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Municipal wireless network using mikrotik

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Municipal wireless

Introduction

Name : Mat Dawam Abas

: Landasan Teknologi (M) Sdn Bhd,
Kuala Lumpur, Malaysia.

Graduate : Telecommunication Engineer

Experience : Communication , Radar System, Oil Platform, Ship to Shore, Cellular Communication, Analogue/2G/ 3G

Mikrotik : Mikrotik Reseller since (end 2006),
Mikrotik Certified Trainer.(2009)

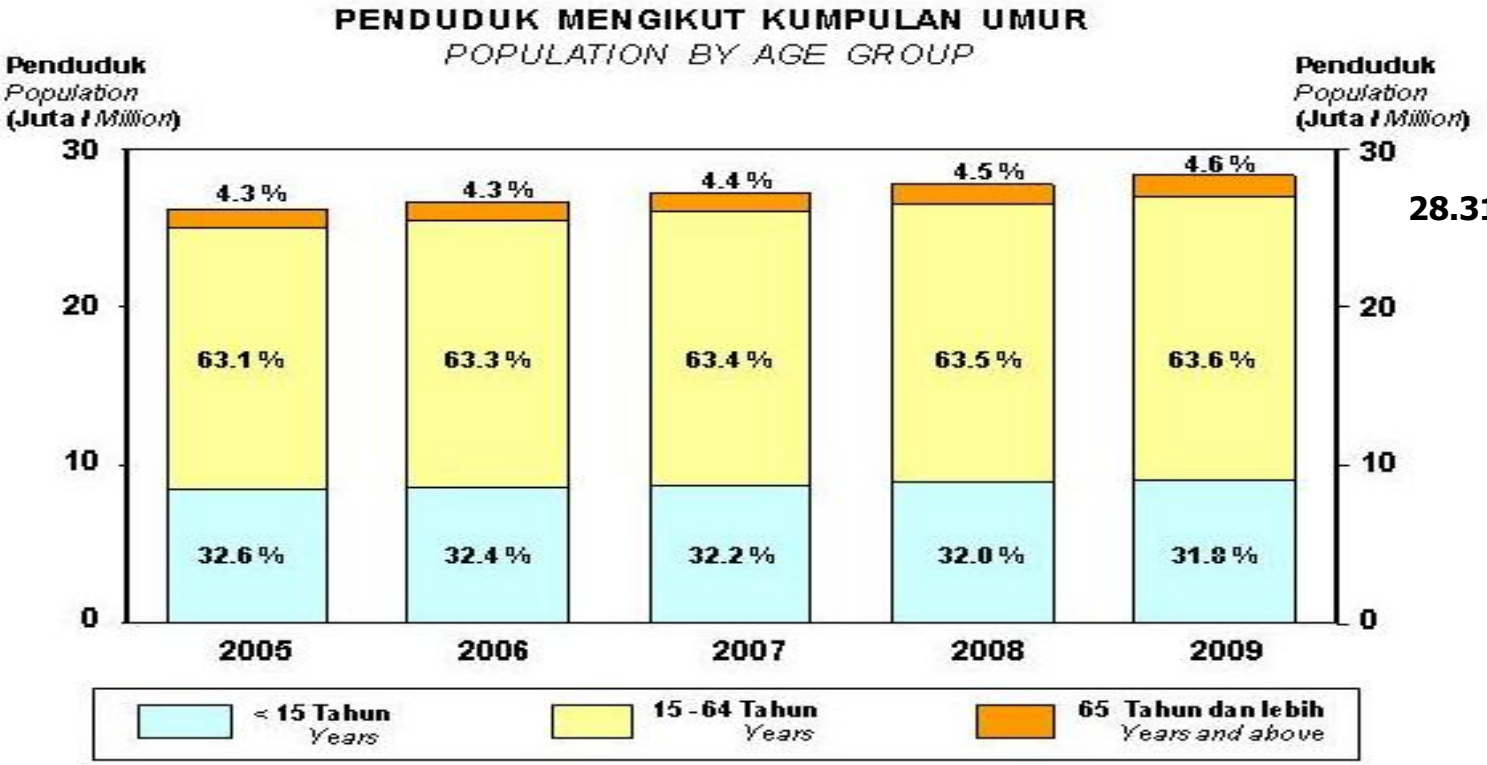
WISP partner with local ISP

Agenda

- Malaysia – broadband scenario some background
  - Statistics
  - Broadband developments & players
  - Licensing - Regulatory Framework
- Municipal wireless
  - Services, Business Model
  - Network topology
  - Typical installation
  - RouterOS function used
- Challenges

Maps -> Malaysia

Malaysia Statistic



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broadband agenda

household broadband penetration

2010

- **Plan – 50 % household broadband penetration**.
- **HSBB - High Speed Broadband**
  - high impact areas (10 Mbps and 1 Gbps).
- **BBGP - Broadband for General Population**
  - (2Mbps)
- **Government + Telekom Malaysia - RM 11.3 billion**

Early 2009

- **21.1% broadband penetration**

2008

- **Malaysia - 18 %**
- **Singapore - 78 %**
- **Hong Kong - 80 %**
- **Korea - 93 %**

2,789

broadband player

ISP's

- 20 + ISP's

ADSL wired technology

- Telekom Malaysia Bhd (TM)
  - owns 95% of the existing fixed line infrastructure

