

The Dude – Network management and monitoring software

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Overview

- The Dude - First steps
- The Dude Tools
- The Dude Notifications
- CHR overview

MikroTik

[illegible]

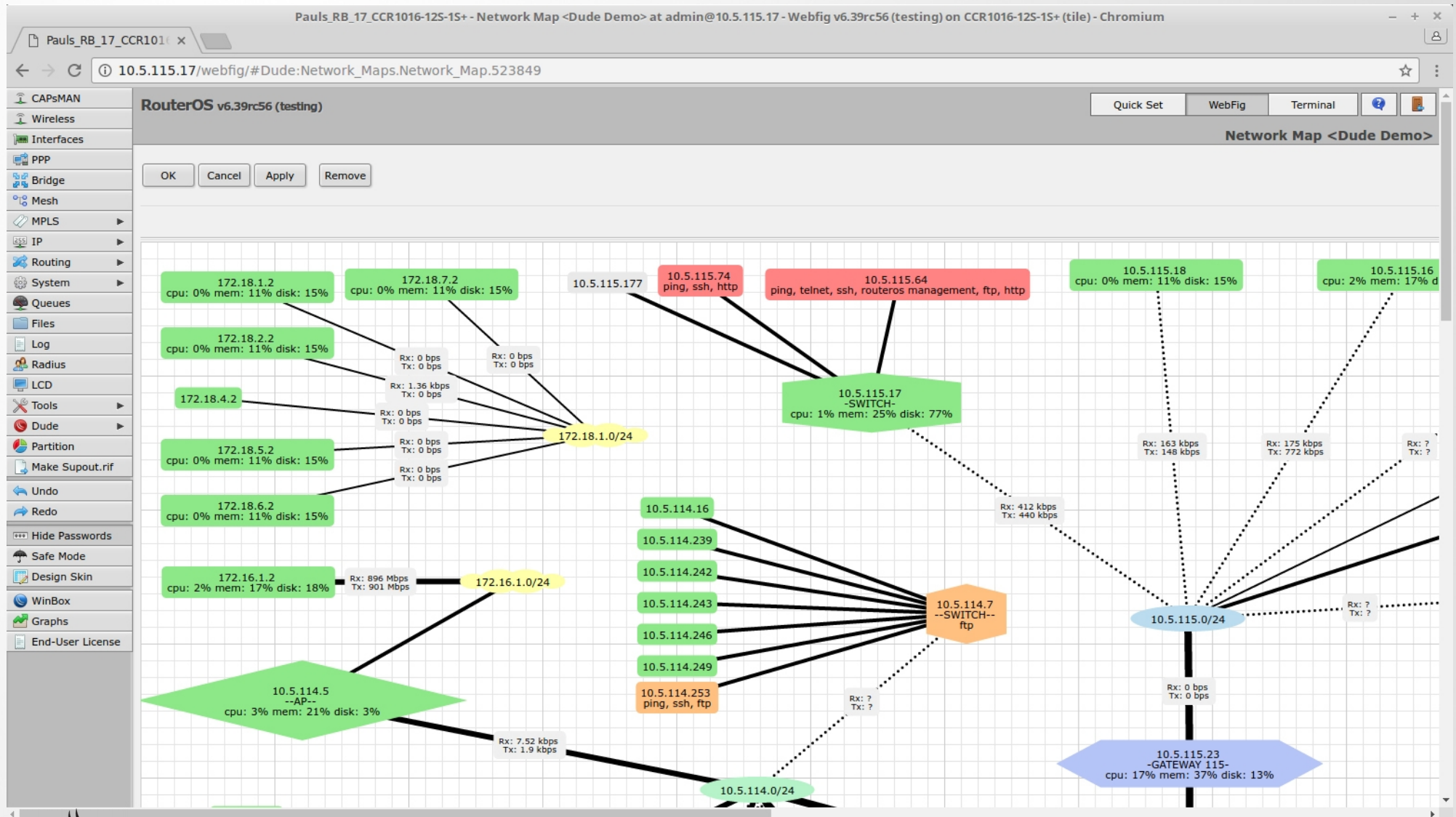
The Dude development

- First version released in 2006
- 4.0beta3 was the latest version
- Development renewed in 2016
- The Dude is integrated back to RouterOS package

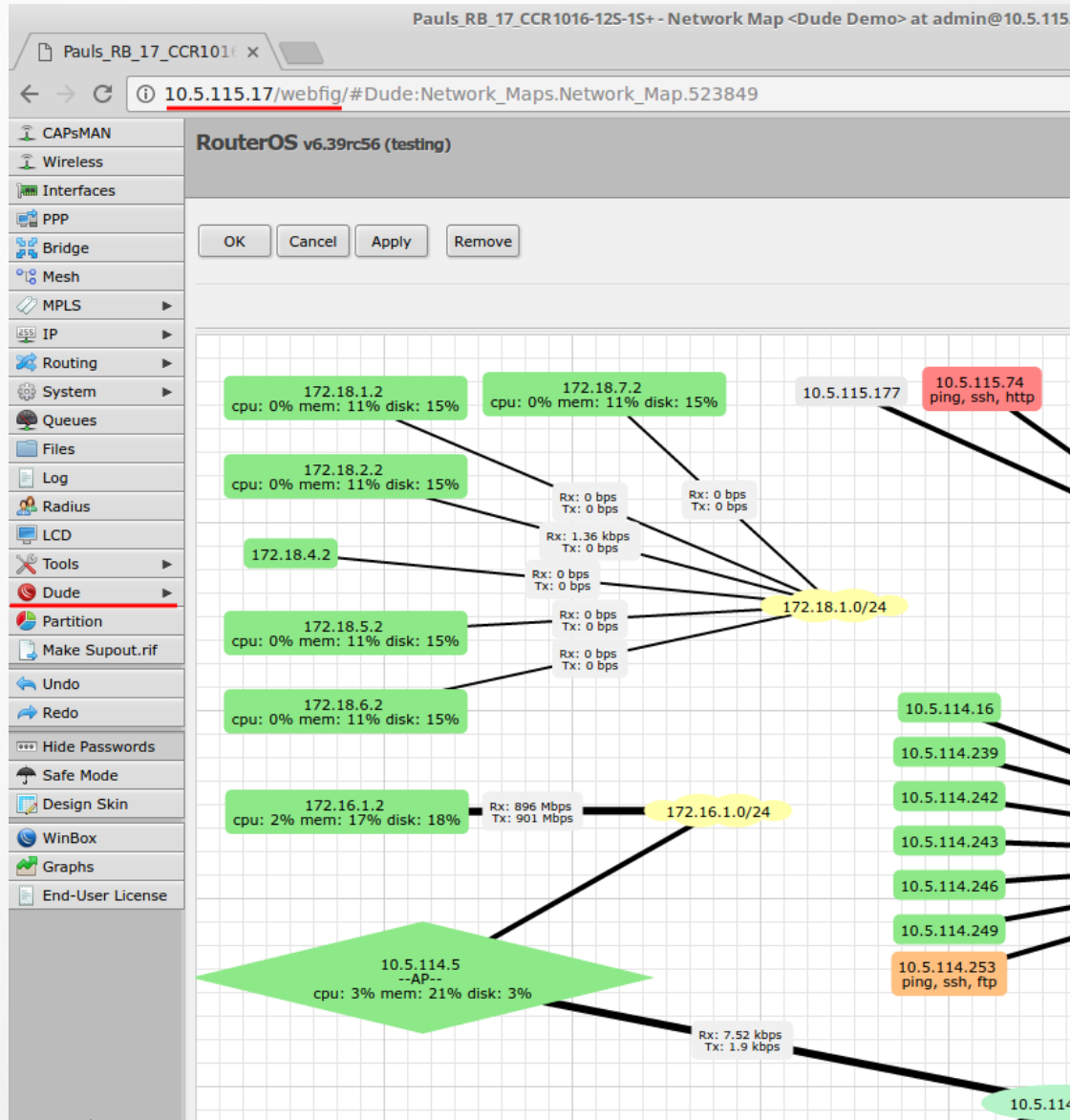
The Dude v6.x changes

| The Dude server | The Dude client |
|------------------------|--------------------------|
| ALL CCR (TILE) | Windows |
| CHR / x86 | Webfig |
| RB3011/1100x4 (ARM) | Winbox |
| RB hEX (MMIPS) | CLI In development... |

The Dude web interface



The Dude web interface



- Provides web access from any browser
- No installation required
- Provides configuration options
- Accessible at **<ServerIP>/webfig/**
- Starting from RouterOS 6.38

Prepare a server...

Install The Dude server:

- 1) Download The Dude server package (mikrotik.com/download)
- 2) Upload it to the RouterOS file system
- 3) Reboot RouterOS

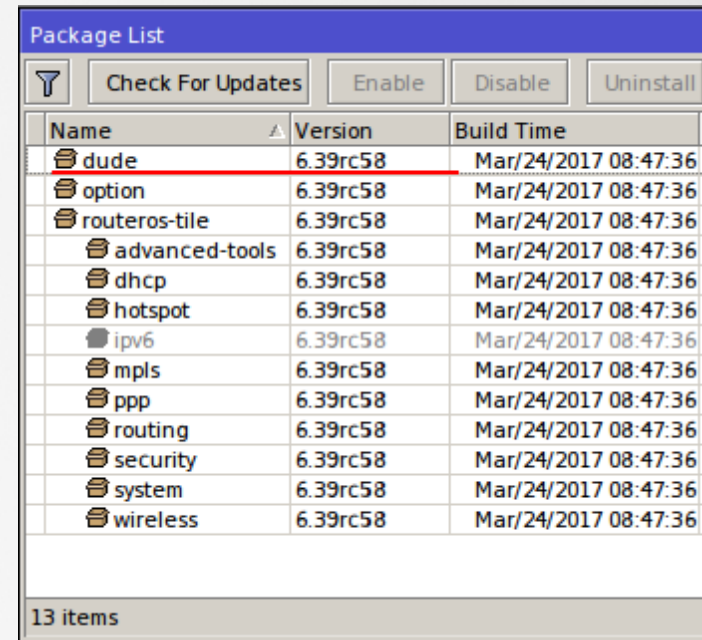
Enable The Dude server:

- 1) Specify directory where the database will be stored

```
/dude set data-directory= disk1/new
```

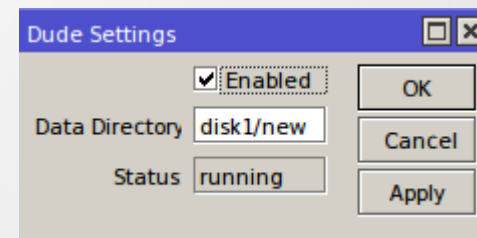
- 2) Enable The Dude

```
/dude set enabled=yes
```



| Name | Version | Build Time |
|----------------|----------|----------------------|
| dude | 6.39rc58 | Mar/24/2017 08:47:36 |
| option | 6.39rc58 | Mar/24/2017 08:47:36 |
| routeros-tile | 6.39rc58 | Mar/24/2017 08:47:36 |
| advanced-tools | 6.39rc58 | Mar/24/2017 08:47:36 |
| dhcp | 6.39rc58 | Mar/24/2017 08:47:36 |
| hotspot | 6.39rc58 | Mar/24/2017 08:47:36 |
| ipv6 | 6.39rc58 | Mar/24/2017 08:47:36 |
| mpls | 6.39rc58 | Mar/24/2017 08:47:36 |
| ppp | 6.39rc58 | Mar/24/2017 08:47:36 |
| routing | 6.39rc58 | Mar/24/2017 08:47:36 |
| security | 6.39rc58 | Mar/24/2017 08:47:36 |
| system | 6.39rc58 | Mar/24/2017 08:47:36 |
| wireless | 6.39rc58 | Mar/24/2017 08:47:36 |

13 items



Dude Settings

☒ Enabled

Data Directory: disk1/new

Status: running

OK Cancel Apply

Recommendations for a server...

