



The Dude is dead

long live The Dude



Agenda

- FMS Company Profile
- The Dude's history
- The Dude on CHR
- Basic security settings
- The Dude's RouterOS features
- Custom Statistics



FMS Internetservice GmbH

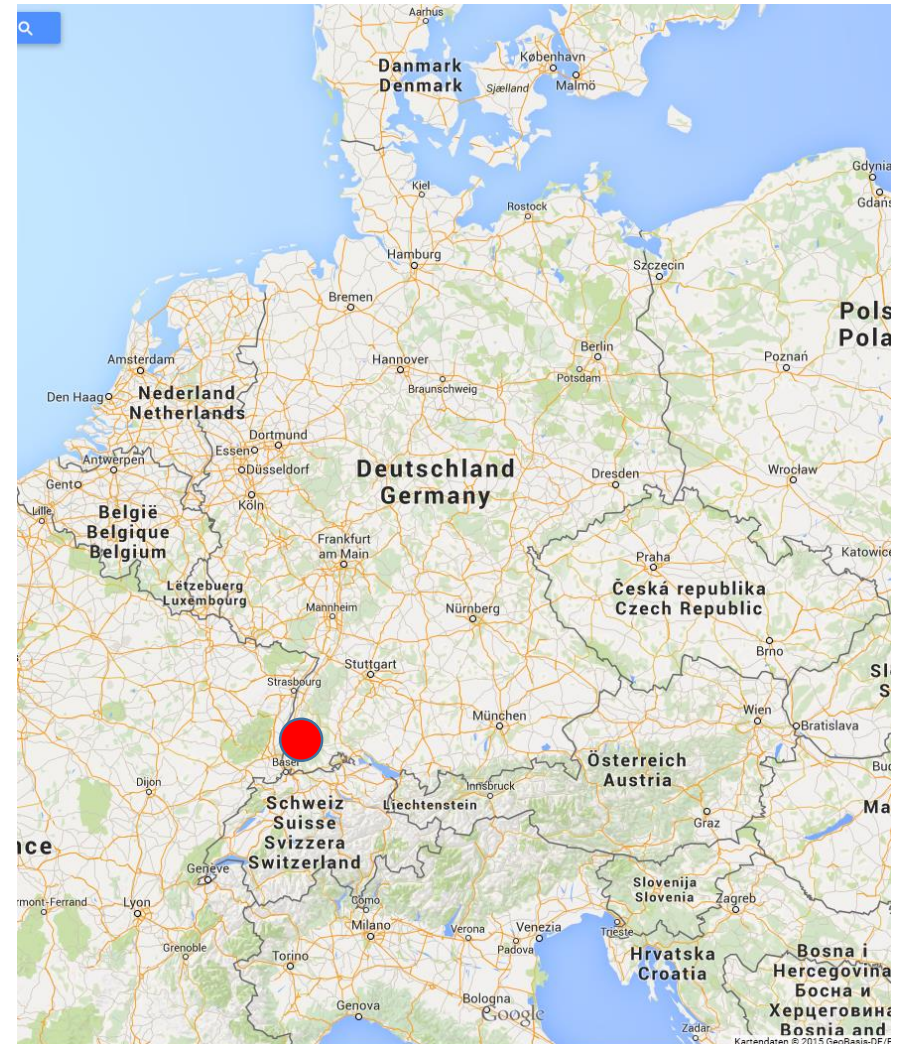
Value Added Distribution



FMS Internetservice GmbH

- Value Added Distributor
 - Distribution
 - Training
 - Consulting
 - Support

- Founded 1997
- 11 employees
- Southern Germany





Get in Touch

- Website: <http://www.fmsweb.de>
- MikroTik Mirror: <http://www.mikrotik-software.de>
- Shop: <http://www.mikrotik-shop.de>
- Wiki: <http://wiki.fmsweb.de>
- Twitter: https://twitter.com/fmsweb_de
- Facebook: <https://www.facebook.com/fmsinternetservice>

- Phone: +49 761 2926500
- Email: sales@fmsweb.de



Training Center

- Official MikroTik trainings
- All certification levels
- First German speaking partner
- Two trainers
- Own training facility
- Inquiries: sales@fmsweb.de

Sebastian Inacker: TR11

Patrik Schaub: TR23





Distributor Table





Distributor Table

- See our MikroTik based appliances
- Learn about VDSLplus and G.FAST with Alcatel-Lucent
- Get an update on SAF Tehnika 2048 QAM support
- See new Spectrum Analysers





Distributor Table



Do you need towers or masts? Contact sales@fmsweb.de



The Dude's history

Unique NMS threatened by extinction



History

- First NMS choice for many IT professionals
- Users outside the MikroTik community
- easy to use
- fast creation of maps
- little overhead
- free but powerful
- no web application

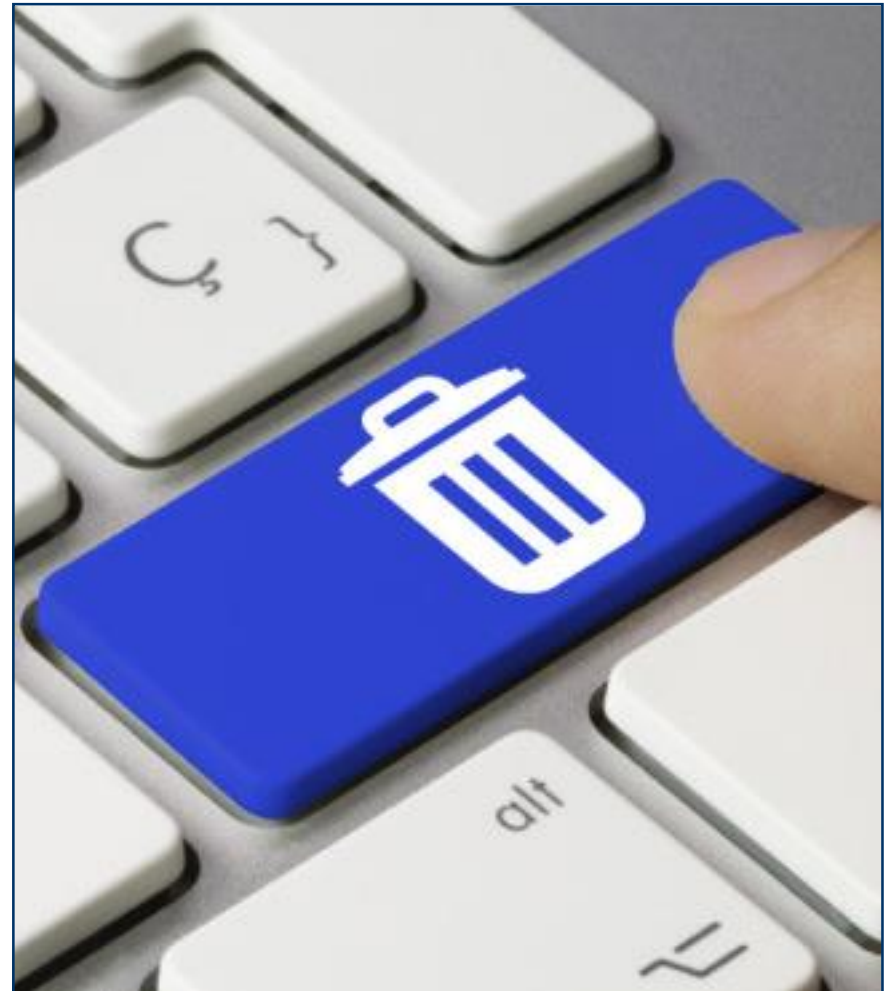


*Mikro***Tik**



Development stopped

- No updates for years
- RouterOS functionality breaking
- Bugs not fixed
- A lot of complains
- No alternatives
- Even more frustration





The Dude is finally back

- During 6.34:

***) dude - The reports of my death have been greatly exaggerated;**



Major changes

	4.0 Beta 3	From 6.33.5
Server, RouterOS Plattformen	All	CHR, x86, CCR (Tile)
Server, Windows	Yes	No
Web GUI	Yes	No
Language	Multi language	English only



Get The Dude running

Installing from scratch



Choose the Platform

- Tile, Bare Metal x86, Virtualisation?
- Virtualisation with x86 or CHR?
- CHR optimized for virtualisation
 - 64Bit Kernel
 - Driver Support





Download CHR Image

	6.32.4 (Bugfix only)	6.34.2 (Current)	5.26 (Legacy)	6.35rc12 (Release candidate)
images	img, vmdk, vhdx, vdi			
The Dude client	-	↓	-	↓
The Dude server	-	↓	-	↓
VMDK image	-	↓	-	↓
VHDX image	-	↓	-	↓
VDI image	-	↓	-	↓
Raw disk image	-	↓	-	↓
Extra packages	-	↓	-	↓
Changelog	-	📄	-	📄
MD5	-	Σ	-	Σ

- Download VMDK CHR Image
- Create Guest with VMware Workstation Player
- Use downloaded VMDK image as disk



CHR Licensing

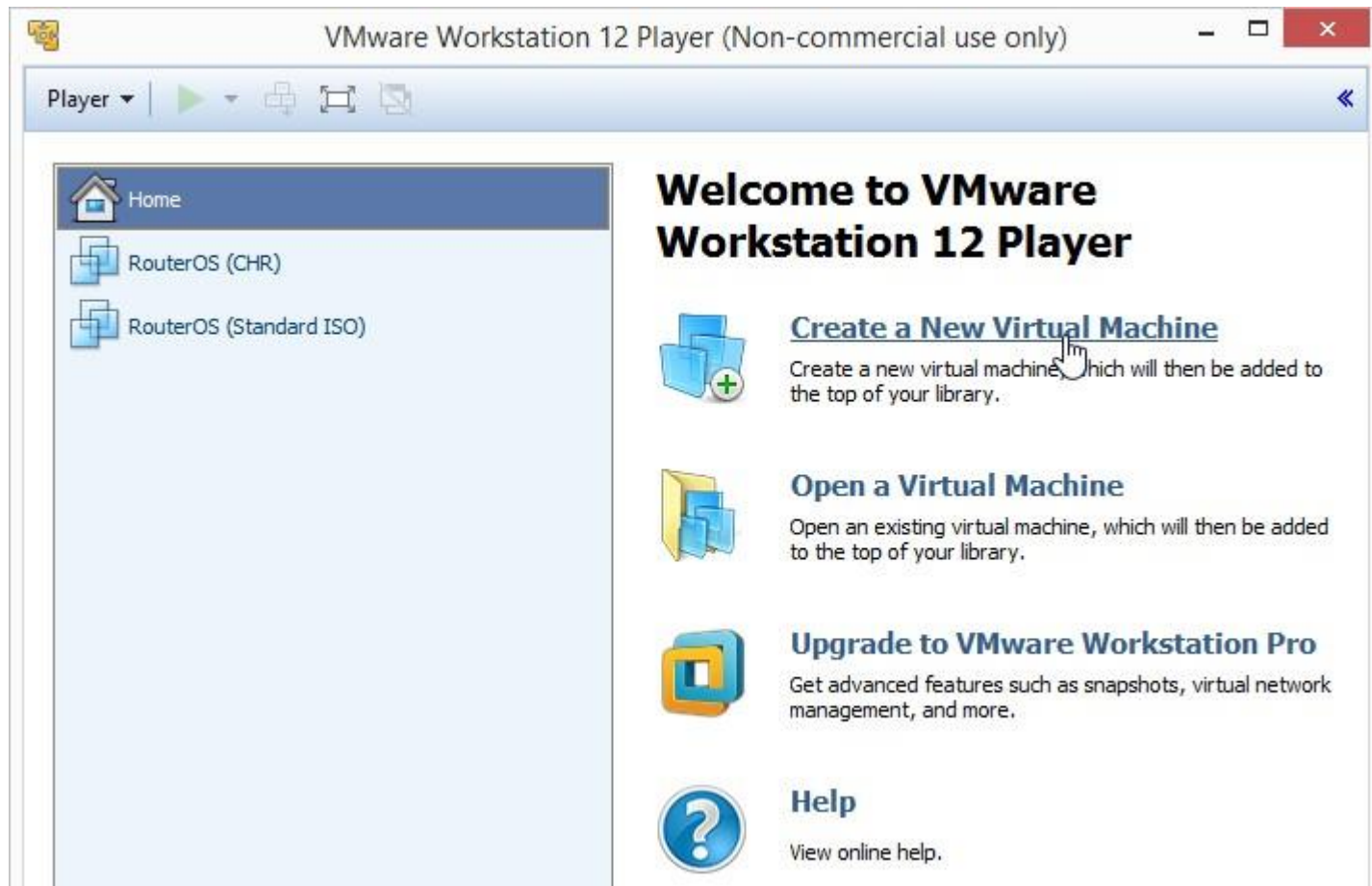
- Option A: Use free license
- Option B: Use MikroTik cloud hosting from FMS (contact sales@fmsweb.de)

License	Speed limit
Free	1Mbit
P1	1Gbit
P10	10Gbit
P-Unlimited	Unlimited

- Option C: Buy a license for your installation
- P1 will be sufficient in most cases (= 1Gbps per interface)



CHR Installation





CHR Installation

New Virtual Machine Wizard

Welcome to the New Virtual Machine Wizard
A virtual machine is like a physical computer; it needs an operating system. How will you install the guest operating system?

Install from:

☐ Installer disc:

DVD-RW-Laufwerk (D:)

☐ Installer disc image file (iso):

Browse...

☒ I will install the operating system later.
The virtual machine will be created with a blank hard disk.

Help < Back Next > Cancel

New Virtual Machine Wizard

Select a Guest Operating System
Which operating system will be installed on this virtual machine?

Guest operating system

☐ Microsoft Windows
☐ Linux
☐ Novell NetWare
☐ Solaris
☒ Other

Version

Other 64-bit

Help < Back Next > Cancel



CHR Installation

New Virtual Machine Wizard

Specify Disk Capacity

How large do you want this disk to be?