3G players

- Maxis, Celcom, U Mobile and DiGi

4 WiMAX (operator) License

- Packet 1, Redtone, YTL and Asiaspace

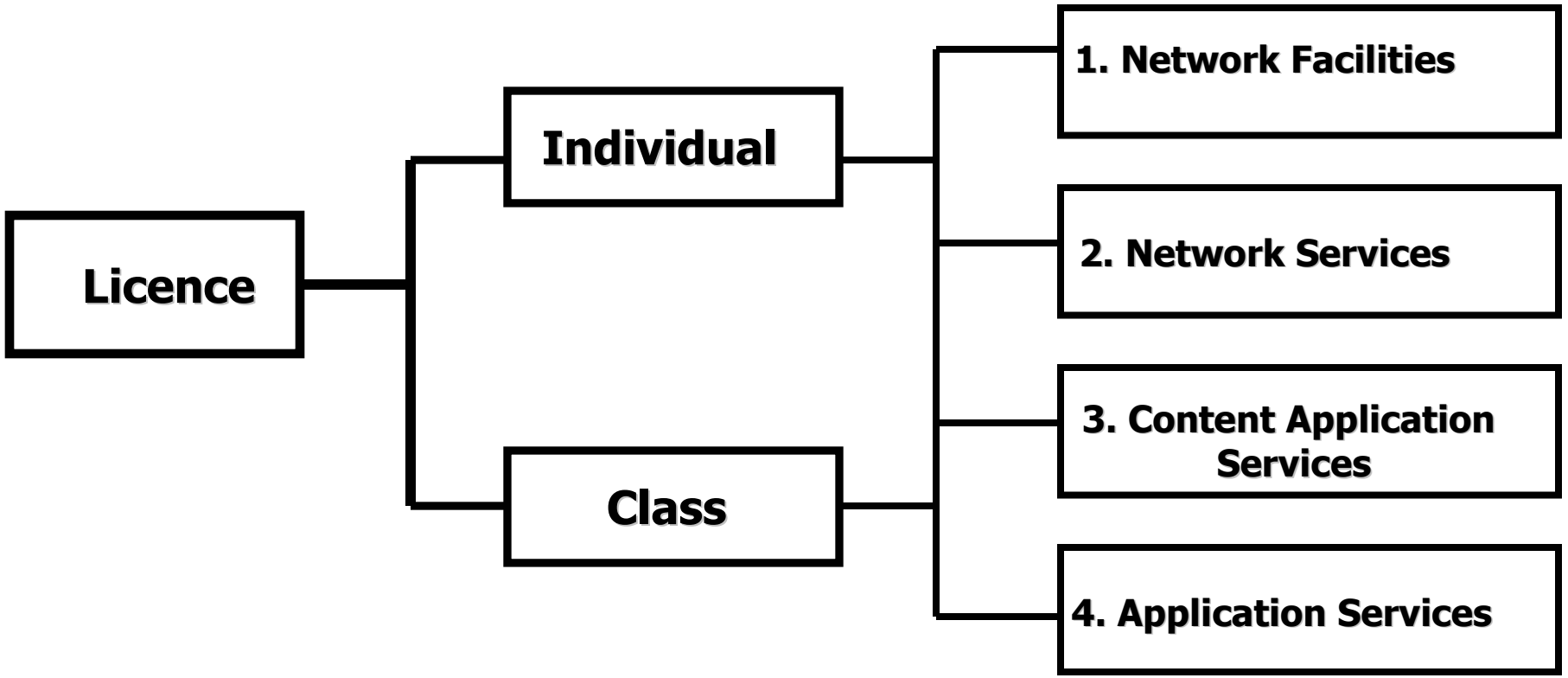
Regulatory Framework

LICENSE	INDIVIDUAL	CLASS
Network Facilities Provider (NFP)	88	12
Network Service Provider (NSP)	96	6
Application Service Provider (ASP)		255
Content Application Service Provider (CASP)	23	22
TOTAL	207	295