File system:

It's suggested to use **ext3** type file system, it's more reliable as a The Dude storage file system

Format drive using command:

```
/disk format-drive disk1 file-system=ext3
```

File storage:

If custom files are used, keep them in "**(data-path)/files/**" directory

Backups:

Make sure that regular database backups are made

Disk drive:

Always use industrial grade microSD cards and USB flashes as they have longer life cycle

If possible use USB instead of micro SD card, this will give you better read/write performance

Prepare a client...

Install The Dude client:

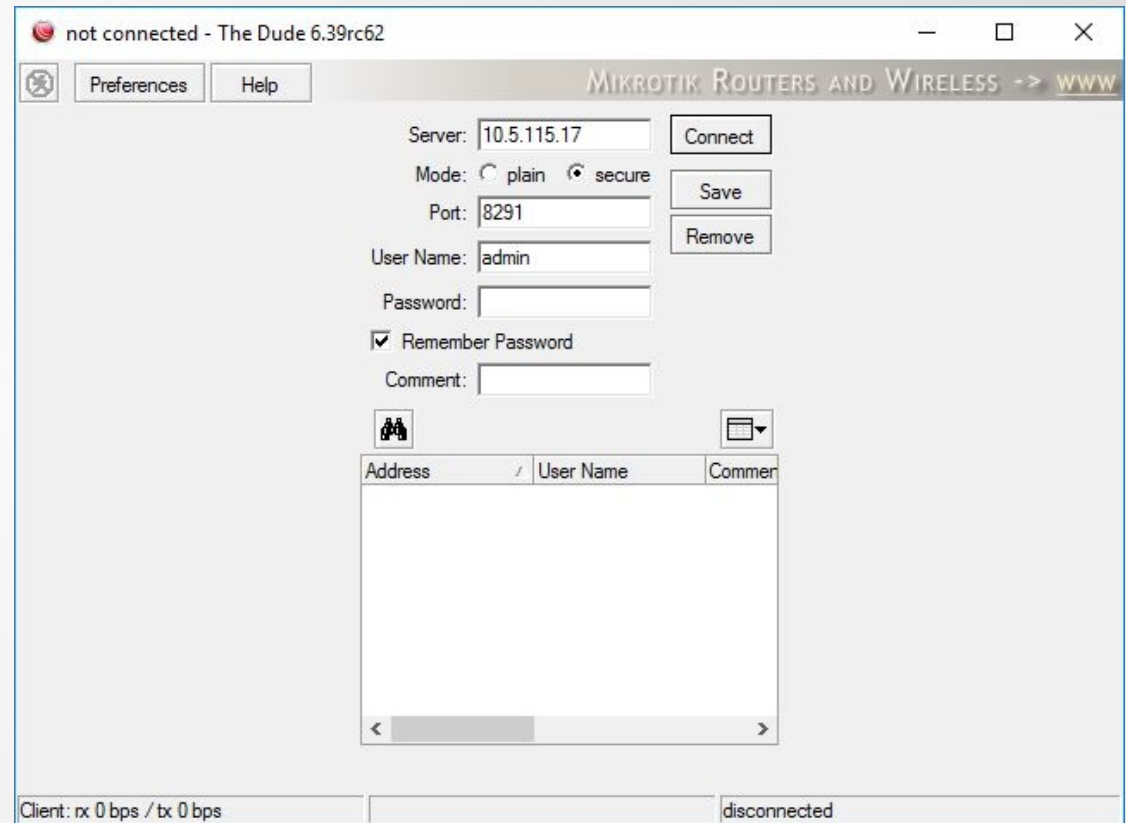
- 1) Download The Dude client
- 2) Install
- 3) Access the server

Use Webfig interface:

- 1) <Server IP>/webfig/

Use Winbox interface:

- 1) Winbox tool -> Dude



- The Dude login uses RouterOS users
- To log in the Dude server, dude policy is required
- The Dude client uses default Winbox port - 8291

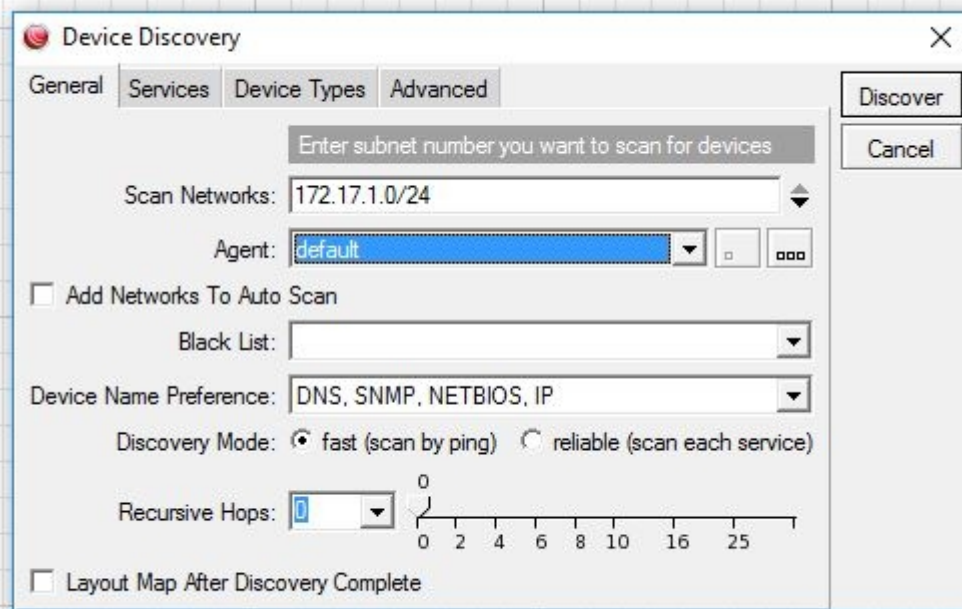
Discover your network

Discovery features:

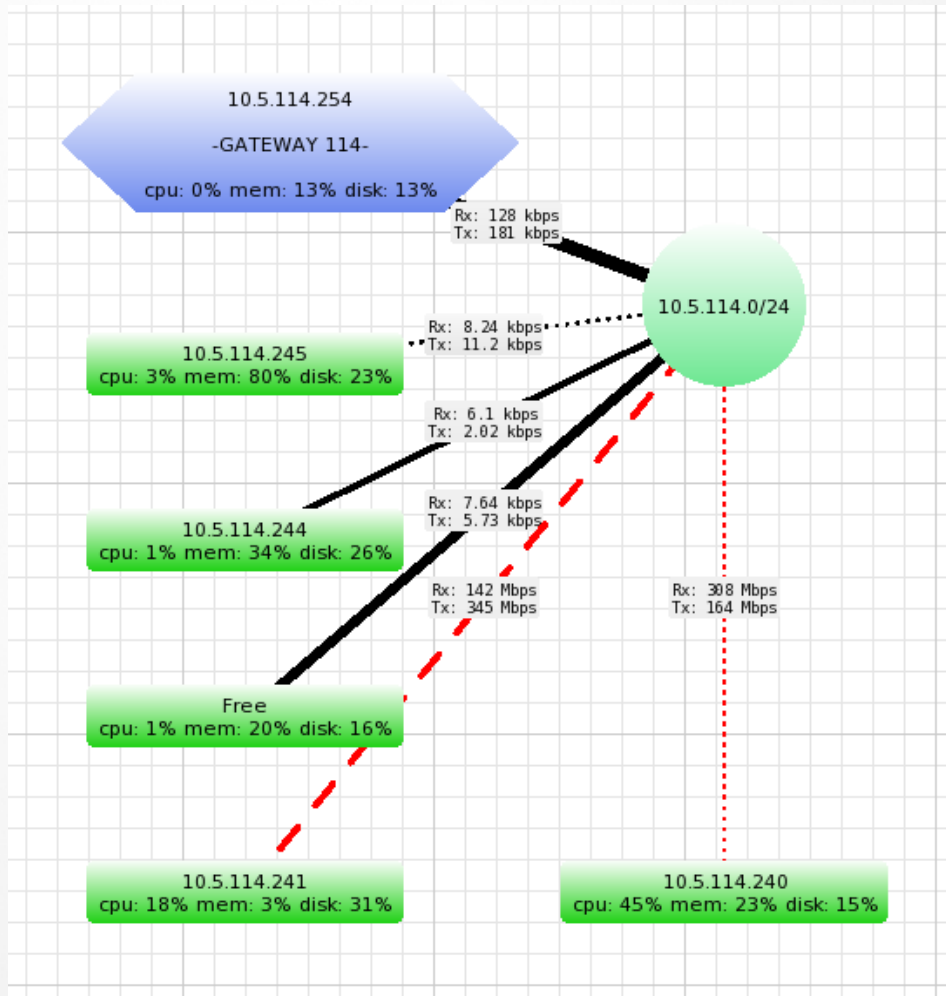
- Automatically scan specified network
- Automatically layout map after scan
- Can use agents to scan networks that are not directly accessible to server

Discovered services:

- ICMP (ping)
- DNS
- SSH
- Telnet
- HTTP
- FTP
- RouterOS management
- Other...



Edit network map



- Add new networks
- Add new devices
- Add submaps
- Add customised backgrounds (Maps / Plannings)
- Add customised info on the labels (Text / SNMP / RouterOS data)
- Edit layout
- Edit appearance of devices / links (shapes, colours)
- Edit device / link speed warnings

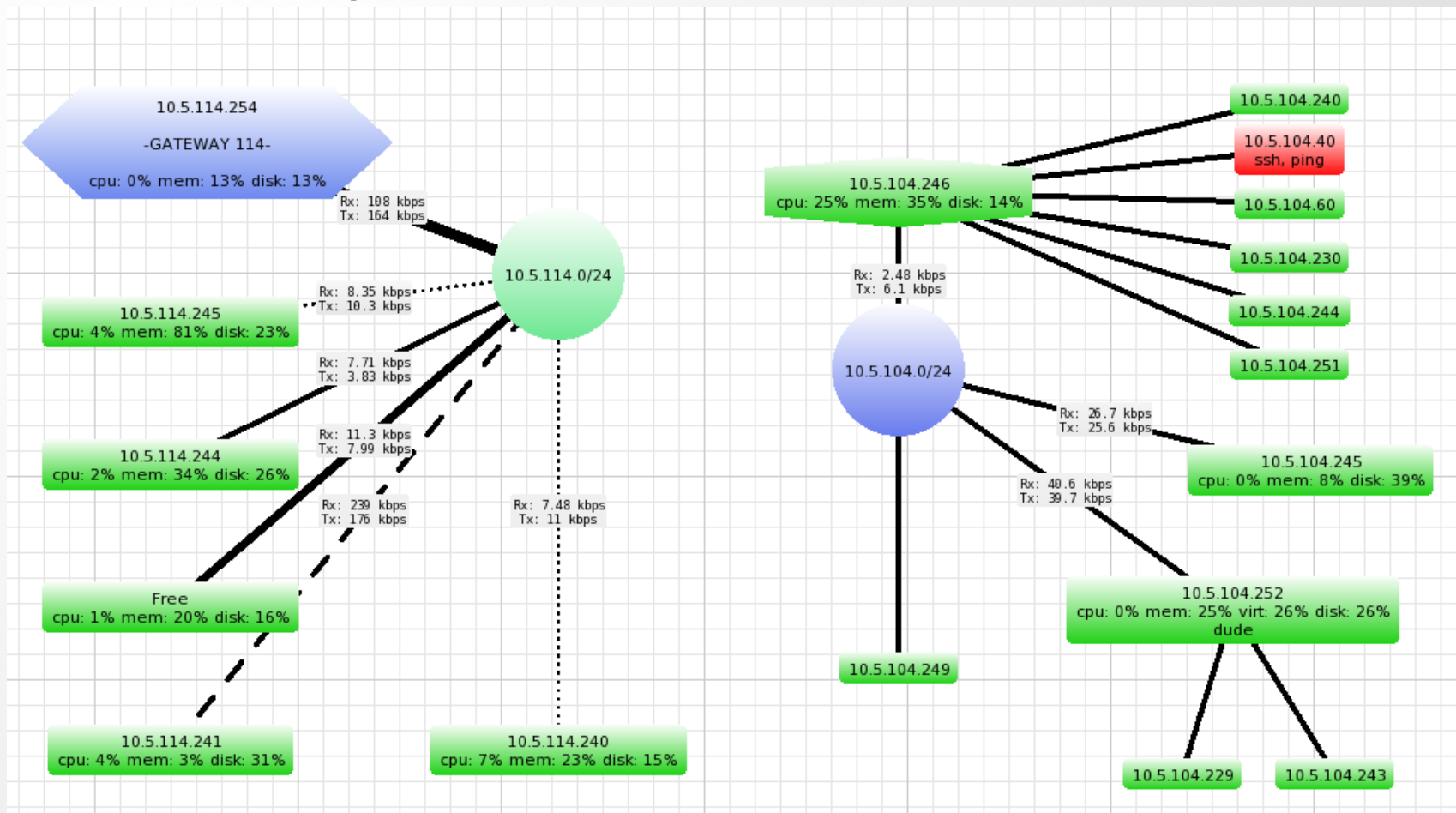
Use custom backgrounds

The Dude allows to use custom images in background, for example maps, that will create more understandable view of your network



