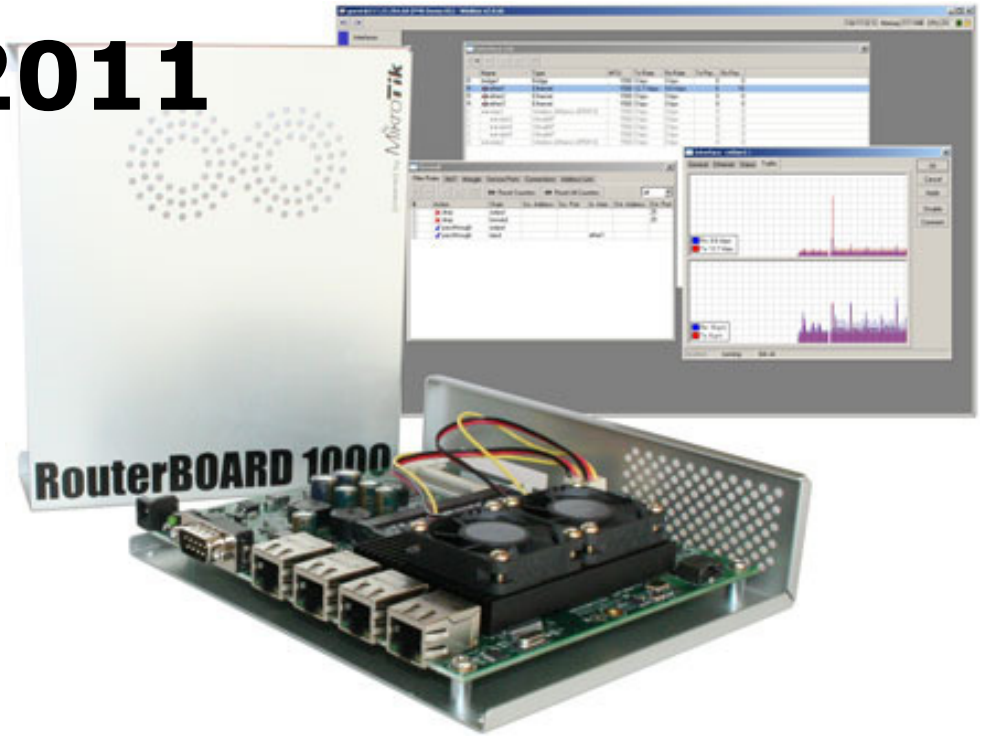
Customizing The Dude

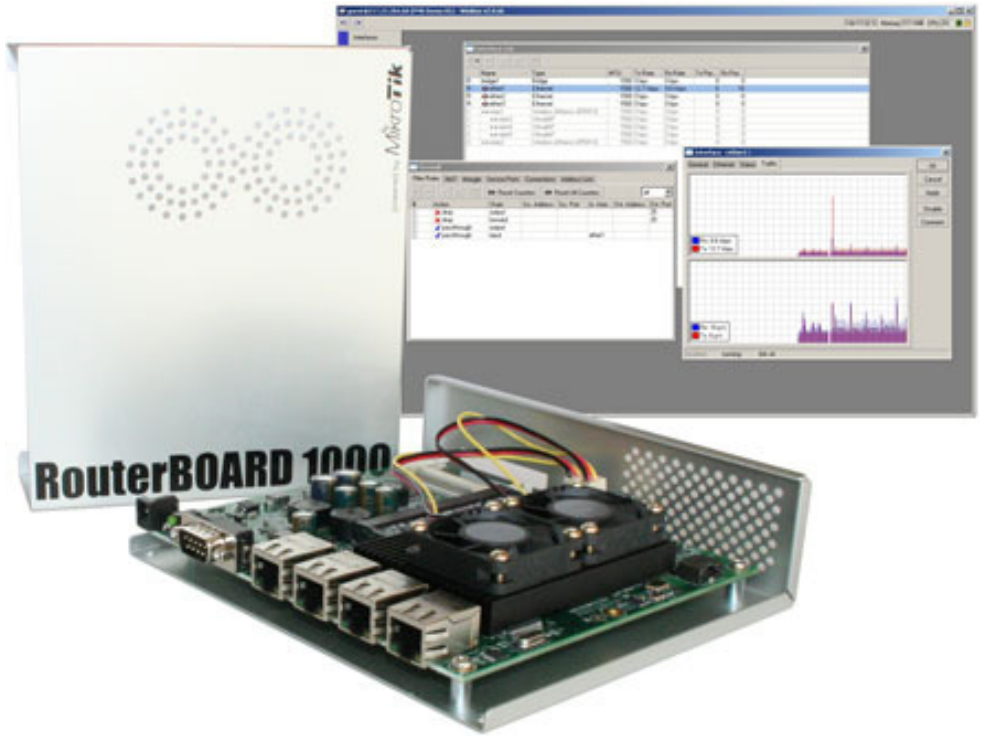
MUM Budapest 2011

by Patrik Schaub



FMS Internetservice, www.fmsweb.de
info@fmsweb.de, Phone: +49 761 2926500

About FMS



About FMS

- Founded in 1999
- MikroTik
  - Distribution (www.mikrotik-shop.de)
  - Training (www.mikrotik-training.de)
  - Consulting and service contracts
  - Custom AAA development / API development
  - Supplementary products
  - Product development

What else is FMS doing - Microwaves

- Microwave solutions
  - Licensed and light licensed band
  - Unlicensed band
- Multiple vendors
  - SIAE Microelettronica, Italy
  - SAF Tehnika, Latvia
- Services
  - General Consulting
  - Planning of advanced setups
    - Protected setups (1+1) or ring topologies
    - Aggregated links, x * (1+0)

