



Link Technologies, Inc.

MikroTik

Routing the World

Using The Dude

Your Trainer – Mike Delp

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Your Instructor

- ▶ Mike Delp
 - Mikrotik Certified
 - In the WISP Industry since 2000
 - Consulting Since 1987 –Startup of two Dial UP ISP's
 - Microsoft Certified
 - WISP Experience
 - Worked on numerous WISP in Midwest Since 2000
 - Deployed many Mikrotik Based Networks
 - Specialized projects like Hurricane Relief 4 yrs ago, and numerous Large capacity PtP links

Course Contents

- ▶ Using the Dude
 - What is it!
 - Why Use it?
 - Installation
 - Windows/Linux
 - RouterOS
 - What can it do?
 - Server – Client – Agent
 - Monitoring
 - History
 - Alerts
 - Notifications

What is the Dude?

- ▶ **NMS (Network Monitoring System)**
 - Provides Up/Down Status Information of a Network
 - Graphical and Logical Network Maps!
 - Provides Notifications via audio/graphics/E-mail of outages
 - Provides Outage information
 - Start Time
 - Duration
 - Graphing of Services
 - Ping Times
 - DNS Query Times
 - Web Server Times
 - Graphing of Link Bandwidth
 - Information such as bandwidth usage across connections etc.

What is the Dude?

- ▶ NMS (Network Management System)
- ▶ Network Management
 - Ability to Use Tools to Gain Access to Devices
 - Winbox into Network Routers
 - Web/Telnet Access
- ▶ SysLog Server Built In
 - Ability to send Logs to single logging location
- ▶ Full SNMP Support
 - Ability to Graph, monitor SMNP OIDs

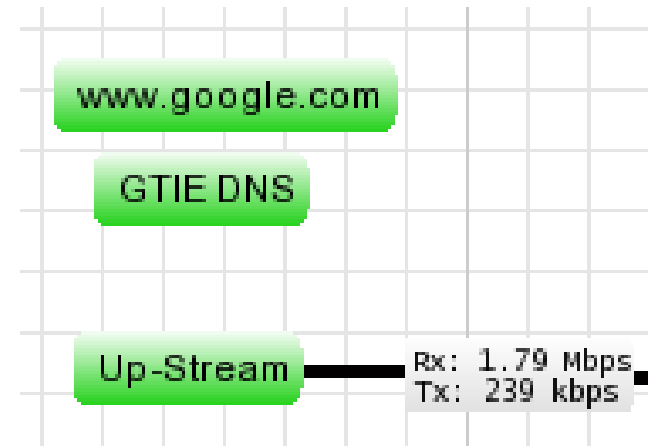
SNMP

▶ SNMP

- Simple Network Management Protocol
 - MIB
 - Management Information Base
 - Tree of Information and settings on a Device
 - OID
 - Object Identifier for an Item in the MIB
 - Object can be graphed, Monitored etc.

Internet Connection Monitoring

- ▶ Monitor Public Site
 - www.google.com
 - www.microsoft.com
- ▶ Provides Metrics for overall Network Performance out to the internet..
 - Monitor DNS services
 - DNS issues shows slow responsive DNS Servers
 - DNS is required to Browse Internet!



Monitoring

- DNS Services
 - Graphing of Response Times
 - Long Times can mean, slow internet access
- Mail Servers
 - Same thing, graph response times
 - OIDs may provide number of messages per second etc in/out!
- Business Clients?
 - Business Services could offer monitoring of their connection
- Residential Clients
 - Depends on the class of service you are offering.

Alerting

- ▶ Beeps
 - Don't help too much
- ▶ Video
 - Projector/Large TV with main Chart
- ▶ Outages
 - TV showing current outages
- ▶ Sounds
 - Hook into your PA System! Put an alert on it!
- ▶ E-Mail
 - Of Course, E-mail! Use Text Messages as well!
 - Use the features to only alert people in the proper areas..

Installing the Dude

- ▶ **Windows Installation**
 - Download File
 - Run though Setup
 - Simple as can be!
- ▶ **RouterOS Installation**
 - Just like installing a Package

Installing the Dude

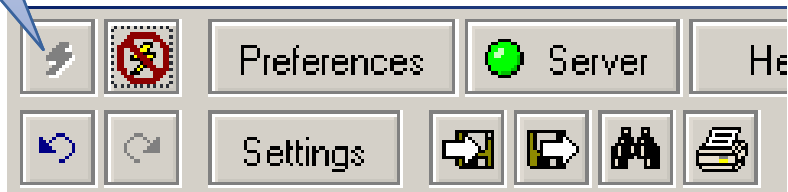
- ▶ RouterOS Installation
 - 500 Series Smallest Routerboard to Install on
 - Do NOT do other functions
 - 433AH is better – Needs Extra Storage
 - PowerRouters Work Great – Extra Storage
 - RouterOS Versions major change after 3.17
 - 3.0 rc2 – Dude package independent of RouterOS version
 - Before this version, Each time you updated RouterOS you updated Dude
 - 3.1 – Allows multiple stores! BIG Deal!
 - Disk Space is an issue! A BIG issue!

Installing the Dude

- ▶ So why is this important to know!
 - VERSION 3.1 and newer, will allow you to use this system to STORE dude data..
- ▶ Storage requirements
 - I have seen systems balloon up to several hundred meg very quickly with data.

Server Information

Connect To



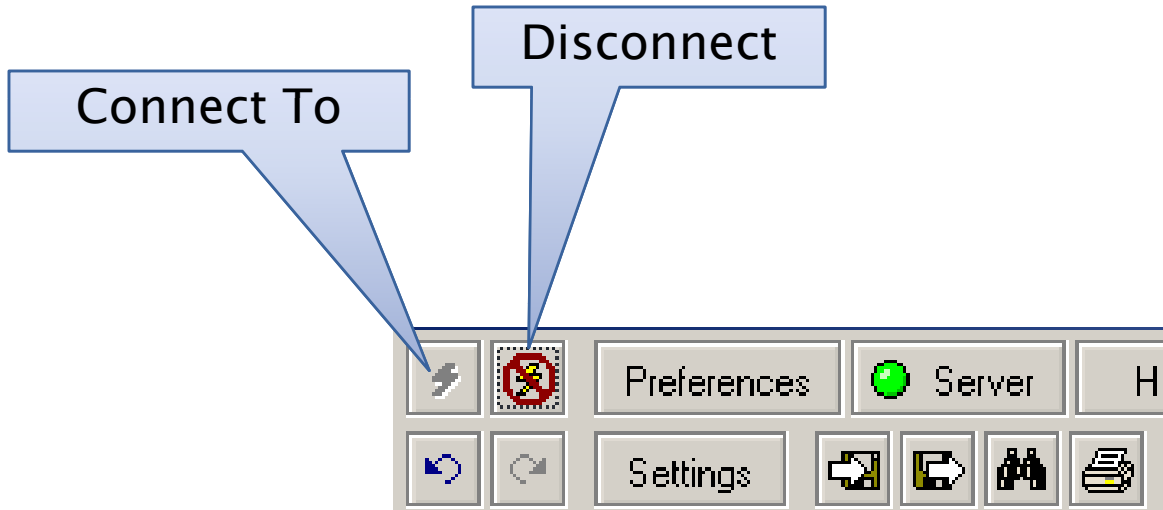
Server Information

The image shows a 'Connect' dialog box with the following fields and callouts:

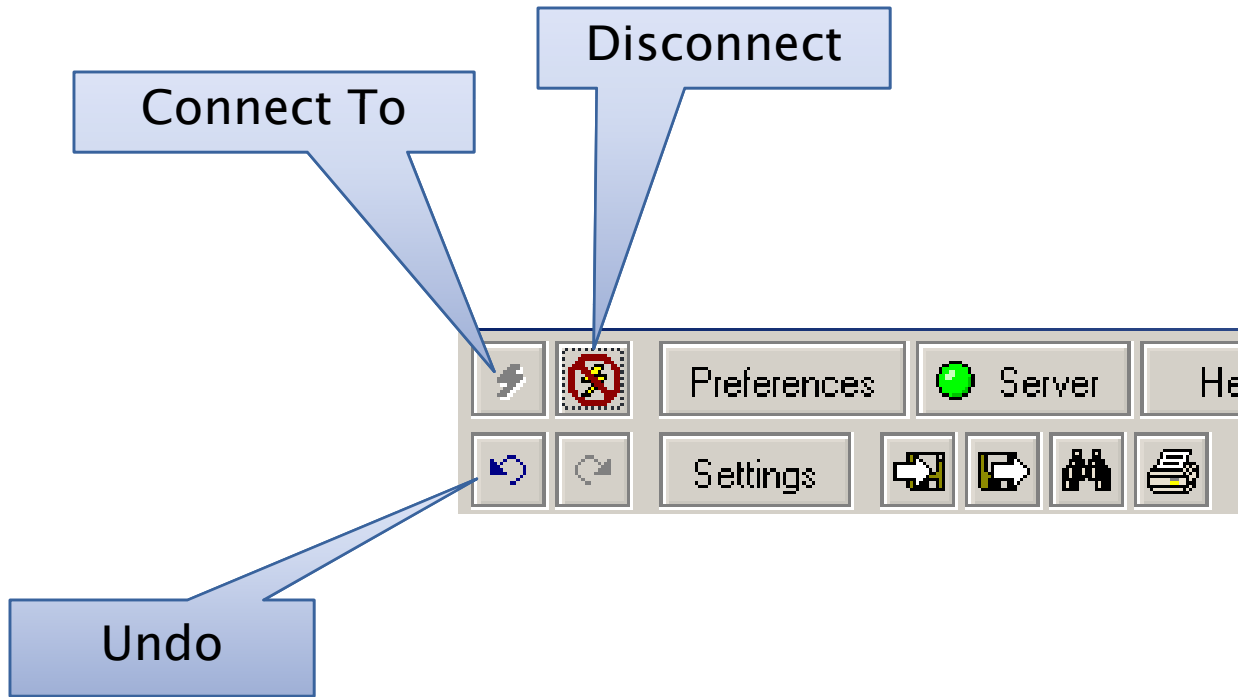
- Mode:** A dropdown menu set to 'remote'. A callout box labeled 'Local Remote' points to this dropdown.
- User Name:** A text field containing 'admin'.
- Password:** A text field containing 'xxxxxxx'.
- Remember Password:** A checked checkbox.
- Connect To:** A text field containing '71.10'. A callout box labeled 'IP Address to Connect to' points to this field.
- Port:** A text field containing '2210'.