Use agents in The Dude

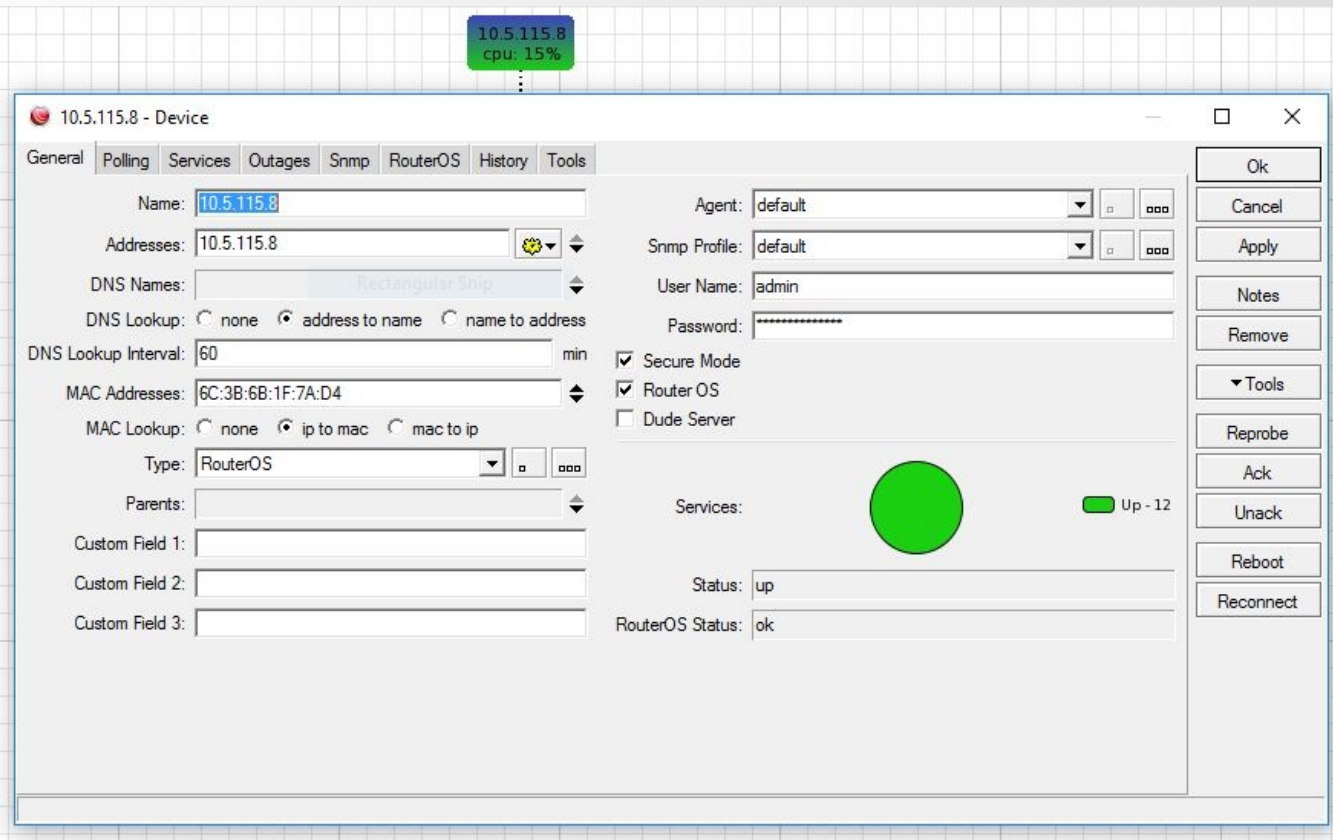
Agents allow to monitor remote sites which are not directly accessible from The Dude server



Device

Device is network object which is monitored by The Dude server

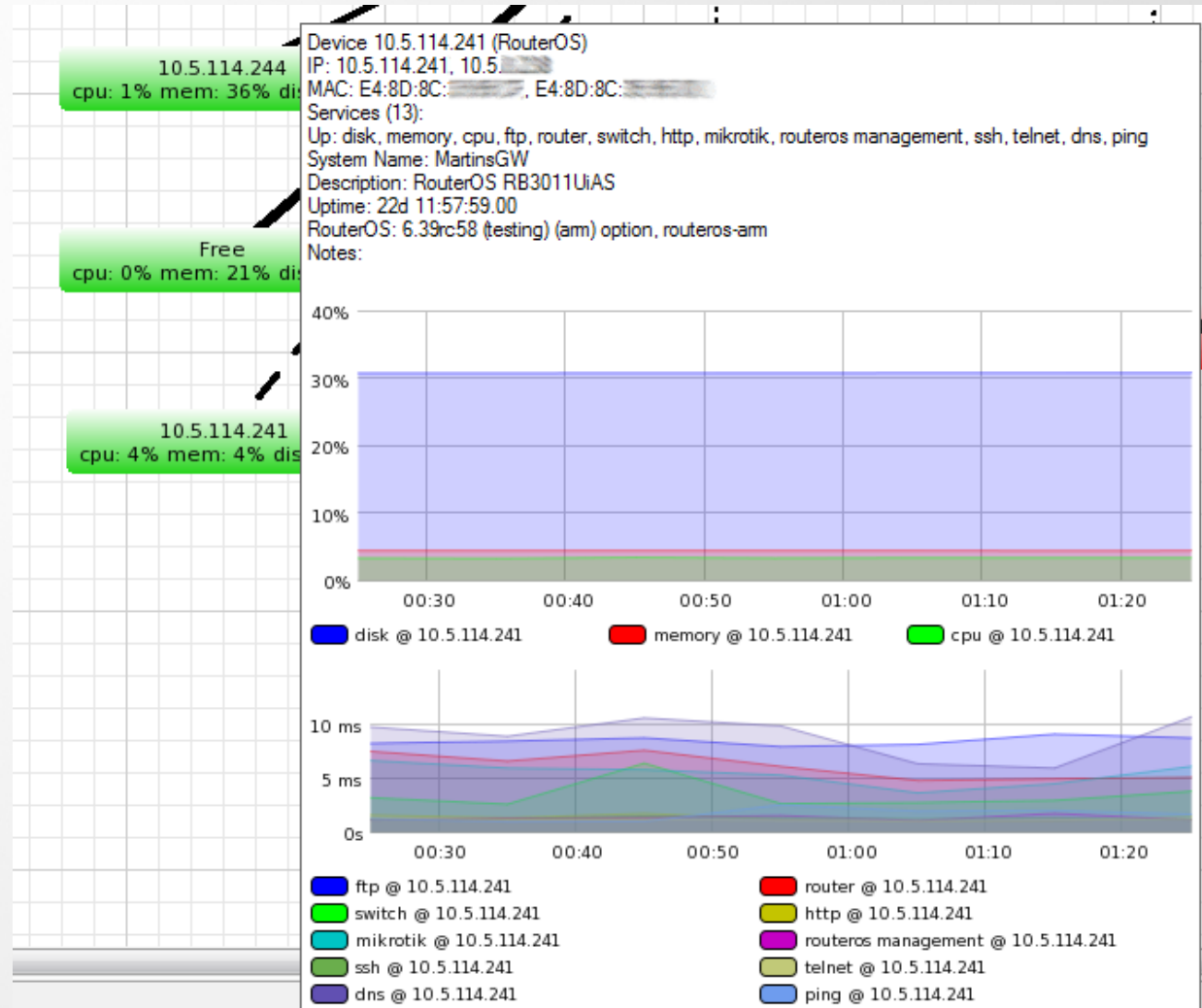
- Stores general info of a device
- Shows all available SNMP data (Interface list, traffic, route list, ip list, arp table, etc.)
- Shows additional RouterOS data
- Stores all graphs of service latencies
- Stores custom data graphs (CPU / Disk / Memory usage)
- Stores all service outage history
- Editable services which will be monitored



The screenshot shows the '10.5.115.8 - Device' configuration window in The Dude. Above the window, a small status bar displays '10.5.115.8' and 'cpu: 15%'. The window has tabs for General, Polling, Services, Outages, Snmp, RouterOS, History, and Tools. The 'General' tab is active, showing fields for Name (10.5.115.8), Addresses (10.5.115.8), DNS Names, DNS Lookup (address to name), DNS Lookup Interval (60 min), MAC Addresses (6C:3B:6B:1F:7A:D4), MAC Lookup (ip to mac), Type (RouterOS), Parents, Custom Fields, Agent (default), Snmp Profile (default), User Name (admin), Password, Secure Mode (checked), Router OS (checked), Dude Server (unchecked), Services (Up - 12), Status (up), and RouterOS Status (ok). A large green circle is visible in the Services section. The right side of the window contains buttons for Ok, Cancel, Apply, Notes, Remove, Tools, Reprobe, Ack, Unack, Reboot, and Reconnect.

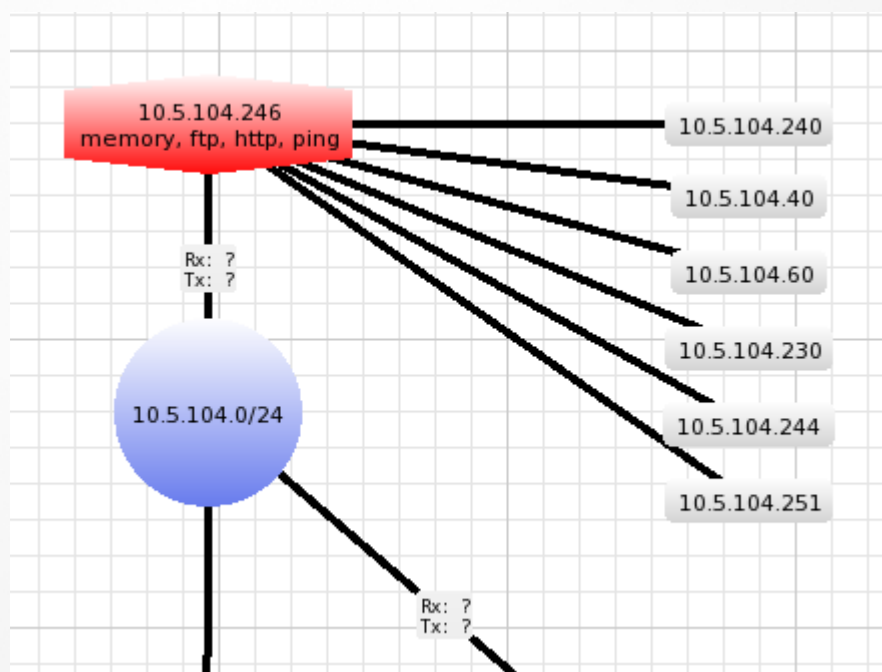
Device

Hovering your mouse cursor over a device item will show you a quick graph of the service availability



