Choosing MikroTik for Your Network

Faisal Reza

MUM ID – Yogyakarta - 2014

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MikroTik SUPPORT

About Speaker

Faisal Reza

Certified MikroTik Trainer & Consultant

profil lengkap :

http://imxpert.co/Trainer

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Kelas Training MikroTik

Kelas Reguler & Personal

- Kelas terdiri minimum 4 peserta
- Peserta merupakan professional atau perorangan
- Waktu pelaksanaan mengikuti jadwal kegiatan training yang akan dicantumkan di http://imxpert.co/Jadwal dan akan menunggu sampai kuota terpenuhi
- Tempat kegiatan dilaksanakan di ruang training, meeting room hotel, atau bootcamp
- Perangkat training disediakan oleh IMXpert

Students Group & Community

- Kelas terdiri dari minimum 10 peserta dan merupakan pelajar/mahasiswa/akademisi
- Peserta harus dari institusi yang sama
- Waktu pelaksanaan berdasarkan appoinment
- Tempat kegiatan training dilaksanakan di ruangan kelas, lab komputer sekolah/kampus yang bersangkutan
- Perangkat training disediakan oleh pihak sekolah/kampus
- Harga Training untuk pelajar/mahasiswa lebih terjangkau

Perusahaan / In House Training

- Kelas terdiri minimum 3 orang peserta
- Peserta merupakan professional di perusahaan yang sama
- Waktu pelaksanaan berdasarkan appointment (menentukan jadwal sendiri)
- Tempat kegiatan training dilaksanakan di perusahaan/instansi yang terkait
- Perangkat training disediakan oleh IMXpert
- Transport & akomodasi Trainer diluar Jakarta disediakan pihak Perusahaan
- Biaya training akan dikenakan pajak

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Program Kemitraan

Membuka kesempatan untuk menyelenggarakan training MikroTik di kota Anda.

Proposal kemitraan dapat di download di :

http://goo.gl/UmejXk

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MikroTik launch new products regularly

- New line of products for different puropses

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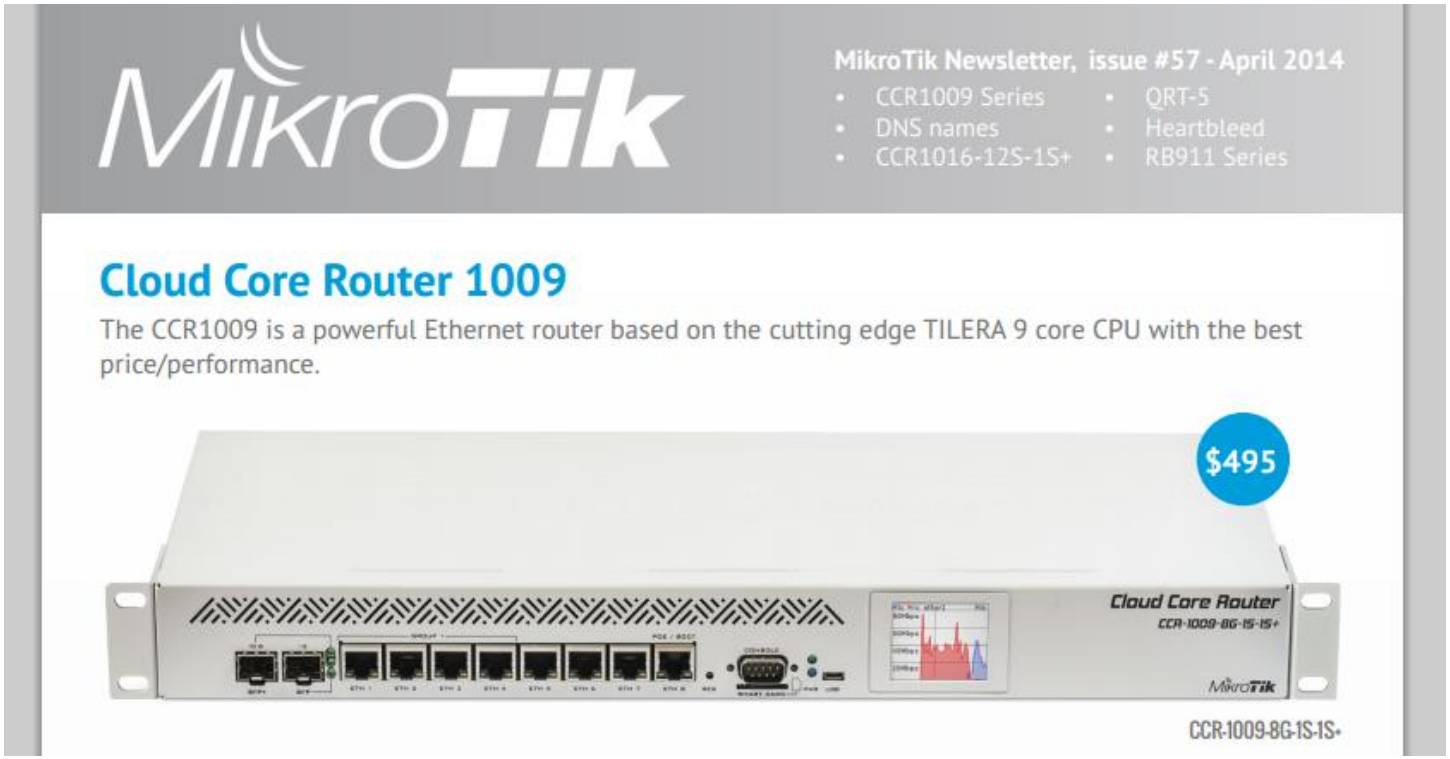
Always have something new

