



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

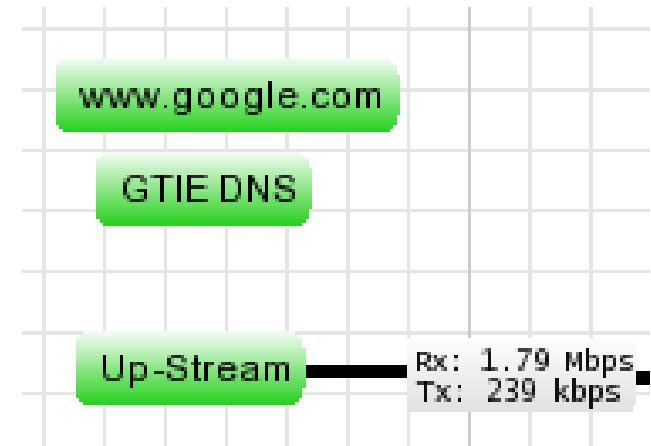
SNMP

▶ 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

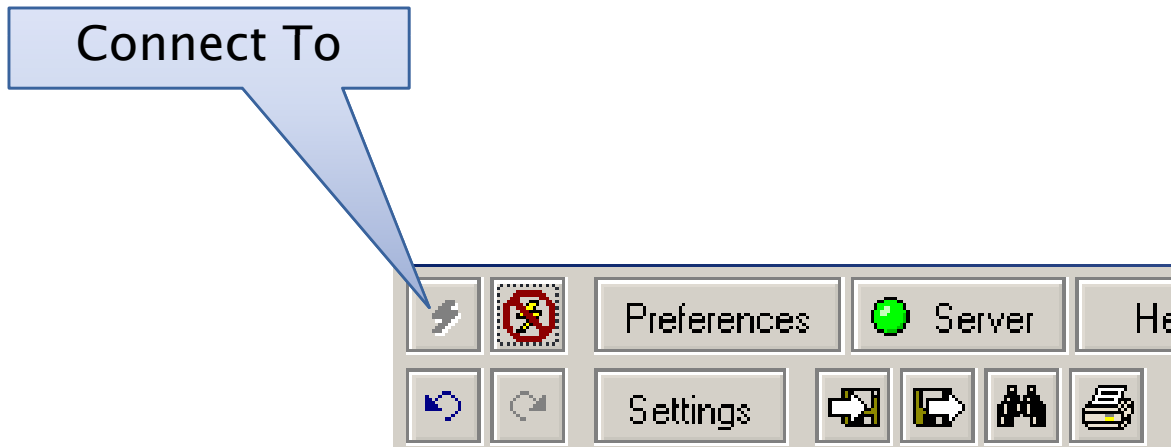
Installing the Dude

- ▶ 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!

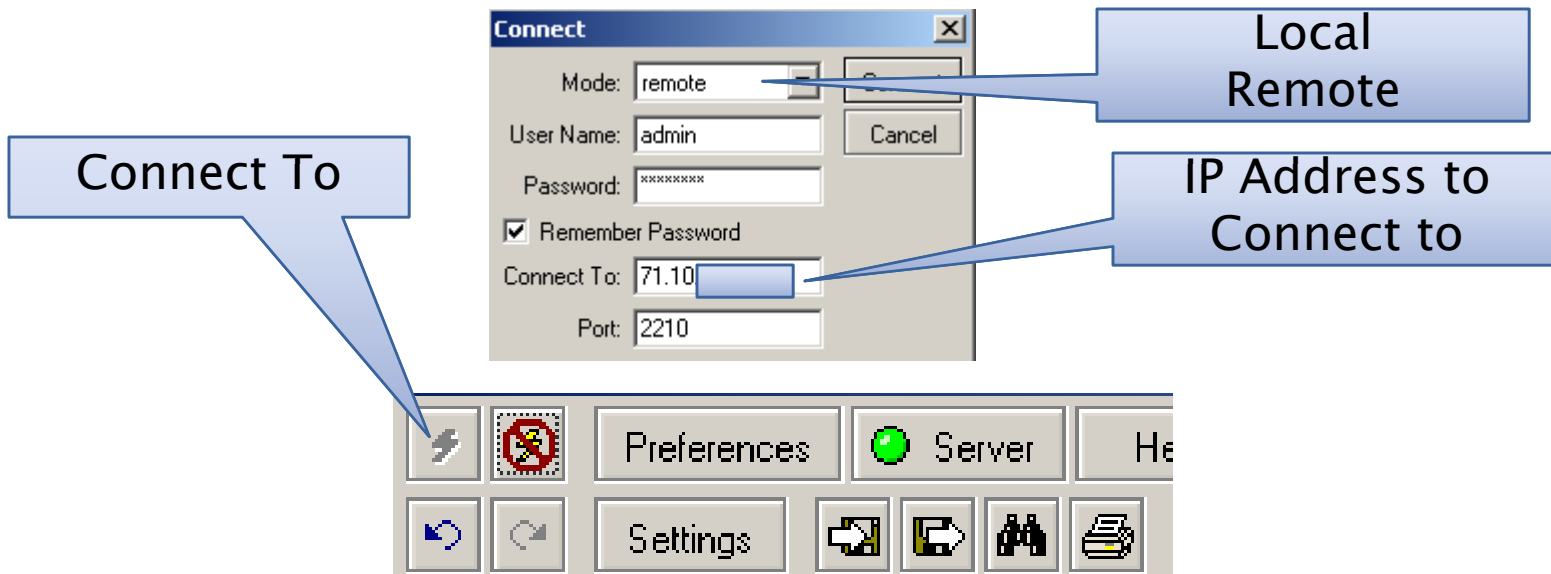
Installing the Dude

- ▶ 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.