What else is FMS doing – Last mile

- Our #1 solution: MikroTik
- WIMAX
- (Outdoor) DSLAMs, ADSL/VDSL
- Fttx

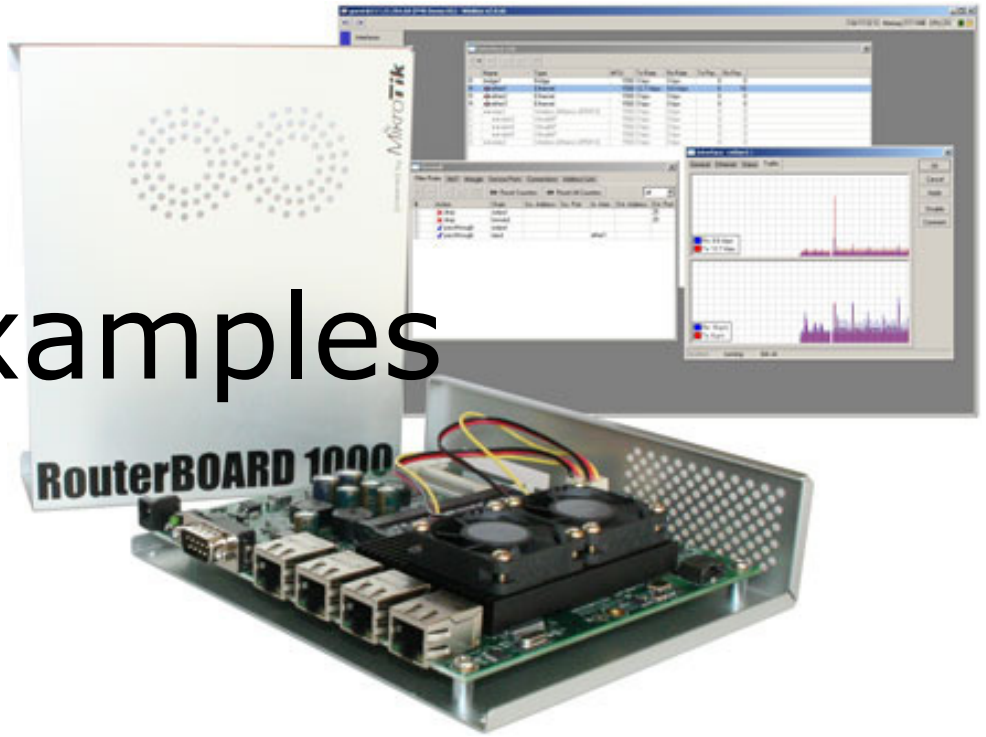
Visit our Distributor Table

- See the proto type:
  Ogma Connect 2600

- Get the news:
  Low cost Restless Powerbox

- Win an intelligent Power Supply:
  Restless Powerbox Compact

Customisation
3 real world examples



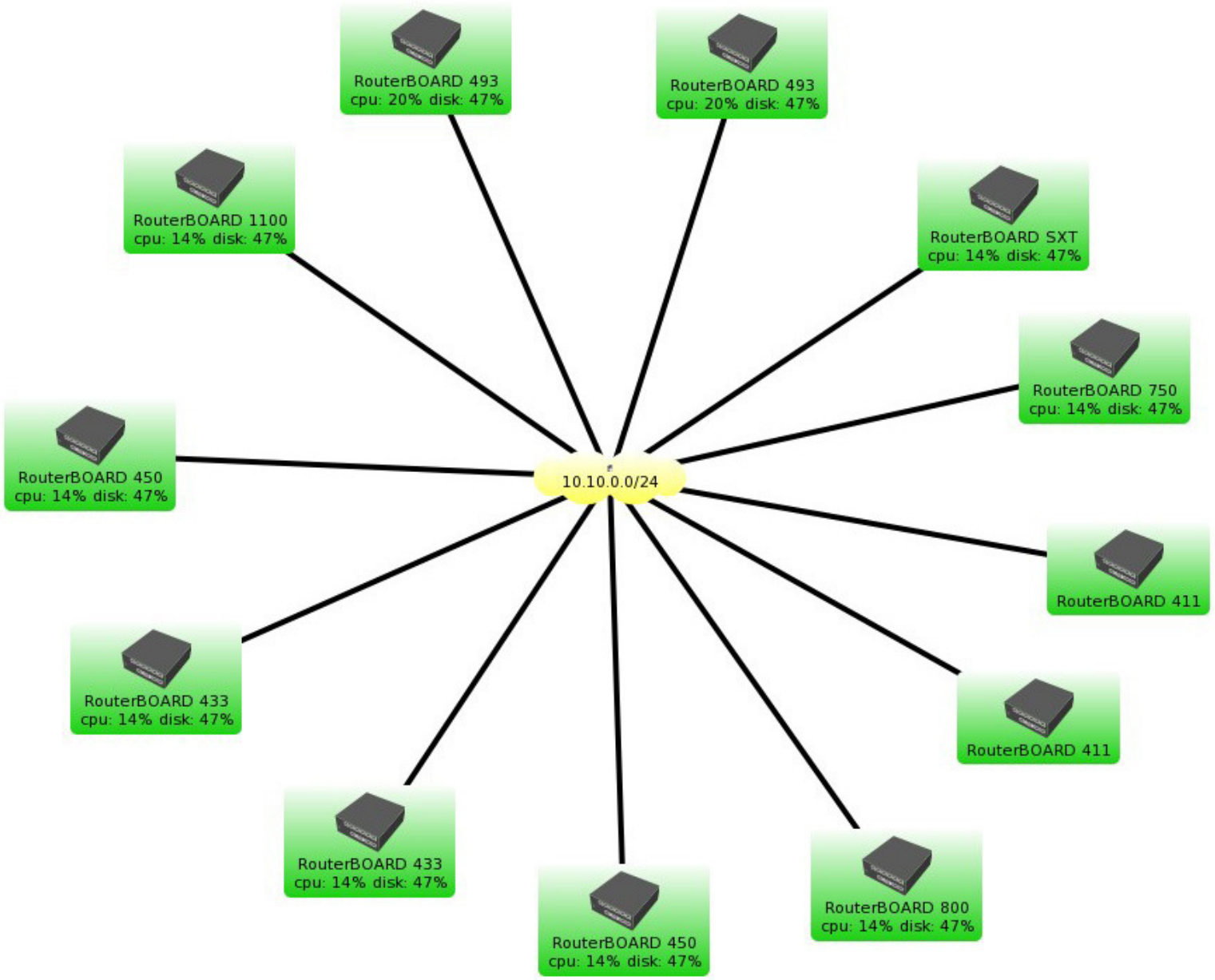
Example#1

Enhance Auto Discovery for RouterBOARD devices

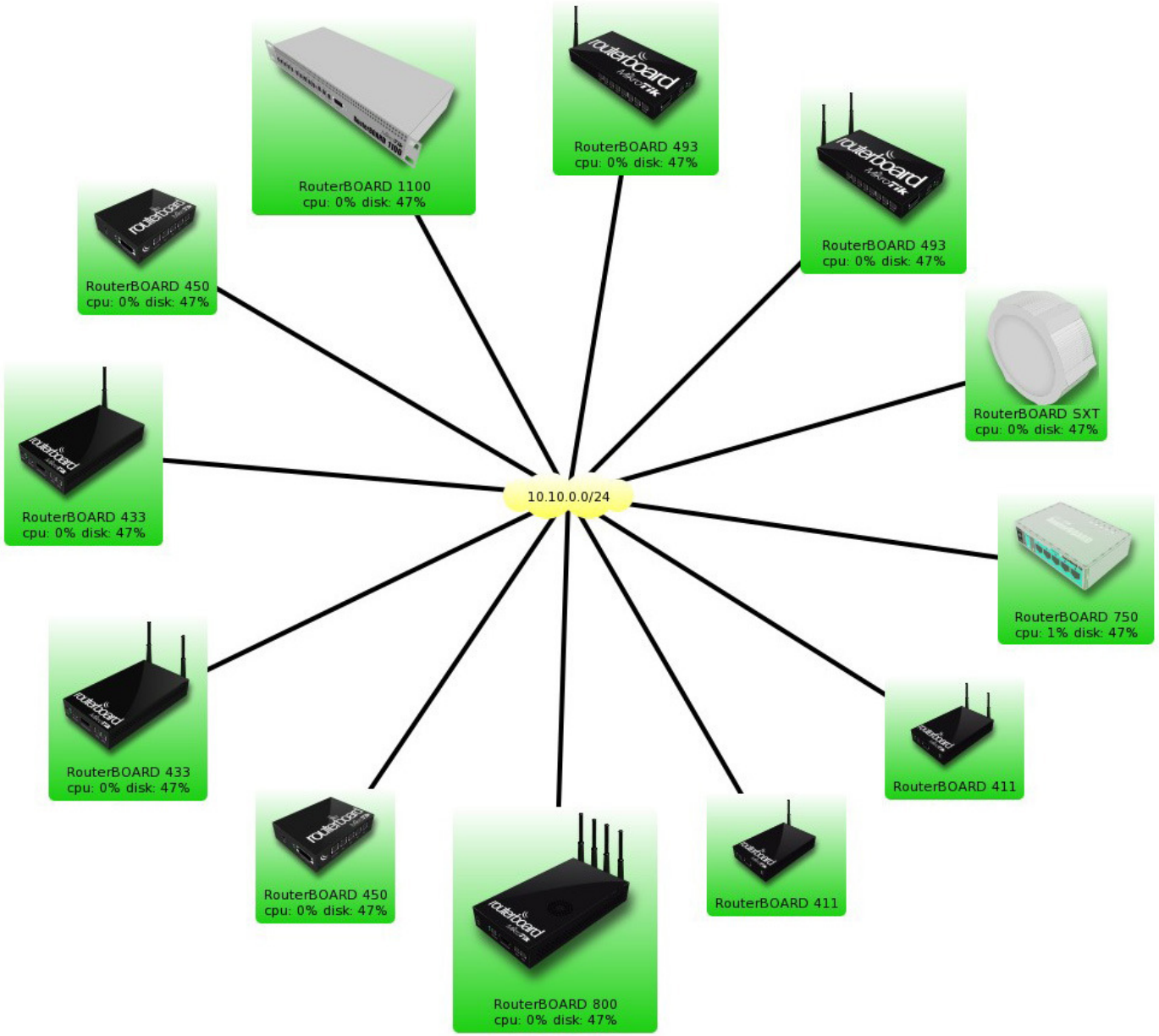
Objectives

- Discover RouterBOARD type
- Show right image

Standard Auto Discovery Output



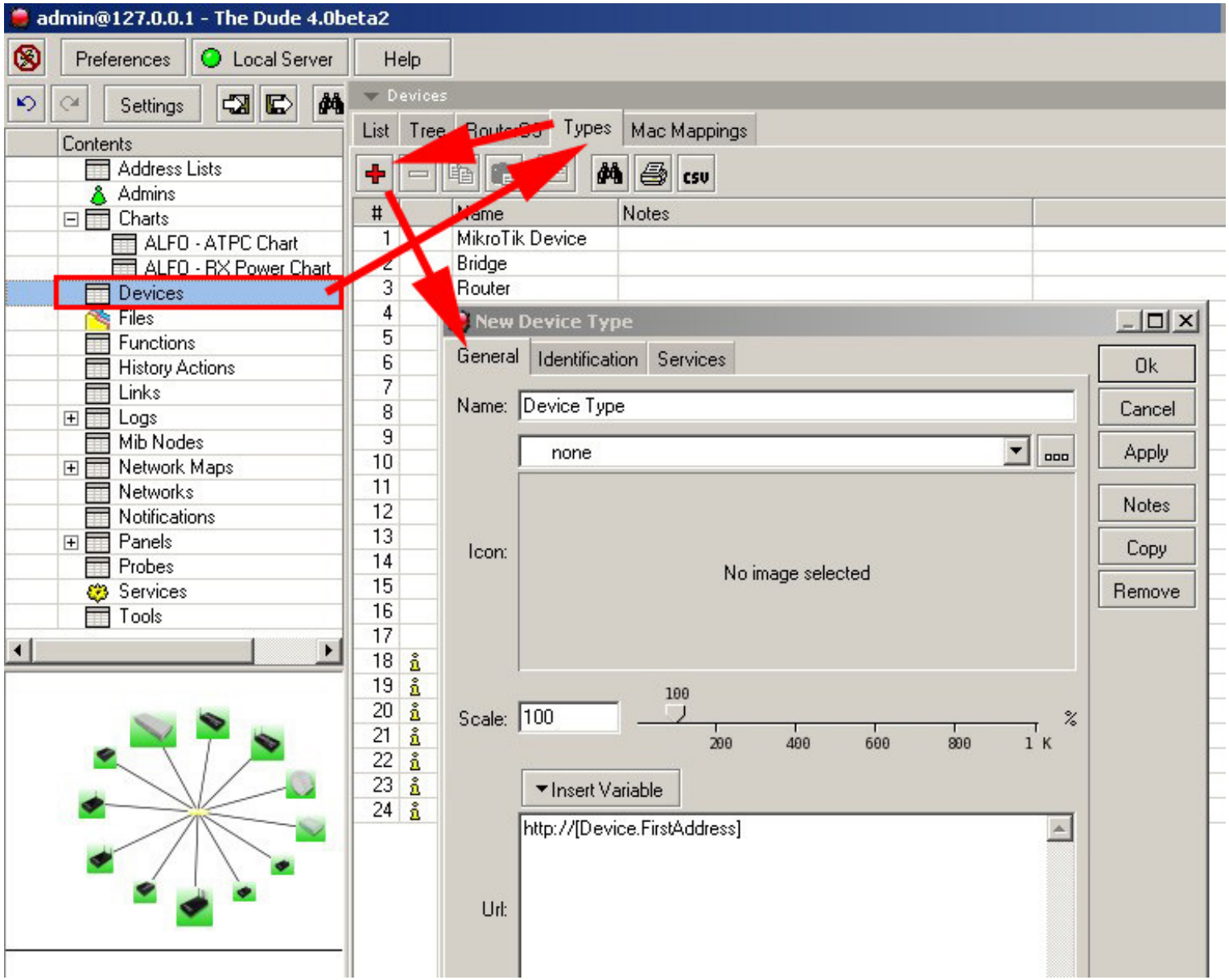
Enhanced Auto Discovery Output



Steps to take

1. Create a new device type for each RouterBOARD
2. Set appearance options for device types
3. Set discovery options for device types

1) Create new Device Type

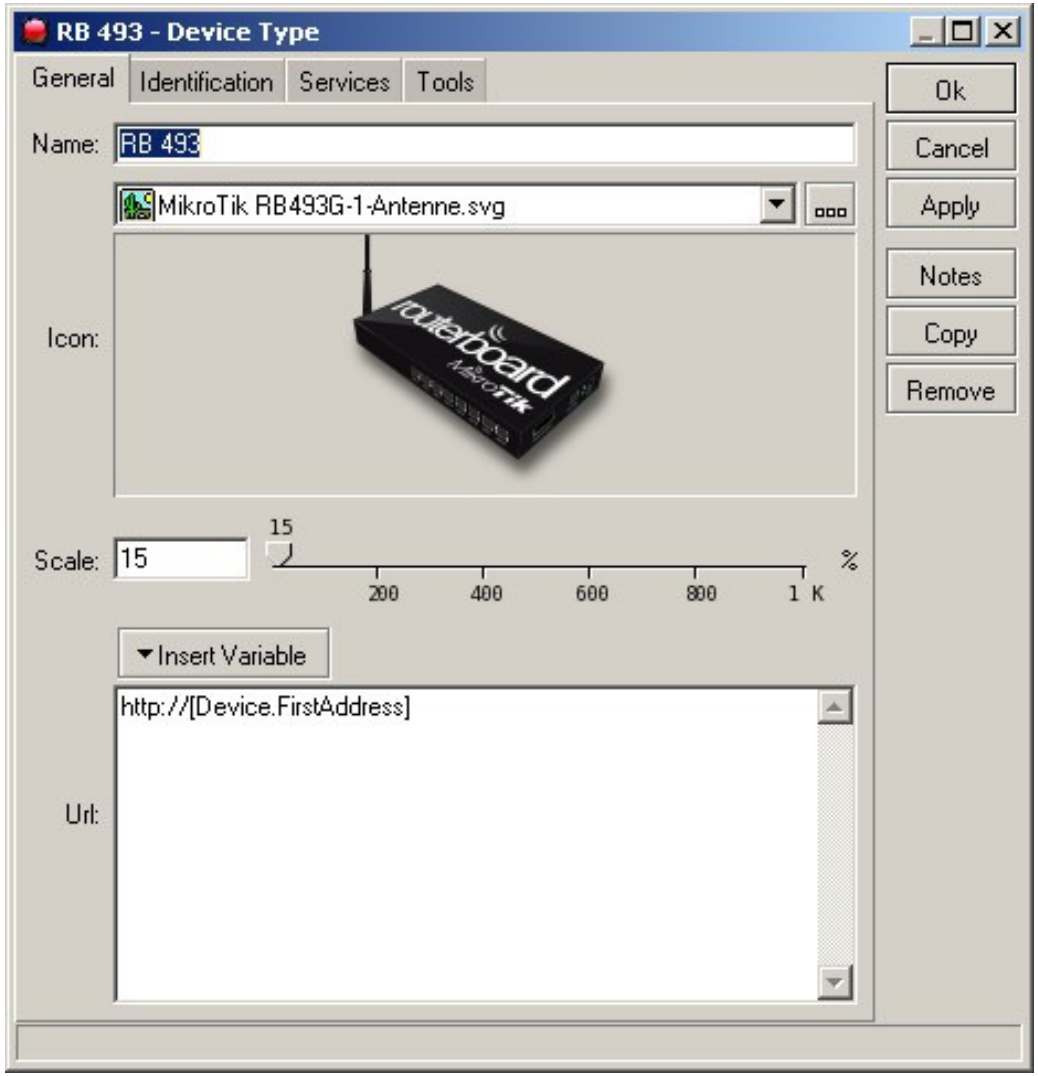


2) Set apperance options

Icon:

Image (JPG, GIF) or vectorbased (SVG)

Upload to Dude like Other files

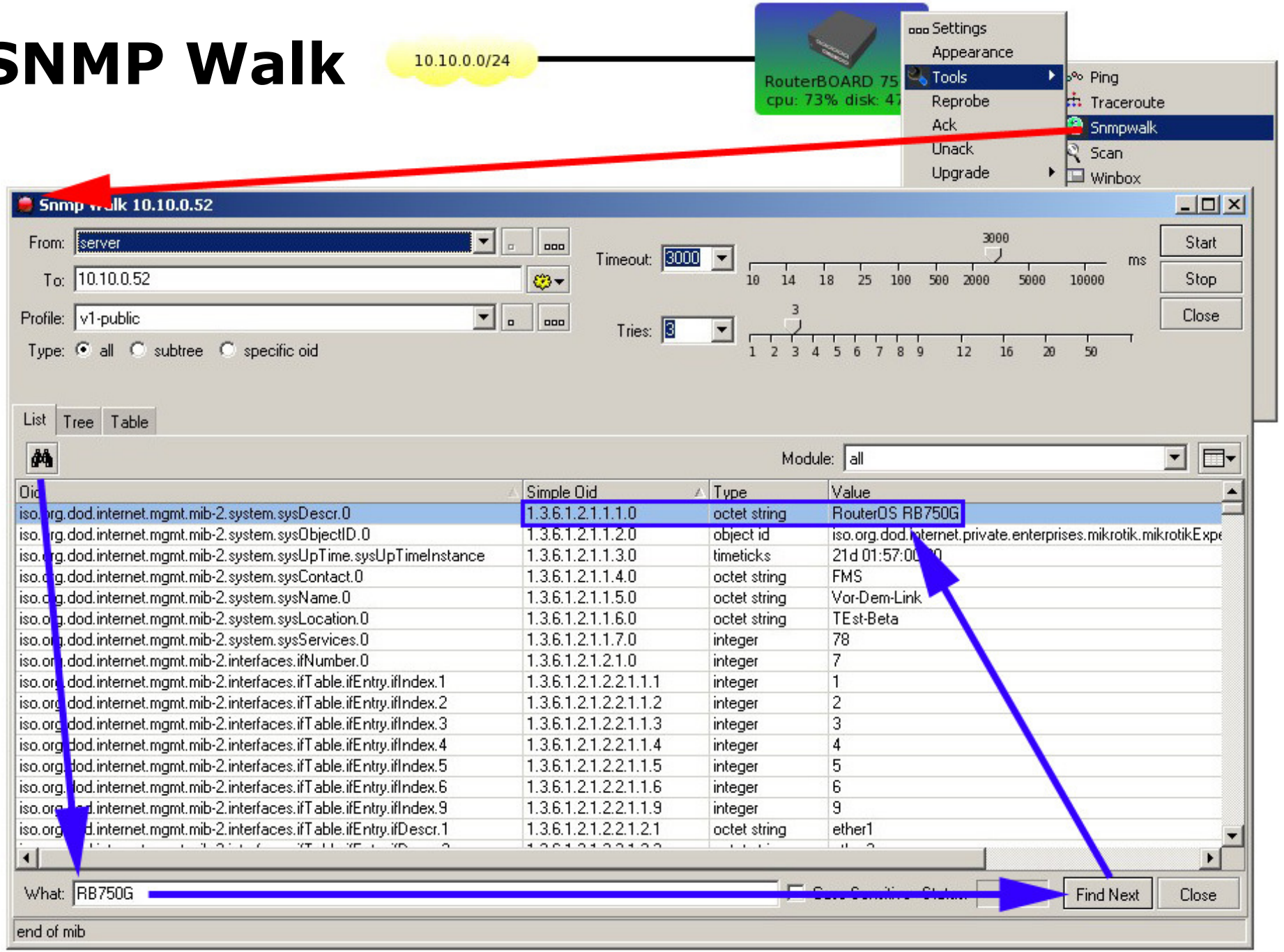


3) Set discovery options

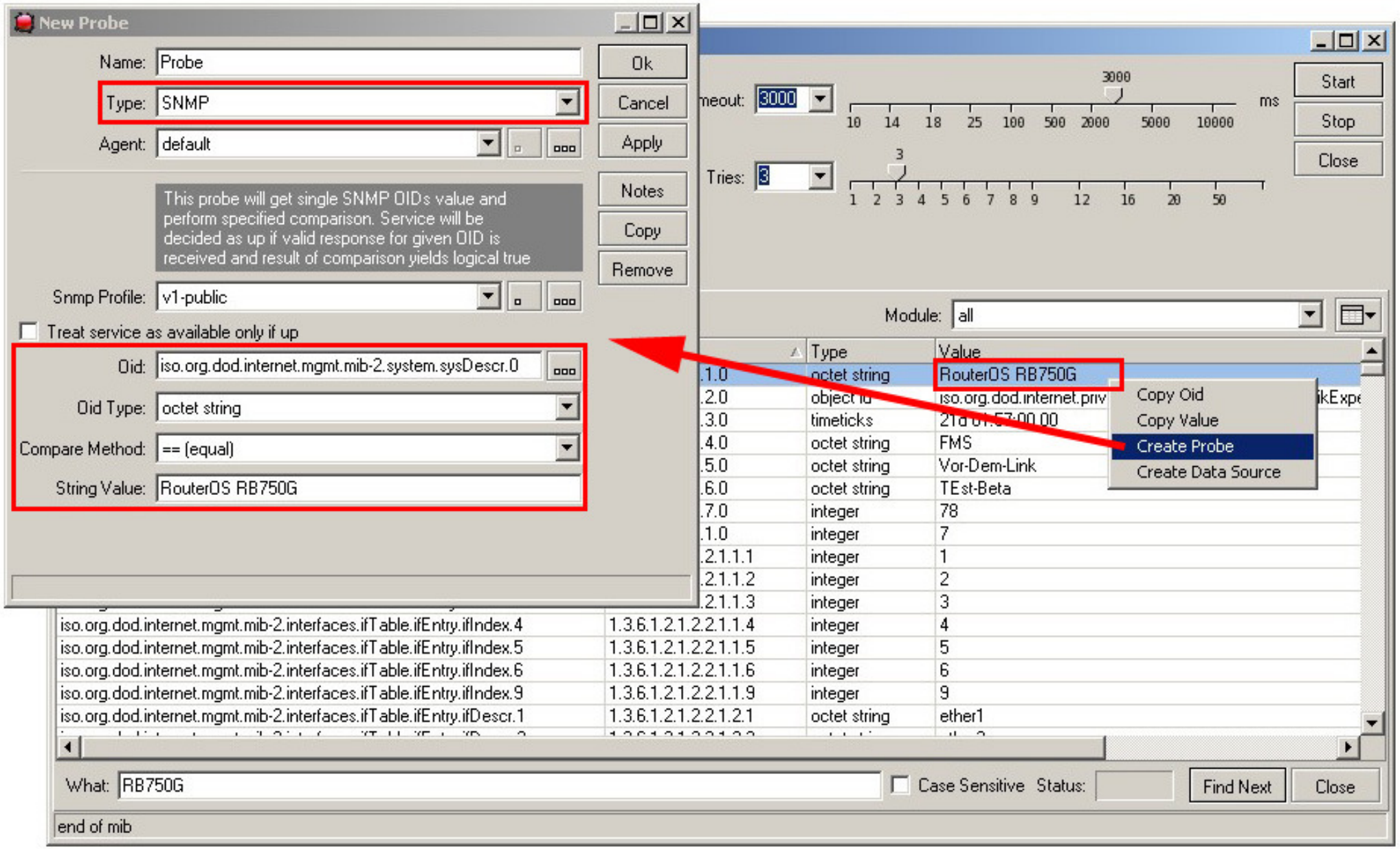
How to identify a device type by scanning?

