NOC-PS manual

Table of contents

Installation....3
System requirements....3
Network setup....5
Installation under Vmware Vsphere....8
Installation under Citrix Xenserver....10
Initial configuration....12
Overview of web interface....13
Overview of the available menu options:....14
Adding new servers....15
Automated server installations (provisioning)....18
Profiles....19
Creating new VPSes....20
Console functionality....22
Server properties....23
General....23
Connections....24
Private network....25
Hardware information....26
Data traffic graphs....27
Adding additional subnets....28
Splitting subnets....29
Adding Windows support (not available in Lite edition)....30
Support for APC switching PDUs....33
Profile settings....35
Adding and cloning profiles....36
Add-ons....37
Import data from external system or database....38
Installing a SSL certificate....39
Creating users....40
Programming and configuring Yubikey OTP tokens....41
Logging in with Yubikey....45

Installation

System requirements

For easy of use, the NOC-PS software is shipped as a so called “virtual appliance”, that requires little configuration to get it up and running.

To install the regular NOC-PS software the following system requirements apply:

- The NOC-PS virtual appliance has to be installed under one of the following hypervisors:
  - Vmware Vsphere
  - Citrix Xenserver
  - HyperV
- The host system must have a processor that supports 64-bit instructions. (all AMD Opteron processors and the latest generation of Intel Xeon processor support this).
- The virtual appliance has to be assigned a dedicated public IP-address that has direct Internet connectivity. This is required to be able to automatically download the necessary operating system installation files, upon first use. Proxy servers are NOT supported.
- No other DHCP servers may be active in the appliance's VLAN.

NOC-PS Lite does not require a hypervisor, but runs on a Raspberry Pi instead.

The following requirements apply to the dedicated servers that you wish to provision with NOC-PS:

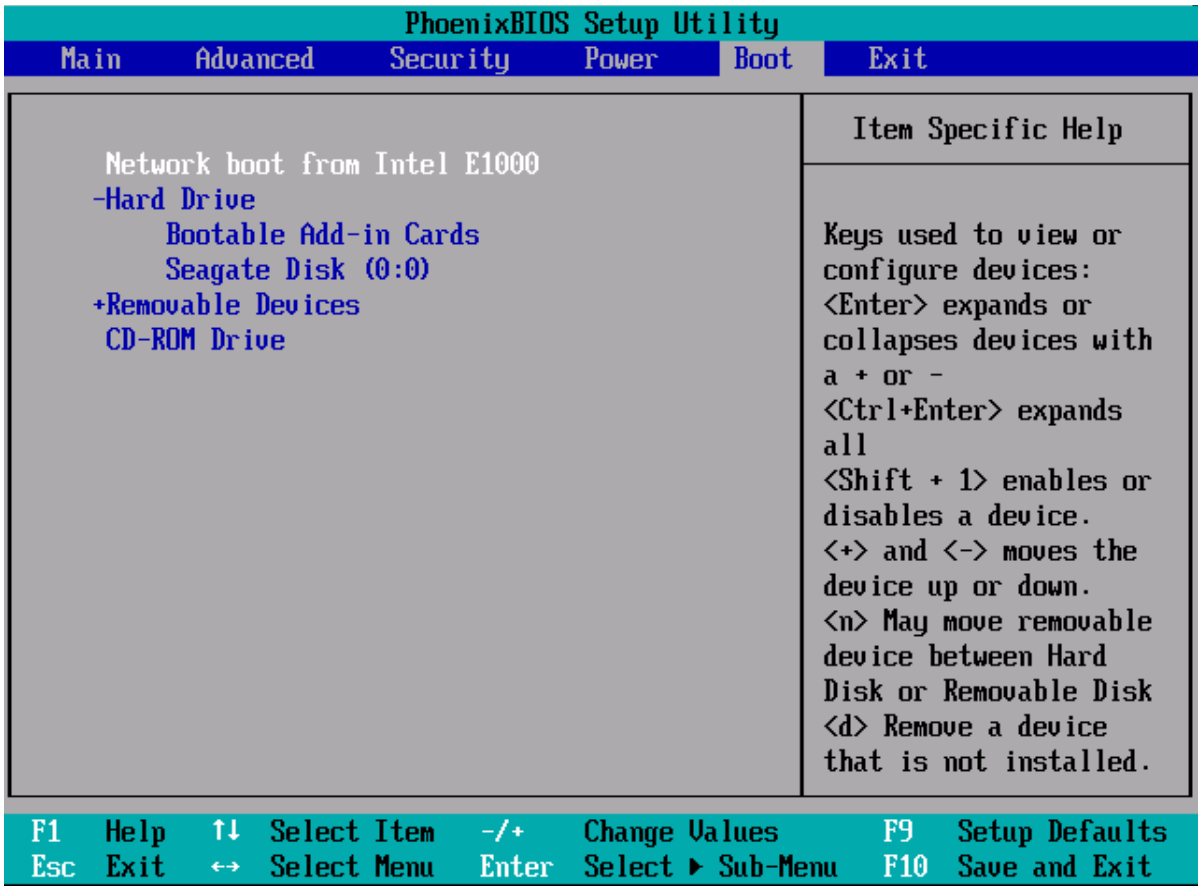
- The servers to be provisioned have to be located in the same VLAN as the NOC-PS appliance.

  -OR-

You have to configure your router to forward DHCP requests to the NOC-PS appliance. This is usually called “DHCP relaying” or “broadcast forwarding”

- The dedicated servers have to support network booting (PXE). Virtually all server grade mainboards and ethernet cards supports this, however this is not guaranteed to be the case with hardware meant for desktop systems.

- To be able to provision servers over the network, they have to be restarted. To automate this it is recommend that your servers are equiped with either an IPMI management card or connected to a switchable APC power distribution unit. Otherwise an engineer has to go on-site and restart the server manually.



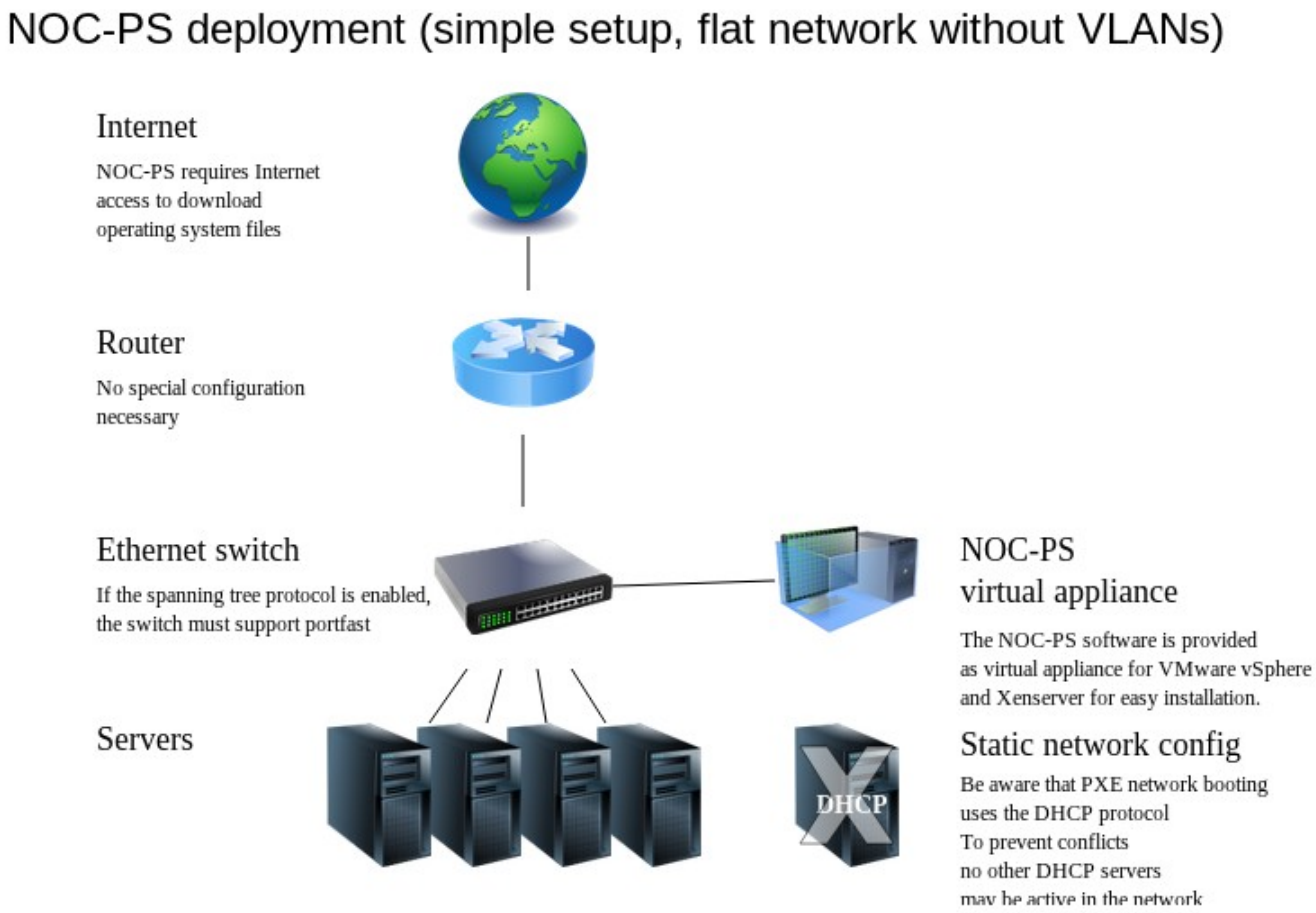
– To tell the server to boot from network instead of disk, it is required that:

  You modify the BIOS boot order, so that the system first attempts to boot from the network, before falling back to booting from hard drive.

  -OR-

  Your system has to have an IPMI management card. In that case NOC-PS can instruct the server to boot from network automatically, without having to change the boot order manually.

Network setup



In a simple setup without VLANs no special router configuration is necessary.

Do make sure that no DHCP servers are active in the network as those can conflict with provisioning.

Also make sure that if the Spanning Tree Protocol is enabled on your Ethernet switches, portfast is activated on switch ports connected to servers (but not on ports that connect to other switches)

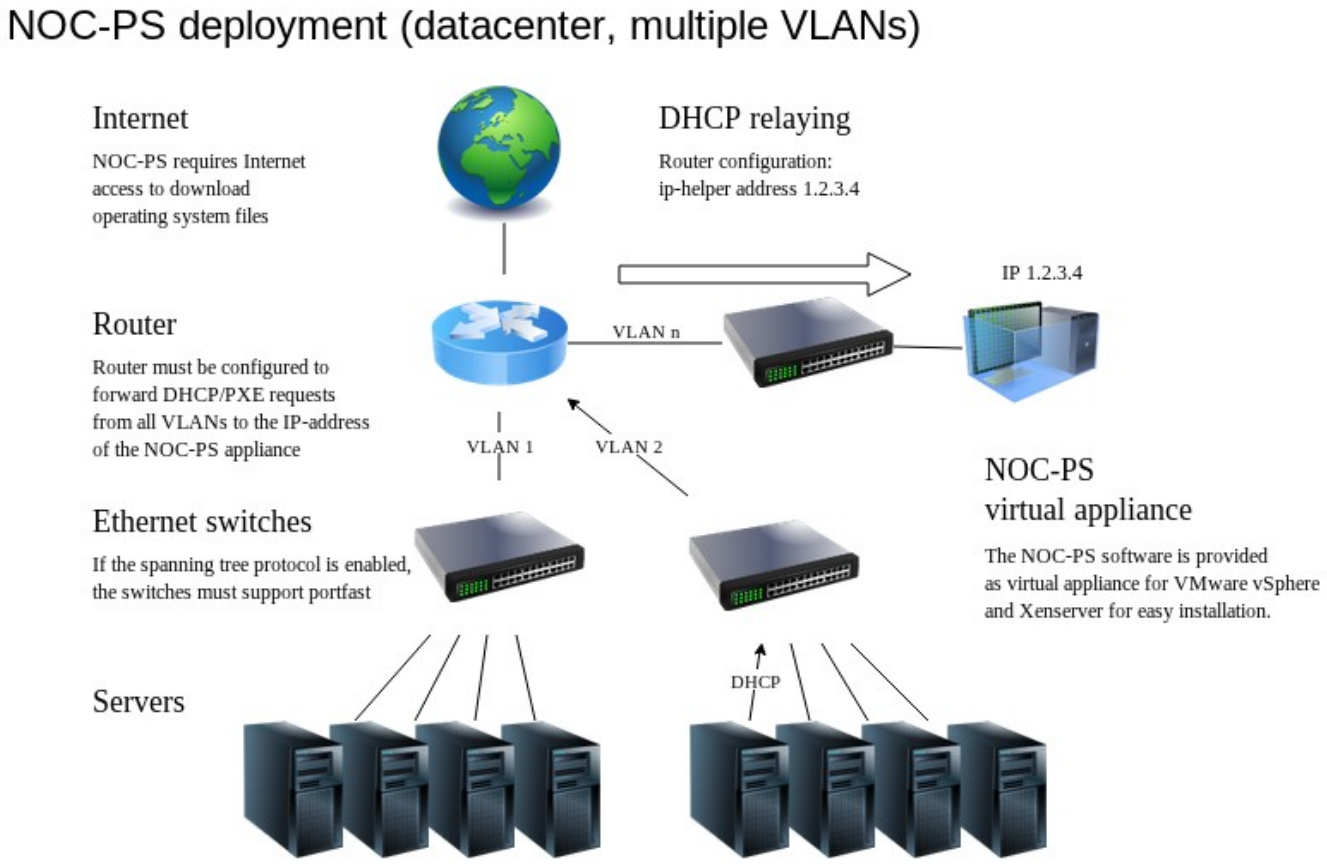
Enabling portfast on all ports for a Cisco rack switch:

```
Switch2> enable
Switch2# configure terminal
Switch2(config)#spanning-tree portfast default
```

If some of your ports are connected to other switches, instead of servers, do not make portfast the default, but set each interface individually.

Using the standard Spanning Tree Protocol without portfast causes problems when booting servers over the network, as it can take 30-50 seconds before the server has network connectivity (the switch port transitions to the forwarding state) and boot firmware is often not that patient.

If your switch does not support portfast, see if it has Rapid STP instead, or disable STP completely.



If you have multiple VLANs you must configure your router or L3 switch to forward DHCP requests from foreign VLANs to the IP-address of your NOC-PS installation.