The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.

Maximum disk size (GB):

Recommended size for Other 64-bit: 8 GB

- ☐ Store virtual disk as a single file
- ☒ Split virtual disk into multiple files

Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.

Help

< Back

Next >

Cancel

New Virtual Machine Wizard

Ready to Create Virtual Machine

Click Finish to create the virtual machine. Then you can install Other 64-bit.

The virtual machine will be created with the following settings:

Name:	CHR #2
Location:	C:\Users\schaub\Documents\Virtual Machines\CHR #2
Version:	Workstation 12.0
Operating System:	Other 64-bit
Hard Disk:	8 GB, Split
Memory:	256 MB
Network Adapter:	NAT
Other Devices:	CD/DVD, Sound Card

Customize Hardware...

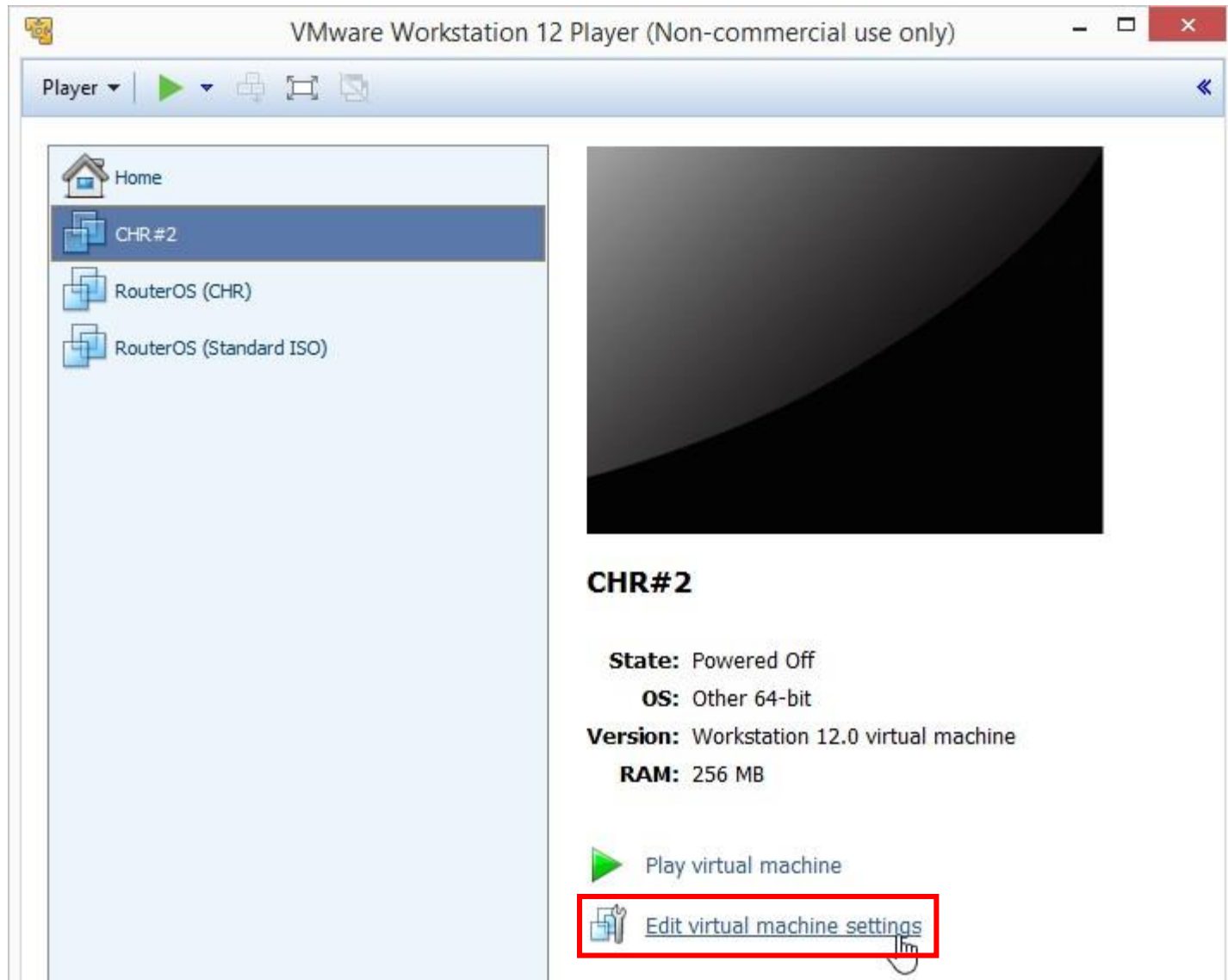
< Back

Finish

Cancel

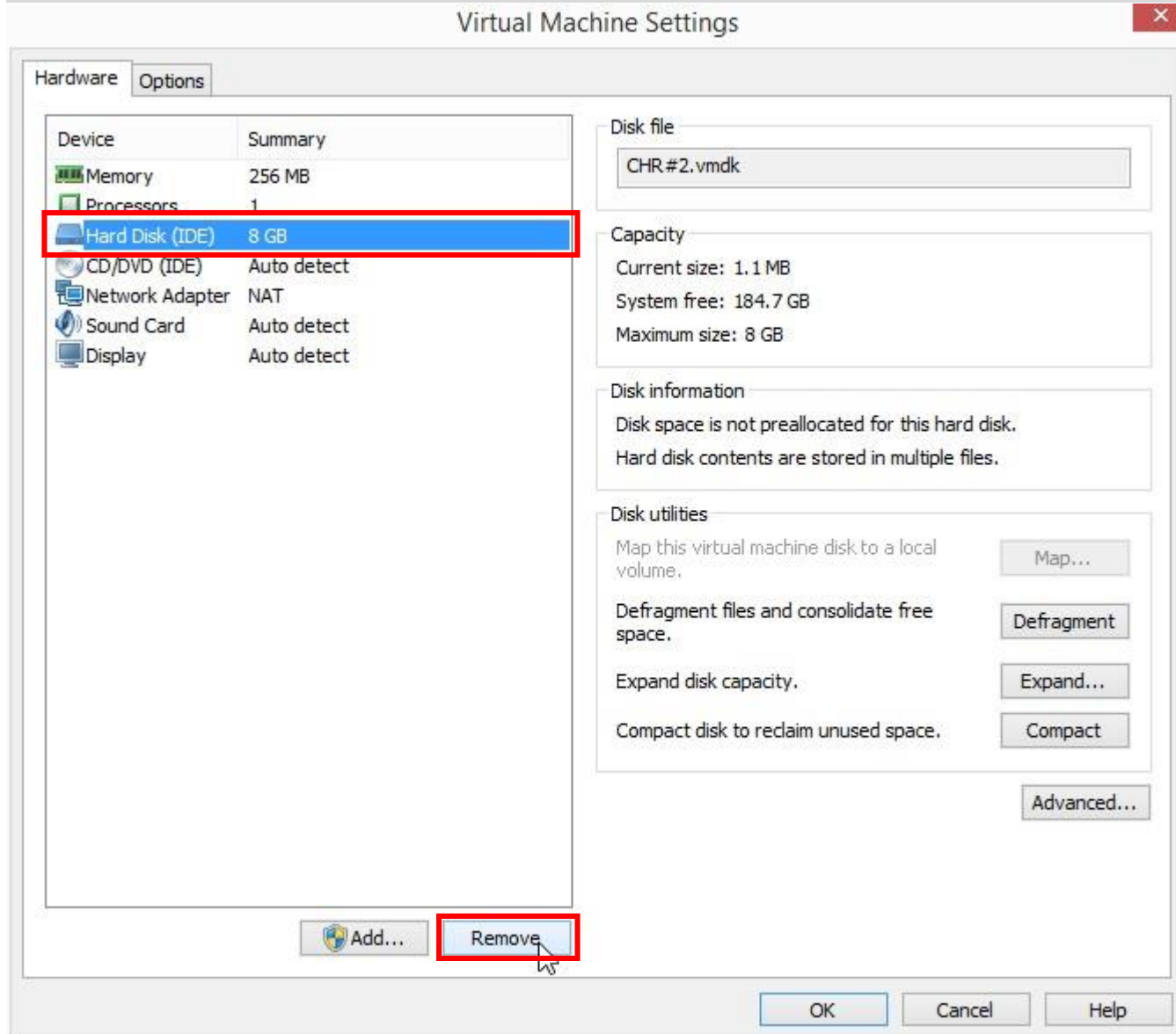


CHR Installation



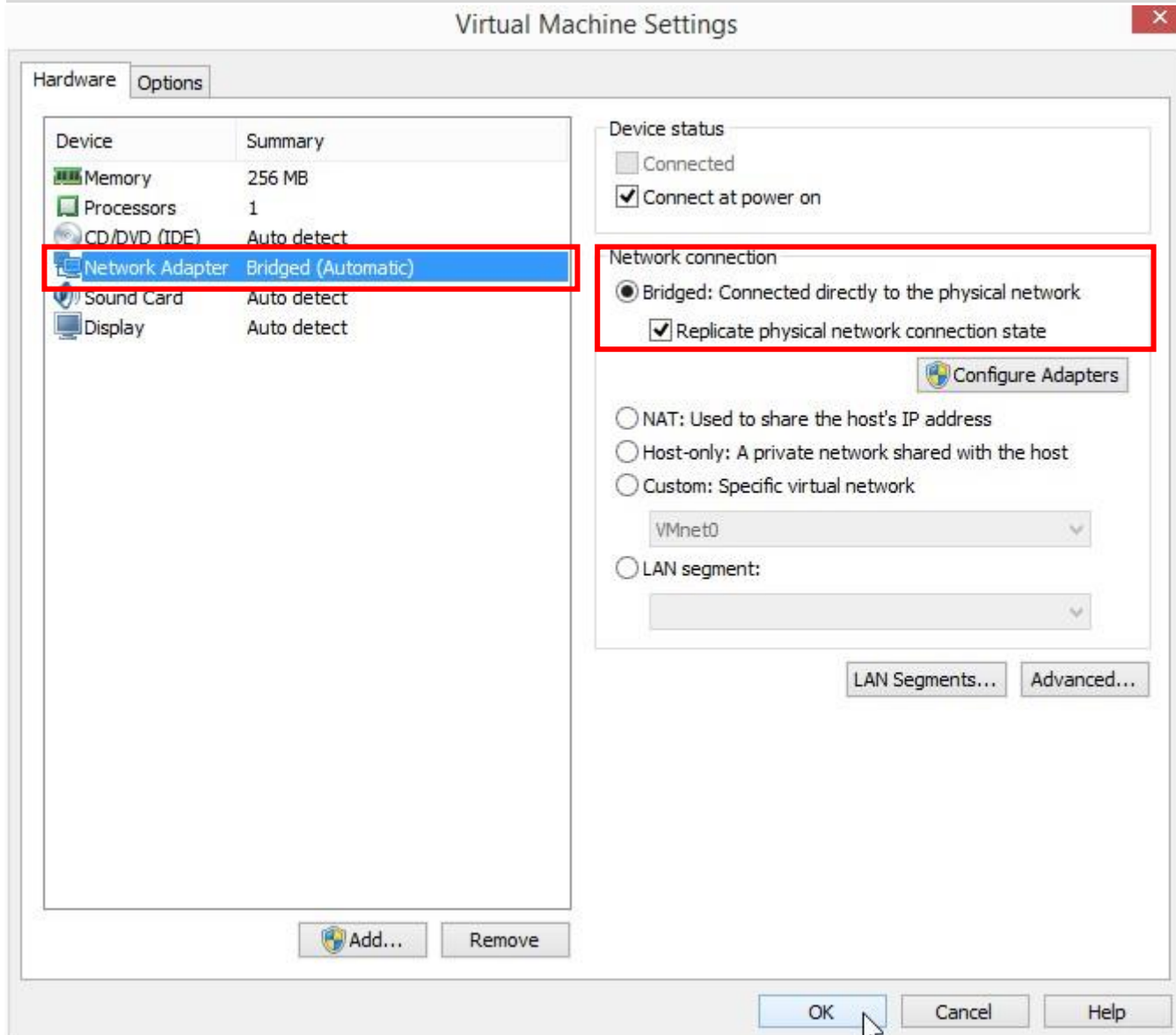


CHR Installation



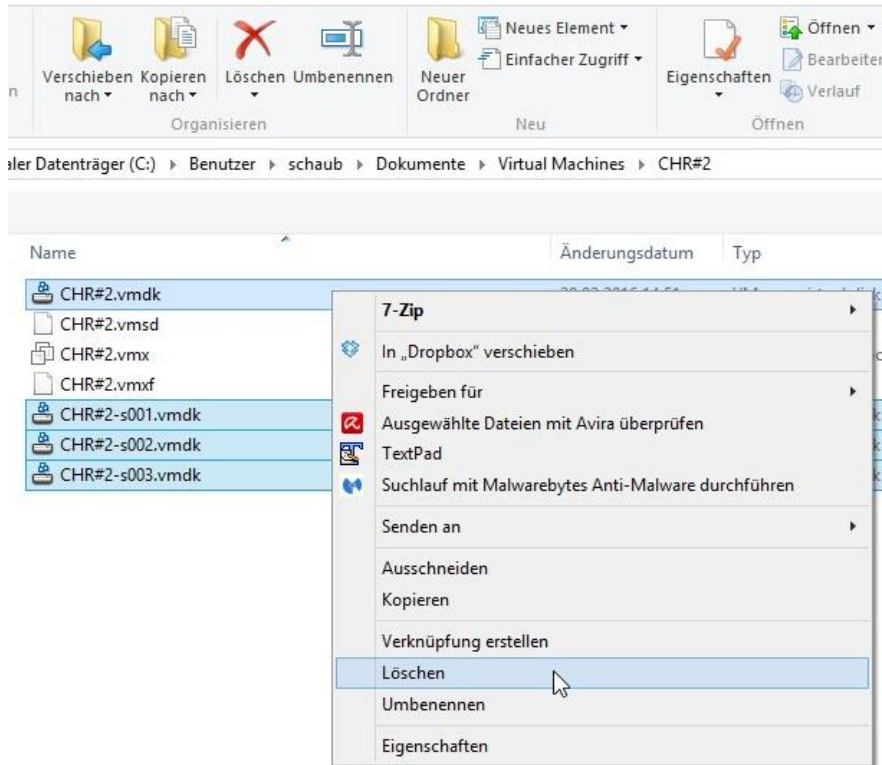


CHR Installation

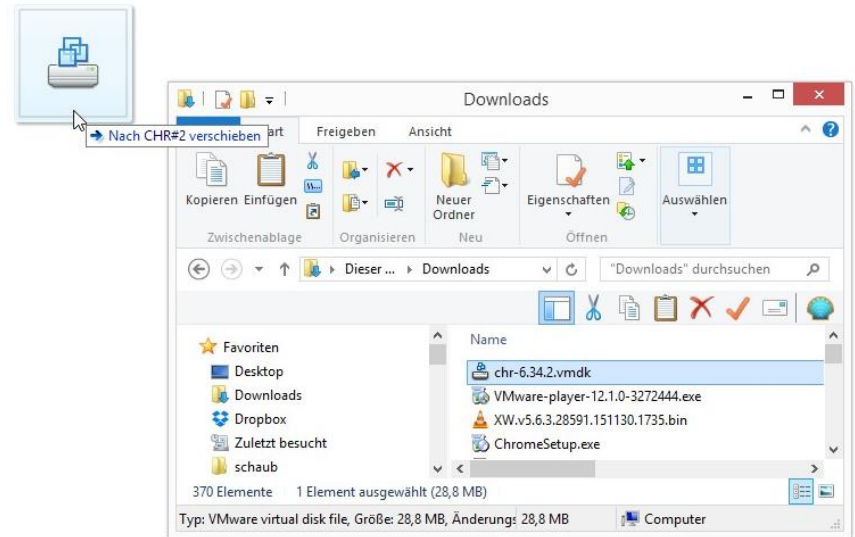




CHR Installation



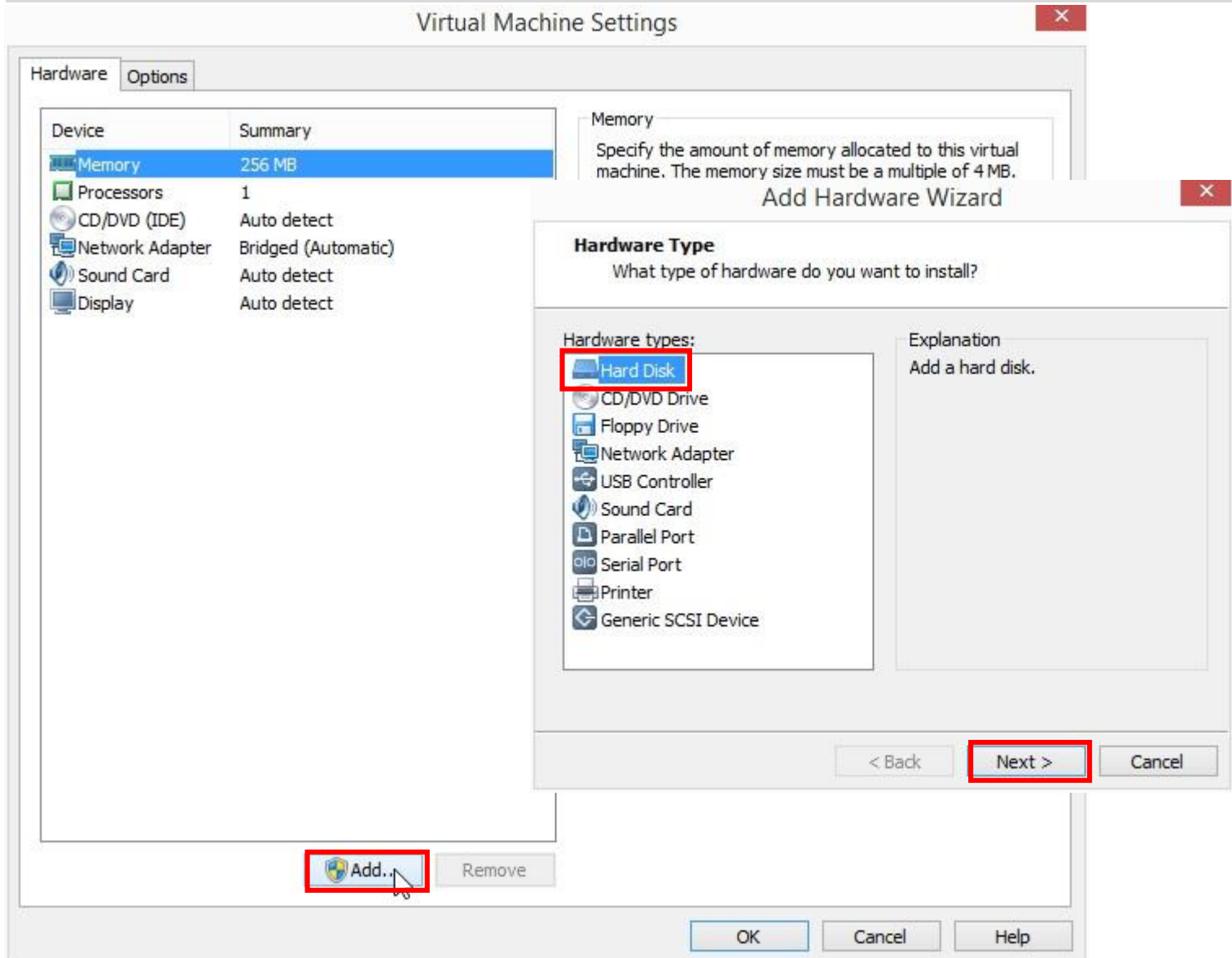
■ Copy CHR image



■ Delete unused disk files



CHR Installation





CHR Installation

Add Hardware Wizard [X]

Select a Disk Type
What kind of disk do you want to create?

Virtual disk type

- ☒ **IDE (Recommended)**
- ☐ SCSI
- ☐ SATA

< Back **Next >** Cancel

Add Hardware Wizard [X]

Select a Disk
Which disk do you want to use?

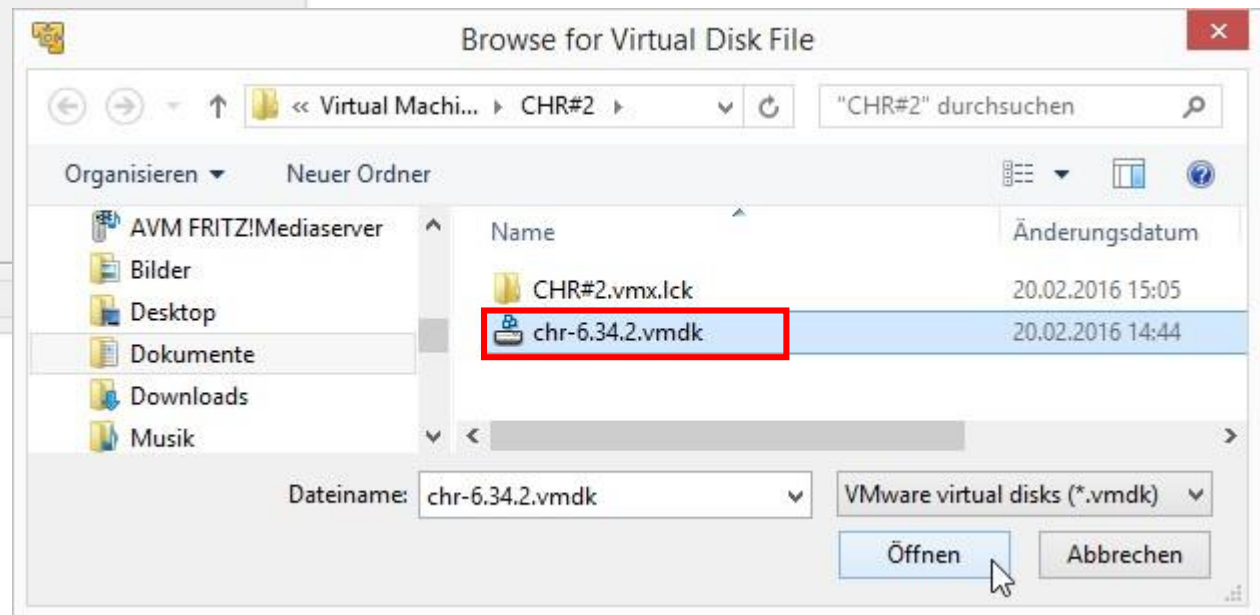