A callout box labeled 'Connect To' points to a lightning bolt icon in the application's toolbar. Below the dialog box is a toolbar with buttons for 'Preferences', 'Server', 'Settings', and several icons.

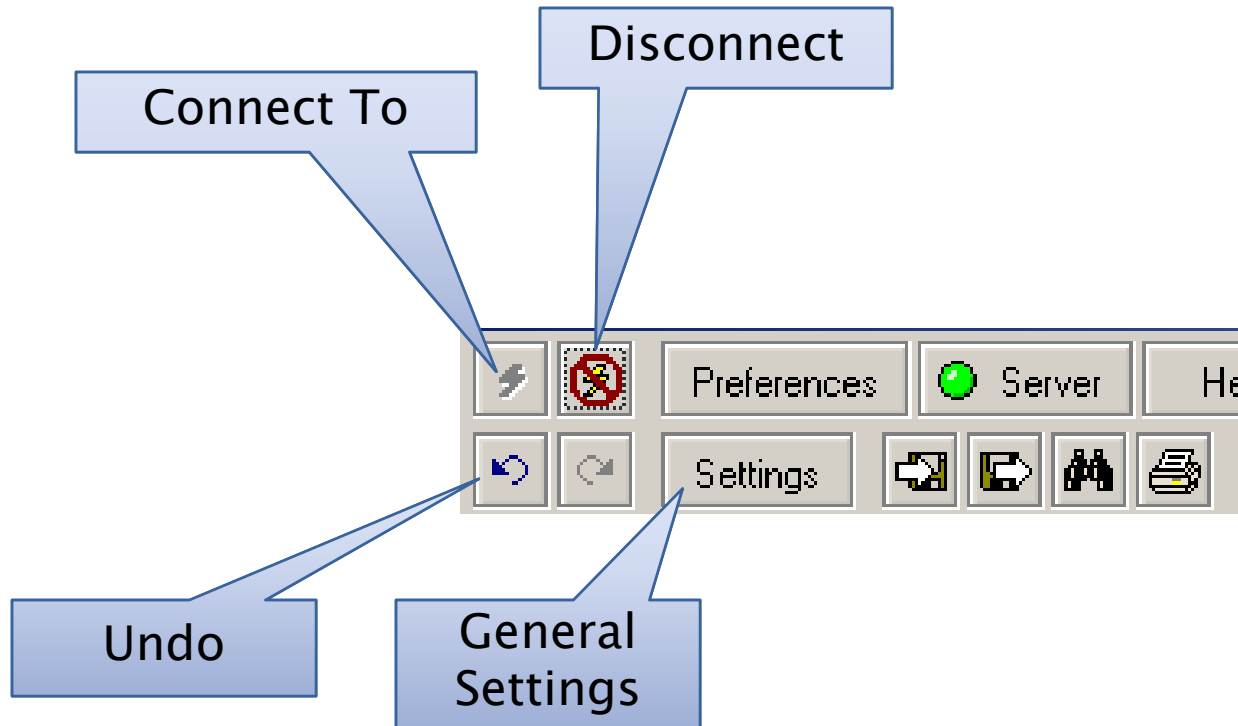
Server Information



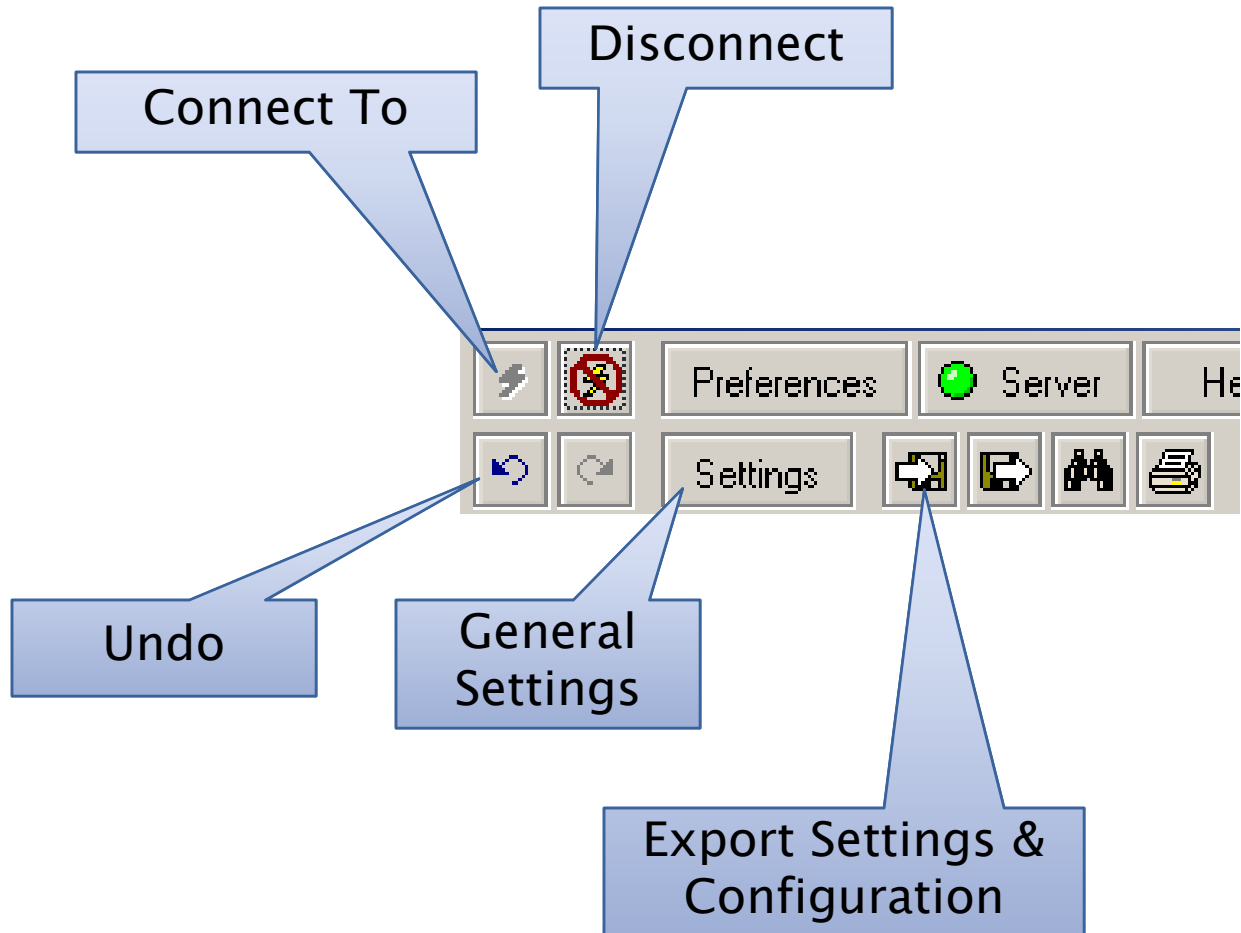
Server Information



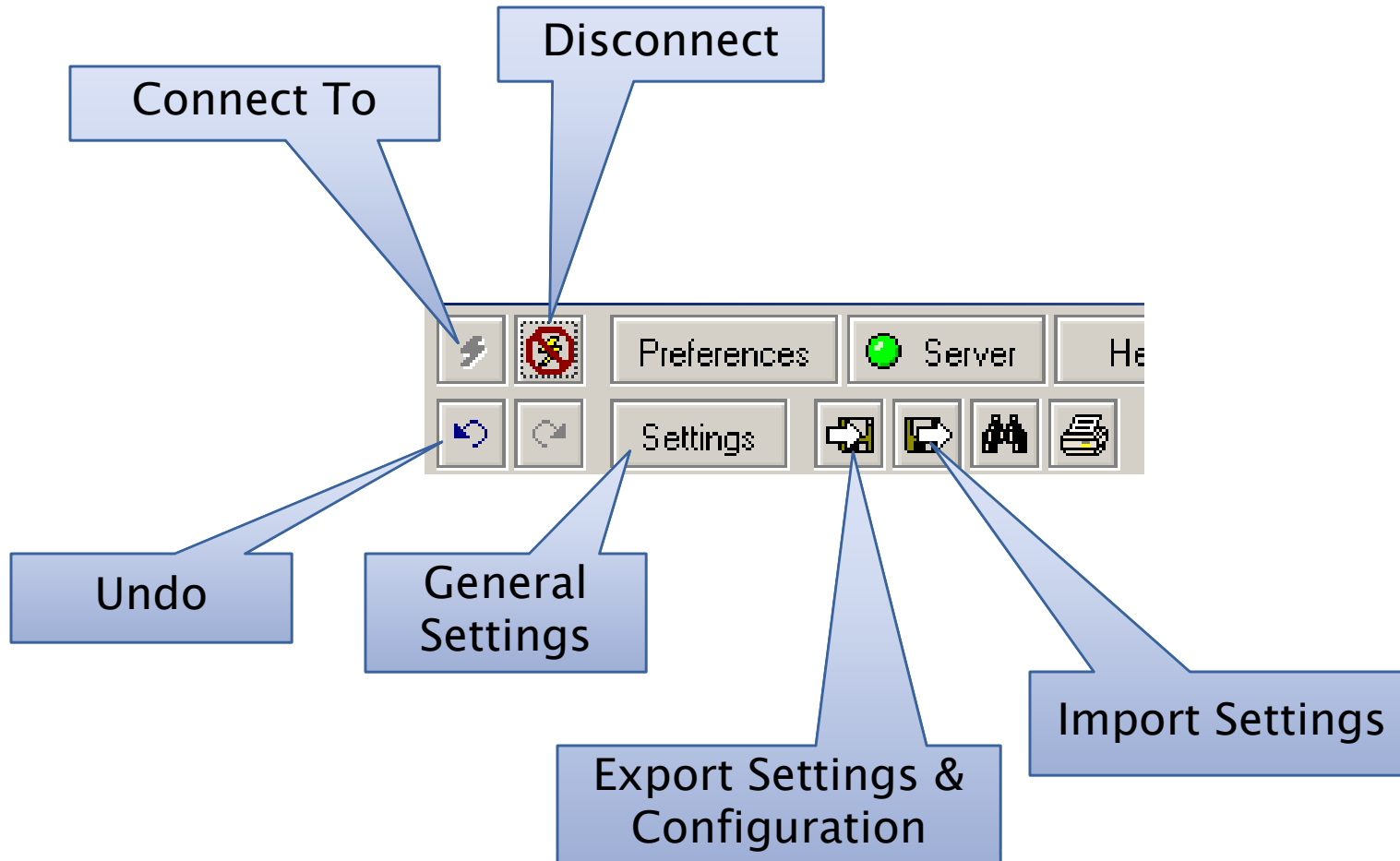
Server Information



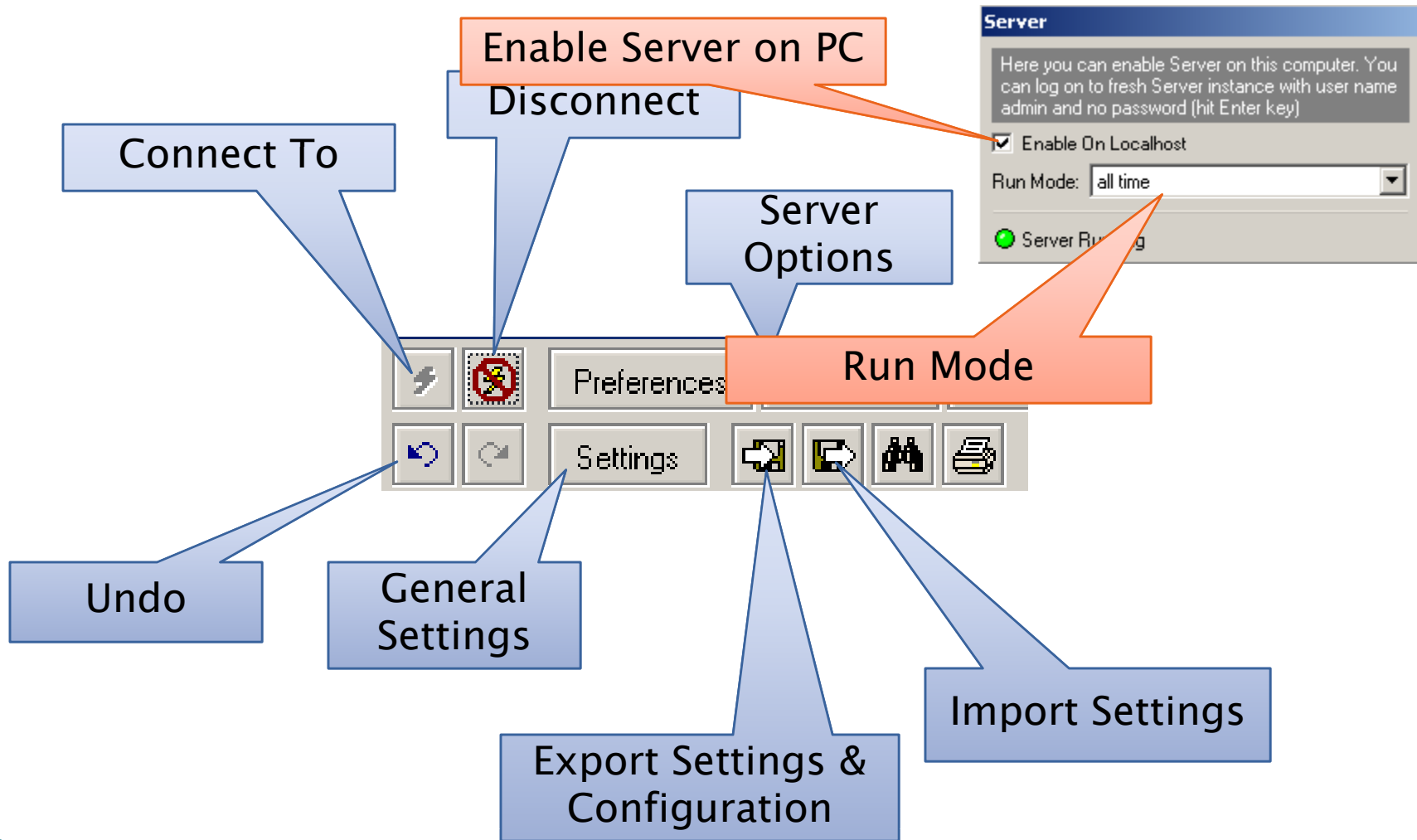
