User's Manual

PowerShield³ for VMWare Esxi 5.x and up to 6.5 vMA installation and setup

Doc name: RM930 Rev04 (VMware ESXi 5.x_6.x)
Release date: 17/07/2019

Contents

1 Introduction

RPS Spa has tested these scripts in a 5.5 and 6.0 VMware environment.

RPS Spa assumes no liability or warranty for any damage caused by the use of these scripts in your VMware environment.

IMPORTANT!
To be able to perform a vMotion, an Enterprise Plus license must be present in the **VMware ESXi**:

Enterprise Plus license

To operate the vMotion the script uses DRS (Distributed Resource Scheduler) VMware feature which automatically moves VMs when a host is put in Maintenance mode.

ALL OPERATIONS MUST EXCLUSIVELY BE CARRIED OUT BY QUALIFIED AND TRAINED PERSONNEL.

2 Installation of the “vSphere Management Assistant”. Following called vMA

1. Download the vMA you need from www.riello-ups.com

2. Unzip the vMA Virtual Application Package.

3. Start the VMware Infrastructure vSphere Client:

   Choose File > **Deploy OVF Template…**
   Select **Browse**
   Choose Open Virtualization Format (OVF) and select “Next”
   Perform the complete Installation.
   If the message “NO NETWORKING DETECTED” displayed, please configure your network via console using “yast2”.

4. The **default user** is “**vi-admin**“. To get the **password** please refer to the “**Overview**” tab and the “**Comments**“-window in the “**vSphere Client**“.
   After login please enter: **sudo su [Enter]**

   Enter again the vi-admin password to obtain the permanent "root" rights.

3 References for vSphere Management Assistant (vMA)

1. The vMA is for DHCP configured. On “**https://[ip-number]:5480**“ you can configure a static IP-address if required. On the pages below there is described the alternative configuration with “yast2“.

2. To add your "vCenter Server" **OR** your "host(s)" please use the following command:

   vifp addserver <ip-number> or

   vifp addserver <hostname> or

   vifp addserver <ip-number> --username name or

   vifp addserver <hostname> --username name

   Example: vifp addserver 10.10.10.10

   vifp addserver 10.10.10.11 or

   vifp addserver esx-host10.domain.local --username vma_user

   vifp addserver esx-host11.domain.local --username vma_user

   Notice: You need the respective administrator or user passwords.
   If you add your host(s), then the last host must be the vMA host!

   Notice: It is not possible to add “vCenter Server” **AND** one or more host(s)!

   Notice: If you add a vcenter_vma (virtual not physical) with vifp command (the vcenter is in the top of the vsphere tree) and you have the DNS as a virtual machine inside one of the hosts of the vcenter, you need to set the file /etc/hosts. This is due to the reason that the DNS would shut down before the host where riello_vma is running, before the riello_vma itself, before the host where vcenter is running and before the vcenter_vma itself

3. To test your configurations please enter:

   vifptarget –s <ip-nummer>

   Example: vifptarget –s 10.10.10.10

   Notice: To disconnect please use “vifptarget –c**“**

4. To list all added servers please use:

   vifp listservers --long

   Example answer:
   10.10.10.10 vCenter fpauth
   or
   esx-host.domain.local vCenter fpauth
   or
   10.10.10.11 ESXi fpauth
   10.10.10.12 ESXi fpauth
   or
   vma-host11.domain.local ESXi fpauth
   vma-host12.domain.local ESXi fpauth

5. To delete a host from the list please use:

   vifp removeserver <ip-number>

   or

   vifp removeserver <hostname>

   Notice: It's possible to add your "vCenter Server" OR your "host(s)" also following the step by step instruction when you run "./install" as described in paragraph nr 7 below.
   In case you have already added "vCenter Server" OR your "host(s)" using the above paragraph nr 3, you don't need to add it again using step by step procedure described in praragraph nr 7 below and you can skip this configuration point in "./install" procedure simply pressing enter

4 VMware ESXi Server Configuration

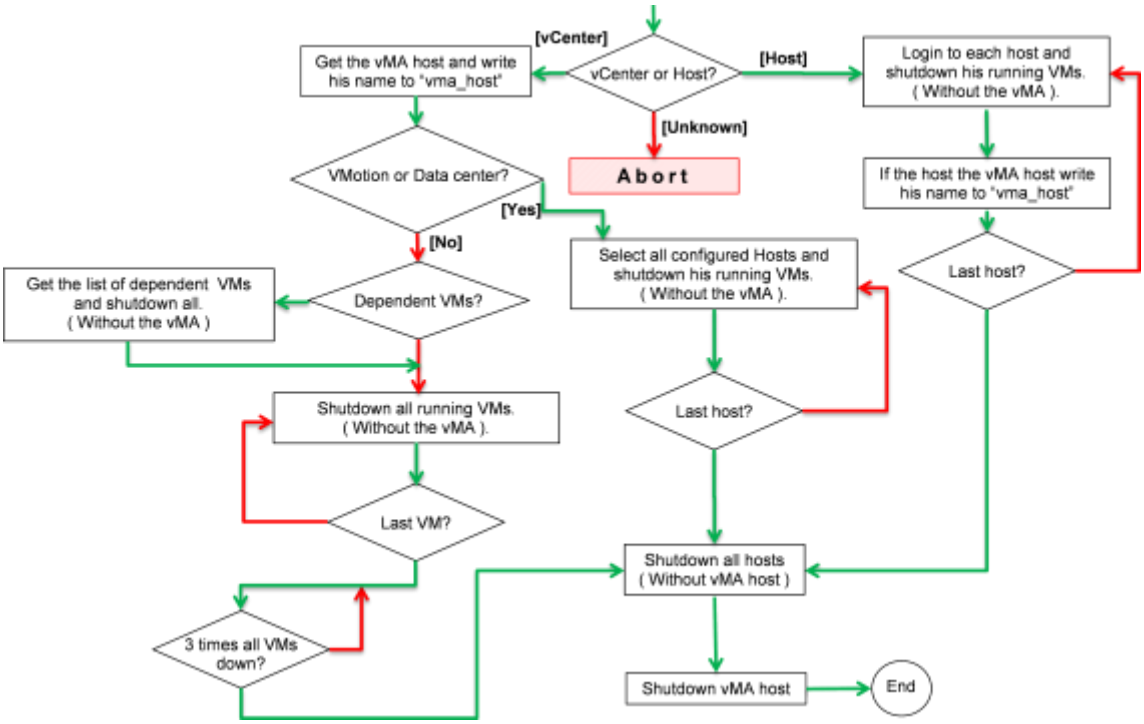
If using a "vCenter Server" and administering more than one datacenter, the "vCenter Server" must not be a virtual machine!