- Guessing by combination of scanned services
- By availability of a vendor dependent service
- By SNMP query
  - Requires support by the device
  - Which OID to check?

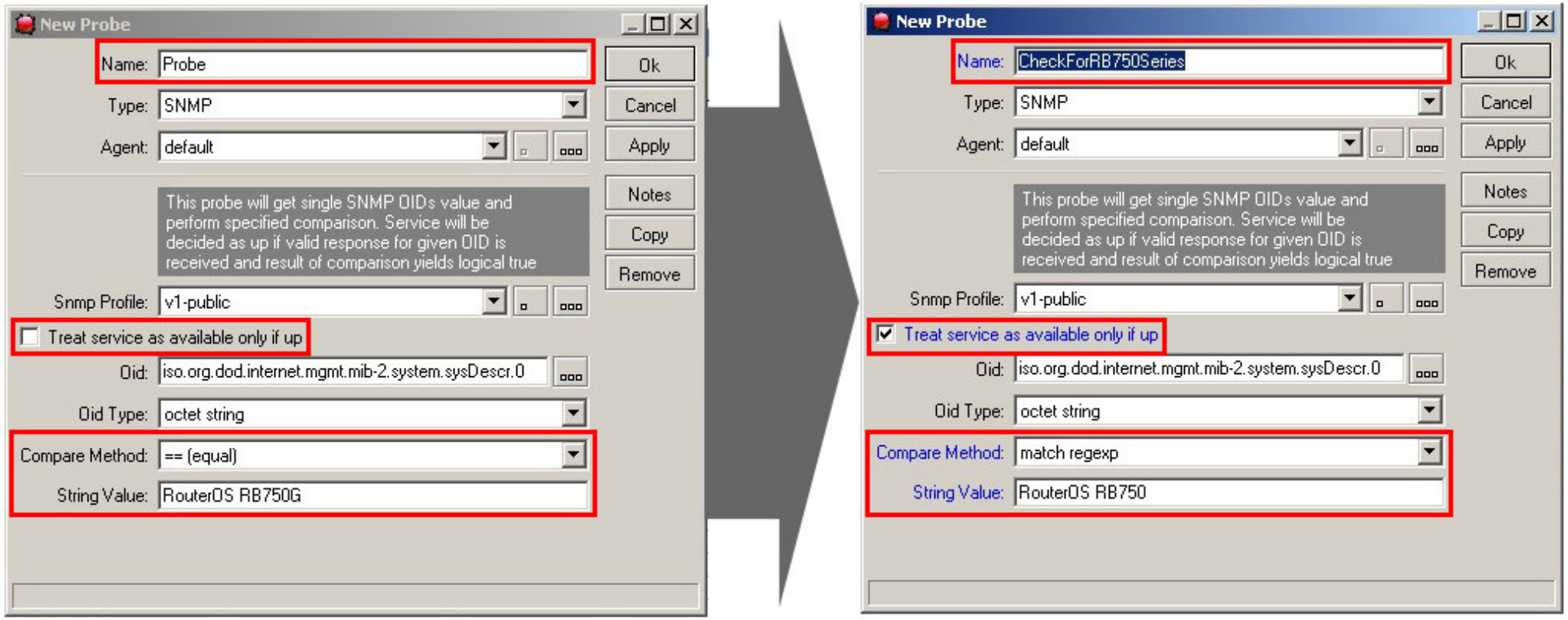
SNMP Walk


10.10.0.0/24
RouterBOARD 75
cpu: 73% disk: 47
Settings
Appearance
Tools
Reprobe
Ack
Unack
Upgrade
Ping
Traceroute
Snmpwalk
Scan
Winbox
Snmp Walk 10.10.0.52
From: server
To: 10.10.0.52
Profile: v1-public
Type: all subtree specific oid
Timeout: 3000
Tries: 3
Start
Stop
Close
List
Tree
Table
Module: all
Oid
Simple Oid
Type
Value
iso.org.dod.internet.mgmt.mib-2.system.sysDescr.0 1.3.6.1.2.1.1.1.0 octet string RouterOS RB750G
iso.org.dod.internet.mgmt.mib-2.system.sysObjectID.0 1.3.6.1.2.1.1.2.0 object id iso.org.dod.internet.private.enterprises.mikrotik.mikrotikExp
iso.org.dod.internet.mgmt.mib-2.system.sysUpTime.sysUpTimeInstance 1.3.6.1.2.1.1.3.0 timeticks 21d 01:57:00
iso.org.dod.internet.mgmt.mib-2.system.sysContact.0 1.3.6.1.2.1.1.4.0 octet string FMS
iso.org.dod.internet.mgmt.mib-2.system.sysName.0 1.3.6.1.2.1.1.5.0 octet string Vor-Dem-Link
iso.org.dod.internet.mgmt.mib-2.system.sysLocation.0 1.3.6.1.2.1.1.6.0 octet string TEst-Beta
iso.org.dod.internet.mgmt.mib-2.system.sysServices.0 1.3.6.1.2.1.1.7.0 integer 78
iso.org.dod.internet.mgmt.mib-2.interfaces.ifNumber.0 1.3.6.1.2.1.2.1.0 integer 7
iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry.ifIndex.1 1.3.6.1.2.1.2.2.1.1.1 integer 1
iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry.ifIndex.2 1.3.6.1.2.1.2.2.1.1.2 integer 2
iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry.ifIndex.3 1.3.6.1.2.1.2.2.1.1.3 integer 3
iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry.ifIndex.4 1.3.6.1.2.1.2.2.1.1.4 integer 4
iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry.ifIndex.5 1.3.6.1.2.1.2.2.1.1.5 integer 5
iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry.ifIndex.6 1.3.6.1.2.1.2.2.1.1.6 integer 6
iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry.ifIndex.9 1.3.6.1.2.1.2.2.1.1.9 integer 9
iso.org.dod.internet.mgmt.mib-2.interfaces.ifTable.ifEntry.ifDescr.1 1.3.6.1.2.1.2.2.1.2.1 octet string ether1
What: RB750G
Find Next
Close
end of mib

Create Probe



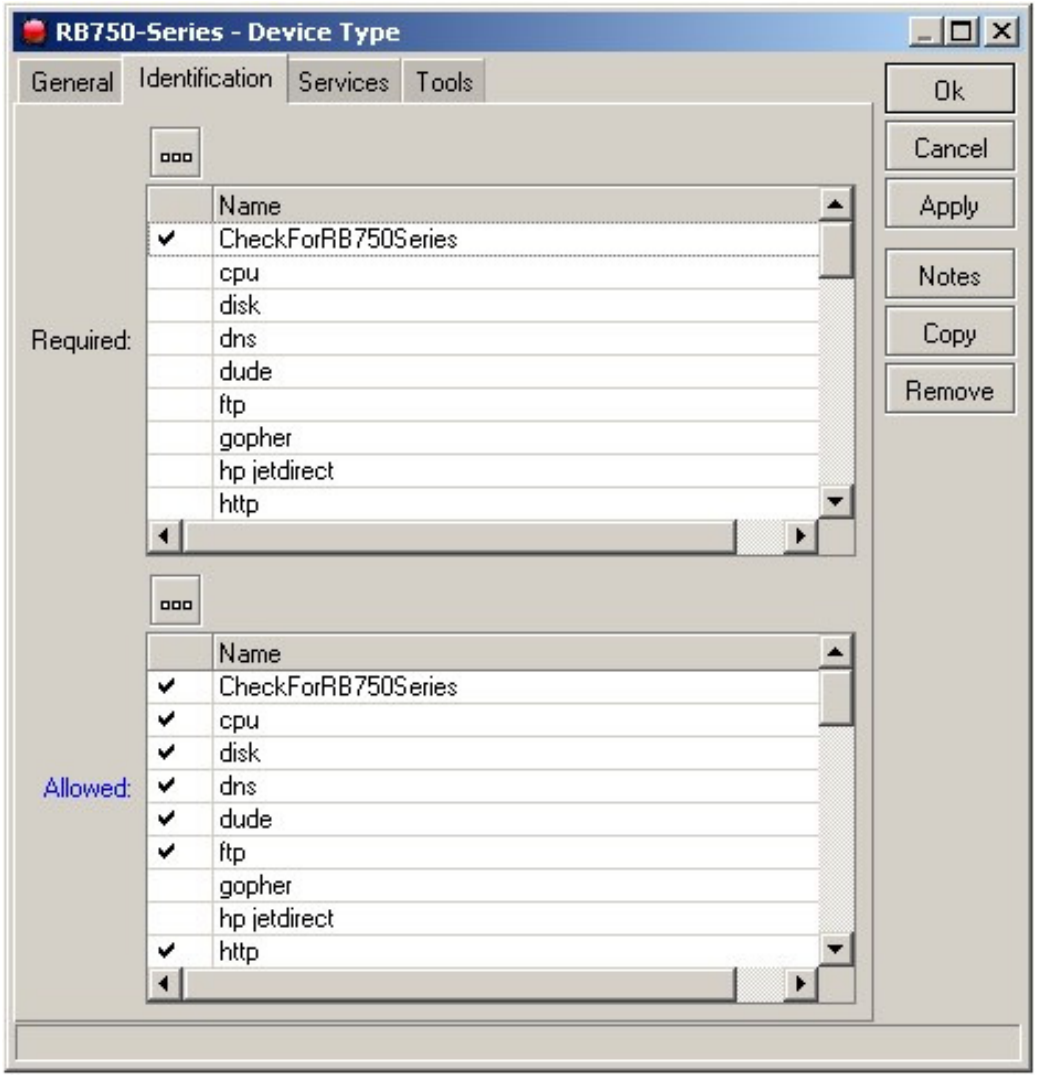
Modify new probe



Identification

Required Probe =
CheckForRB750Series

Allowed Probes =
CheckForRB750Series
+ anything



Identification

Result:

- Devices with „RouterOS RB750“ in SNMP answer will be detected as device type „RB750-Series“

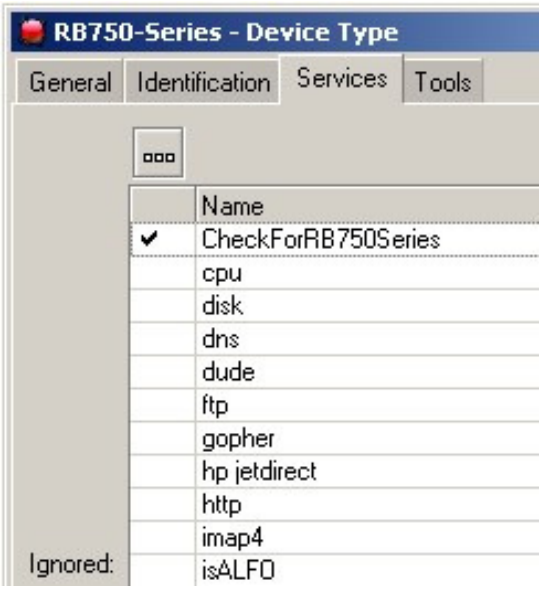
Remark:

- „Treat Service as available only if up“ ensures, that other answers will be interpreted as „service not available“

Services Tab

Checked box =

a service, that was available during „discover“ will not be added to the monitoring list of the device