Server Information



Server Information



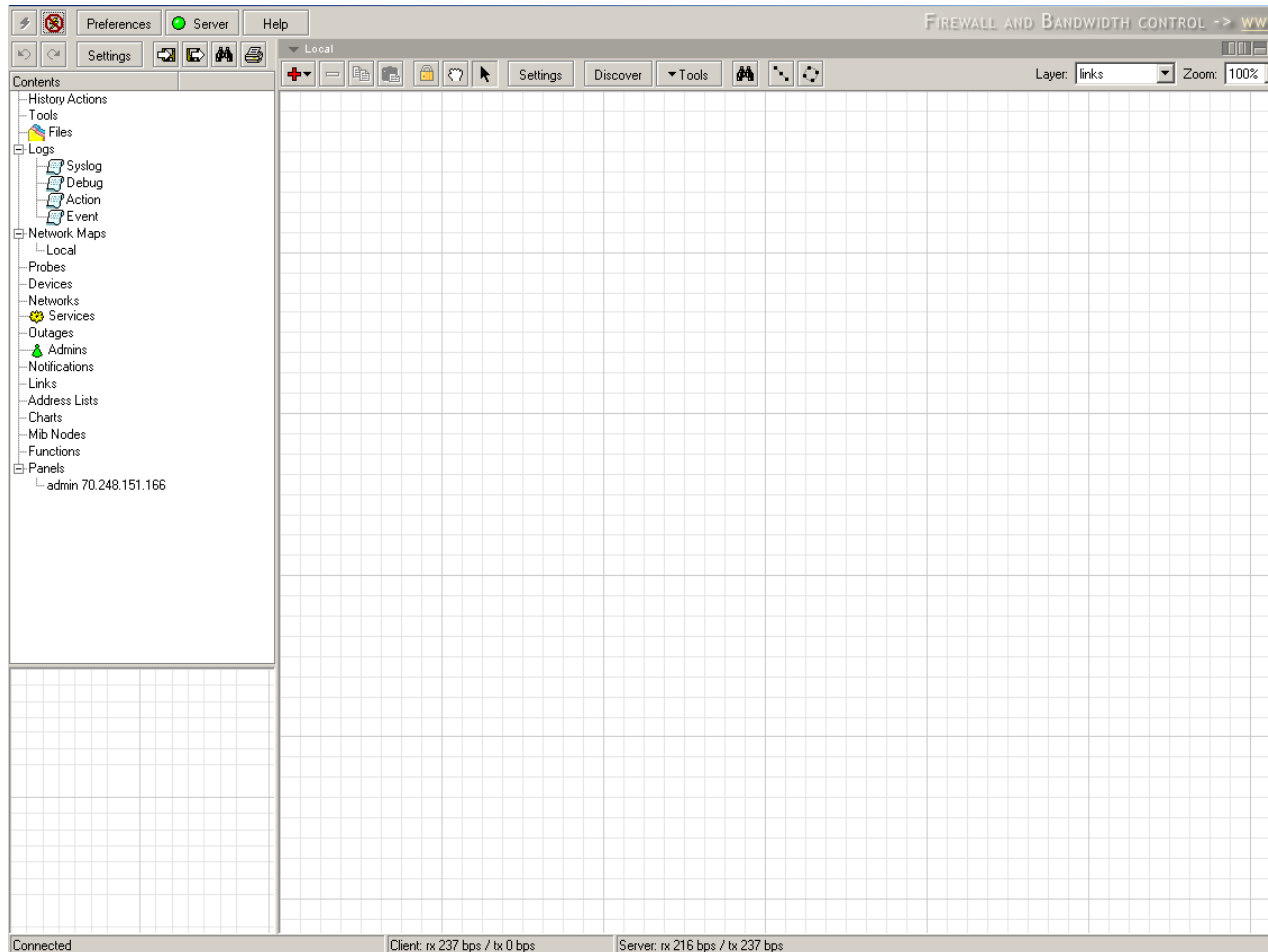
Server Information



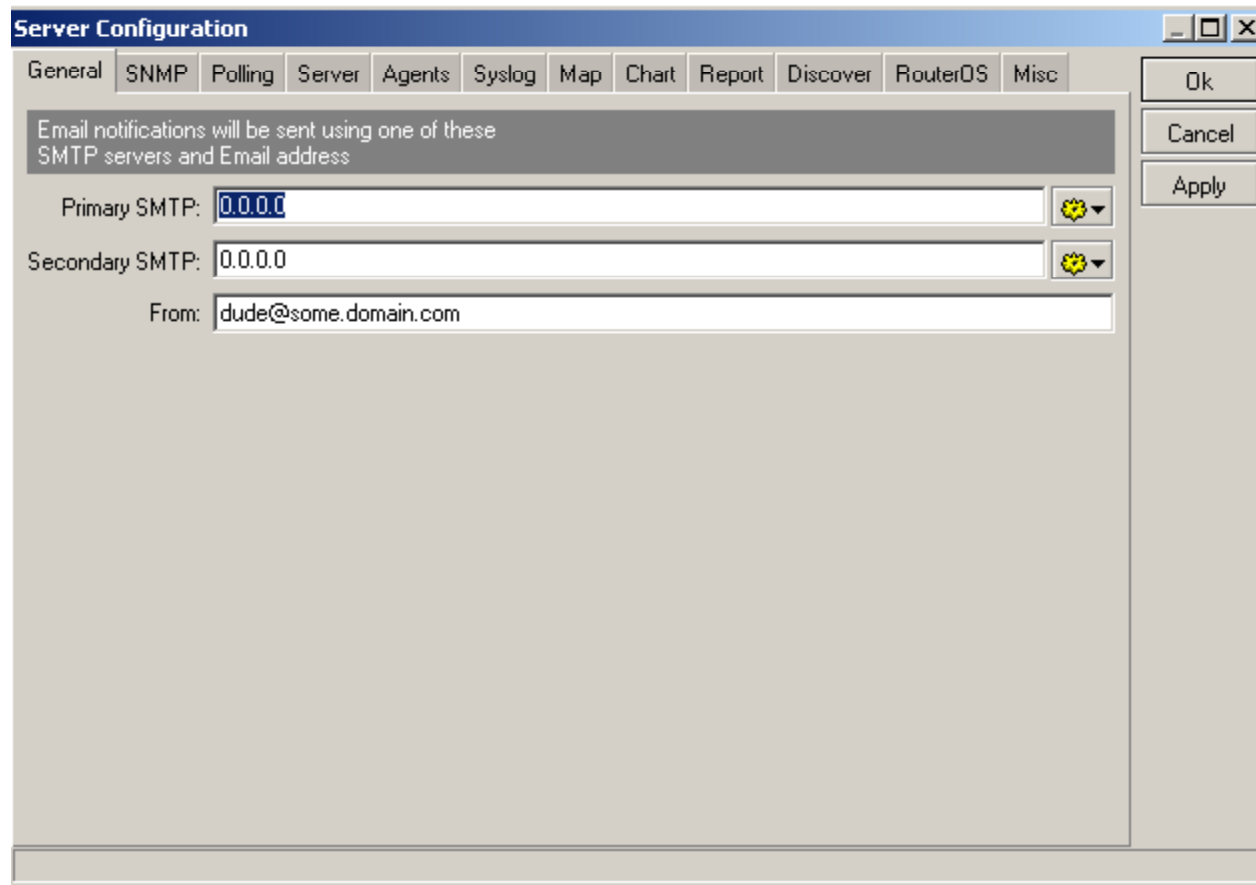
Server Information

- ▶ Run As Service
 - Don't need to do this if you have separate server.
 - Runs as windows service
 - Keeps it running upon startup
 - Service called "The Dude"

Setting Up The Dude



Server Configuration



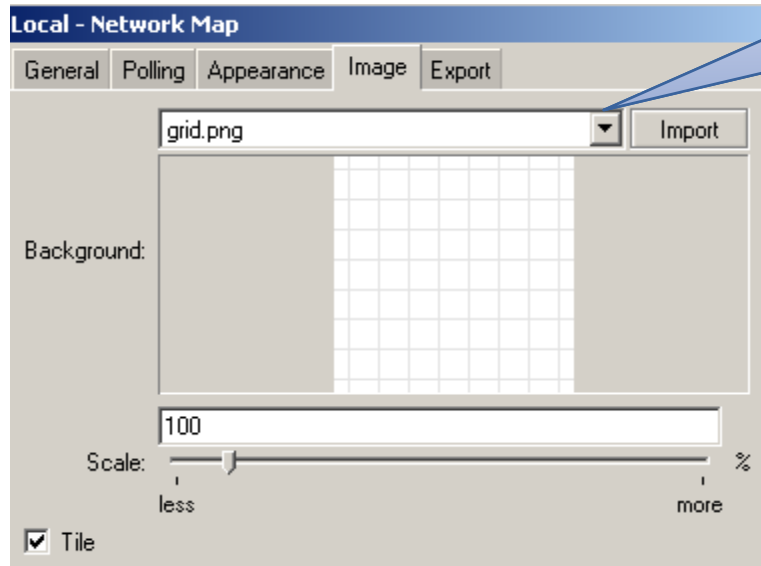
