3G Applications on RouterOS

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Overview of this Presentation

- Why 3G / GPRS
- M2M and why it's going to be BIG!
- New Features in RouterOS V4 for 3G
- Interface Types
- Real World Applications
- SMS Configuration
- PPP Configuration
- Live Demonstration

Why 3G / GPRS?

- WiFi or wired Internet is not available
- Backup link, if the main link fails
- Out-of-band management of router systems
- Sending SMS from the router
- Receiving SMS and executing scripts
- 3G becomes faster and Internet access is more affordable

3G Applications

- Public Safety
- Rural Areas
- Mobile / Fixed Hotspots
- Bandwidth Backup / Redundancy
- Digital Signage
- Kiosks
- Remote Monitoring / Security
- Transportation
- M2M Applications

M2M (Machine to Machine)

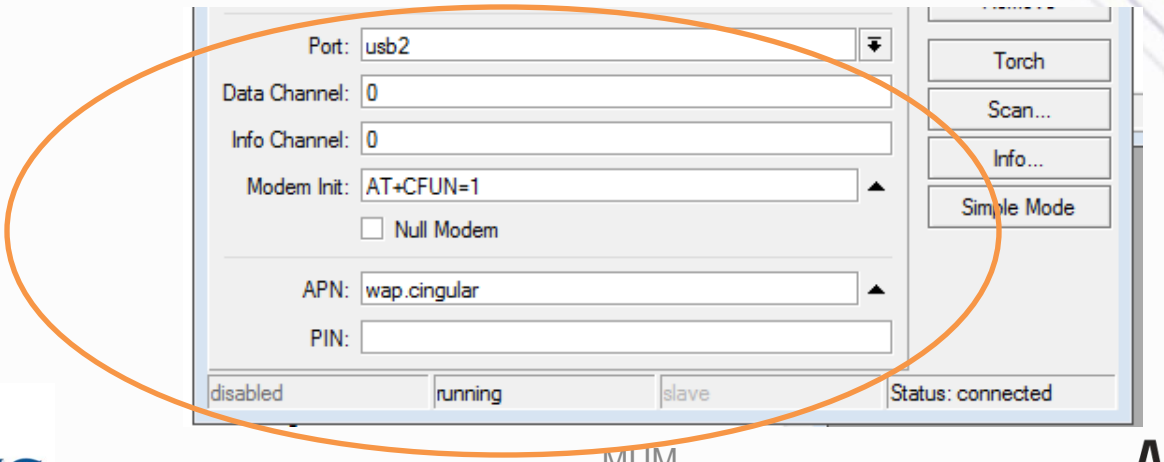
- M2M is the concept of a device sending data to another device
- Extreme competition in voice services is driving down revenue, carriers looking at data.
- Carriers starting to embrace having “embedded devices” on their network besides mobile phones.
- Meters, Appliances, Remote Access, Lighting, Medical, Retail Inventory, etc. --- Reducing Costs and saving energy.
- Wireless M2M will increase 73 million units in 2008 to 430 million units in 2013 worldwide (Harbor Research)

New 3G RouterOS 4.0 Features

- Added the ability to talk to multiple channels within a USB connection at same time

Added PIN ability (so you can SIM Unlock within winbox)

Added APN (Access Point Name)