Device tree structure

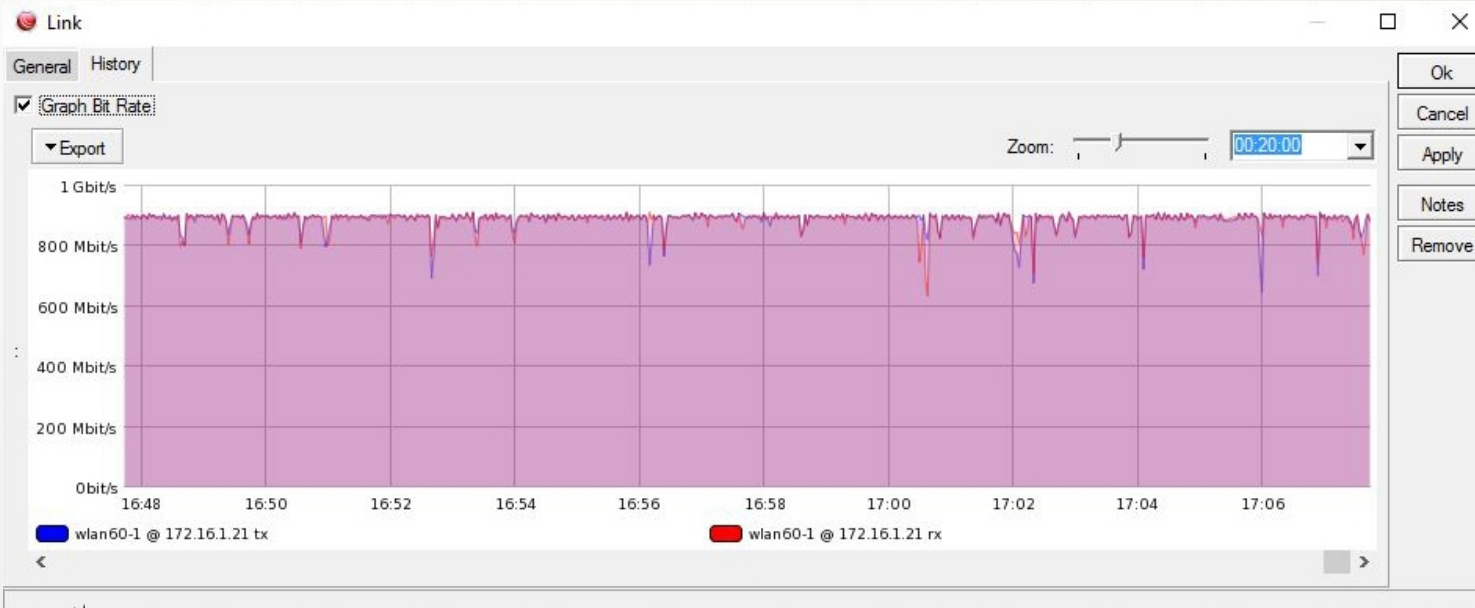
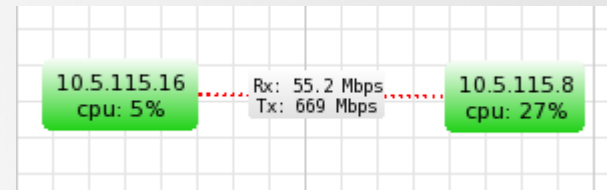
Device tree structure allows to create logical **child - parent** hierarchy in the network, which later can be used for advanced notification delivering.



- Notifications will be sent only about parent devices
- If parent is down, child status will stay "Unknown"
- Easy configurable – select multiple devices, set one parent
- Helps to avoid unnecessary notification messages

Links

- Links represent a connection between devices/networks
- Automatically stores graphical history of a data transmit
- Indicates link usage by changing the link colour
- Links speeds can be monitored using SNMP or RouterOS management.
- Choose from predefined link types (shapes / speeds)

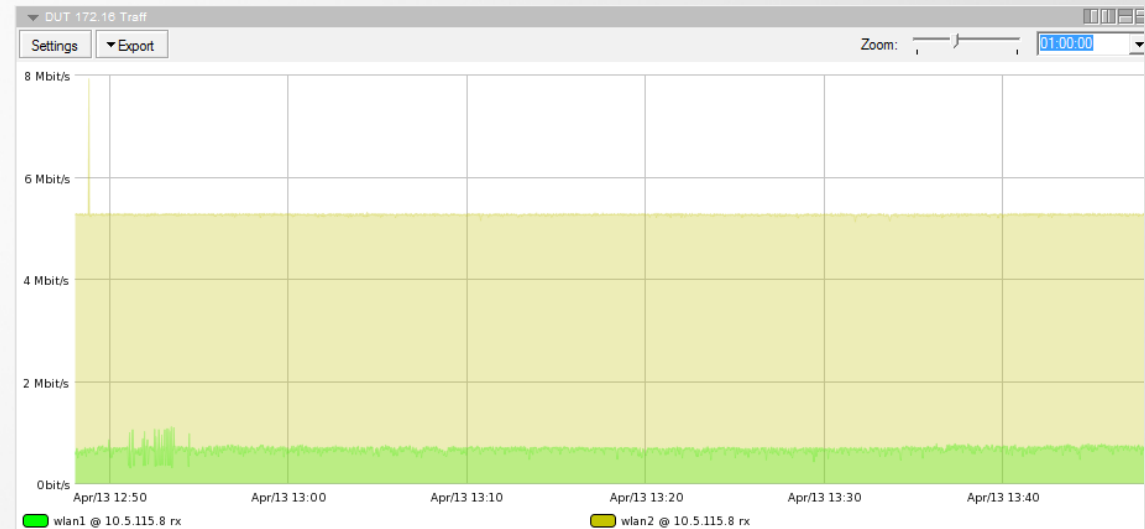


Charts

Charts allows to create a graphical representation of data stored by The Dude server

Charts can be made from:

- Automatically stored data, for example link speeds and device service latencies
- Manually created data sources (SNMP / RouterOS data)



- Unlimited number of charts can be created in The Dude server
 - Each chart can have multiple data sources

Charts

To create custom graphs, first you need to create new **data source** from SNMP or function command output

Get data using SNMP:

- Check available OIDs

```
[admin@Pauls_RB_17_CCR1016-12S-1S+] > system health print oid
active-fan: .1.3.6.1.4.1.14988.1.1.3.9.0
voltage: .1.3.6.1.4.1.14988.1.1.3.8.0
temperature: .1.3.6.1.4.1.14988.1.1.3.10.0
processor-temperature: .1.3.6.1.4.1.14988.1.1.3.11.0
current: .1.3.6.1.4.1.14988.1.1.3.13.0
fan-speed: .1.3.6.1.4.1.14988.1.1.3.17.0
fan-speed2: .1.3.6.1.4.1.14988.1.1.3.18.0
power-consumption: .1.3.6.1.4.1.14988.1.1.3.12.0
psu1-state: .1.3.6.1.4.1.14988.1.1.3.15.0
psu2-state: .1.3.6.1.4.1.14988.1.1.3.16.0
```

- Use OID code to store values

```
oid("1.3.6.1.4.1.14988.1.1.3.10.0")
```

Name:

Unit:

Device:

Code:

Get data using functions:

- Function `ros_command` allows to capture output from RouterOS device and use it as a value for charts

```
ros_command("/interface wireless
registration-table print count-only
where interface=wlan1")
```

☒ Enabled

Name:

Unit:

Device:

Code:

Interval:

1s 2s 5s 15s 30s 1m 5m

Files

The Dude allows to use custom files:

- Images – Background maps, device labels
- MIBS – To get custom SNMP data from devices
- RouterOS packages – To perform auto upgrade on monitored devices

Files can be managed using:

- Winbox / Webfig / FTP / SMB / Tool fetch

File structure:

- The Dude default files are stored in **(data-path)/files/default** and have read-only permission
- Custom files should be stored in **(data-path)/files/** directory

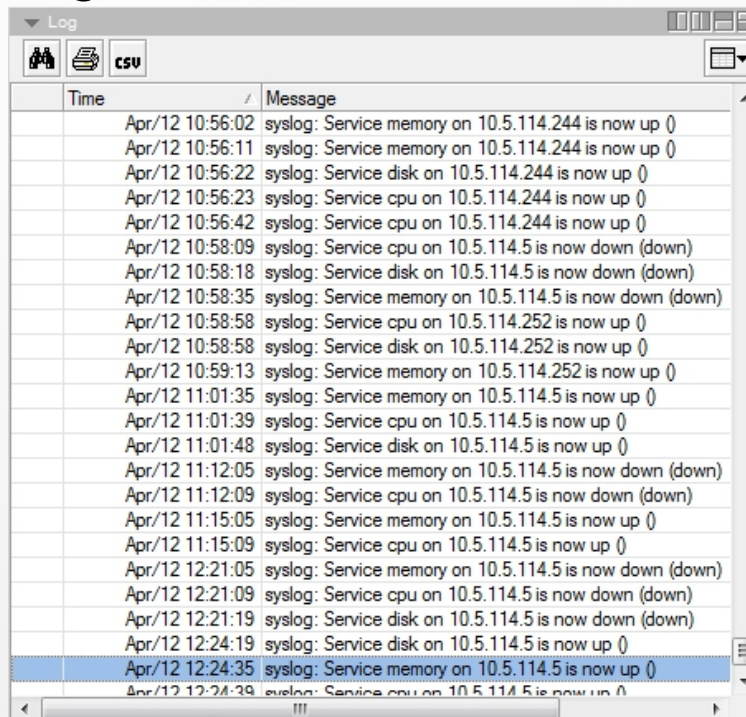
Backups:

- Backups also include files

Logs

- Logs store records of device status history
- The Dude can be used as a syslog server
- All logs can be viewed from the RouterOS and The Dude server

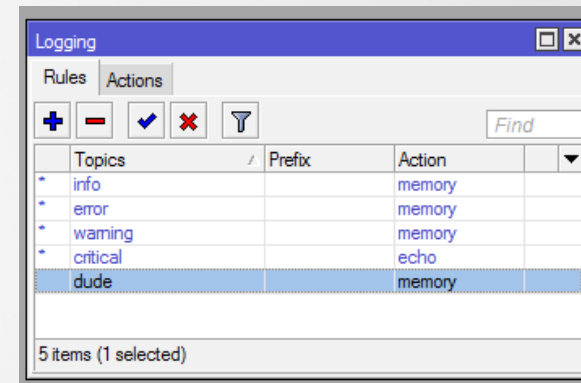
Logs in The Dude



The screenshot shows the 'Log' window in The Dude interface. It contains a table with two columns: 'Time' and 'Message'. The messages are syslog entries from a MikroTik device, indicating the status of various services (memory, disk, cpu) on different IP addresses (10.5.114.244 and 10.5.114.5) as 'now up' or 'now down'.

| Time | Message |
|-----------------|---|
| Apr/12 10:56:02 | syslog: Service memory on 10.5.114.244 is now up () |
| Apr/12 10:56:11 | syslog: Service memory on 10.5.114.244 is now up () |
| Apr/12 10:56:22 | syslog: Service disk on 10.5.114.244 is now up () |
| Apr/12 10:56:23 | syslog: Service cpu on 10.5.114.244 is now up () |
| Apr/12 10:56:42 | syslog: Service cpu on 10.5.114.244 is now up () |
| Apr/12 10:58:09 | syslog: Service cpu on 10.5.114.5 is now down (down) |
| Apr/12 10:58:18 | syslog: Service disk on 10.5.114.5 is now down (down) |
| Apr/12 10:58:35 | syslog: Service memory on 10.5.114.5 is now down (down) |
| Apr/12 10:58:58 | syslog: Service cpu on 10.5.114.252 is now up () |
| Apr/12 10:58:58 | syslog: Service disk on 10.5.114.252 is now up () |
| Apr/12 10:59:13 | syslog: Service memory on 10.5.114.252 is now up () |
| Apr/12 11:01:35 | syslog: Service memory on 10.5.114.5 is now up () |
| Apr/12 11:01:39 | syslog: Service cpu on 10.5.114.5 is now up () |
| Apr/12 11:01:48 | syslog: Service disk on 10.5.114.5 is now up () |
| Apr/12 11:12:05 | syslog: Service memory on 10.5.114.5 is now down (down) |
| Apr/12 11:12:09 | syslog: Service cpu on 10.5.114.5 is now down (down) |
| Apr/12 11:15:05 | syslog: Service memory on 10.5.114.5 is now up () |
| Apr/12 11:15:09 | syslog: Service cpu on 10.5.114.5 is now up () |
| Apr/12 12:21:05 | syslog: Service memory on 10.5.114.5 is now down (down) |
| Apr/12 12:21:09 | syslog: Service cpu on 10.5.114.5 is now down (down) |
| Apr/12 12:21:19 | syslog: Service disk on 10.5.114.5 is now down (down) |
| Apr/12 12:24:19 | syslog: Service disk on 10.5.114.5 is now up () |
| Apr/12 12:24:35 | syslog: Service memory on 10.5.114.5 is now up () |
| Apr/12 12:24:39 | syslog: Service cpu on 10.5.114.5 is now up () |