http://www.skmm.gov.my

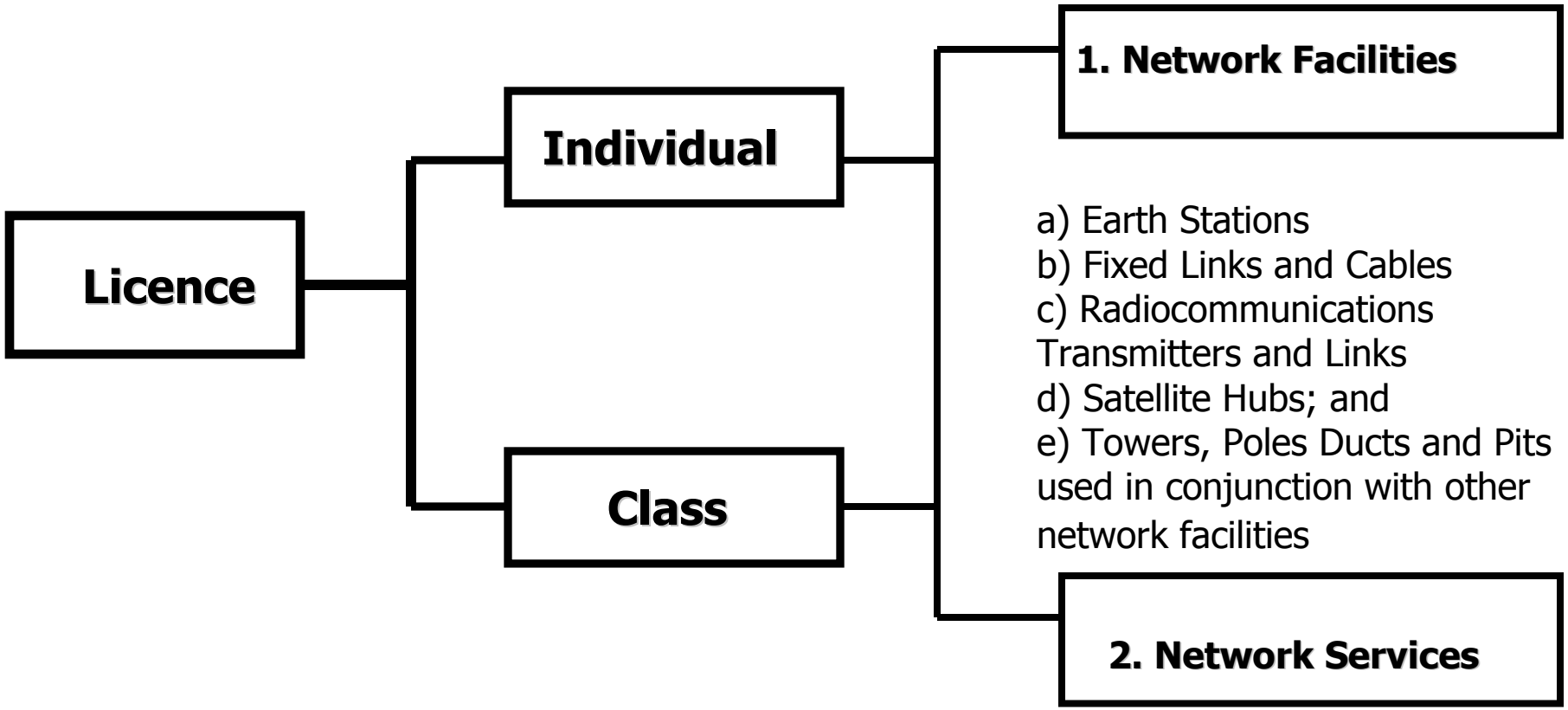
Regulatory Framework

Licensing Structure



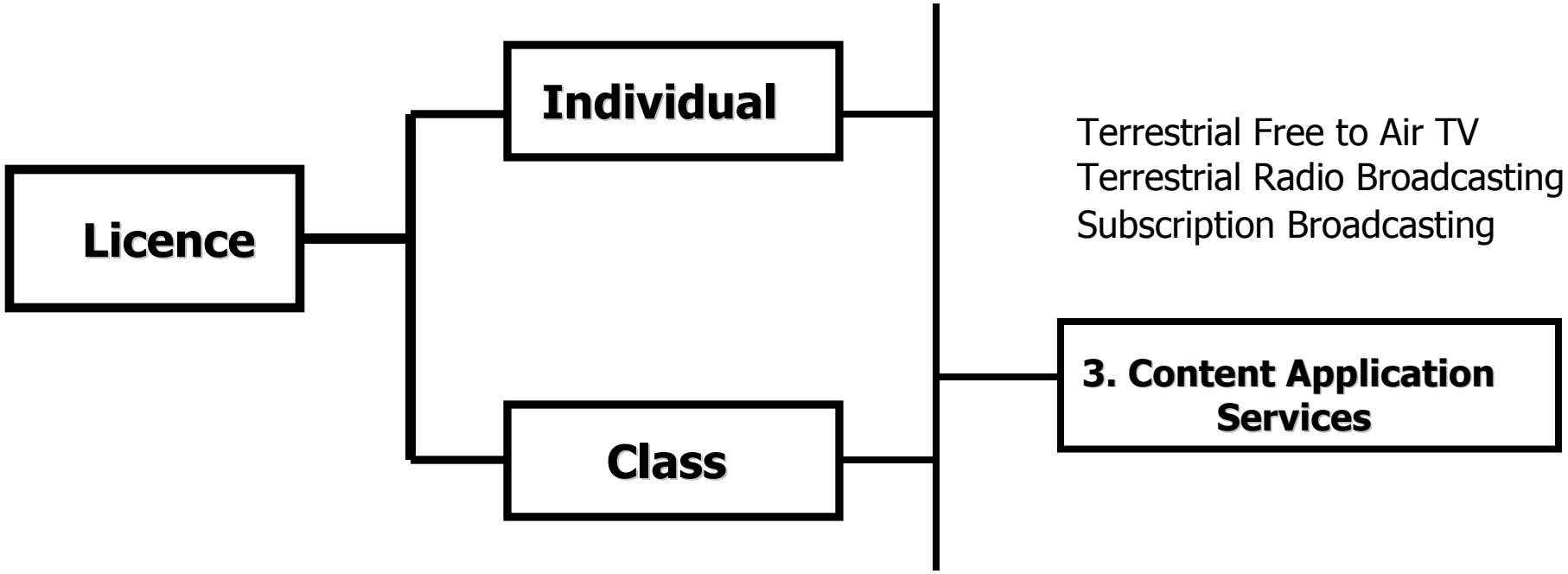
Regulatory Framework

Licensing Structure



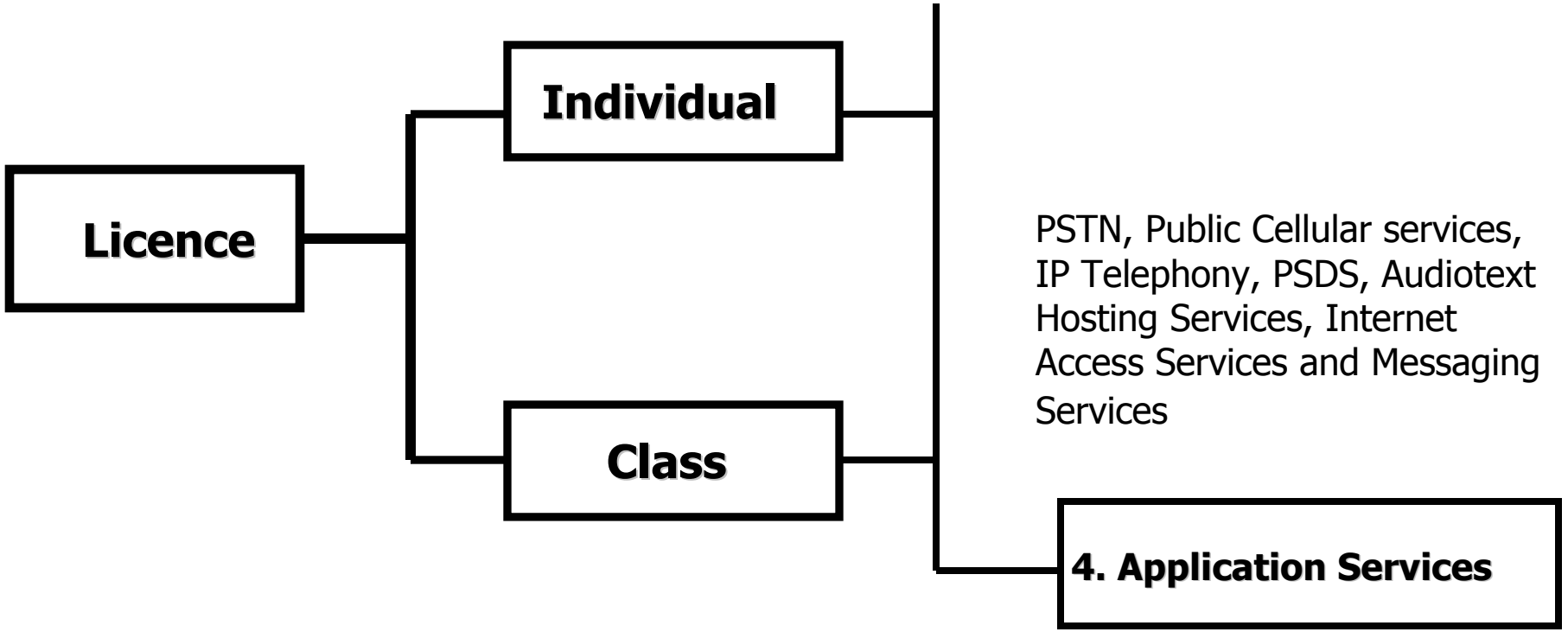
Regulatory Framework

Licensing Structure



Regulatory Framework

Licensing Structure



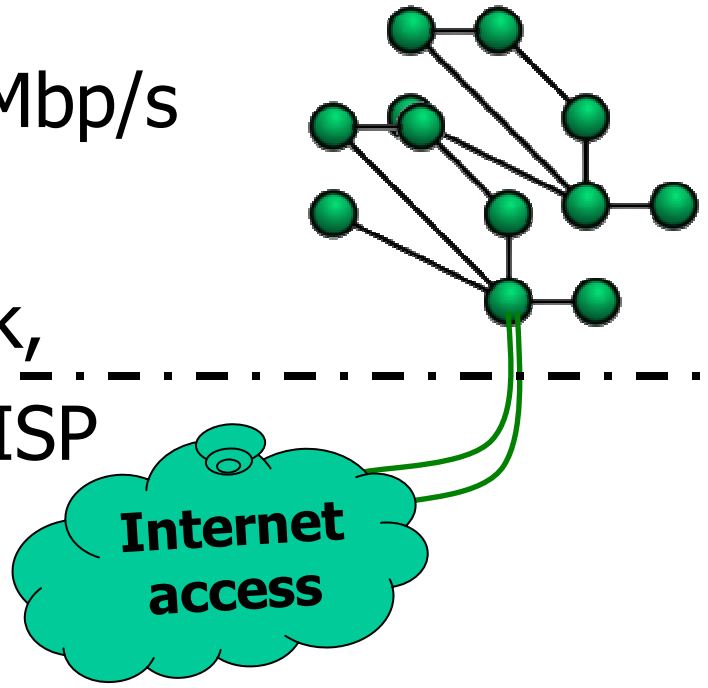
municipal wireless network

- 40 sq km
- Population - 500k
- Traditional town
- College – ~ 6 colleges

municipal wireless network

Powered by MikroTik

- 100 % Mikrotik equipment
- 100 % wireless 5Ghz and 2.4 Ghz band
- Services
  - PPPoE : 1 Mbp/s , 2 Mbp/s
  - Hotspot : 384kbp/s.
- We build last mile network,
- Radius, Billing system by ISP
- ISP provide bandwidth
- Revenue share



Hotspot Service

Coverage

campus, student area, public area

- zero configuration
- captive portal
- external radius (AAA)
  - "roaming "

Payment

- online registration, reseller
- payment credit card, local bank, reseller

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Hotspot Service

- user connect to SSID
- open browser
- captive portal
- enter username & password
- **Authenticated** thru external radius
- start using if **Authorized**
- **Accounting** start

Hotspot Service

- Speed 384k/384k
- Rates :
  - 1 day ($ 1.4 USD)
  - 1 month ($ 5.5 USD)
  - 3 month ($ 14 USD)

Hotspot Service

- Collaboration with campus
- We build hotspot infrastructure
- customized - Campus captive portal
- Campus user can roam using town hotspot service using same credential.
- Campus register and collect from student.
- Campus deposit $ top up.
- Revenue sharing with campus