Ignore device detection probe

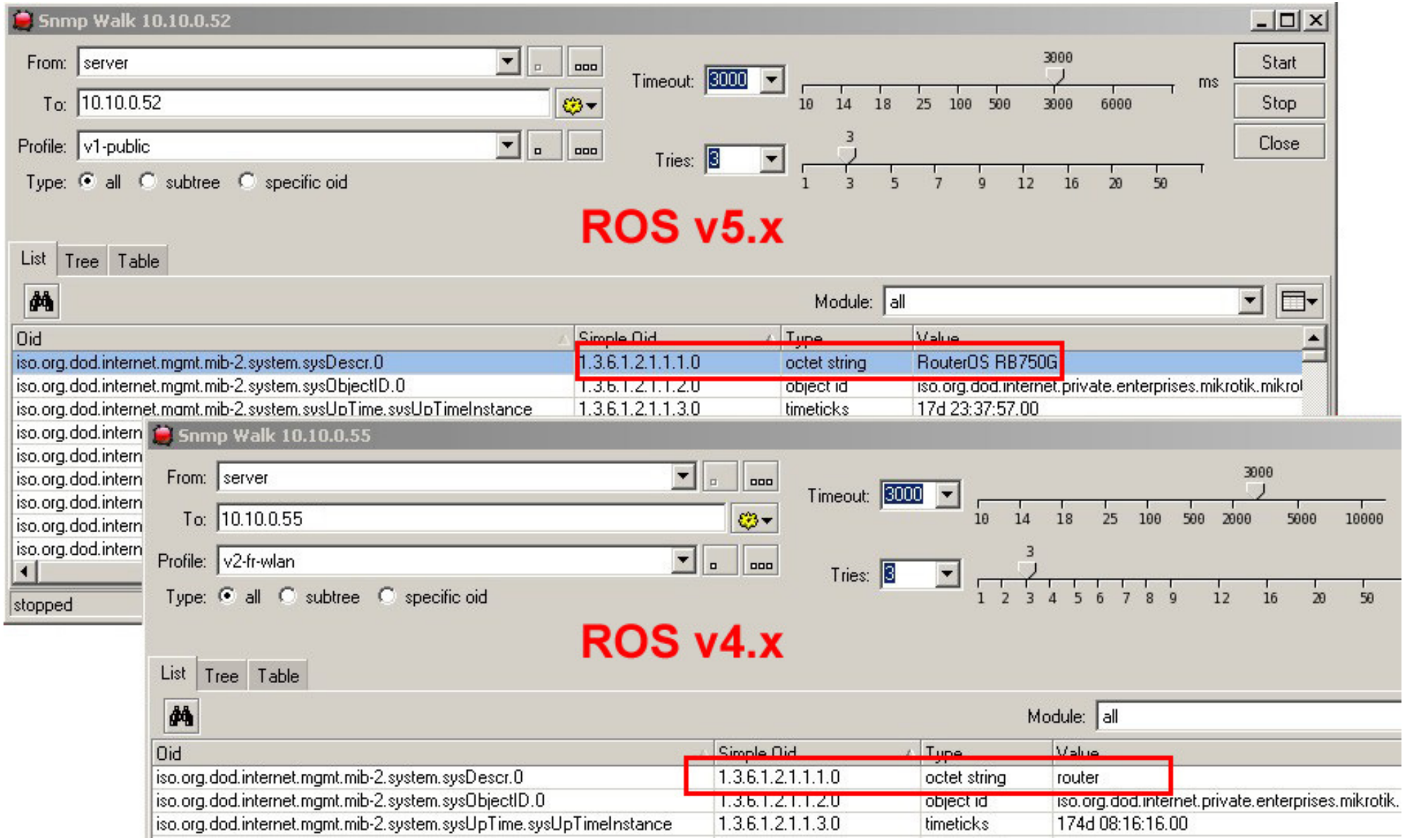
Details about SNMP OID

- Many vendors give system information by SNMP OID 1.3.6.1.2.1.1.1.0

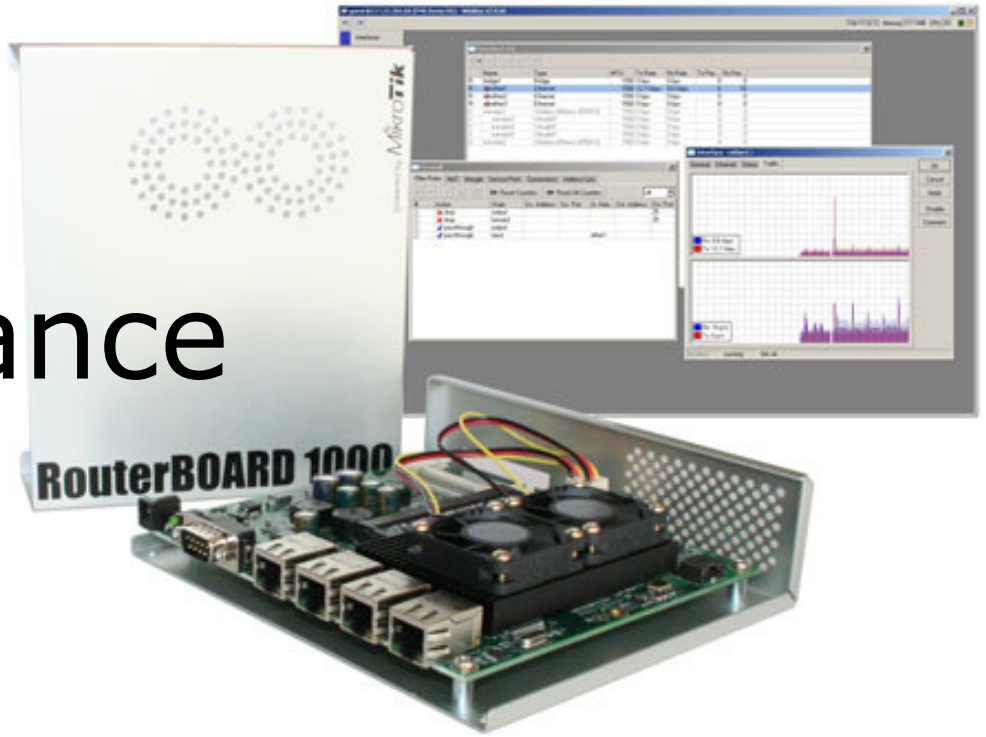
- RouterOS behaviour

  until ROS 4.x value = router
  from ROS 5.x value = RouterOS RB750G

Different behaviour in ROS 4 and 5



Example 2
ALFO Performance



SIAE ALFO - Full Outdoor Microwave

The vendor

- SIAE from Italy
- Market leader in Germany
- Carrier grade

The device

- ALFO, 100MBit Full Outdoor
- Medium priced
- Often used for connecting MikroTik base stations

Identification

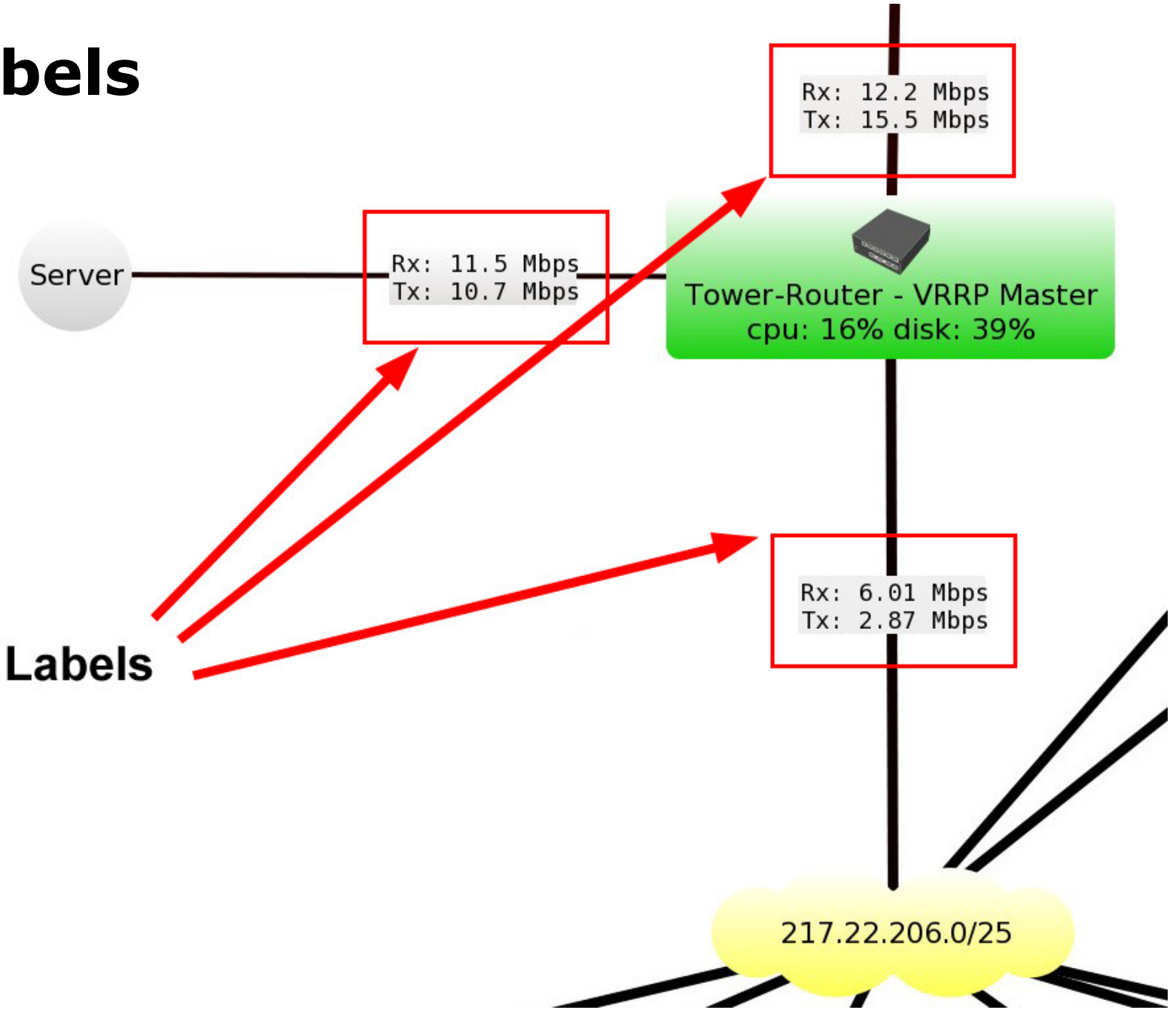
- As in the last example
- With SNMP based probe:

OID: 1.3.6.1.2.1.1.1.0
(iso.org.dod.internet.mgmt.mib-2.system.sysDescr.0)

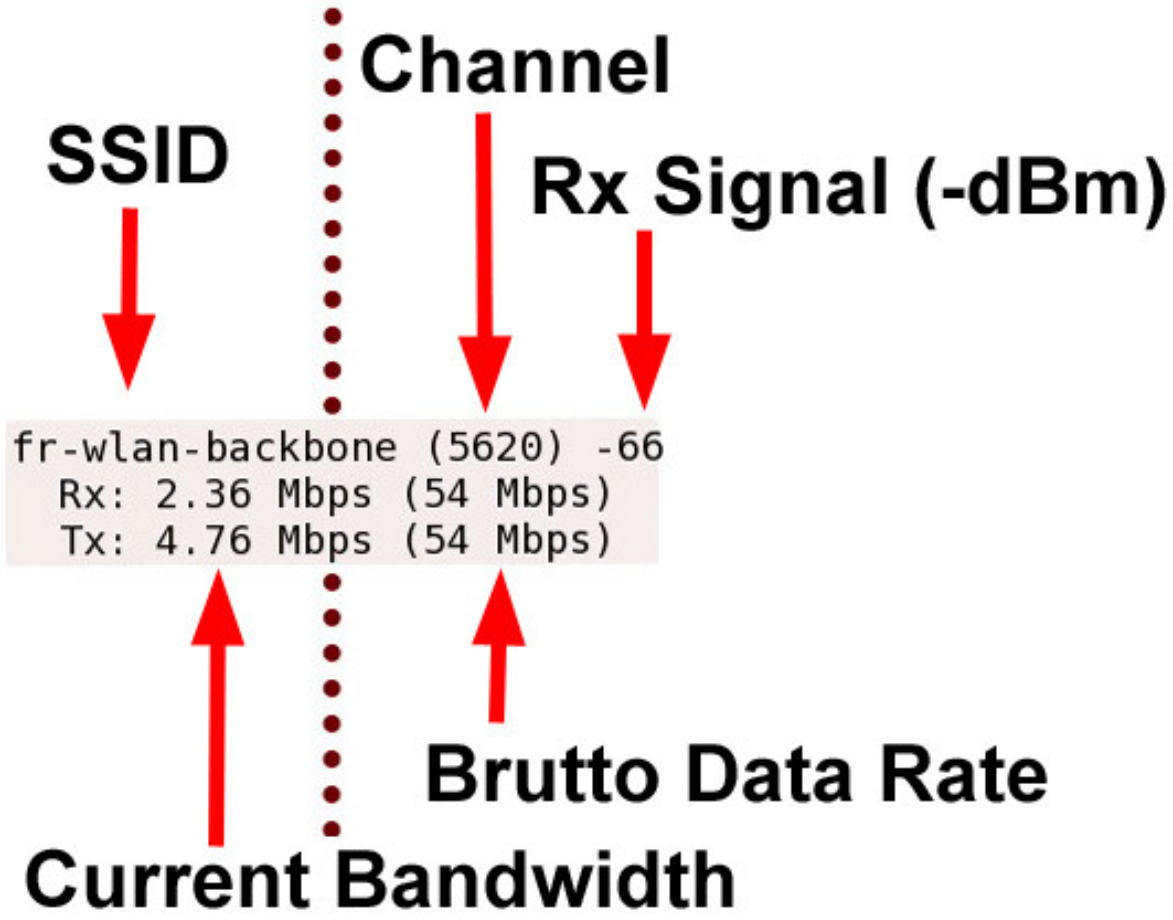
Compare: Regex

Value: ALFO MIB

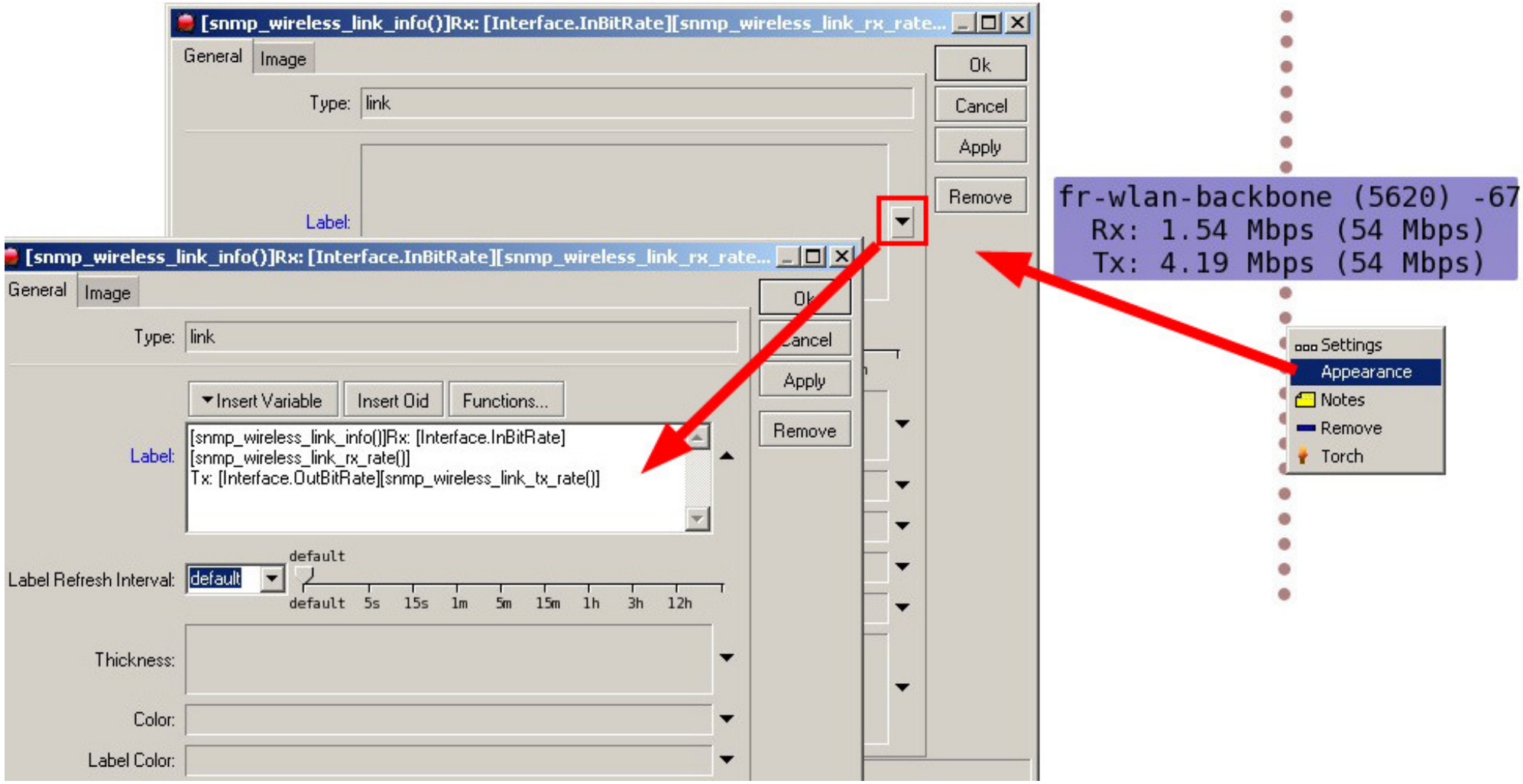
Link-Labels


Rx: 12.2 Mbps
Tx: 15.5 Mbps
Server
Rx: 11.5 Mbps
Tx: 10.7 Mbps
Tower-Router - VRRP Master
cpu: 16% disk: 39%
Rx: 6.01 Mbps
Tx: 2.87 Mbps
Labels
217.22.206.0/25

Link-Labels


Channel
SSID
Rx Signal (-dBm)
fr-wlan-backbone (5620) -66
Rx: 2.36 Mbps (54 Mbps)
Tx: 4.76 Mbps (54 Mbps)
Brutto Data Rate
Current Bandwidth