The screenshot shows a 'Server Configuration' dialog box with a blue title bar and standard window controls. The 'General' tab is selected, and a sub-tabbed area contains the following fields:

- Primary SMTP: 0.0.0.0
- Secondary SMTP: 0.0.0.0
- From: dude@some.domain.com

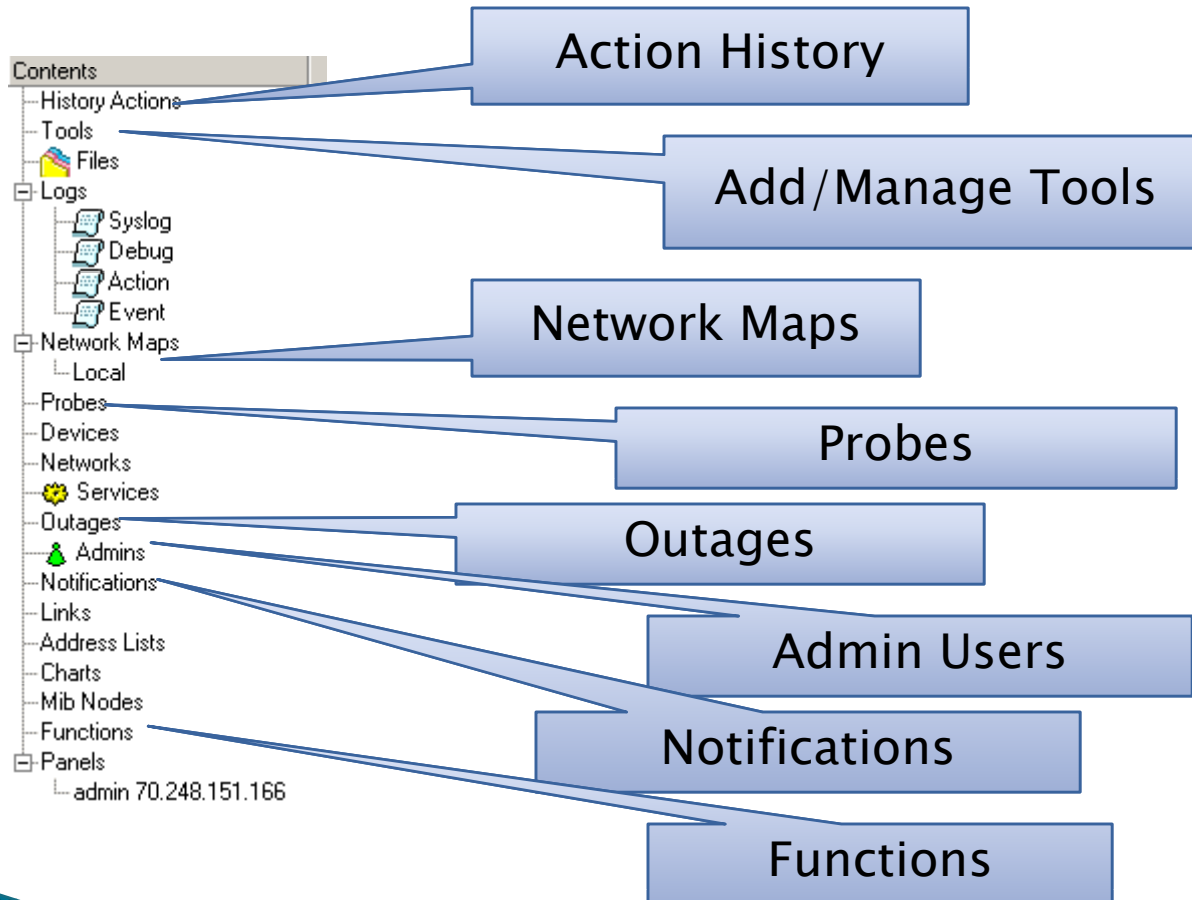
Buttons for 'Ok', 'Cancel', and 'Apply' are located on the right side of the dialog.