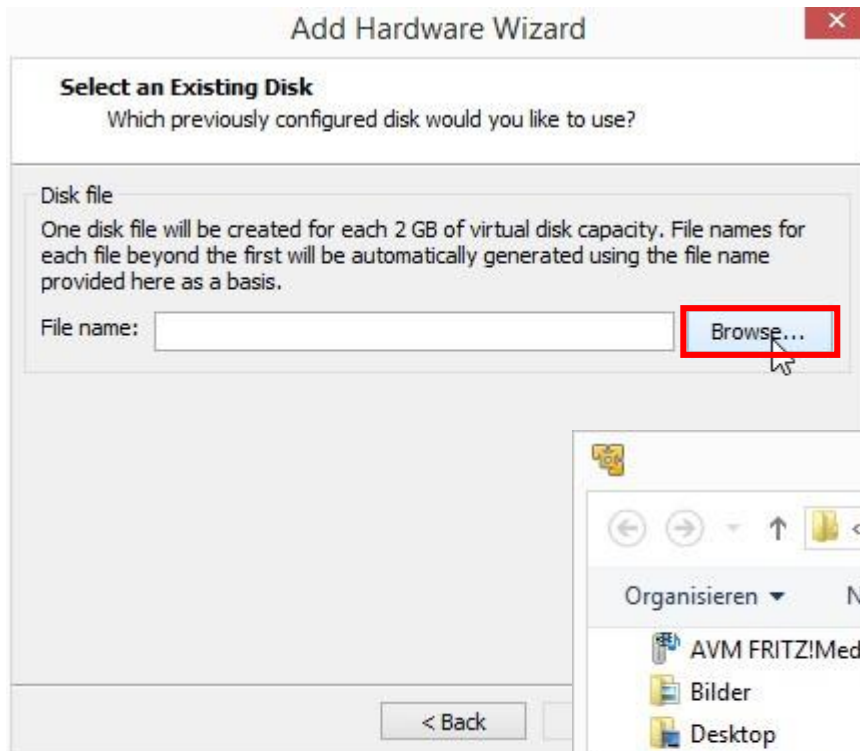
Disk

- ☐ Create a new virtual disk
A virtual disk is composed of one or more files on the host file system, which will appear as a single hard disk to the guest operating system. Virtual disks can easily be copied or moved on the same host or between hosts.
- ☒ **Use an existing virtual disk**
Choose this option to reuse a previously configured disk.
- ☐ Use a physical disk (for advanced users)
Choose this option to give the virtual machine direct access to a local hard disk.

< Back **Next >** Cancel



CHR Installation





Resize Disk

Virtual Machine Settings

Hardware Options

Device Summary

Expand Disk Capacity

Specify the maximum size for the virtual disk:

Maximum disk size (GB): 1

Expand increases only the size of a virtual disk. Sizes of partitions and file systems are not affected.

Expand Cancel Help

VMware Workstation 12 Player

The disk was successfully expanded. You must repartition the disk and expand the file systems from within the guest operating system.

OK

Disk file

chr-6.34.2.vmdk

Capacity

Current size: 28.9 MB
System free: 184.7 GB
Maximum size: 128 MB

Disk information

Disk space is not preallocated for this hard disk.
Hard disk contents are stored in a single file.

Disk utilities

Map this virtual machine disk to a local volume. Map...

Defragment files and consolidate free space. Defragment

Expand disk capacity. Expand...

Compact disk to reclaim unused space. Compact

Advanced...