- April Newsletter - Router



- May Newsletter - Antenna

MikroTik

MikroTik Newsletter, issue #58 - May 2014

mANT30

mANT30 is a professional class 5 GHz 30dBi dish antenna, built to the highest industry standards. Built to seamlessly accomodate our Basebox series products, but can be used for any pole mounted wireless device due to the adequate length of the included FlexGuide cable.

Two antennas are available, with **a standard type mount (MTAD-5G-30D3)**, and with **a precision alignment mount (MTAD-5G-30D3-PA)** that allows for more precise vertical, and also horizontal alignment, without rotating the mount on the pole. The antennas come packaged with all necessary accessories and cables.

FlexGuide included

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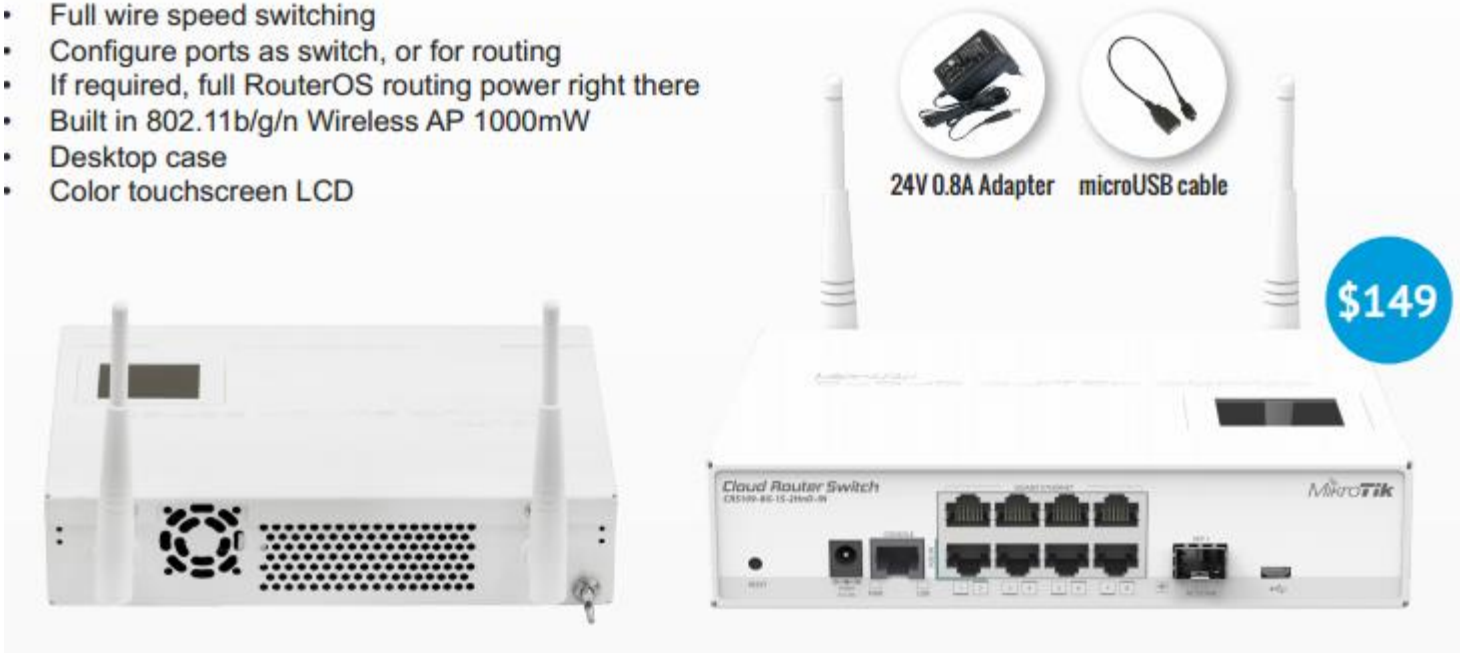
- Wireless Device