Usually the command is called “ip-helper address”

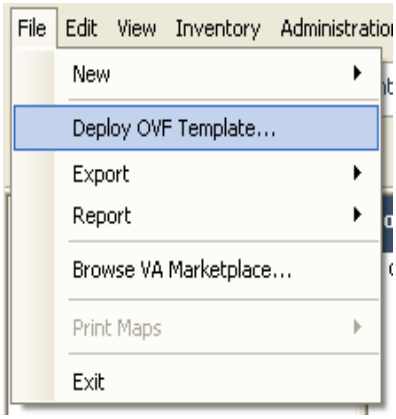
```
ip-helper address 1.2.3.4
```

Where 1.2.3.4 is the NOC-PS IP.

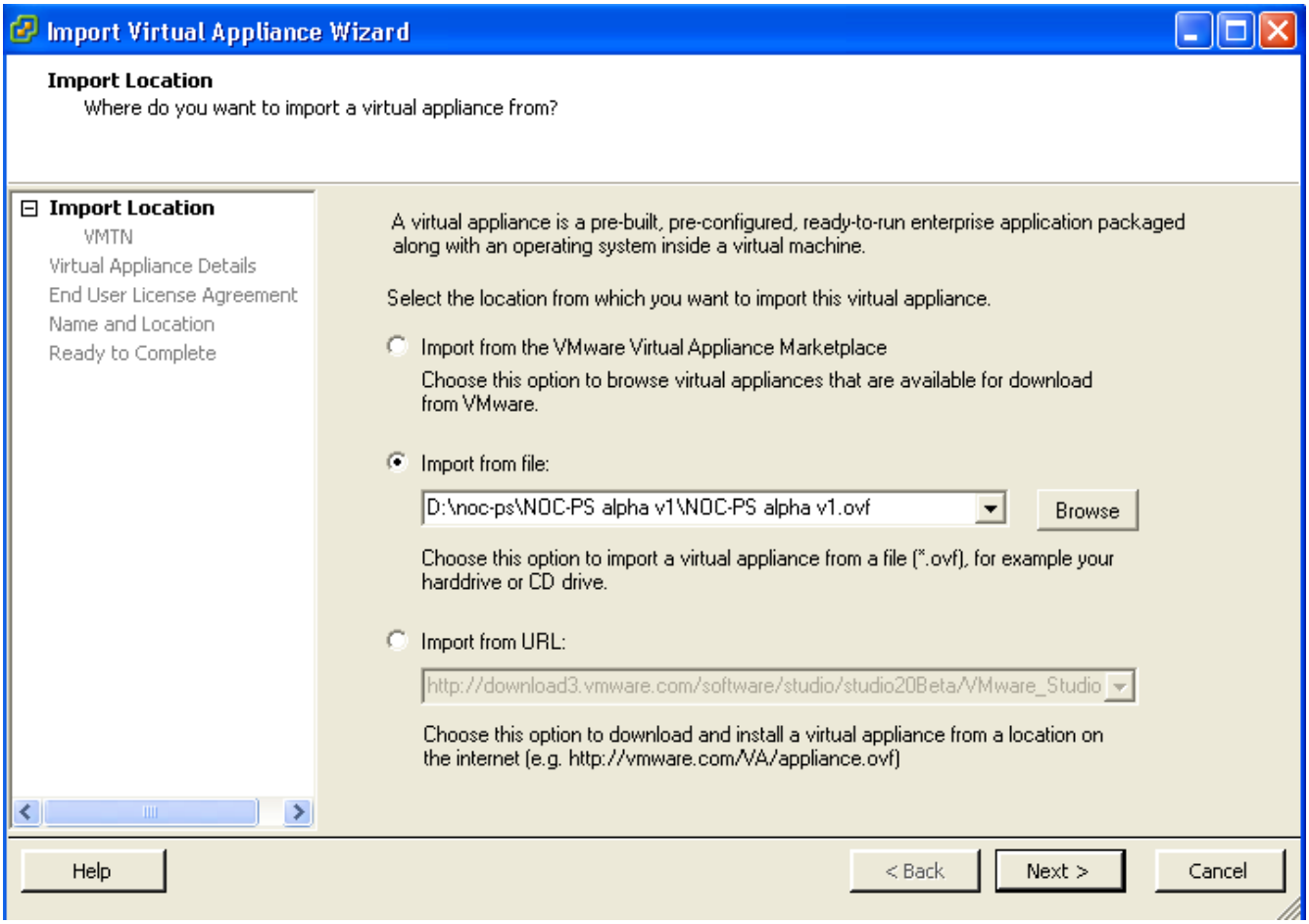
Look for the term “DHCP relaying” or “Broadcast forwarding” in your router's manual if in doubt.

Installation under Vmware Vsphere

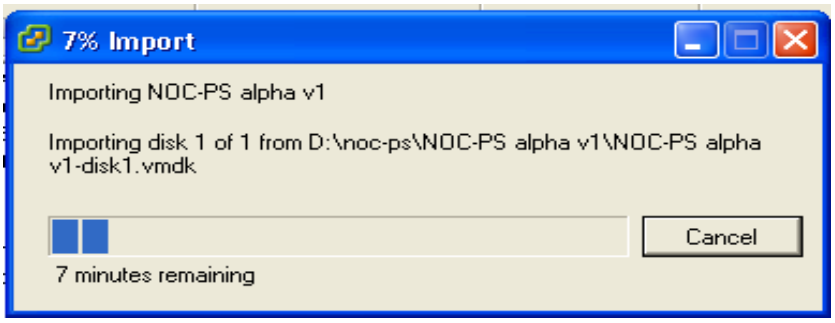
To install the NOC-PS virtual appliance under Vmware vSphere ESXi:



1) Download the .ZIP from the NOC-PS website, and extract it to a temporarily folder on your hard drive.
2) Start the “Vmware vSphere client”, and go to the menu “File” → “Deploy OVF template”



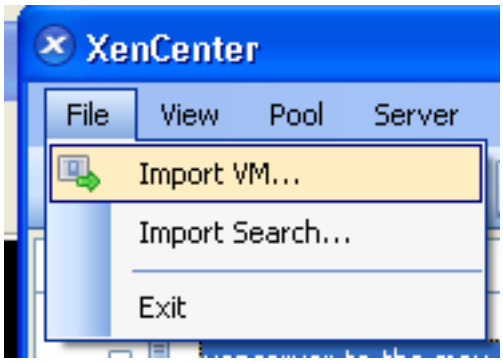
3) Choose “import from file”, browse to the folder where you extracted the files, and select the .ovf file.



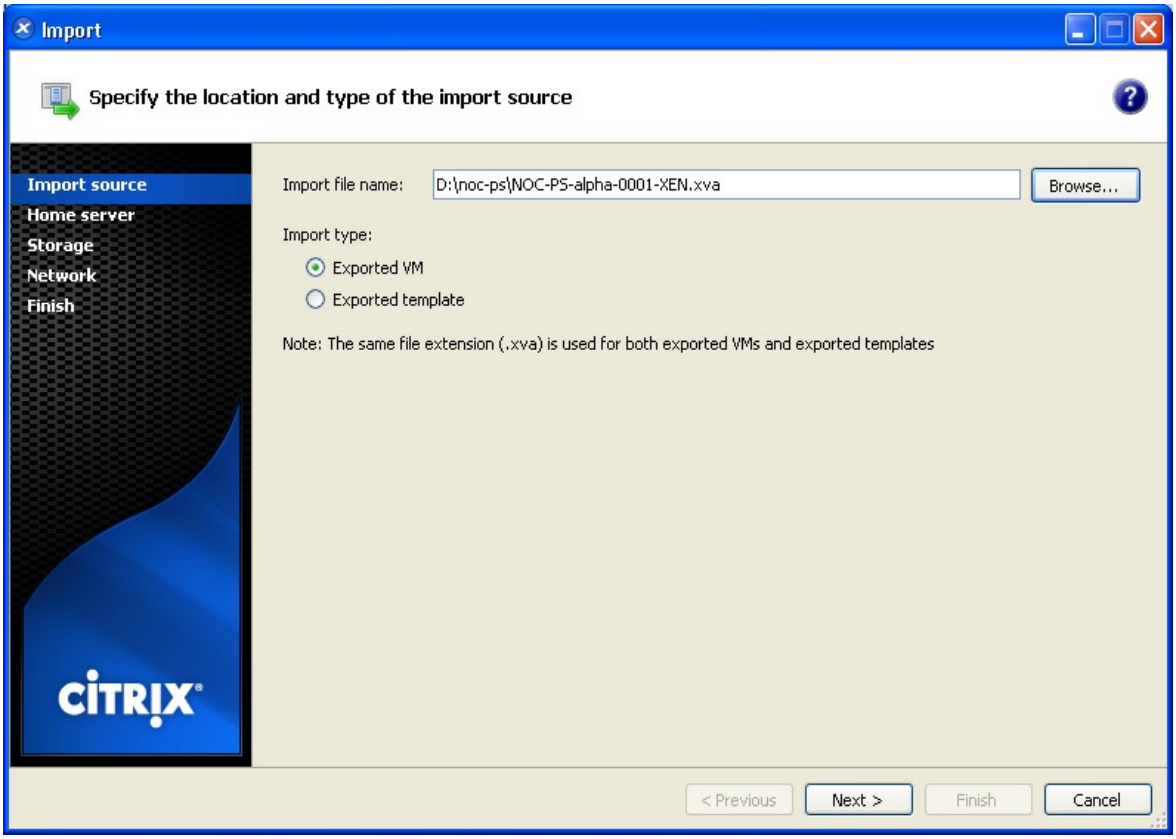
4) Choose “next” → “next” → “finish”, and wait for the upload to finish.

Installation under Citrix Xenserver

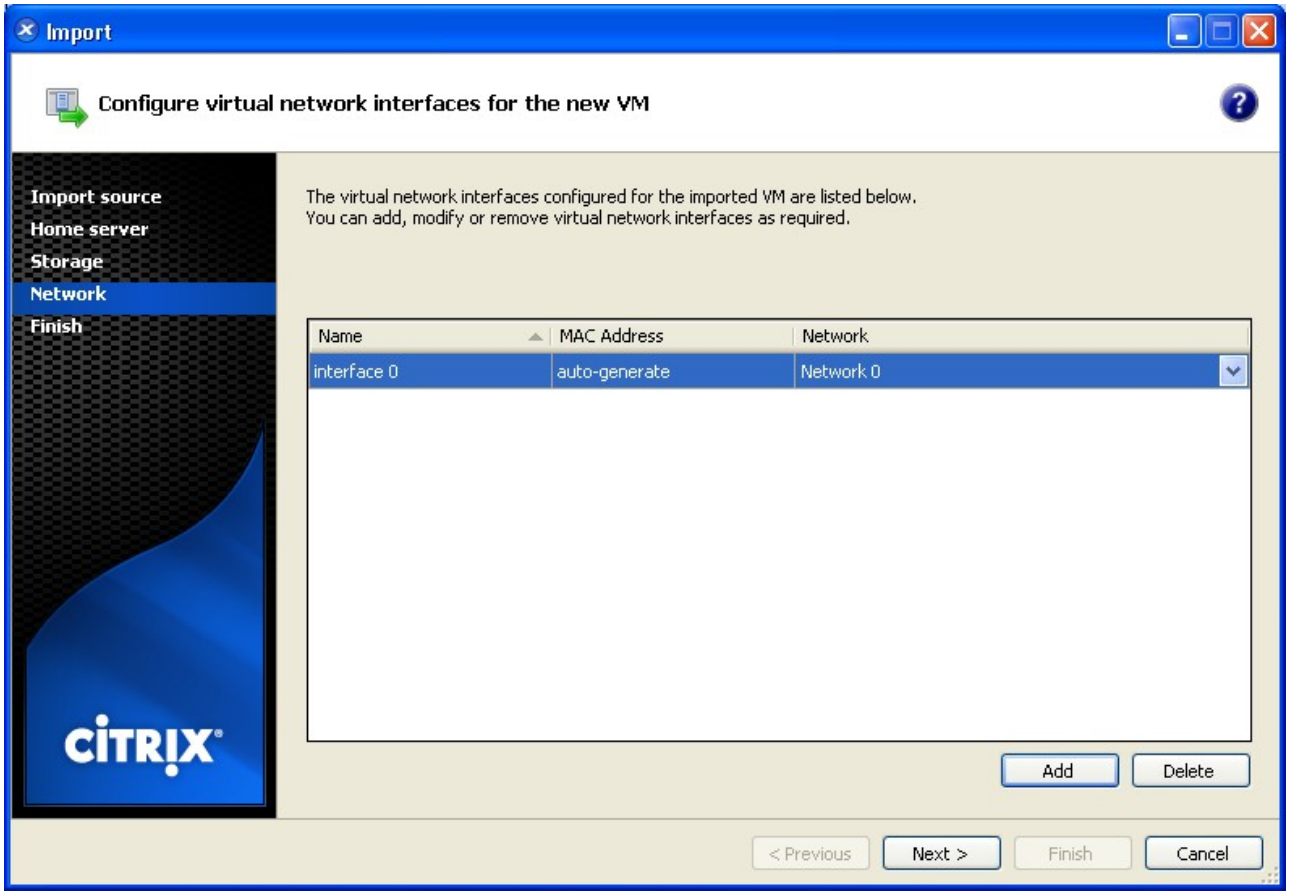
1) Download the .XVA bestand from the NOC-PS website.