Interface Types

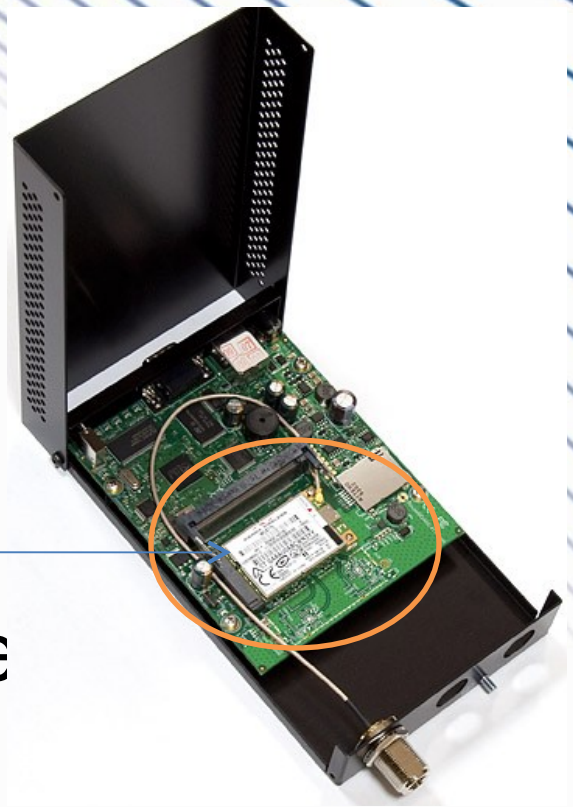
- 3G Modems come in both USB and mPCIe cards using USB signals.
- USB Modems are easier to obtain, but protrude out in front of your router.
- mPCIe cards are slick, built-in and look like a WiFi Card, but are more expensive and support is harder to obtain.
- RB411u has mPCIe USB
- RB800 has mPCIe but no USB support

USB Dongle Type Modems

mPCIe Modules w/RB411U

- Some cards that have been tested:
  - Option GTM378
  - Sierra Wireless MC8775,8780 8781,8790

See wiki.mikrotik.com For additional supporte cards



mPCIe Module Types

- Quadband GSM 850/900/1900/2100Mhz
- EVDO Rev A CDMA (3.1 Down / 1.8 Up)
- UMTS/HSDPA (7.2 Down / 2.0 Up)
- HSDPA+ 3.5G (28 Down / 5.8 Up)
- LTE (Long Term Evolution) (100 Down / 50 Up)
- LTE With 4x4 MIMO can Achieve 300Mbps!

SMS Applications

- RouterOS Supports sending SMS messages by script to any mobile device.
- RouterOS can accept SMS messages and trigger scripts to run
- Applications Include:
  - Remote Router Reboot
  - Check Voltage or Signal Strength and SMS Back

Sending SMS from the Router

- Command line example to send an SMS:
  - /tool sms send usb2 "29111222" channel=0 message="Help!"
- In RouterOS V4, SMS can be sent while the port is used by other service (PPP or terminal)

Receiving SMS

- Turn on receiving the SMS
  - specify “port” and “channel”
  - set “secret” (required)
  - set “allowed-number” (optional)
- Received SMSs are stored in /tool sms inbox
- SMS message format
  - :cmd SECRET script NAME [[VAR[=VAL]] ...]

```
[admin@MikroTik] /tool sms>
[admin@MikroTik] /tool sms> print
  receive-enabled: yes
             port: usb2
          channel: 2
           secret: "111"
   allowed-number: ""
     keep-max-sms: 10
[admin@MikroTik] /tool sms>
```

```
[admin@MikroTik] /tool sms> inbox
[admin@MikroTik] /tool sms inbox> pr
 # SRC              TIMESTAMP                      TEXT
 0 16308540580      Nov/20/2009 01:23:21 GMT +26   :cmd 111 script log
[admin@MikroTik] /tool sms inbox>
[admin@MikroTik] /tool sms inbox>
```