- Multifunction Switch

CRS 8 port series

CRS109 has eight Gigabit ports and one SFP port, it also has a built in Wireless Access Point. Our CRS series combines the best features of a fully functional router and a Layer 3 switch, is powered by the familiar RouterOS. All the specific Switch configuration options are available in a special Switch menu, but if you want, ports can be removed from the switch configuration, and used for routing purposes

- Full wire speed switching
- Configure ports as switch, or for routing
- If required, full RouterOS routing power right there
- Built in 802.11b/g/n Wireless AP 1000mW
- Desktop case
- Color touchscreen LCD



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So how to

Choose the right MikroTik for your network?

Know your network

- How big it is?
  - How many users?
  - How many branch or point of presence?
  - Will it be expanded?
- How much traffic will flow through your network?
- If there are existing network, any issues in current environment? Eg. Congestion, bottleneck, slow.

Know your application

- What kind of application will rely on your network?
- Application characteristics
    - demand low latency?
    - need high troughput?
    - have small / big packet size?
    - have minimum bandwitdh requirement?

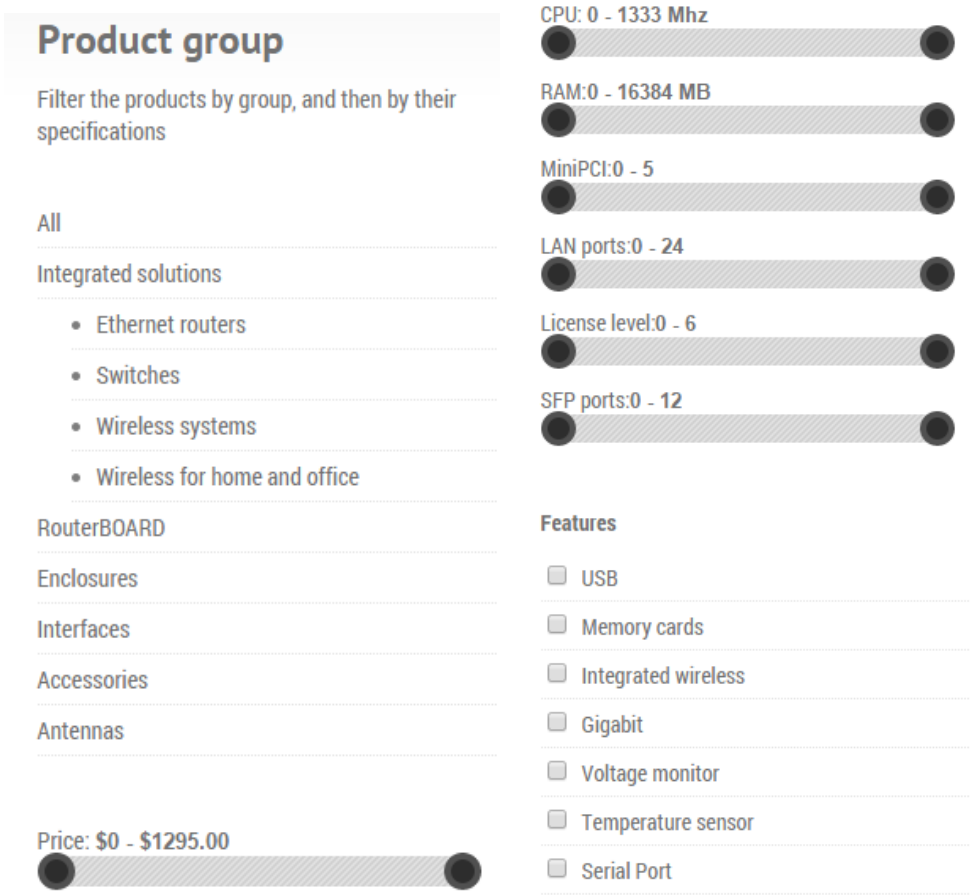
Know features you want to implement

- Do you need routing or switching?
- Do you need wireless interface?
- What services do you run? eg. PPPoE server, Hotspot
- Do you need encryption? eg. IPSEC
- Require special protocol? eg. ISIS
- Require specific security standard? Eg. PCI DSS

Where to begin?