It is possible to make an interaction between the physical and virtual systems; however, on each virtual machine must be VMware Tools installed. You can download the corresponding instructions using the following link:
http://www.vmware.com/pdf/osp_install_guide.pdf

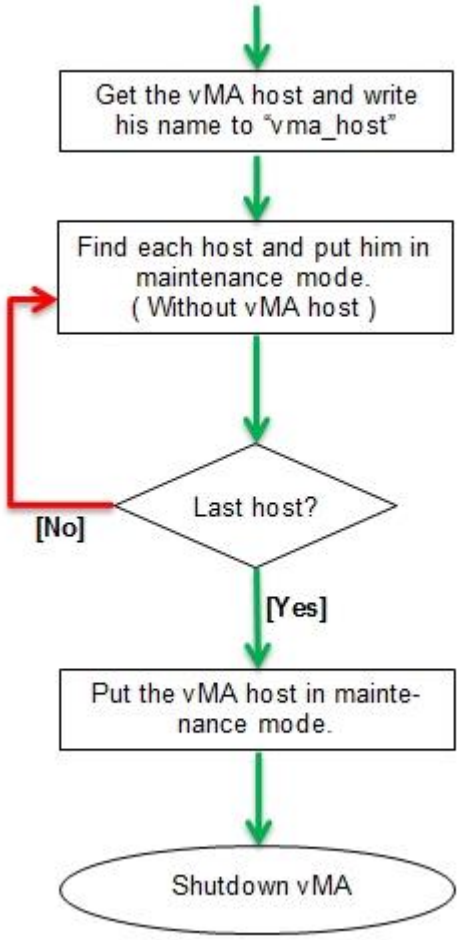
Helpful VMware references:
ESXi- und vCenter Server 5-Documentation
Getting Started with vMA

ESXi- und vCenter Server 6.0-Documentation
Getting Started with vMA

5 Flowchart of shutdown scenario



6 Flowchart of maintenance scenario



7 Configure UPS-Software and Scripts

1. Start the script "**./install**" located in "**/home/vi-admin**" directory and follow the instructions. Two files will created, when you will complete the procedure: "**ups_conf.sh**" and "**ups_conf.pl**" in "/**opt/upsmon**". Described below is the description of each variable of both files.

2. Configure **PowerShield^3/Upsmon**
   If you did not set Powershield^3/Upsmon using the step by step procedure given by "**./install**" then you can set it manually. "**./install**" will ask "configure ups parameters (yes/no).
   Notice: Download the manual using the following link manual

3. Description of "**/opt/upsmon/ups_conf.sh**"

The central parameters / variables for the **shell** environment are stored in this file.

Notice: Please ensure correct spelling and case sensitivity, if you enter vCenter-, Host- or VM-names!

At the end of this document is a description of the most important commands for the Linux editor "**vi**".

If you want to change some of the parameters, you can edit "**ups_conf.sh**" or "**ups_conf.pl**" file using **vi** or you can run the command "**./install**" again. If run "**./install**"you can press enter to skip the variables you don't want to modify

Variable	Type	Description
test_mode	String	Run this script in test mode [yes/no]? Default "**[yes]**" **Notice:** If test_mode "yes", it's possible to execute manually "/opt/upsmon/ups_shut.scr" to write the log file "/opt/upsmon/event.log".
vma_name	String	The name of the vMA you have configured in "vSphere Client". **Absolutely necessary!**
vm_delay	Decimal	Delay in seconds to give VMs time for shutdown. Default "**[15]**"
vm_repeat	Decimal	Number of repetitions by "vm_delay". Default "**[3]**"
v_center	String	Is a "vCenter Server" available [yes/no]? Default "**[no]**"
v_center_name	String	Only requested if v_center = „yes" If a "vCenter Server" is installed and is it a virtual machine, then enter the name given in "vSphere Client". Otherwise, enter "no". Default "**[no]**"
datacenter	String	Only requested if v_center = „yes" If you have different UPS's supplying the system, one for each data center for example, you have to add all the hosts present in that data center feeded by that UPS Shall more than one data center managed [yes/no]? Default "**[no]**" **Notice:** If "[yes]" then you have to install and configure a vMA also in other data center.
depend_vms	String	Only requested if v_center = „yes" There are dependent VMs [yes/no]? Default "**[no]**"
vm_name(n)	String	Only requested if depend_vms = „yes" One or more name(s) of dependent VM.
vm_delay(n)	Decimal	Only requested if depend_vms = „yes" One or more delay(s) in second to shut down next VM.
vmotion	String	Only requested if v_center = „yes" Is VMotion configured and activated [yes/no]?
maintenance_delay	Decimal	Only requested if vmotion = "yes" Delay in seconds till "ups_shut.scr" is stopped or waiting for return from "upsHostMaintenance".
extern_ups_ip	String	Only requested if vmotion = „yes" One or more (max 4) IP-addresses for monitoring UPSs in the other/second data center. **Example:** extern_ups_ip[0]="10.10.10.10" extern_ups_ip[1]="10.10.10.11"

