

Using Mikrotik in Regional/Rural Australia

A collection of real world case studies

Intro

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Small company located in Cooma, NSW, Australia

- Been using Mikrotik since 2010 (training and MUM in Brisbane)
- Networking (wired and wireless), PBX installs (SIP trunking)
- Data cabling, security, CCTV/NVR
- First In Maintenance for several Carriers
- Whatever the customer wants!









Why do we use Mikrotik?

- **We became attracted to Mikrotik equipment because of lower cost and large range of features.**
- **Lower cost means that our customers can afford to go ahead with a project whereas they might not have if using other brand name gear.**

Why do we use Mikrotik?

- Lower cost also means that we can have spare stock on our shelves in the event we need to replace a router (rare to be honest).
- Reliable distributor (duxtel Take Control... ) who provides excellent technical support.
- We can afford to have a decent number of test units to bench test with and try advanced features. It is a great way of learning networking when you can have a lab setup at home for such a low cost. **Even though my name is Dave, I have yet to send an email to support@mikrotik.com!**

Variety of installed equipment

- **Power monitoring**
- Wifi in alpine village setting
- Remote pump start
- Last mile link



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A Ski club needed to know if members were staying longer than they had booked.

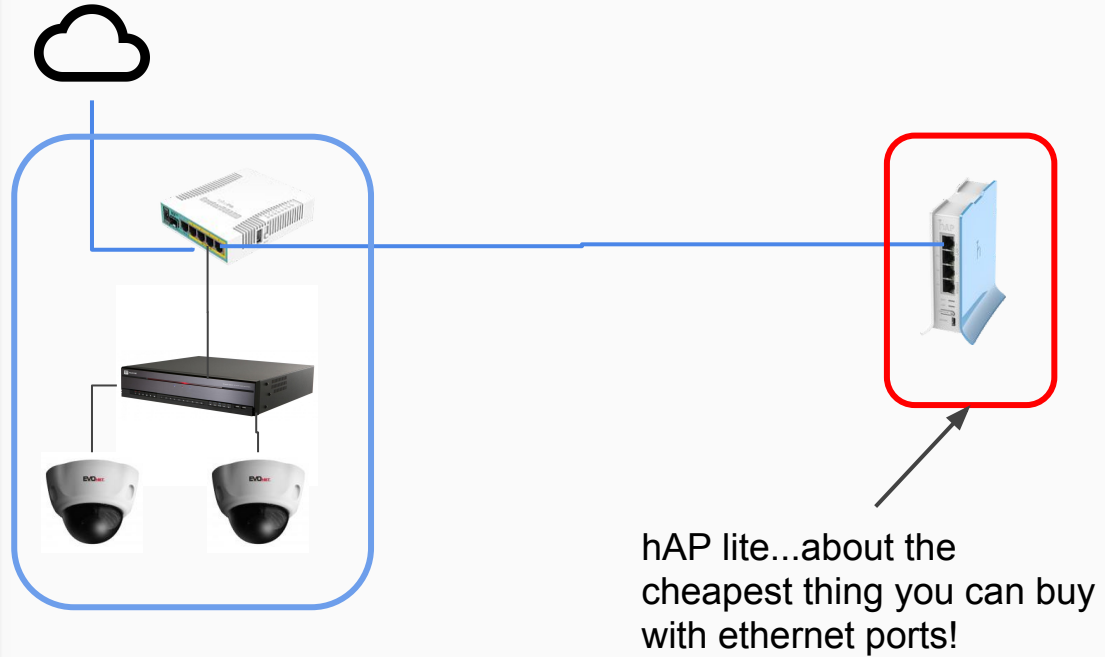
We suggested a power monitor to see when members turned on the main power.

The cheapest option was to monitor an ethernet port on a device connected to the main power circuit.

When the system detects power is on, a notification email gets sent.

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24/7 power circuit



Power circuit activated by members

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hAP lite connected to ether3 of main router. Script is run every minute to check running status of ether3.

If ether3 comes up, we assume power is turned on, and an email is sent.