Go to **www.routerboard.com**

is always a good start



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Identify Device features

> CPU / Processing Power

> Memory

> Interface type & Interface speed

> Wireless Speed & protocol standard

> Expansion Slot

> Device extra feature

> Designed Capacity

CPU / Processing Power

- Impact on troughput
- Impact on latency
- When running services, impact on how many user that you can serve

Based on implementation experience :
400 Mhz for 5-10 Mbps traffic
600 Mhz for 10 – 20 Mbps traffic
720 Mhz for 20-40 Mbps traffic
1066 Mhz for traffic < 100 Mbps
1.2 Ghz & multicore for higher traffic

Memory

- Impact on features (logging, queues, webproxy, hotspot)

RouterOS use just small amount of RAM,
But other features like queues, log, webproxy, firewall will eat memory

Interface type

All ethernet type minimum 10 Mbps

- Fast Ether (up to 100 Mbps speed)
- Gigabit Ether (up to 1 Gbps speed)
- SFP (up to 1 Gbps speed)
- SFP+ (10 Gbps speed)

Wireless Standard

Wireless standard - impact on troughput :

802.11a - 54 Mbps (rarely used)

802.11b – 11 Mbps (obsolete)

802.11g – 54 Mbps (obsolete)

802.11n – 150 Mbps (SISO) – 300 Mbps (MIMO)

802.11ac – 844 Mbps

Wireless procotol – impact on latency and link quality over distance :

802.11

nstreme

Nv2

Caveat :

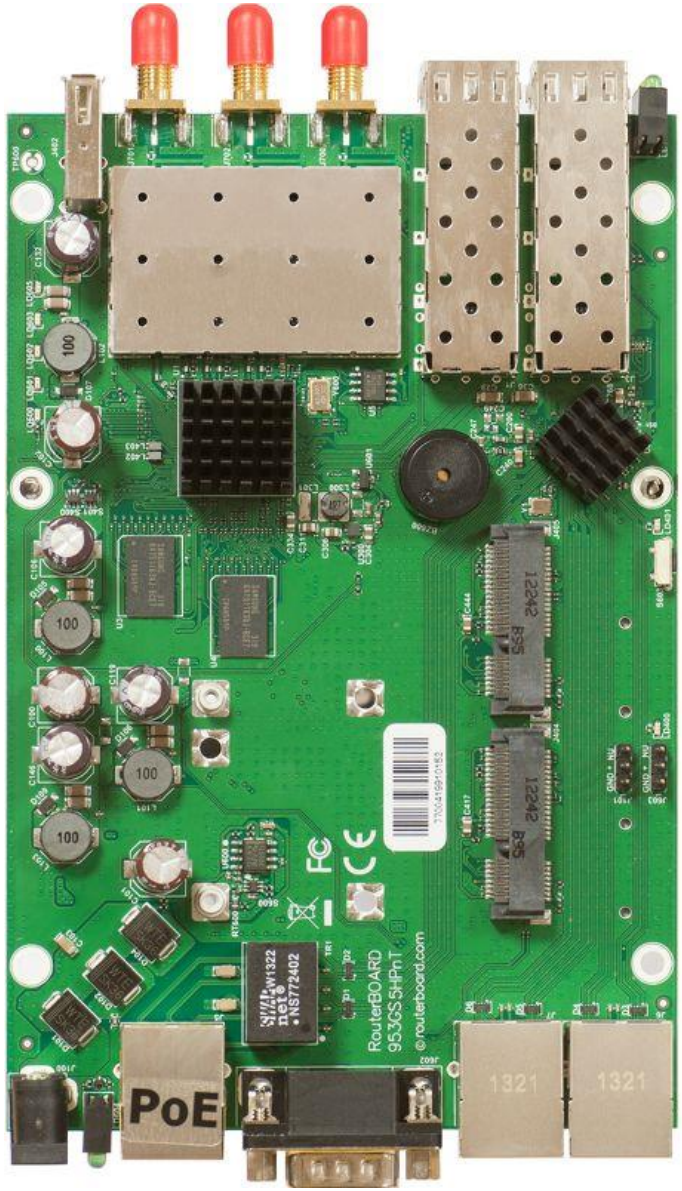
Wireless data rate is theoritical speed, it has never achieved in the real network

Expansion Slot

RB RB953GS-5HnT-RP

Simply has it all!!

