



Wi2 Solution



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Pre-Sales Manager

April 2009

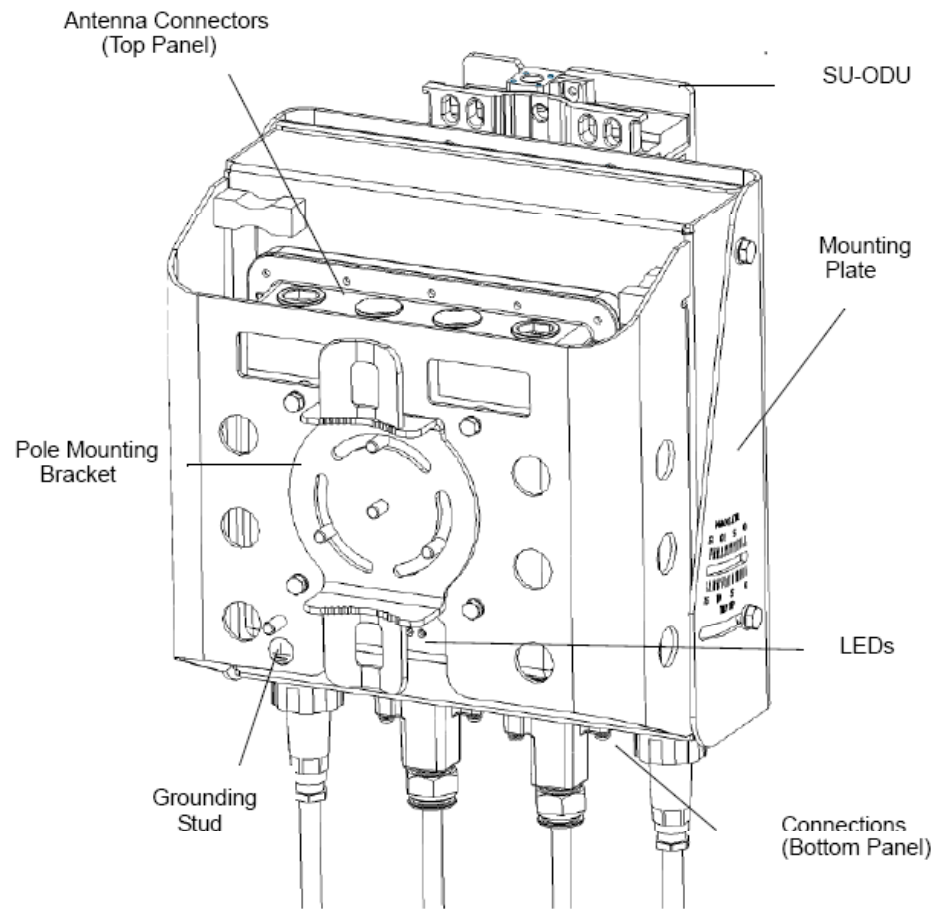
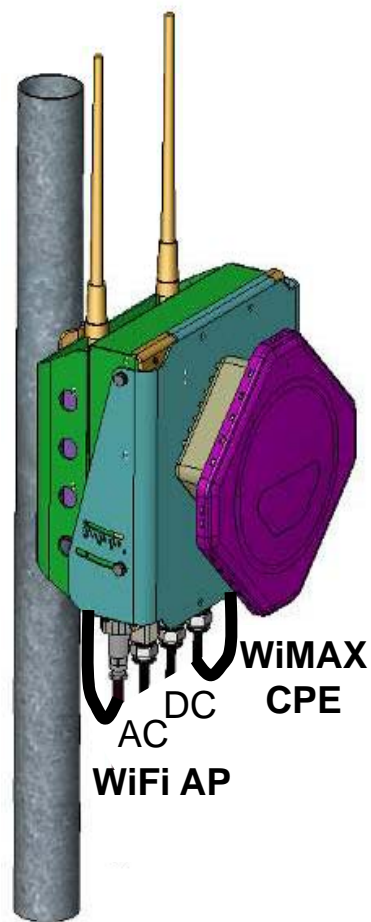


Alvarion Wi² solution

Wi² according to Market Segmentation

Alvarion Wi² Next Generation Solution

Wi² Solution



**WiFi unit - 802.11b/g AP, all outdoor robust IP-67 solution
Over 20Mbps net per AP, max TX power 20 dBm @ antenna port**