PPPoE Service

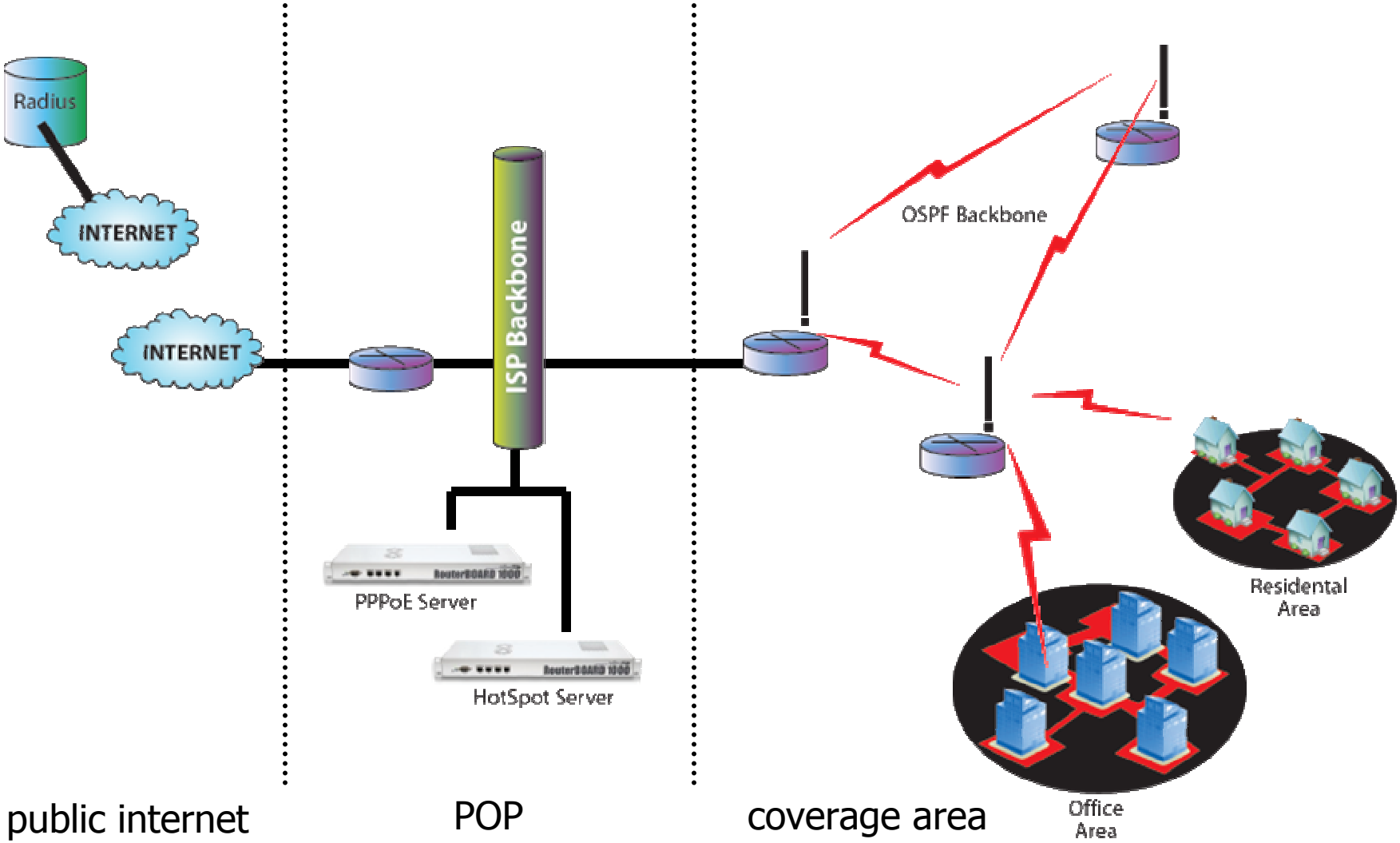
Coverage
Office and home user

- 1 Mbps/1 Mbps, 2 Mbps/2 Mbps
- 1 month ($ 23/34 USD)
- CPE (RB 112/133c/411),
  - PPPoE client, DHCP server in CPE
- Online registration, credit card, online banking, local bank.
- Through reseller

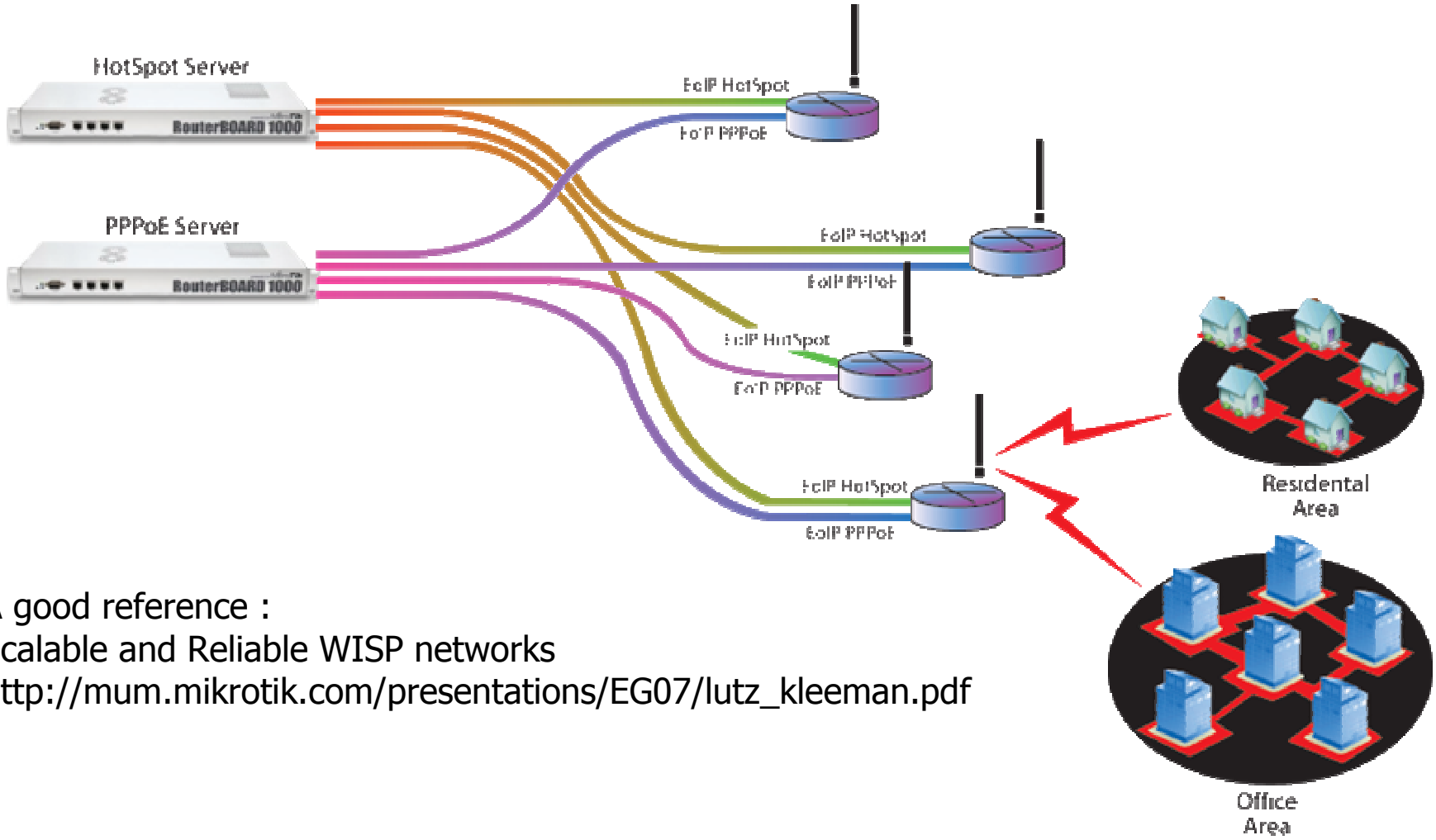
QOS

- Standard limit for service, control by ISP
- Queue tree based on traffic type
  - http, https
  - dns,
  - P2P
  - download byte
  - youtube , etc ..

