server settings. The server will restart/ start with the new settings when ever you press OK.

13) Finally, you must set a password for your shared folders. This will be the password that users on the network will use to connect to your shared folders. Do this using the smbpasswd command. Press**ALT-F6** to open a linux prompt. Type "smbpasswd -a root". Enter your password when prompted.

Note: If you ever forget this password, just run "smbpasswd -a root" and you can change the password (without knowing the current password).

```
┌─                              Terminal                              ↑ _ □ ✕ ┐
 File  Edit  View  Terminal  Go  Help
 17:51 /cncroot/c/cncm # smbpasswd -a root
 New SMB password:
 Retype new SMB password:
 17:52 /cncroot/c/cncm # █
```

14) Now you should be able to see your shared folders in your windows computer (or in any other centroid controls that are on the network). For connecting, the user name is "root" and the password is the one that you specified with smbpasswd.

CNC Linux Firewall Settings.

Note: The lastest version of the cnc11 update should already be configured to allow samba and file sharing. This section is provided for troubleshooting.
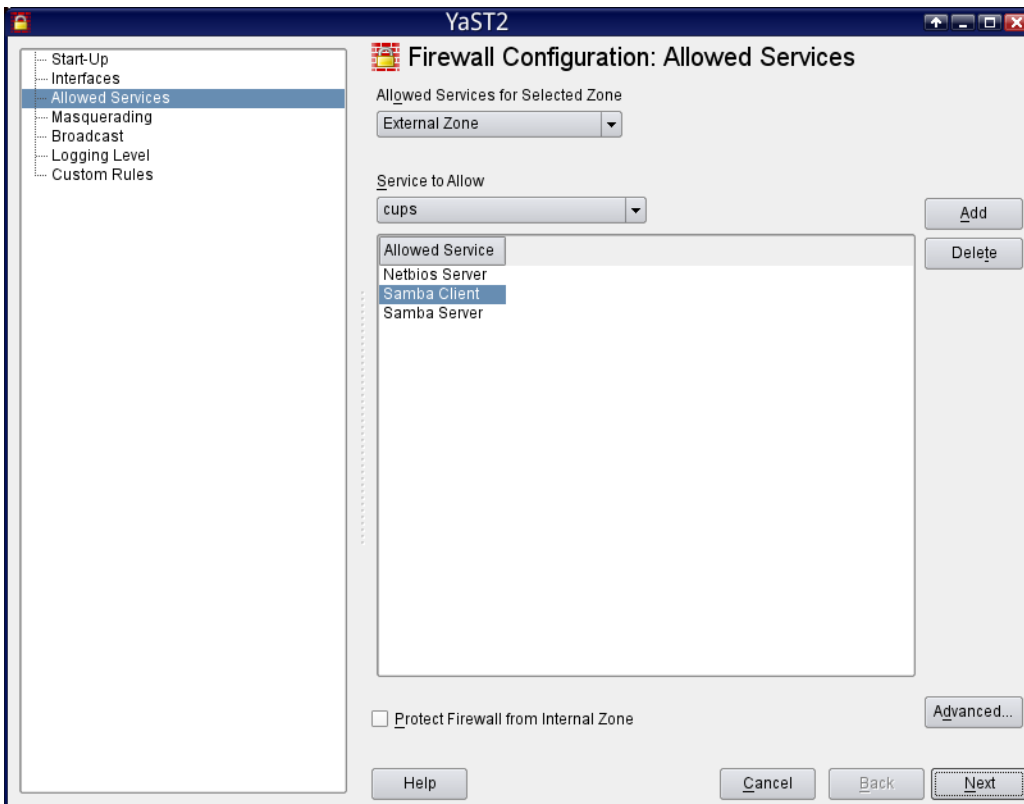
Also starting in CNC11 3.01 r28 you can run "configure-firewall-for-samba.sh" which will configure the firewall to work with network file sharing.
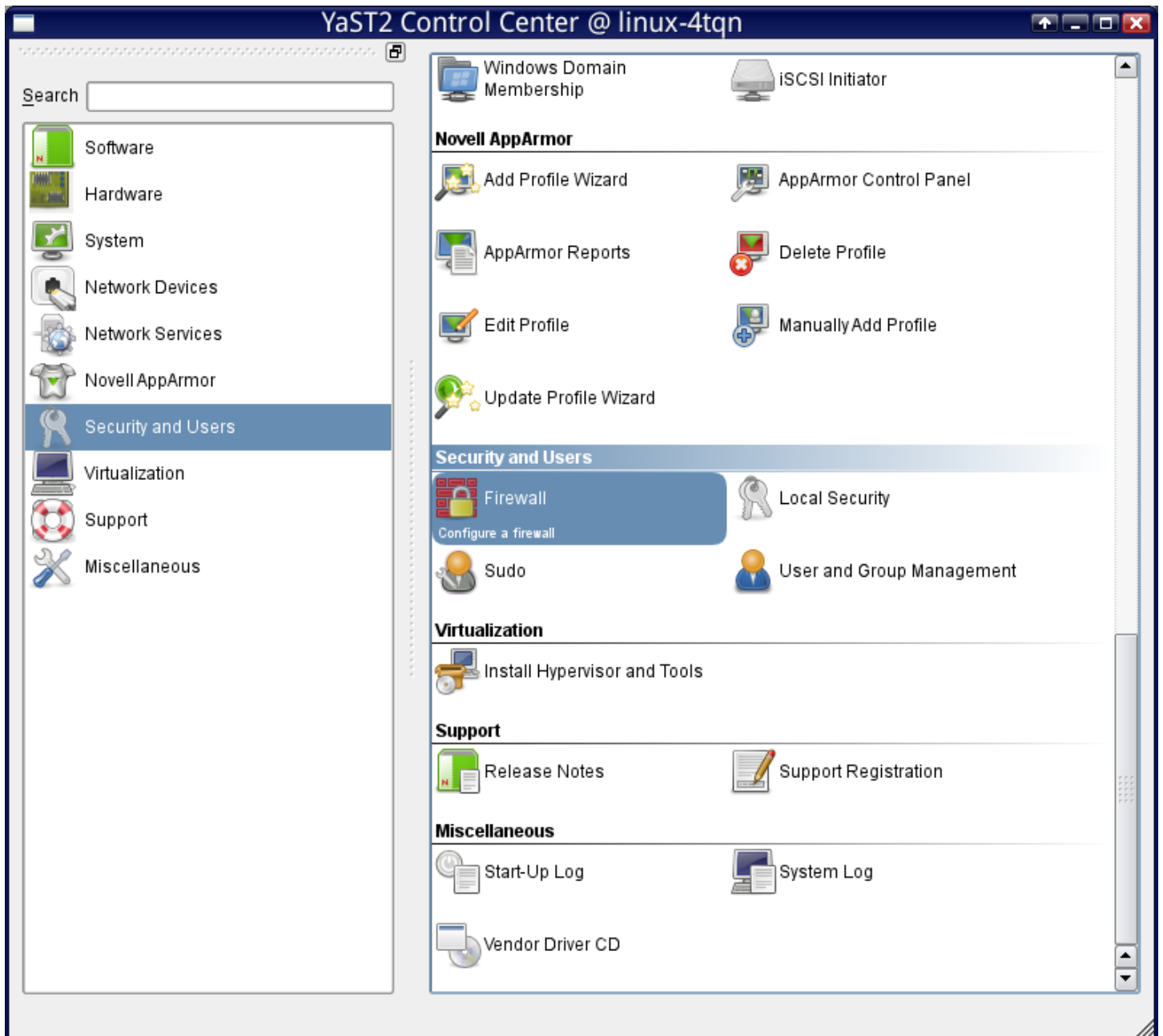
Ensure that Samba Browsing is allowed in the Broadcast section.
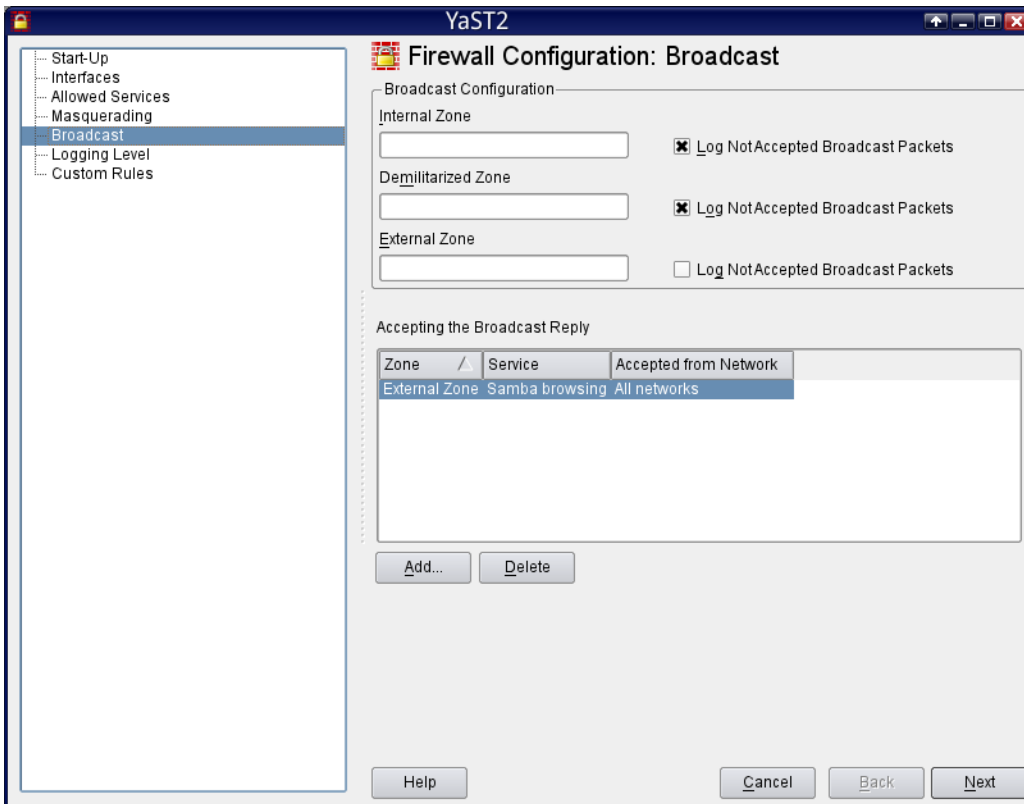
Ensure that the Samba Server, Samba Client, Netbios Server are allowed for the External Zone.

Make sure that the ethernet adapters are in the right zones. The one connected to the mpu11 should be in the Internal Zone, all others should be in the External Zone. Note that in the following example, adapters with "No Zone assigned" will end up into the "any" interface which has the External Zone.

YaST2

Firewall Configuration: Interfaces

- Start-Up
- Interfaces
- Allowed Services
- Masquerading
- Broadcast
- Logging Level
- Custom Rules

Firewall Interfaces

Device	Interface or String	Configured In
Custom string	eth0	Internal Zone
Custom string	any	External Zone
MCP61 Ethernet	eth1	No zone assigned

[Change...] [Custom...]

[Help]   [Cancel] [Back] [Next]

Document History

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