Script copied/hacked from forum and Greg Sowell's website :-)

```
# Checking eth3 link status:
:global "ether3-state"
:global "ether3-laststate"
/interface ethernet monitor ether3-monitor once do={:set
"ether3-state" $status}
:if ($"ether3-state" != $"ether3-laststate") do={
    /tool e-mail send server=smtg.gmail.com port=587
    user=someone@qazxsw.com password="secretstuff" from="Some
    Where <somewhere@someplace.com>"
    to="someonewhocares@qazxsw.com" subject="$[/system
    identity get name]: power status changed" body=("$[/system
    clock get date] $[/system clock get time] Interface ether3
    - link status changed to:" . $"ether3-state")
    :log info ("Interface ether3 - link status changed to: "
    . $"ether3-state")
    :set "ether3-laststate" $"ether3-state"
}
```


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Wifi distribution in Alpine Village setting



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Some of the natives
and conditions we
work in!

Someone has to do
it :-)



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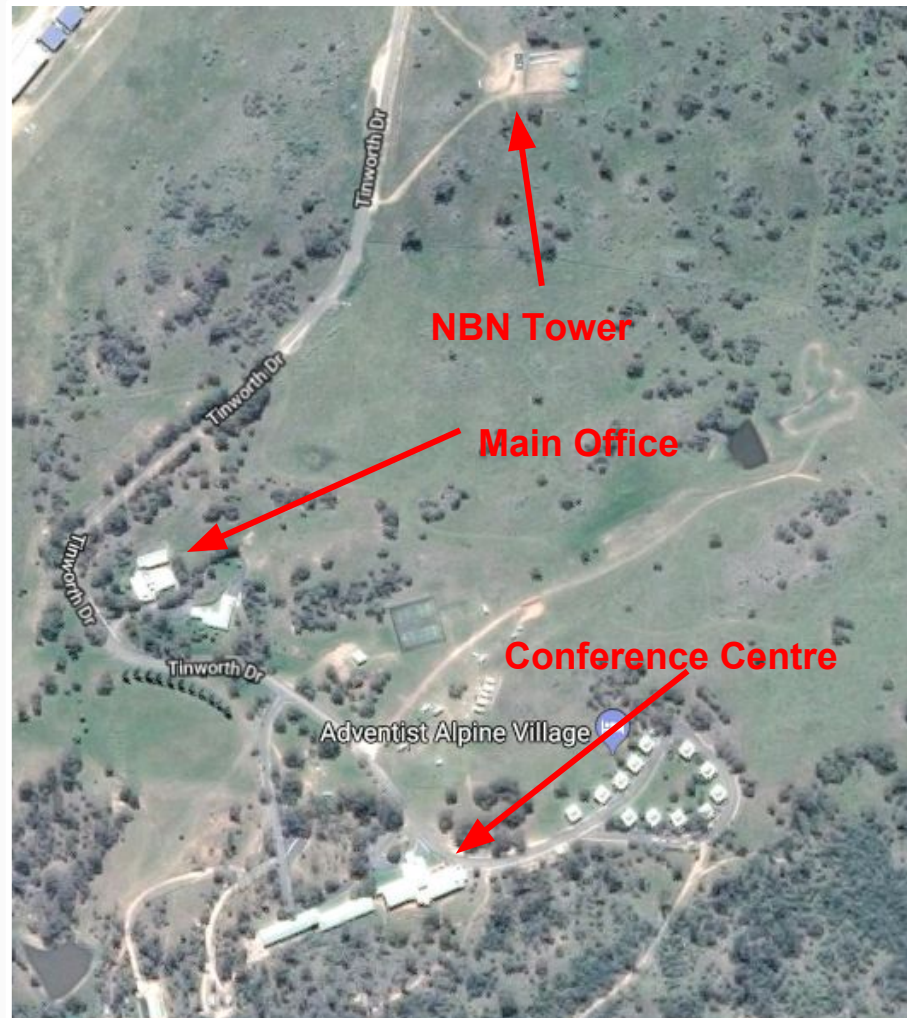
An Alpine accommodation village located in the Snowy Mountains of NSW Australia.