Network Topology



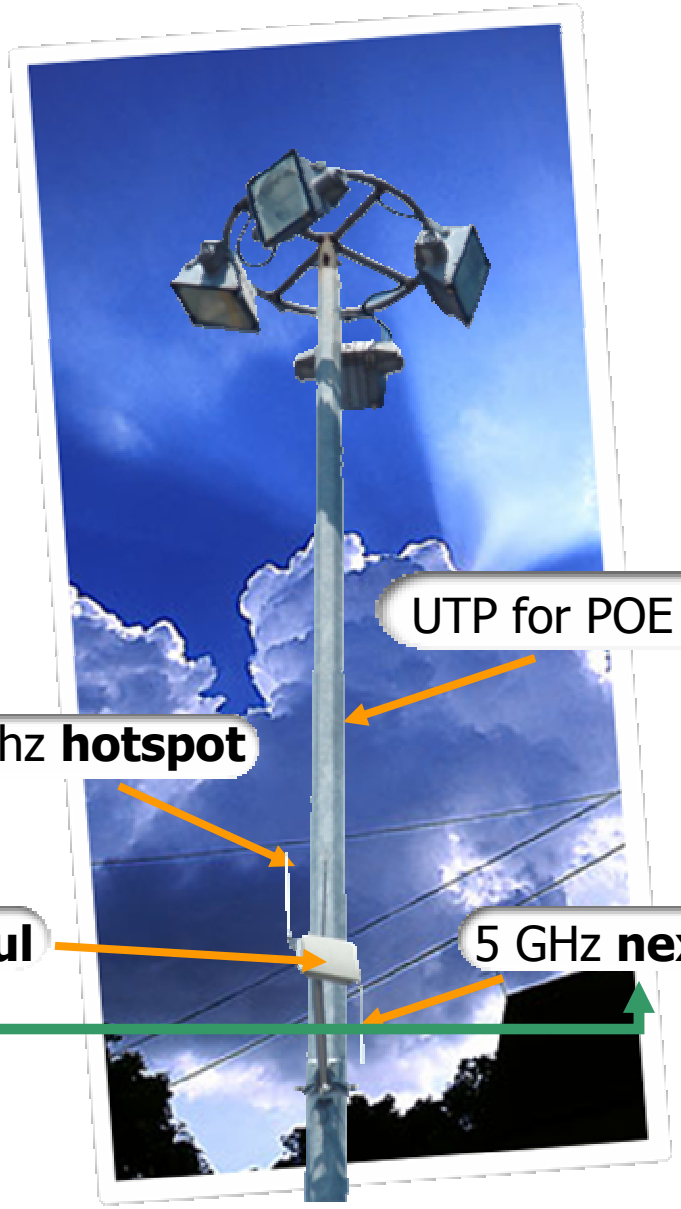
Using EoIP for PPoE & Hotspot



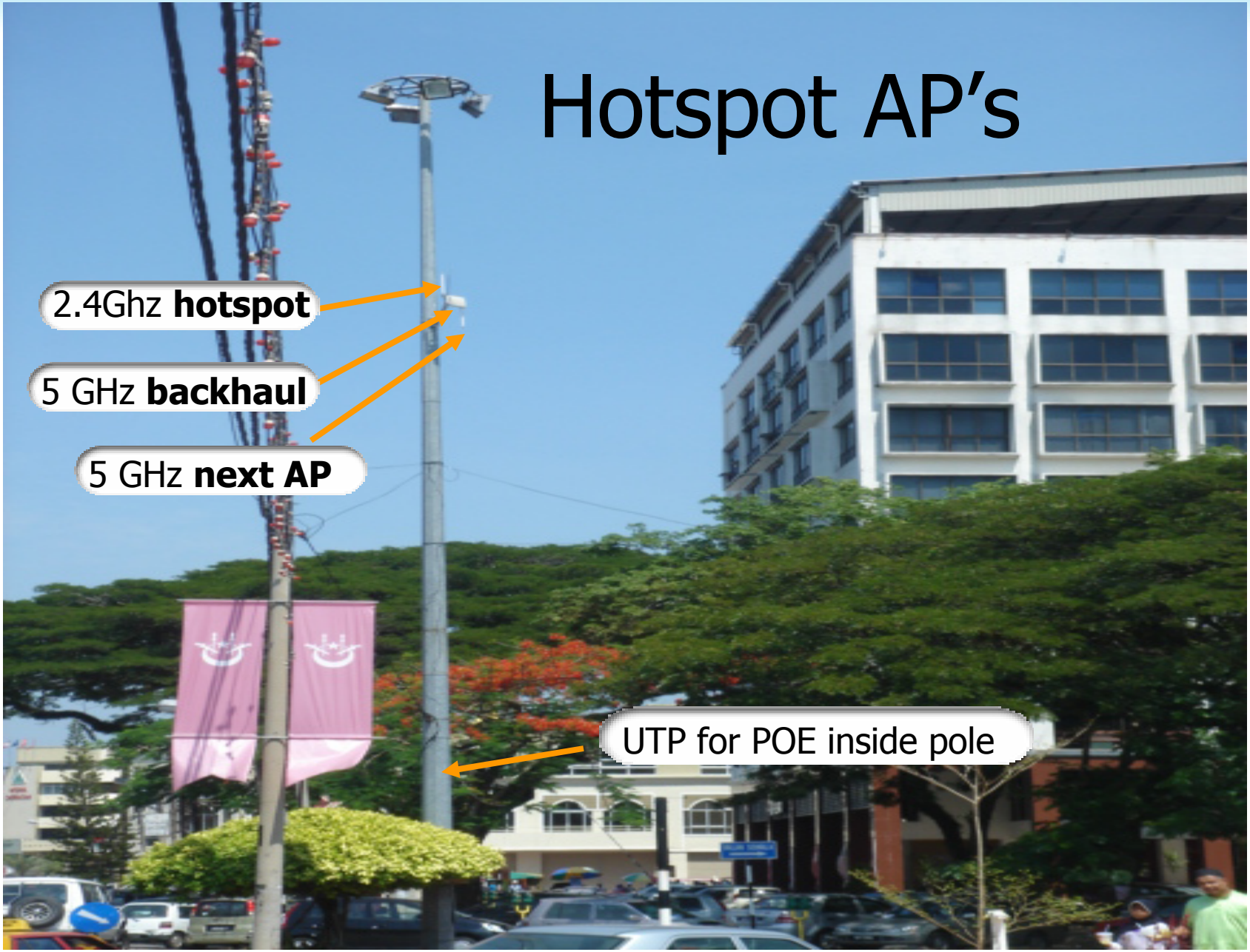
A good reference :
Scalable and Reliable WISP networks
http://mum.mikrotik.com/presentations/EG07/lutz_kleeman.pdf