Add... Remove

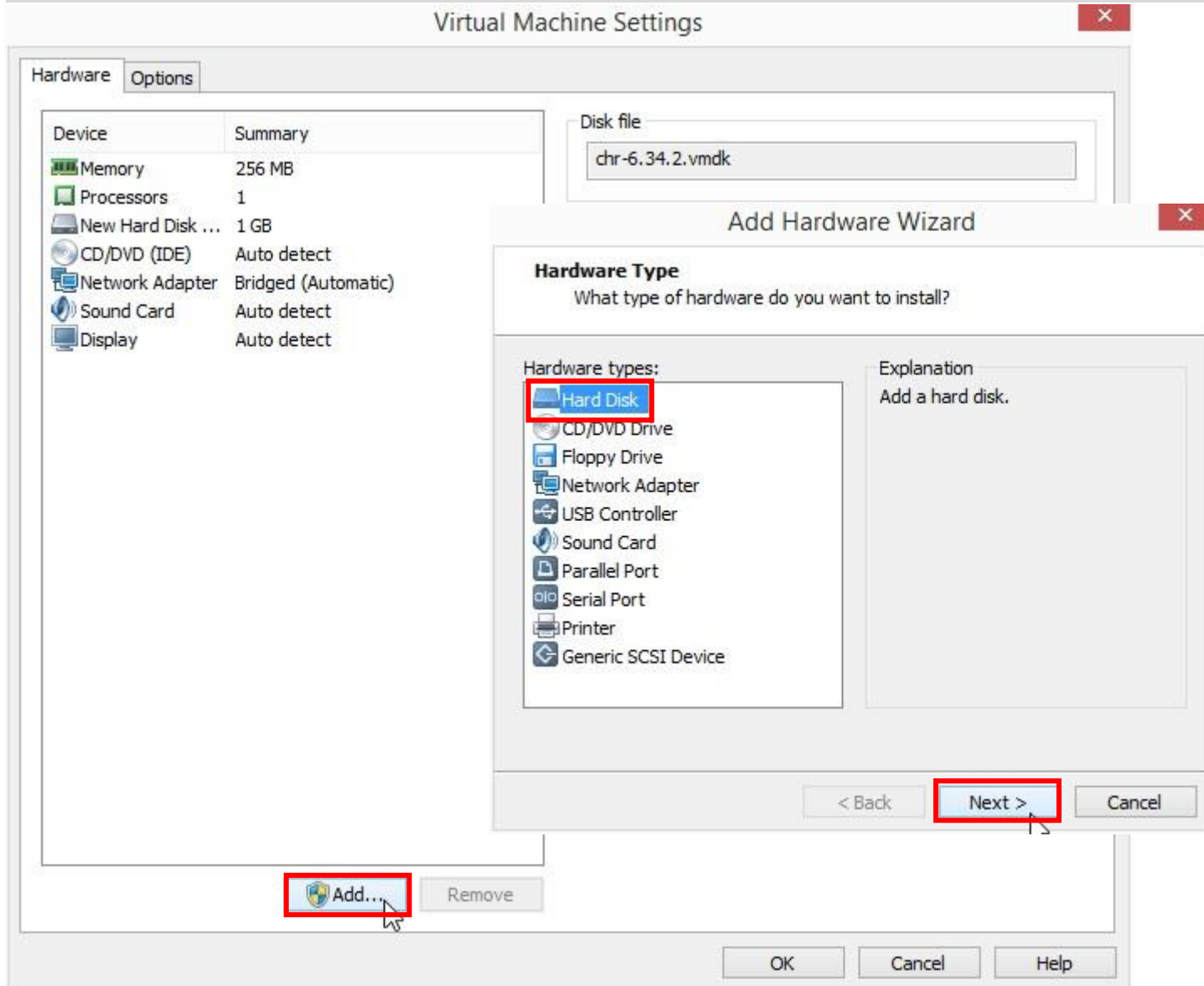
OK Cancel Help

Diagram illustrating the steps to resize a disk:

1. In the Virtual Machine Settings window, under the Hardware tab, select the disk file (chr-6.34.2.vmdk) and click the "Expand..." button in the Disk utilities section.
2. In the Expand Disk Capacity dialog box, click the "Expand" button.
3. In the Expand Disk Capacity dialog box, specify the maximum size for the virtual disk (e.g., 1 GB) and click the "Expand" button.



Add second Disk





Configure Second Disk

The image displays three overlapping screenshots of the 'Add Hardware Wizard' dialog boxes, illustrating the steps to configure a second disk.

Top Left Screenshot: Select a Disk Type
What kind of disk do you want to create?
Virtual disk type
☒ IDE (Recommended)
☐ SCSI
☐ SATA

Top Right Screenshot: Select a Disk
Which disk do you want to use?
Disk
☒ Create a new virtual disk
A virtual disk is composed of one or more files on the host file system, which will appear as a single hard disk to the guest operating system. Virtual disks can easily be copied or moved on the same host or between hosts.
☐ Use an existing virtual disk
Choose this option to reuse a previously configured disk.

Bottom Screenshot: Specify Disk Capacity
How large do you want this disk to be?
Maximum disk size (GB):
Recommended size for Other 64-bit: 8 GB
☐ Allocate all disk space now.
Allocating the full capacity can enhance performance but requires all of the physical disk space to be available right now. If you do not allocate all the space now, the virtual disk starts small and grows as you add data to it.
☒ Store virtual disk as a single file
☐ Split virtual disk into multiple files
Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.
Buttons: < Back, Next >, Cancel



First Boot of Guest

```
Welcome to MikroTik Router Software hard disk installation 6.34.2  
Press Ctrl-Alt-Delete to abort
```

```
Loading drivers  
Looking for harddrives...  
Reading: routeros-x86-6.34.2...  
Reading: dude-6.34.2...
```

```
Creating partition...  
Formatting data partition 100%  
Formatting boot partition 100%
```

```
installed routeros-x86-6.34.2  
installed dude-6.34.2
```

```
Software installed.
```

```
-
```



Default Situation

Package List

Name	Version	Build Time	Scheduled
dude	6.34.2	Feb/18/2016 06:31:18	
routeros-x86	6.34.2	Feb/18/2016 06:31:18	
advancedt...	6.34.2	Feb/18/2016 06:31:18	
dhcp	6.34.2	Feb/18/2016 06:31:18	
hotspot	6.34.2	Feb/18/2016 06:31:18	
ipv6	6.34.2	Feb/18/2016 06:31:18	
...	6.34.2	Feb/18/2016 06:31:18	

14 items (1 selected)

Terminal

```
[admin@MikroTik] >  
[admin@MikroTik] >  
[admin@MikroTik] >  
[admin@MikroTik] >  
[admin@MikroTik] > /dude print  
    enabled: no  
  data-directory: dude  
    status:  
[admin@MikroTik] >
```

Dude part of CHR image

Second disk not ready to use

Dude is disabled, default Directory set to main disk

No Dude store has been created

Disk List

Name	Label	Type	Disk	Free	Size
		unknown	VMware Virtual IDE Hard Drive	0 B	2048.0 MiB

1 item

File List

File Name	Type	Size	Creation Time
skins	directory		Feb/20/2016 15:15:43

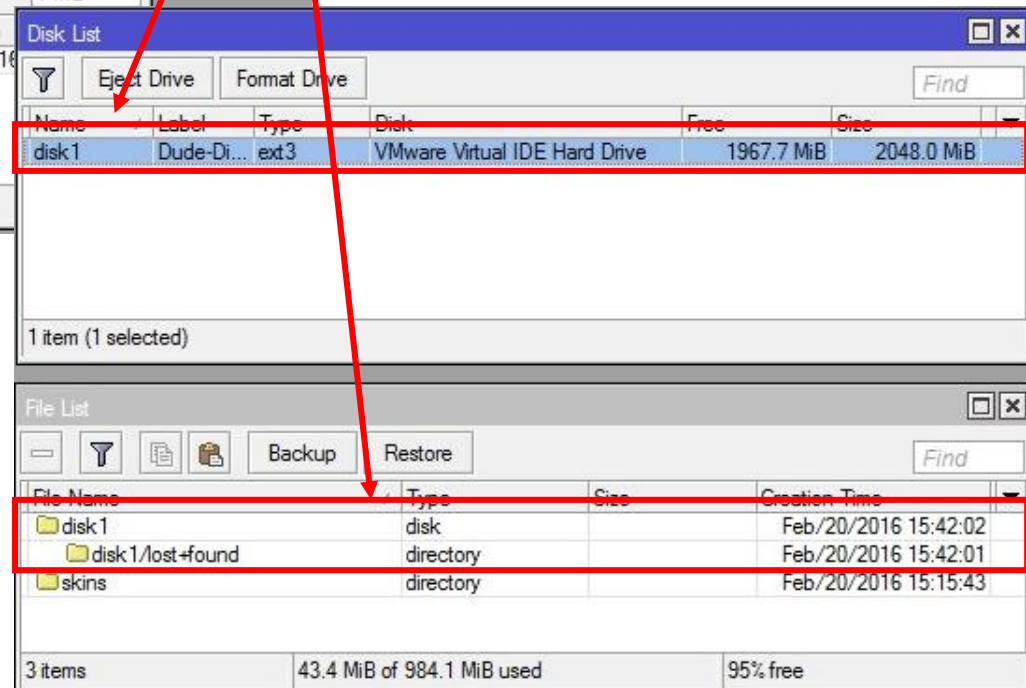
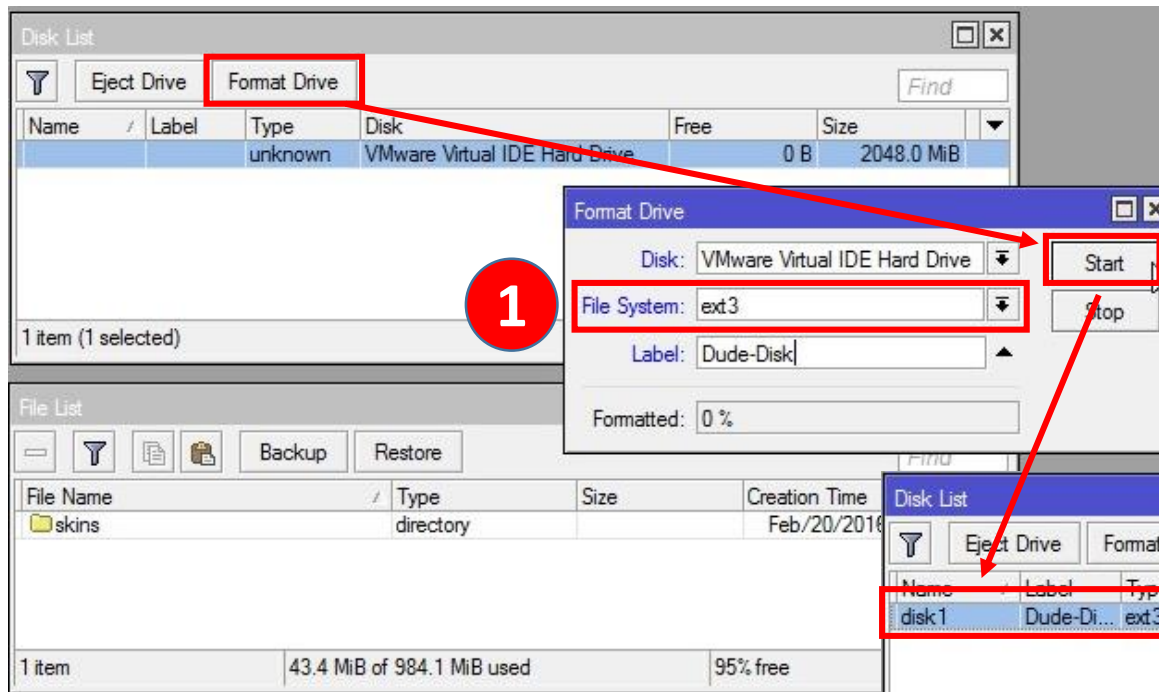
1 item

43.4 MiB of 984.1 MiB used

95% free



Format second Drive





Change Data-Store and Enable Dude

The screenshot shows the Mikrotik WinBox interface. On the left is a sidebar with navigation options: Quick Set, CAPsMAN, Interfaces, Wireless, Bridge, PPP, Mesh, IP, MPLS, Routing, System, Queues, Files, Log, Radius, Tools, and New Terminal. The main area contains two windows:

File List

File Name	Type	Size	Creation Time
disk1	disk		Feb/20/2016 15:42:02
disk1/dude-store	dude store		Feb/20/2016 15:45:49
disk1/lost+found	directory		Feb/20/2016 15:42:01
skins	directory		Feb/20/2016 15:15:43

Summary: 4 items, 43.4 MiB of 984.1 MiB used, 95% free.

Terminal

```
[admin@MikroTik] >
[admin@MikroTik] > /dude set data-directory=disk1/dude-store
[admin@MikroTik] > /dude set enabled=yes
[admin@MikroTik] > /dude print
        enabled: yes
    data-directory: disk1/dude-store
        status: running
[admin@MikroTik] >
```



Connect using the Dude Client

not connected - The Dude 6.34.2

Preferences Help

FIREWALL AND BANDWIDTH CONTROL -> [WWW](#)

Server: 10.10.0.32 Connect

Mode: ☐ plain ☒ secure Save

Port: 2211 Remove

User Name: admin

Password: ***

☒ Remember Password

Address	User Name
10.10.0.67	admin
10.15.202.203	admin
10.3.230.3	admin

Client: rx 0 bps / tx 0 bps Disconnected



Basic Security Setting

Securing the Dude



Setting the Admin Password

The screenshot shows the FMS Admin interface. On the left is a tree view of the system components, with 'Admins' selected. The main panel displays a table of administrators. A dialog box titled 'admin - Admin' is open, allowing the user to set or modify the password for the 'admin' user. The 'Password' field is highlighted with a red rectangle.

Admins Table:

Name	Group	Notes
admin	full	

admin - Admin Dialog:

- Name: admin
- Group: full
- Allowed Address: 0.0.0.0/0
- ☒ Allow More Than One
- ☒ Separate Panels



Disable Plain Access

The screenshot shows the FMS interface. On the left is a 'Contents' sidebar with various categories like Address Lists, Admins, Agents, Charts, Devices, Files, Functions, History Actions, Links, Logs, Action, Debug, Event, Syslog, Mib Nodes, and Network Maps. The 'Settings' menu item is highlighted with a red box. A red arrow points from this box to the 'Port' field in the 'Server Configuration' dialog box. The 'Server Configuration' dialog has tabs for General, SNMP, Polling, Server, Agents, Syslog, Map, Chart, Report, Discover, RouterOS, and Misc. The 'Server' tab is selected. A message box says 'These settings control access to this Dude server:'. Below this, the 'Port' field is set to 0, 'Secure Port' is 2211, and 'Allowed Networks' is 127.0.0.1/32. There are 'Ok', 'Cancel', and 'Apply' buttons on the right.

- Change from 2210 to 0 to disable



Set ACL

The screenshot shows a 'Server Configuration' window with tabs for General, SNMP, Polling, Server, Agents, Syslog, Map, Chart, Report, Discover, RouterOS, and Misc. The 'Server' tab is active, showing a message: 'These settings control access to this Dude server'. The 'Port' is 2210 and 'Secure Port' is 2211. The 'Allowed Networks' field contains '127.0.0.1/32' and '0.0.0.0/0'. The '0.0.0.0/0' entry is highlighted with a red box. A red arrow points from this box to the '10.10.0.0/24' entry in a second, partially visible dialog box below it. The second dialog box also shows 'Port: 2210', 'Secure Port: 2211', and 'Allowed Networks: 127.0.0.1/32' and '10.10.0.0/24'. The '10.10.0.0/24' entry is also highlighted with a red box. Both dialog boxes have 'Ok', 'Cancel', and 'Apply' buttons.