2) Start “Xencenter” and go to “File” → “Import VM”



3) Browse to the downloaded .XVA file, and select the option “exported VM”, and click “next” → “next” → “next”



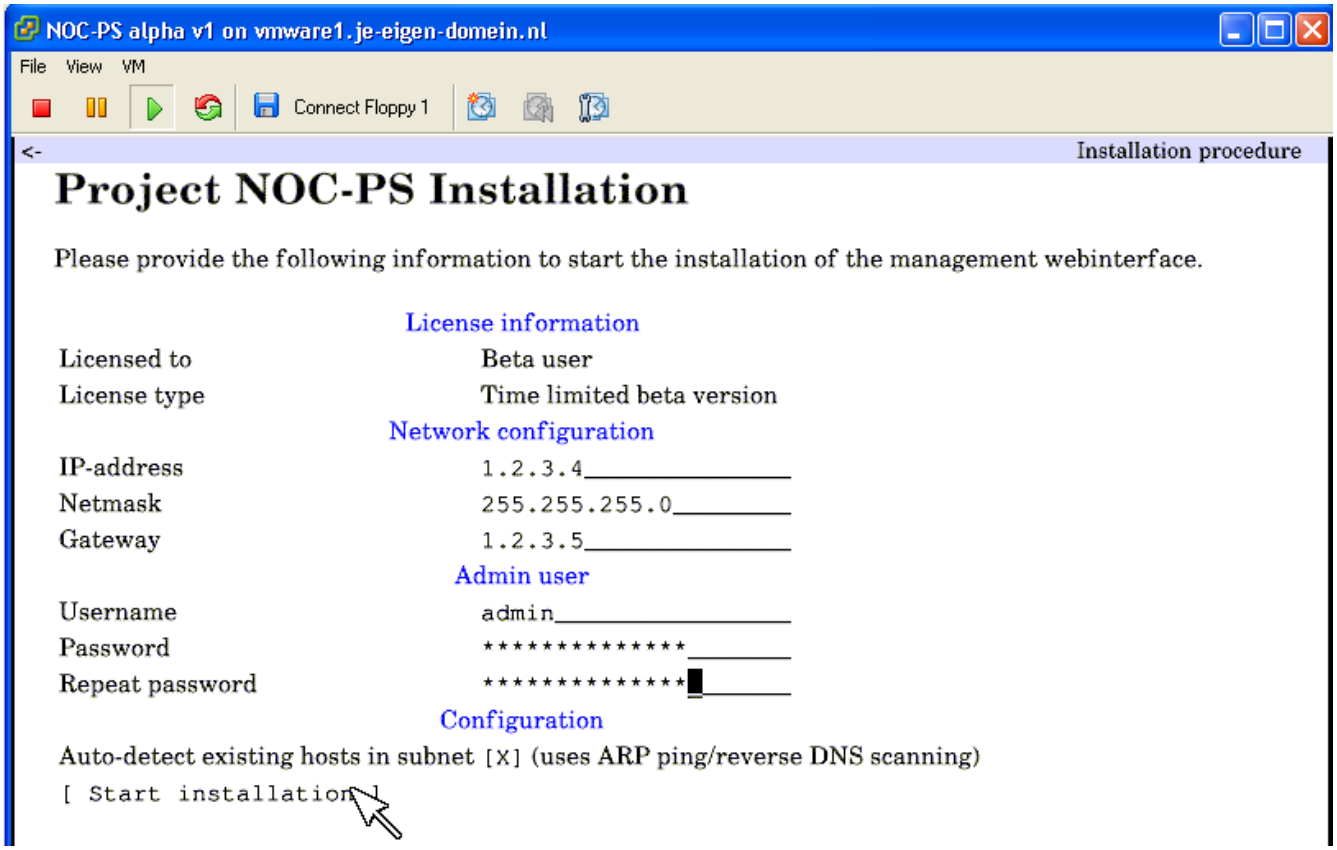
4) IMPORTANT: under “Configure virtual network interfaces for the new VM” add one virtual network card, by pressing “Add”

Press “next” -> “finish”, en wait until the upload is complete.

Initial configuration

After the software has been installed, you have to configure the network and login settings.

Go to your (Vmware/Xen) “console” and enter the information there. Depending on your hypervisor this window might look slightly different.

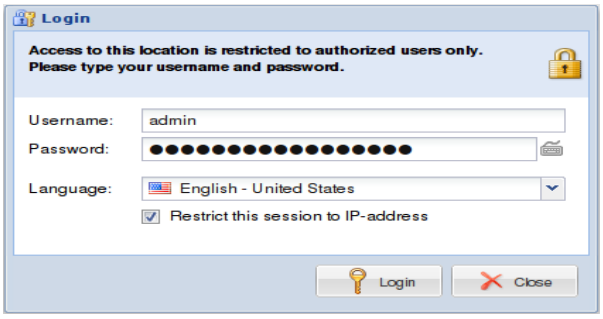


Enter the following information:

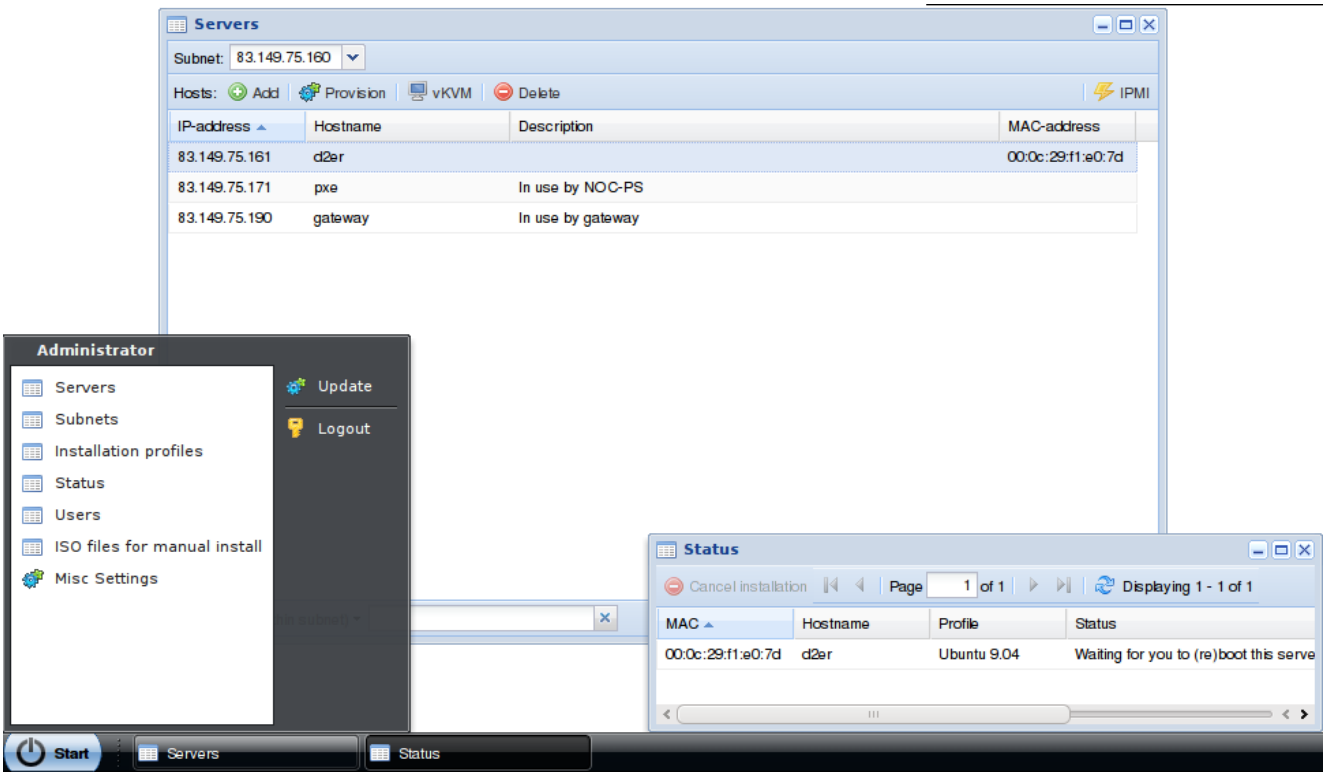
- IP-address, netmask, gateway: the IP-address and network information the NOC-PS software and web interface will use.
- Admin user: the desired administrative username and password. This is the information you use to login to the NOC-PS web interface.
- “Auto-detect existing hosts”: NOC-PS can optionally auto-detect existing servers in your network, so that it knows which IP-addresses are available and which are in use. Note: this works only for servers within the same VLAN.

Click on “start installation” to complete the configuration and start installation.

Overview of web interface



After installation has completed, go to the IP-address you specified during installation, with a normal web browser such as Firefox. You will be prompted for the username and password you specified earlier.



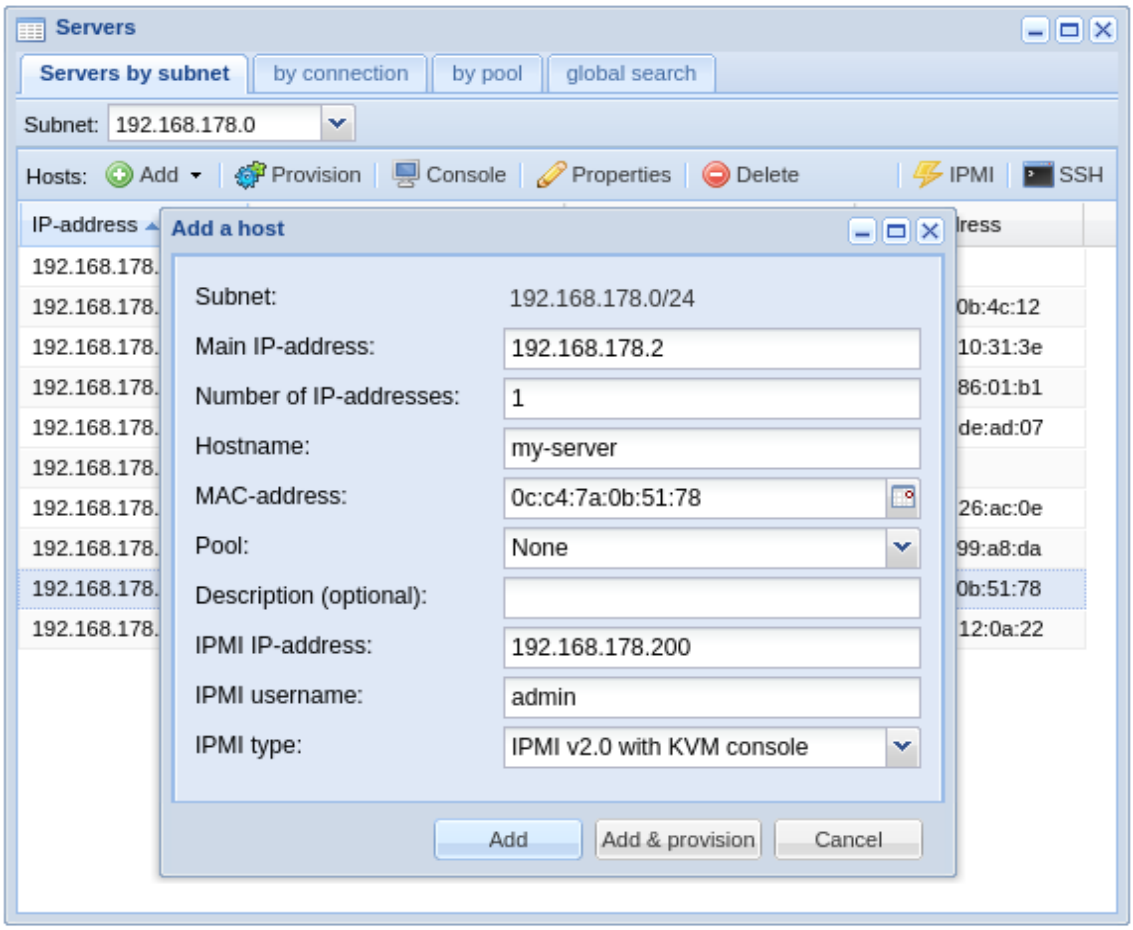
By default two windows are openend, “servers” and “status”. By clicking “start” on the bottom-left of the screen, a menu with the other options is presented.

Overview of the available menu options:

Servers	Provides an overview of all servers. By selecting a server and pressing the “provision” button, it is possible to install a new Operating System on the server. It is possible to show the servers grouped by subnet, by connection to devices such as switches and by pool.
Status	Provides a status overview of the server installations in progress.
Subnets	Can be used to configure additional subnets.
Installation profiles	Installation profile settings.
Users	Add and remove administrative users.
Misc settings	Configures default settings, and the SSL certificate of the web interface.
Pools	Add and remove pools
Update	Updates the NOC-PS software to the latest version.

Adding new servers

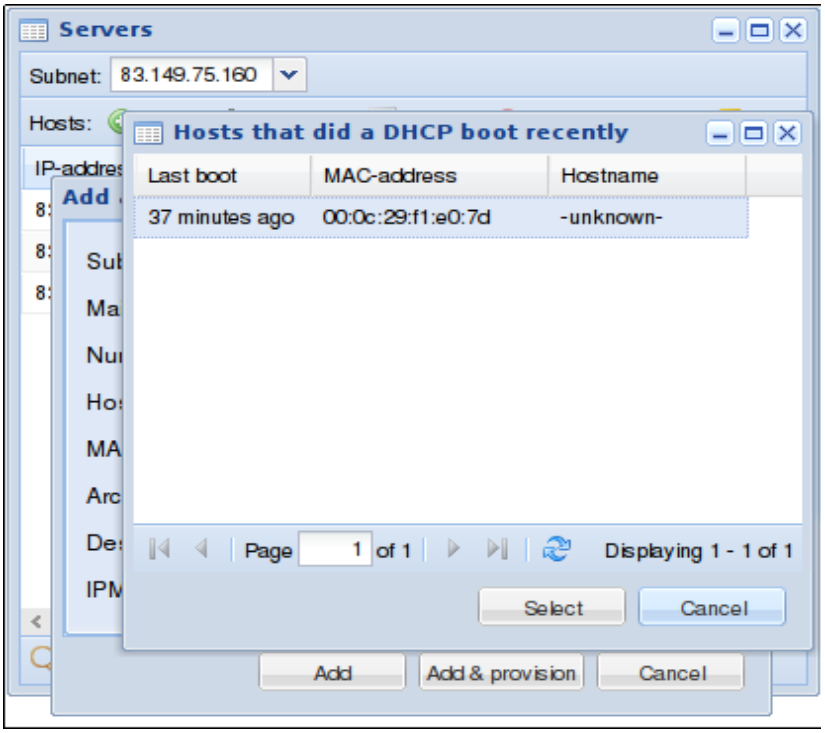
1) go to “start” → “servers”
2) next to “hosts” click “add”
3) add the following information:



- Main IP-address: the first IP-address of the server.
- Number of IP-addresses: the number of IP-address to assign to the server. Note: the IP-address must be numbered sequentally from the first IP.
- Hostname: the name of the server.

– MAC-address: the MAC-address of the server.

  Address unknown? Reboot the server, and click on the icon to the right of the MAC-address input field.



  A list of unknown servers that started recently will be presented.

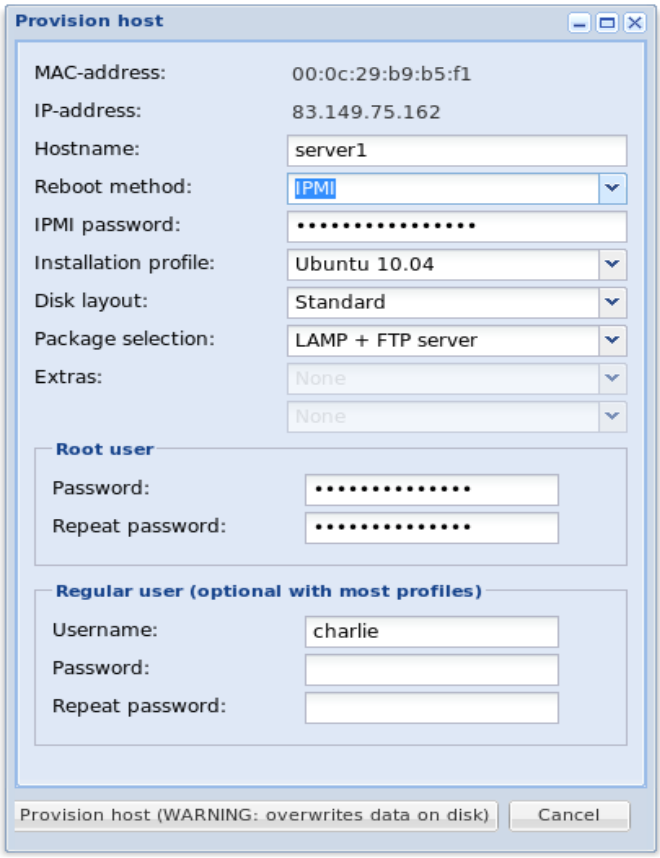
  This does require that the server has been configured to attempt to boot from the network first (in the BIOS boot order, or using IPMI).