Backhaul CPE - BMAX PRO-S or BreezeACCESS VL, outdoor



Basic unit



**Pole/wall mounting
accessory**

Up/down tilting

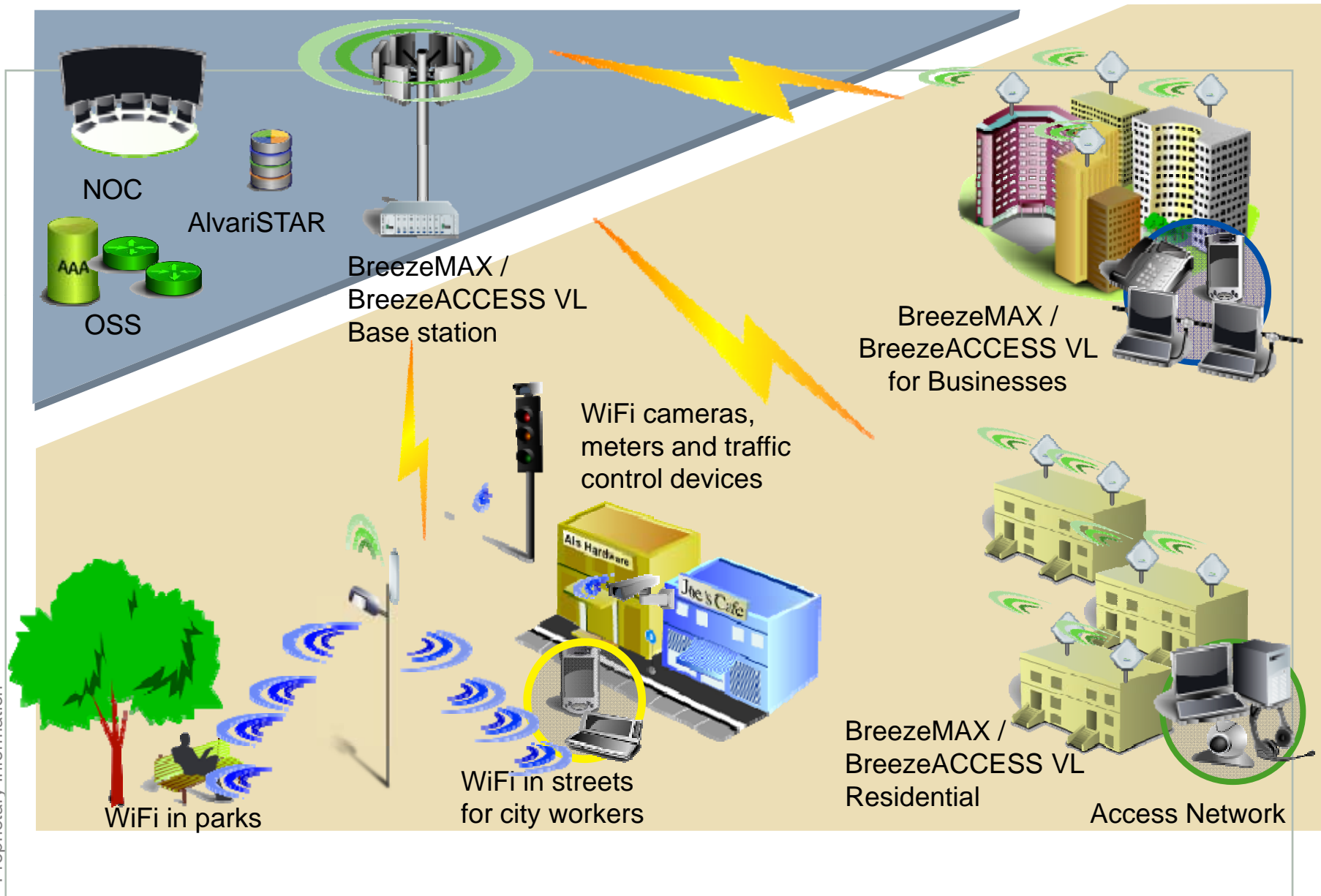


Alvarion Wi² solution

Wi² according to Market Segmentation

Alvarion Wi² Next Generation Solution

Existing WiMAX Customer



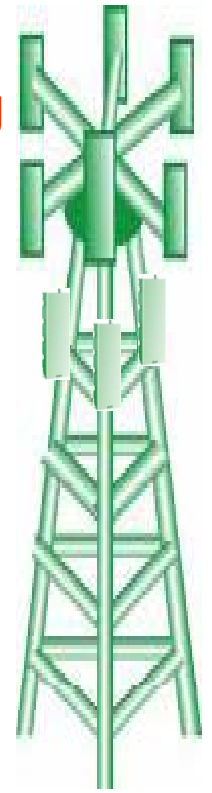
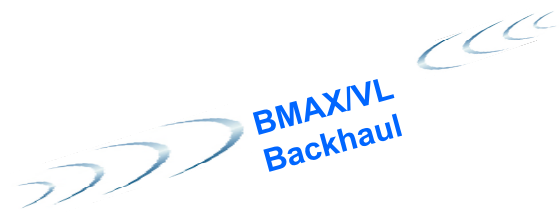
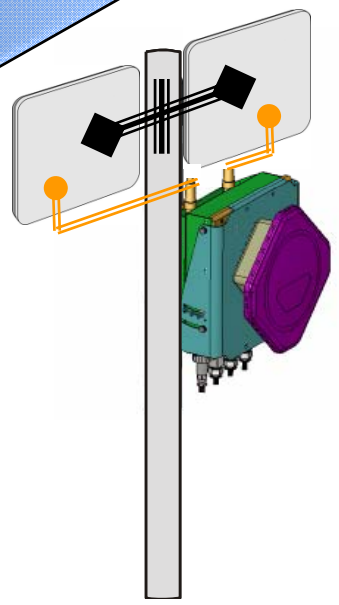
Proprietary Information

In-Building WiFi Coverage using Wi² hotspot
WiFi 802.11b/g

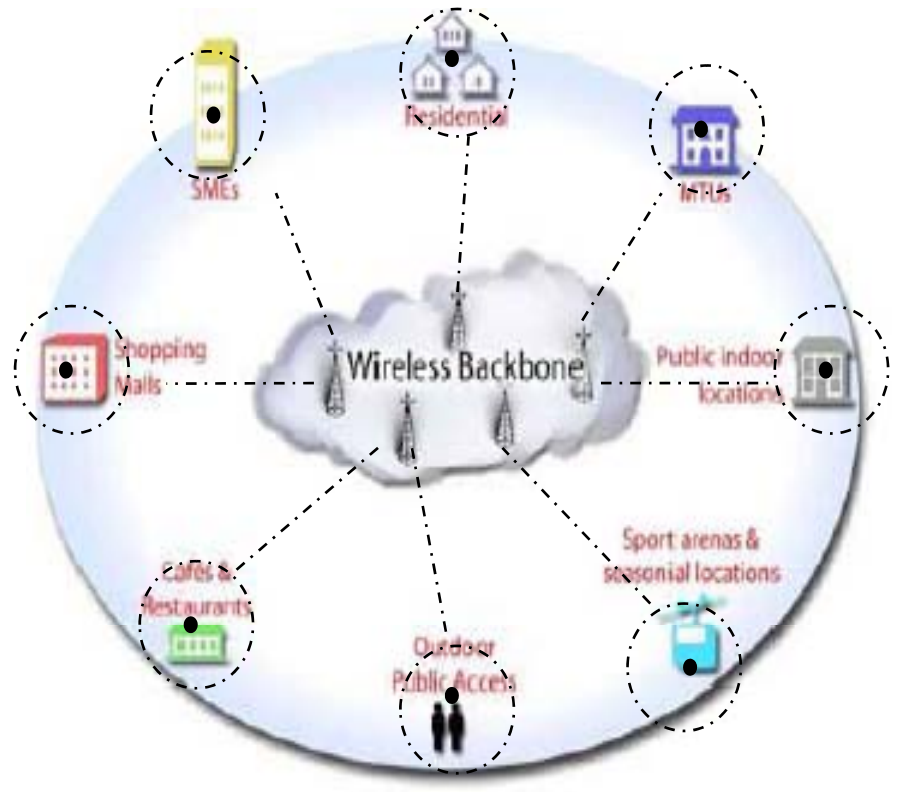
- ⇒ **Low Cost basic voice / data solution to apartment building**
- ⇒ **Improve performance using inexpensive window antenna**



Directional high gain WiFi antennas



- Coverage of a specific area using several APs
- Increase personal efficiency
- Mobility / portability
- Access where-ever and when-ever
- Easy to get and use
- Affordable prices
- Good Security
- Reliable services
- Fast connections