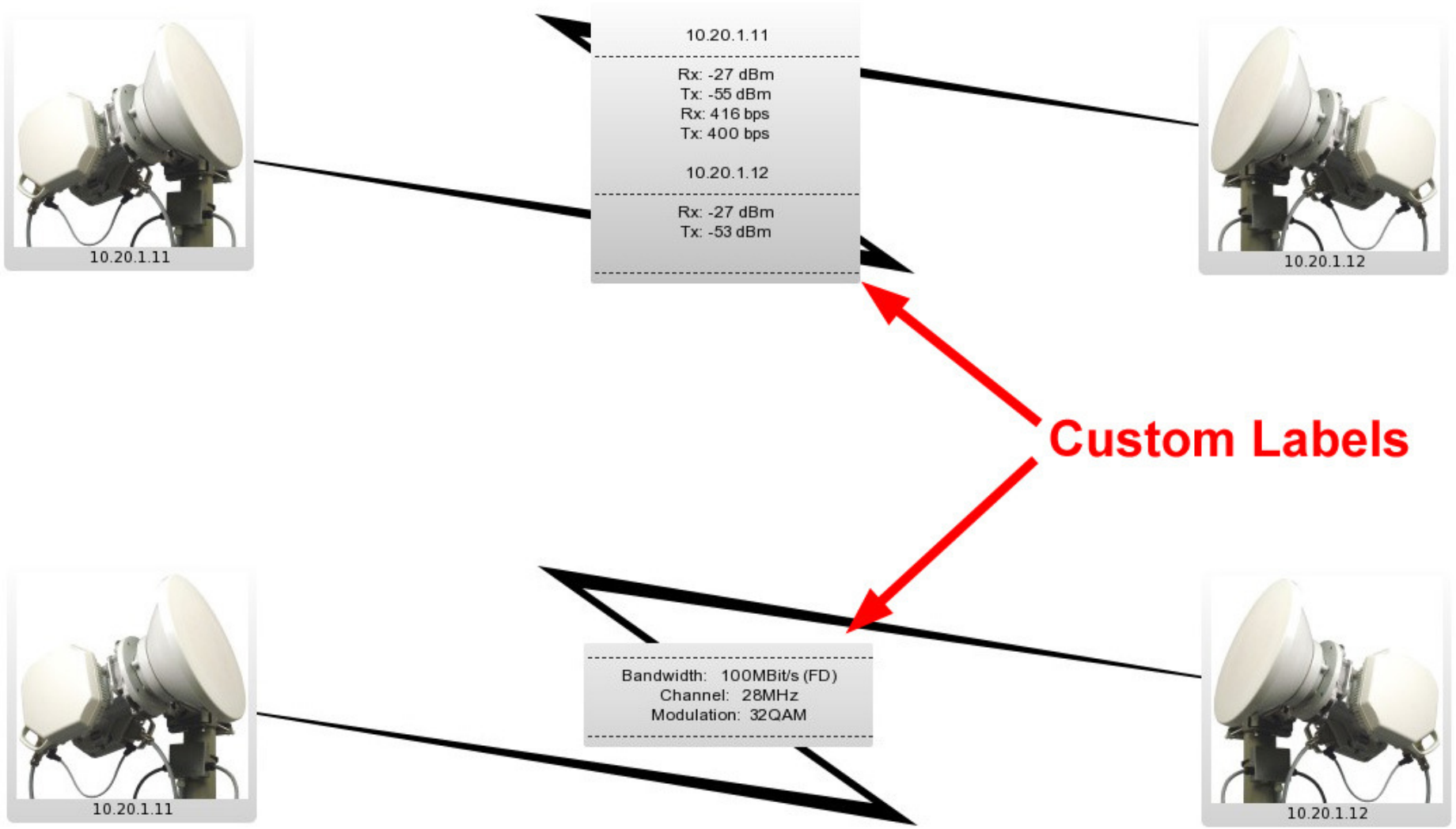
Edit Labels


[snmp_wireless_link_info()]Rx: [Interface.InBitRate][snmp_wireless_link_rx_rate...
General
Image
Type: link
Label:
Ok
Cancel
Apply
Remove
[snmp_wireless_link_info()]Rx: [Interface.InBitRate][snmp_wireless_link_rx_rate...
General
Image
Type: link
Insert Variable
Insert Oid
Functions...
Label:
[snmp_wireless_link_info()]Rx: [Interface.InBitRate]
[snmp_wireless_link_rx_rate()]
Tx: [Interface.OutBitRate][snmp_wireless_link_tx_rate()]
Label Refresh Interval:
default
default 5s 15s 1m 5m 15m 1h 3h 12h
Thickness:
Color:
Label Color:
fr-wlan-backbone (5620) -67
Rx: 1.54 Mbps (54 Mbps)
Tx: 4.19 Mbps (54 Mbps)
Settings
Appearance
Notes
Remove
Torch

Label

Function	[snmp_wireless_link_info()]
String	Rx:
Variable	[Interface.InBitRate]
	[snmp_wireless_link_rx_rate()]
String	Tx:
Variable	[Interface.OutBitRate]
Function	[snmp_wireless_link_tx_rate()]

Custom ALFO Labels



Label 1

10.20.1.11

Rx: [oid("1.3.6.1.4.1.3373.12.10.1.1.13.0","5","300","10.20.1.11","ALFO")] dBm
Tx: [oid("1.3.6.1.4.1.3373.12.10.1.1.12.0","5","300","10.20.1.11","ALFO")] dBm
Rx: [Interface.InBitRate]
Tx: [Interface.OutBitRate]

10.20.1.12

Rx: [oid("1.3.6.1.4.1.3373.12.10.1.1.13.0","5","300","10.20.1.12","ALFO")] dBm
Tx: [oid("1.3.6.1.4.1.3373.12.10.1.1.12.0","5","300","10.20.1.12","ALFO")] dBm

---

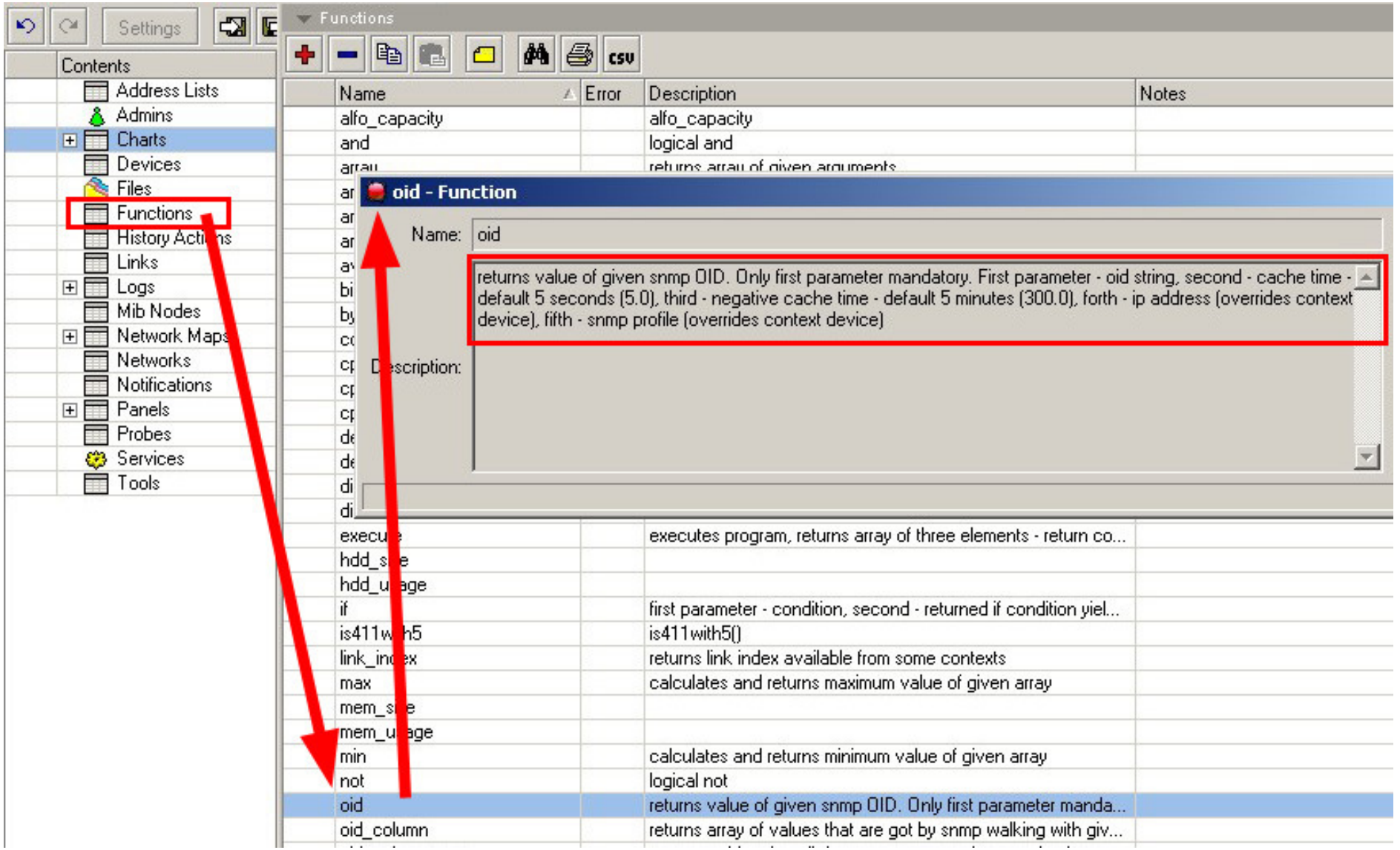
OID Function

oid("1.3.6.1.4.1.3373.12.10.1.1.13.0","5","300","10.20.1.11","ALFO")

Function: oid()

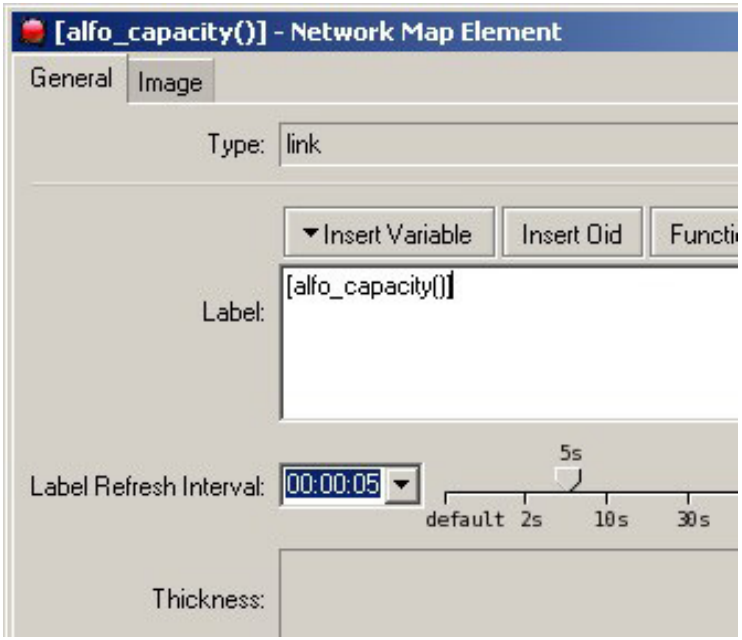
1. parameter: # of OID to get
2. parameter: Cache time in seconds
3. parameter: Negative cache time in minutes
4. parameter: Device IP
5. parameter: SNMP profile

Functions and Functions Description



Label 2

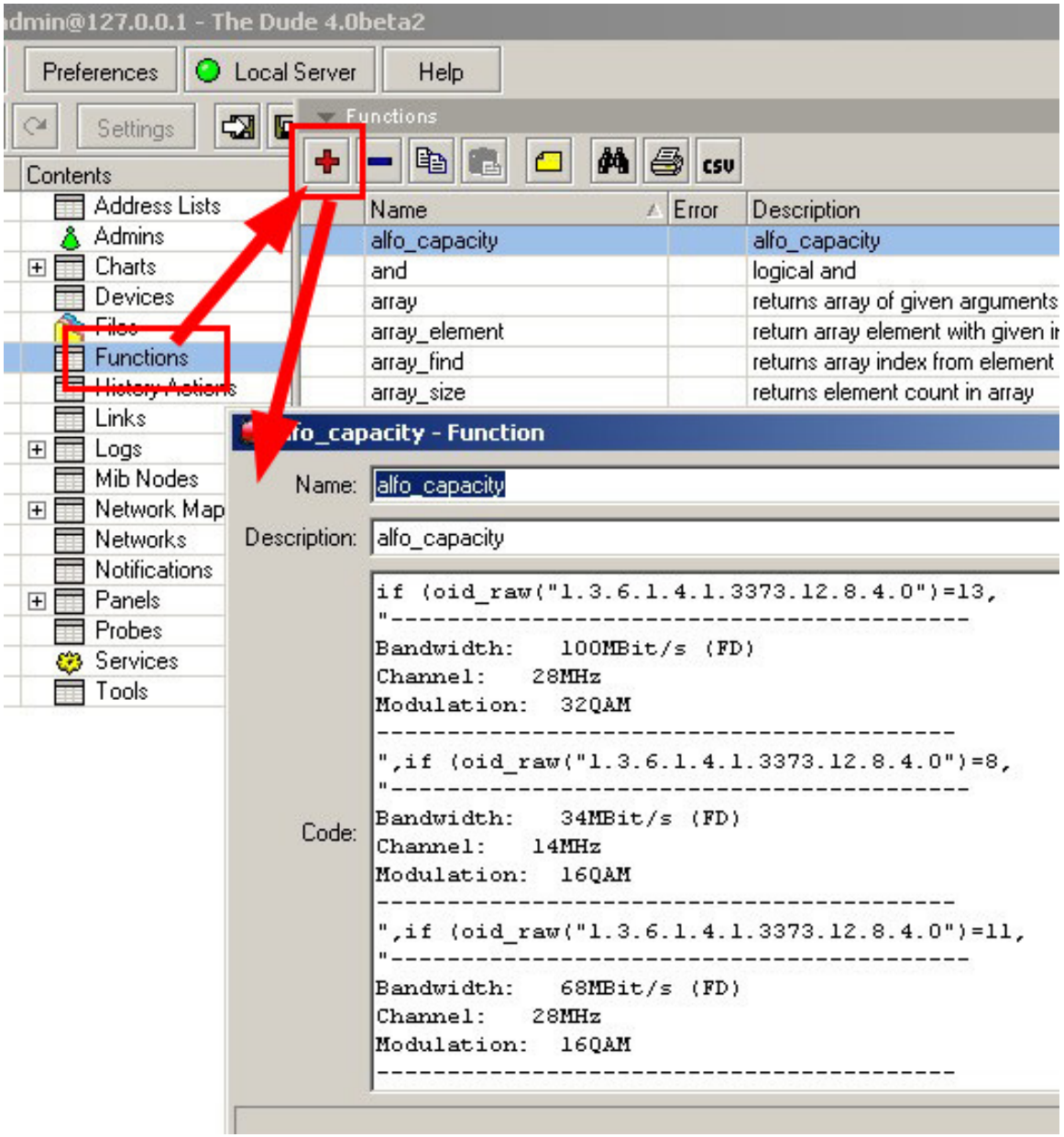
- Label source is a function call: [alfo_capacity()]
- Custom function



Additional challenge:

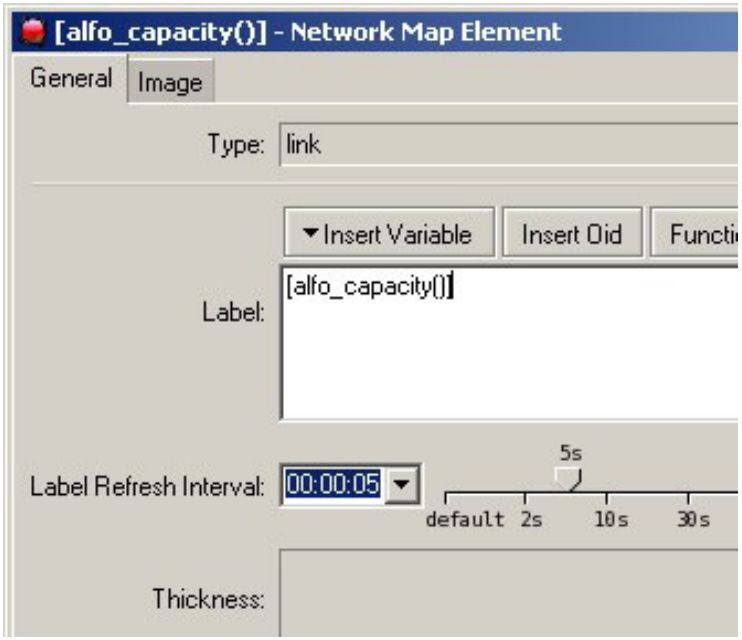
- Required information not directly available by SNMP
- ALFO MIB will provide combined number code for operational mode (Ch. BW and Modulation)
- Using nested if statements for creating output

Create new Function

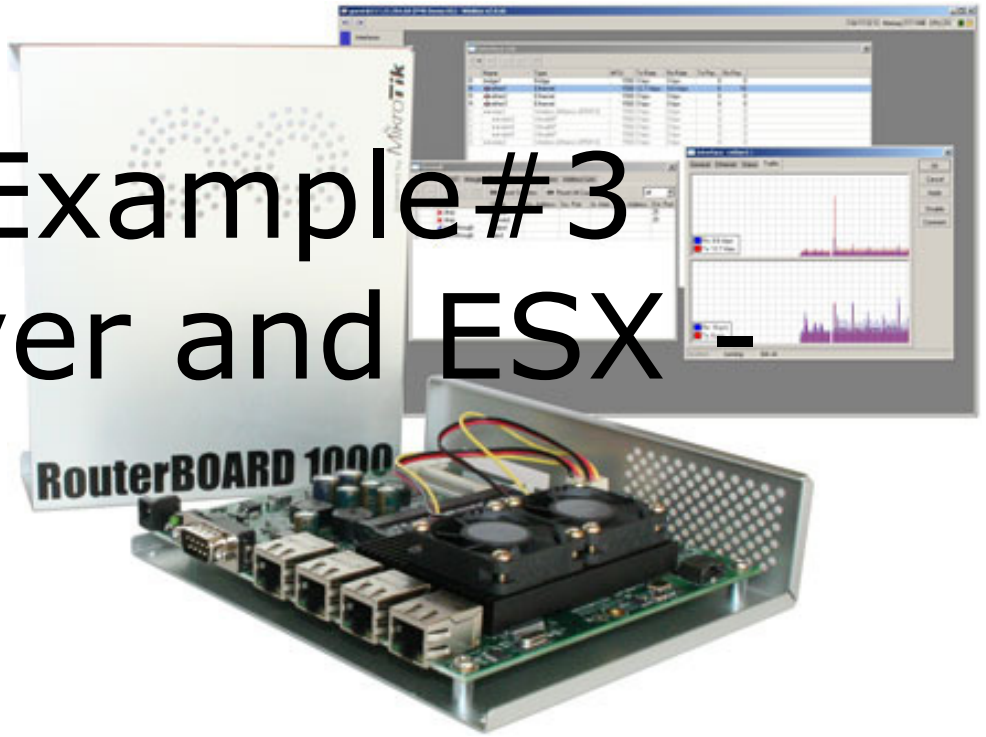


Label 2 – individual function

```
if (oid_raw("1.3.6.1.4.1.3373.12.8.4.0")=13,
"----------------------------------------
Bandwidth:   100MBit/s (FD)
Channel:   28MHz
Modulation:  32QAM
----------------------------------------
",if (oid_raw("1.3.6.1.4.1.3373.12.8.4.0")=8,
"----------------------------------------
Bandwidth:   34MBit/s (FD)
Channel:   14MHz
Modulation:  16QAM
----------------------------------------
",if (oid_raw("1.3.6.1.4.1.3373.12.8.4.0")=11,
"----------------------------------------
Bandwidth:   68MBit/s (FD)
Channel:   28MHz
Modulation:  16QAM
----------------------------------------
","unknown")))
```



Device Types Example#3 - VMware Server and ESX -



VMware server 2 and ESX 3

- Separate types for different products
- Even better visualization with different icons
- Web access and tools

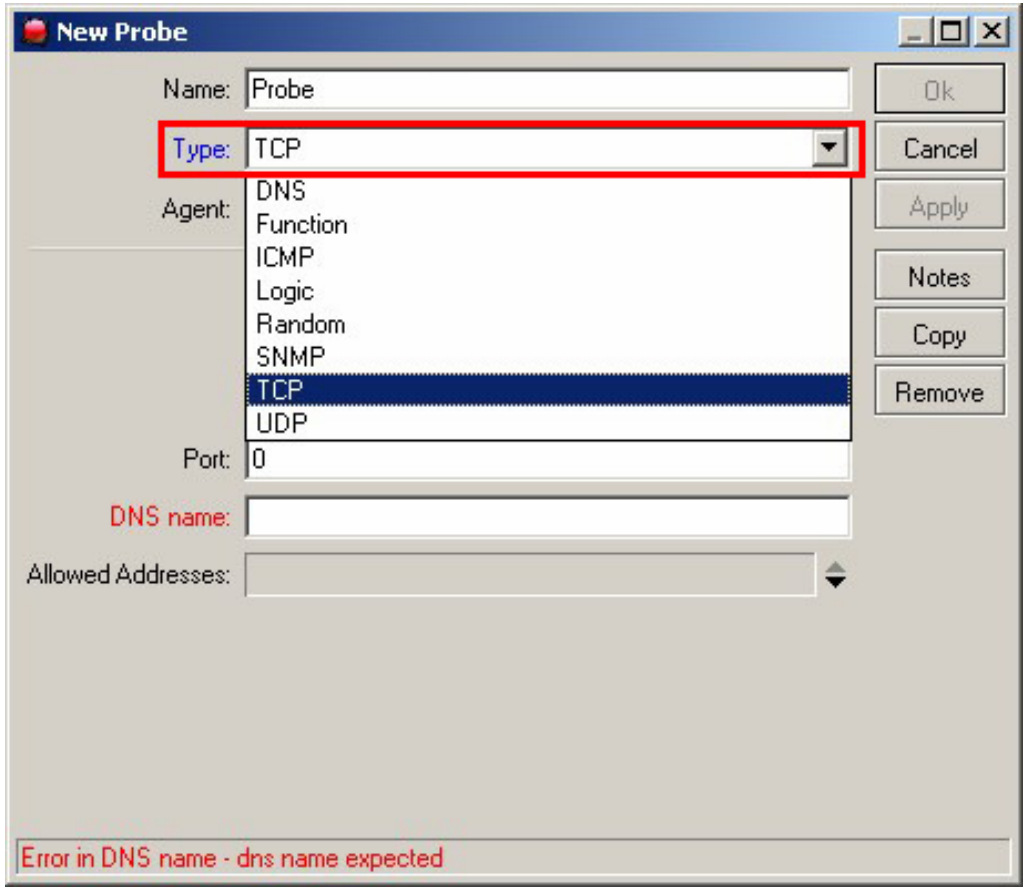
TCP Probe

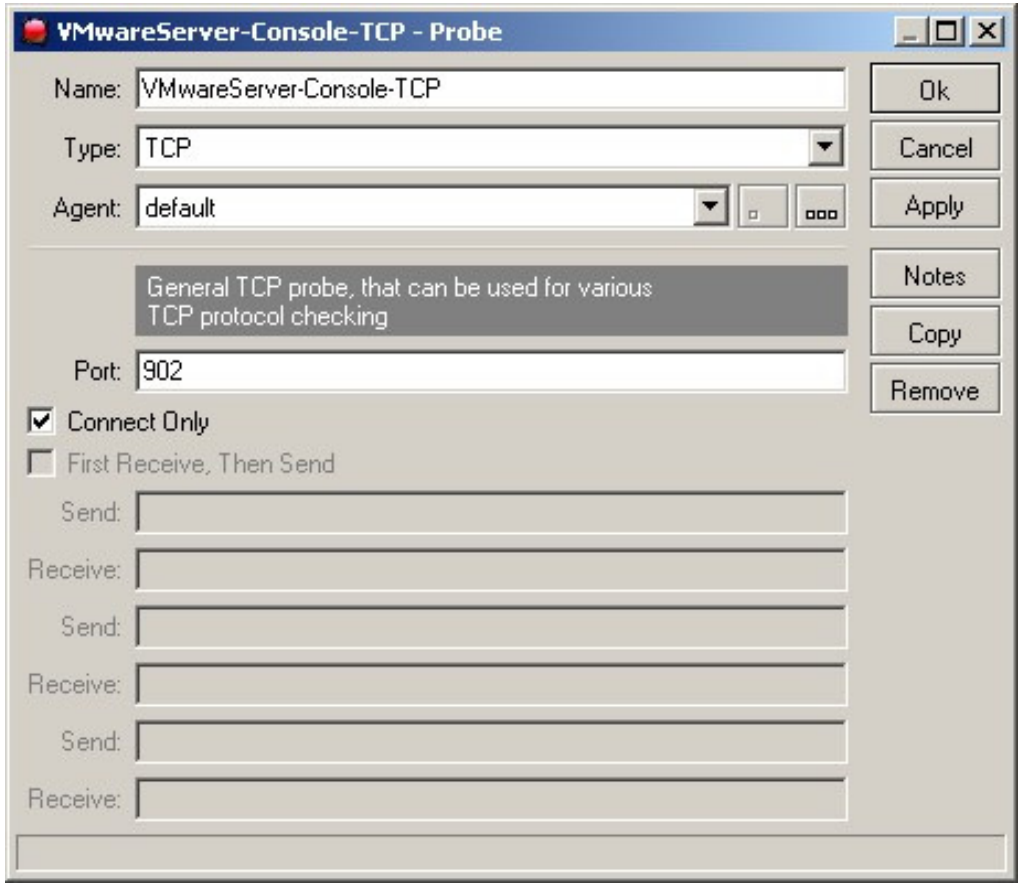
VMware Server 2 and ESX3 have different management ports

Use TCP probes for identification

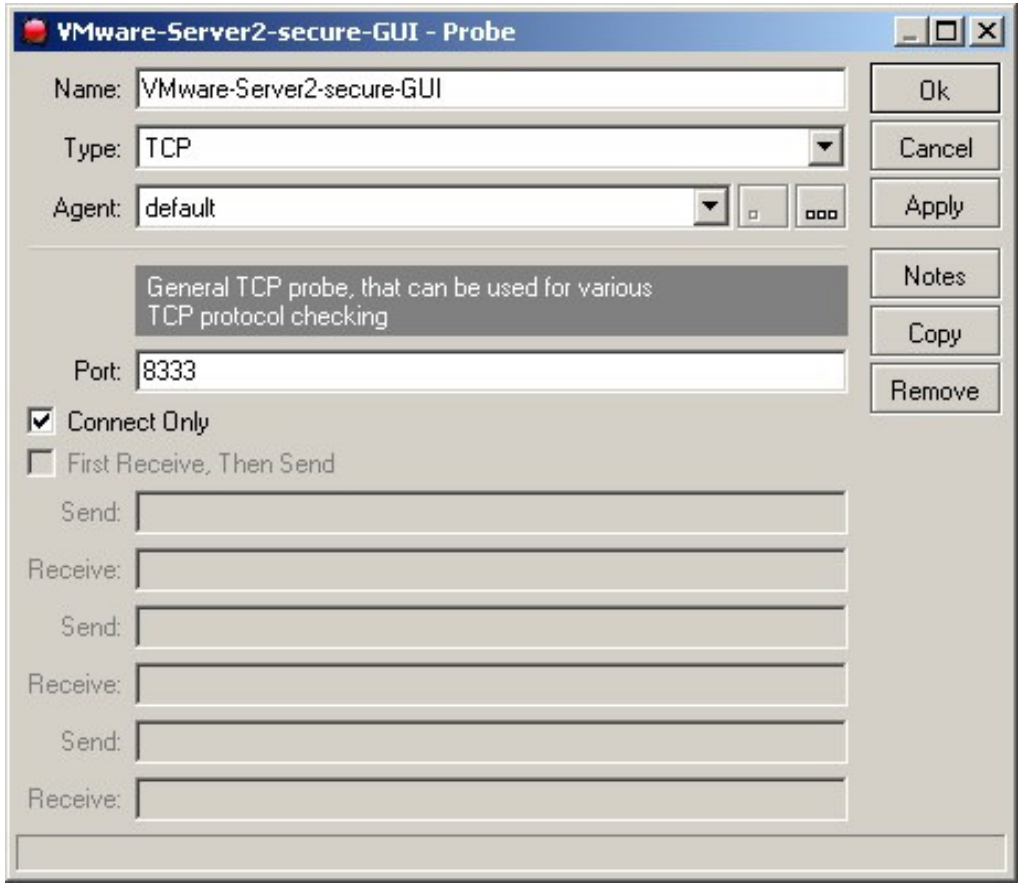
VMware Server2 Ports:	902, 8222, 8333
VMware ESX 3 Ports:	902