– Pool: optionally you can organize your servers into pools. E.g. you can put servers that are currently not in-use into the “available servers” pool.
– Description: optional description of the server.
– IPMI IP-address: if your server is equiped with an IPMI/iLO/DRAC management card, enter its address here.
– IPMI username: IPMI username, for example “admin”. Note this is case-sensitive. And some manufacturers use “ADMIN” by default.
– IPMI type: the IPMI or AMT version to use.

4) Click “add” to only add the server to the system for later use, or “add & provision” to install an operating system on the server straight away.

Automated server installations (provisioning)

1) go to “start” → “servers”
2) selectect the server you wish to install, and choose “provision”
3) enter the following information:



- Hostname: the current host name is displayed, which you can edit if desired.
- Reboot method: wheter you would like to use IPMI, an APC switching PDU to automatically reboot the system, or if you are going to do so manually.
- IPMI password: if you would like tell the server to reset and boot from network using IPMI, you need to enter your IPMI password here. For security reasons, passwords are NOT saved by default, and you have to enter them each time.
- Installation profile: the desired operating system.
- Disk layout, package selection and extras: select additions options here (“add-ons”). The

available options differ by installation profile.

- Root user password / confirm password: enter the desired administrative (root) password twice.
- Regular user: in addition to creating an administrative (root) account, it is possible to add a “regular” user account as well. This is optional with most profiles.

4) click on “provision host”

5) restart the server. (this is done automatically if you selected “IPMI” or “APC PDU” as reboot method)

6) The installation will start automatically. You can monitor its progress in the “status” window.

Profiles

CentOS, Ubuntu, Fedora, Debian, FreeBSD:

A minimal Operating System is installed by default, with a static network configuration, a SSH daemon for remote management, and a local DNS server, so that it does not depend on other systems.

Additional software has to be installed manually, or must be added to the “installation profile” settings.

Note that FreeBSD, Ubuntu and Debian do not allow direct root logins through SSH. So always create a regular user as well. If you wish to connect through SSH you need to login with this regular user first, and su for root afterwards.

Sysrcd:

Using the “rescue system” you can solve boot issues, or reset forgotten root passwords.

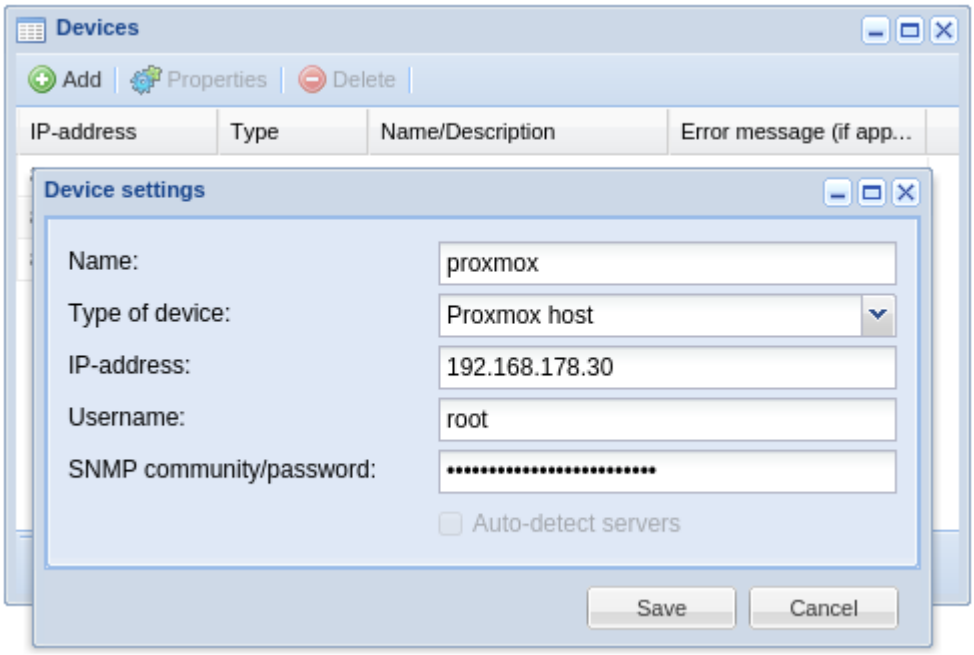
The software will not be installed on the hard drive, but is executed over the network.

After activating the profile, you need to use SSH or VNC to connect to the IP-address of the server, using the supplied root password.

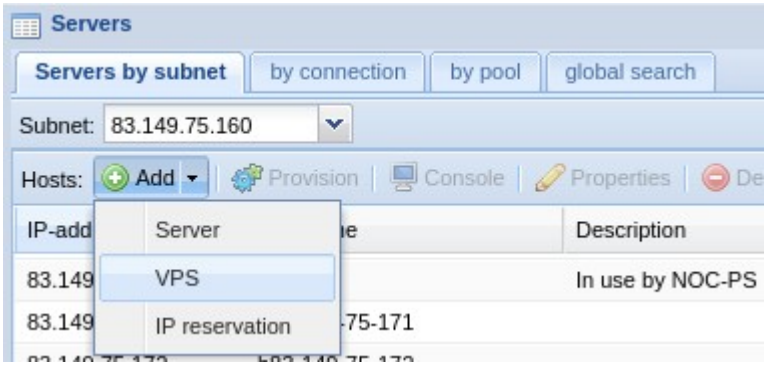
After you finished with the maintenance, press “cancel provisioning” in the “status” window, to end the session. After which you will need to restart the server.

Creating new VPSes

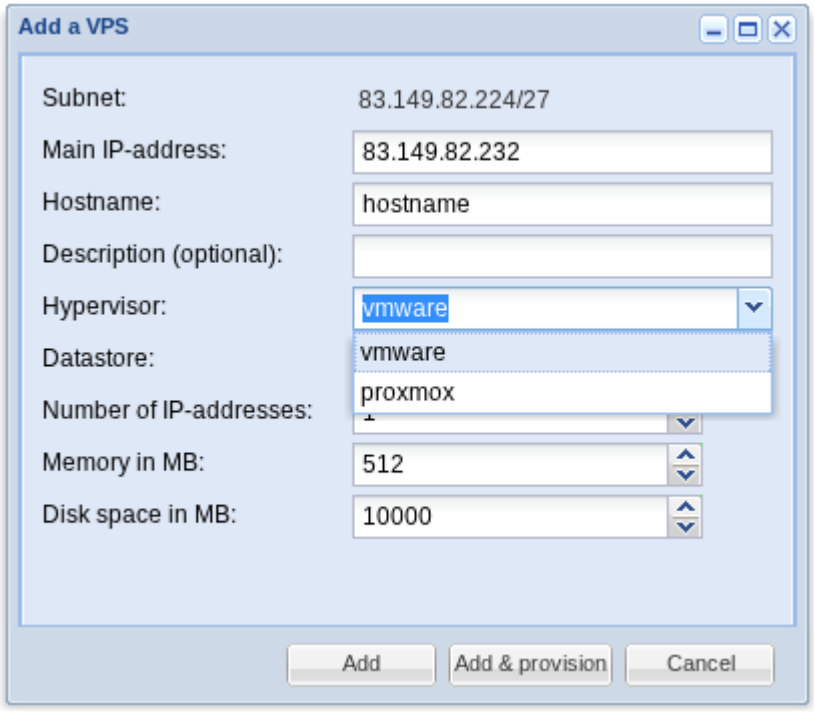
Instead of adding physical servers to the system, it is also possible to let NOC-PS create new virtual machines on a Vmware vSphere, Xenserver HVM or Proxmox node.



1. Go to “start” → “devices”, press “add” and add your hypervisor nodes to the NOC-PS system first.

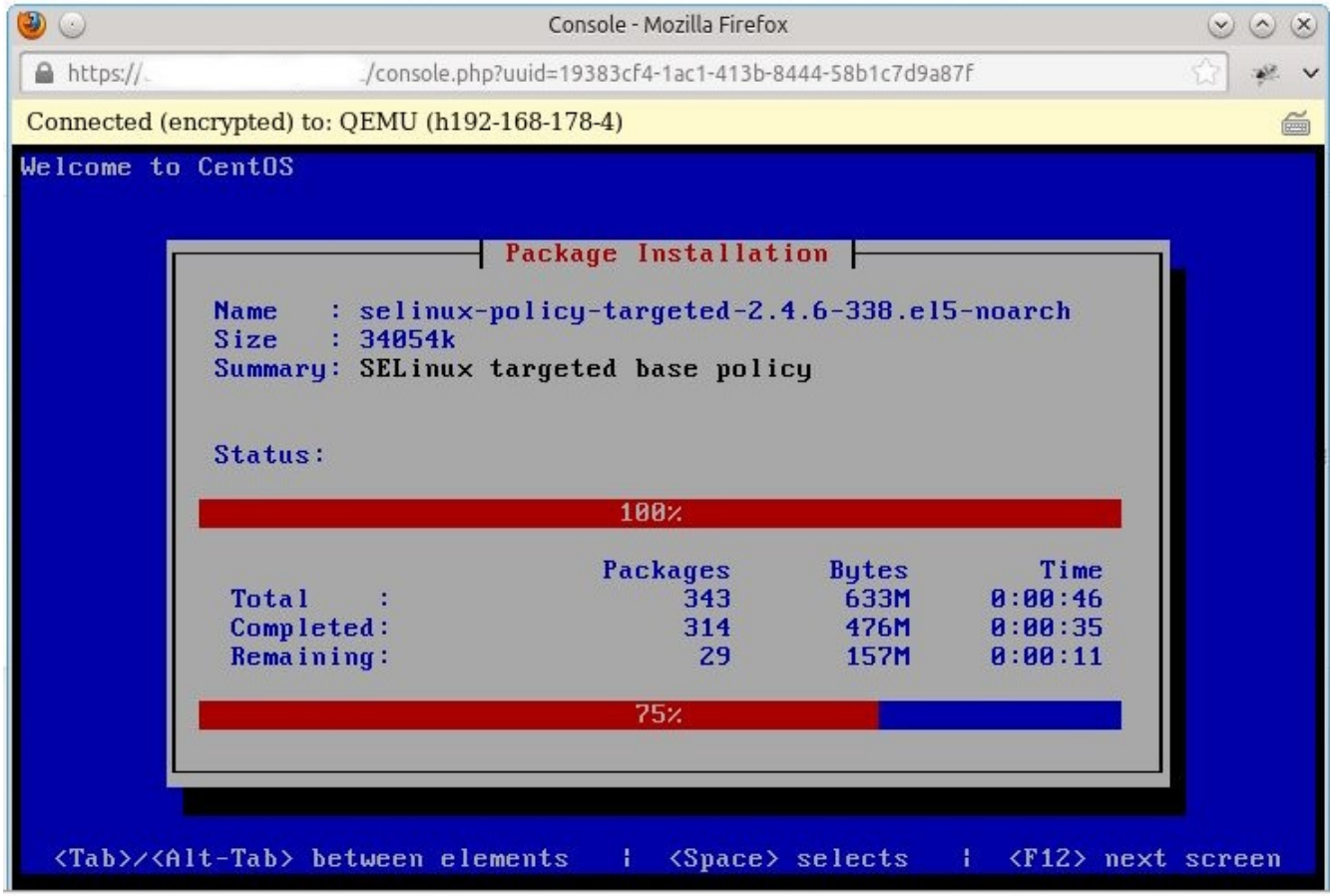


2. To create a new VPS: go to “start” → “servers”, press the arrow down symbol to the right of “Add” and select “VPS”



3. Enter the network information, hostname, description of the VPS.
4. Select the “hypervisor” node you want to create the new VPS on.
5. And enter the virtual hardware specifications such as “memory” and “disk space”
6. Press “add” to just create the new VPS, and “add & provision” if you wish to install an operating system on it straight away.

Console functionality



– Go to “start” → “servers” → select a server → press the “console” button, to view the server's console.

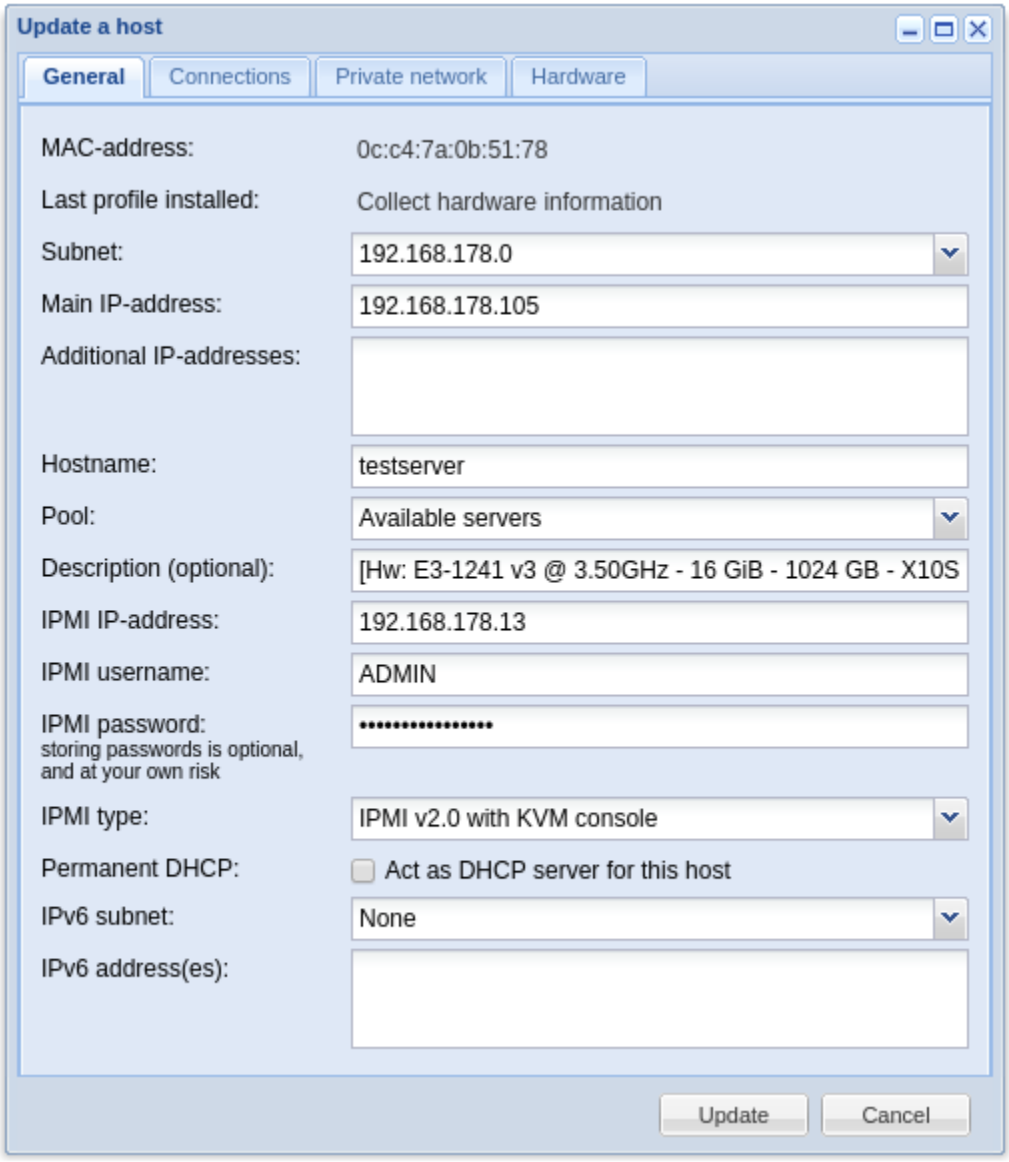
This functionality is available for all virtual machines, and a limited number of physical server models.