Proprietary Information



American Football Stadium



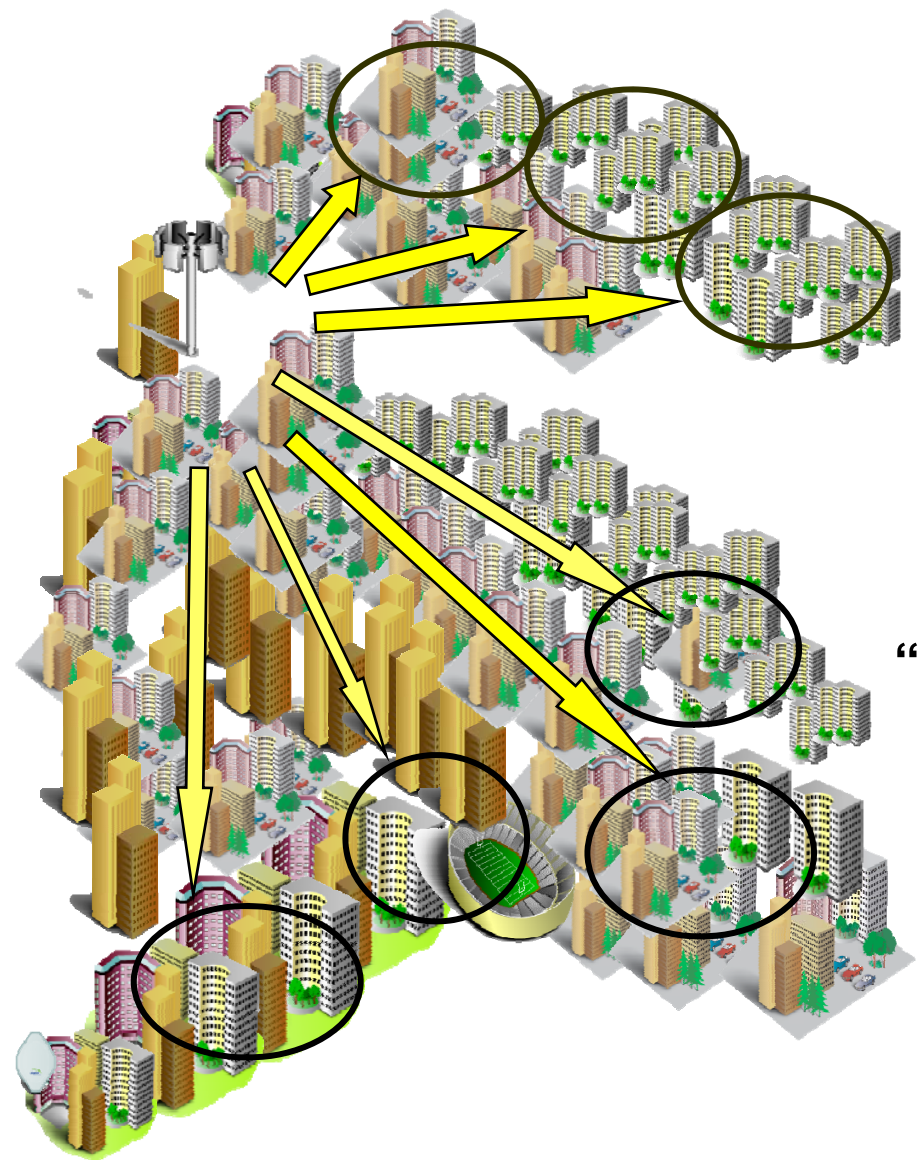
Cafe



Shopping Center / Mall



On the Park

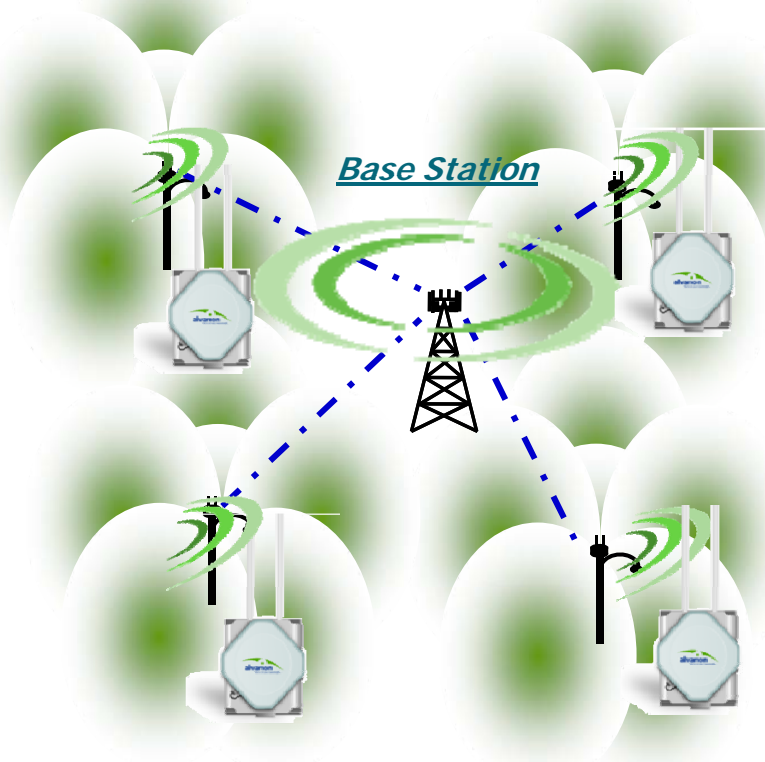


- ✓ PtMP network architecture
- ✓ Easily deploy multitude of Hot Zones
- ✓ Converge WiFi access with WiMAX QoS

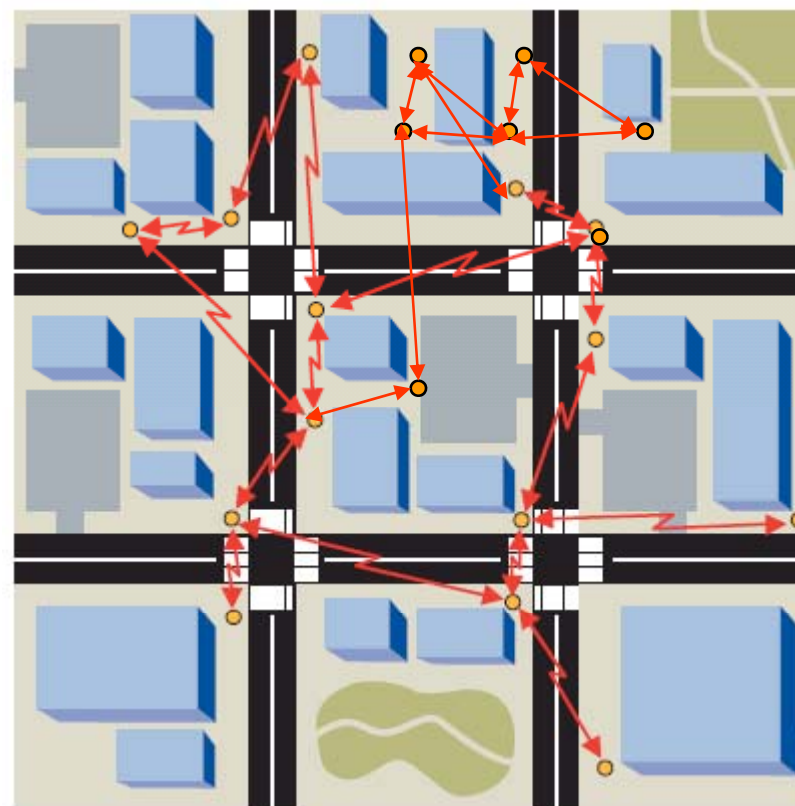
“Wireless” Municipality Applications

- Public Internet access
- Video surveillance
- Traffic management
- Outdoor workers
- Public safety
- Various nomadic applications