- Limit Dude access to the 10.10.0.0/24 network



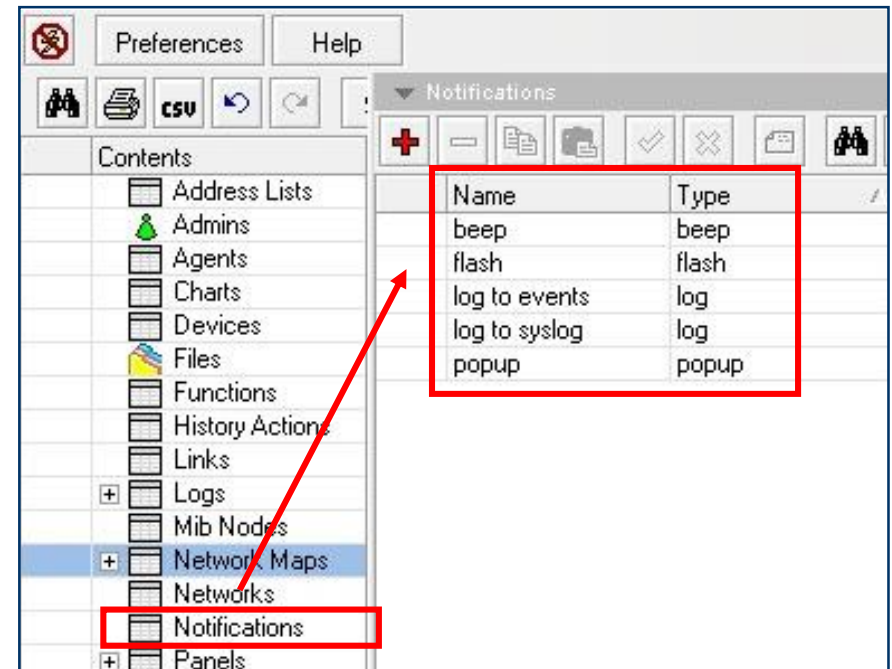
Setup Email Notifications

Sending email alerts by Gmail



Preconfigure Notifications

- Notification types for events like outages
- Some preconfigured
- Some unused types
- Not preconfigured: Email
- Generic email notification using Gmail





Email Notification

The screenshot shows the FMS interface with the 'Notifications' menu item highlighted in the left sidebar. A red arrow points from this menu item to the '+' icon in the Notifications toolbar. The 'email - Notification' dialog box is open, showing the 'General' tab. The following fields are highlighted with red circles and numbers:

- 1: Name: email
- 2: Type: email
- 3: Server Port: 587

The dialog box also includes the following fields:

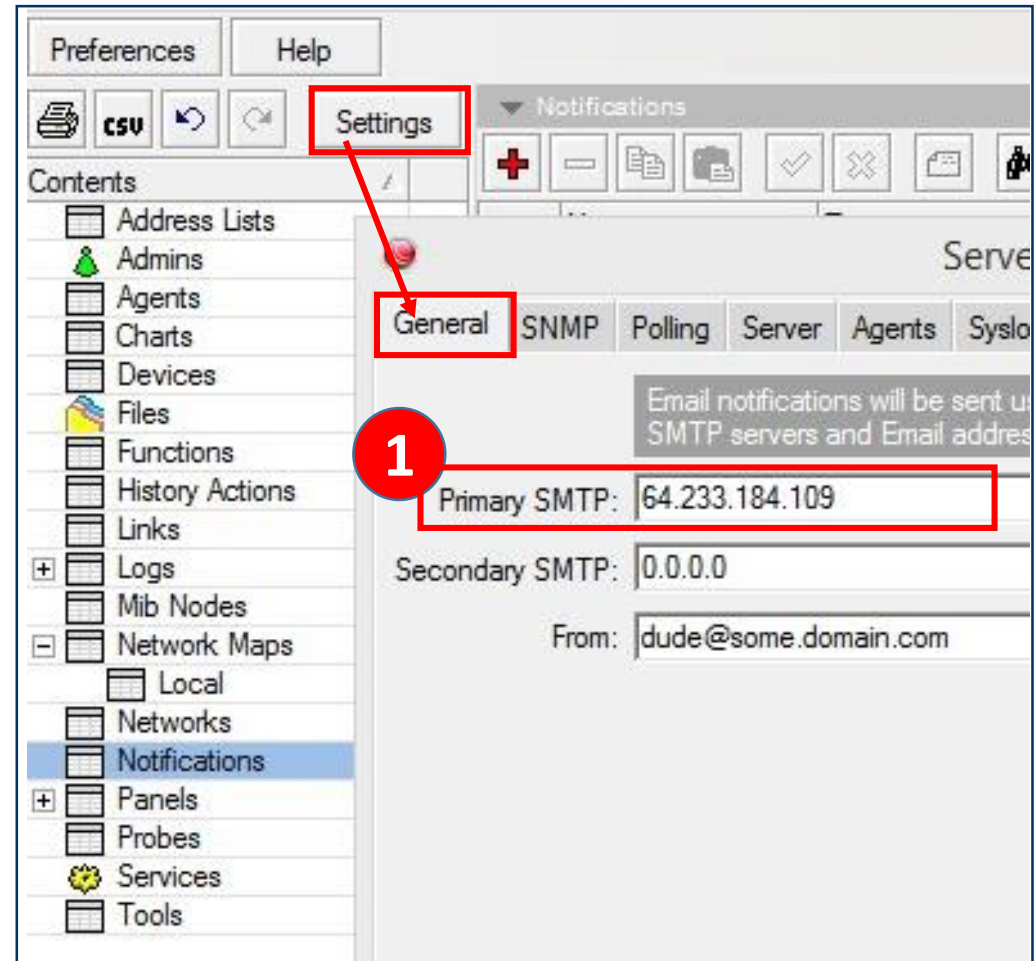
- Enabled: ☒
- Server: ☐
- User: myaccount@gmail.com
- Password: [masked]
- Tls Mode: yes
- To: receipient@foo.bar
- Cc: [empty]
- Subject: Service [Probe.Name] on [Device.Name] is now [Service Status]

The dialog box has buttons for Ok, Cancel, Apply, Notes, Copy, Remove, and Test.



Email Notification

- Server setup in general settings
- Default for new notifications
- Can be superseded
- IP (not URL) of Gmail SMTP





Testing Email Notification

The screenshot illustrates the steps to test an email notification in the FMS interface. The main window shows configuration fields for an email server (Server, Server Port, User, Password, Tls Mode, To, Cc, Subject, Body) and buttons for Copy, Remove, and Test. A red box highlights the Test button. A red arrow points from the Test button to the System menu in the left sidebar. Another red arrow points from the System menu to the Add button (+) in the Logging Rules section. A third red arrow points from the Add button to the New Log Rule dialog box. In this dialog, the Topics field is set to 'e-mail', and the Action is set to 'memory'. A red box highlights the Topics field. A final red arrow points from the 'Ok' button in the New Log Rule dialog back to the main window's 'Ok' button.

Server: ☐
Server Port: ☒ 25
User: 587
Password:
Tls Mode: yes
To: receipient@foo.bar
Cc:
▼ Insert Variable
Subject: Service [Probe.Name] or [Service.Status]
▼ Insert Variable
Body: Service [Probe.Name] or [Service.Status] [Service.ProblemDescr]
Copy
Remove
Test
Routing
System
Queues
Files
Log
Radius
Tools
New Terminal
Make Supout.rif
Manual
New WinBox
Exit
Logging
Rules
Actions
+
-
Find
Topics
critical
error
info
warning
4 items
New Log Rule
Topics: e-mail
Prefix:
Action: memory
OK
Cancel
Apply
Disable
Copy
Remove
enabled
Ok



Gmail Consideration

e-mail, debug	send AUTH PLAIN AHRwdGVjaDAxMEBnbWFpbC5jb20AbnVyMWtvcWl3Y2hlc0xvZ2luMg==
e-mail, debug	recv: 534-5.7.14 <https://accounts.google.com/ContinueSignIn?sarp=1&sc=1&plt=AKgnsbvTi
e-mail, debug	recv: 534-5.7.14 FiAliAW-fjiqfJ9B0a6YYaSB5Nfr0aUQ8JGvWus9cSWEdCRPEhBbSjy-LOWFGXaJcf
e-mail, debug	recv: 534-5.7.14 yVUaJyhSdWwbNOgtNaVOOA14HSnOgrlmuyGWj6qAqTMRqGvU4xi9suSh2d5F7X
e-mail, debug	recv: 534-5.7.14 UXTIBgjd0j0KGuVrUXgskPmfzjtqOjHc3HS6eU0pE5oUivQ40\A-eh-MfwVCBnXaXC
e-mail, debug	recv: 534-5.7.14 vDo2vsDFRN9w36NshUcQRILLEe0I> Please log in via your web browser and
e-mail, debug	recv: 534-5.7.14 then try again.
e-mail, debug	recv: 534-5.7.14 Learn more at
e-mail, debug	recv: 534 5.7.14 https://support.google.com/mail/answer/78754 jc7sm17523957wjb.33 - gsmt
system, e-mail, error	Error sending e-mail <Service [Probe.Name] on [Device.Name] is now [Service.Status]>: AUTH failed
e-mail, debug	send RSET

- Watch log for
“Please log in via your web browser and then try again.”
- Turn on "Access for less secure apps"
- Probably referring to “OAuth2.0”
- Not referring to lack of encryption



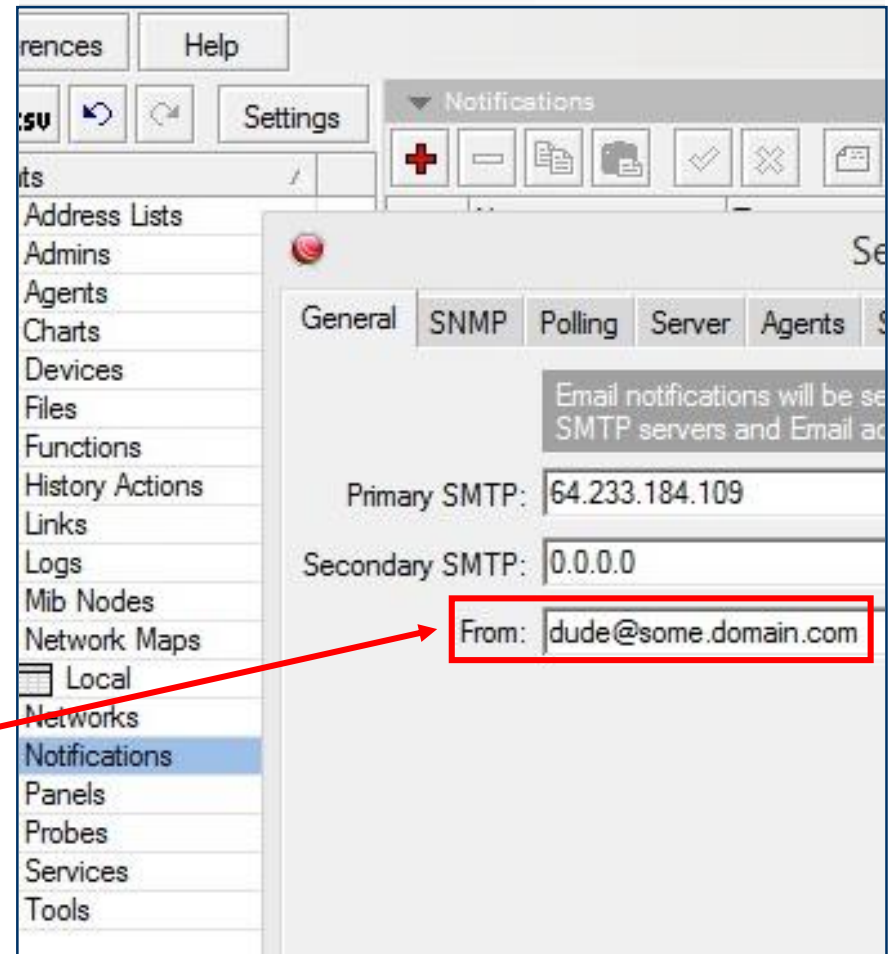
Email Header

Message-ID:

56c7f2db.45312c0a.ac355.ffffc
9a2@mx.google.com

From: myaccount@gmail.com

X-Google-Original-From:
dude@some.domain.com





The Dude for RouterOS

Dedicated RouterOS features and extensions



Enabling Extra Features

AP OG1 - Device

General Polling Services Outages Snmp RouterOS Dude History Tools

Name: AP OG1

Addresses: 192.168.0.246

DNS Names:

DNS Lookup: ☒ none ☐ address to name ☐ name to address

DNS Lookup Interval: 60 min

MAC Addresses: D4:CA:6D:96:FF:7E

MAC Lookup: ☐ none ☒ ip to mac ☐ mac to ip

Type: MikroTik Device

Parents:

Custom Field 1:

Custom Field 2:

Custom Field 3:

Agent: default

Snmp Profile: v1-public

User Name: admin

Password:

☒ Secure Mode

☒ Router OS

☒ Dude Server

Services:  Up - 7

Status: up

Ok Cancel Apply Notes Remove Tools Reprobe Ack Unack Reboot Reconnect



RouterOS Tab

AP EG - Device

GeneralPollingServicesOutagesSnmpRouterOSDudeHistoryTools

InterfaceIpRouteArpPackageFileNeighborRegistration TableSimple QueueDhcp Lease

CSV

	Interface	Radio Name	MAC	AP	WDS	Tx/Rx Rate	Tx/Rx ...	Comment	Last IP
	wlan2		64:9A:BE:9A:0...	no	no	65Mbps-20MHz/1S/52Mbps-20MHz...	0/-72		192.168.0.29
	wlan2		B8:FF:61:0F:84...	no	no	1Mbps/65Mbps-20MHz/1S	0/-59	iPad Patrik	192.168.0.49
	wlan2		64:9A:BE:98:2...	no	no	54Mbps/65Mbps-20MHz/1S	0/-62		192.168.0.30
	wlan3		8C:FA:BA:8A:7...	no	no	39Mbps-20MHz/1S/65Mbps-20MHz...	0/-59		192.168.0.45
	wlan3		74:E2:F5:CB:7...	no	no	65Mbps-20MHz/1S	0/-60		192.168.0.36
	wlan3		74:E2:F5:E2:2...	no	no	1Mbps/58.5Mbps-20MHz/1S	0/-76		192.168.0.38

OkCancelApplyNotesRemoveToolsReprobe

AP EG - Device

GeneralPollingServicesOutagesSnmpRouterOSDudeHistoryTools

InterfaceIpRouteArpPackageFileNeighborRegistration TableSimple QueueDhcp Lease

CSV

	Name	Type	MTU	Tx Bps	Rx Bps	Tx Pps	Rx Pps
	bridge1	bridge	1500	40.5 kbps	6.34 kbps	4	7
	ether1	ethernet	1500	56.8 kbps	71.4 kbps	20	22
X	wlan1	wireless	1500	0 bps	0 bps	0	0
	wlan2	wireless	1500	65.2 kbps	16.3 kbps	17	16
	wlan3	wireless	1500	968 bps	0 bps	2	0

OkCancelApplyNotesRemoveTools



Dude Tab

192.168.0.249 - Device

General Polling Services Outages Snmp RouterOS **Dude** History Tools

Contents

- Address Lists
- Admins
- Agents
- Charts
- Devices
- Files
- Functions
- History Actions
- Links
- Logs
 - Action
 - Debug
 - Event
 - Syslog
- Mib Nodes

Local

Settings Discover Tools Layer

Rx: 1.42 kbps
Tx: 600 bps

192.168.0.249

192.168.0.0/24

Rx: 1.83 kbps
Tx: 4.64 kbps

AP Floor 1
cpu: 2% disk: 23%
4 Stations connected

192.168.0.21

APNAS

Ok
Cancel
Apply
Notes
Remove
Tools
Reprobe
Ack
Unack
Reboot
Reconnect



Files/Package Window

The screenshot shows the FMS interface. On the left, the 'Contents' sidebar has the 'Files' tab selected. In the top bar, the 'Packages' tab is selected. The main window displays a table of packages:

Name	Size	Version	Architect...	Notes
routeros-mipsbe	10.1 MB	6.34.1	mipsbe	
routeros-mipsbe	10.2 MB	6.34.2	mipsbe	

Below this, a 'Transfers' window is open, showing a list of file transfers:

#	File	Time	Device	Direction	Status	Progress	Err
1	routeros-mipsbe-6.34....	23:15:36		upload	done	100	
2	dude-6.34rc41.npk	23:15:44		upload	done	100	
3	routeros-powerpc-6.3...	23:38:15		upload	in process	26	
4	routeros-mipsbe-6.33...	23:38:15		upload	queued	0	
5	routeros-mipsbe-6.33...	23:38:15		upload	queued	0	
6	routeros-mipsbe-6.34...	23:38:15		upload	queued	0	
7	routeros-powerpc-6.3...	23:38:15		upload	queued	0	
8	routeros-powerpc-6.3...	23:38:15		upload	queued	0	

- Drag & Drop Firmware to “Packages” tab
- Available for upgrading RouterOS devices



Devices/RouterOS Window

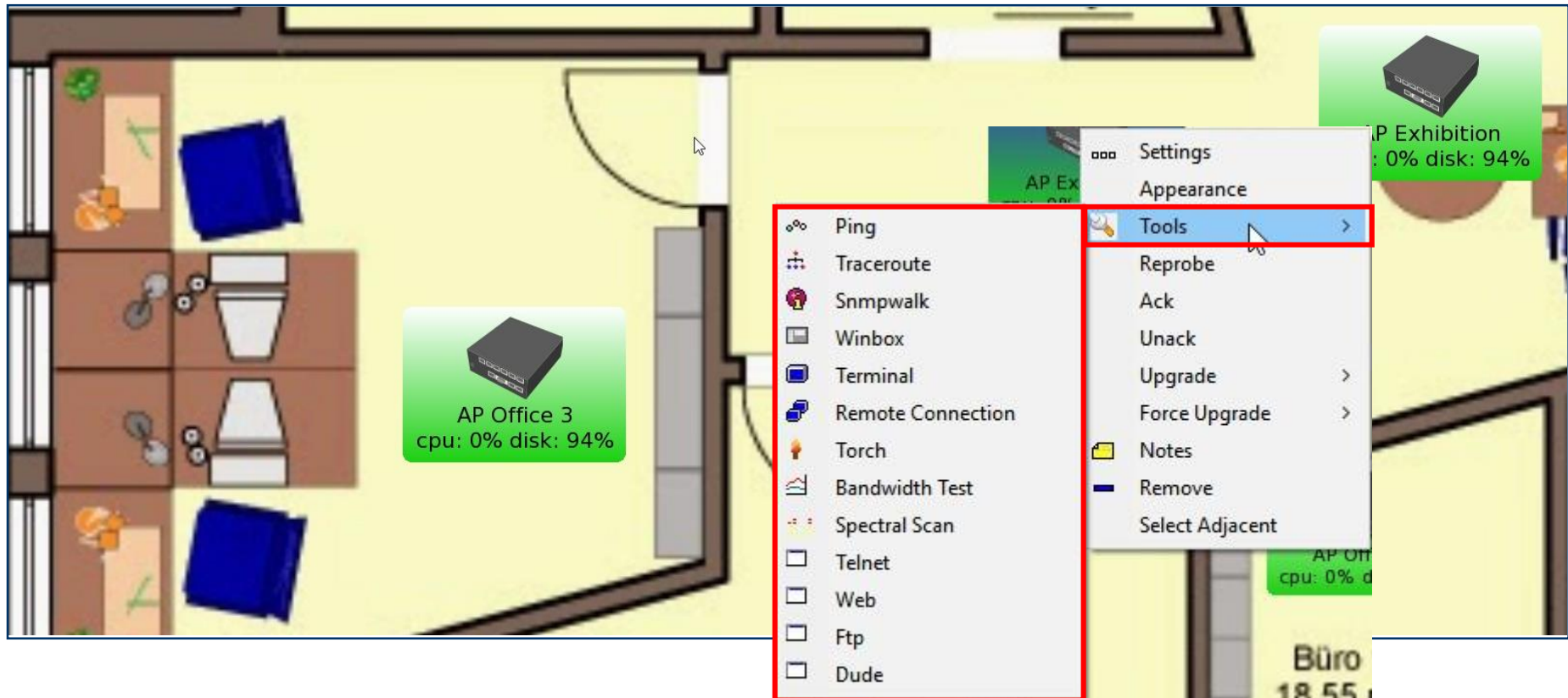
The screenshot displays the FMS interface with the 'RouterOS' tab selected. The 'Device' sub-tab is active, showing a list of devices. The 'Devices' menu item in the left sidebar is highlighted. A context menu is open for the 'AP Floor 1' device, showing options like 'Device Settings', 'Show On Map', 'Tools', 'Settings', 'Upgrade', 'Force Upgrade', and 'Reconnect'. The 'Upgrade' option is highlighted, and a sub-menu shows available versions: 6.34.2, 6.34.1, 6.33.3, and 6.33.5.

Status	Name	Version	Architecture	Board	Upgrade Status	Packages
ok	192.168.0.21	6.35rc12	x86	CHR		
ok	192.168.0.249	6.35rc12	x86	CHR		
ok	AP Floor 1	6.34.1	mipsbe	RB411AR		
ok	AP Floor 2	6.34.2	mipsbe	RB2011UAS-2H		

- See only RouterOS devices and details
- Run RouterOS updates directly



RouterOS Tools

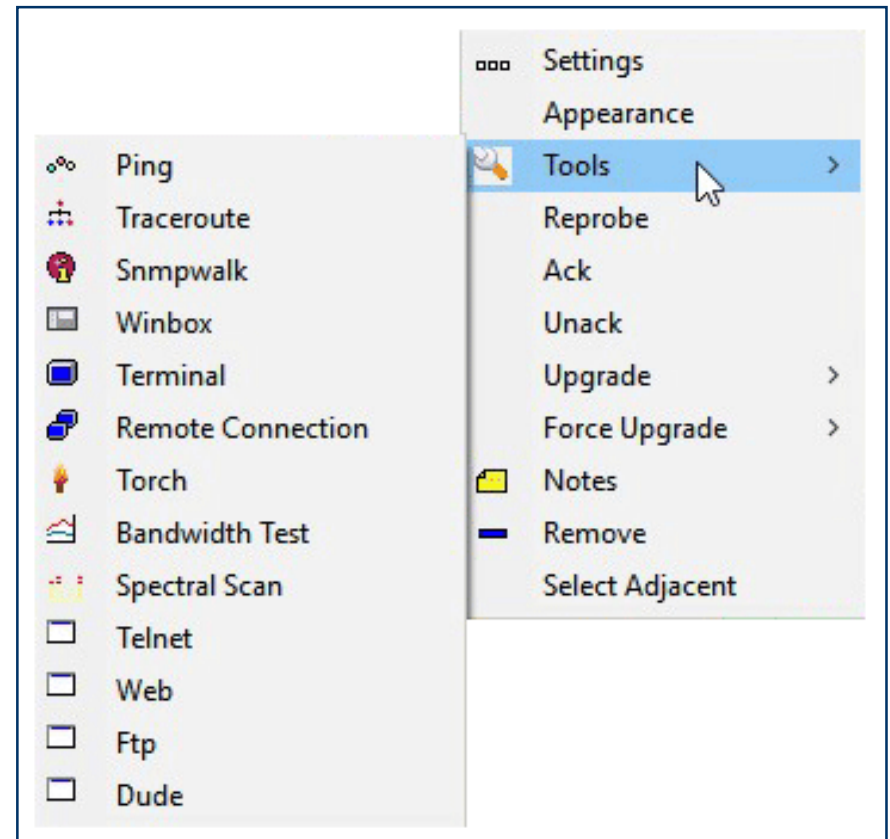


- Context menu shows tools sub menu
- General and RouterOS specific tools



RouterOS Tools (to a Device)

- Winbox
 - Terminal
 - Remote Connection (MAC)
 - Dude
-
- More Tools “from” a Device
 - More powerful than in Winbox





Bandwidth Test



- Device selection

- No credentials



Torch

- Select any device
- See network from different views
- Additional charts

Torch AP Exhibition

General

From: AP Exhibition

Interface: 192.168.0.21
192.168.0.249
AP Exhibition

Average: AP Floor 1
AP Floor 2
AP Kitchen
AP Living Room
AP Office 2
AP Office 3
AP Office 3
AP Office EDV

1m

Fit

Eth

IP

Src

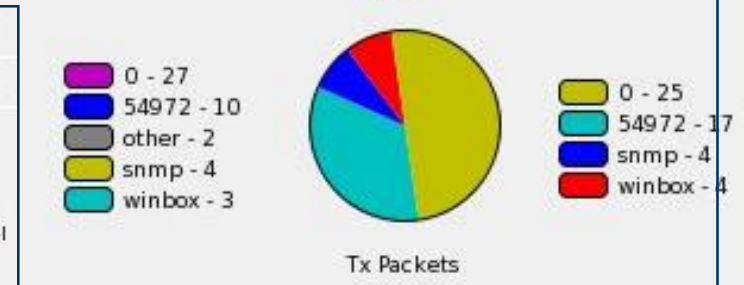
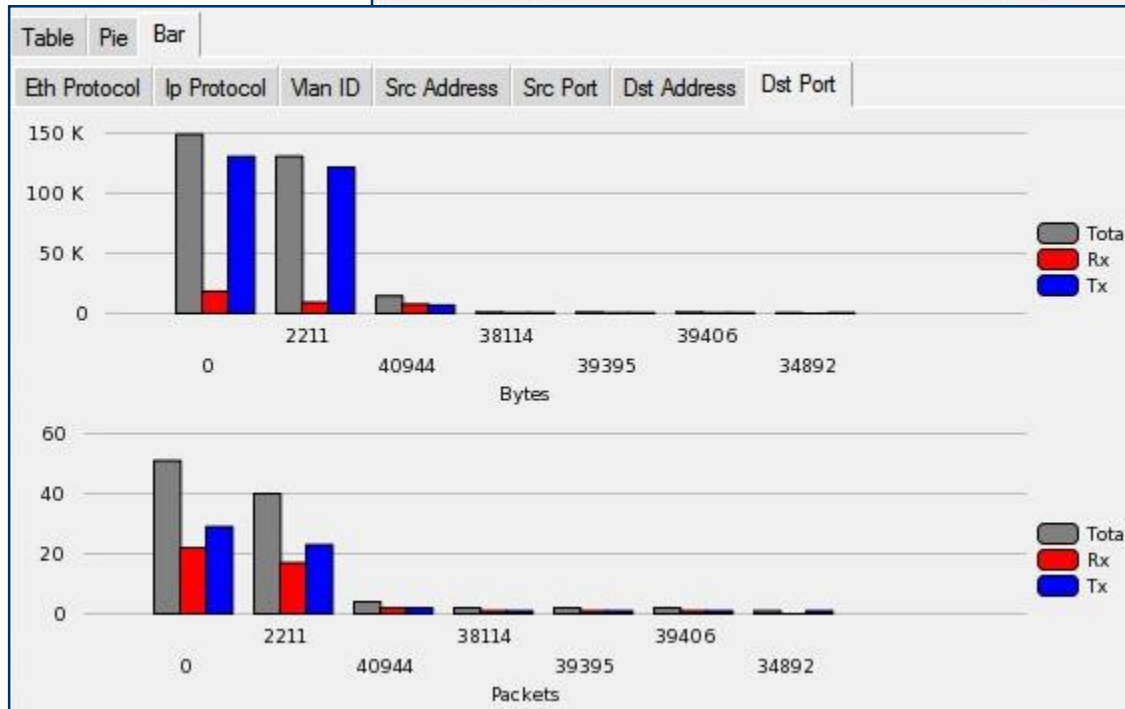
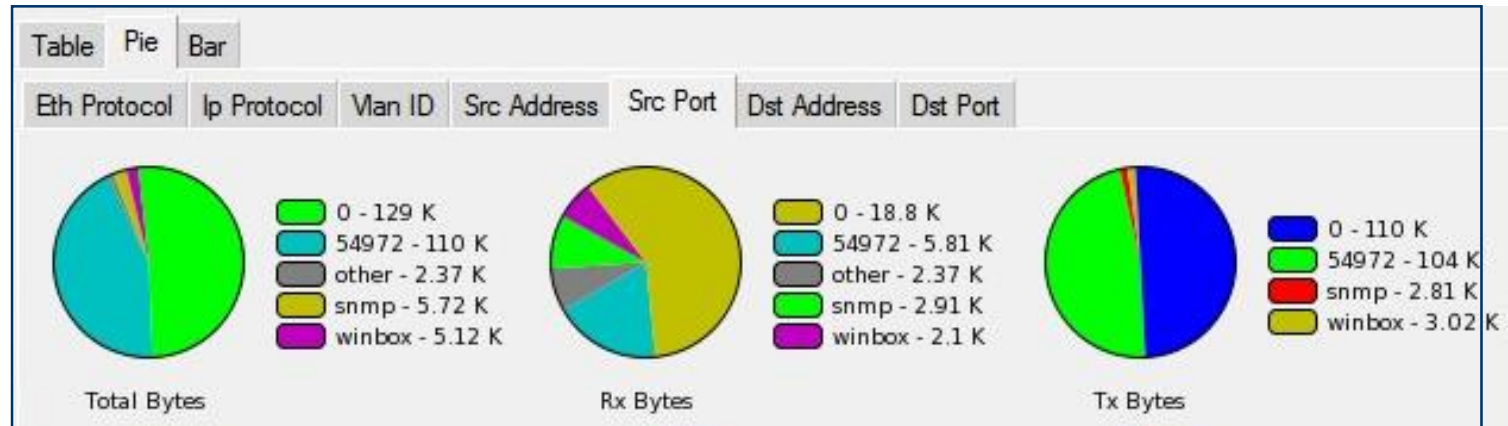
Dst