Map Settings

Ability to Setup a Background Map. Could be Image etc.



Contents



Adding Devices

Right-Click Map

- + Add Device
- + Add Network
- + Add Submap
- + Add Static
- + Add Link

Adding Devices

Right-Click Map

Select Add Device

- + Add Device
- + Add Network
- + Add Submap
- + Add Static
- + Add Link

IP or DNS

Add Device

Enter IP address or DNS name

Address: 10.0.99.254

Login for fast access to device with Telnet/Winbox

User Name: admin

Password: *****

Secure Mode

Router OS

Back Next Cancel

Adding Devices

Right-Click Map

Select Add Device

- + Add Device
- + Add Network
- + Add Submap
- + Add Static
- + Add Link

Enter IP address or DNS name

Address: 10.0.99.254

Login for fast access to device with Telnet/Winbox

User Name: admin

Password: xxxxxxxx

Secure Mode

Router OS

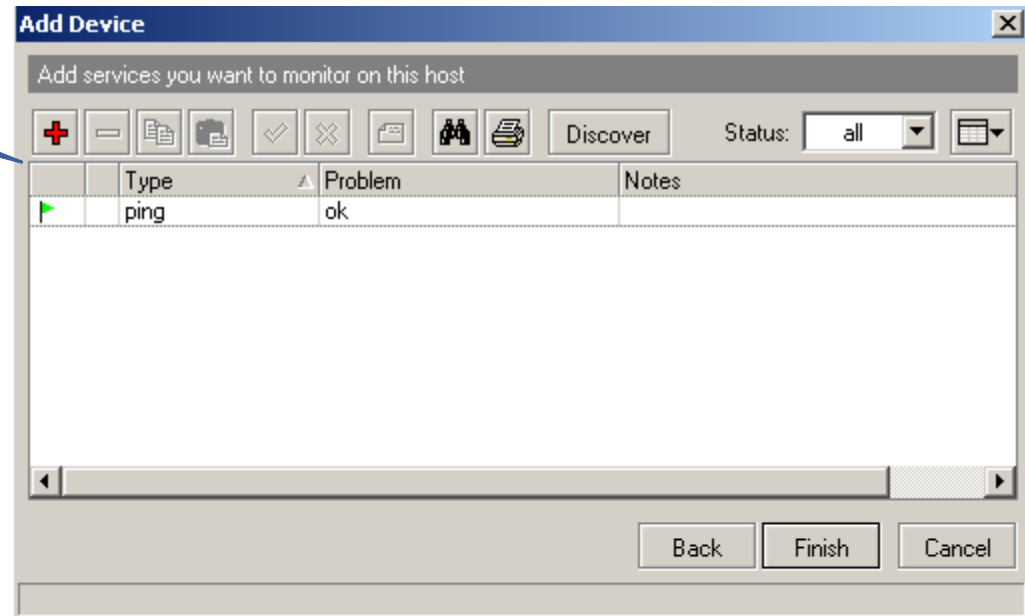
Back Next Cancel

IP or DNS

RouterOS
username/password

Adding Devices

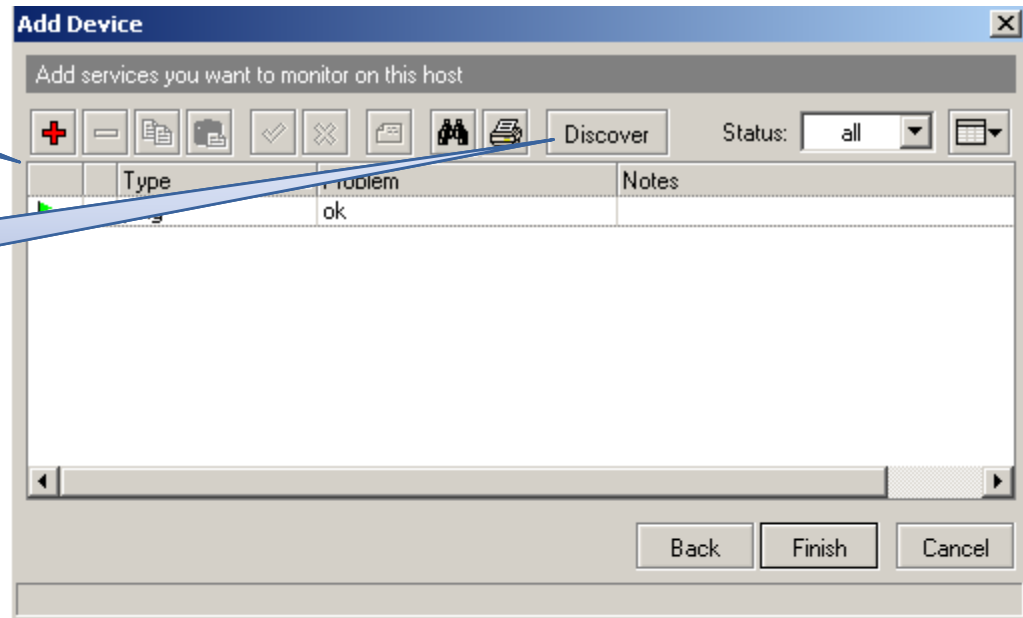
Services



Adding Devices

Services

Use Service
Discovery



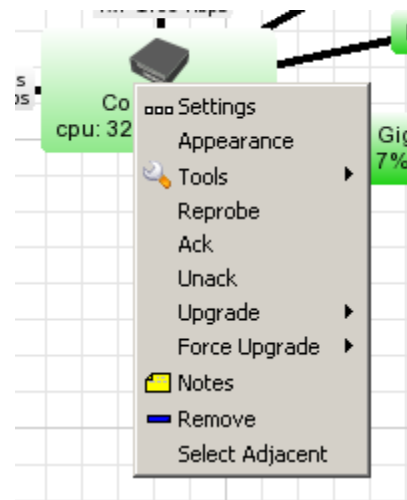
Adding Devices

- ▶ Device is Created
 - RouterOS Devices with Correct Information
 - Will show Device Performance



Device Appearance

- ▶ Right-Click on Device
- ▶ Select Appearance



Device Appearance

- ▶ Lots of Information
 - Label can contain OID's from your MIB database
 - Frequency?
 - Channels
 - Number of Clients
 - Hotspot Users
 - Image
 - Ability to set a image for the device

The screenshot shows a configuration window titled "[Device.Name] [device_performance()][Device.ServicesDown] - Network Map Ele..". It has two tabs: "General" and "Image". The "Image" tab is active. The configuration includes:

- Type: item
- Item Type: device
- A note: "Map specific values of following settings are used for this item if not specified here"
- Label: (empty dropdown)
- Label Refresh Interval: default (dropdown)
- Unknown: (empty dropdown)
- Up: (empty dropdown)
- Down Partial: (empty dropdown)
- Down Complete: (empty dropdown)
- Acked: (empty dropdown)
- Shape: (empty dropdown)
- Font: (empty dropdown)

Device Information

Lots Of Information Per Device
Setup "Name" here

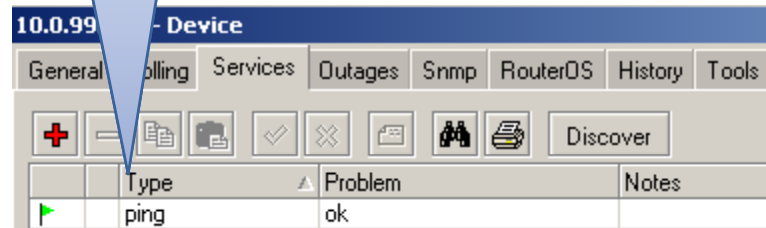
The screenshot displays a web-based configuration interface for a network device. The main title is "10.0.99.254 Device". Below the title are several tabs: "General", "Polling", "Services", "Outages", "Snmp", "RouterOS", "History", and "Tools". The "General" tab is active. The form contains the following fields and controls:

- Name:** 10.0.99.254 (highlighted by a callout box)
- Addresses:** 10.0.99.254
- DNS Names:** (empty)
- DNS Lookup:** address to name
- DNS Lookup Interval:** 60 min
- MAC Addresses:** 00:0C:42:21:91:49
- MAC Lookup:** ip to mac
- Type:** MikroTik Device
- Parents:** (empty)
- Custom Field 1:** (empty)
- Custom Field 2:** (empty)
- Custom Field 3:** (empty)
- Agent:** default
- Snmp Profile:** default
- User Name:** admin
- Password:** (masked with asterisks)
- Secure Mode
- Router OS
- Dude Server
- Services:** (indicated by a large green circle and "Up - 1")
- Status:** up

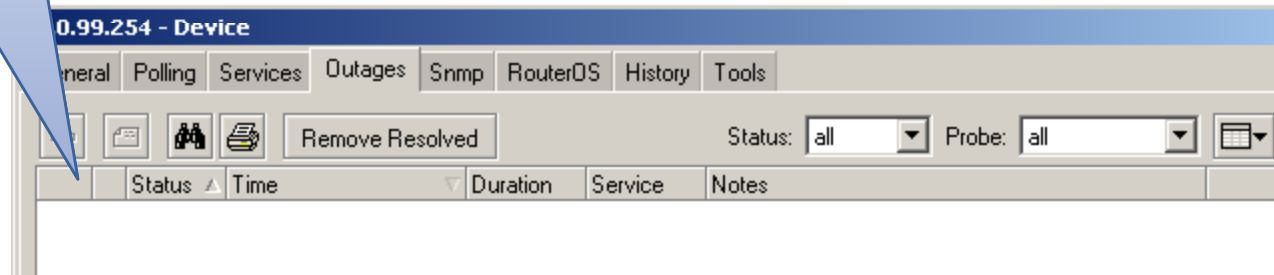
Device Information

Device Services

Device Outage Information



| Type | Problem | Notes |
|------|---------|-------|
| ping | ok | |



| Status | Time | Duration | Service | Notes |
|--------|------|----------|---------|-------|
|--------|------|----------|---------|-------|


Device Information

- ▶ Device SNMP Info
 - If SNMP is configured
 - And Enabled on RouterOS

10.0.99.254 - Device

General Polling Services Outages Snmp RouterOS History Tools

Interface Ip Route Arp Bridge Fdb Storage Cpu Wireless Station Register

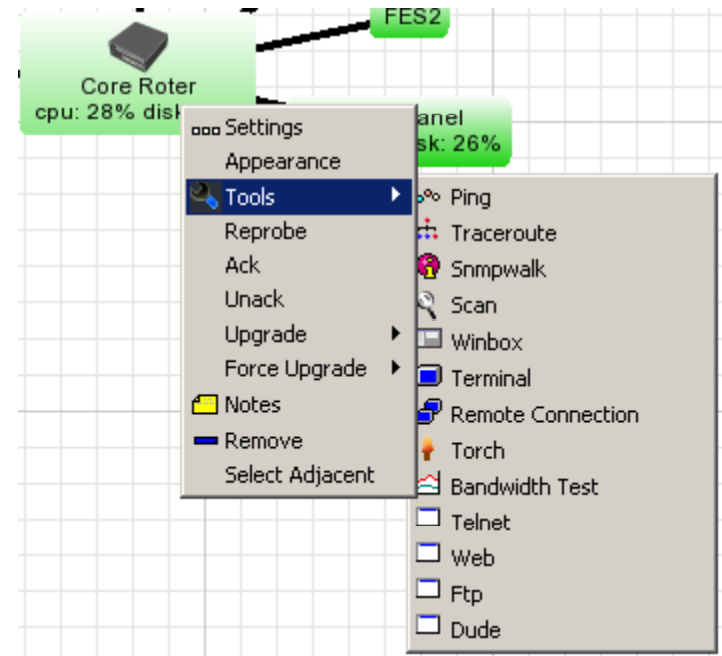


| Name | Type | MTU | Tx Rate | Rx Rate |
|---------------------|-----------------|------|-----------|-----------|
| pptp-in1 (237) | ppp | 0 | 0 bps | 0 bps |
| ether1 (241) | ethernet-csmacd | 1500 | 2.51 Mbps | 1.39 Mbps |
| ether2 (242) | ethernet-csmacd | 1500 | 195 kbps | 1.2 Mbps |
| ether3 (243) | ethernet-csmacd | 1500 | 80 bps | 48 bps |
| <l2tp-roynet> (255) | ppp | 1200 | 3.39 kbps | 54.6 kbps |

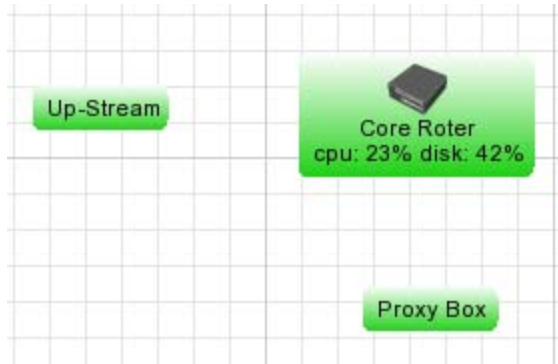
Device Tools

▶ Tools

- Make it very simply for network management
 - Winbox
 - Starts a Winbox session using username/password in Dude
 - Terminal
 - Does the same but with Terminal Window
 - Remote Connection
 - Adds IP address into MS Term Server.
 - Telnet/Web etc – Ability to open Telnet or web client to Device!
- You can add more!



Adding Links



Right Click
Select Link
Click & Drag
Between Devices

Add Link [X]

Links can be static things on map, or they can show some statistics about some interface, here you can set how link should be managed

Device: Core Roter

Mastering Type: simple

Speed: _____

Type: unknown [v] [] [] []

Finish Cancel

Select Device

SNMP or RouterOS

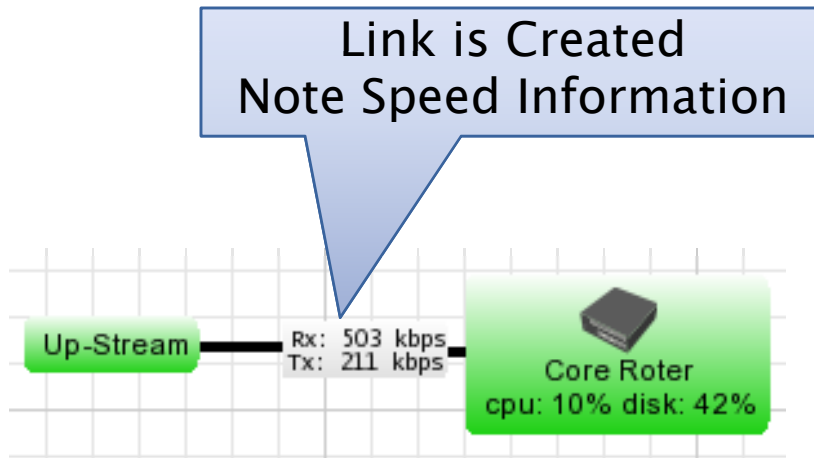
Device: Core Roter

Mastering Type: routeros

Interface: ether2

Interface for Link

Adding Links



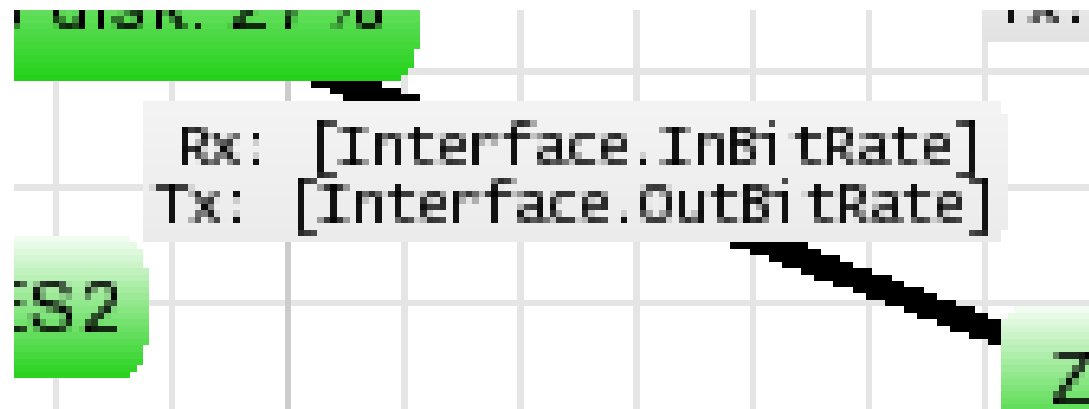
Link Information

- ▶ If you use SNMP
 - Must be enabled on RouterOS
 - See SSID, Channel, and Signal
 - As well as Data Rates and Air Rates!

```
2KFES_2_HILL (5745) -56  
Rx: 2.34 Mbps (54 Mbps)  
Tx: 275 kbps (54 Mbps)
```

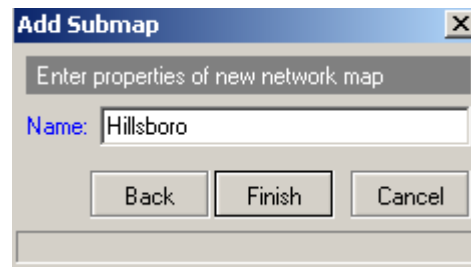

Link Errors

- ▶ Error such as this
 - Shows username/password is not correct in Link Device
 - SNMP community String is not correct.