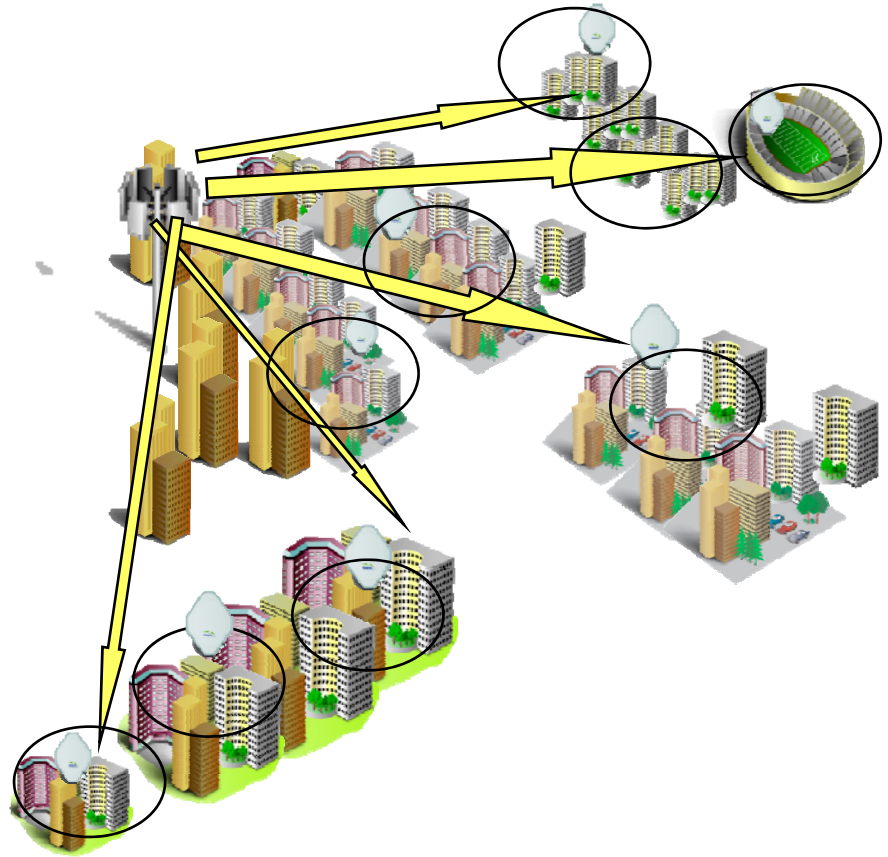
Star Solution Using Wi2



Traditional Mesh Solution



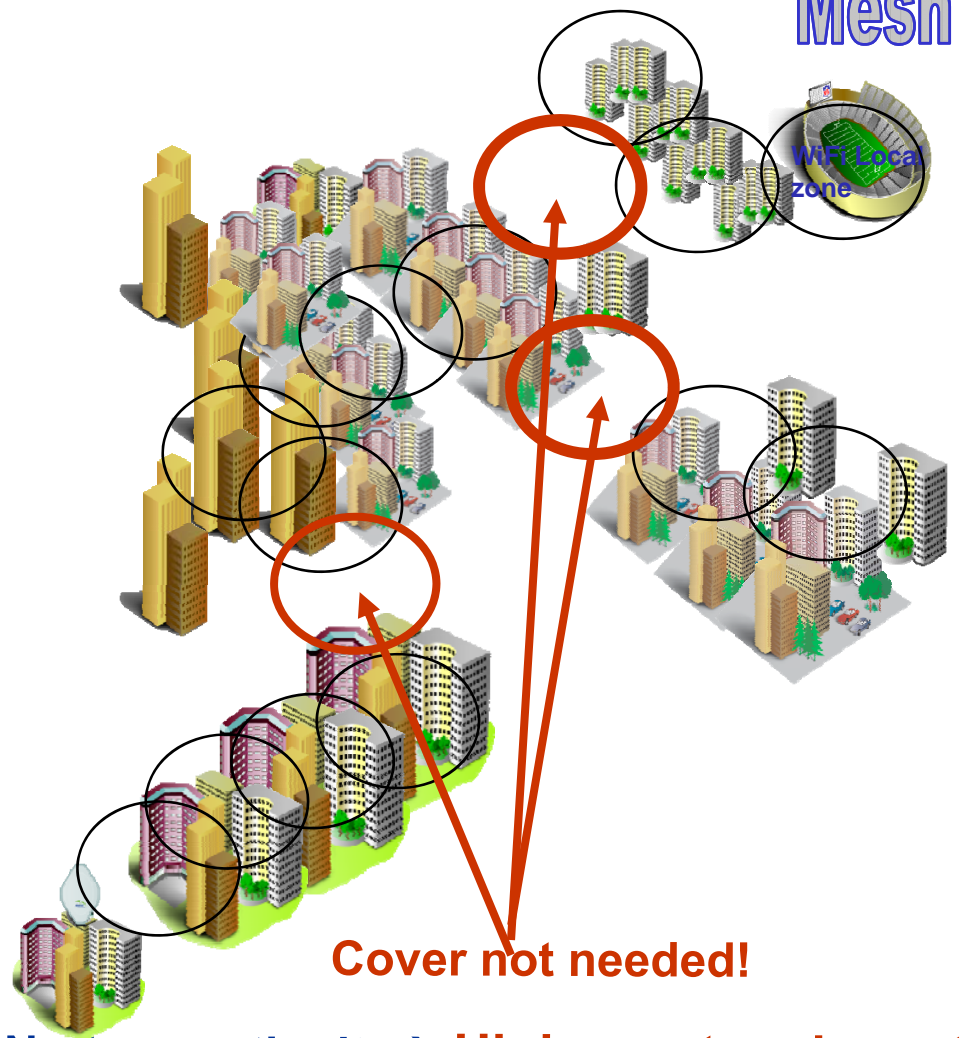
Wi²



Cover just where required!

Deployed only in needed locations

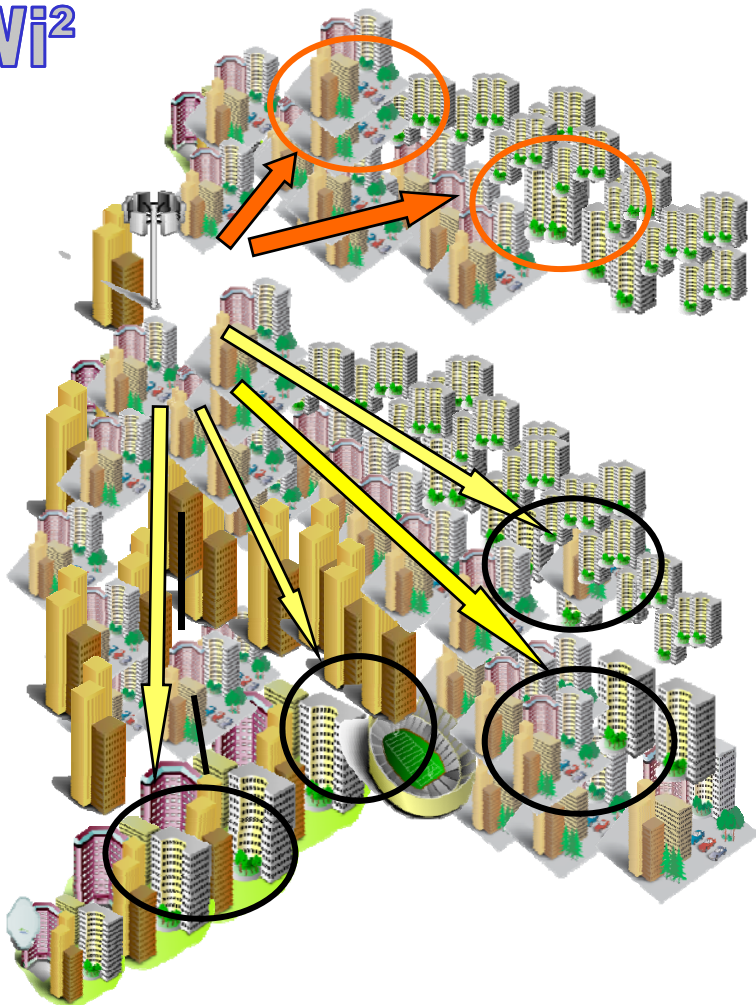
Mesh



Cover not needed!