The problem with dedicated server support is that the console functionality is not part of the core IPMI specification, but vendor specific.

Server properties

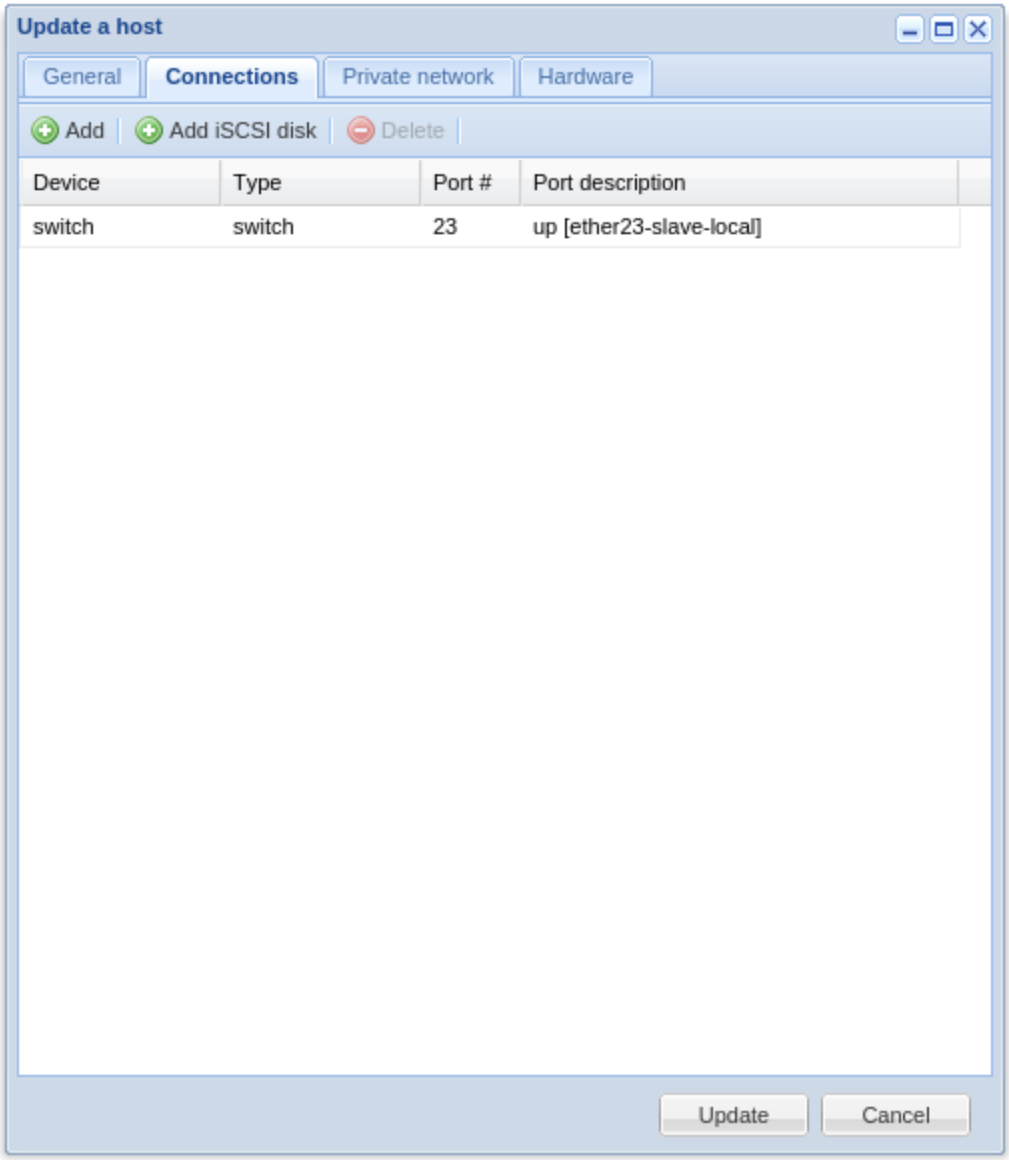
By going to “start” → “servers” → select a server → press “properties” button, you can edit the server's properties.

General



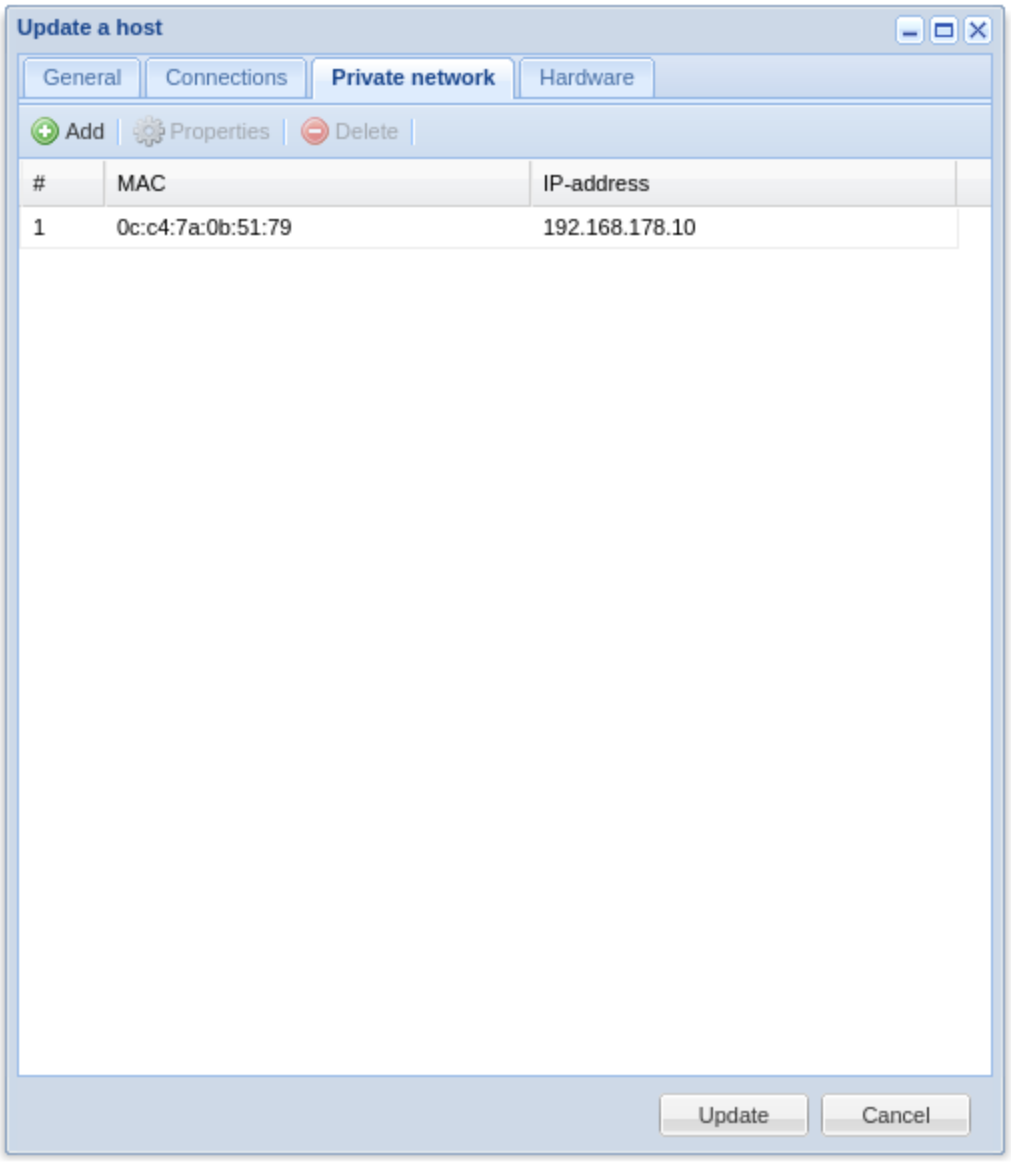
In the “General” tab one can set network settings, and optionally save the IPMI password in the system.

Connections



In the “Connections” tab one can create connections to devices such as Ethernet switches (for data traffic graphing), and remote power switches (for automated rebooting).

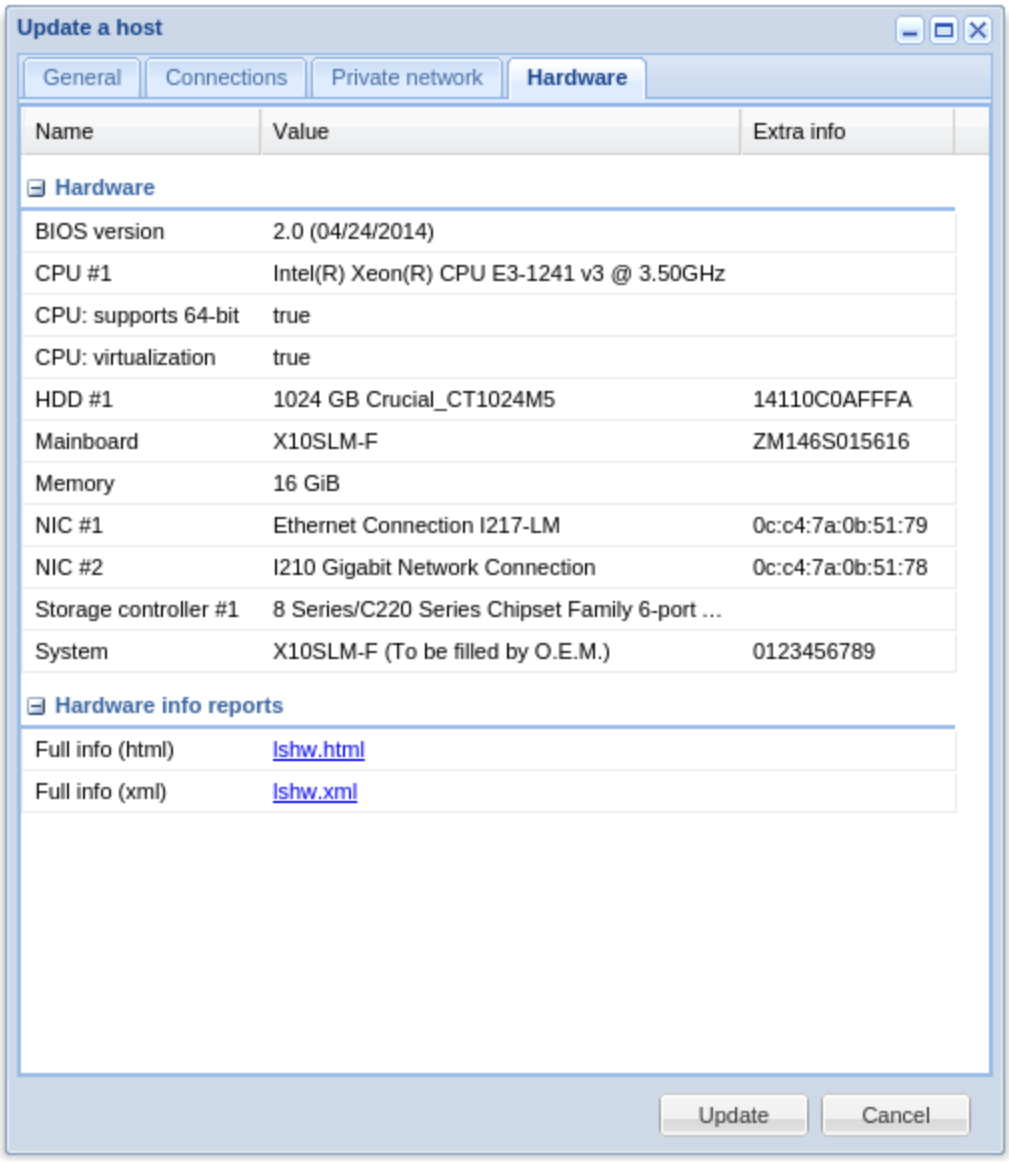
Private network



In the “private network” tab, one can assign IP-addresses to secondary network cards.

Note that despite the tab being labeled “private network”, you can also set your “public network” settings here if you choose to use a “private network” as your main network for provisioning.