Enable logs in RouterOS



Enable RouterOS logs from CLI

```
> system logging add topics=dude action=memory
```

The Dude Tools

Tools

The Dude Tools

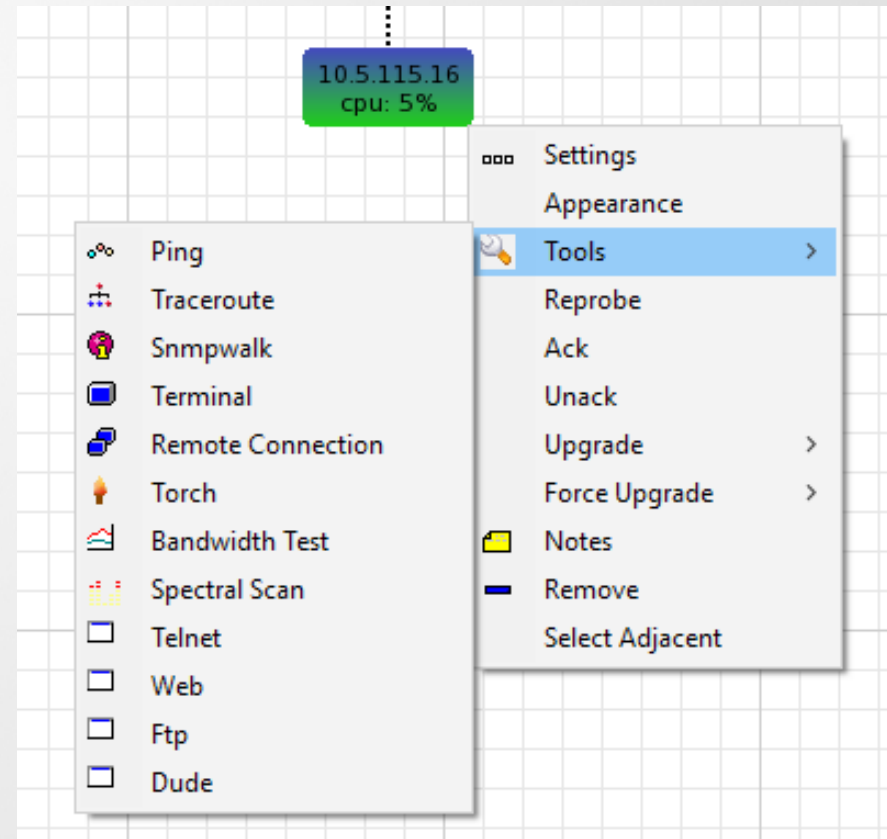
Variables
(Device) (User) (Password)

Arguments

192.168.1.1 admin nopass

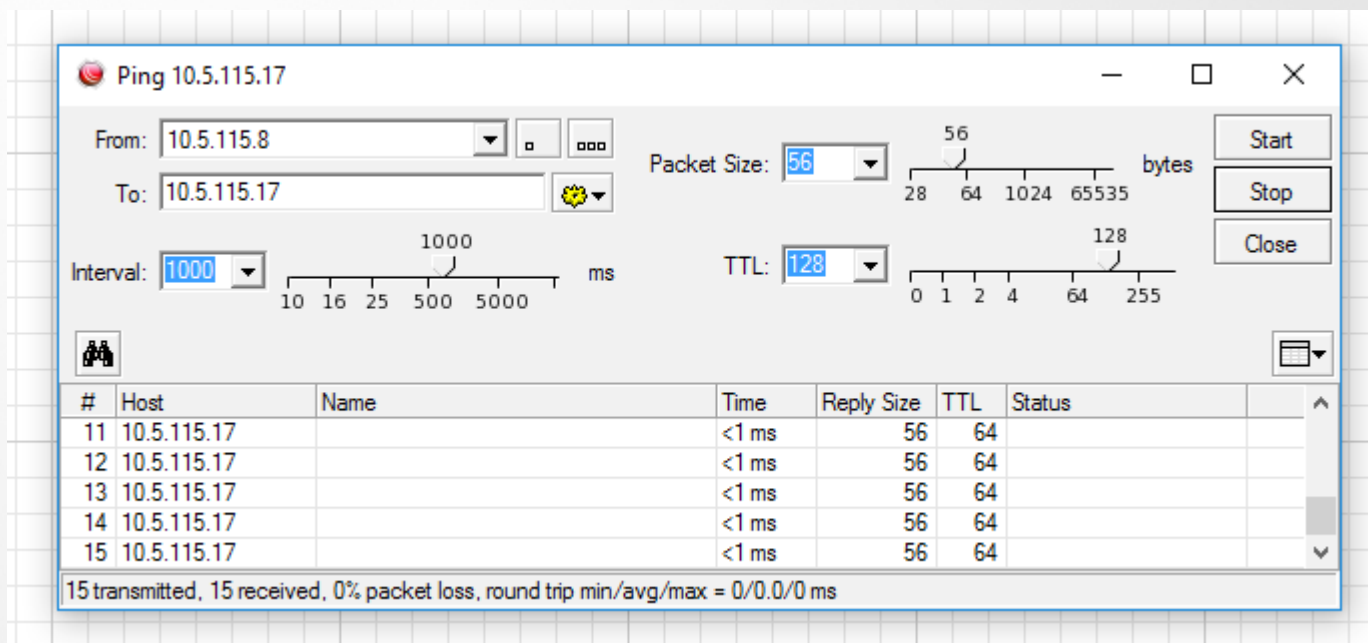
Remote program

- Tools manage utilities and programs that can be executed from The Dude
- Tools can use variables from monitored devices, and pass them to other programs
- The Dude allows to add your own custom tools
- Custom tools are added by specifying a command or path to the program



Ping

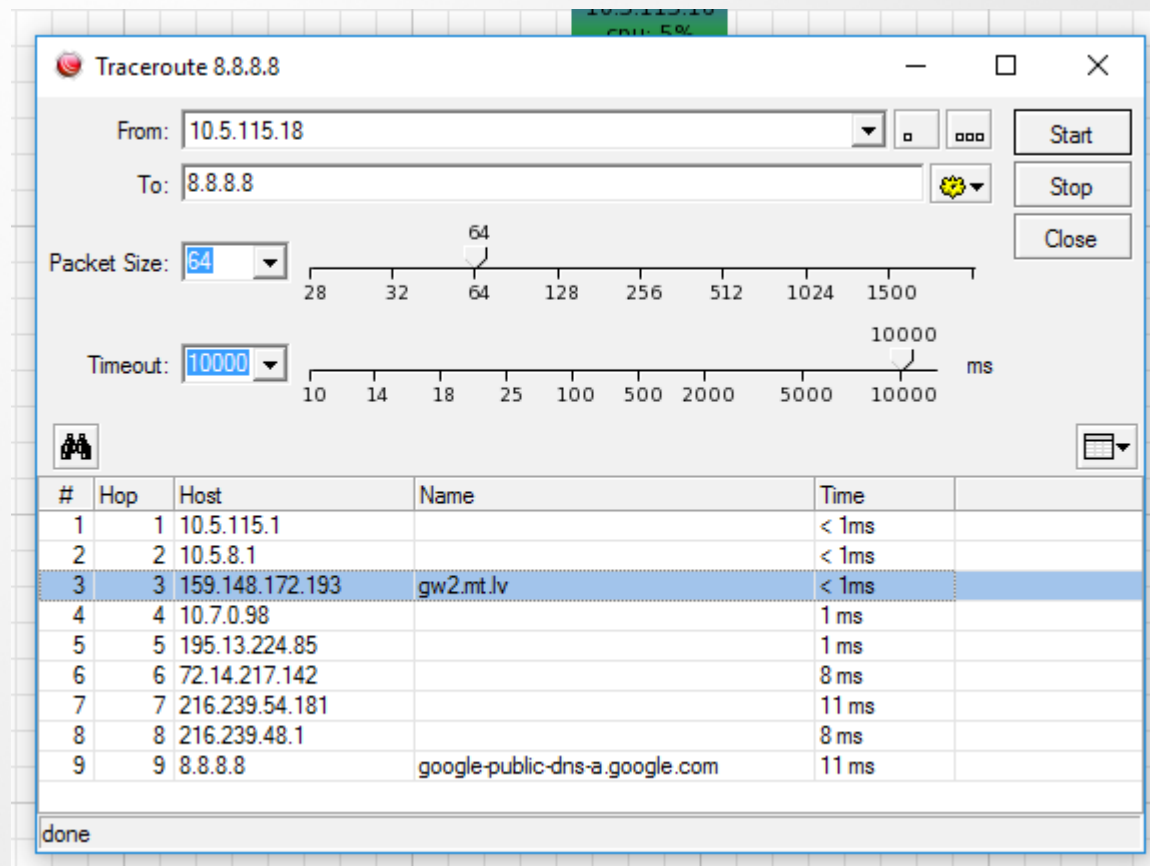
- Allows to quickly check response time between devices
- Allows to change some ICMP packet settings: packet size, TTL, speed
- Ping is sent from a selected device



Traceroute

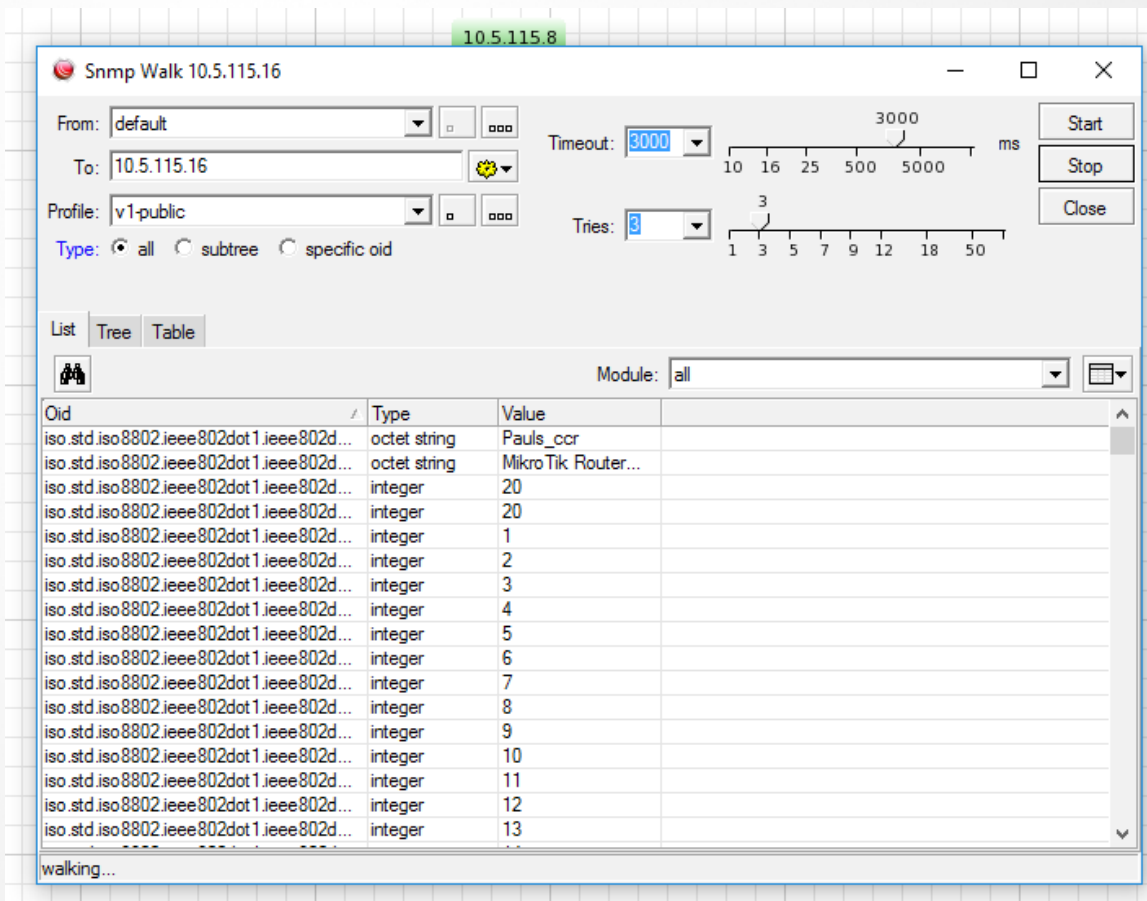
Diagnostic tool for displaying a route and measure transit delays