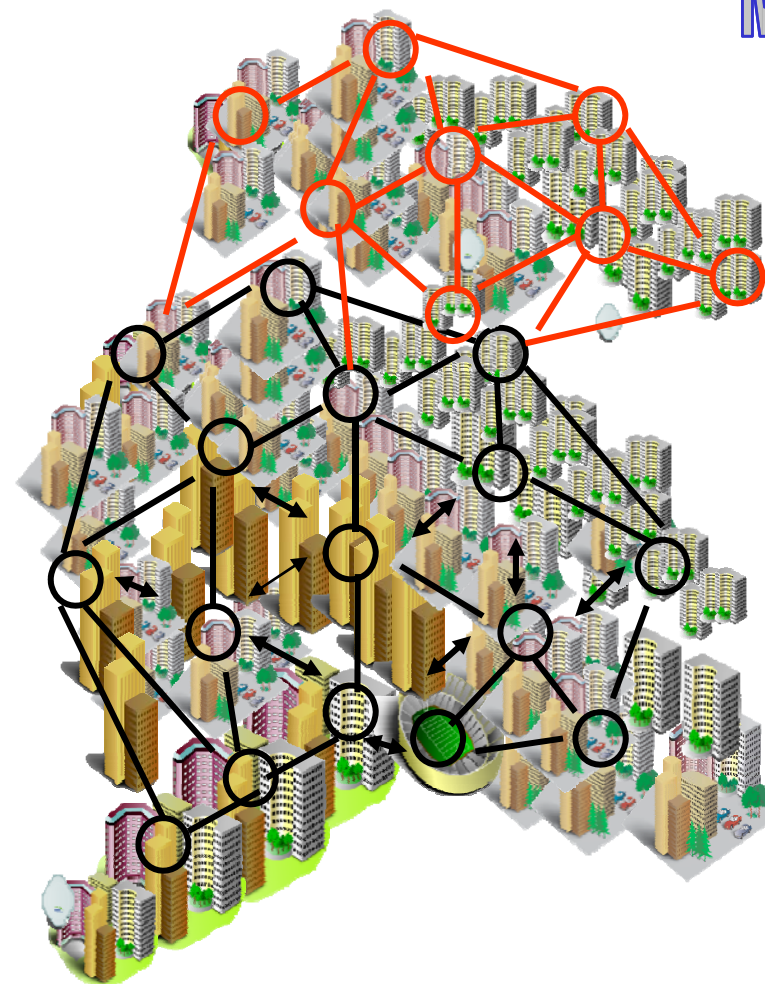
Nodes continuity → Higher network cost

Wi²



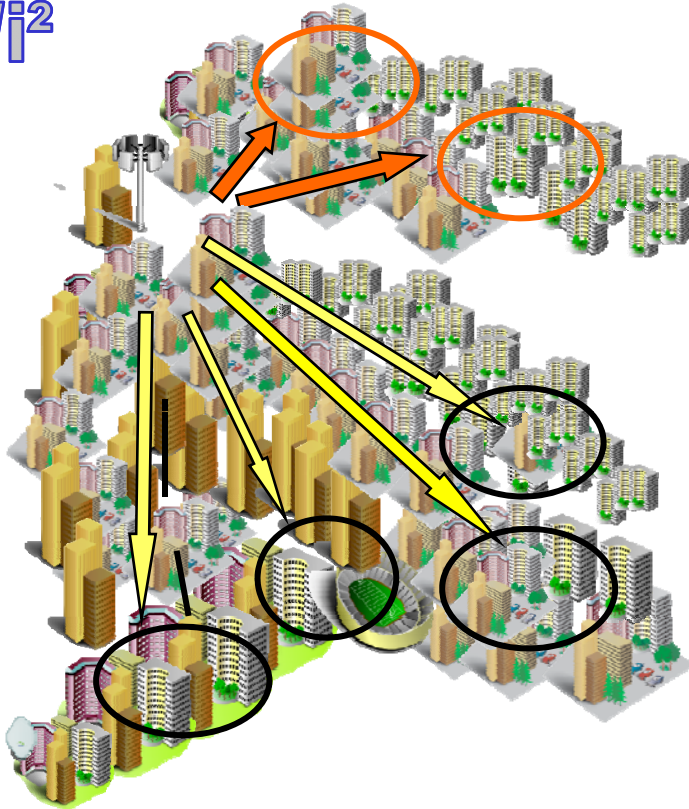
Seamlessly add new nodes

Mesh



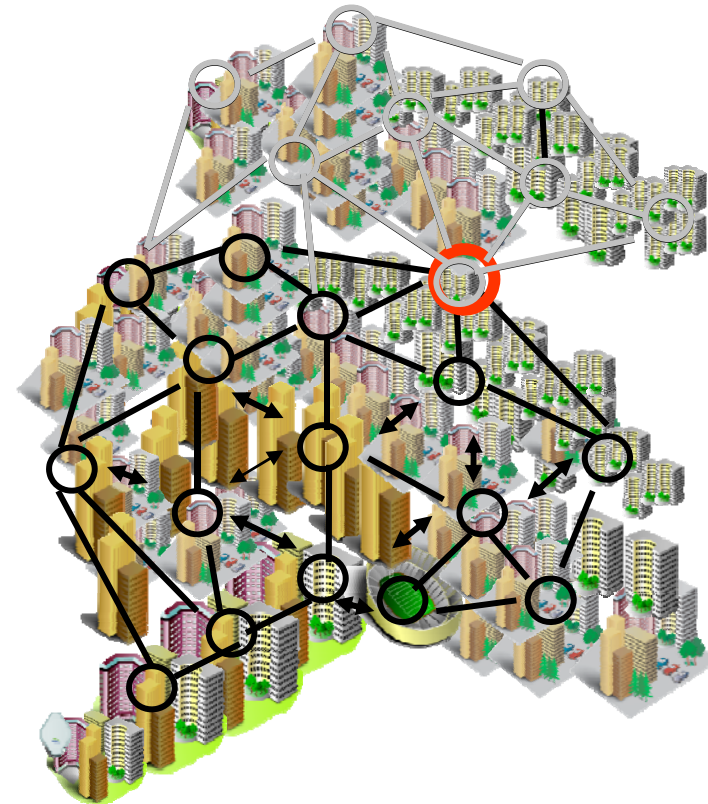
**High network routing complexity
Nodes addition increasingly complicated**