Maps

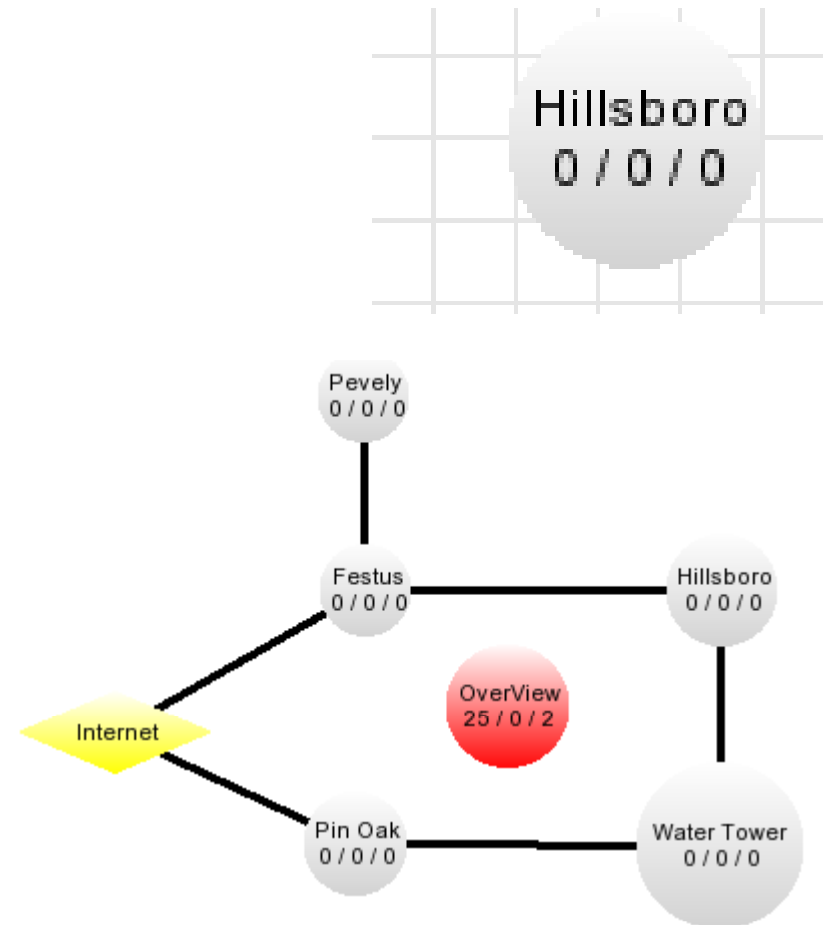
- ▶ Right-Click
- ▶ Add Map
 - Create Map
 - Name



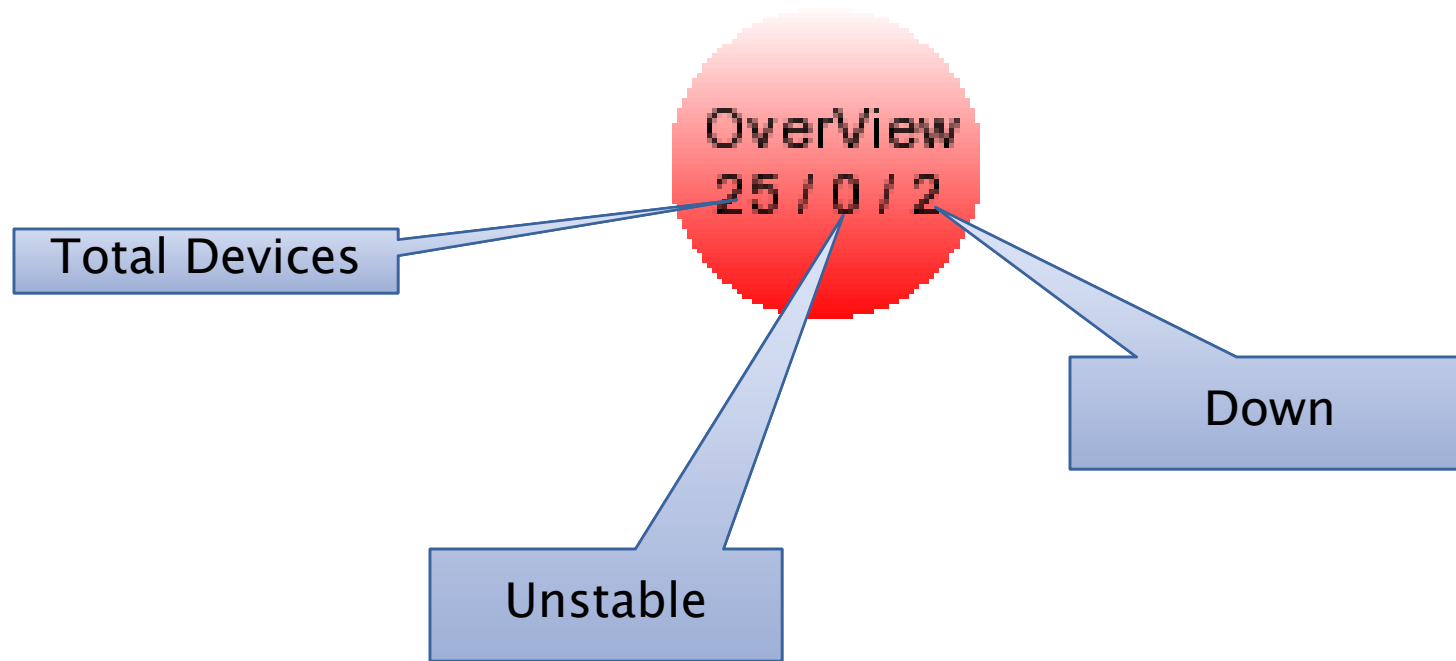
Maps

▶ Submaps

- Ability to Drill Down
 - Setup Customers
 - Tower / Site Monitoring
 - Show overall Topology



Maps Notifications



Pinging / Tracing from Dude

Ping 10.0.49.1

From: server Packet Count: 8 Start

To: 10.0.49.1 Packet Size: 32 Stop

Interval: 1000 ms TTL: 64 Close

| # | Host | Name | Time | Reply Size | TTL | Status |
|---|-----------|------|-------|------------|-----|--------|
| 1 | 10.0.49.1 | | <1 ms | 32 | 61 | |
| 2 | 10.0.49.1 | | <1 ms | 32 | 61 | |
| 3 | 10.0.49.1 | | 10 ms | 32 | 61 | |
| 4 | 10.0.49.1 | | 10 ms | 32 | 61 | |
| 5 | 10.0.49.1 | | <1 ms | 32 | 61 | |
| 6 | 10.0.49.1 | | <1 ms | 32 | 61 | |
| 7 | 10.0.49.1 | | <1 ms | 32 | 61 | |
| 8 | 10.0.49.1 | | <1 ms | 32 | 61 | |

8 transmitted, 8 received, 0% packet loss, round trip min/avg/max = 0/2.5/10 ms

Pinging / Tracing from Dude

Ping 10.0.49.1

From: server Packet Count: 15 Start

To: local
server Packet Size: 32 Stop

Interval: 1000 ms TTL: 64 Close

| # | Host | Name | Time | Reply Size | TTL | Status |
|----|-----------|------|-------|------------|-----|--------|
| 1 | 10.0.49.1 | | <1 ms | 32 | 61 | |
| 2 | 10.0.49.1 | | <1 ms | 32 | 61 | |
| 3 | 10.0.49.1 | | 10 ms | 32 | 61 | |
| 4 | 10.0.49.1 | | 10 ms | 32 | 61 | |
| 5 | 10.0.49.1 | | <1 ms | 32 | 61 | |
| 6 | 10.0.49.1 | | <1 ms | 32 | 61 | |
| 7 | 10.0.49.1 | | <1 ms | 32 | 61 | |
| 8 | 10.0.49.1 | | <1 ms | 32 | 61 | |
| 9 | 10.0.49.1 | | <1 ms | 32 | 61 | |
| 10 | 10.0.49.1 | | <1 ms | 32 | 61 | |
| 11 | 10.0.49.1 | | <1 ms | 32 | 61 | |
| 12 | 10.0.49.1 | | <1 ms | 32 | 61 | |
| 13 | 10.0.49.1 | | <1 ms | 32 | 61 | |
| 14 | 10.0.49.1 | | <1 ms | 32 | 61 | |
| 15 | 10.0.49.1 | | 10 ms | 32 | 61 | |