- Uses ICMP to determine the path from selected device to specified host



SNMP walk

Use SNMP walk tool to overview the information available over SNMP



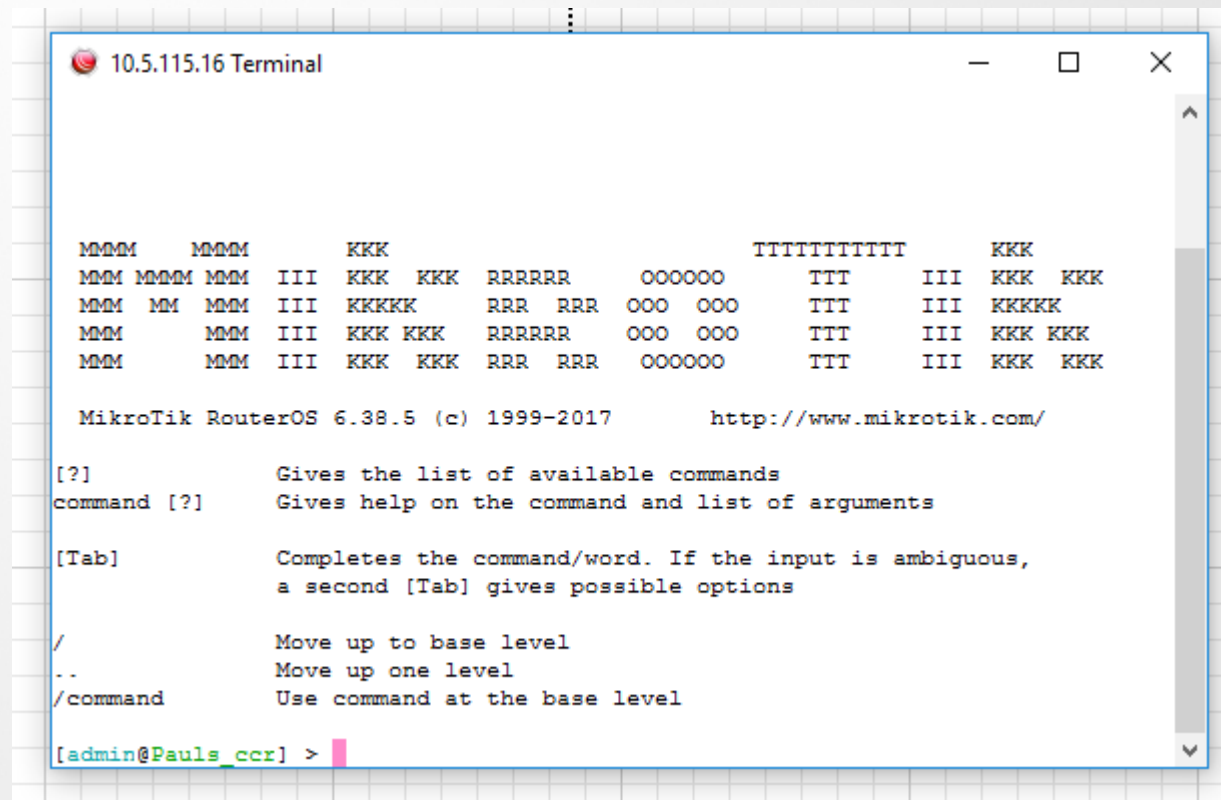
Returned results can be viewed in 3 ways:

- List – Shows OID, type and value
- Tree – Results are ordered in a tree look structure
- Table shows corresponding MIB module and a description

Each returned OLD can be used to create a custom data source, for example to create a chart

Terminal

- Gives a quick way to login in selected device using terminal
- Tool opens a new CLI window that can be used to execute commands and receive responses



```
10.5.115.16 Terminal

MMM  MMM  KKK
MMM MMM MMM III KKK KKK RRRRRR  OOOOOO  TTT  III KKK KKK
MMM MM  MMM III KKKKK  RRR RRR  OOO  OOO  TTT  III KKKKK
MMM      MMM III KKK KKK RRRRRR  OOO  OOO  TTT  III KKK KKK
MMM      MMM III KKK KKK RRR  RRR  OOOOOO  TTT  III KKK KKK

MikroTik RouterOS 6.38.5 (c) 1999-2017      http://www.mikrotik.com/

[?]          Gives the list of available commands
command [?]  Gives help on the command and list of arguments

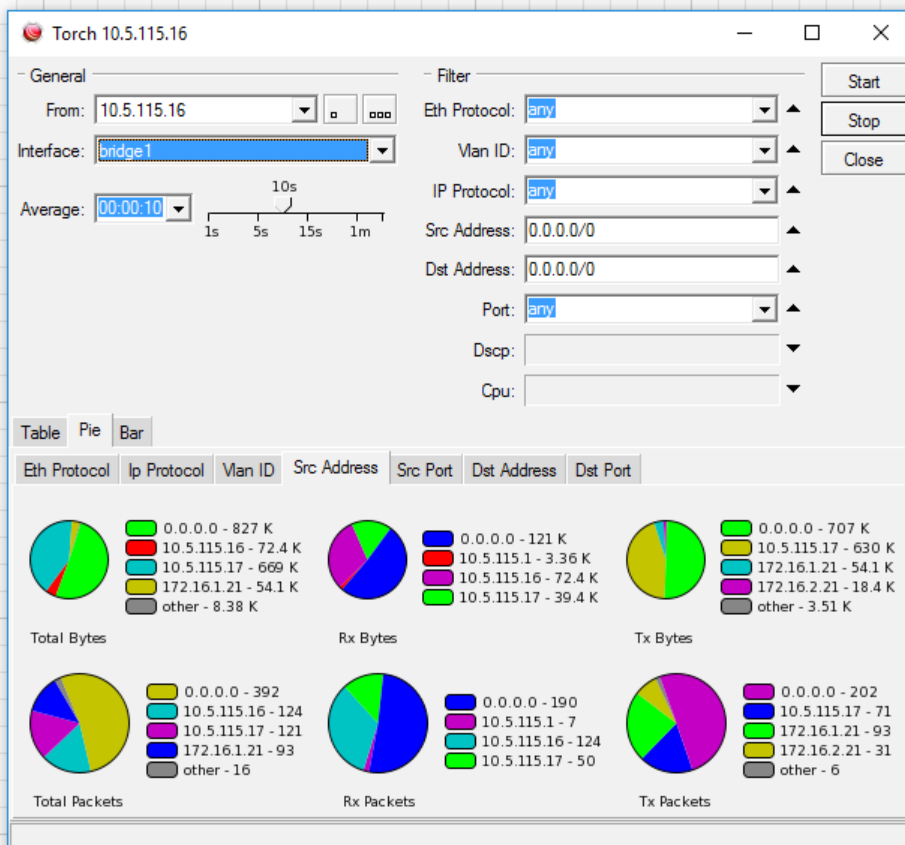
[Tab]        Completes the command/word. If the input is ambiguous,
              a second [Tab] gives possible options

/            Move up to base level
..          Move up one level
/command     Use command at the base level

[admin@Pauls_ccr] >
```

Torch

Tool torch is a real time traffic monitor which can be called directly from The Dude

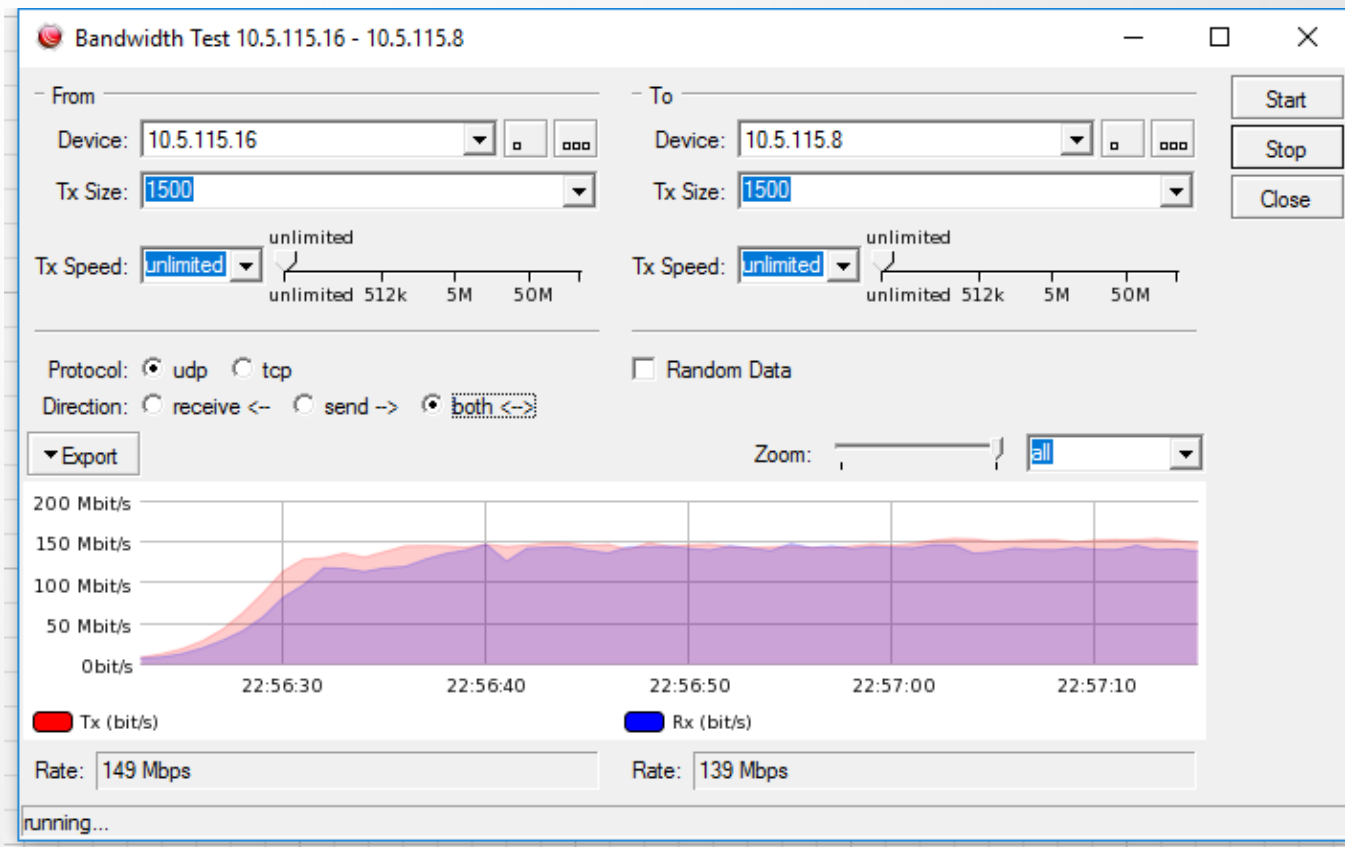


Returned results can be viewed in 3 ways:

- Table – traffic flow shown in a list
- Pie - shows graphical representation of current traffic flow
- Bar – traffic shown in bar type graphical images

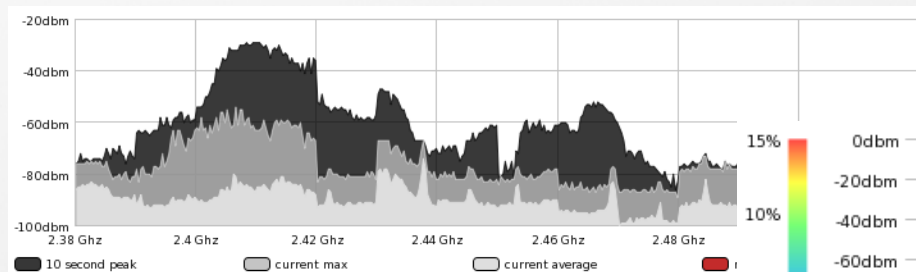
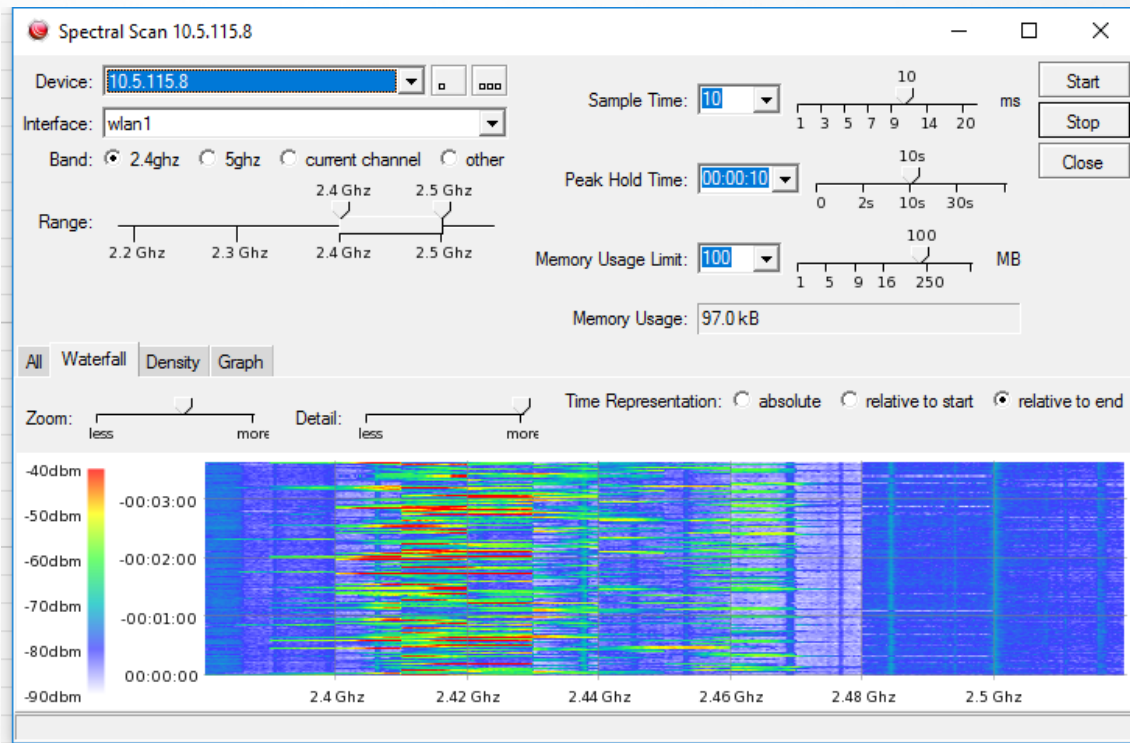
Bandwidth-test

The Dude allows to quickly measure available bandwidth between devices with a single click

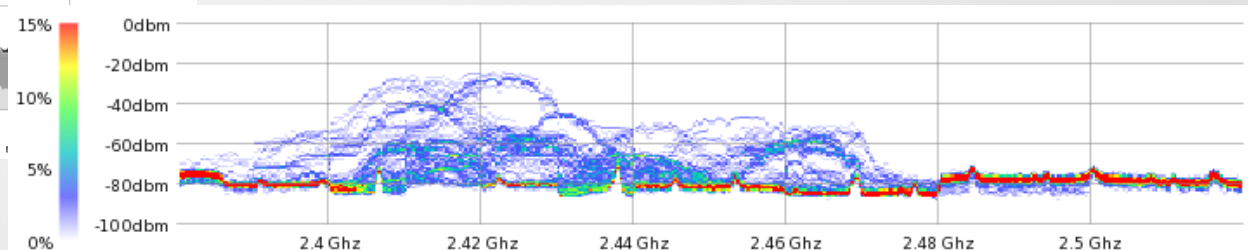


Spectral-scan

Spectral scan can scan all frequencies supported by the selected device



Different graphs are available



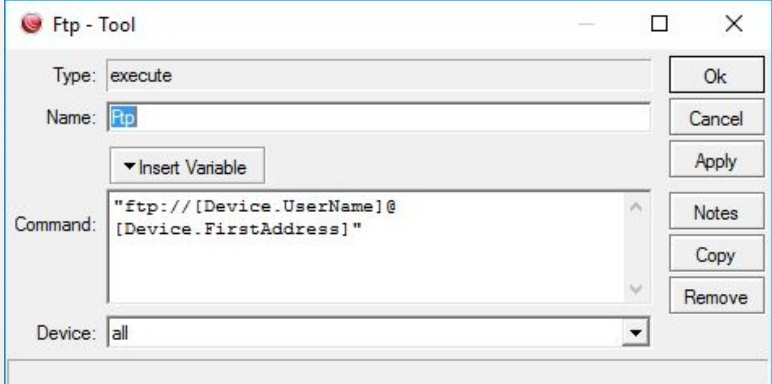
External tools

The Dude provides some predefined tools that will be executed on OS where The Dude client is installed on.

This provides a quick way to access selected device with a chosen service using one click.

- FTP – Opens FTP connection to selected device
- Web – Opens web browser with device URL
- Telnet – Connects using telnet protocol
- Dude – Opens a new Dude client if selected device is a Dude server

FTP command example



The screenshot shows a window titled "Ftp - Tool". It contains the following fields and controls:

- Type:** A text field containing the word "execute".
- Name:** A text field containing the word "Ftp".
- Command:** A text area containing the command: `"ftp://[Device.UserName]@[Device.FirstAddress]"`. Above this field is a button labeled "▼ Insert Variable".
- Device:** A dropdown menu currently showing "all".
- Buttons:** On the right side of the dialog, there are six buttons: "Ok", "Cancel", "Apply", "Notes", "Copy", and "Remove".

Custom tools

Winbox tool – requires path to executable Winbox file on your OS

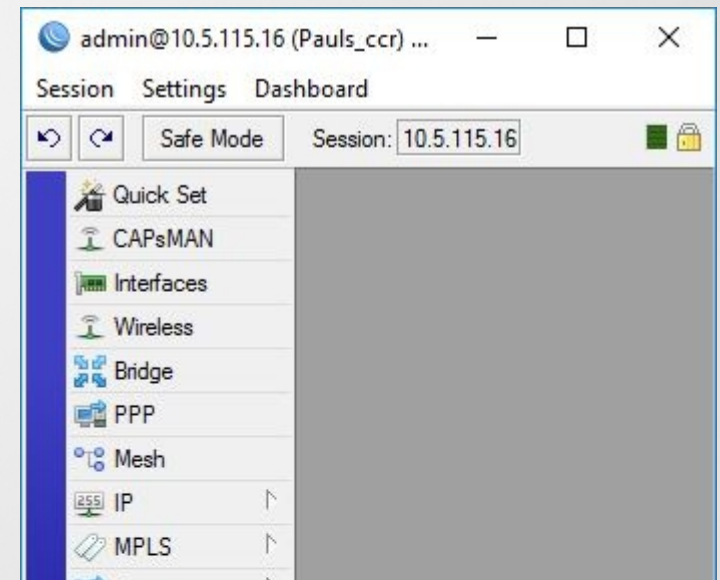
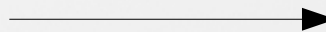
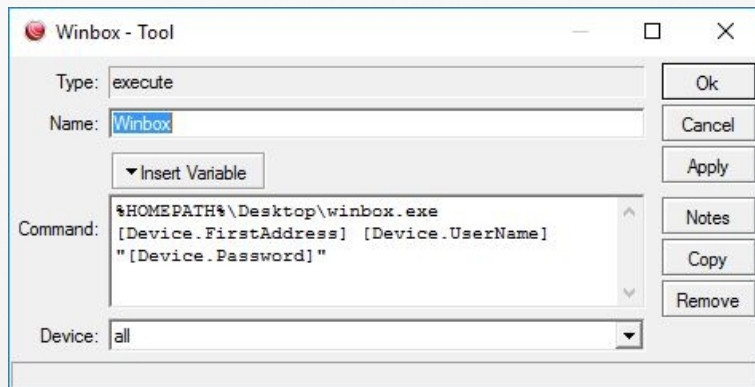
Hard path to winbox.exe

```
C:\Users\support\Desktop\winbox.exe (Device.FirstAddress) (Device.UserName) "(Device.Password)"
```

Path to winbox.exe using OS variables

```
%HOMEPATH%\Desktop\winbox.exe (Device.FirstAddress) (Device.UserName) "(Device.Password)"
```

This tool will open Winbox with already provided IP, Username and Password



Custom tools

Remote shutdown – When clicked, The Dude executes command that will shut down Windows device

Hard path to winbox.exe

```
c:\windows\system32\shutdown.exe -s -t 30 /m \\(Device.FirstAddress)
```

Connect with VNC – Command allows to connect to a remote PC via UltraVNC client

```
D:\programs\uvnc\vncviewer.exe -connect (Device.FirstAddress) -password (Device.Password)
```

Windows PSremote – Open Powershell window and use Windows PSremote feature from The Dude client to access Windows workstations where PSremoting is enabled.

```
D:\programs\uvnc\vncviewer.exe -connect (Device.FirstAddress) -password (Device.Password)
```

- The Dude supports any executable process/programm that can be started from OS CLI

The Dude Notifications

Notifications

Notifications in The Dude can trigger some action if a device or some service is not responding

Available predefined notification actions:

- **Beep** – Makes a beeping sound from the PC speaker of the server PC
- **Flash** – Flashes The Dude taskbar menu
- **Log** – Saves message in The Dude log file
- **Syslog** – Saves information to a remote Syslog server
- **Popup** – Opens a small notification window
- **Email** – Sends email to a specified recipient
- **Execute locally** – Runs command on the local Windows machine (where The Dude viewer runs)
- **Execute on server** – Execute RouterOS command/script on The Dude server
- **Sound** – Plays sound from specified sound file
- **Group** – Executes a group of actions
- **Speak** – Uses Windows speech to play digital voice message

Notifications

Notifications can be created with a few clicks

1. Choose device/s
2. Specify notification type
3. Specify services that will be monitored

10.5.115.8 - Device

General Polling Services Outages Snmp RouterOS History Tools

☒ (Enabled)

Probe Interval: default

Probe Timeout: default

Probe Down Count: default

☒ Use Notifications

Notifications:

- Name
- Email-Notification
- ☒ Telegram notification
- beep
- flash
- log to events
- log to syslog
- popup

10.5.115.8 - Device

General Polling Services Outages Snmp RouterOS History Tools

| Type | Problem |
|--|---------|
| <input checked="" type="checkbox"/> X cpu | |
| <input checked="" type="checkbox"/> X disk | |
| <input checked="" type="checkbox"/> X ftp | |
| <input checked="" type="checkbox"/> X http | |
| <input checked="" type="checkbox"/> X memory | |
| <input checked="" type="checkbox"/> X mikrotik | |
| <input checked="" type="checkbox"/> X ping | |
| <input checked="" type="checkbox"/> X router | |
| <input checked="" type="checkbox"/> X routeros manage... | |
| <input checked="" type="checkbox"/> X ssh | |
| <input checked="" type="checkbox"/> X switch | |
| <input checked="" type="checkbox"/> X telnet | |

10.5.115.8 - Device

General Polling Services Outages Snmp RouterOS History Tools

Remove Resolved

| Status | Time | Duration | Service |
|----------|----------|----------|---------|
| active | 13:27:37 | 00:09:43 | http |
| resolved | 13:33:20 | 00:03:45 | ping |

Telegram messenger notification example

Using notification type - **execute on server**, The Dude can send messages using HTTP protocol, for example to **Telegram messenger**.