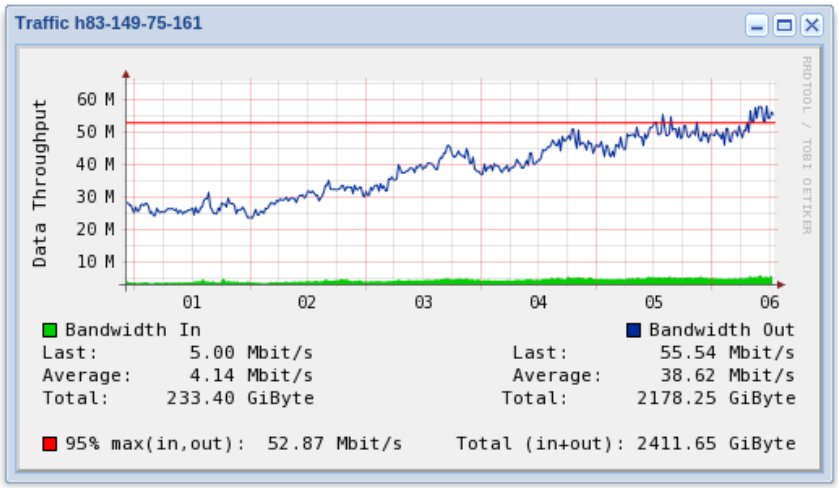
Hardware information

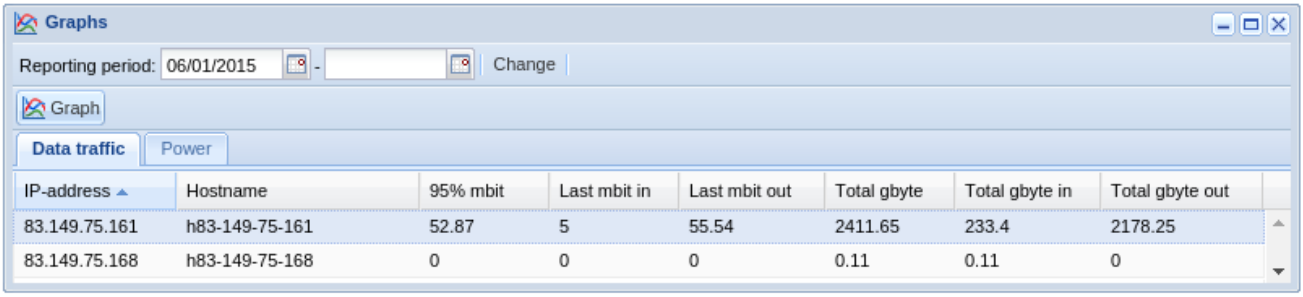


You can let NOC-PS collect hardware information of the systems by provisioning a server with the “Collect hardware information” profile.

The results will then be displayed in the “hardware tab” of the server properties.

Data traffic graphs



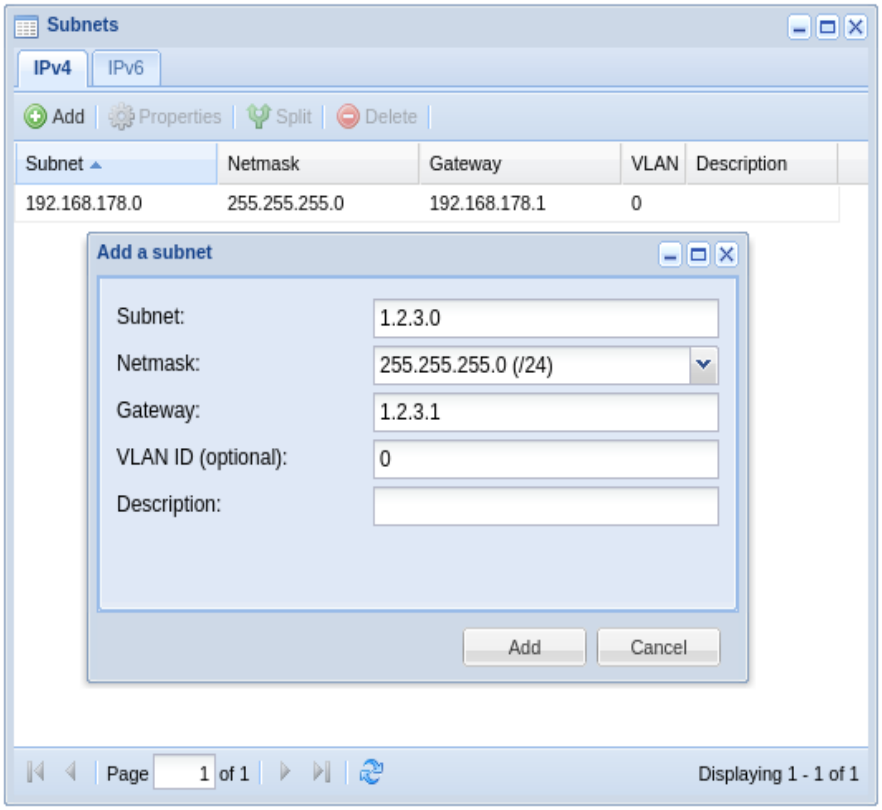


Under “start” → “data traffic” data traffic statistics and graphs can be displayed.

This does require that the servers have been associated with an Ethernet switch port in the server properties first.

Adding additional subnets

To add additional subnets to the system:



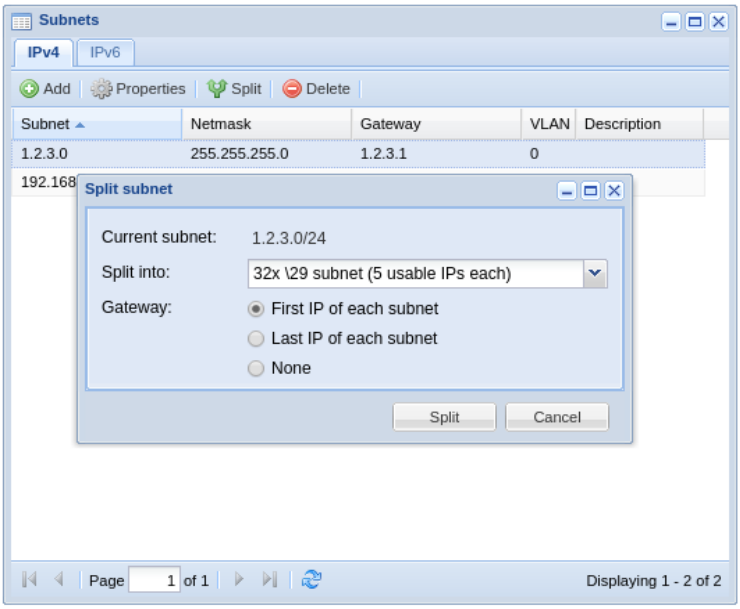
1) go to “start” → “subnets”.
2) click on “add”
3) enter the network IP-address, the “netmask and “gateway” and click “add”

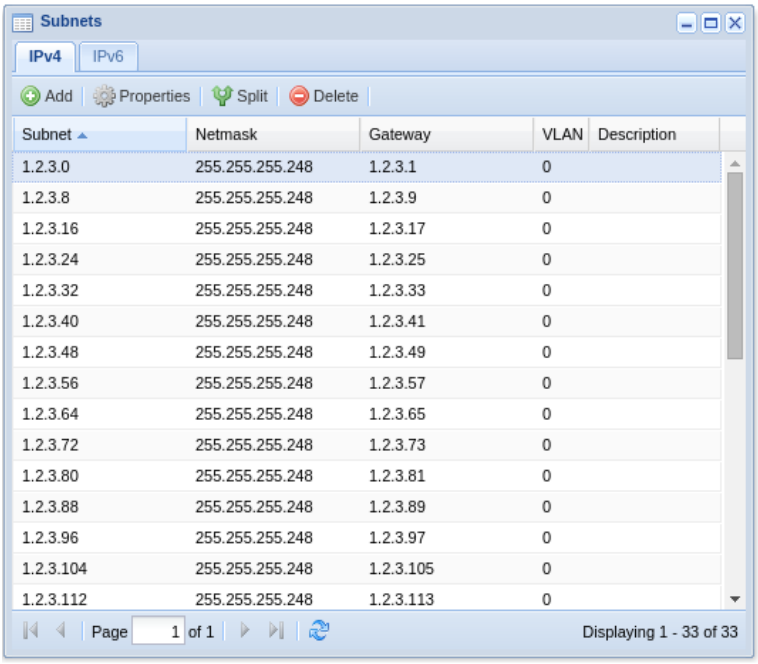
Entering a VLAN ID is optional and only used to match Ipv4 subnets to Ipv6 subnets.

Note that if the “subnet” resides in another VLAN than the NOC-PS system, you have to configure your router to use DHCP relaying, to forward DHCP requests to the NOC-PS system.

Usually that is a matter of adding a one-liner like “ip helper-address 1.2.3.4” to the configuration, where 1.2.3.4 is the NOC-PS IP-address.

Splitting subnets





It is also possible to add a bigger subnet to the system first, covering your network, and use the “split” subnet button, to split it into smaller subnets.

Adding Windows support (not available in Lite edition)

NOC-PS provides support for Windows server 2008, 2012 and later versions.

However due to licensing issues we cannot ship the necessary installation files, with the NOC-PS software.

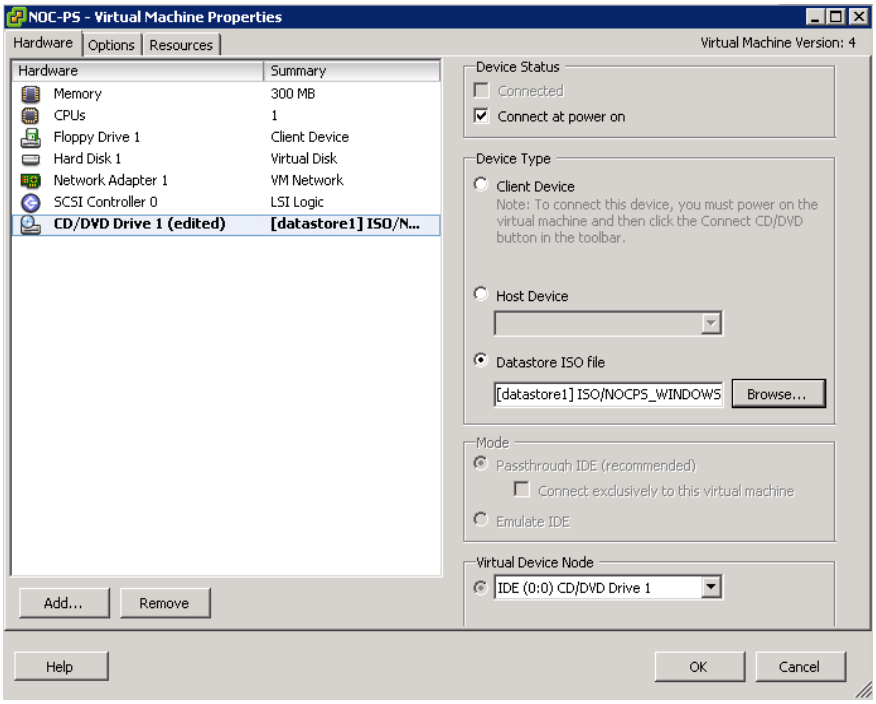
To add Windows support, you need to insert a Windows ISO into the virtual DVD drive of the NOC-PS virtual machine

You can either:

- Upload the ISO to the Hypervisor (e.g. VMware)

OR

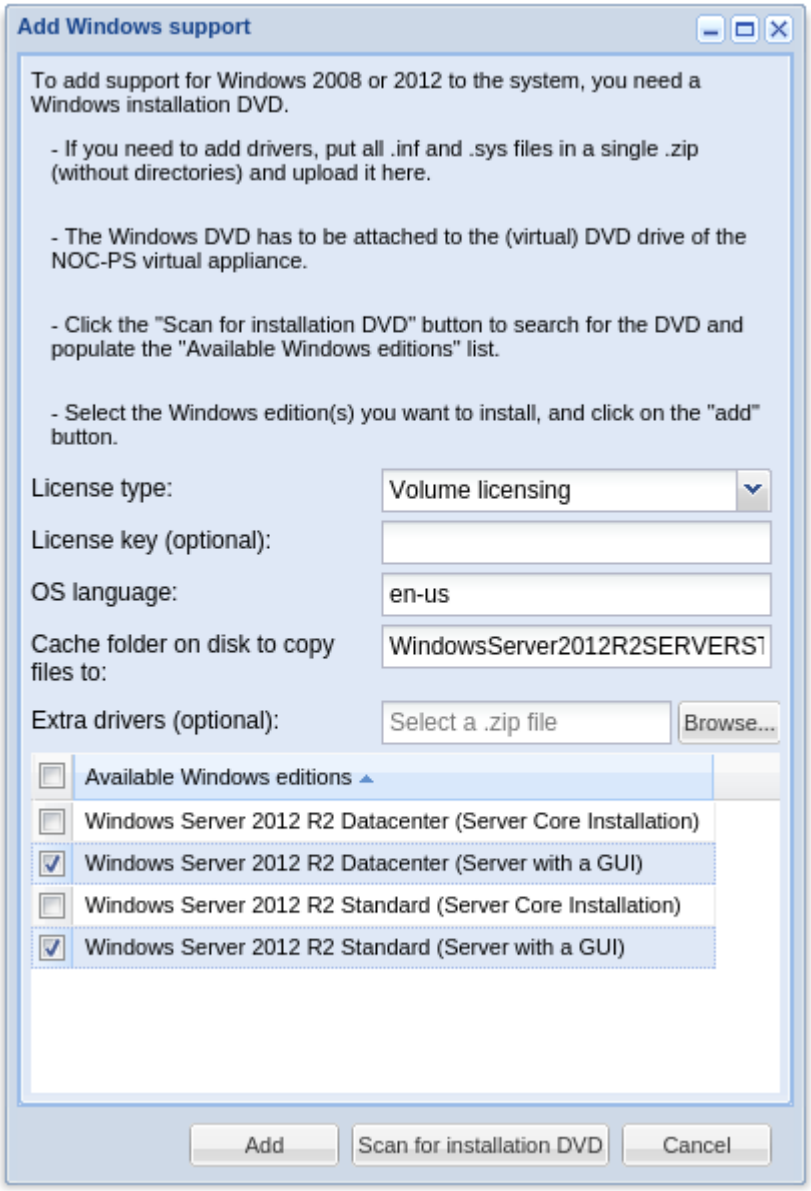
- Burn it to DVD and put the DVD in the Hypervisor server.



Assign a virtual DVD drive to the virtual machine running the NOC-PS software.

(Vmware: under “Vmware virtual machine properties”: “add” → “CD/DVD drive”)

Tell NOC-PS to copy the files from the ISO image:



1. Go to “Start” → “Profiles”
2. Click on “Add windows”
3. Enter your license number, select the Windows editions you would like to add, and click on

"Add"

Alternatively: you can leave the license number field blank, and add the license numbers manually to the provisioned servers after installation.