Hotspot AP's

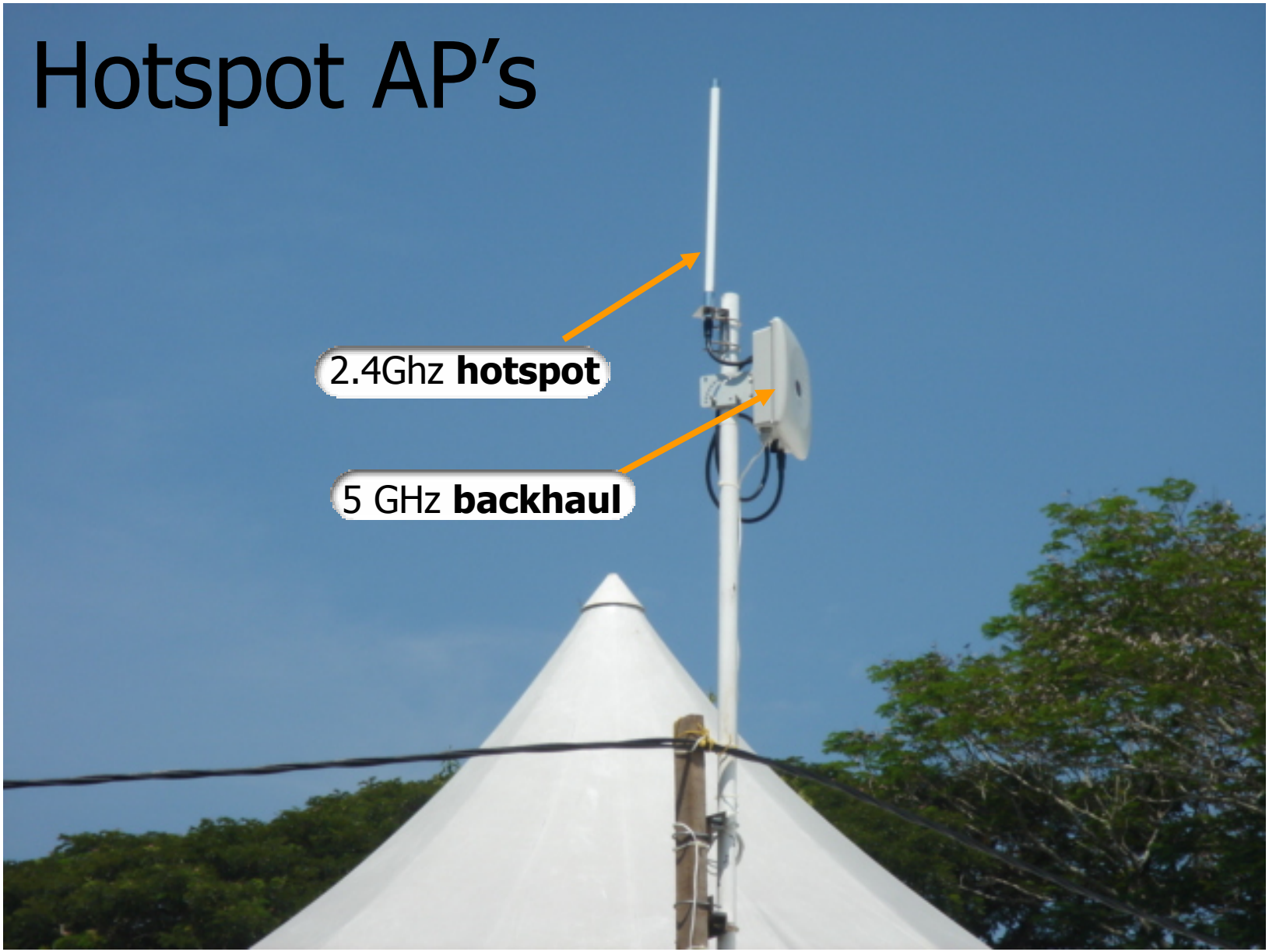
- Routed network
- EOIP for Hotspot
- OSPF
- 3 radio