- 1) Make a server or web app that can receive messages sent by The Dude, in this case a Telegram bot (<https://core.telegram.org/api>)
- 2) Specify URL where the messages will be sent to

```
/tool fetch url="https://api.telegram.org/bot309683994:AAFh8645FeAOgUbcOgUVIhtclbmzpwIXpAB/sendMessage\?  
chat_id=312605050&text=ExampleMessage" keep-result=no
```

- 3) Add variables to a message for more useful notification

```
...&text= Time: (Time); Device: (Device.FirstAddress); Status: (Service.Status) "
```

Telegram messenger notification example

The screenshot shows the MikroTik WinBox interface. The main window is titled "admin@10.5. - The Dude 6.39rc7". The left sidebar shows the "Contents" tree with "Notifications" selected. The main panel displays the "Notifications" configuration table. A dialog box titled "Notification-Telegram - Notification" is open, showing the configuration for a specific notification.

Notifications Table:

| Name | Type | Notes |
|-----------------------|-------------------|-------|
| beep | beep | |
| Notification-Telegram | execute on server | |
| flash | flash | |
| log to syslog | log | |
| log to events | log | |
| popup | popup | |

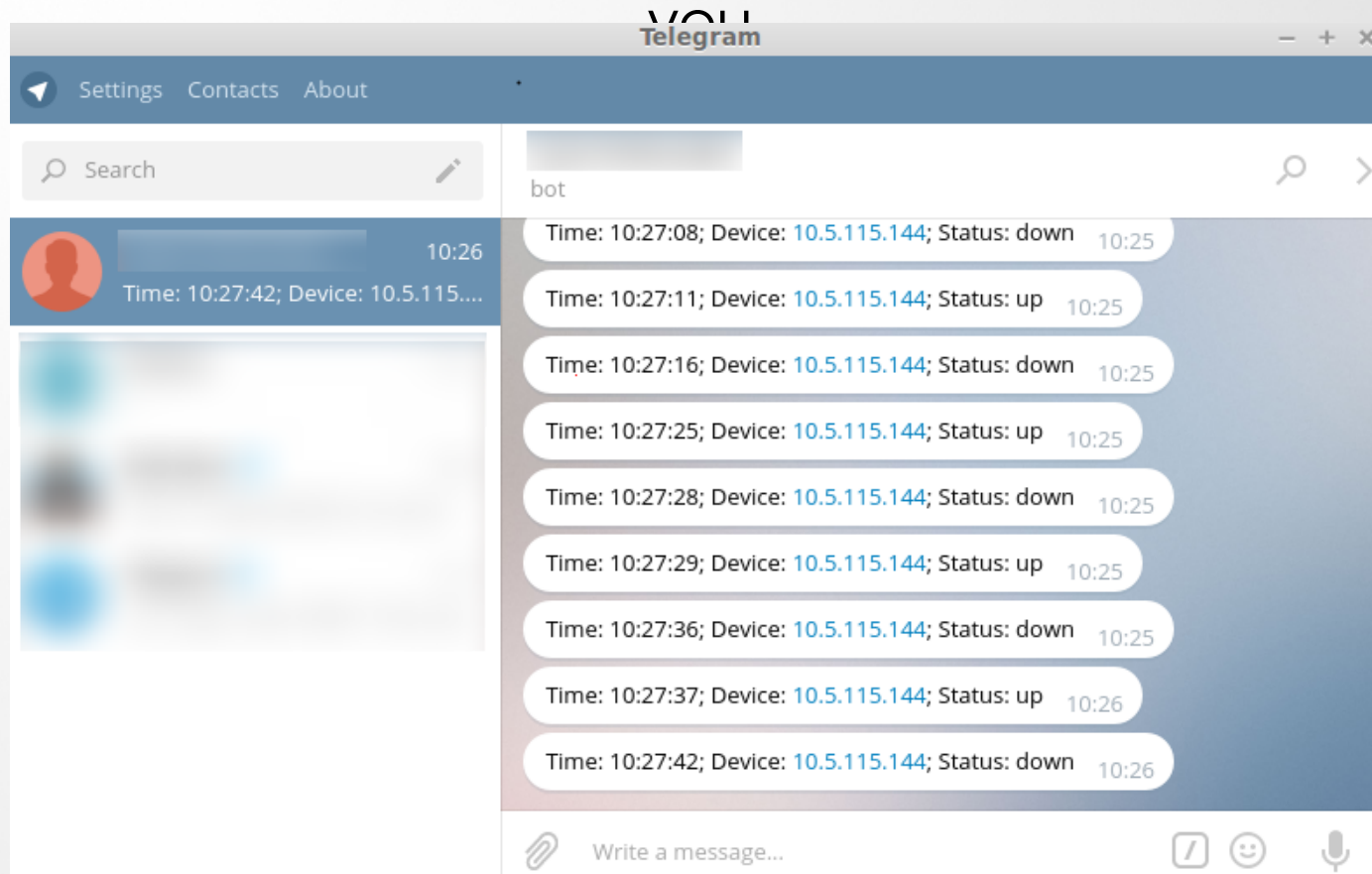
Notification-Telegram - Notification Dialog:

- General tab selected.
- Name: Notification-Telegram
- Enabled: ☒
- Type: execute on server
- Command:

```
/tool fetch
url="https://api.telegram.org/bot309683994:AAFh8645FeAOgUbcOgUVIhtclbmzpwI
XpA/sendMessage?chat_id=312605050&text=Time: [Time]; Device:
[Device.FirstAddress]; Status: [Service.Status]"
```

Telegram messenger notification example

When a notification command will be triggered by the Dude, the Telegram messenger will receive and resend a message for



Facebook notification example

Since The Dude can execute commands with arguments locally on a operating system where The Dude client is installed, this option can be used to create a custom notification methods



The Dude

1) executes local shell script and passes arguments



Custom program
(e.g. Shell script)

2) Uses arguments to create and send HTTP POST request



Facebook
Messenger bot

3) Delivers notification message to a specified recipient

Facebook notification example



The Dude

To call a custom program on local OS, The Dude need to know a path of the program, and the text which will be passed as argument

Code example:

```
/home/pauls/Desktop/./Facebook.sh "(Time) Device (Device.Name), (Service.Status)"
```

Where a path to program is:

```
/home/pauls/Desktop/./Facebook.sh
```

Argument that will be passed:

```
"(Time) Device (Device.Name), (Service.Status)"
```

Facebook - Notification

General Schedule Advanced

Name: Facebook

☒ Enabled

Type: execute locally

▼ Insert Variable

```
/home/pauls/Desktop/./Facebook.sh "[Time] Device [Device.Name], [Service.Status]"
```

Ok Cancel Apply Notes Copy Remove Test

Facebook notification example



Custom program
(e.g. Shell script)

Since delivering messages over Facebook requires **HTTP POST** request with content type: **application/json**, we need to use some custom program to create such request.
e.g. simple **shell script**

Code executed by The Dude:

```
/home/pauls/Desktop/./Facebook.sh "(Time) Device (Device.Name), (Service.Status)"
```

Argument received by Facebook.sh from The Dude:

```
21:37:36 Device 10.5.115.8, down
```

Facebook.sh example

```
1  #!/bin/bash
2
3  curl -X POST -H "Content-Type: application/json" -d "{
4    \"recipient\": {
5      \"id\": \"1048570848608888\"
6    },
7    \"message\": {
8      \"text\": \"$1\"
9    }
10 }" "https://graph.facebook.com/v2.6/me/messages?access_token=EAAY..."
```

Facebook notification example

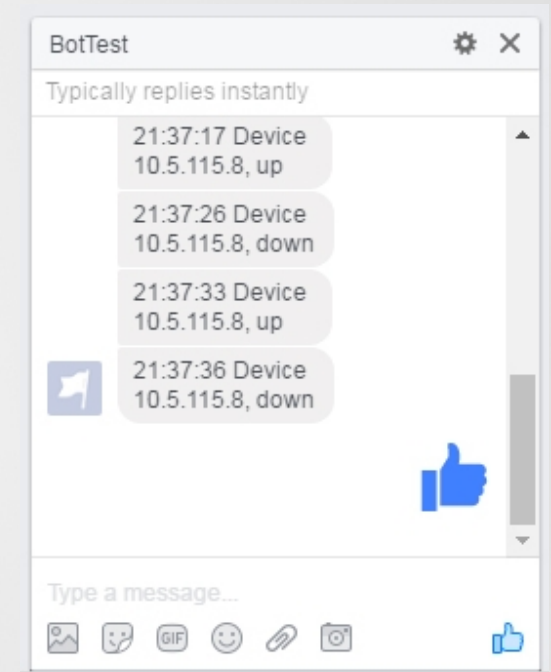


Facebook
Messenger bot

Shell script uses **curl** to create a HTTP POST request and send it to a specified recipient. Message is sent each time when specified device changes status

- Message content is created by **The Dude server**
- Message is sent using **custom program** (e.g shell script)
- Message is delivered using **Facebook messenger bot**

Received message



Additional resources

Forum – User discussions about The Dude, version changelogs
<https://forum.mikrotik.com>

Wiki – The Dude manuals
https://wiki.mikrotik.com/wiki/Manual:The_Dude

Support – Feature requests, suggestions, bug reports
support@mikrotik.com

CHR

CHR – Cloud Hosted Router

- CHR is a RouterOS version intended for running as a virtual machine
- Runs on VMware Workstation and ESXi, VirtualBox, HyperV, KVM, XenServer, etc
- Cloud services - Amazon, Azure and others

CHR – Cloud Hosted Router




























| License | Speed limit | Price |
|-------------|-------------|-------|
| Free | 1Mbit | FREE |
| P1 | 1Gbit | \$45 |
| P10 | 10Gbit | \$95 |
| P-Unlimited | Unlimited | \$250 |

- 60 day trial available
- Purchased license can be transferred

CHR – Cloud Hosted Router

CHR can be installed in few steps:

- 1) Download a virtual disk image (mikrotik.com/download)
- 2) Create a guest virtual machine
- 3) Use previously downloaded image file as a virtual disk drive
- 4) Start the guest CHR virtual machine
- 5) Log in to your new CHR. Default user is 'admin', without password

| Cloud Hosted Router ? | | | | |
|------------------------------------|---|---|---------------|---|
| | 6.37.5 (Bugfix only) | 6.38.5 (Current) | 5.26 (Legacy) | 6.39rc72 (Release candidate) |
| Images | vmdk, vhdx, vdi, img | | | |
| VHDX image |  |  | - |  |
| VMDK image |  |  | - |  |
| VDI image |  |  | - |  |
| Raw disk image |  |  | - |  |
| Extra packages |  |  | - |  |
| The Dude server |  |  | - |  |
| The Dude client |  |  | - |  |
| Changelog |  |  | - |  |
| Checksum |  |  | - |  |

<https://wiki.mikrotik.com/wiki/Manual:CHR>

Suggestions?
Feature requests?

THANK YOU!