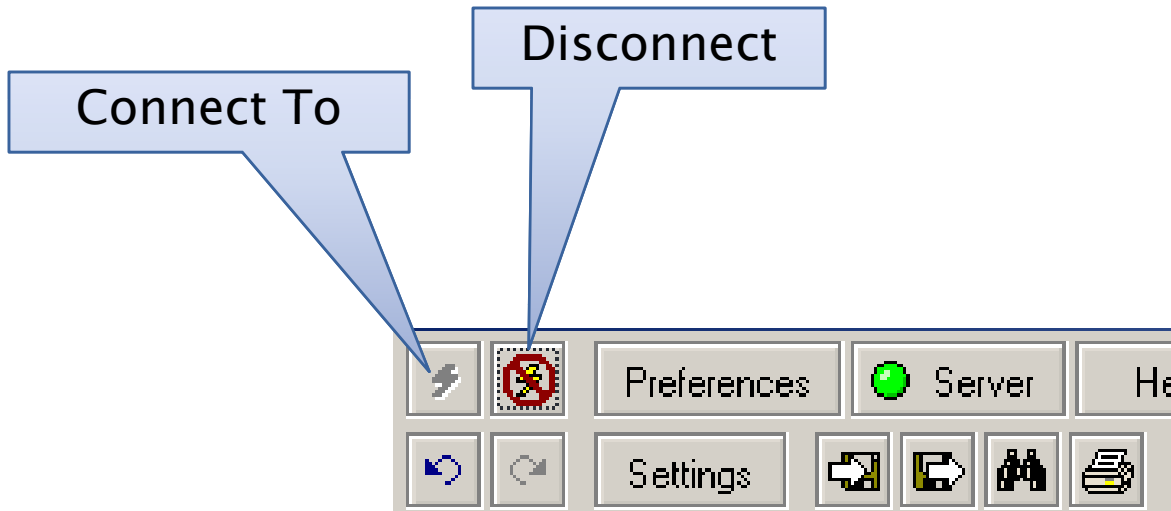
Server Information



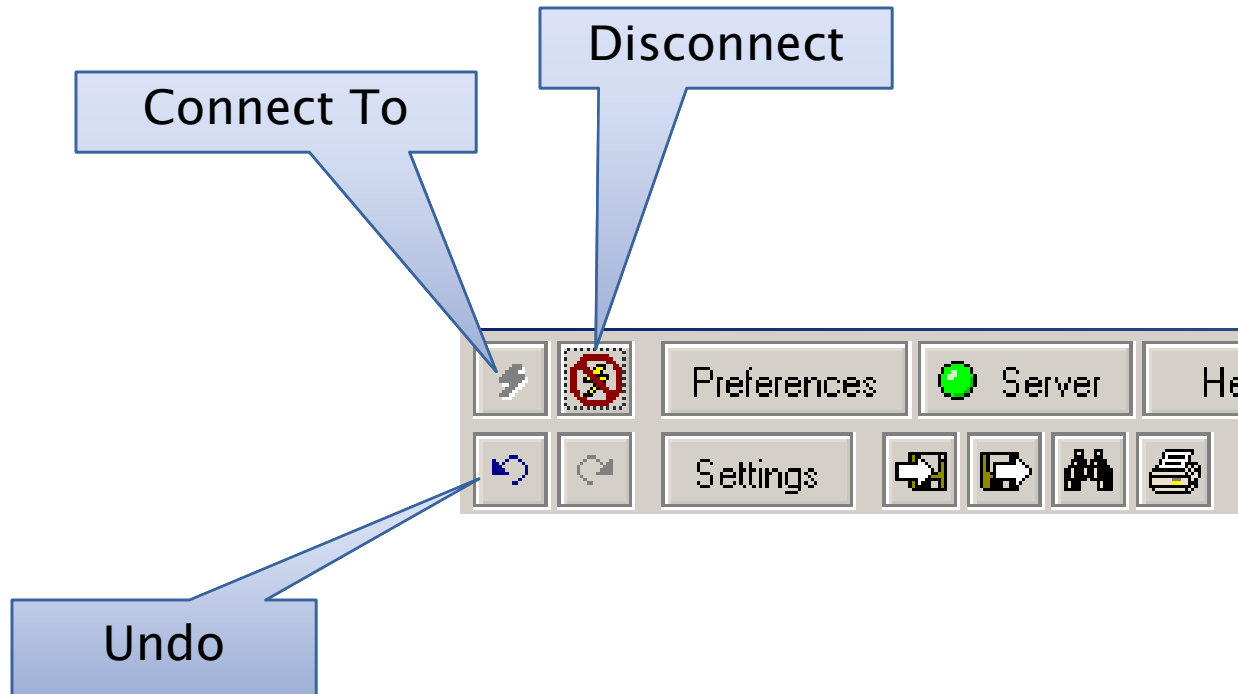
Server Information



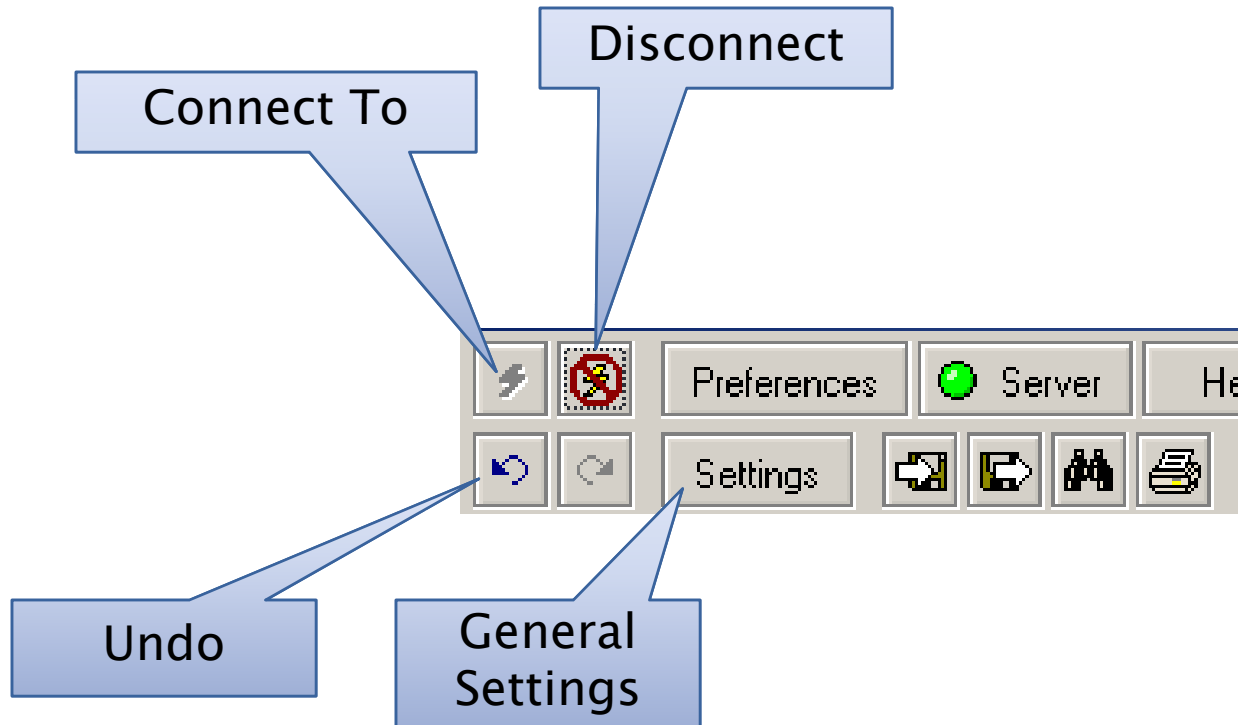
Server Information



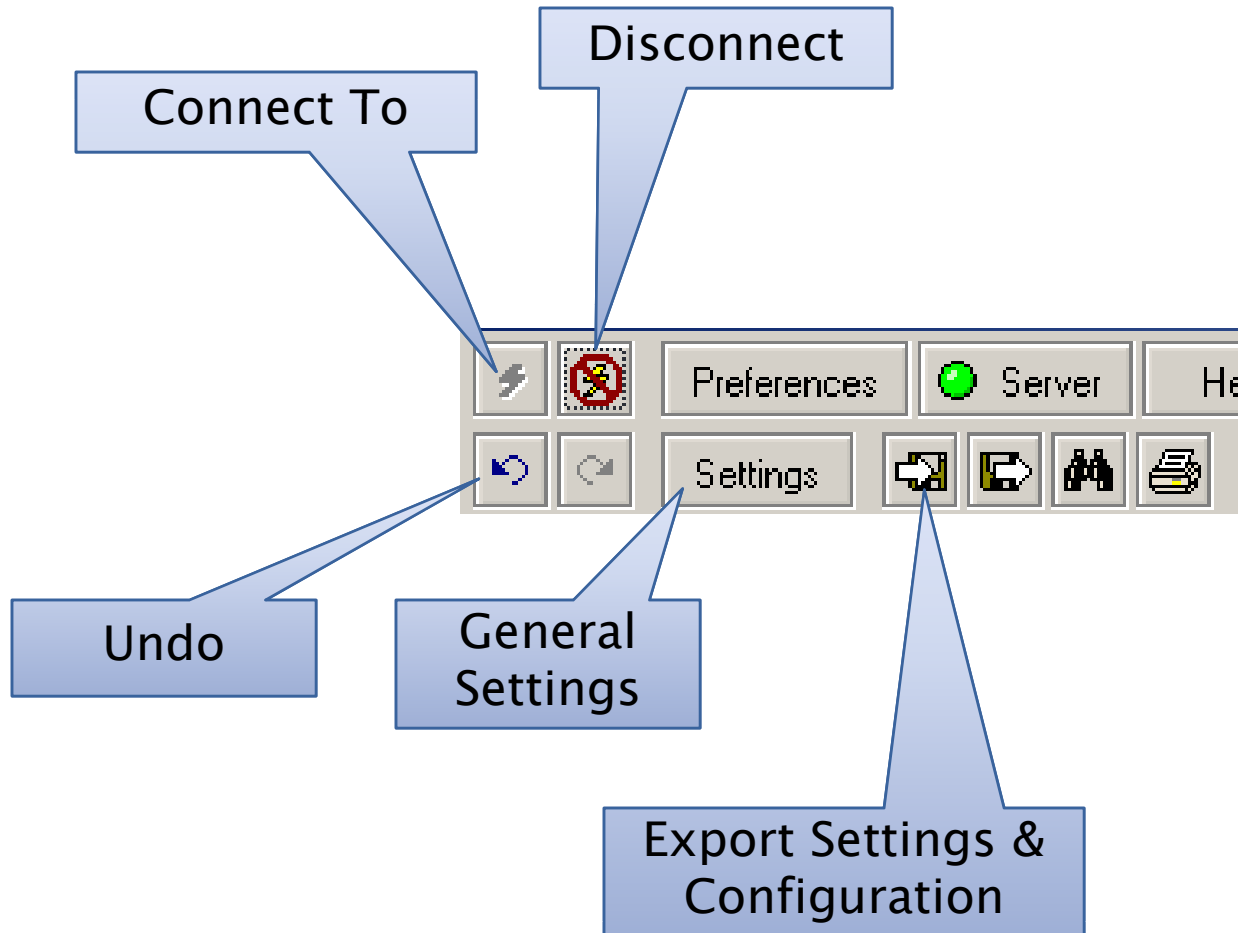
Server Information



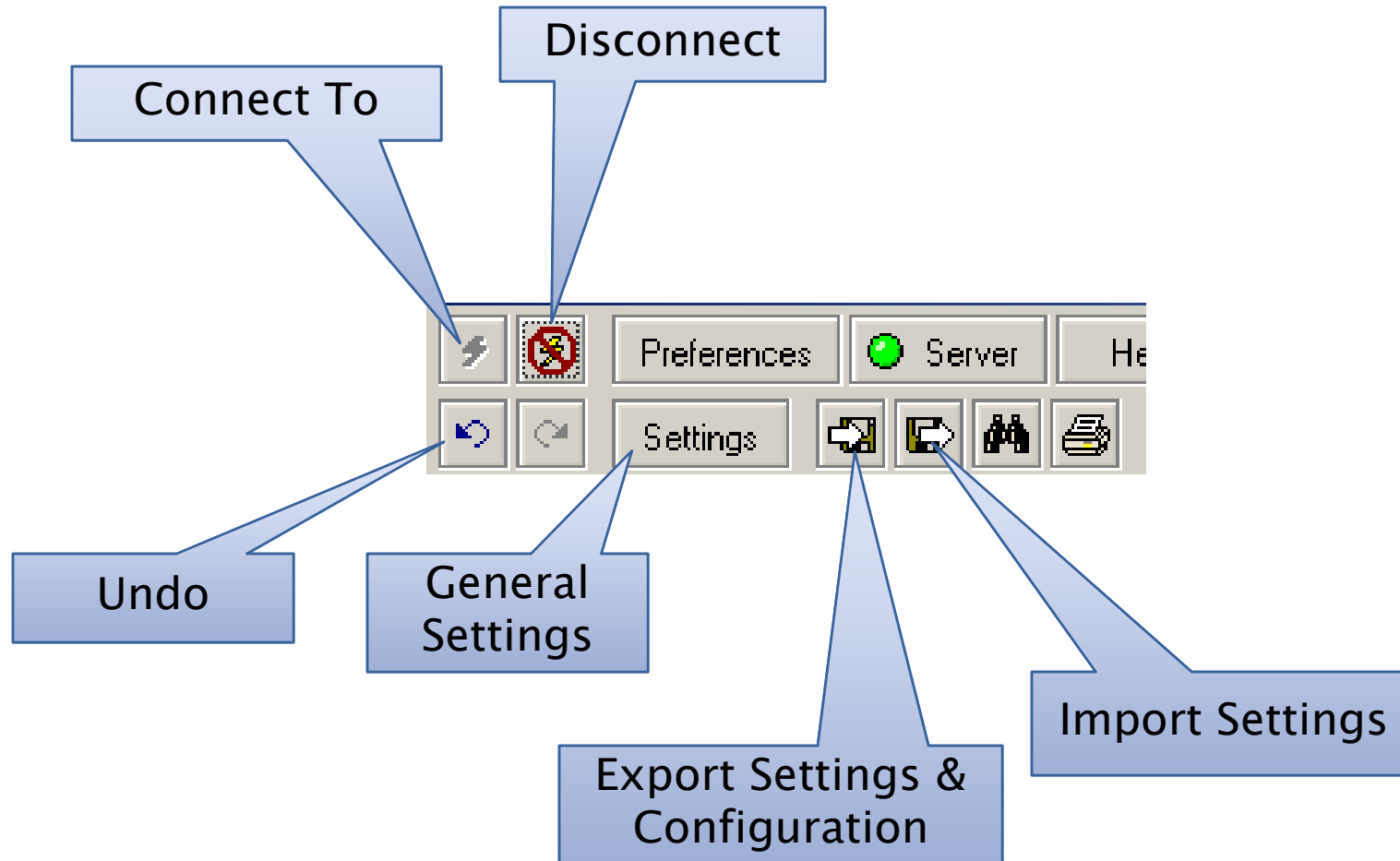
Server Information



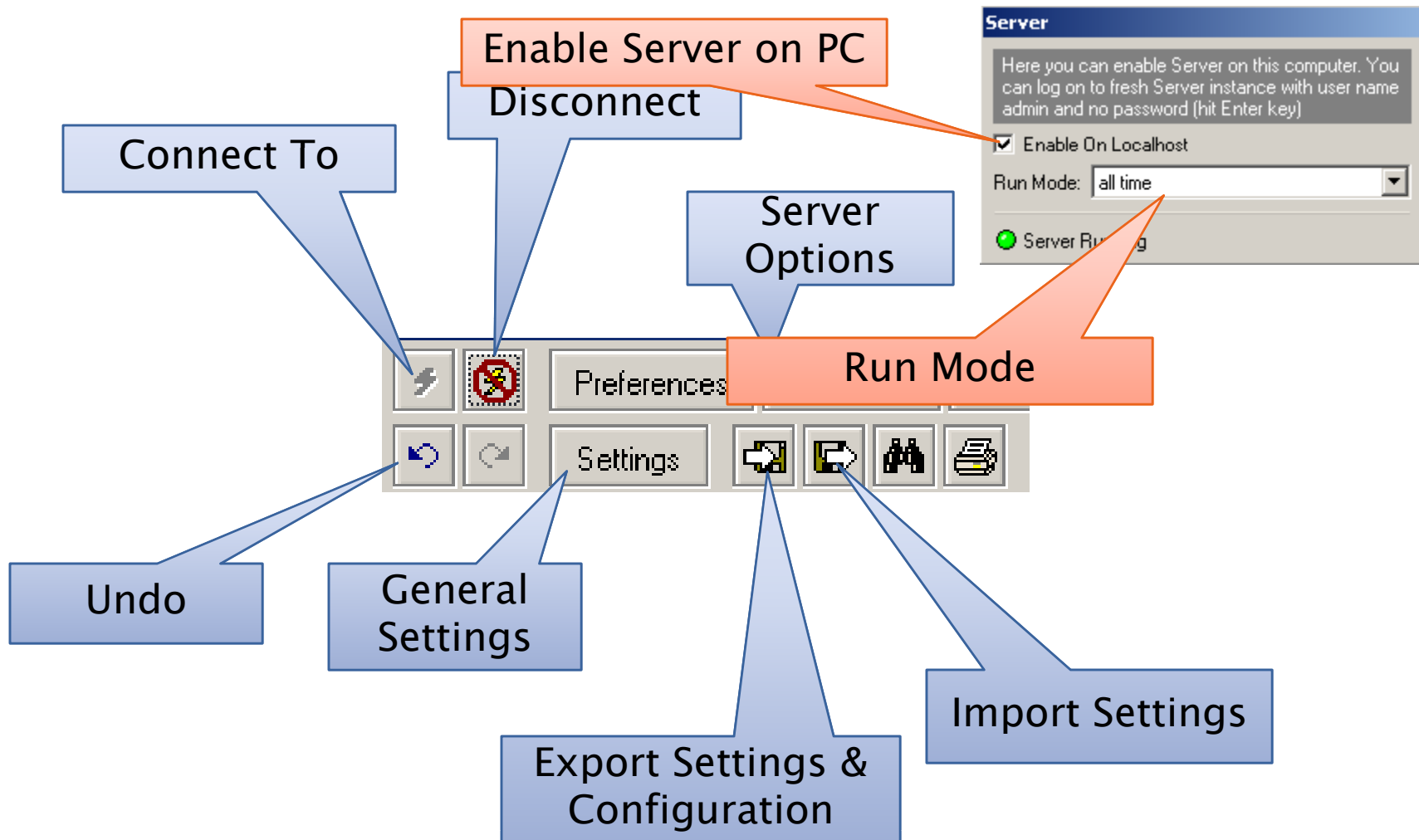
Server Information



Server Information



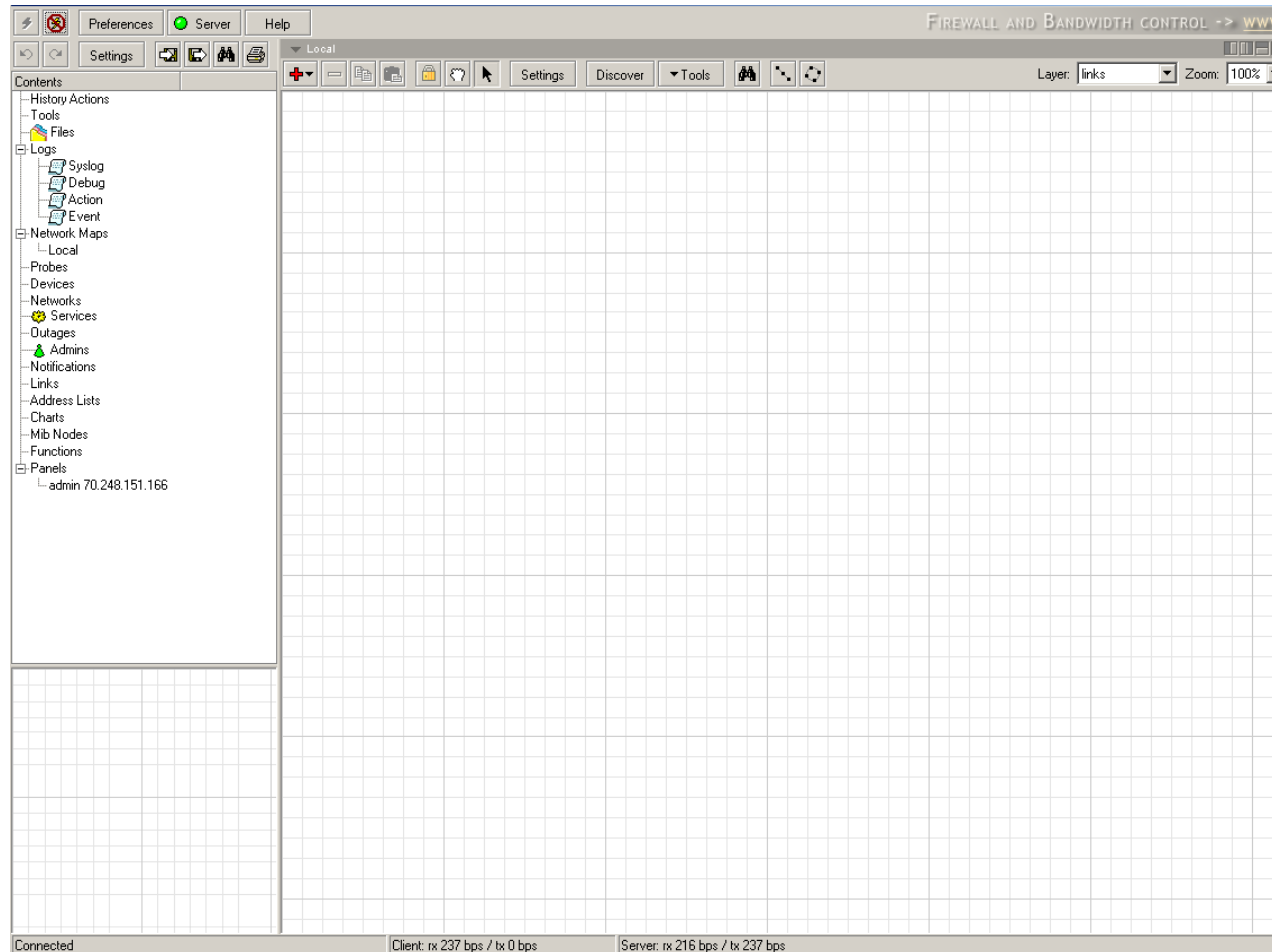
Server Information



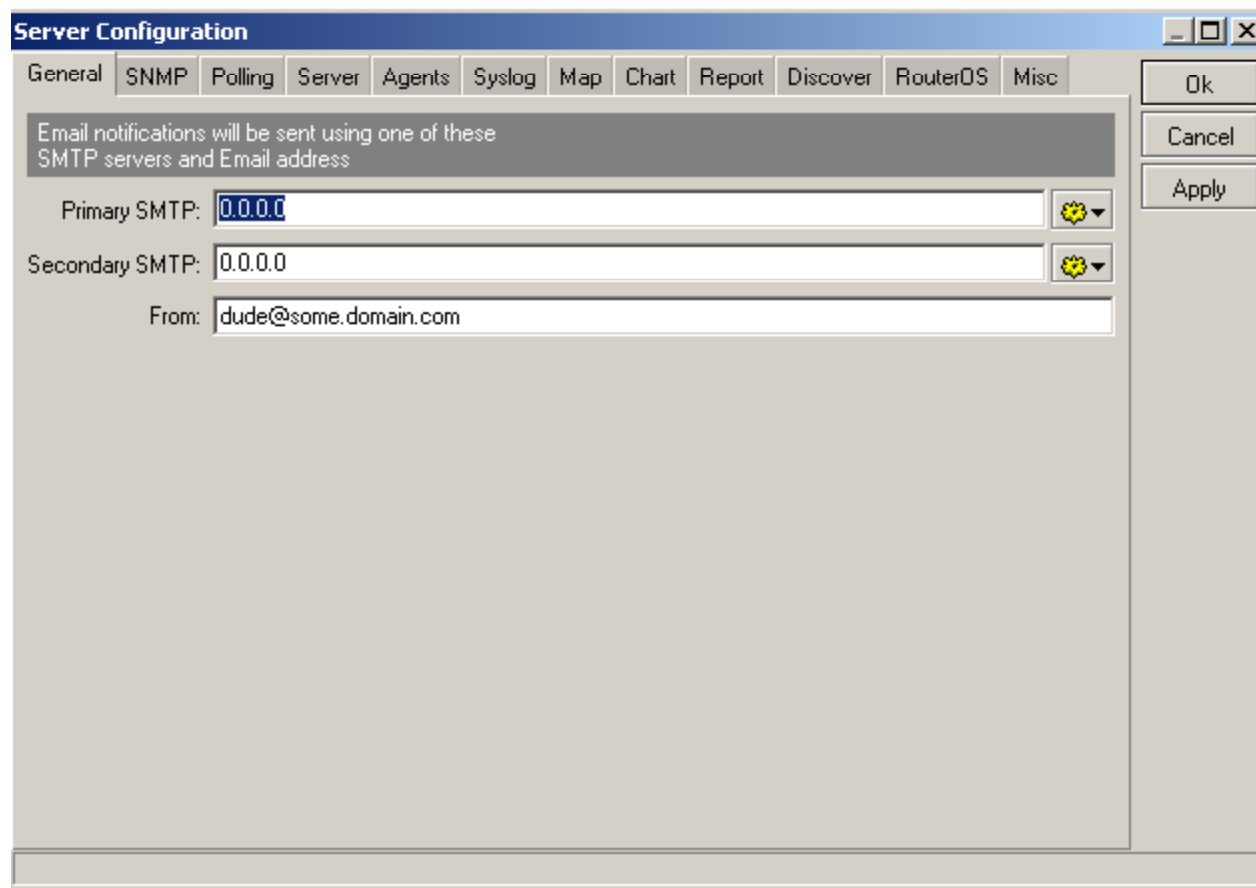
Server Information

- ▶ 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' window with a tabbed interface. The 'General' tab is selected. The window title bar includes standard minimize, maximize, and close buttons. The tabs are: General, SNMP, Polling, Server, Agents, Syslog, Map, Chart, Report, Discover, RouterOS, and Misc. The main content area has a grey header with the text: 'Email notifications will be sent using one of these SMTP servers and Email address'. Below this, there are three input fields: 'Primary SMTP:' with the value '0.0.0.0', 'Secondary SMTP:' with the value '0.0.0.0', and 'From:' with the value 'dude@some.domain.com'. Each of the first two fields has a small gear icon to its right. On the right side of the window, there are three buttons: 'Ok', 'Cancel', and 'Apply'.

Server Configuration

General | SNMP | Polling | Server | Agents | Syslog | Map | Chart | Report | Discover | RouterOS | Misc

Email notifications will be sent using one of these SMTP servers and Email address