Hotspot AP's


2.4Ghz **hotspot**
5 GHz **backhaul**
5 GHz **next AP**
UTP for POE inside pole

Hotspot AP's

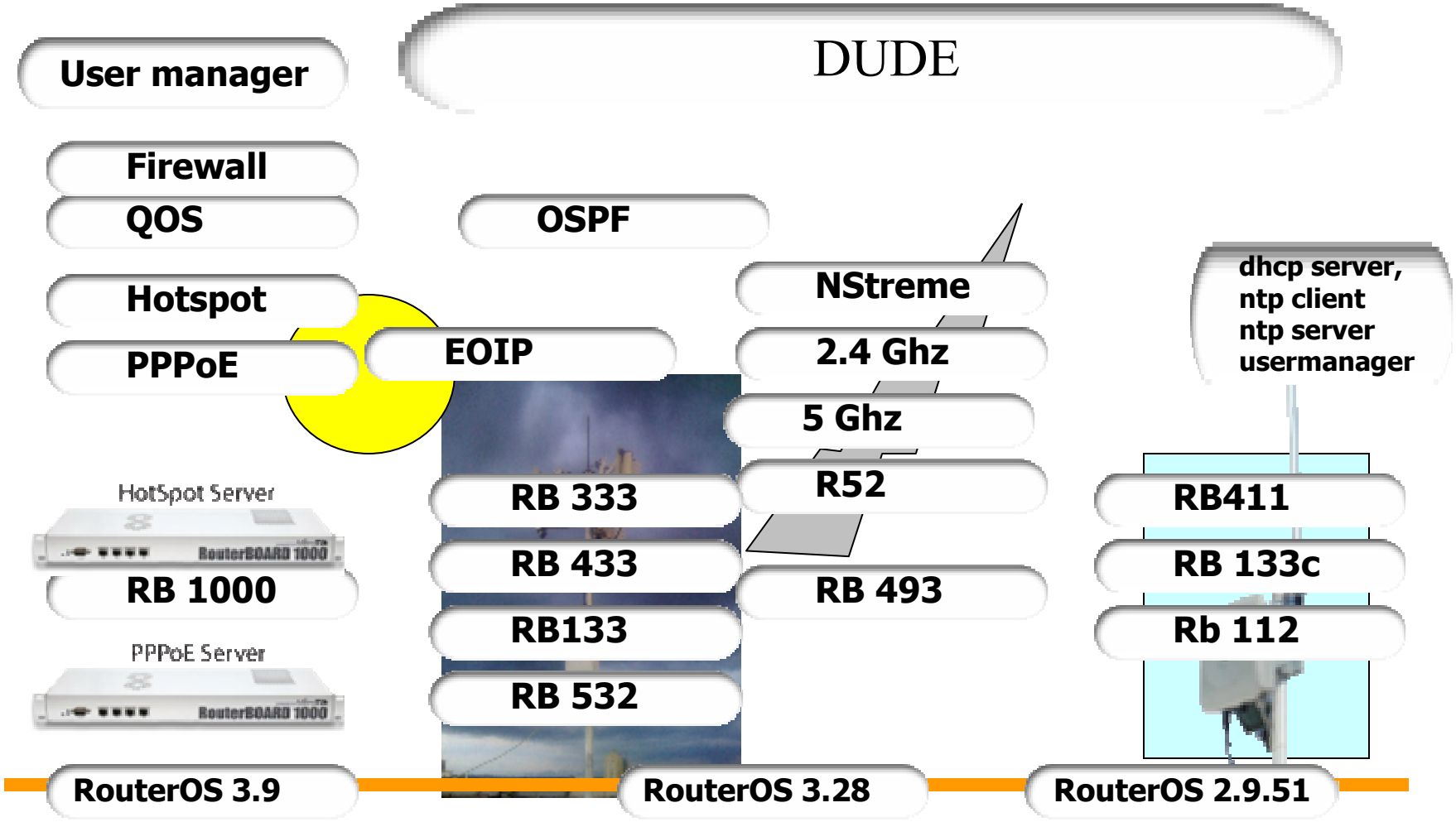


Hotspot AP's

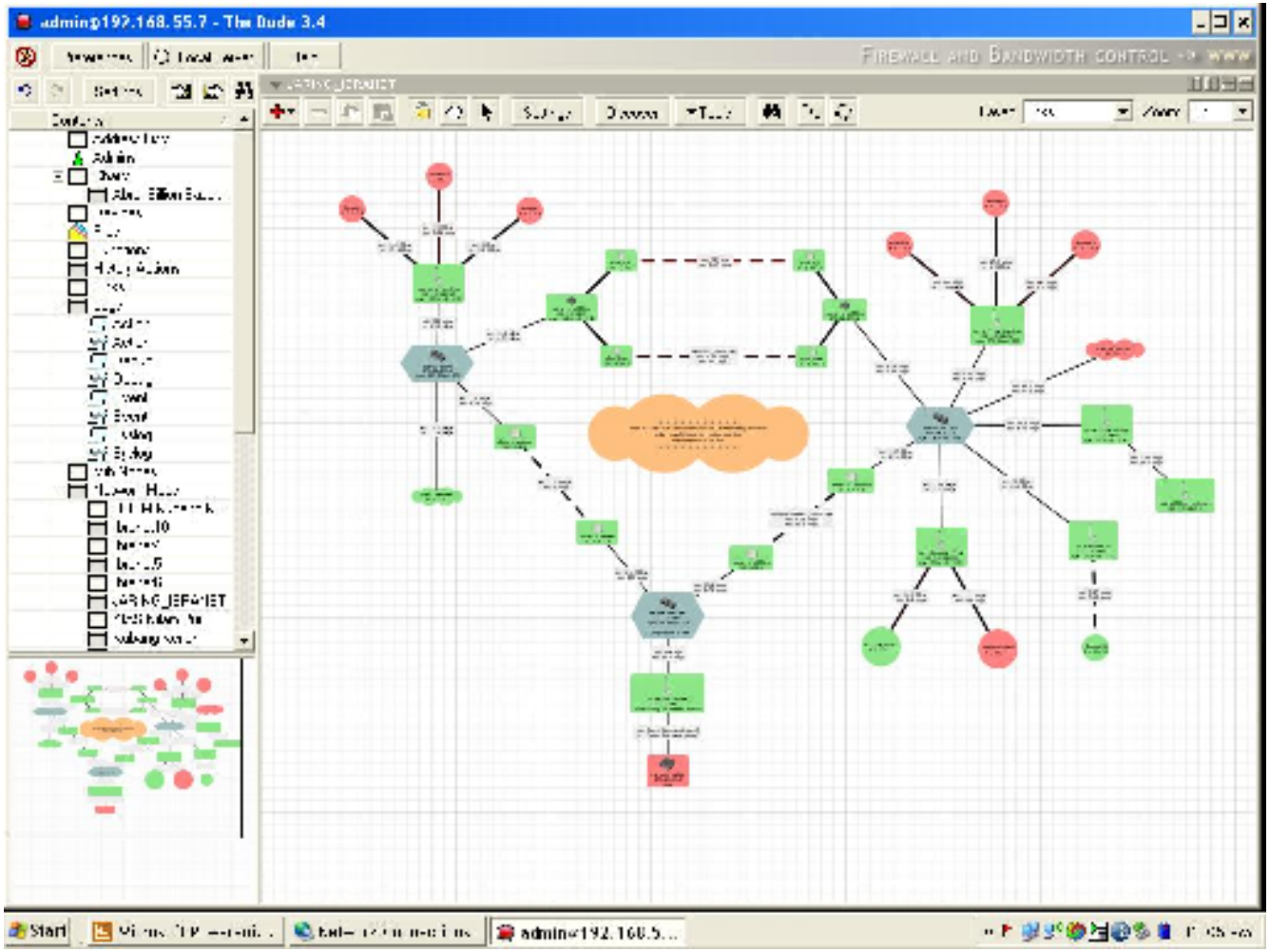
Client CPE's

- CPE- to customer
- Station mode,
  - Access list on AP's
  - TX limit
- PPPoE client, DHCP server on CPE.
- Client plug in Desktop/ Switch/Router direct to CPE
- Easy maintenance, eliminate client equipment troubleshooting.

Summary : Mikrotik solution we used



Mikrotik Solution – Dude



Mikrotik Solution – challenges

When we first started

- **Mikrotik ??**

Mikrotik Solution – today

After deployment

- Why , there's no customer complain from your network ??
- 8 university campuses
- 4 ISP's
- 10 corporate offices

- Few more towns looking at the model

Terima Kasih

Thank you