The client wanted wifi coverage over selected areas of the village, with capacity to expand later on.

They had an NBN connection at their main office, but not at the conference centre.

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We used a SEXTANT link from the NBN NTD in the main office to the conference centre router where a PPPoE connection was created.

Distribution to other parts of the village was via Omnitiks at 5GHz. SXT units at the other ends would connect to Groove 2.4GHz access points and an SXT 2.4GHz sector which would then distribute the wifi signal to the clients.



Main office
router

Sextant link to
conference centre

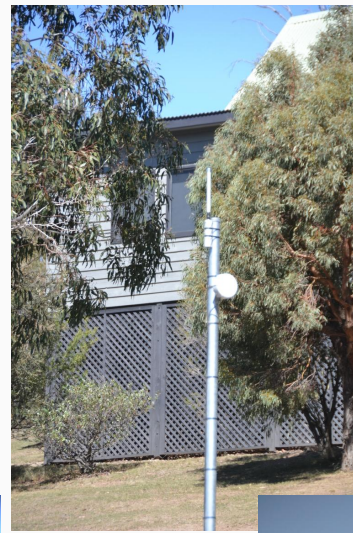
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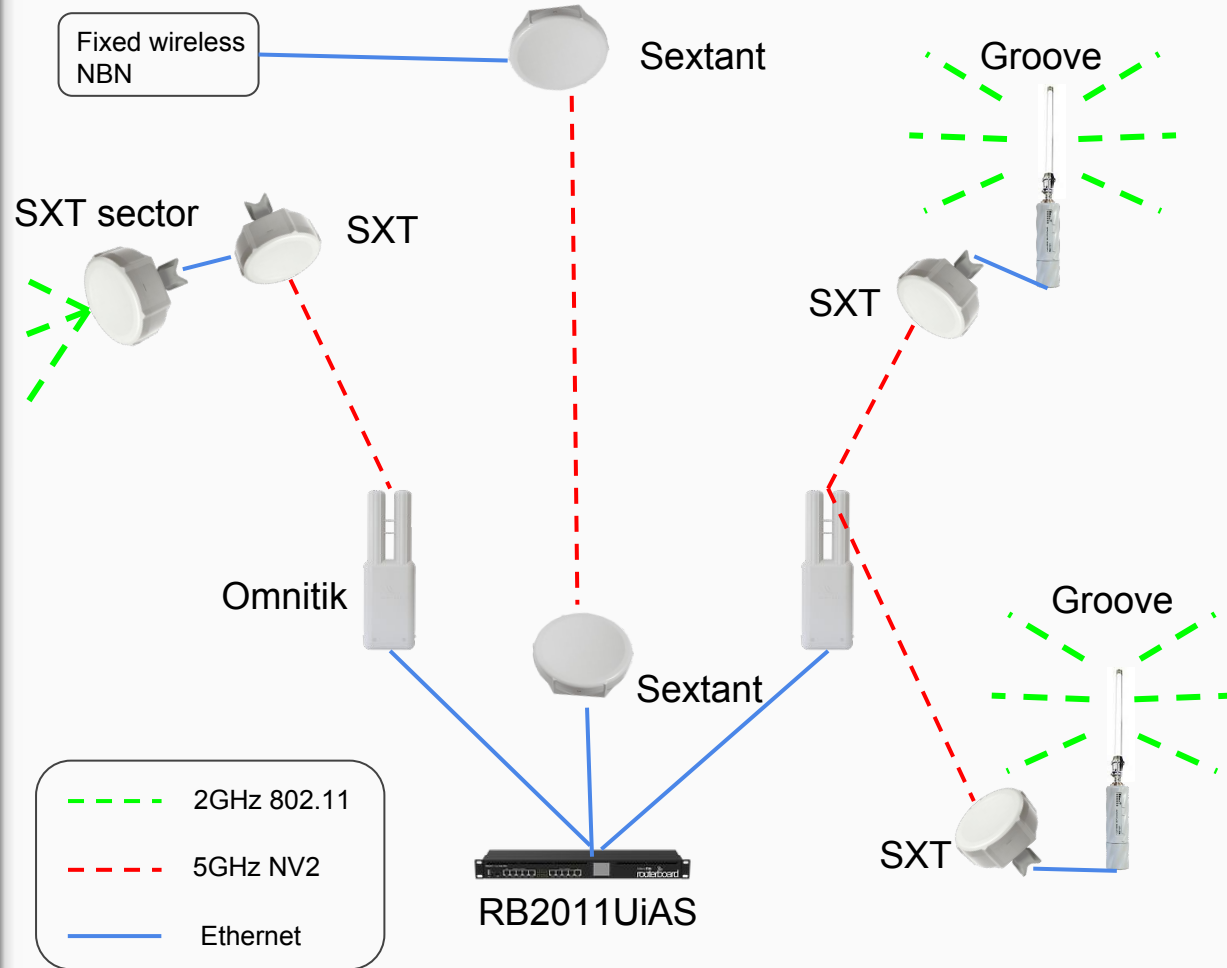
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For ease of management and control, CAPSMAN and a hotspot were used on the main router.