Variable	Type	Description
ups_community	String	Only requested if vmotion = „yes“ The SNMP Community for read/get access. Default “**[public]**“ Default “**[no]**“
domain	String	Are domain controllers physical Windows systems [yes/no]? Default “**[no]**“
dc_system	String	Only requested if domain = „yes“ One or more IP-addresses of physical domain controllers which are also to be shutdown. **Example:** dc_system[0]=“10.10.10.20“ dc_system[1]=“10.10.10.21“
windows	String	There are physical Windows systems [yes/no]? Default “**[no]**“
windows_system	String	Only requested if windows = „yes“ One or more IP-addresses of physical Windows systems which are also to be shutdown. **Example:** windows_system[0]=“10.10.10.30“ windows_system[1]=“10.10.10.31“
unix	String	There are physical Unix systems [yes/no]? Default “**[no]**“
unix_key	String	Only requested if unix = „yes“ Path and name of the ssh-keygen file.
unix_user	String	Only requested if unix = „yes“ Name of shutdown user
unix_system	String	Only requested if unix = „yes“ One or more IP-addresses of physical Unix systems which are also to be shutdown. **Example:** unix_system[0]=“10.10.10.40“ unix_system[1]=“10.10.10.41“
linux	String	There are physical Linux systems [yes/no]? Default “**[no]**“
linux_key	String	Only requested if linux = „yes“ Path and name of the ssh-keygen file.
linux_user	String	Only requested if linux = „yes“ Name of shutdown user

Variable	Type	Description
linux_system	String	Only requested if linux = „yes“ One or more IP-addresses of physical Linux systems which are also to be shutdown. **Example:** linux_system[0]=“10.10.10.50“ linux_system[1]=“10.10.10.51“
sendmail	String	Send alarms by mail [yes/no]? If yes, sendmail has to be configured by customer! Default “**[no]**“
mail_extern	String	Only requested if sendmail = „yes“ is the mail server external [yes/no]? Default “**[no]**“
mail_to	String	Only requested if sendmail = „yes“ Receivers mail address
mail_from	String	Only requested if sendmail = „yes“ Senders mail address Default “**[ups-vma@power.net]**“
mail_subject	String	Only requested if sendmail = „yes“ Subject of the delivered mail. Default “**[$vma_name => Shutdown system!]**“
output_normal	Decimal	Return value of SNMP request to OID upsOutputSource (**1.3.6.1.2.1.33.1.4.1.0**). Default return value for all RFC1628 UPSs are “**[3]**“ 0 = "unknown" 1 = "other" 2 = "none" 3 = "normal" <= Default 4 = "bypass" 5 = "battery" 6 = "booster" 7 = "reducer"

References: All external systems (Windows, Unix und Linux) will be shutdown prior to the virtual environment!

However, external domain controllers must be shut down at the end. Therefore, they need their own variables (“domain” and “dc_system”).

Test with following commands whether sendmail works or not:

“**/opt/upsmon/ups_eml.scr /opt/upsmon/ups.msg**“

If you do not receive an email, please look in the file:

“**cat /var/log/mail**“

whether you find a similar entry like:

“**from=<root@hostname.domain.suffix>**“

If this the case you have to edit following file:

“**vi /etc/mail/genericstable**“

Add a line like:

“root@hostname.domain.suffix<tab>receiver@domain.suffix“
“root@vma60.company.local admin@company.local“

and save the changes. Lastly you need to execute following commands:

“SuSEconfig”
“service sendmail restart“

The sendmail configuration will be set.

4. Description of "**/opt/upsmon/ups_conf.pl**"

   The central parameters / variables for the **perl** environment are stored in this file.

Variable	Type	Description

host_name	String	Only requested if v_center **and** vmotion = “yes“
		One or more hostnames to be monitored and shutdown in conjunction with a "vCenter Server" and multiple datacenters.
		Example:
		@host_name = {
		"host_one.domain.com",
		"host_two.domain.com",
		•
		•
		"host_end.domain.com",
		};
		Notice: If it is only one datacenter then leave this empty!

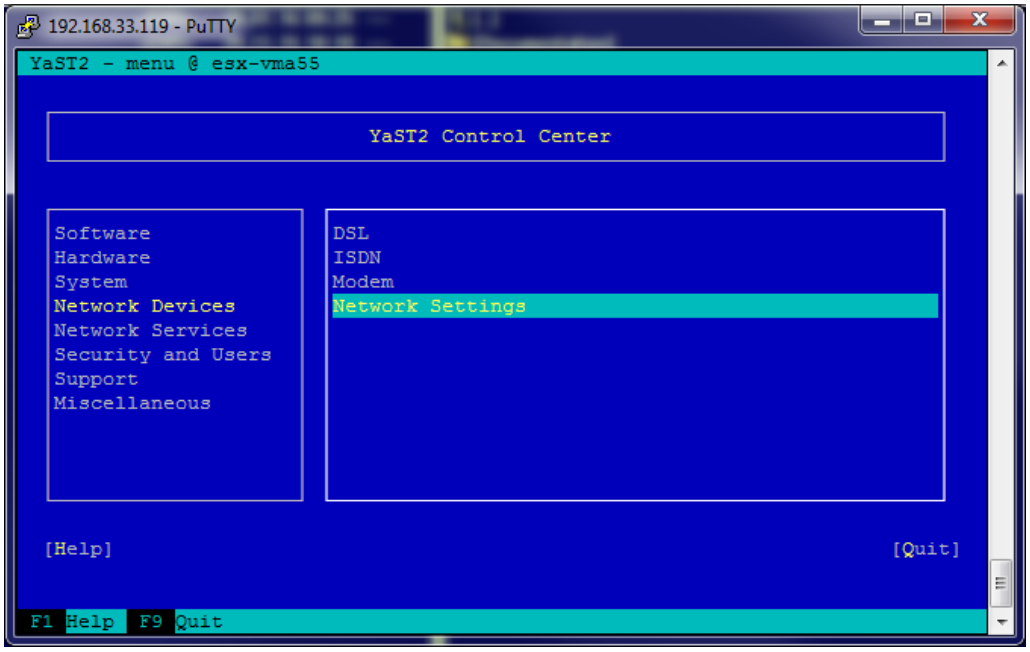
vm_depends	String
	Decimal
		Only requested if v_center **and** depend_vms = “yes“
		One or more VM names of virtual systems which must shutdown in sequence. The delay in seconds before the next system receives the shutdown command.
		Example:
		@vm_depends = {
		["1st virtual Server", 10],
		["2nd virtual Server", 20],
		["3rd virtual Server", 5],
		•
		•
		["Last virtual Server", 30],
		};
		Notice: Virtual domain controllers must always be entered as last in the table of dependent systems!