3x Gigabit Ethernet, 2xSFP cage, built-in 5GHz 3x3 MIMO wirelss, 2x miniPCI-e, 2x SIM, USB, 3xRPSMA connectors



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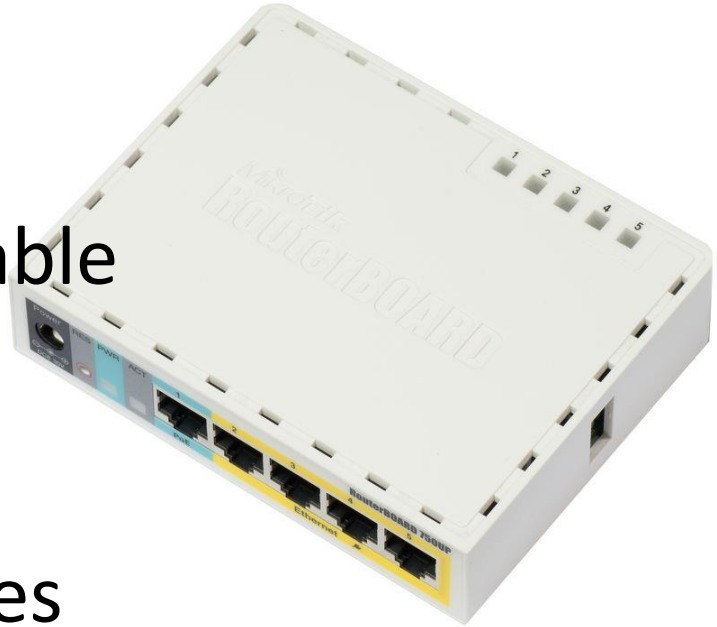
Power Features

RB-750UP

PoE In

Recive power via ethernet cable



PoE Out

Supply power to other devices

Ports 2-5 can supply with the same voltage as applied to the unit. Less power adapters and cables to worry about! Max current is 500mA per port,

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Designed Capacity

Usually can get the information from products brochure :

http://i.mt.lv/routerboard/files/CCR1036-8G-2Splus-131030144844.pdf

Cloud Core Router

CCR1036-8G-2S+

Highest performance

8 mpps standard forwarding

41.5 mpps fastpath forwarding

(wire speed for all ports)

Up to 28Gbit/s throughput

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Case Study 1 :

Chain Hotel group

- One hosted application on Headoffice
  Hotel Property management system (using Citrix)
- Headoffice already 2 dedicated Internet connection
- Have 14 branch accross Java, Sumatra, Borneo
- Average 10 user in each branch access PMS
- Want resilient connection, if primary fail switch to secondary
- Several branch have minimum 1 dedicated internet connection, and option ASDL and 3G connection for backup
- Each site should connect securerly with vpn over internet encrypted using IPSEC

Sizing

Characteristic of application (using citrix)

- small bandwitdh 64-256kbps per concurrent connection, average 128k
- Need latency < 60 ms

Bandwitdh Needed

Head office :

Average 10 user per branch x 14 = 140 user x ~128 kbps = 17 Mbps on head office

Overhead for vpn tunnel 12% of total traffic = 2,4 Mbps

Recomended minimum dedicated internet = ~20 Mbps **per line**

Branch Office :

10 user per branch x 128k = 1280 kbps ~ 1.5 Mbps dedicated internet conection

Backup conection : 2 mbps ADSL should be enough

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Encryption

They want secure tunnel communication **using IPSEC,** we better choose routerboard device in head office and branch office that have dedicated encryption chip

The choice :