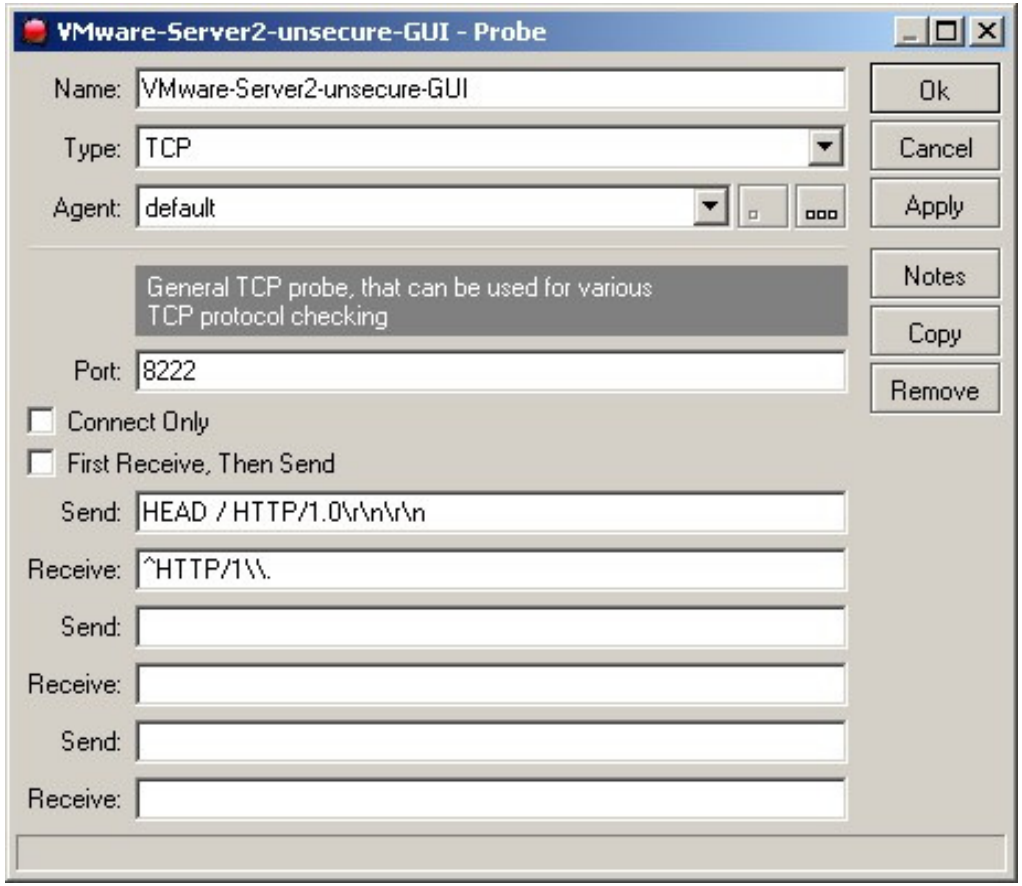
VMware Console Probe (TCP, connect only)





VMware Server GUI Probe (TCP wo/w connect)

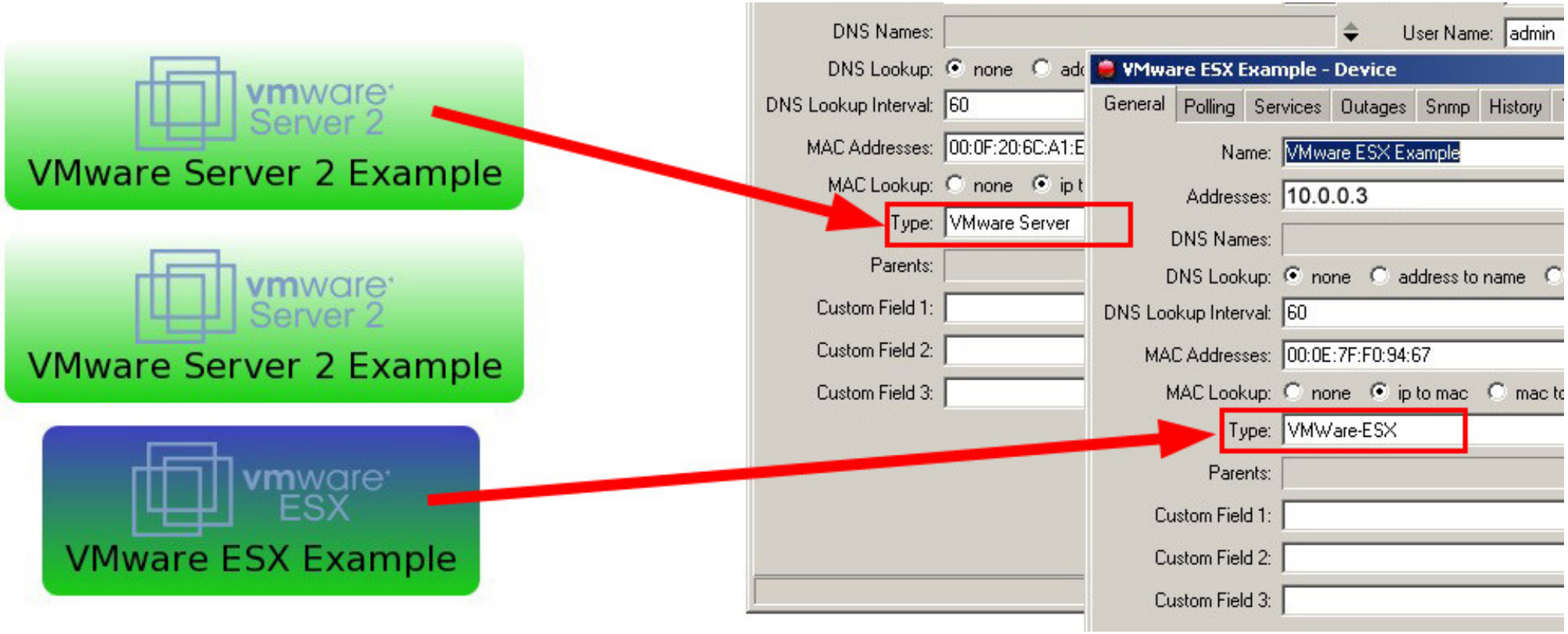




Device Type Identification

VMWare Type	Server 2	ESX Server
Require	8333	902
Allow	902 8222 8333	902

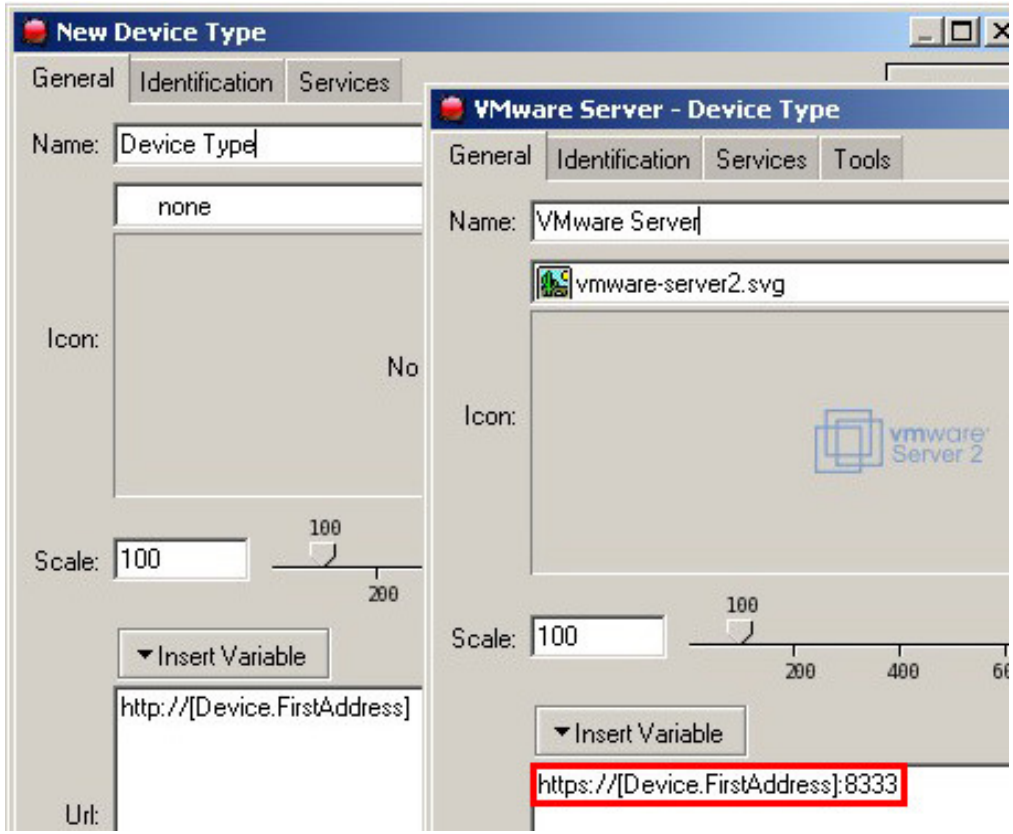
Result of Discover



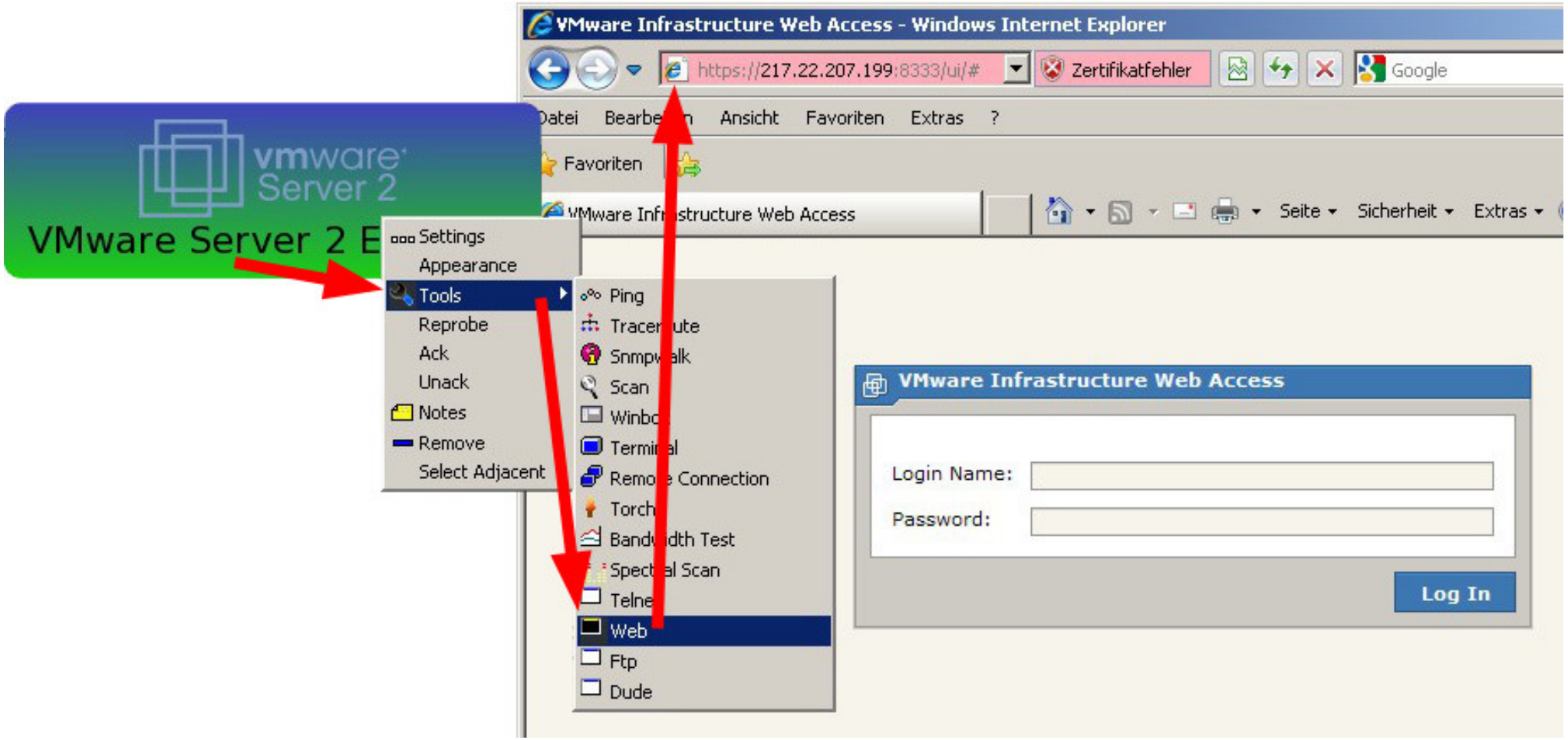
Device Type -> General -> URL

Change Default URL:
http -> https
Port 80 -> 8333

URL will be available as variable:
[DeviceType.Url]



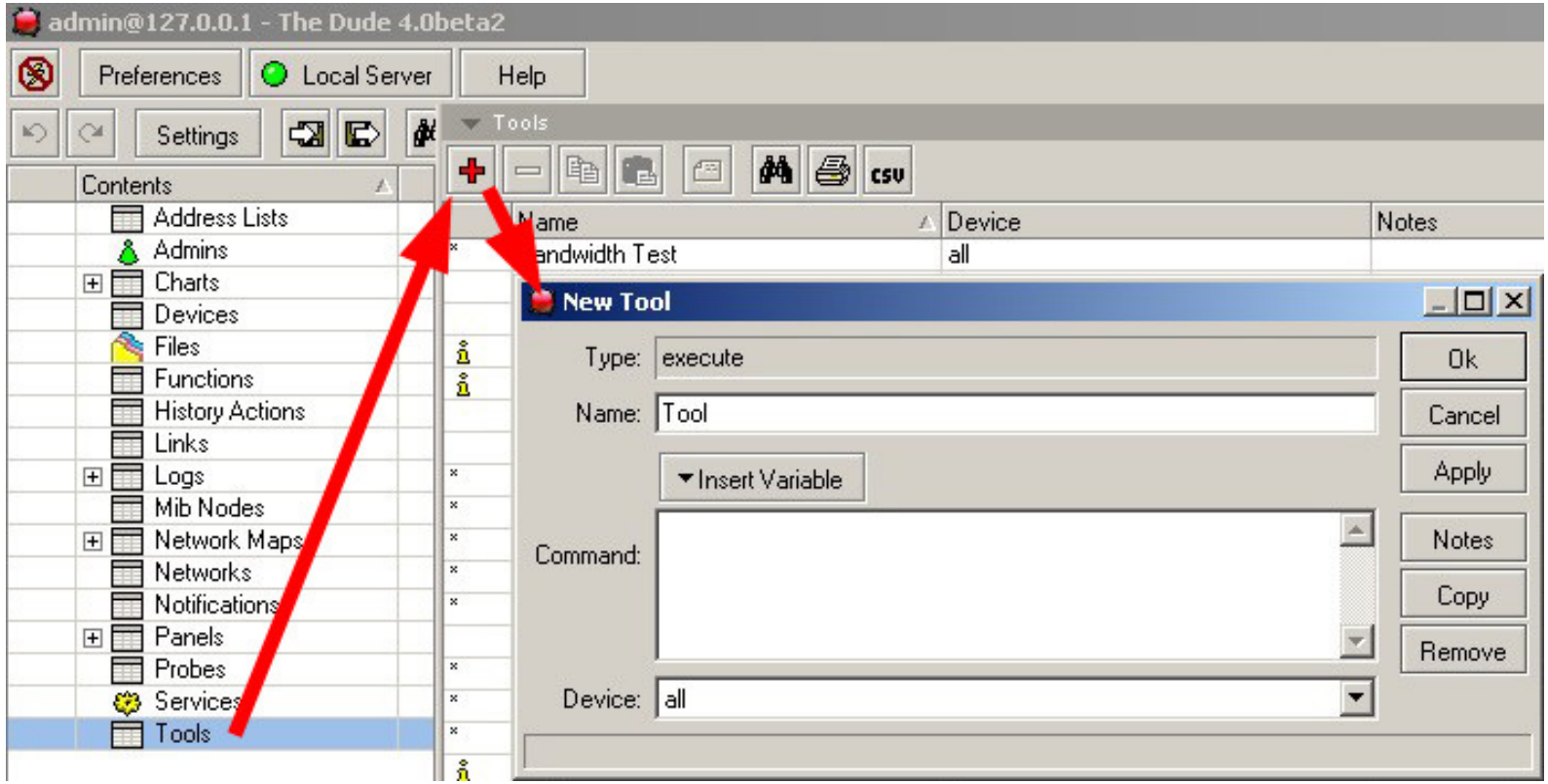
Device Type -> General -> URL



Add desired functionality

1. Create tool in the tools section
2. Select appropriate device types (can not be changed afterwards)
3. Will appear in the tools menus