8 Run a test to check if everything is working properly

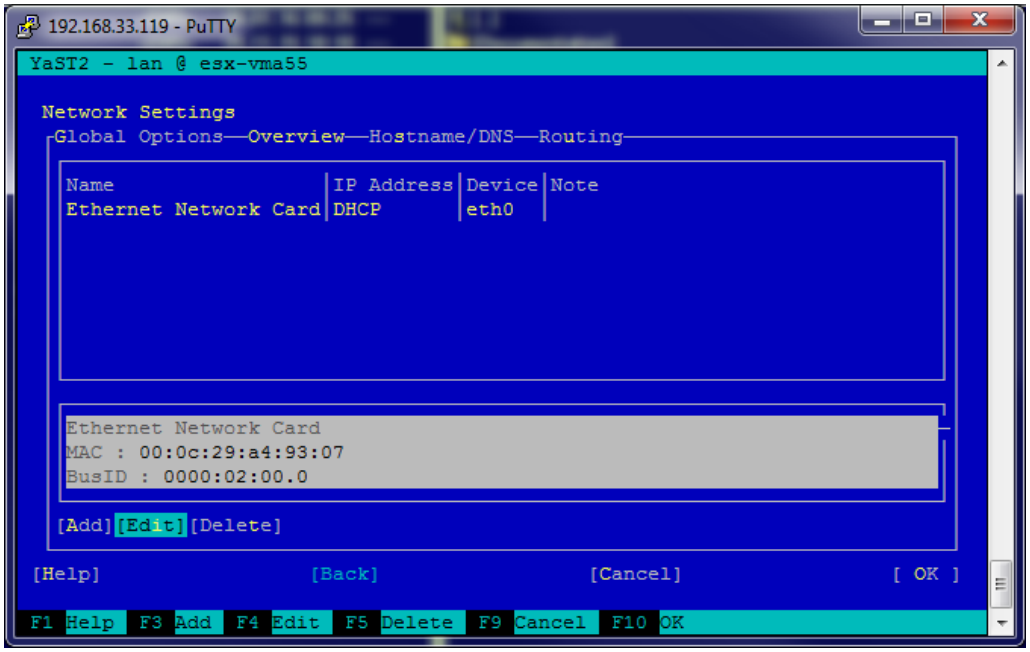
To run a test, be sure that in the file "**ups_conf.sh**" the variable "**test_mode**" is set to **yes**. If so, you can run as sudo (root) from "**/opt/upsmon**" the command "**./ups_shut.scr**".
A log file called "**event.log**" in "**/opt/upsmon**" will be created. You can check this file to see if the test shutdown has been done correctly. It will be only a test, it will be not performed a real shutdown of the system.