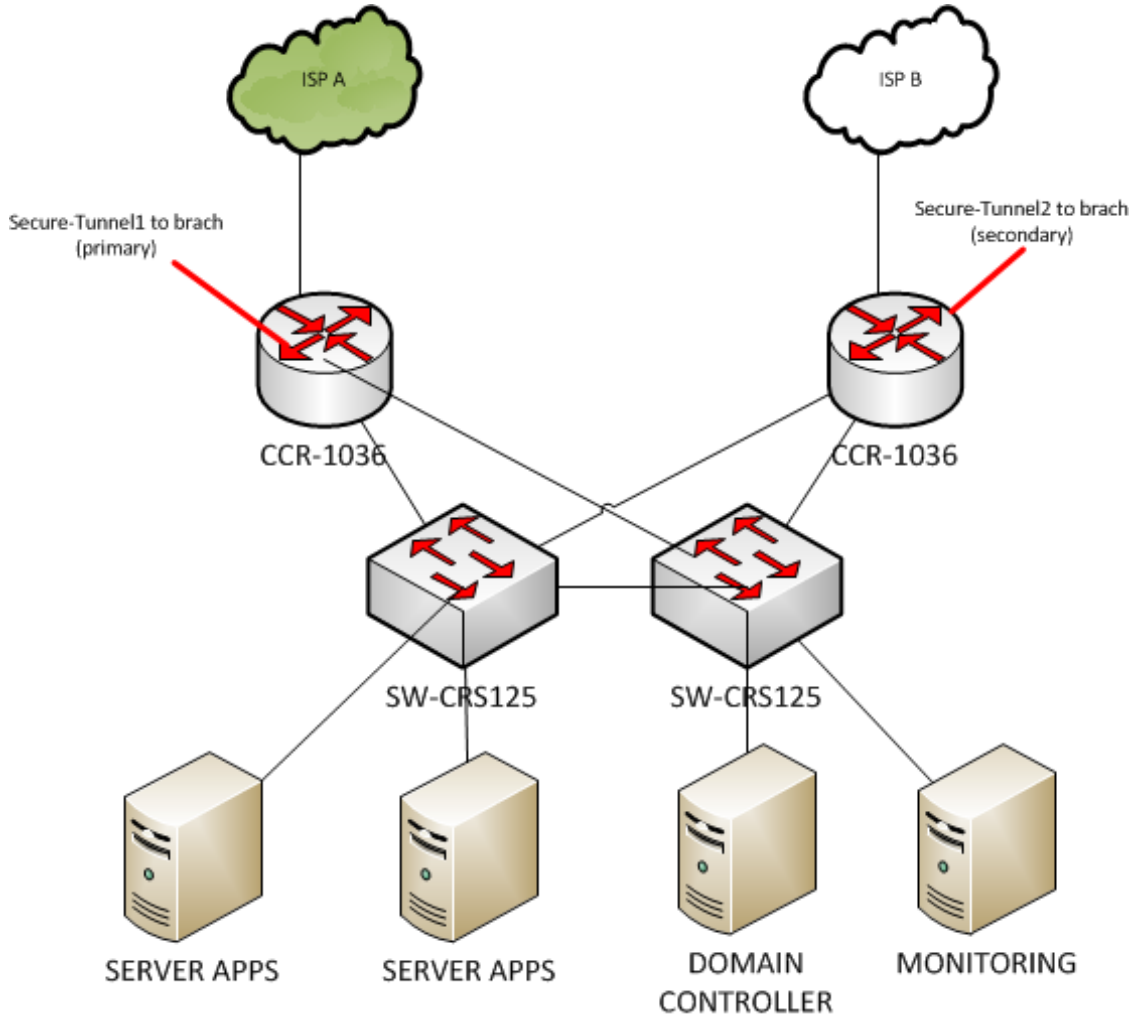
CCR series

RB1100 series, but in branch should also support 3G