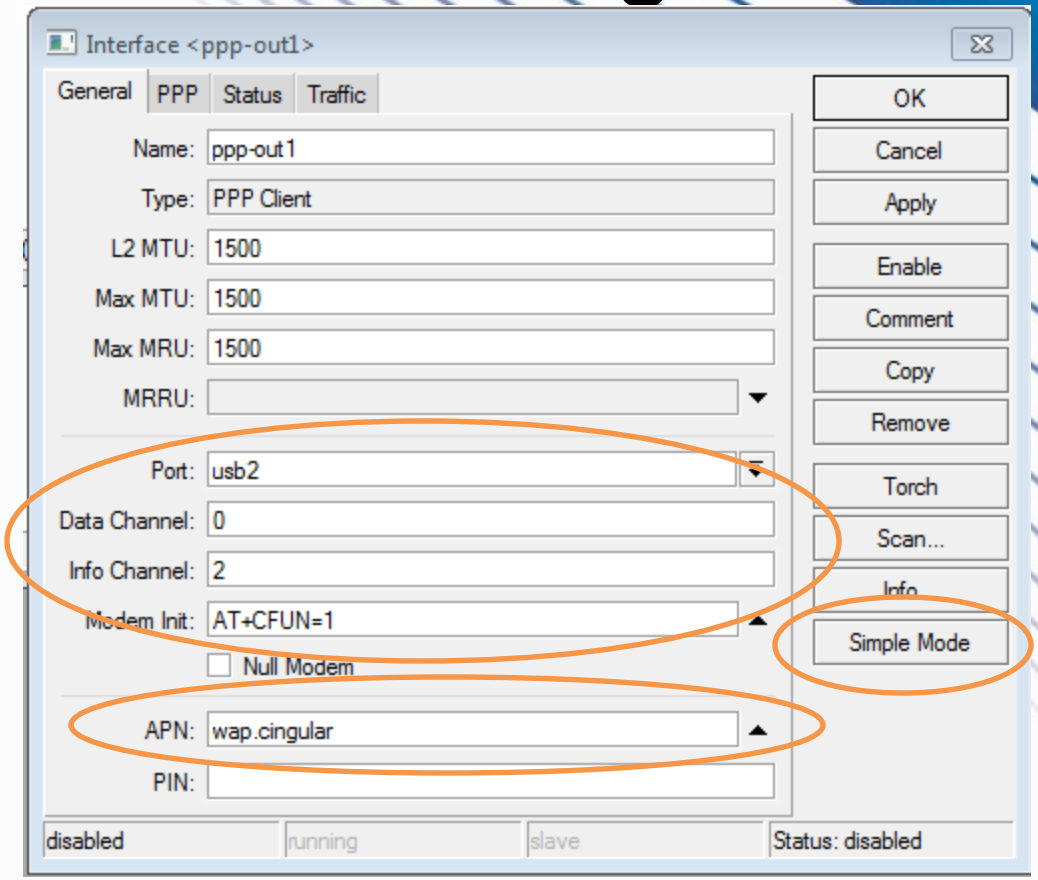
Jan/02/1970 01:59:06	gsm read debug	07913121139426F0040B816103580485F0000090 11021071704A13BA719B0C8AC562A0F9589E86 D341ECF719
Jan/02/1970 01:59:06	gsm read debug	OK
Jan/02/1970 01:59:06	gsm debug	running script: log
Jan/02/1970 01:59:06	script info	Hello This Works!
Jan/02/1970 01:59:06	gsm debug	keepMax exceeded, removing some mesages.
Jan/02/1970 01:59:06	gsm write debug	AT+CMGD=0
Jan/02/1970 01:59:06	gsm write debug	
Jan/02/1970 01:59:06	gsm read debug	AT+CMGD=0
Jan/02/1970 01:59:06	gsm read debug	OK
Jan/02/1970 01:59:11	gsm write debug	AT+CMGL=0