With CAPSMAN, it is easy to see how many clients are on which AP.

With the correct configuration, we can name the AP's with a location.

This way we can see if any particular AP is being overloaded.

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The image shows two screenshots of network management software. The top screenshot is the CAPsMAN 'Registration Table' showing two wireless interfaces. The bottom screenshot is the 'Hotspot' 'Active' tab showing two active users.

CAPsMAN Registration Table

Interface	SSID	MAC Address	EAP Identity	Tx Rate	Rx Rate	Tx Signal	Rx Signal	Uptime	Tx/Rx Packets	Tx/Rx Bytes	Col
Groove-caravans-1	AdventistAlpine	A4:5E:60:C5:A4:C3		65Mbps-20MHz/15	6Mbps	0	-79	05:04:31.22	64 113/103 412	15.2 MiB/131.4 MiB	
Groove-cottages-1	AdventistAlpine	E4:9A:79:21:B4:9A		36Mbps	6.5Mbps-20MHz/15	0	-81	00:00:34	93/124	57.0 KiB/15.1 KiB	

Hotspot Active

Server	User	Domain	Address	Uptime	Idle Time	Session Time ...	Bytes In	Bytes Out	Rx Rate	Tx Rate	Comment
hotspot1	guest		192.168.110.149	05:07:42	00:00:03		3698.1 KiB	1743.4 KiB	0 bps	0 bps	
hotspot1	guest		192.168.110.157	01:57:14	00:11:51		129.9 MiB	554.6 KiB	0 bps	0 bps	

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By using a custom skin for webfig, we can allow the onsite admin staff to change guest passwords and other features quite easily, without giving them full router access.

RouterOS v6.40.5 (stable)

WebFig

Hotspot User <guest>

OK Cancel Apply Remove Reset Counters

Enabled ☒

Server all

Name guest

Password 123456

Address ▼

MAC Address ▼

Profile default

Routes ▼

Email ▼

General

Limits

Limit Uptime ▼

Limit Bytes In ▼

Limit Bytes Out ▼

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A local council was using a 240V control line to start a water pump located at their weir in order to send water to their treatment plant.

The local electricity company needed to reroute their power lines, meaning that the control line was to be removed.

RJS first suggested a UHF irrigation pump control. This suffered from unknown interference - enter a point-to-point link using Mikrotik!

We knew the topography would not allow a direct, single hop link, so a dual hop link was designed.

Since mains power was no longer available, a solar powered setup was required.