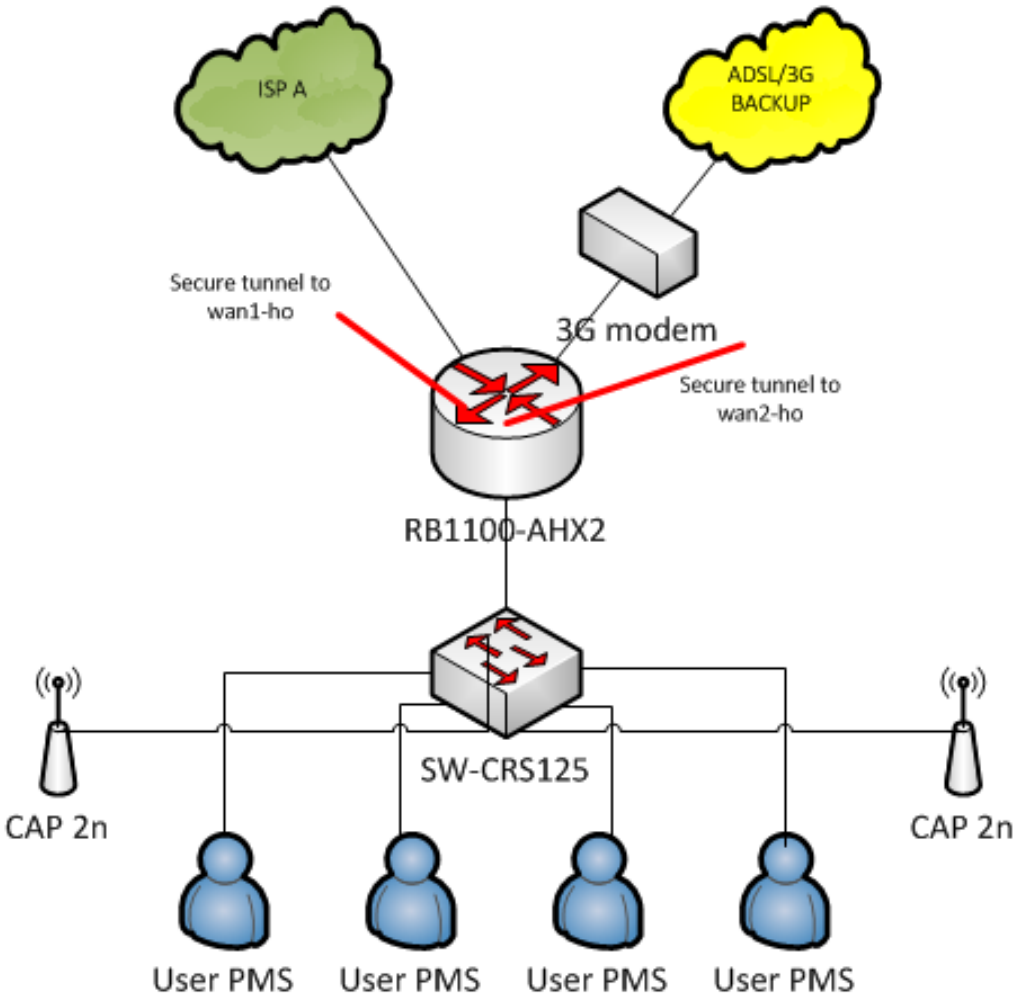
So we go with CCR-1036 EM in head office