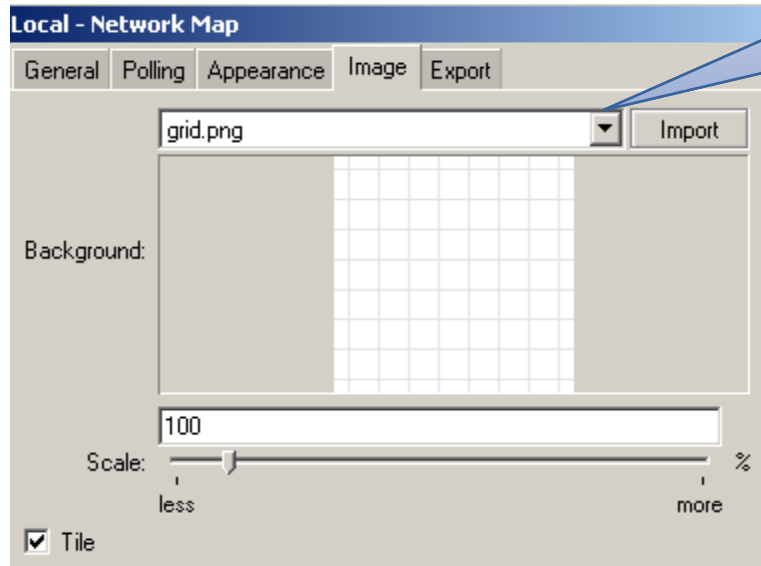
Primary SMTP: 0.0.0.0

Secondary SMTP: 0.0.0.0

From: dude@some.domain.com

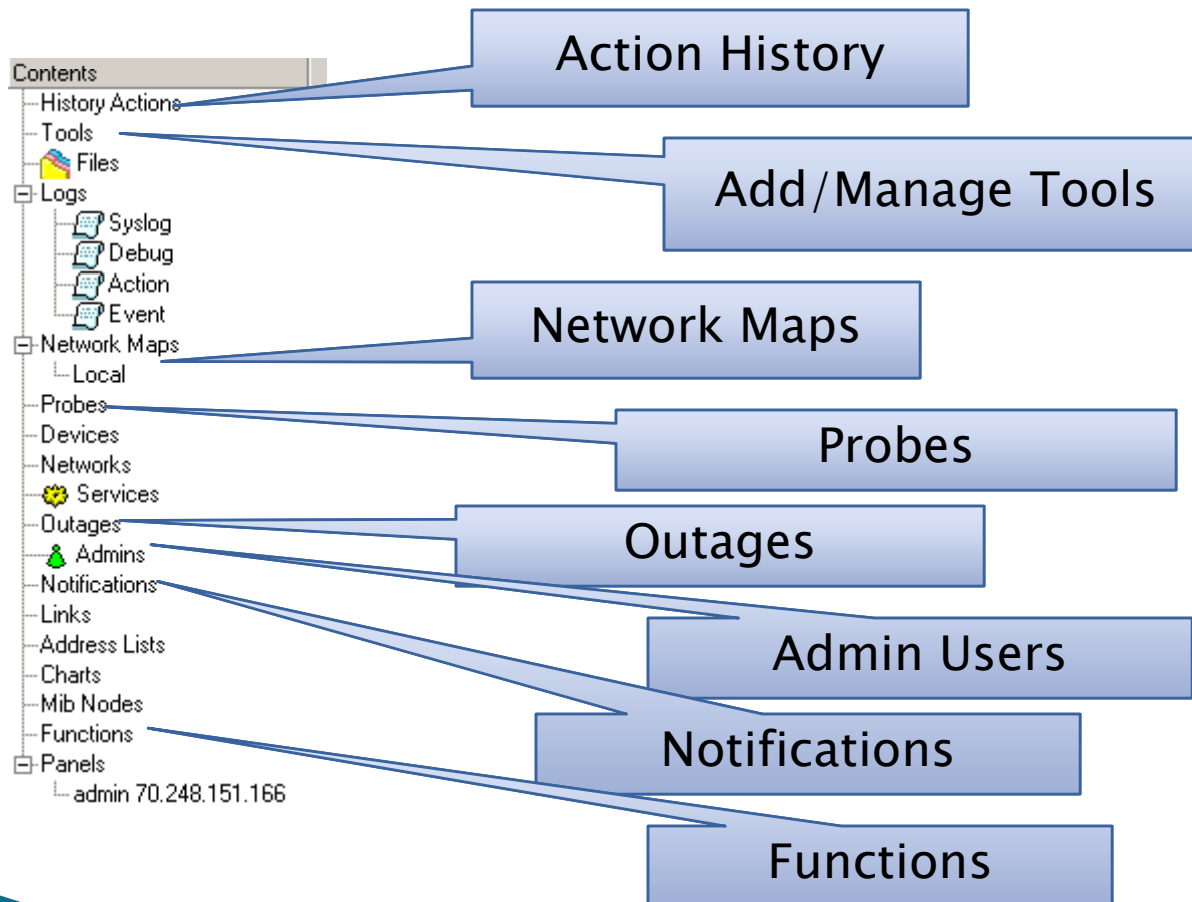
Ok
Cancel
Apply

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: xxxxxxxx

☐ 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

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: xxxxxxxx

☐ Secure Mode

☒ Router OS

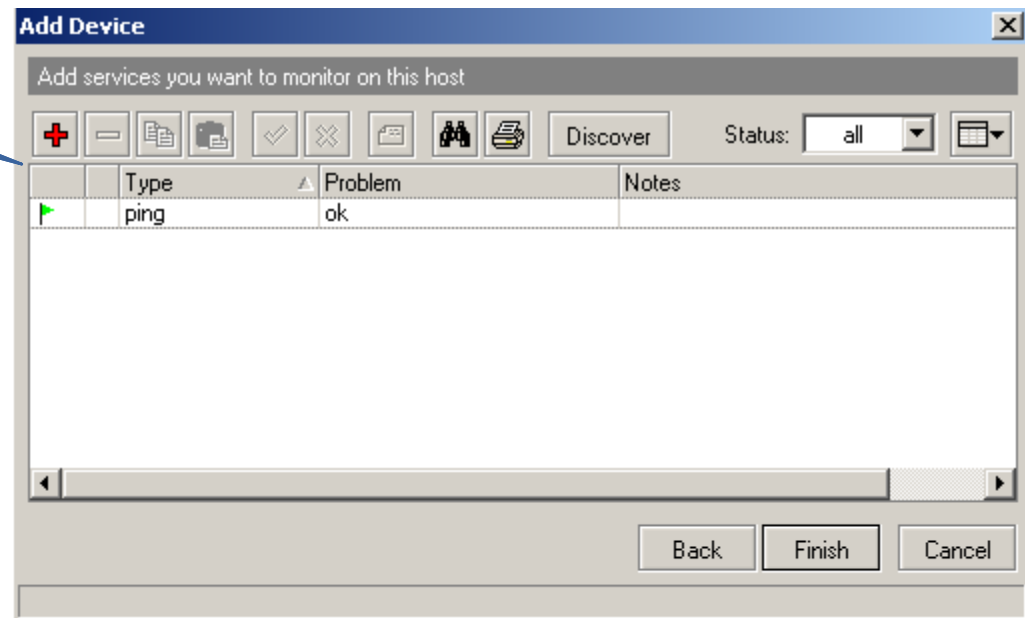
Back Next Cancel

IP or DNS

RouterOS
username/password

Adding Devices

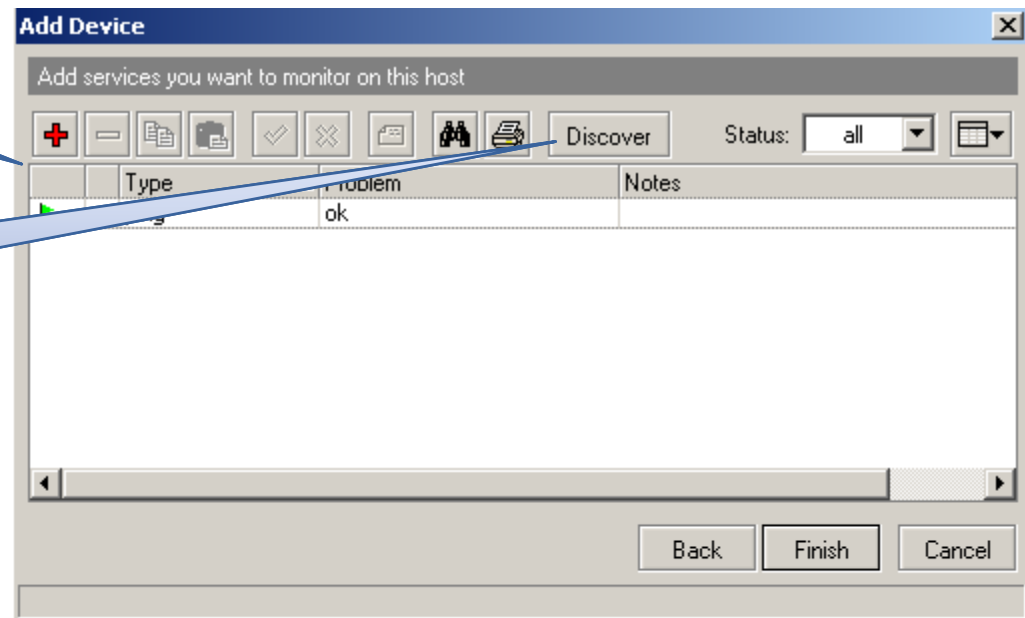
Services



Adding Devices

Services

Use Service
Discovery



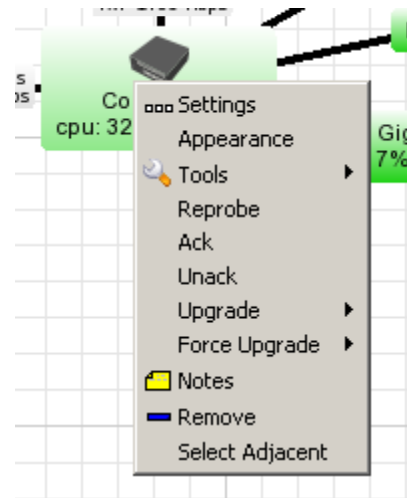
Adding Devices

- ▶ 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 "Type" field is set to "item" and the "Item Type" field is set to "device". Below these fields is a grey box with the text: "Map specific values of following settings are used for this item if not specified here". The "Label" field is a large text area. The "Label Refresh Interval" is a dropdown menu set to "default". Below this are several other dropdown menus: "Unknown:", "Up:", "Down Partial:", "Down Complete:", "Acked:", "Shape:", and "Font:". Each of these dropdowns has a small downward arrow on its right side.

Device Information

Lots Of Information Per Device
Setup "Name" here

10.0.99.254 Device

General Polling Services Outages Snmp RouterOS History Tools

Name: 10.0.99.254

Addresses: 10.0.99.254

DNS Names:

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:

Custom Field 1:

Custom Field 2:

Custom Field 3:

Agent: default

Snmp Profile: default

User Name: admin

Password: xxxxxxxx

☐ Secure Mode

☒ Router OS

☐ Dude Server

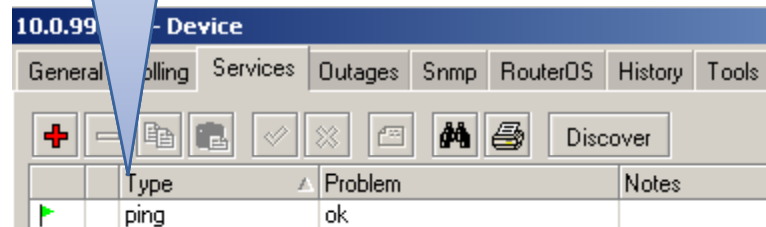
Services:  Up - 1

Status: up

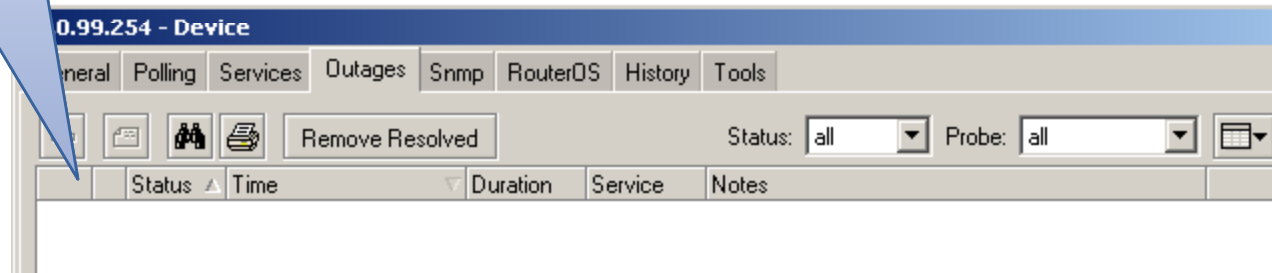
Device Information

Device Services

Device Outage Information



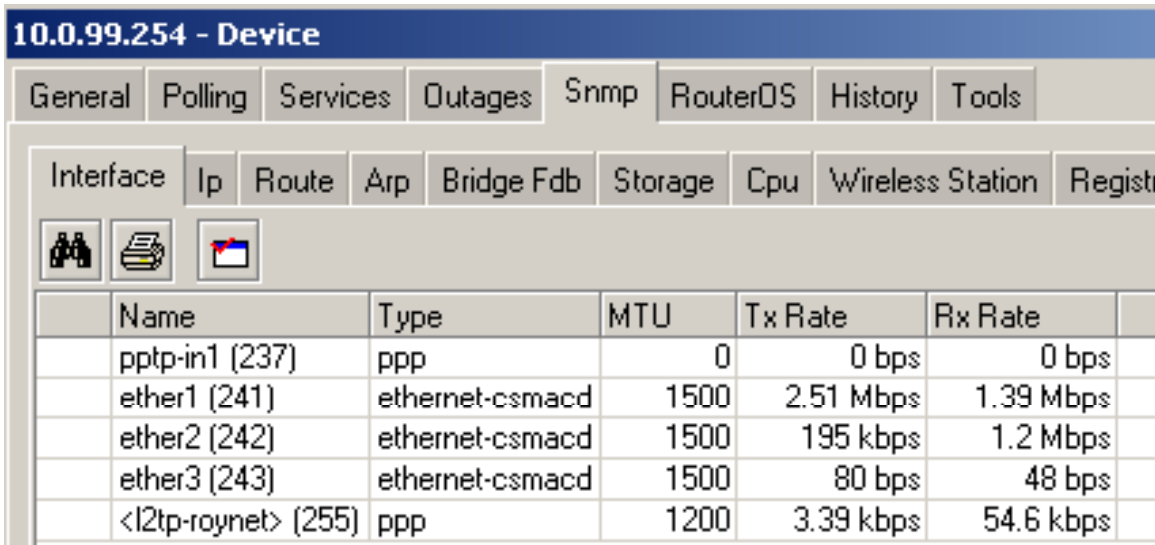
10.0.99 - Device			
General Polling Services Outages Snmp RouterOS History Tools			
+ - [Icons] Discover			
	Type	Problem	Notes
▶	ping	ok	



0.99.254 - Device					
General Polling Services Outages Snmp RouterOS History Tools					
[Icons] Remove Resolved				Status: all ▼	Probe: all ▼
	Status	Time	Duration	Service	Notes

Device Information

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

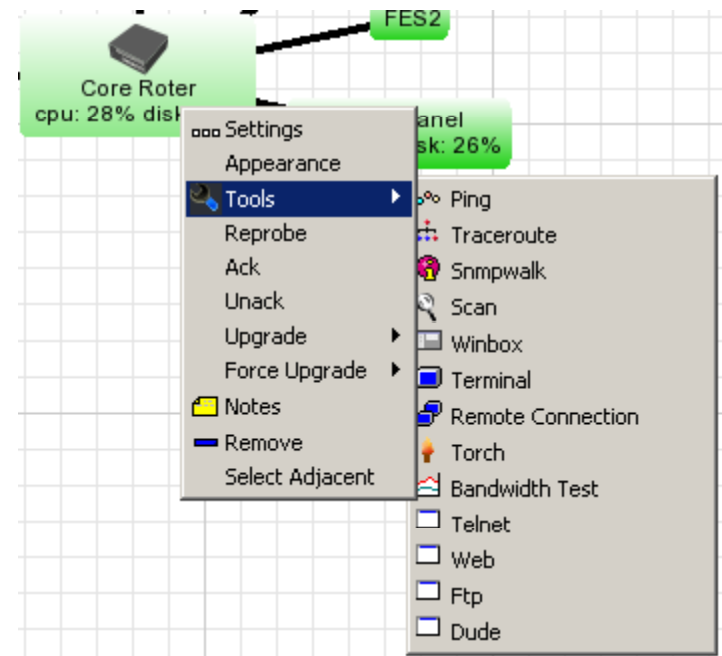


Name	Type	MTU	Tx Rate	Rx Rate
pptp-in1 (237)	ppp	0	0 bps	0 bps
ether1 (241)	ethernet-csmacd	1500	2.51 Mbps	1.39 Mbps
ether2 (242)	ethernet-csmacd	1500	195 kbps	1.2 Mbps
ether3 (243)	ethernet-csmacd	1500	80 bps	48 bps
<l2tp-roynet> (255)	ppp	1200	3.39 kbps	54.6 kbps

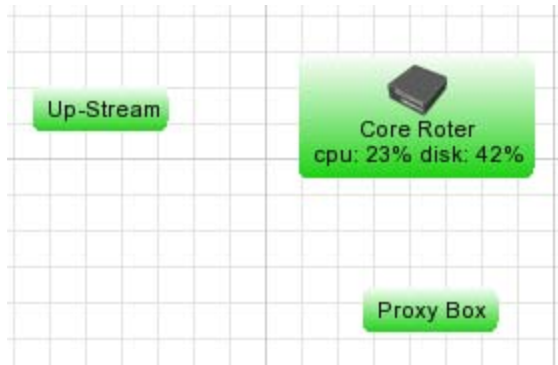
Device Tools

► Tools

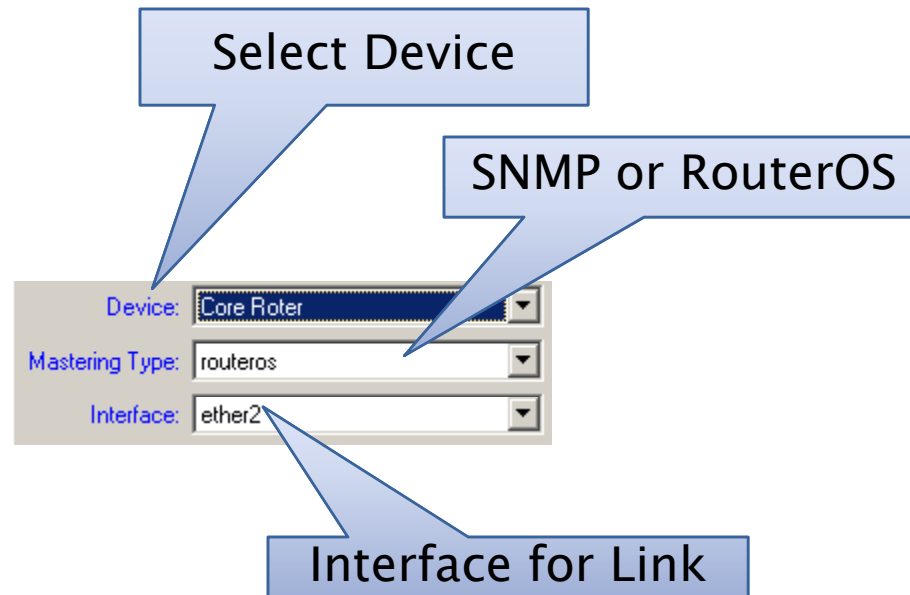
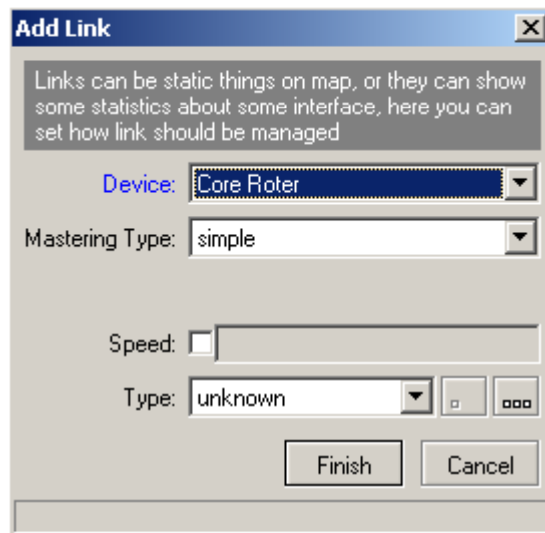
- Make it very simply for network management
 - Winbox
 - Starts a Winbox session using username/password in Dude
 - Terminal
 - Does the same but with Terminal Window
 - Remote Connection
 - Adds IP address into MS Term Server.
 - Telnet/Web etc – Ability to open Telnet or web client to Device!
- You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