Table Pie Bar

#	Eth ...	IP Pr...	Man ID	Src Address	Src Port
...	ip	tcp		192.168.0.250	lpr
...	ip	tcp		192.168.0.250	http
...	ip	udp		192.168.0.250	netbios-ns
...	ip	icmp		192.168.0.250	0
...	ip	tcp		192.168.0.247	winbox
...	ip	tcp		192.168.0.247	winbox
...	ip	tcp		192.168.0.247	winbox

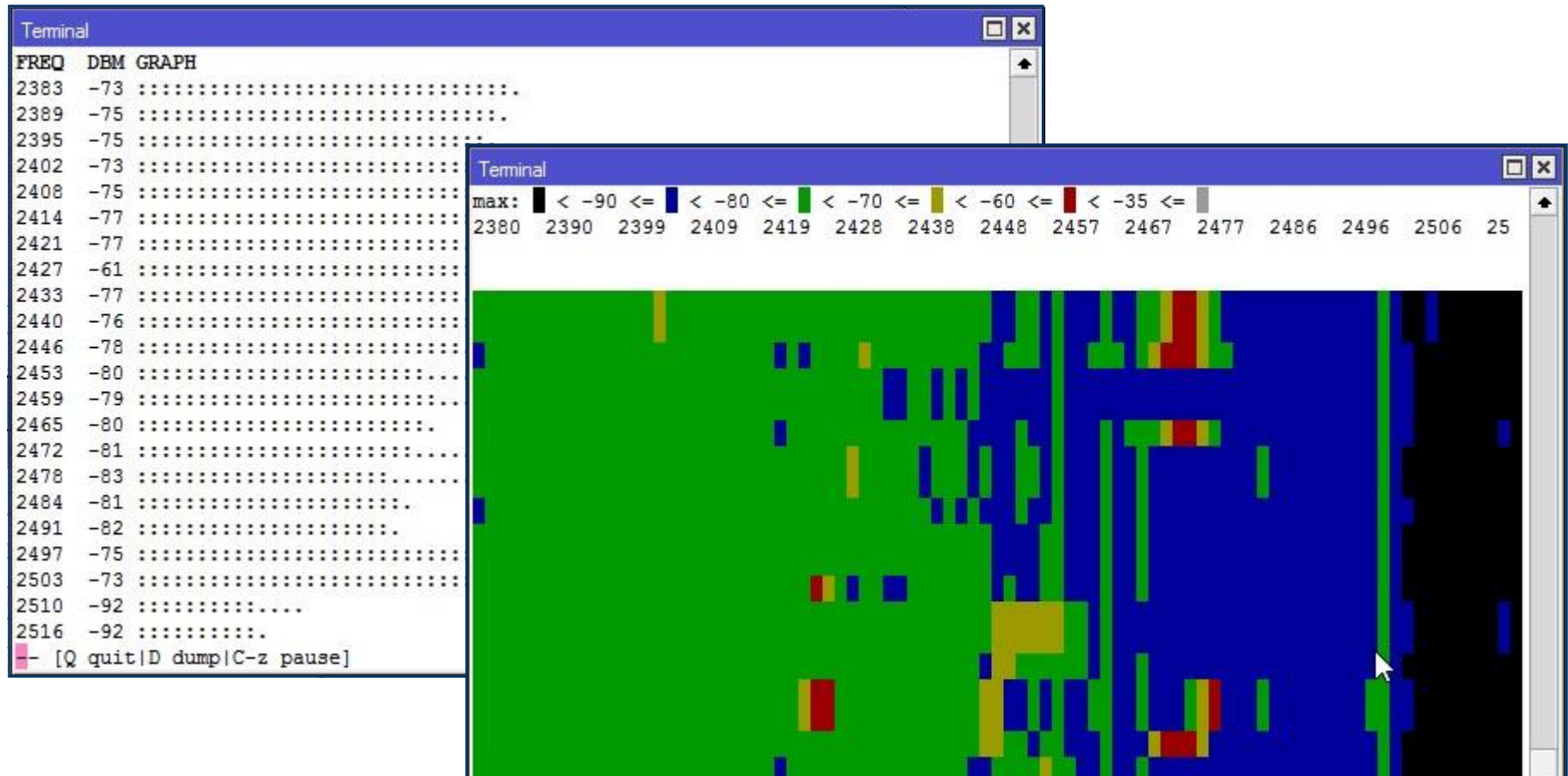


Torch Charts





Spectral Scan (Winbox)

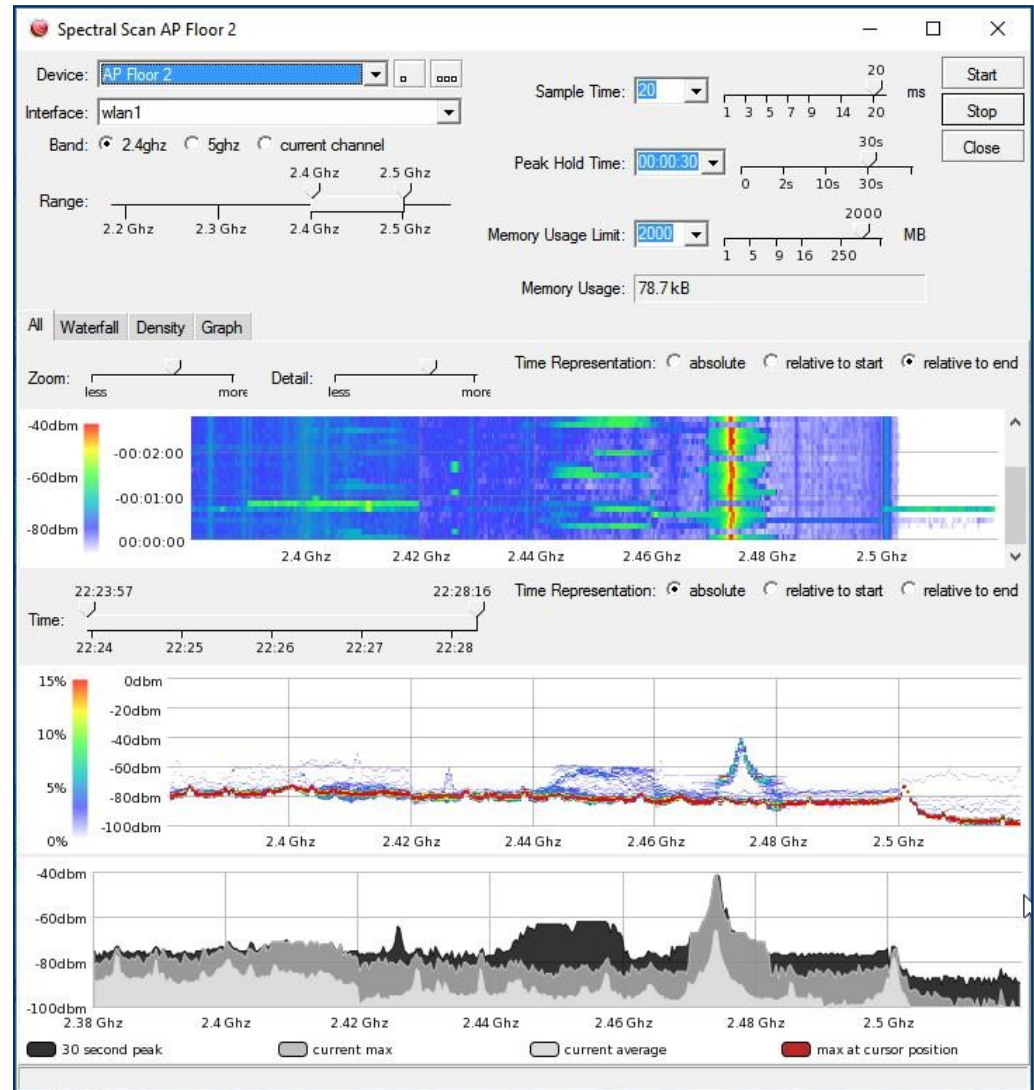


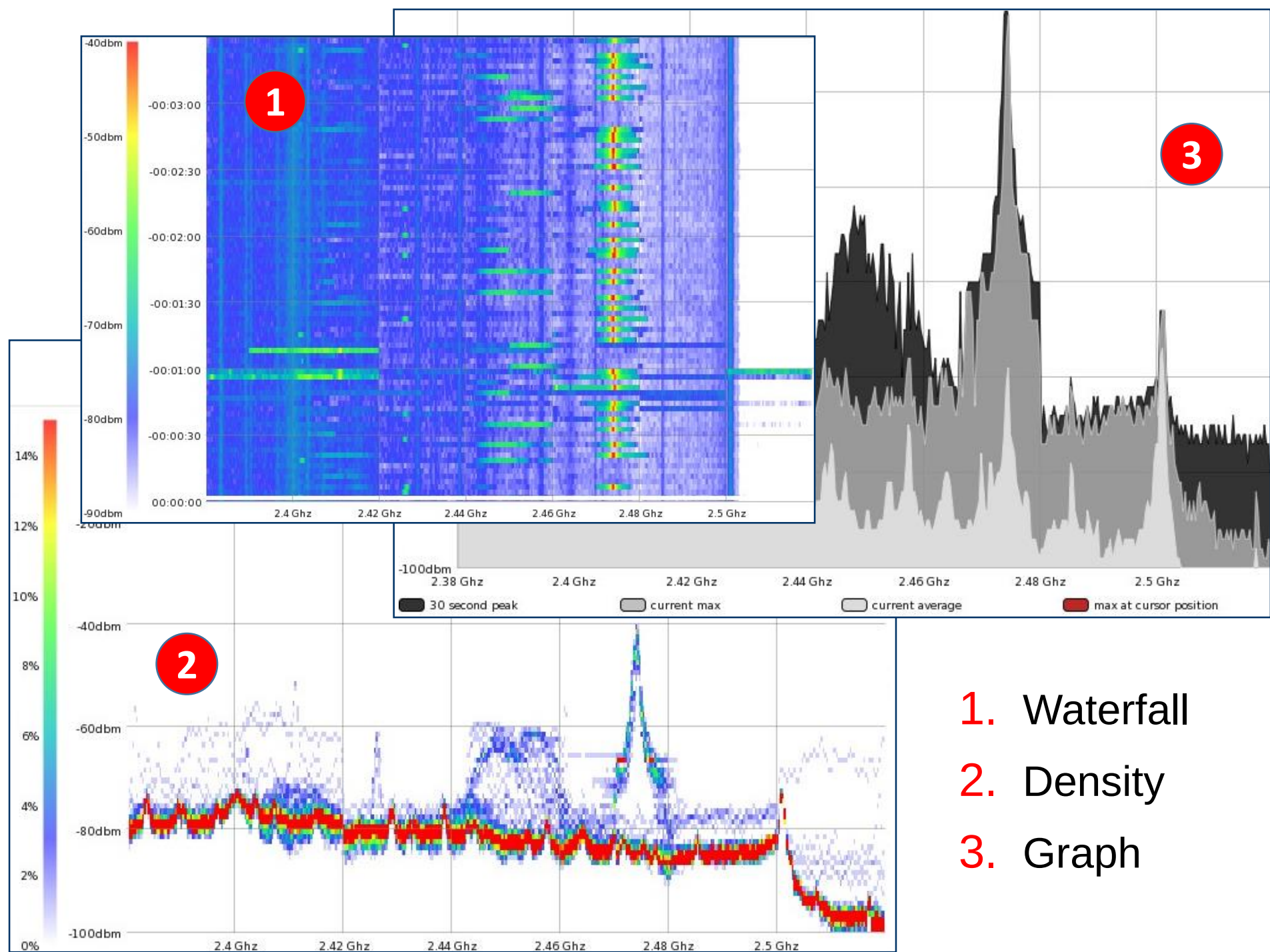
- /interface wireless spectral-scan number=0
- /interface wireless spectral-history value=max



Spectral Scan (Dude)

- From any device
- Good representation
- Simultaneous scans
- Spectral view for network with multiple sensors





1. Waterfall
2. Density
3. Graph



Labels

- Great graphical maps
- Devices & links carry information
- Dynamic labels
- RouterOS specific



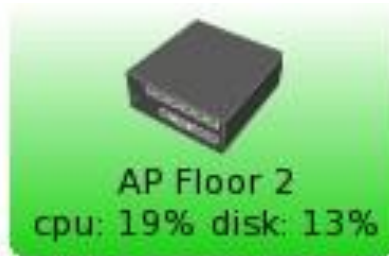


Device Labels



No SNMP

No RouterOS
Function



SNMP on

No RouterOS
Function



SNMP on

RouterOS
Function



Device Labels

The screenshot illustrates the FMS interface for configuring device labels. On the left, a device card for 'AP Floor 2' shows CPU usage at 12% and disk usage at 13%, running RouterOS 6.34.2 (mipsbe). A context menu is open over the card, listing options like Settings, Appearance, Tools, Reprobe, Ack, Unack, Upgrade, Force Upgrade, and Notes. On the right, the configuration window for the device is shown, with the 'Image' tab selected. The 'Type' is set to 'item' and the 'Item Type' is set to 'device'. A section titled 'Map specific values of following settings are used for this item if not specified here' contains three buttons: 'Insert Variable', 'Insert Oid', and 'Functions...'. Below these buttons, a list of variables and functions is shown, including [Device.Name], [device_performance()], and [ros_info()].