Limitations:

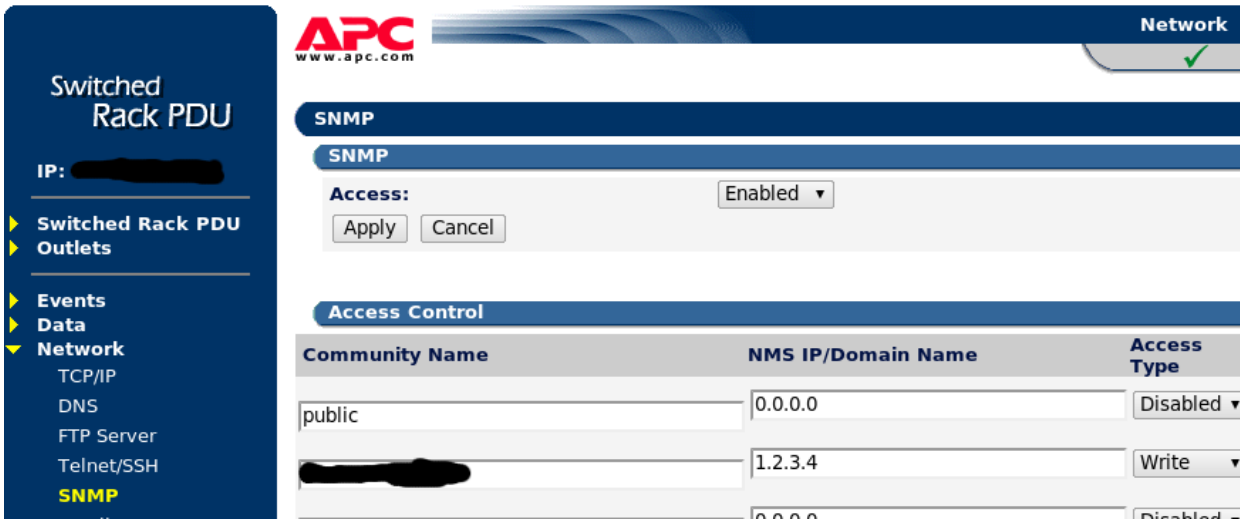
- The hardware of your servers should be supported out-of-the-box by Windows.

  While it is possible to add additional drivers, it is not guaranteed to work in all cases, and no support can be given by us on this.

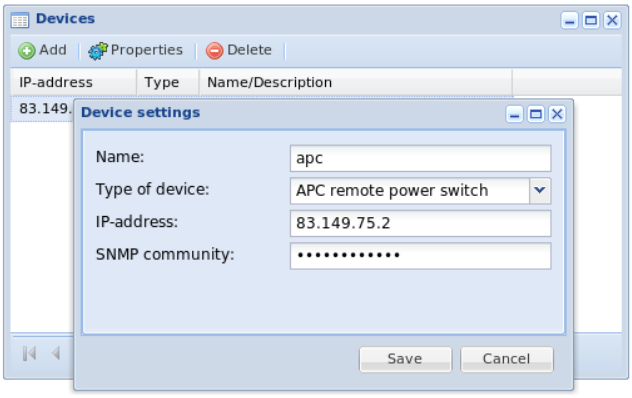
Support for APC switching PDUs

In addition to using IPMI, it is also possible to automatically reboot systems using an APC switching Power Distribution Unit, which can turn the power of the system, off and on again.

First you need to configure SNMP access in the webinterface of your APC PDU:

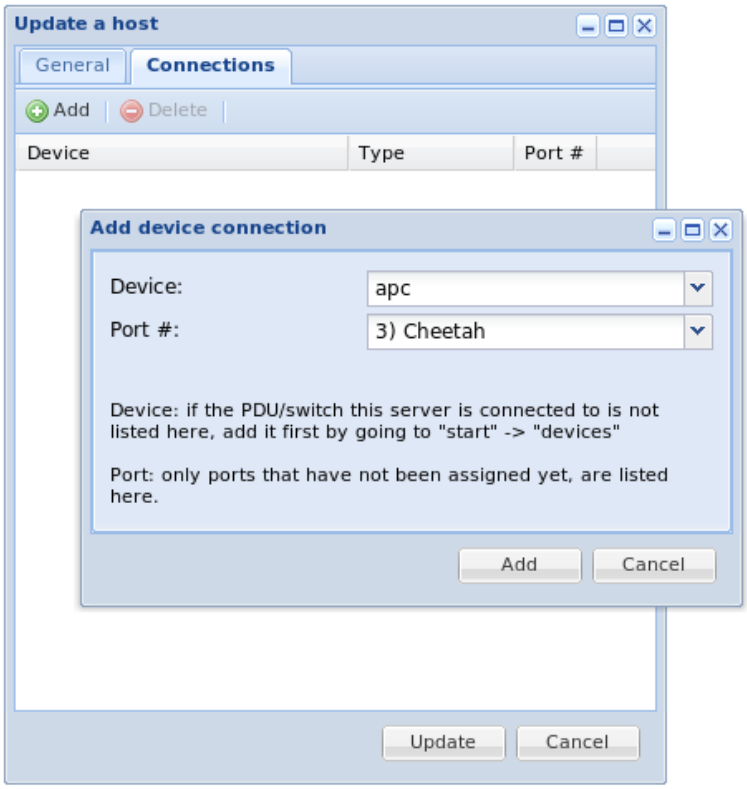


1) Go to “Network” → “SNMP”. Make sure “access” is “Enabled”
2) Under “access control” in the same window, enter a secret community name, the IP-address of the NOC-PS appliance, and select “access type” “write+”. Now “apply” the configuration.



3) In the NOC-PS interface, go to “start” → “devices”, and press “add”. Enter a friendly name for your device (e.g. “APC unit 123”), “APC remote power switch” as type, the IP-address of the device, and the secret community name. Finish by pressing “save”

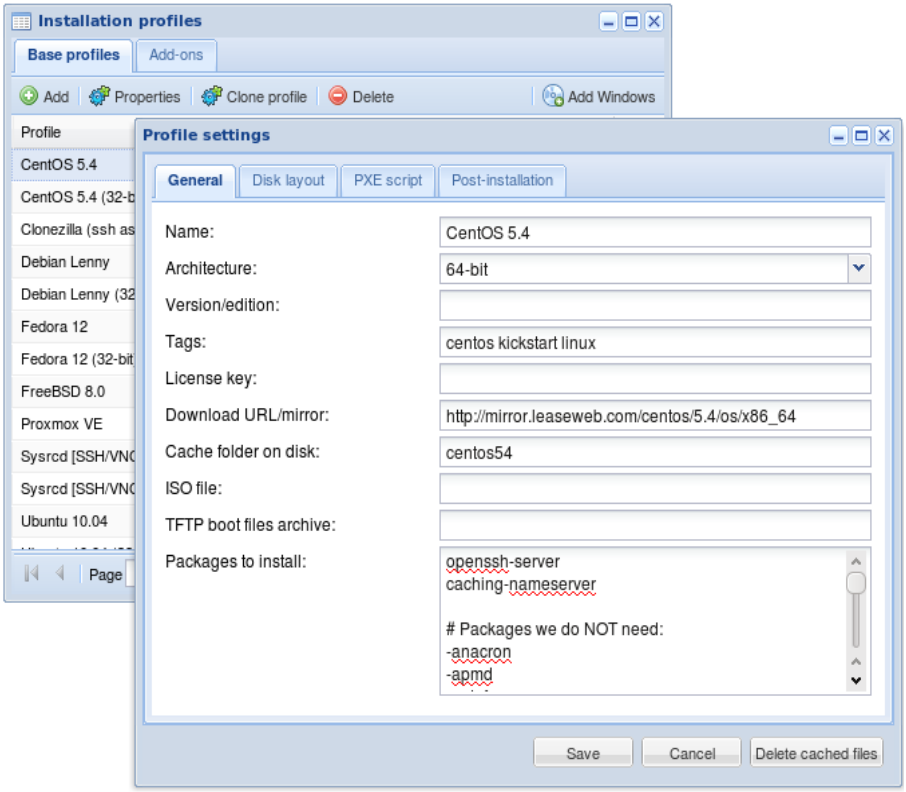
You now need to assign the ports of the power switch to individual servers:



- Go to “start” → “servers”. Select an individual server, and press “properties”
- Under the tab “Connections”, click on “Add”. Select the device from the list, and choose the port number.

Profile settings

To change the profile settings:



1) Go to “start” → “profiles
2) Select the profile you wish to update and select “properties”

The following information is listed here:

Name	Name of profile
Architecture	Meant for 32-bit or 64-bit systems.
Version/edition	If an operating system has multiple editions, the desired edition is

	entered here.
Tags	Tags seperated by spaces. Tags are used to determinate which add-ons are related to this profile.
License key	License key (if necessary)
Download URL/mirror	Location where the installation files of the operating system can be found.
Cache folder on disk	Folder on disk where the installation files will be cached. Using the button “delete cached files” you can delete stale files.
ISO file	If a location of an ISO file is supplied. The file will be downloaded, extracted and its contents placed in the cache folder.
TFTP boot files archive	If a location of an archive file (for example .tar.gz) is supplied, its contents will be extracted in the TFTP boot folder.
Packages to install	Which software packages to install.
Tab “disk layout”	Partition layout. Format is specific to each operating system.
Tab “PXE script”	PXE boot script. You can enter specialized kernel parameters here.
Tab “post-installation”	Post-installation script that is executed at the end of installation.
Tab “first boot”	Script that is executed after installation on first boot.

Adding and cloning profiles

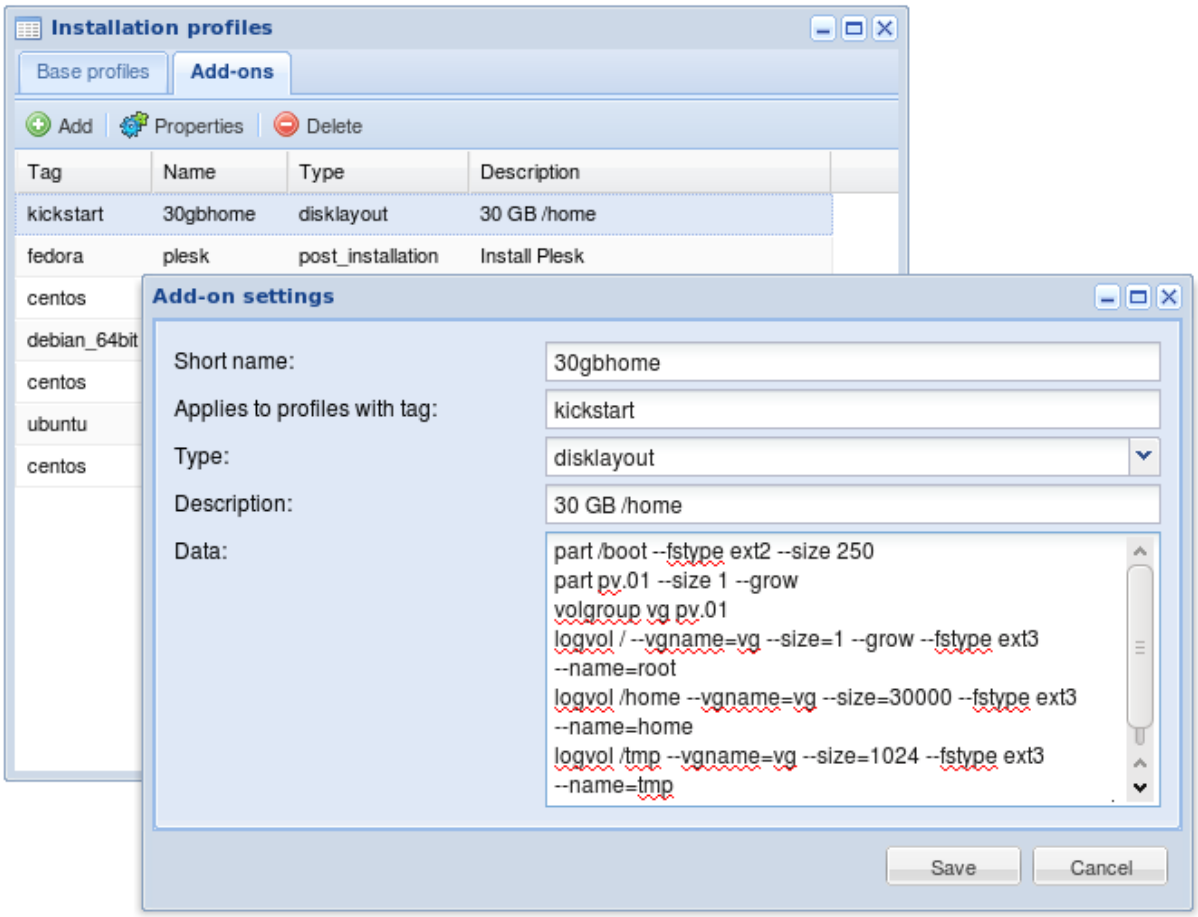
To create a new profile, click “add”.

To base your new profile on an existing profile, click “clone”.

Add-ons

Instead of creating an entire new profile, it is also possible to add small optional modifications to an existing profile, using add-ons.

For example you can use add-ons to specify a custom disk layout, or a post-installation script that installs additional software.



Creating “add-ons” is done under the tab “add-ons” in the window “profiles”

Each add-on is associated with a tag, to determinate to which profiles it is related. E.g. by using the tag “linux” the system knows this add-on applies to all Linux distributions.

Using the tag “kickstart” it only applies to distributions that support the “kickstart” installation mechanism, such as CentOS, Fedora or Ubuntu.

Import data from external system or database.

You can integrate the NOC-PS system with your own software using our XML-RPC or JSON-RPC API.

PHP examples can be found on the NOC-PS website, under “downloads”

Installing a SSL certificate

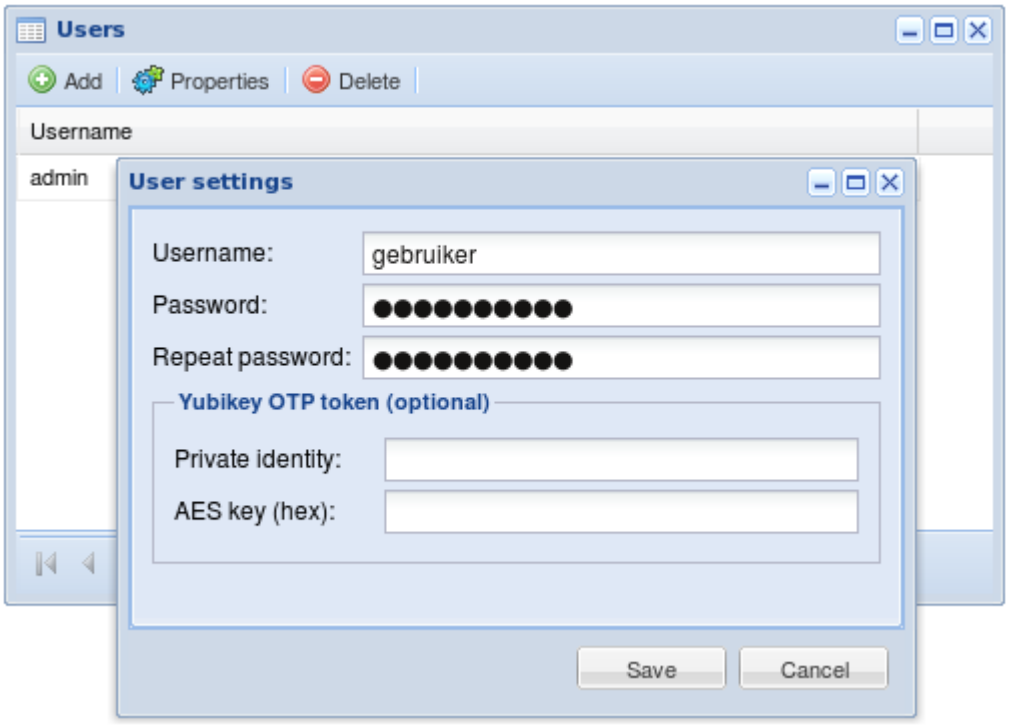
You can add a proper SSL certificate to the NOC-PS webinterface.