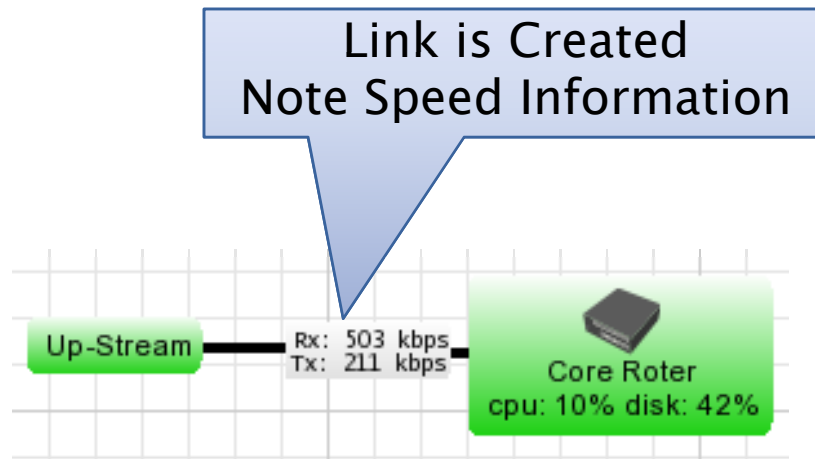
Adding Links



Right Click
Select Link
Click & Drag
Between Devices



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)
```

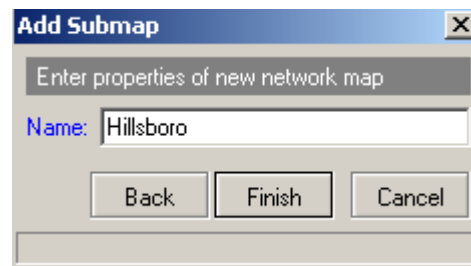

Link Errors

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



Maps

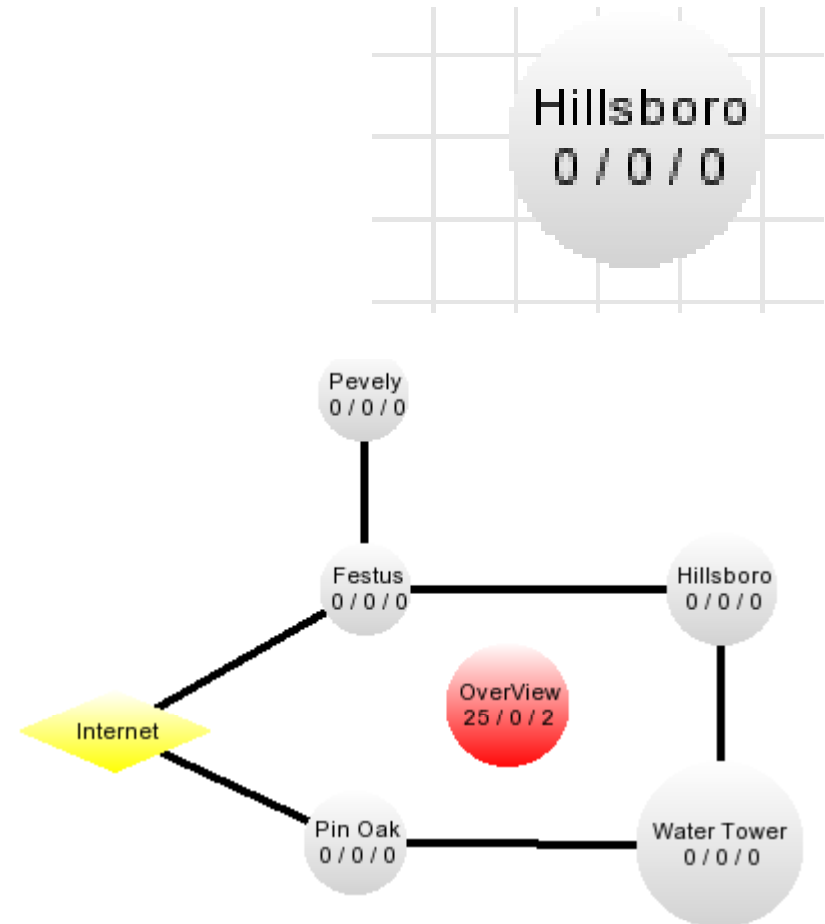
- ▶ Right-Click
- ▶ Add Map
 - Create Map
 - Name



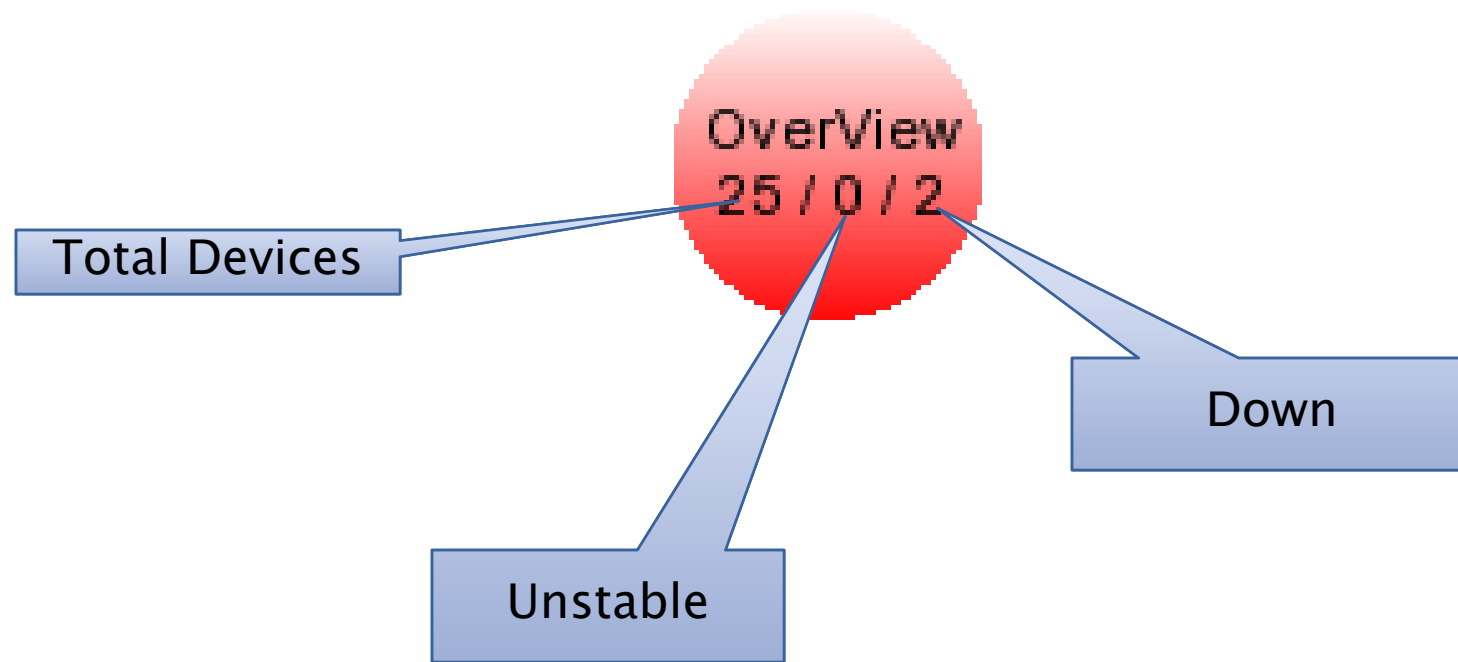
Maps

▶ 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: ☐

To: 10.0.49.1 Packet Size: Start

Interval: 1000 ms TTL: ☒ 64 Stop

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: ☐ Start

To: local Packet Size: 32 Stop