1. Variable

2. Function using SNMP

3. Function using RouterOS

1. Variable
2. Function using SNMP
3. Function using RouterOS



Custom RouterOS Functions

- Custom functions combining existing functions
- `ros_command()`
- Calling script / running CLI commands
- Returning output
- Almost anything possible

admin@192.168.0.249 - The Dude 6.35rc12

Preferences Help

Contents

- Address Lists
- Admins
- Agents
- Charts
- Connected Statio...
- Devices
- Files
- Functions**
- History Actions
- Links
- Logs
 - Action
 - Debug
 - Event
 - Syslog
- Mib Nodes
- Network Maps
 - Local
 - New Map
- Networks
- Notifications
- Panels
 - admin 192.168.0....
 - admin 192.168.0....
- Probes
- Services

Functions

Name	Description
and	logical and
array	returns array of given ar
array_element	return array element with
array_find	returns array index from
array_size	returns element count in
average	calculates and returns a
bitrate	formats number as bitrat
bytes	formats number as bytes
concatenate	concatenates two or mo
cpu_mem_disk	
cpu_usage	
cpu_usage_available	
device_performance	
device_property	returns device property
diff32	returns counter differenc
diff64	returns counter differenc
hdd_size	
hdd_usage	
if	first parameter - conditio
link_index	returns link index availa
max	calculates and returns n
mem_size	
mem_usage	
min	calculates and returns n
not	logical not

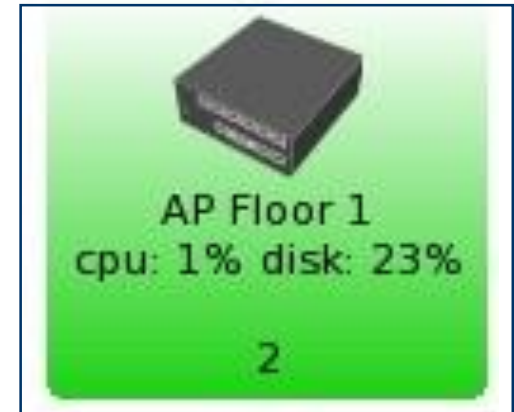


Number of WIFI Connections

- Label:

```
[ros_command("/interface wireless  
registration-table print count-only")]
```

```
[concatenate(round(ros_command("/interface wireless registration-table print  
count-only")), " stations connected")]
```





Use Functions inside Label

- Function easier to reuse in labels
- Two functions, 1 x Integer & 1 x String



- `ros_registration_size()`

`ros_command("/interface wireless registration-table print count-only")`

- `ros_registration_size_label()`

`concatenate(round(ros_registration_size()), " stations connected")`



Creating the new Functions

The screenshot shows the FMS interface. On the left, the 'Contents' pane has 'Functions' highlighted. In the center, the 'Functions' window displays a list of functions, with 'ros_registration_size' selected. On the right, the 'New Function' dialog is open, showing the following fields:

- Name:** `ros_registration_size label`
- Description:** Returns a formatted string of `ros_registration()` to be used in a label
- Code:**

```
concatenate(round(ros_registration_size()), " stations connected")
```

Red arrows and boxes highlight the '+' icon in the Functions window and the 'New Function' dialog fields.

- Choose “+” in functions window
- Enter name, description and source code



Custom Statistics

Using Probes, Services and Charts



Statistics

- Information over time
- In context layer
- In history
- Necessary
 - Probe
 - Service





Creating the Probe

- Type: Function
- Available: $1 = 1$
 - always available
- Error: `if (1>0, "", "")`
 - always up
- Value: `ros_registration_size()`
- Unit: Stations

The screenshot shows the 'Probes' configuration window. A table lists several probes, with 'ros_registration_size' selected. A detailed configuration panel for this probe is open, showing fields for Name, Type, Agent, Available, Error, Value, and Unit, along with descriptive text for each.

Name	Type	Notes
dns	DNS	
Test-Probe	Function	
cpu	Function	
disk	Function	
memory	Function	
ros_registration_size	Function	

ros_registration_size - Probe

Name: `ros_registration_size`

Type: `Function`

Agent: `default`

Performs custom functions to decide if service is available and up. If up graphs value of another function

Should return true if service is available

Available: `1=1`

If return string is empty then service is assumed up

Error: `if(1 > 0, "", "")`

Should return value to graph if up

Value: `ros_registration_size()`

Unit: `Stations`



Creating the Service

- Service =

Probe + Device

The screenshot shows a 'Services' window with a table of existing services and a 'New Service' dialog box open at the bottom.

	Device	Type	Problem
▶	192.168.0.249	ssh	ok
▶	AP Exhibition	ssh	ok
▶	AP Floor 1	ssh	ok
▶	AP Floor 2	ssh	ok
▶	AP Living Room	ssh	ok
▶	AP Office 3	ssh	ok
▶	AP Office EDV	ssh	ok
▶	AP Exhibition	ros_registration_s...	ok
▶	AP Floor 1	ros_registration_s...	timeout

New Service

General | Notifications | History

Device: AP Exhibition [v] [o] [ooo]

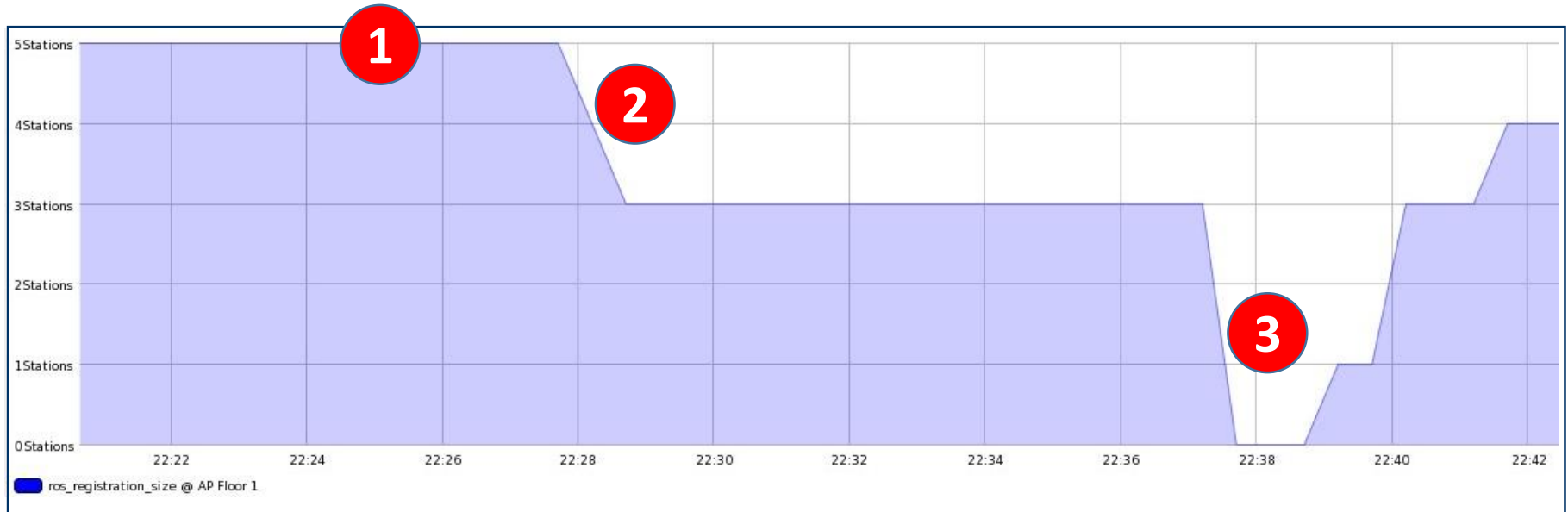
Probe: ros_registration_size [v] [o] [ooo]

Agent: default [v] [o] [ooo]

☒ Enabled



History



1. 5 stations connected

2. 4 stations connected

3. 0 stations connected



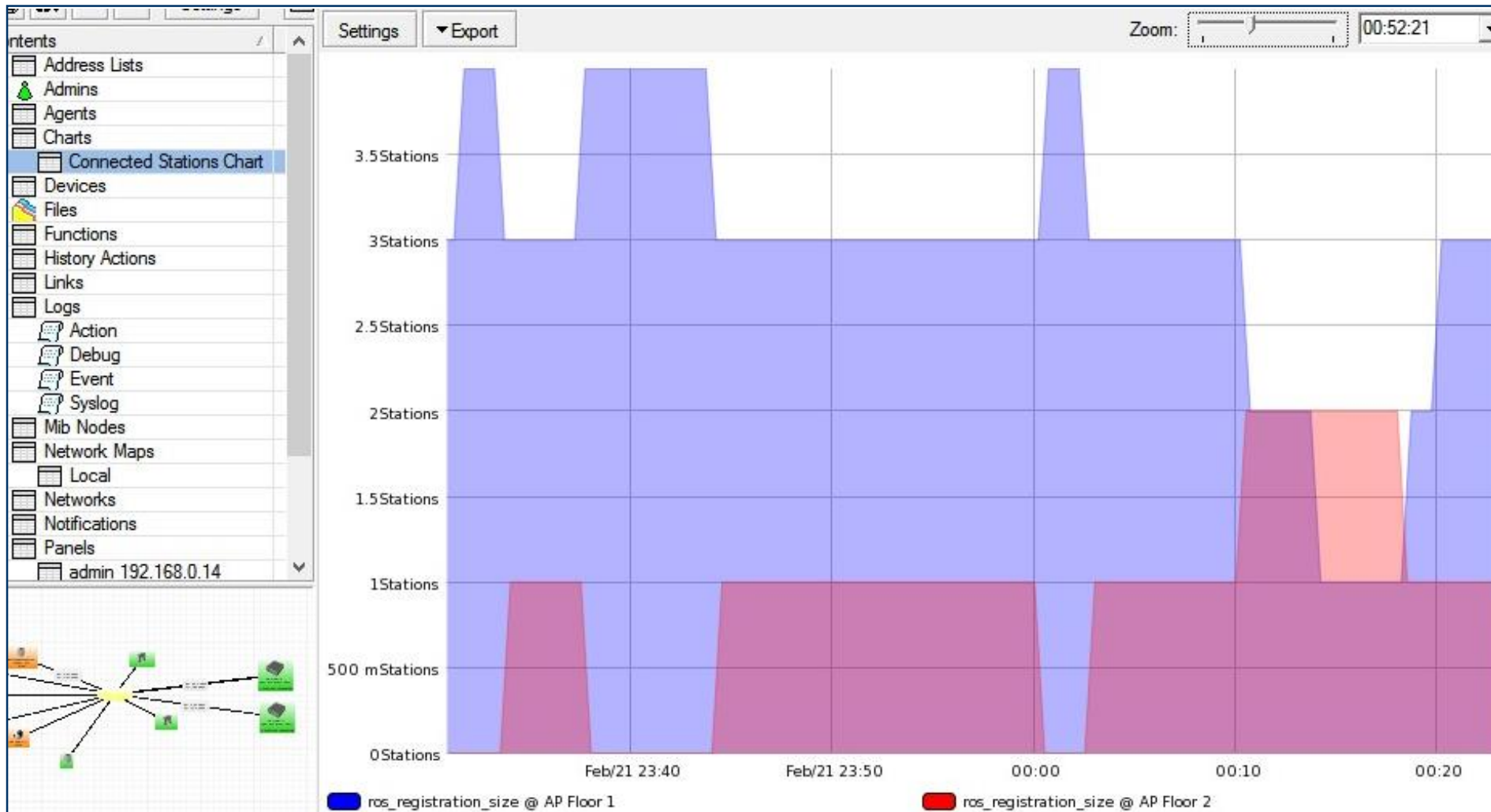
Context History



- Station flapping between „AP Floor 1,, and „AP Floor 2,,



Charts for graphing multiple Services



- Station flapping between „AP Floor 1,, and „AP Floor 2,,



THANK YOU

... and enjoy the Usermeeting



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