15 transmitted, 15 received, 0% packet loss, round trip min/avg/max = 0/2.0/10 ms

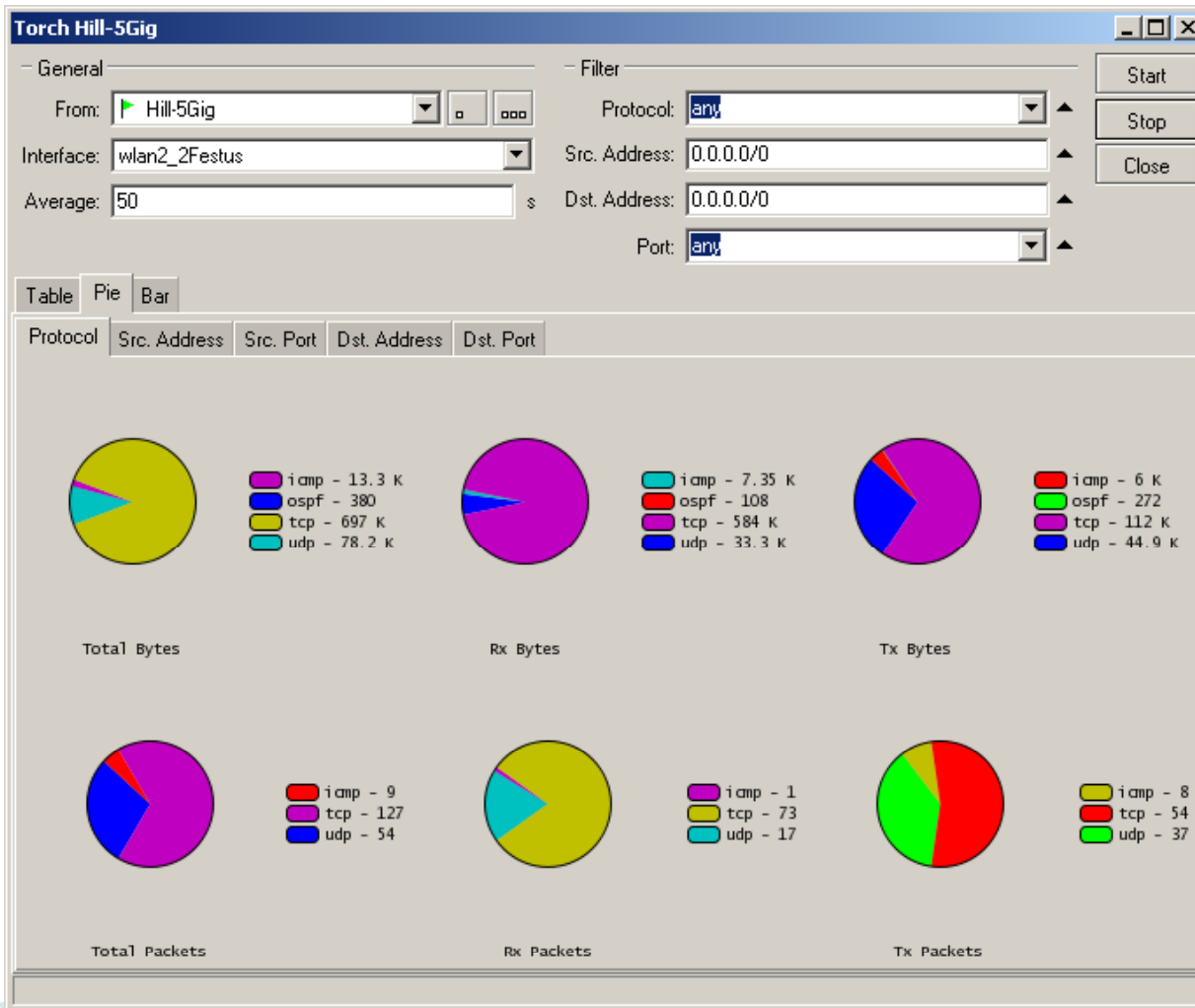
Pinging / Tracing from Dude

The screenshot shows the Traceroute 4.2.2.2 application window. The 'From' field is set to 'server' and the 'To' field is set to '4.2.2.2'. The 'Packet Size' is 56 and the 'Timeout' is 5000 ms. The 'Start' button is highlighted. Below the input fields is a table with the following data:

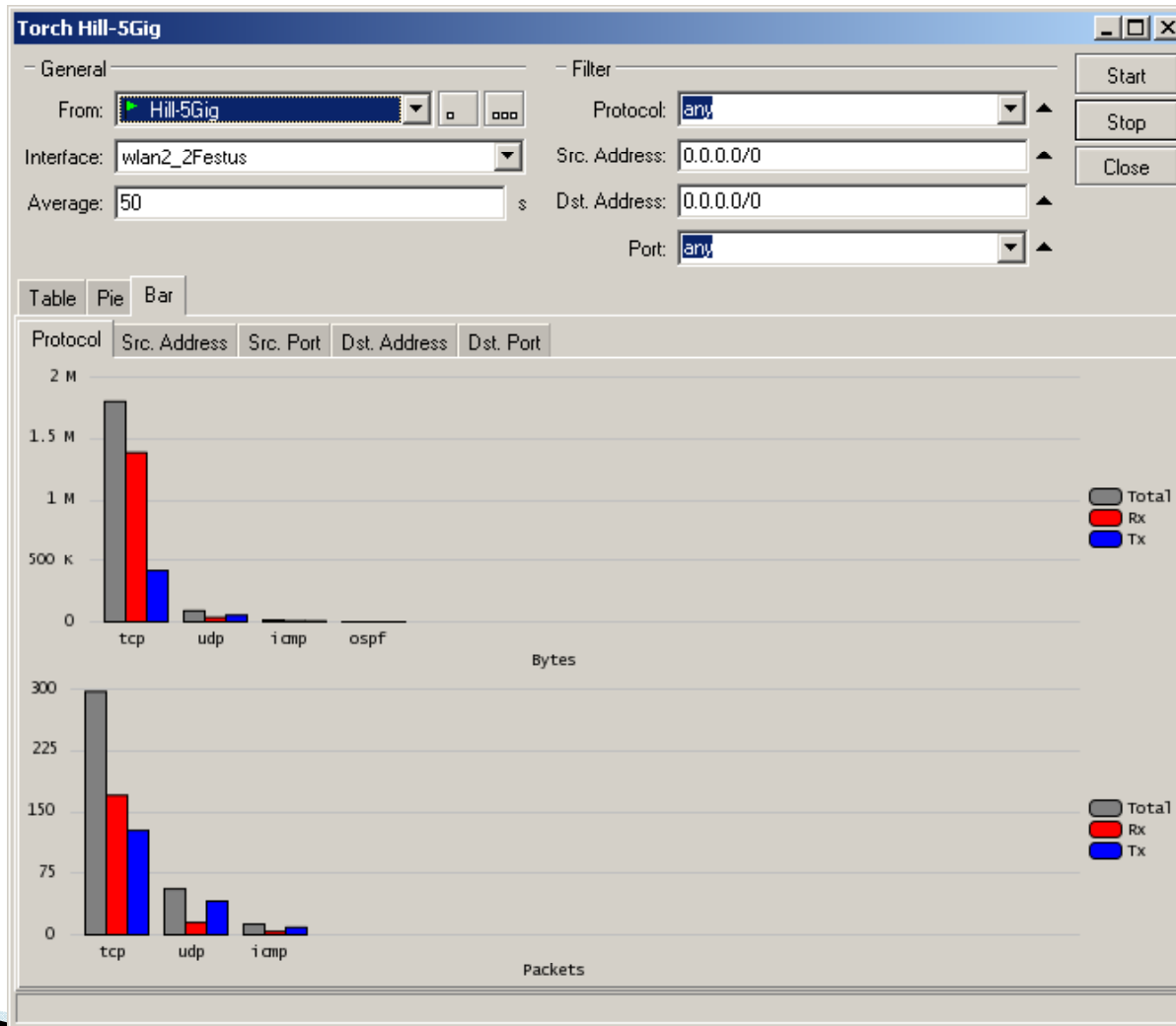
| # | Hop | Host | Time |
|---|-----|--------------|--------|
| 1 | 1 | 10.0.99.254 | failed |
| 2 | 2 | 10.174.101.1 | failed |
| 3 | 3 | 24.217.1.253 | failed |
| 4 | 4 | 24.217.1.229 | failed |
| 5 | 5 | 24.217.58.82 | failed |
| 6 | 6 | 24.217.2.130 | failed |
| 7 | 7 | 4.79.74.1 | failed |
| 8 | 8 | 4.68.101.164 | failed |
| 9 | 9 | 4.2.2.2 | 50 ms |

The status bar at the bottom of the window displays 'done'.

Torching from Dude



Torching from Dude



What we covered

- ▶ Using the Dude
 - Installation
 - Basic configuration
 - Notifications
 - Charting
 - Graphing
 - Services
 - Tools
 - Ping
 - Traceroute
 - Torch