PPP Config: Part 1 – Info Channel

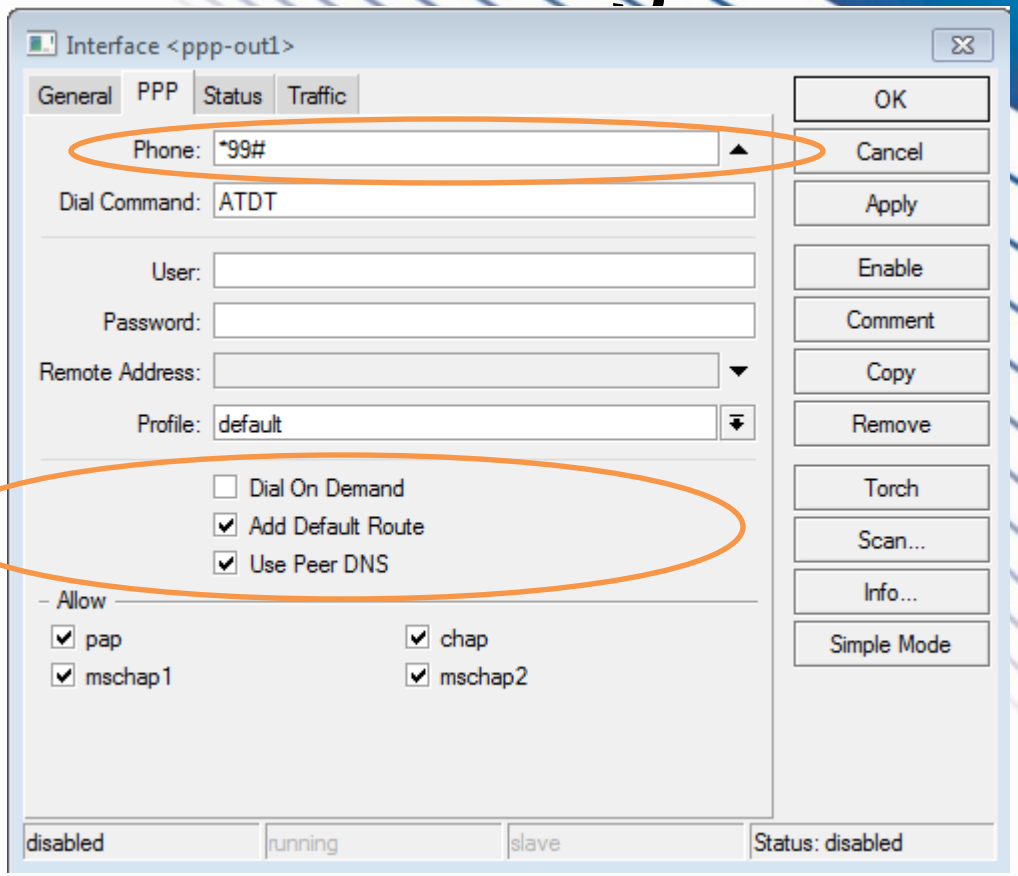
```
[admin@MikroTik] /system> serial-terminal usb2 channel=2

[Ctrl-A is the prefix key]


ATi5
Manufacturer: Sierra Wireless, Inc.
Model: MC8781
Revision: F1_2_3_15AP C:/WS/FW/F1_2_3_15AP/MSM7200R3/SRC/AMSS 2008/07/09 13:02:11
IMEI: 356685011813019
IMEI SV: 13
FSN: D350558387911
3GPP Release 6
+GCAP: +CGSM,+DS,+ES


OK
```

```
[admin@MikroTik] /system> serial-terminal usb2 channel=0

[Ctrl-A is the prefix key]


Sierra Wireless, Inc.
MC8781
APP1

OK
```