Wi²



Seamlessly add new nodes
Useful radio planning in any scalability
required

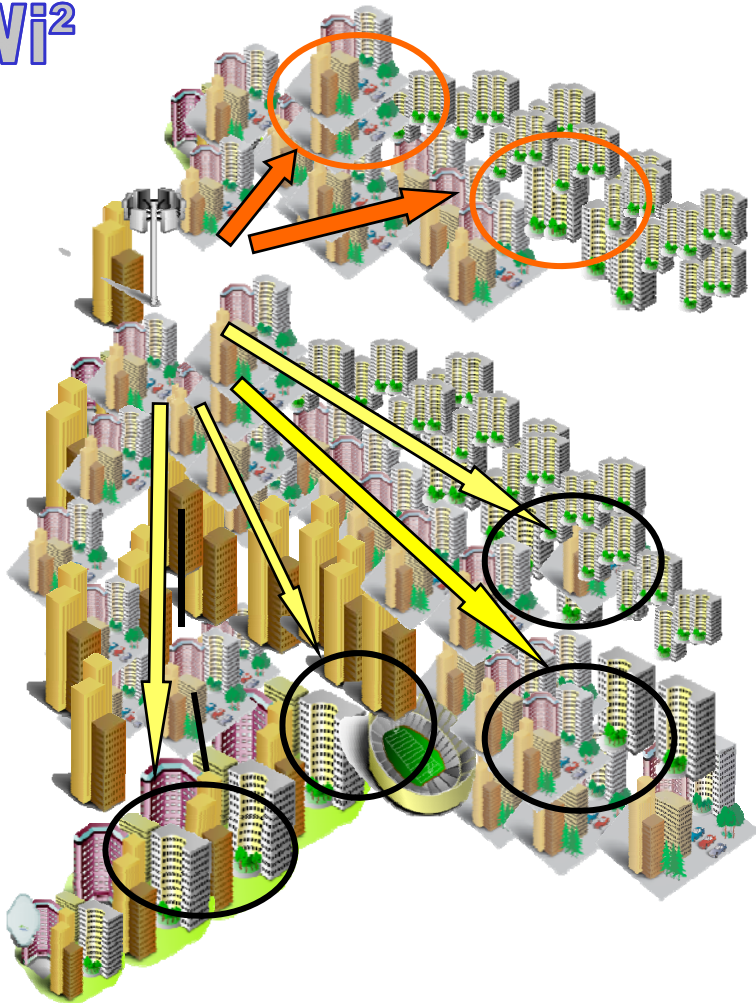
Mesh



High network routing complexity
Requires high complexity of radio planning

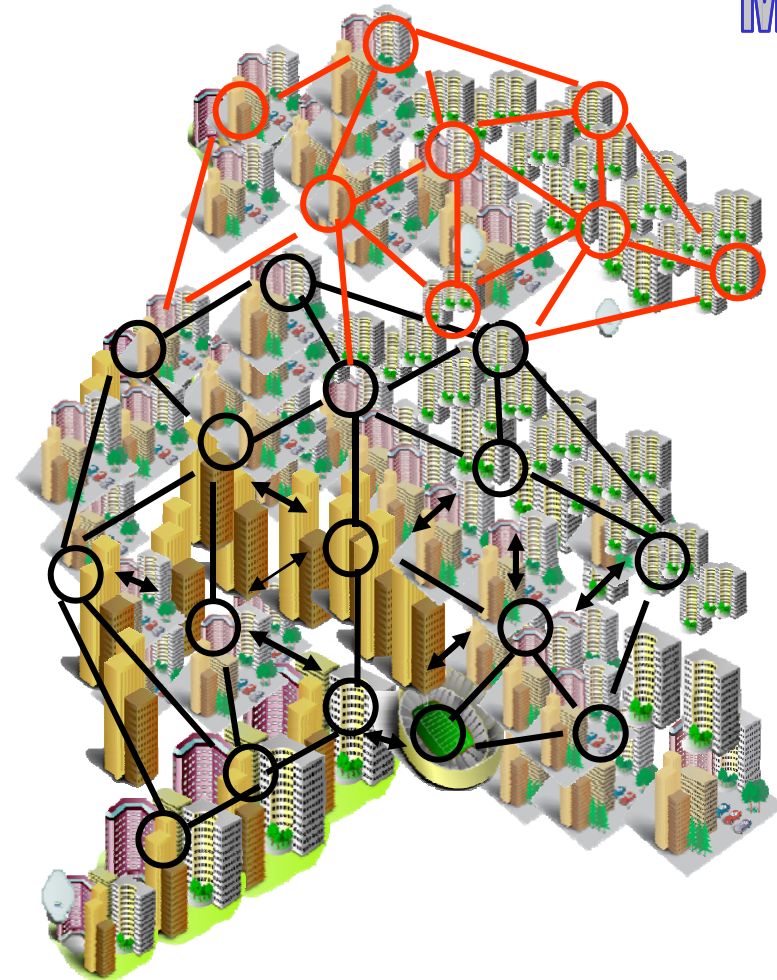
“Holes“ in the RF planning can create non
covered areas in case of one AP failure