Create new tool



Custom Tools (Webbased)

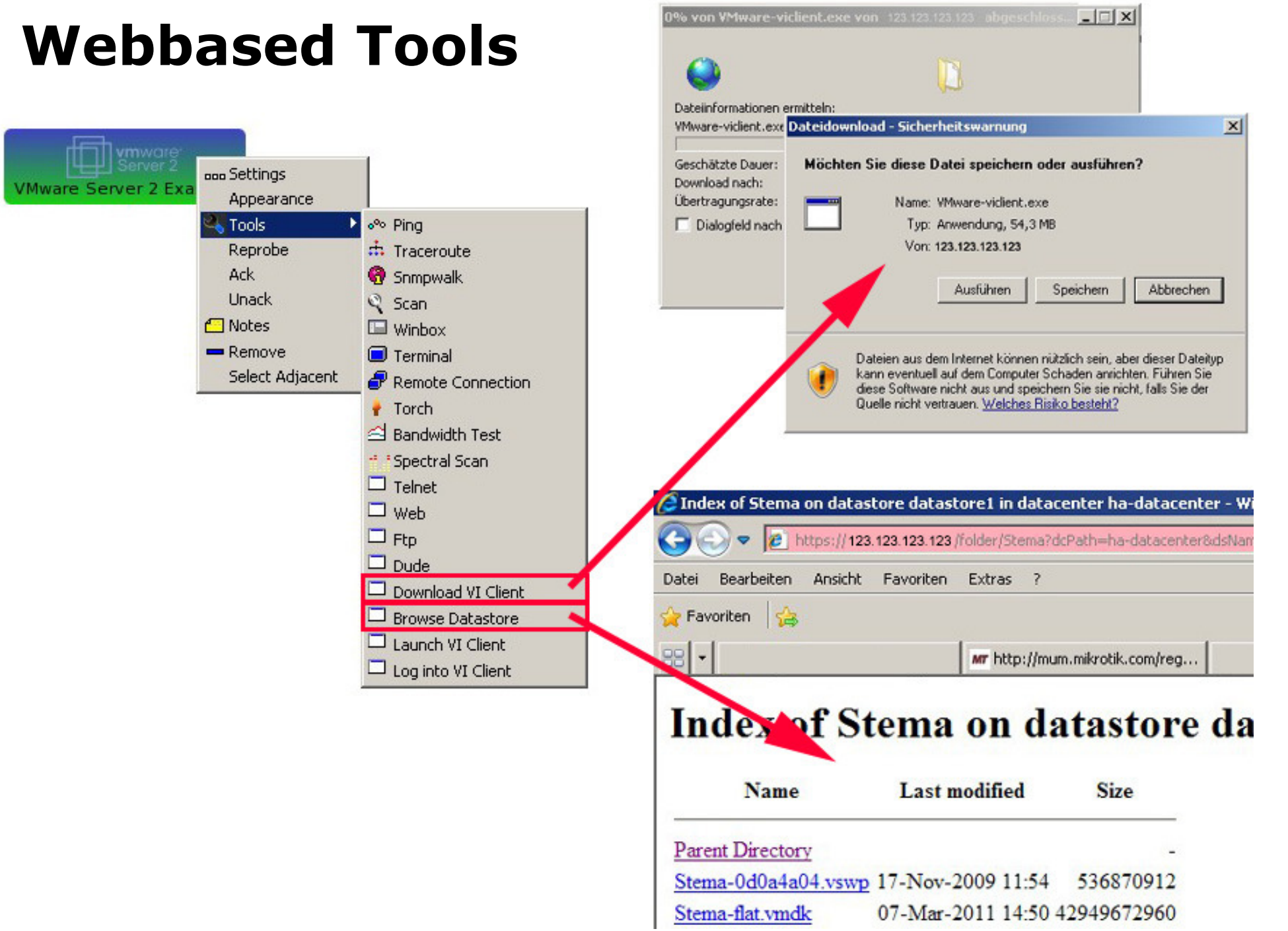
- Browse datastore
  [DeviceType.Url]/folder?dcPath=ha-datacenter

- Download infrastructure client
  [DeviceType.Url]/client/VMware-viclient.exe

- [DeviceType.Url] has been adapted for Server2

  Server 2: [DeviceType.Url] = https://URL:8333
  ESX 3: [DeviceType.Url] = http://URL

Webbased Tools



Custom Tools (Applications)

Launch VI client:

"C:\Programme\VMware\Infrastructure\Virtual Infrastructure Client\Launcher\VpxClient.exe" –s [Device.FirstAddress]

Launch VI client and log in:

"C:\Programme\VMware\Infrastructure\Virtual Infrastructure Client\Launcher\VpxClient.exe" –s [Device.FirstAddress] -u [Device.UserName] –p [Device.Password]

“Launch VI client” in Detail

Command line switch

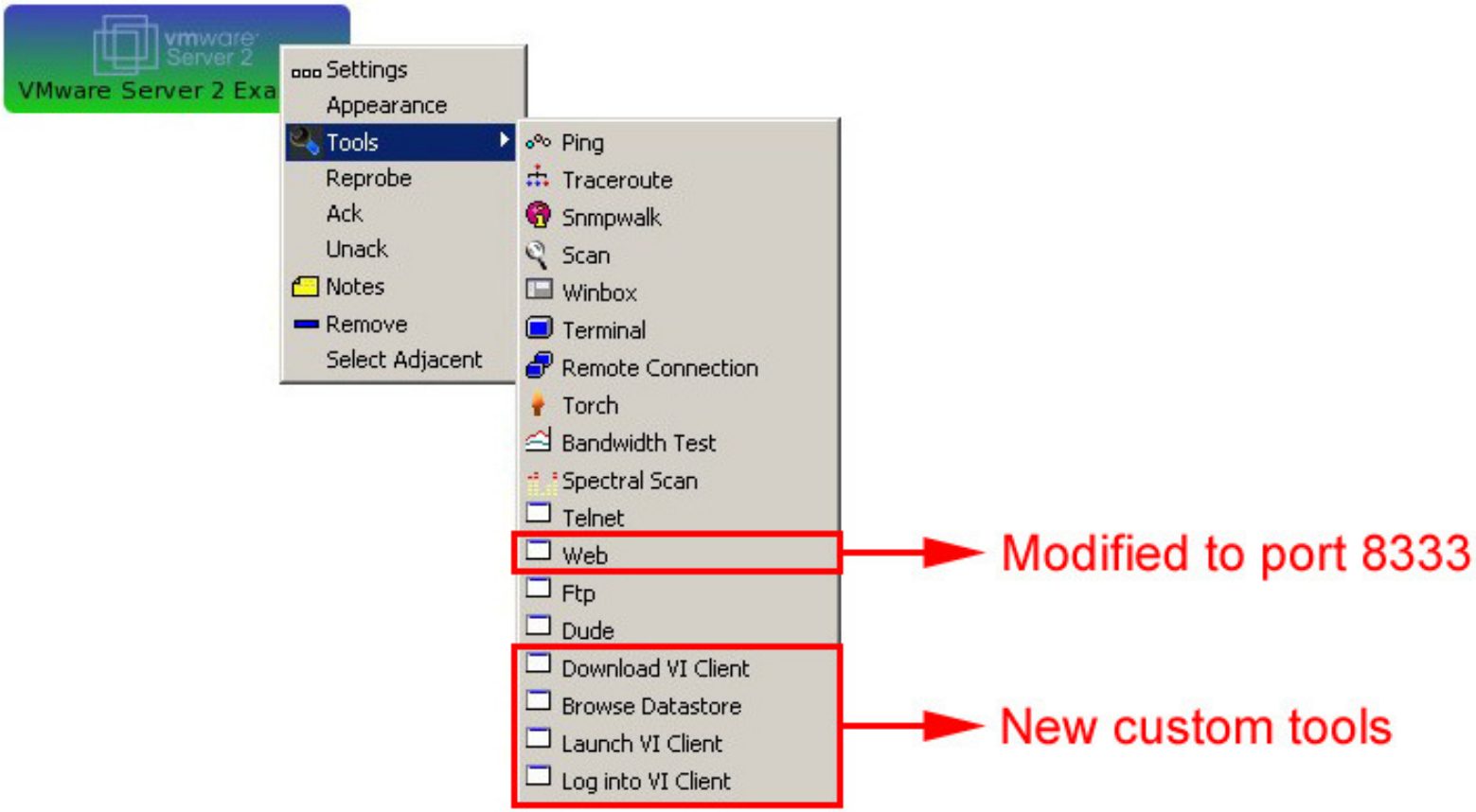
Dude variable

-s [Device.FirstAddress]
-u [Device.UserName]
-p [Device.Passwortd]

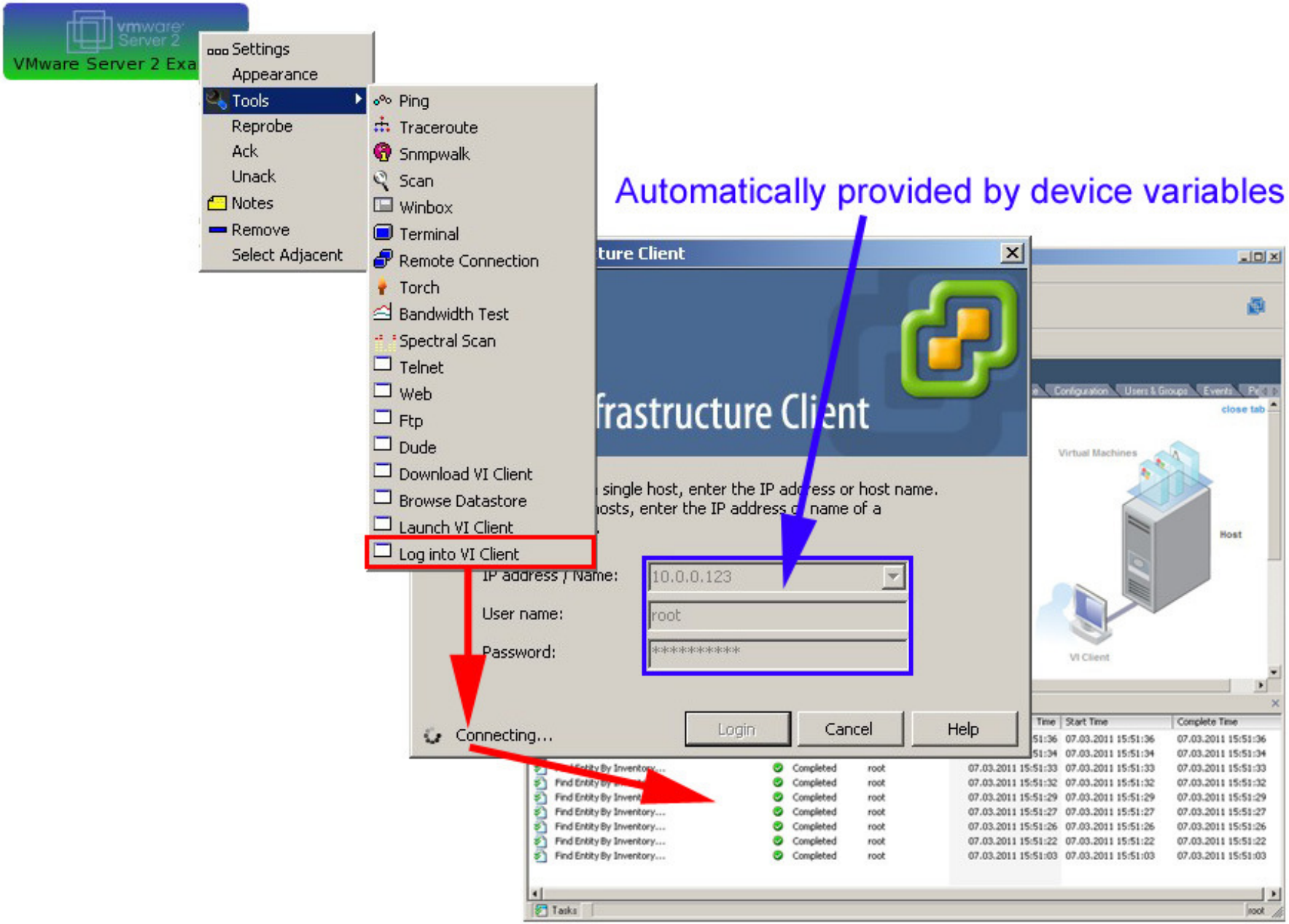
Complete Source:

"C:\Programme\VMware\Infrastructure\Virtual Infrastructure Client\Launcher\VpxClient.exe"
–s [Device.FirstAddress] -u [Device.UserName]
–p [Device.Password]

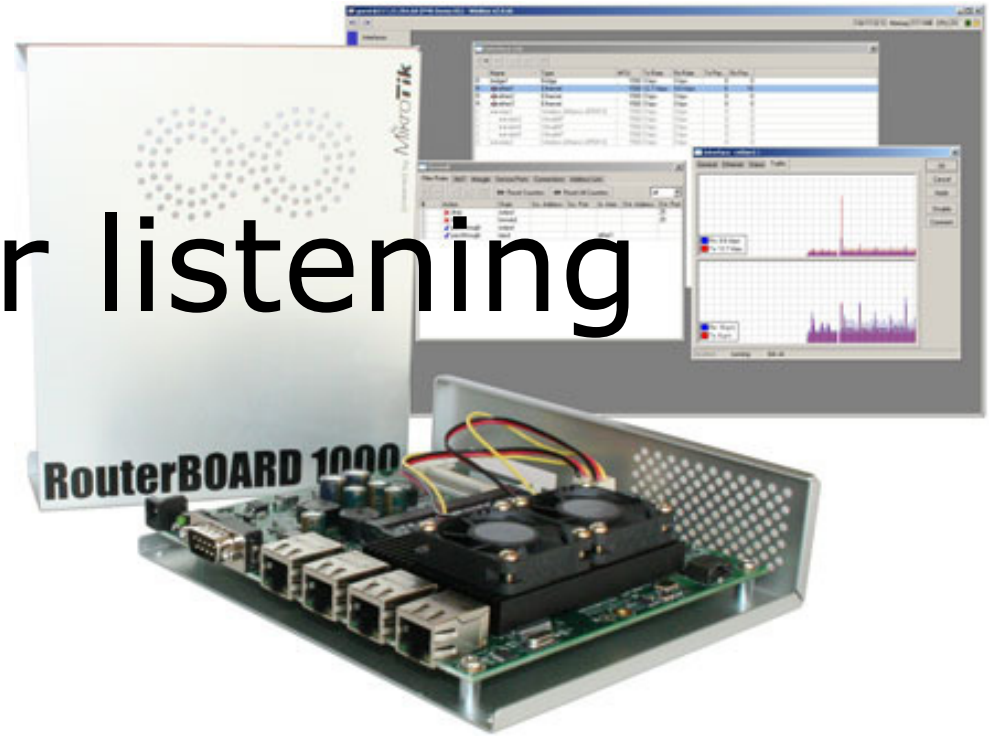
Finished: VMware Server 2 Device Type



Using tool „Log into VI Client“



Thank you for listening



FMS Internetservice, www.fmsweb.de
info@fmsweb.de, Phone: +49 761 2926500