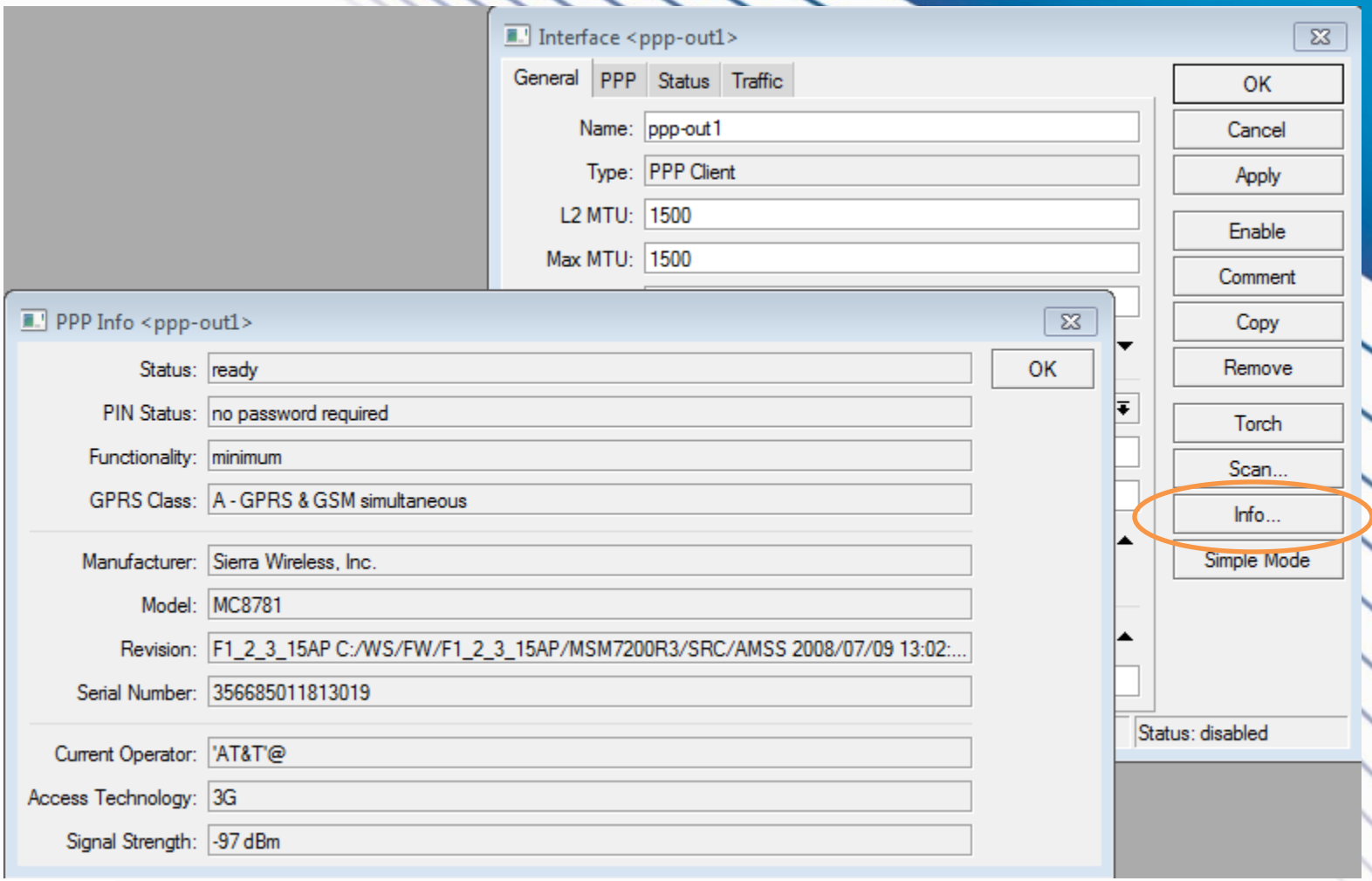
PPP Config: Part 2 – General Settings



PPP Config Part 3 – PPP Settings



PPP Config Part 4 - Info



3G Configuration Reminders

- Don’t forget to add a SRC-NAT rule to Masquerade your ppp-out1 interface
- If your carrier charges for connect time, select that you want to dial on demand vs. always on
- Some carriers will give you private address space, depends on APN you connect to.
- Make sure you are using the default profile and not trying to do encryption

Troubleshooting

- **Can you talk to the modem at all?** Try using serial terminal to talk to the modem!
- **Is the SIM card requiring the PIN?** Disable PIN request, or, enter your PIN in winbox!
- **Consult MikroTik WiKi** and any 3G/GPRS AT Command Reference!

References / Live Demonstration

- http://wiki.mikrotik.com/wiki/Supported_Hardware#3G_cards
- http://www.option.com/
- http://www.sierrawireless.com/
- http://forum.mikrotik.com
- http://www.mikrotik.com
- http://www.balticnetworks.com

Thank You!