and RB1100AHx2 with additional 3G router

Headoffice Diagram



Branch Diagram



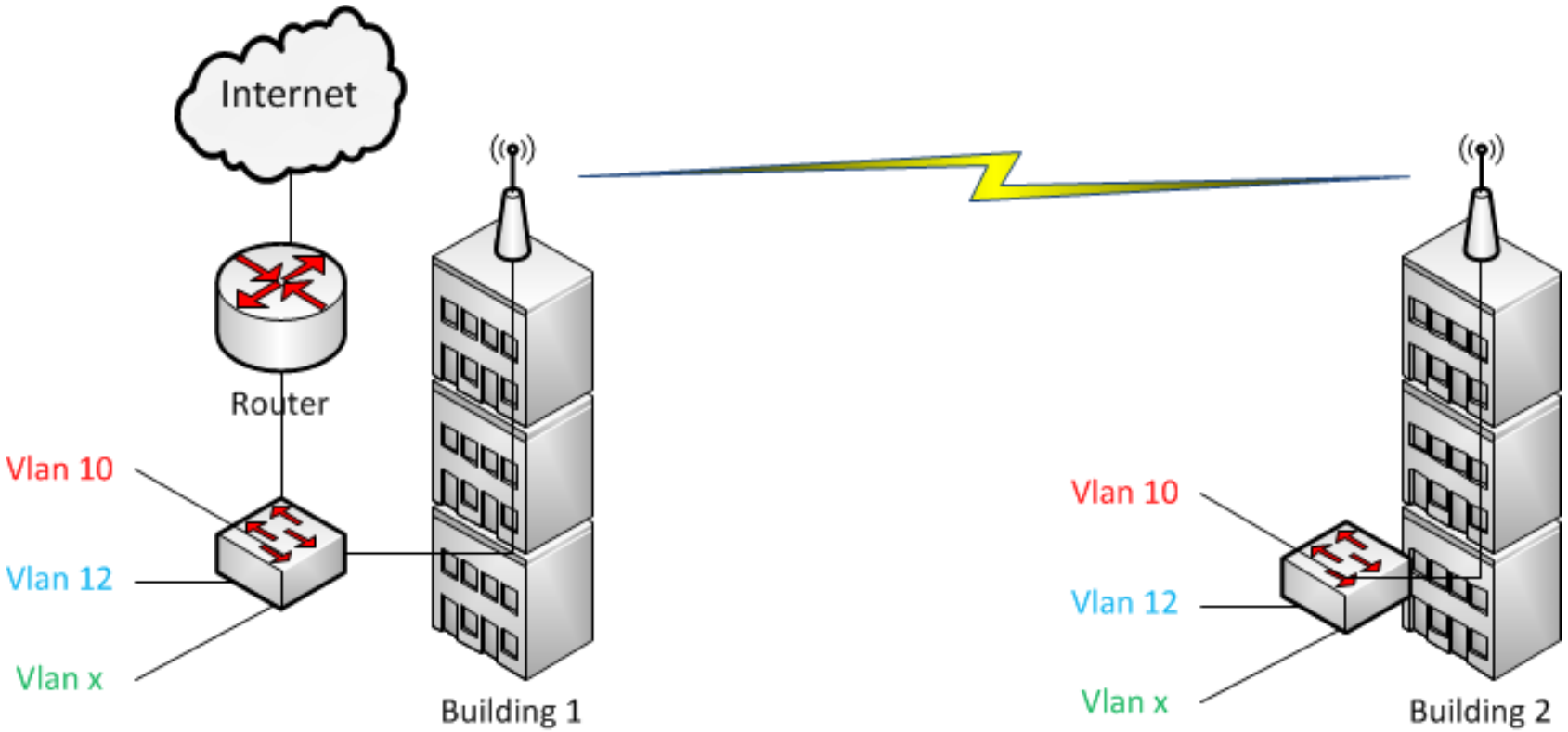
If the **IPSEC is not mandatory** and **aplication is using HTTP (web)**

- We can use RB1100AHx2 in Head office since traffic is less than 100 Mbps
- And use RB2011 in the branch office because traffic is not more than 10 Mbps and application is not latency sensitive
- We can remove 3G modem and put usb directly to RB2011

Case Study 2

- Engineering Company, have 130 workers
- Split into two buildings, separated by 1.5km
- They have 5 departement and separated network by vlan (server, IT, mgmt, staff, and guest)
- Want to interconnect between sites and apply the vlan rules
- There are file sharing server in building 1
- Main application is web based, and they also have IP phone for each workers.

Network Ilustration



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Sizing

- Application file sharing, need high troughput
- VOIP IP phone, small packet low latency
- Distance is 1.5 km, relatively near

Hardware to Choose

- Since the distance is near, SXT G 5HnD can handle this kind of situation, troughput maximum theoritical speed is 300 Mbps, and it has gigabit interace
- From real world experiece, real troughput is can achieve 70 Mbps full duplex, with signal strenght -55 dbi
- Nv2 is used to optimize the latency for voip
- We need transparent brigde for vlan trunking, so we can configure VPLS brigde over wireless

Need more Troughput

- Change the hardware configuration with higher stadard (802.11ac)

Since the distance is near, reduce TX power to avioid Noise

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I  discussion

reza@imxpert.co

PT. Asta Informatics

Jakarta, Indonesia
www.astainformatics.com

Menyelenggarakan In-house training MikroTik untuk Perusahaan dan Professional, Jasa Profesional Konsultan IT dan Sistem Integrator, Penyedia barang dan jasa layanan instalasi dan konfigurasi perangkat jaringan, server, storage, rack dan beragam kebutuhan IT perusahaan.

MikroTik Support

Jakarta, Indonesia -
www.mikrotiksupport.co.id

Melayani Jasa konsultasi, instalasi, konfigurasi dan dukungan teknis MikroTik. Beberapa alumni Training IMXpert juga berkesempatan untuk magang kerja sebagai professional di bidangnya dengan MikroTikSupport.co.id sebagai fasilitator

Thank you

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