9 Configure the Network environment with “yast2“

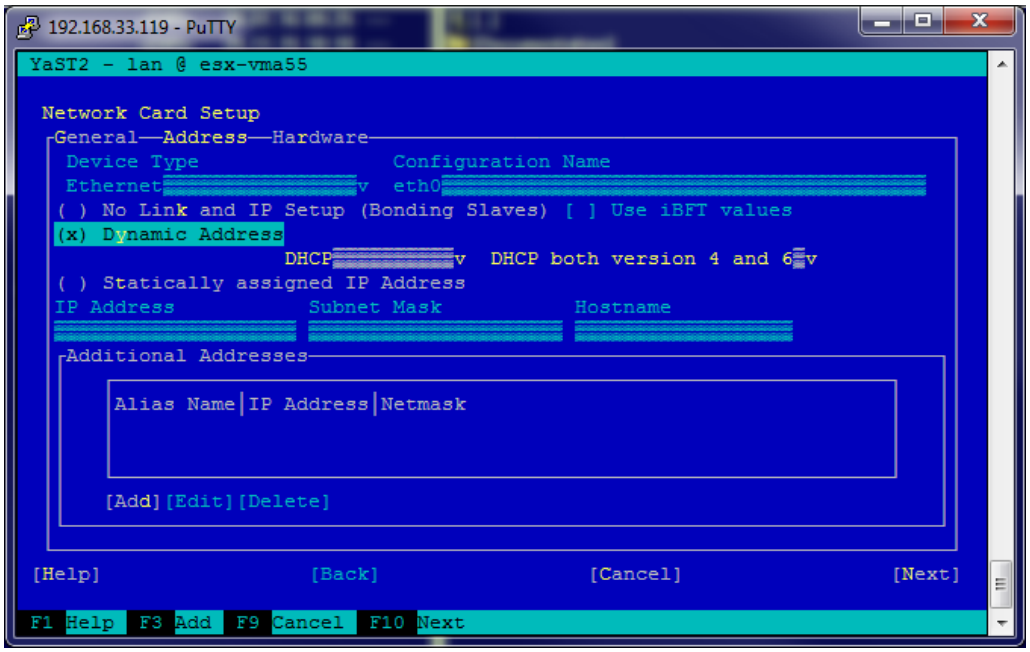
1. Choose Network Settings



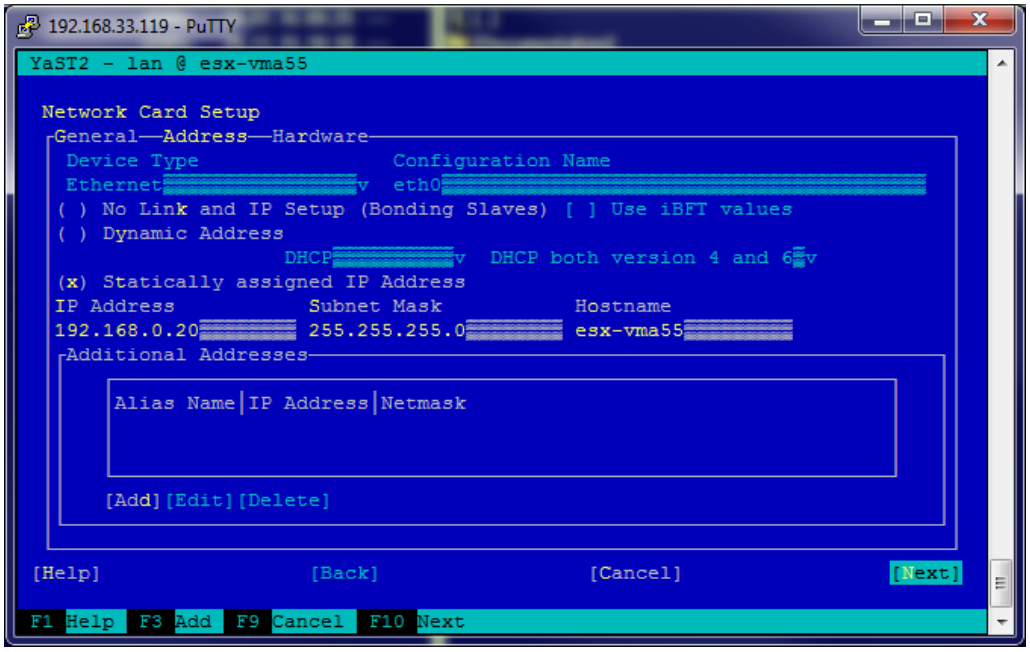
2. Change the settings of the network card