Wi²

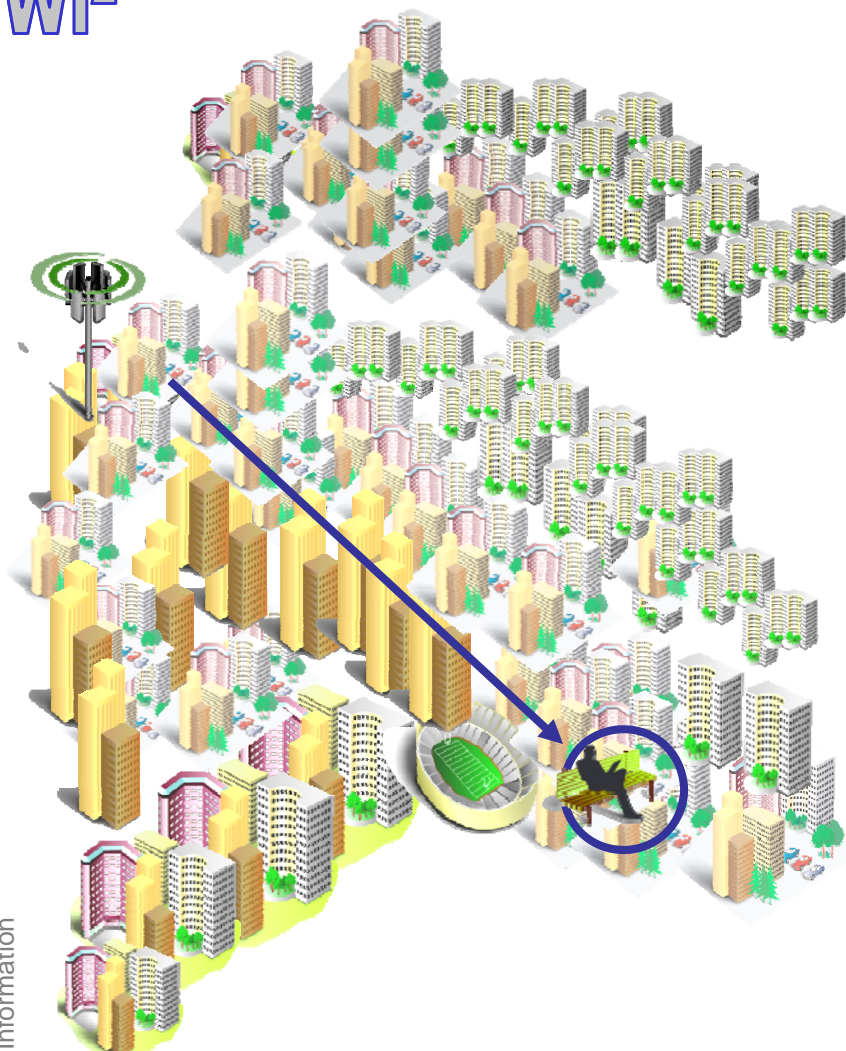


**Wi² units
just where required,
Zero network routing complexity**

Mesh

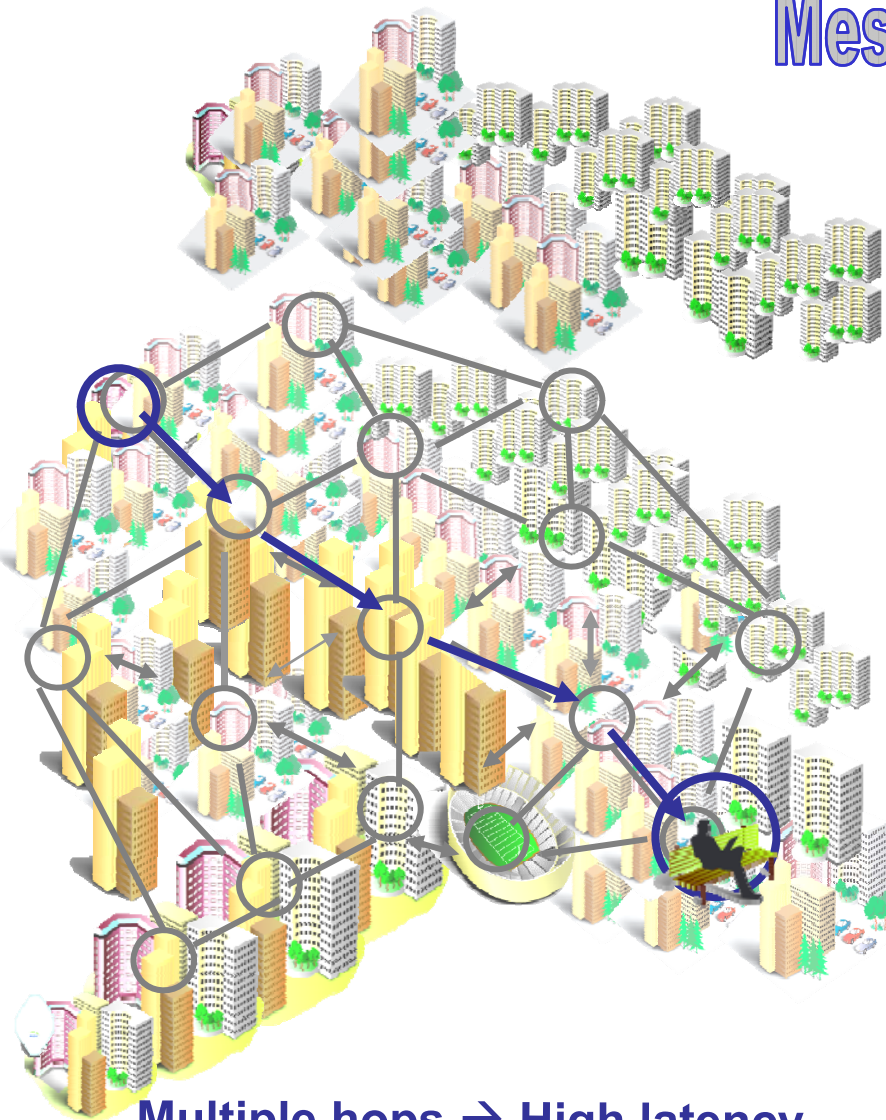


**Installation of high network routing
complexity**

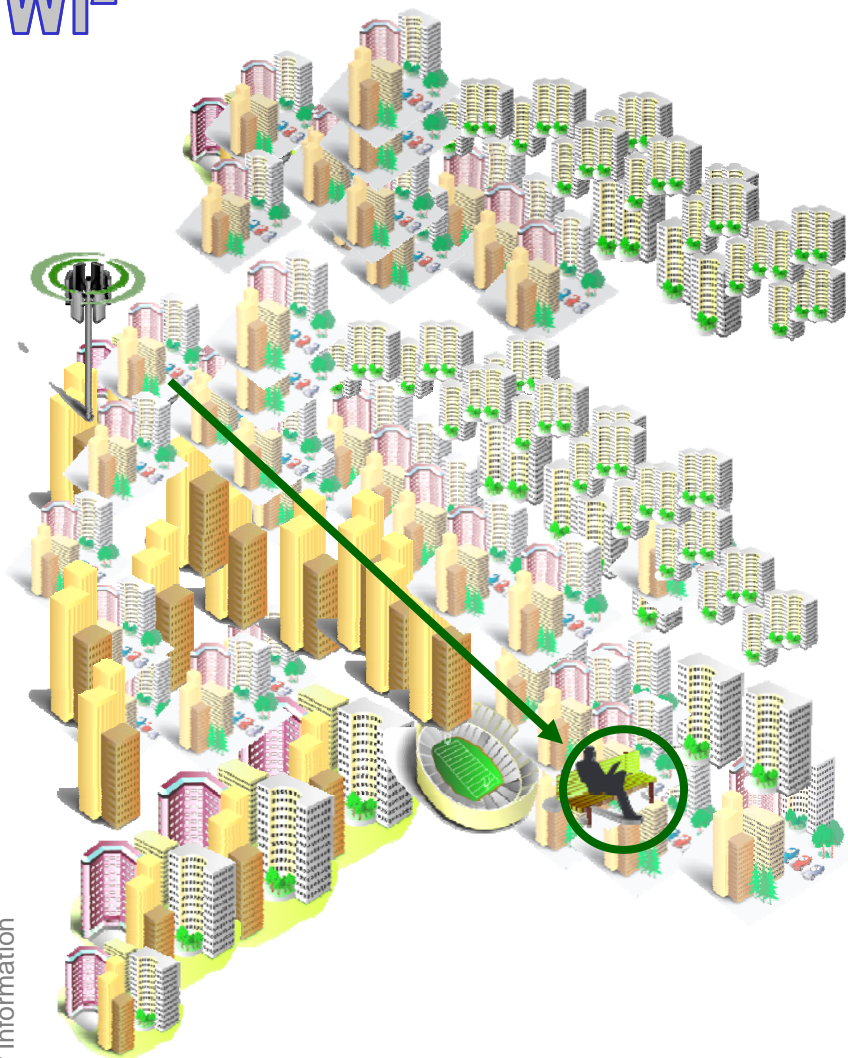
Wi²

Minimal latency – better QoS
→ better VoIP/Video support

Mesh

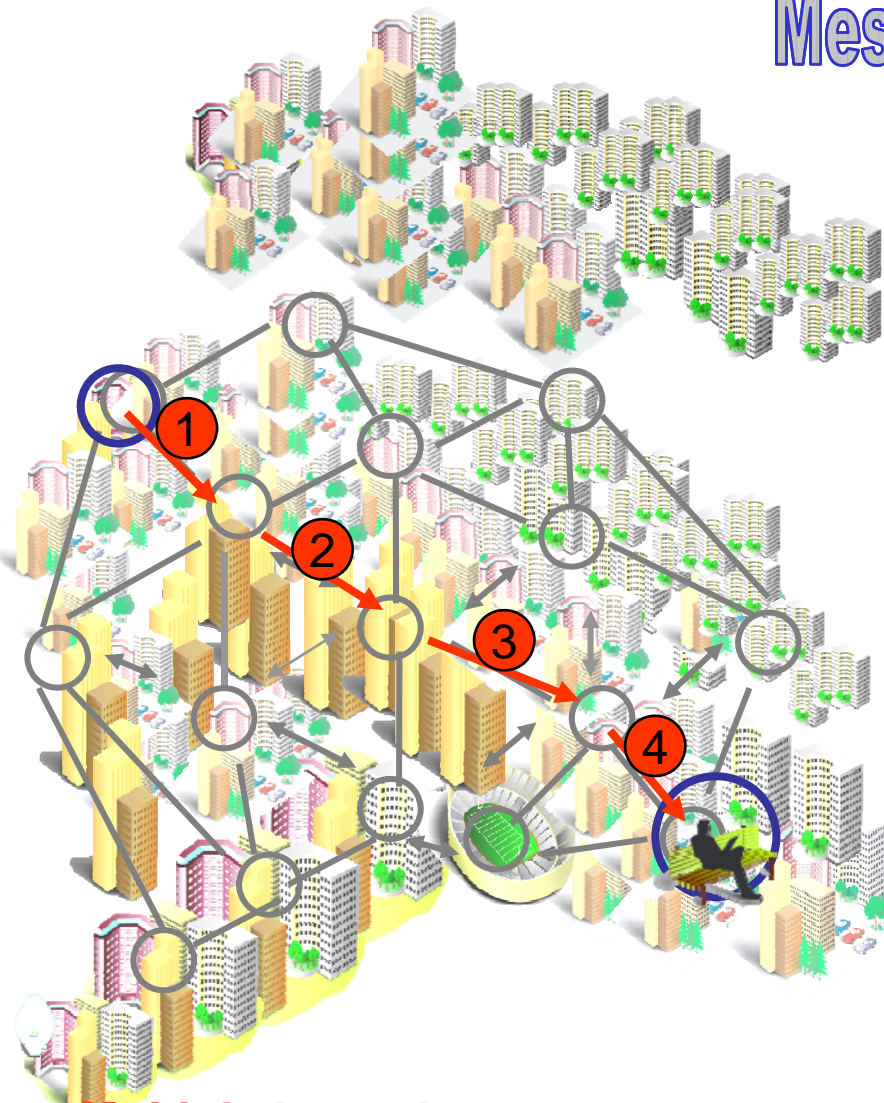


Multiple hops → High latency

Wi²

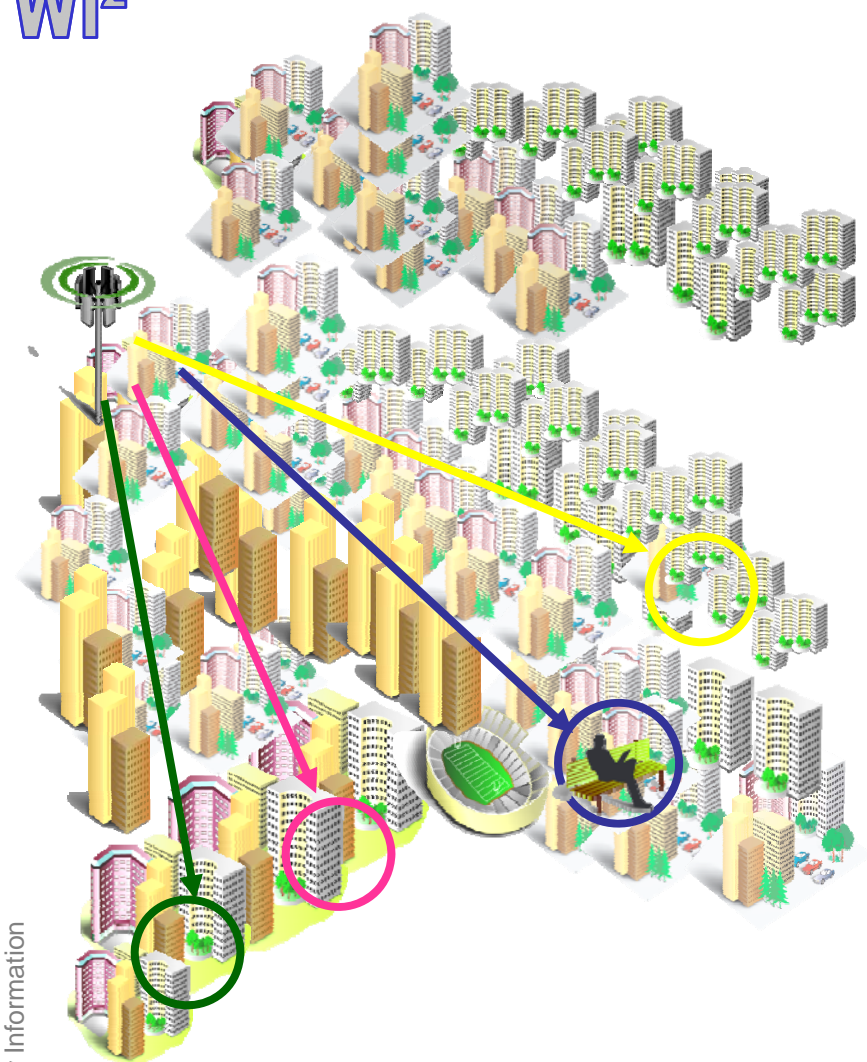
Original capacity directed to source

Mesh



Multiple hops → Capacity reduced