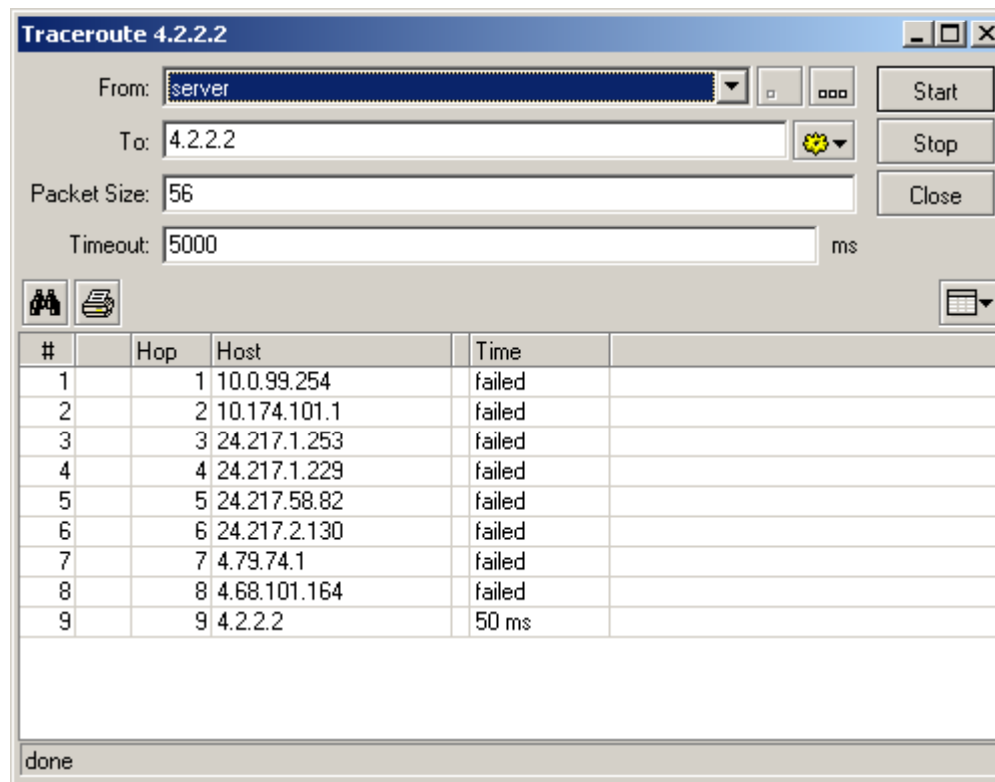
Interval: 1000 ms TTL: ☒ 64 Close

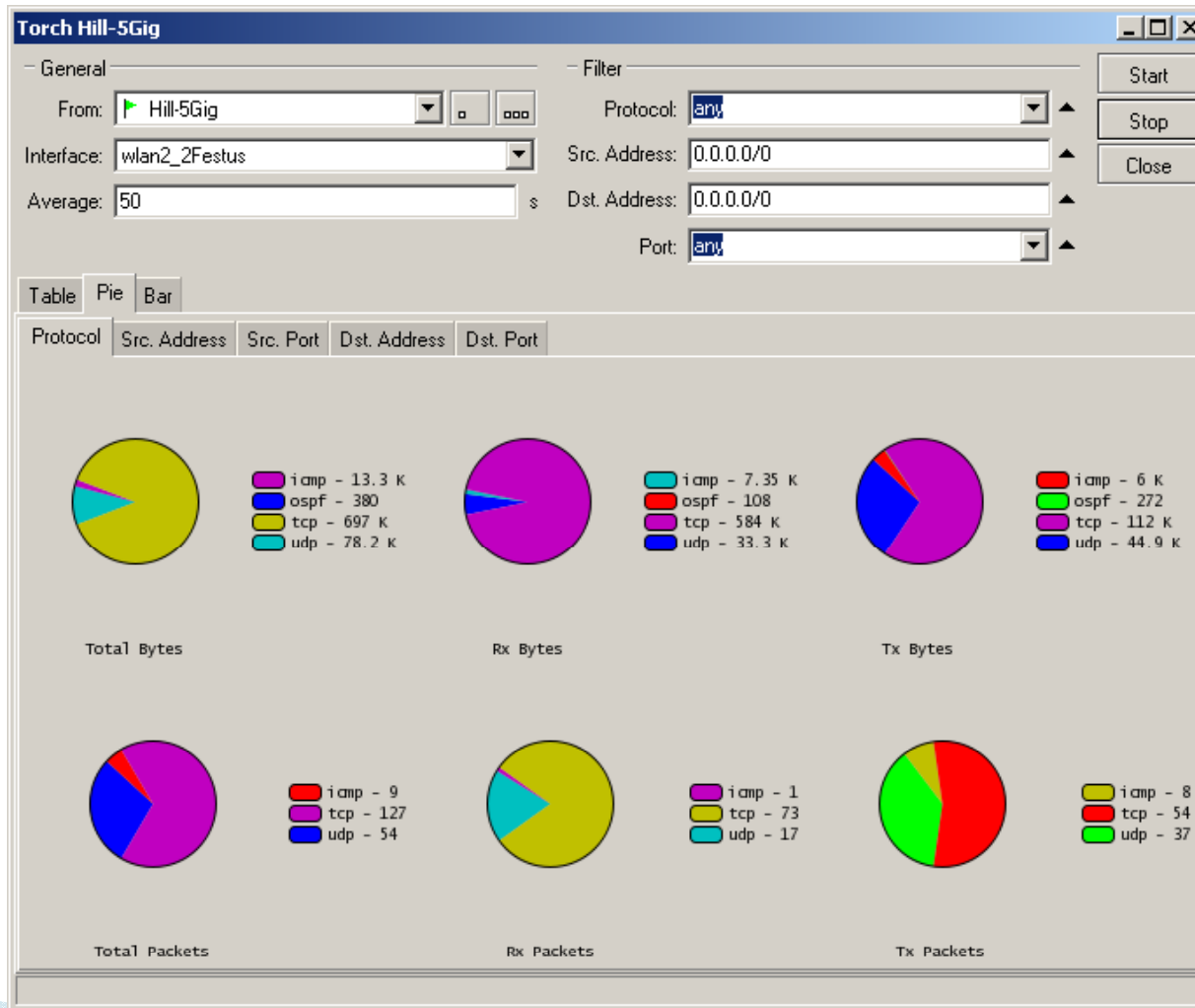
#	Host	Name	Time	Reply Size	TTL	Status
1	10.0.49.1		<1 ms	32	61	
2	10.0.49.1		<1 ms	32	61	
3	10.0.49.1		10 ms	32	61	
4	10.0.49.1		10 ms	32	61	
5	10.0.49.1		<1 ms	32	61	
6	10.0.49.1		<1 ms	32	61	
7	10.0.49.1		<1 ms	32	61	
8	10.0.49.1		<1 ms	32	61	
9	10.0.49.1		<1 ms	32	61	
10	10.0.49.1		<1 ms	32	61	
11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

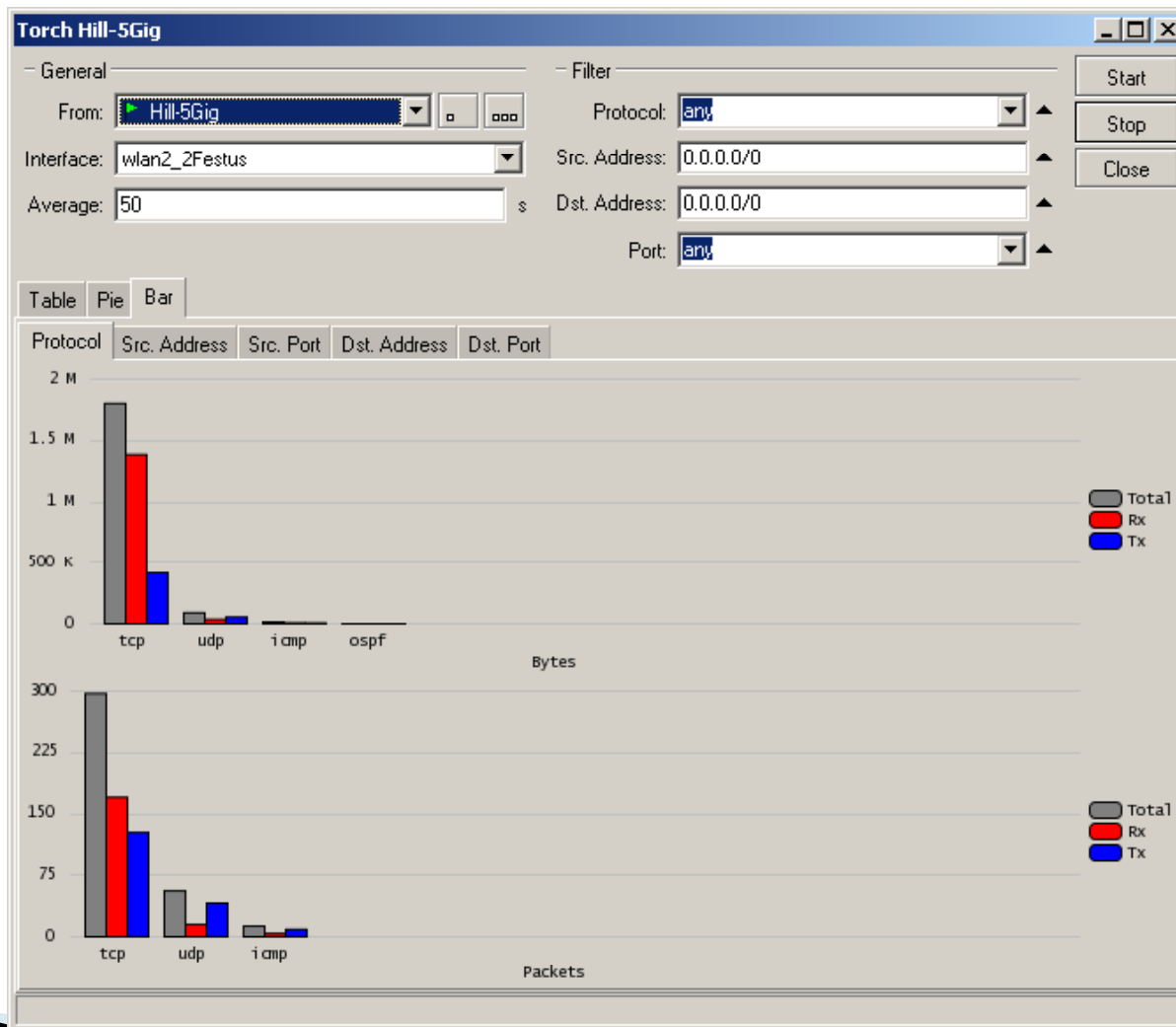
Pinging / Tracing from Dude



Torching from Dude



Torching from Dude



What we covered

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