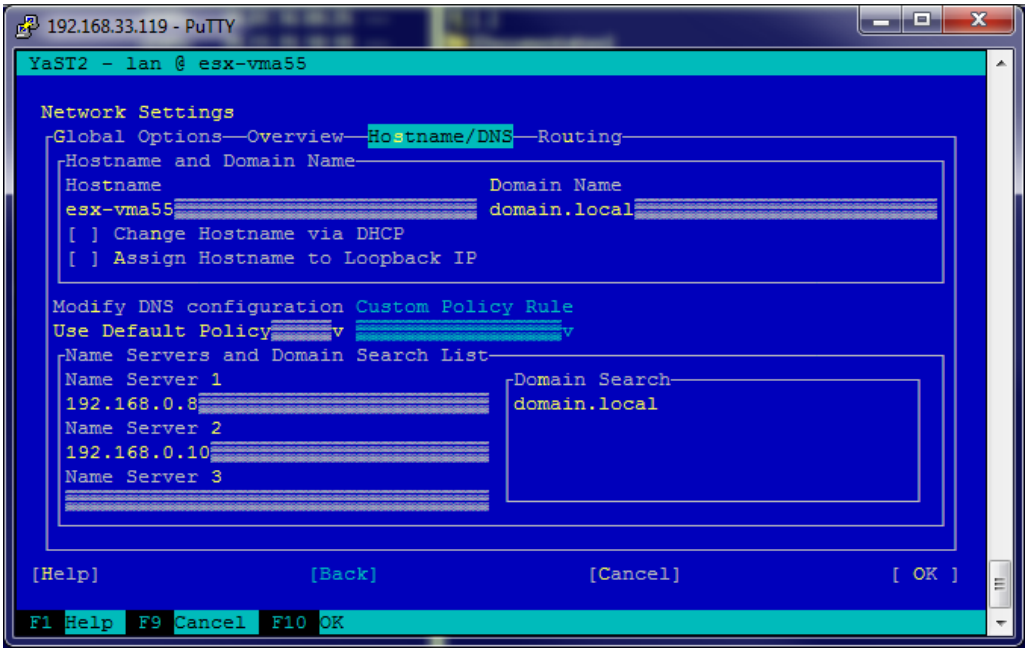
3. Default is DHCP



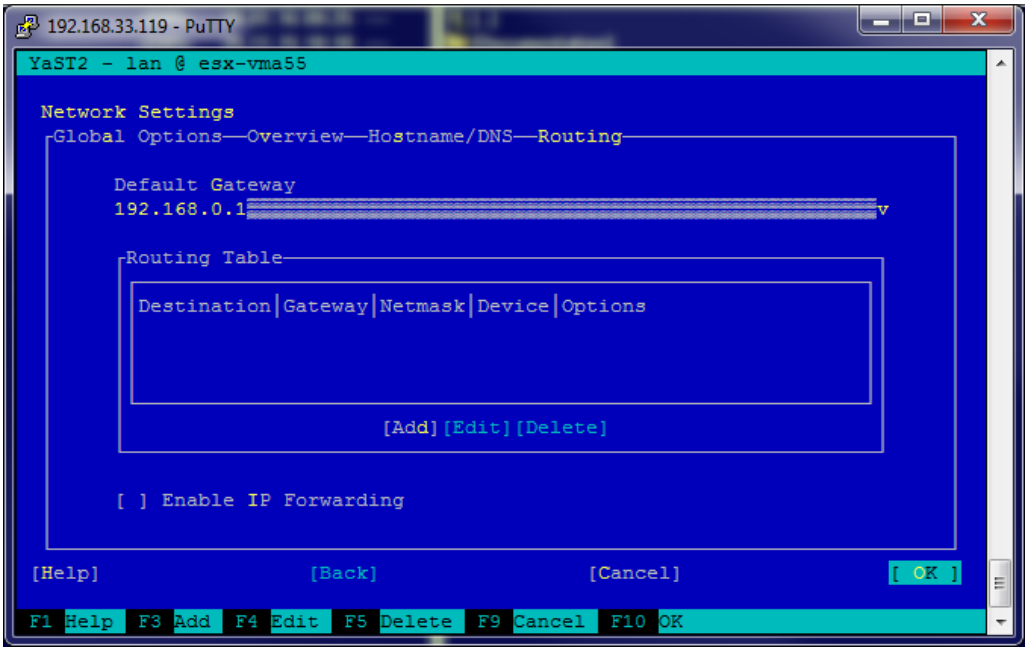
4. Enter the static IP address



5. Enter Hostname, Domain, DNS1, DNS2, DNS3, Domain search

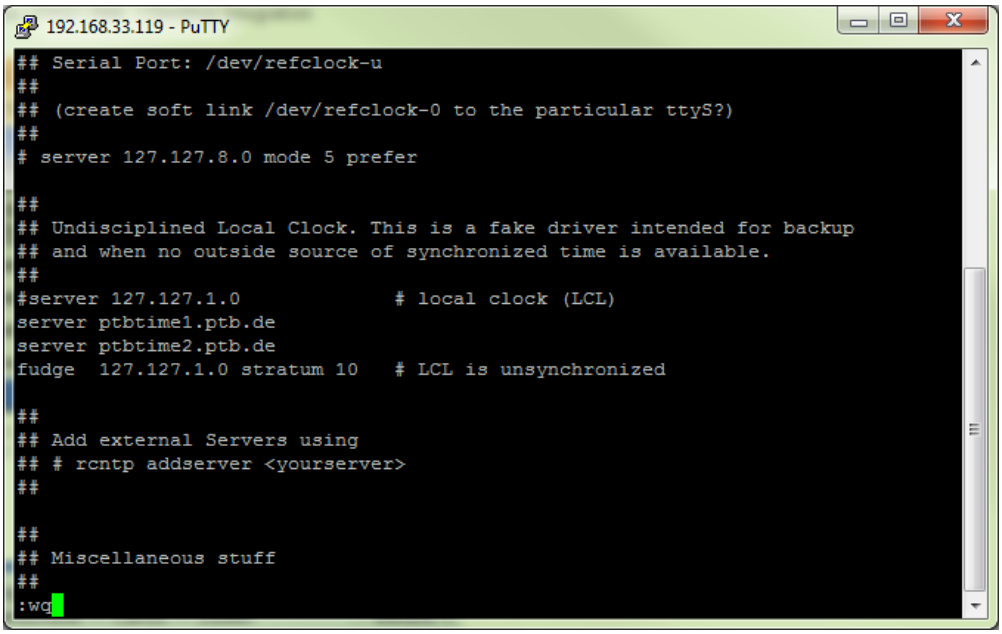


6. Enter Default Gateway

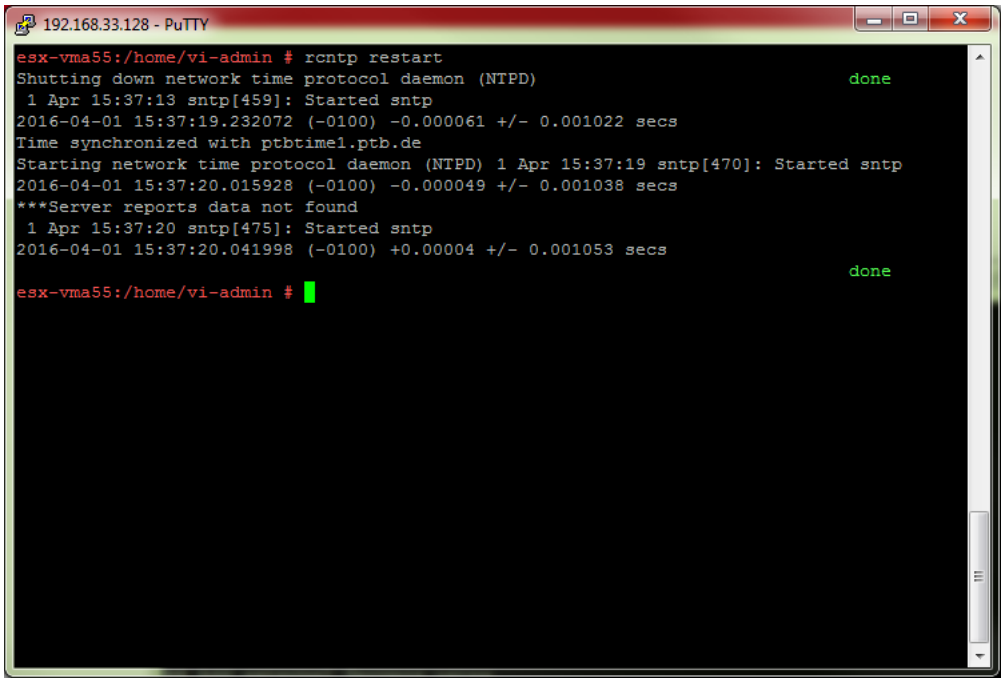


10 Manual configuration of the Timeserver

To synchronize the time with a time server please edit the file “/etc/ntp.conf“.
vi /etc/ntp.conf



Comment the line “**server 127.127.1.0..”** with # character and insert your preferred timeserver. E.g.: **server ptbtime1.ptb.de**
After saving your changes please use the following command:
rcntp restart



11 Commands for the editor “vi”

How to Exit

:q[uit]	Quit Vim. This fails when changes have been made.
:q[uit]!	Quit without writing.
:cq[uit]	Quit always, without writing.
:wq	Write the current file and exit.
:wq!	Write the current file and exit always.
:wq {file}	Write to {file}. Exit if not editing the last
:wq! {file}	Write to {file} and exit always.
:[range]wq[!]	[file] Same as above, but only write the lines in [range].
ZZ	Write current file, if modified, and exit.
ZQ	Quit current file and exit (same as ":q!").