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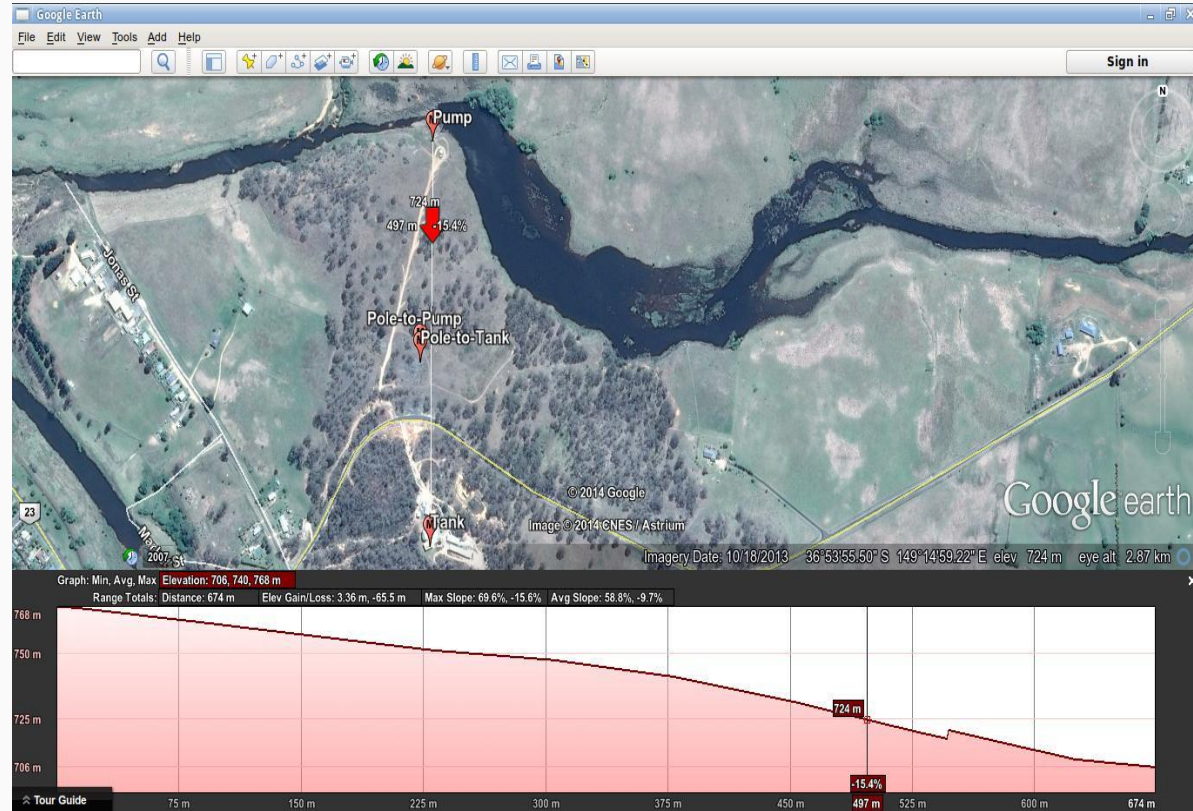
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Custom designed and made mounts for the Sextants and the solar panel.

Meter box mount allows a ladder to be safely leaned against it.



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Solar controller and batteries.

Batteries were designed to supply power for approximately 4 days without solar input.

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Bombala water supply weir.

Morning salute to the SXT!