1) Go to “start” → “Misc settings”
2) Go to the tab “SSL”, press the “Generate CSR” button to generate a certificate signing request (CSR), and enter the hostname you like to use for NOC-PS.
3) Use the generated CSR file to purchase a certificate from a certificate authority such as RapidSSL.
4) Upload the issued certificate file to NOC-PS.

If you have a wilcard certificate (*.provider.com) for use by multiple websites, you can also install that. In that case you do not generate a new CSR, but upload your existing private key and certificate files.

Creating users

You can give multiple users access to the system.



1) Go to “start” → “users”
2) Click “add” and enter the requested username and password.

Warning: the NOC-PS webinterface is meant to be used by administrators only, and as such all users have full administrative rights.

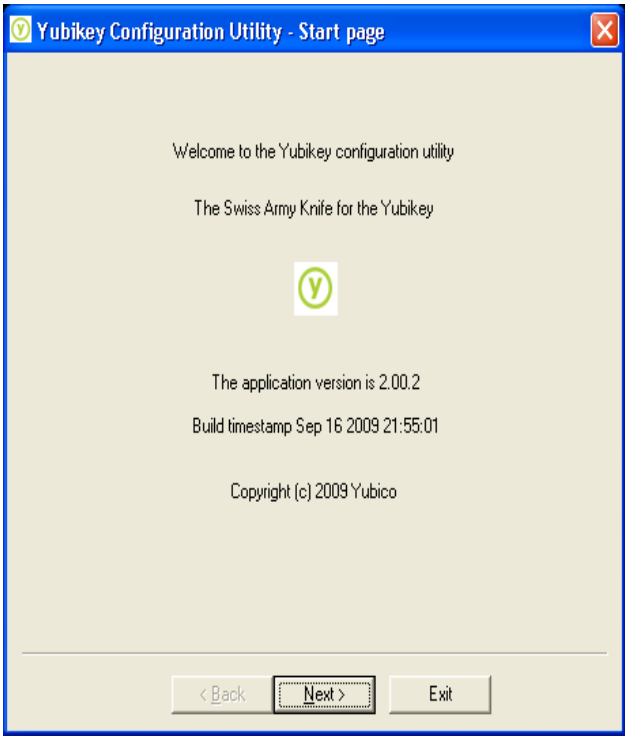
You must integrate our API in your own billing portal if you wish to provide end-users the ability to only manage their own systems.

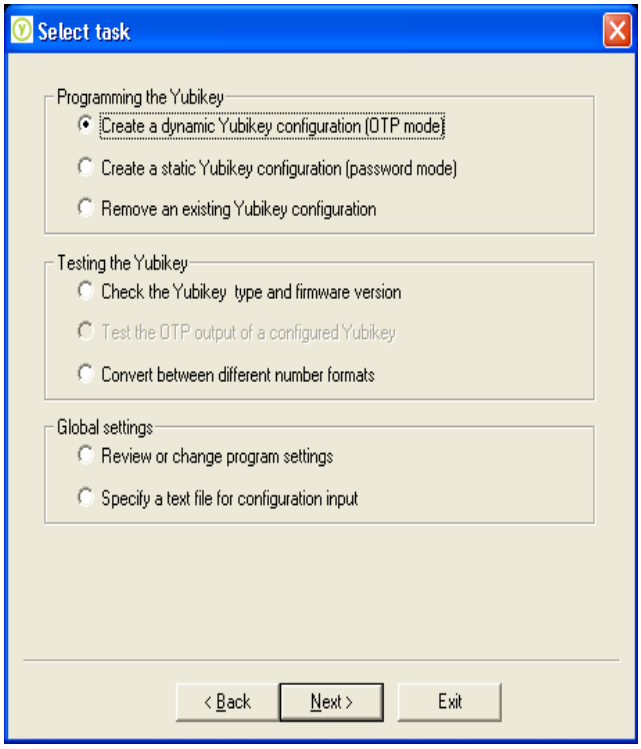
Programming and configuring Yubikey OTP tokens

For additional security it is possible to require the use of Yubikey OTP tokens in addition to normal password authentication.

First you need to program a shared secret into the Yubikey configration Utility.

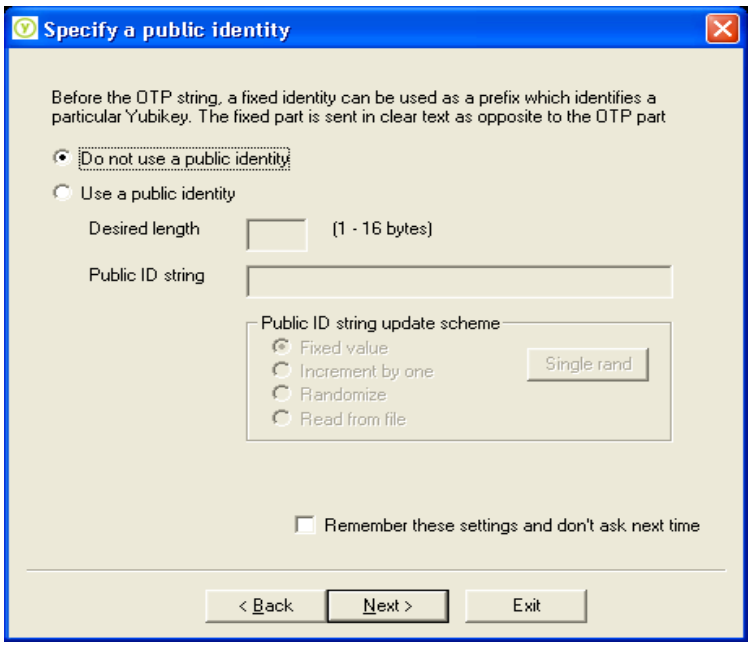
1) Download and install the Yubikey configuration utility:
   http://www.yubico.com/developers/personalization/



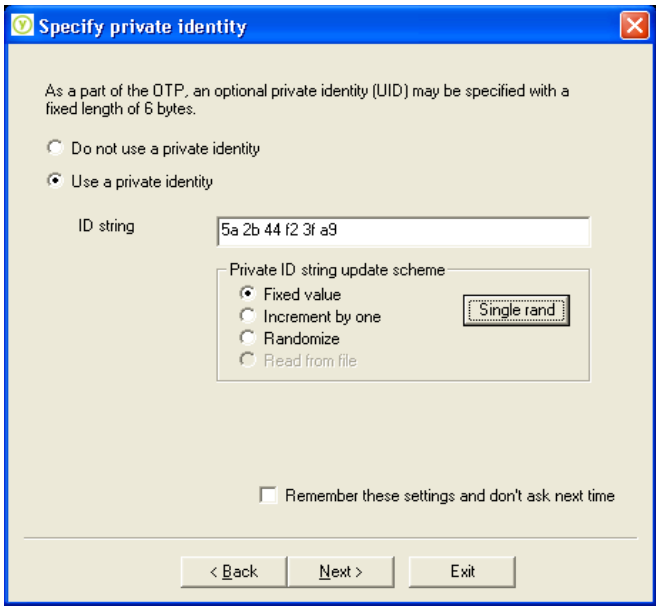


2) Start the configuration utility, and click “next”

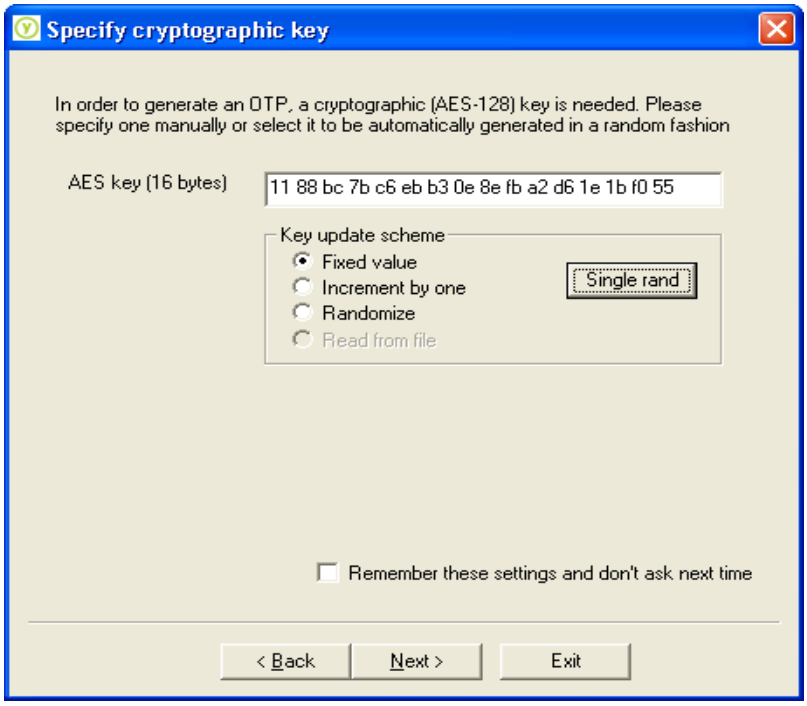
3) Choose “create a dynamic Yubikey configuration (OTP mode)” and click “next”



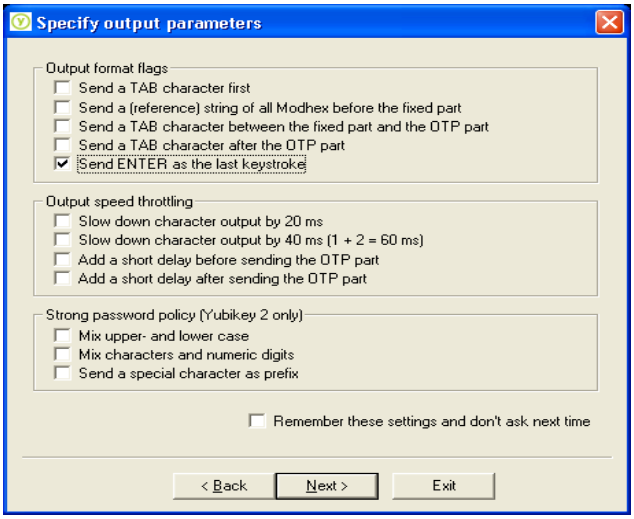
4) Choose “do not use a public identity” and click “next”



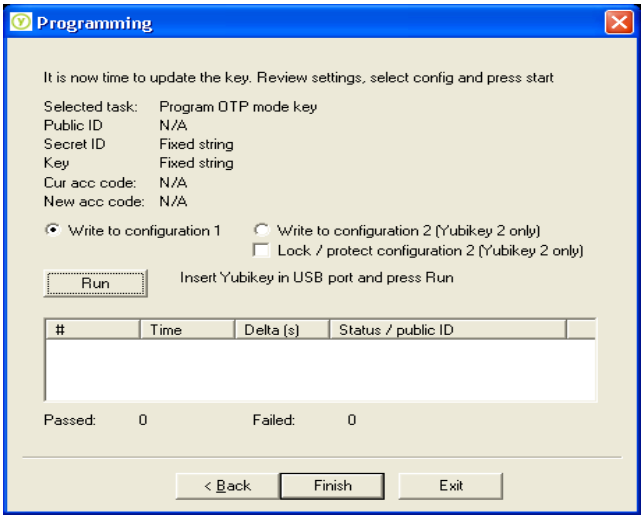
5) Choose “use a private identity”, select “fixed value” and press “single rand” to get a random value. Copy or write down the “ID string” (in this example: 5a 2b 44 f2 3f a9), and click “Next”



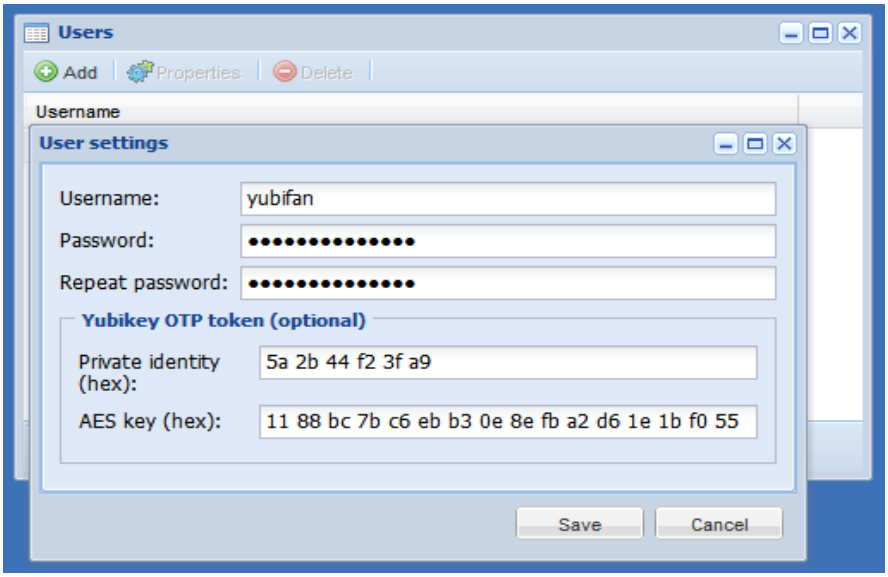
6) Select “key update scheme” “fixed value” and click “single rand” to configure a random key. Copy or write down the “AES key”, and click “next”



7) In the output parameters select “Send ENTER as the last keystroke” → “Next”



7) Press the “run” button to program the token.



8) In the NOC-PS control panel, go to “Start” → “Users”. Select a user, and click on “properties” to edit the settings, and enter the private identity and AES key you wrote down.

Logging in with Yubikey

From now on, you will have to use the Yubikey to login.
First you enter your username and password as usual.

And then you press the button on the Yubikey OTP token, when prompted, to complete sign-in.