Editing a File

:e[dit]	Edit the current file. This is useful to re-edit the current file, when it has been changed outside of Vim.
:e[dit]!	Edit the current file always. Discard any changes to the current buffer. This is useful if you want to start all over again.
:e[dit] {file}	Edit {file}.
:e[dit]! {file}	Edit {file} always. Discard any changes to the current buffer.
gf	Edit the file whose name is under or after the cursor. Mnemonic: "goto file".

Inserting Text

a	Append text after the cursor [count] times.
A	Append text at the end of the line [count] times.
i	Insert text before the cursor [count] times.
I	Insert text before the first non-blank in the line [count] times.
gI	Insert text in column 1 [count] times.
o	Begin a new line below the cursor and insert text, repeat [count] times.
O	Begin a new line above the cursor and insert text, repeat [count] times.

Inserting a file

:r[ead] [name]	Insert the file [name] below the cursor.
:r[ead] !{cmd}	Execute {cmd} and insert its standard output below the cursor.

Deleting Text

<Del> or x	Delete [count] characters under and after the cursor
X	Delete [count] characters before the cursor
d{motion}	Delete text that {motion} moves over
dd	Delete [count] lines
D	Delete the characters under the cursor until the end of the line
{Visual}x or {Visual}d	Delete the highlighted text (for {Visual} see Selecting Text).
{Visual}CTRL-H or {Visual}	When in Select mode: Delete the highlighted text
{Visual}X or {Visual}D	Delete the highlighted lines
:[range]d[elete]	Delete [range] lines (default: current line)
:[range]d[elete] {count}	Delete {count} lines, starting with [range]

Changing (or Replacing) Text

r{char}	Replace the character under the cursor with {char}.
R	Enter Insert mode, replacing characters rather than inserting
~	Switch case of the character under the cursor and move the cursor to the right. If a [count] is given, do that many characters.
~{motion}	Switch case of {motion} text.
{Visual}~	Switch case of highlighted text

Substituting

:[range]s[ubstitute]/{pattern}/{string}/[c][e][g][p][r][i][I] [count]	For each line in [range] replace a match of {pattern} with {string}.
:[range]s[ubstitute] [c][e][g][r][i][I] [count] :[range]&[c][e][g][r][i][I] [count]	Repeat last :substitute with same search pattern and substitute string, but without the same flags. You may add extra flags

The arguments that you can use for the substitute commands:

[c] Confirm each substitution. Vim positions the cursor on the matching string. You can type:

'y' to substitute this match
'n' to skip this match
to skip this match
'a' to substitute this and all remaining matches {not in Vi}
'q' to quit substituting {not in Vi}
CTRL-E to scroll the screen up {not in Vi}
CTRL-Y to scroll the screen down {not in Vi}.

[e] When the search pattern fails, do not issue an error message and, in particular, continue in maps as if no error occurred.

[g] Replace all occurrences in the line. Without this argument, replacement occurs only for the first occurrence in each line.

[i] Ignore case for the pattern.

[I] Don't ignore case for the pattern.

[p] Print the line containing the last substitute.

Copying and Moving Text

"{a-zA-Z0-9.%#:-"}	Use register {a-zA-Z0-9.%#:-"} for next delete, yank or put (use uppercase character to append with delete and yank) ({.%#:} only work with put).
:reg[isters]	Display the contents of all numbered and named registers.
:reg[isters] {arg}	Display the contents of the numbered and named registers that are mentioned in {arg}.
:di[splay] [arg]	Same as :registers.
["x]y{motion}	Yank {motion} text [into register x].
["x]yy	Yank [count] lines [into register x]
["x]Y	yank [count] lines [into register x] (synonym for yy).
{Visual}["x]y	Yank the highlighted text [into register x] (for {Visual} see Selecting Text).
{Visual}["x]Y	Yank the highlighted lines [into register x]
:[range]y[ank] [x]	Yank [range] lines [into register x].
:[range]y[ank] [x] {count}	Yank {count} lines, starting with last line number in [range] (default: current line), [into register x].
["x]p	Put the text [from register x] after the cursor [count] times.
["x]P	Put the text [from register x] before the cursor [count] times.
["x]gp	Just like "p", but leave the cursor just after the new text.
["x]gP	Just like "P", but leave the cursor just after the new text.
:[line]pu[t] [x]	Put the text [from register x] after [line] (default current line).
:[line]pu[t]! [x]	Put the text [from register x] before [line] (default current line).

Undo/Redo/Repeat

u	Undo [count] changes.
:u[ndo]	Undo one change.
CTRL-R	Redo [count] changes which were undone.
:red[o]	Redo one change which was undone.
U	Undo all latest changes on one line. {Vi: while not moved off of it}
.	Repeat last change, with count replaced with [count].