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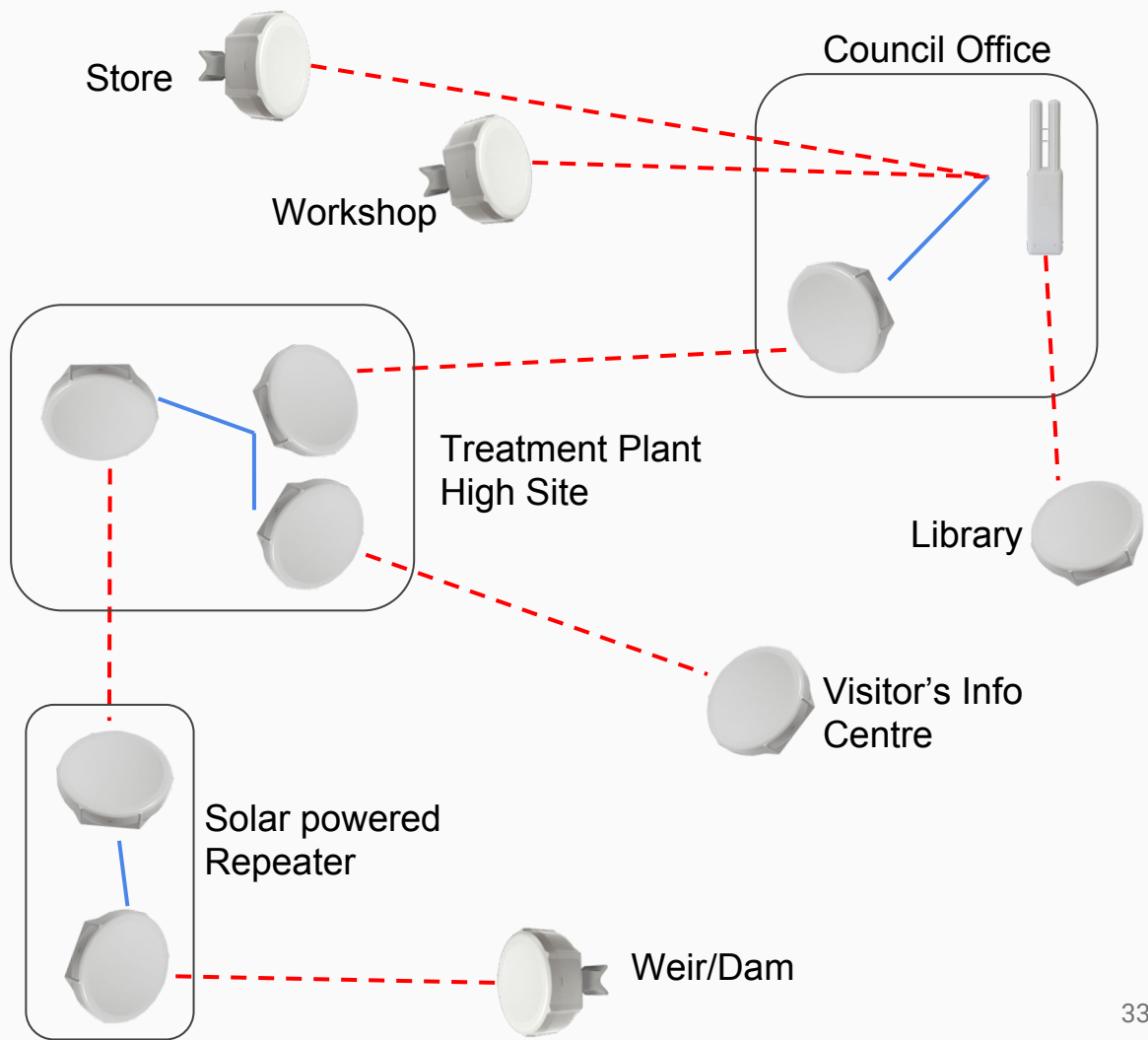
Control panel at water treatment plant.

Web based relay sends pump start signal to other end over Sextant link.

Heartbeat between the two relays prevents the pump end from overflowing the tank, by stopping the pump if it does not receive a signal from the tank end.

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Quick install of last mile link.

An engineering group required a data link that could not be satisfied by current methods (no NBN at that stage).

An alternate ISP was able to provide a link but only to a high spot nearby.

RJS then installed a short hop link (130m) using an SXT and a RB711G routerboard mounted in an antenna enclosure.

The enclosure allowed us to use a USB 3G modem for OOB management. This was particularly useful, as the client end had been configured for 100Mbps while the SXT was set for 1Gbps. As this was causing some issues, it was a simple matter of re-configuring the SXT port remotely, and happy client.

It also allowed us to analyse some issues with strange MAC addresses populating another radio in the path.

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A mix of Mikrotik gear allows the last mile link to be established quickly.

We can mix and choose the necessary components from what we had available.



Carrier wireless



RB711U

3G USB modem

CPE



Mikrotik

Cost effective,
flexible networking
equipment for the
masses!



Thank you for listening.

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