Moving Around

Basic motion commands:

k
h l
j

h or	[count] characters to the left (exclusive).
l or	[count] characters to the right (exclusive).
k or CTRL-P	[count] lines upward
j or CTRL-J or CTRL-N	[count] lines downward (linewise).
0	To the first character of the line (exclusive).
<Home>	To the first character of the line (exclusive).
^	To the first non-blank character of the line
$ or <End>	To the end of the line and [count - 1] lines downward
g0 or g<Home>	When lines wrap ('wrap on): To the first character of the screen line (exclusive). Differs from "0" when a line is wider than the screen. When lines don't wrap ('wrap' off): To the leftmost character of the current line that is on the screen. Differs from "0" when the first character of the line is not on the screen.
g^	When lines wrap ('wrap' on): To the first non-blank character of the screen line (exclusive). Differs from "^" when a line is wider than the screen. When lines don't wrap ('wrap' off): To the leftmost non-blank character of the current line that is on the screen. Differs from "^" when the first non-blank character of the line is not on the screen.
g$ or g<End&gr;	When lines wrap ('wrap' on): To the last character of the screen line and [count - 1] screen lines downward (inclusive). Differs from "$" when a line is wider than the screen. When lines don't wrap ('wrap' off): To the rightmost character of the current line that is visible on the screen. Differs from "$" when the last character of the line is not on the screen or when a count is used.
f{char}	To [count]'th occurrence of {char} to the right. The cursor is placed on {char} (inclusive).
F{char}	To the [count]'th occurrence of {char} to the left. The cursor is placed on {char} (inclusive).
t{char}	Till before [count]'th occurrence of {char} to the right. The cursor is placed on the character left of {char} (inclusive).
T{char}	Till after [count]'th occurrence of {char} to the left. The cursor is placed on the character right of {char} (inclusive).
;	Repeat latest f, t, F or T [count] times.
,	Repeat latest f, t, F or T in opposite direction [count] times.
- <minus>	[count] lines upward, on the first non-blank character (linewise).
+ or CTRL-M or <CR>	[count] lines downward, on the first non-blank character (linewise).
_ <underscore>	[count] - 1 lines downward, on the first non-blank character (linewise).
<C-End> or G	Goto line [count], default last line, on the first non-blank character.

<C-Home> or gg	Goto line [count], default first line, on the first non-blank character.
<S-Right> or w	[count] words forward
<C-Right> or W	[count] WORDS forward
E	Forward to the end of word [count]
E	Forward to the end of WORD [count]
<S-Left> or b	[count] words backward
<C-Left> or B	[count] WORDS backward
ge	Backward to the end of word [count]
gE	Backward to the end of WORD [count]

These commands move over words or WORDS.
A word consists of a sequence of letters, digits and underscores, or a sequence of other non-blank characters, separated with white space (spaces, tabs,). This can be changed with the 'iskeyword' option.

A WORD consists of a sequence of non-blank characters, separated with white space. An empty line is also considered to be a word and a WORD.

(	[count] sentences backward
)	[count] sentences forward
{	[count] paragraphs backward
}	[count] paragraphs forward
]]	[count] sections forward or to the next '{' in the first column. When used after an operator, then the '}' in the first column.
][	[count] sections forward or to the next '}' in the first column
[[	[count] sections backward or to the previous '{' in the first column
[]	[count] sections backward or to the previous '}' in the first column

Screen movement commands

z.	Center the screen on the cursor
zt	Scroll the screen so the cursor is at the top
zb	Scroll the screen so the cursor is at the bottom

Marks

m{a-zA-Z}	Set mark {a-zA-Z} at cursor position (does not move the cursor, this is not a motion command).
m' or m`	Set the previous context mark. This can be jumped to with the "'" or "``" command (does not move the cursor, this is not a motion command).
:[range]ma[rk] {a-zA-Z}	Set mark {a-zA-Z} at last line number in [range], column 0. Default is cursor line.
:[range]k{a-zA-Z}	Same as :mark, but the space before the mark name can be omitted.
'{a-z}	To the first non-blank character on the line with mark {a-z} (linewise).
'{A-Z0-9}	To the first non-blank character on the line with mark {A-Z0-9} in the correct file
`{a-z}	To the mark {a-z}
`{A-Z0-9}	To the mark {A-Z0-9} in the correct file
:marks	List all the current marks (not a motion command).
:marks {arg}	List the marks that are mentioned in {arg} (not a motion command). For example:

Searching

/{pattern}[/]	Search forward for the [count]'th occurrence of {pattern}
/{pattern}/{offset}	Search forward for the [count]'th occurrence of {pattern} and go {offset} lines up or down.
/<CR>	Search forward for the [count]'th latest used pattern
//{offset}<CR>	Search forward for the [count]'th latest used pattern with new. If {offset} is empty no offset is used.
?{pattern}[?]<CR>	Search backward for the [count]'th previous occurrence of {pattern}
?{pattern}?{offset}<CR>	Search backward for the [count]'th previous occurrence of {pattern} and go {offset} lines up or down
?<CR>	Search backward for the [count]'th latest used pattern
??{offset}<CR>	Search backward for the [count]'th latest used pattern with new {offset}. If {offset} is empty no offset is used.
n	Repeat the latest "/" or "?" [count] times.
N	Repeat the latest "/" or "?" [count] times in opposite direction.

Selecting Text (Visual Mode)

To select text, enter visual mode with one of the commands below, and use motion commands to highlight the text you are interested in. Then, use some command on the text.

The operators that can be used are:

~ switch case
d delete
c change
y yank
> shift right
< shift left
! filter through external command
= filter through 'equalprg' option command
gq format lines to 'textwidth' length

v	start Visual mode per character.
V	start Visual mode linewise.
<Esc>	exit Visual mode without making any changes

How to Suspend

CTRL-Z	Suspend Vim, like ":stop". Works in Normal and in Visual mode. In Insert and Command-line mode, the CTRL-Z is inserted as a normal character.
:sus[pend][!] or :st[op][!]	Suspend Vim. If the '!' is not given and 'autowrite' is set, every buffer with changes and a file name is written out. If the '!' is given or 'autowrite' is not set, changed buffers are not written, don't forget to bring Vim back to the foreground later!