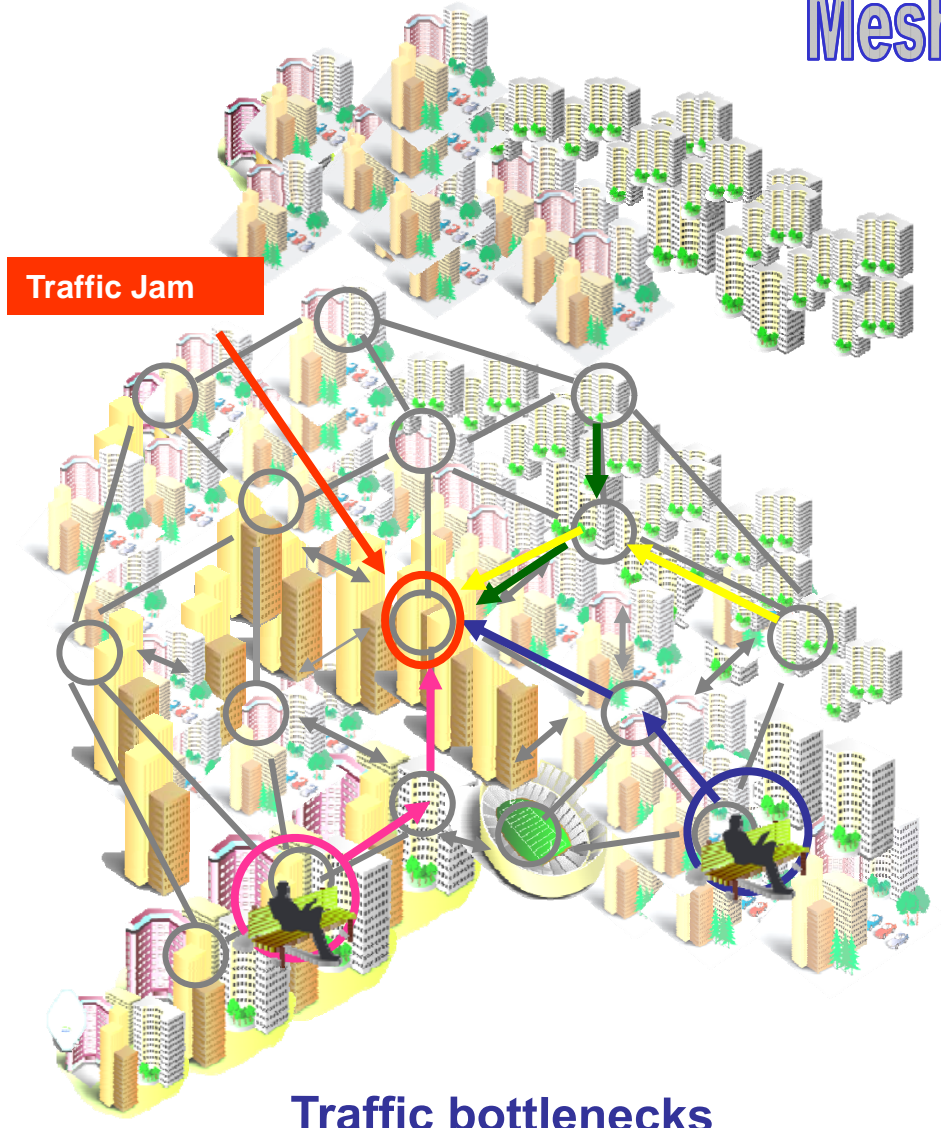
Wi²



Proprietary Information

Minimal latency - WiMAX QoS
→ better Access/VoIP/Video support

Mesh



Traffic bottlenecks

Alvarion Wi² solution

Wi² according to Market Segmentation

Alvarion Wi² Next Generation Solution – Improved BC

Wi2 – Next Generation – End to End Outdoor WiFi Solution



● Network Management System

- Support large distributed networks
- Plug & play installation
- Scalable architecture – up to 5000 APs!

● Embedded OSS abilities

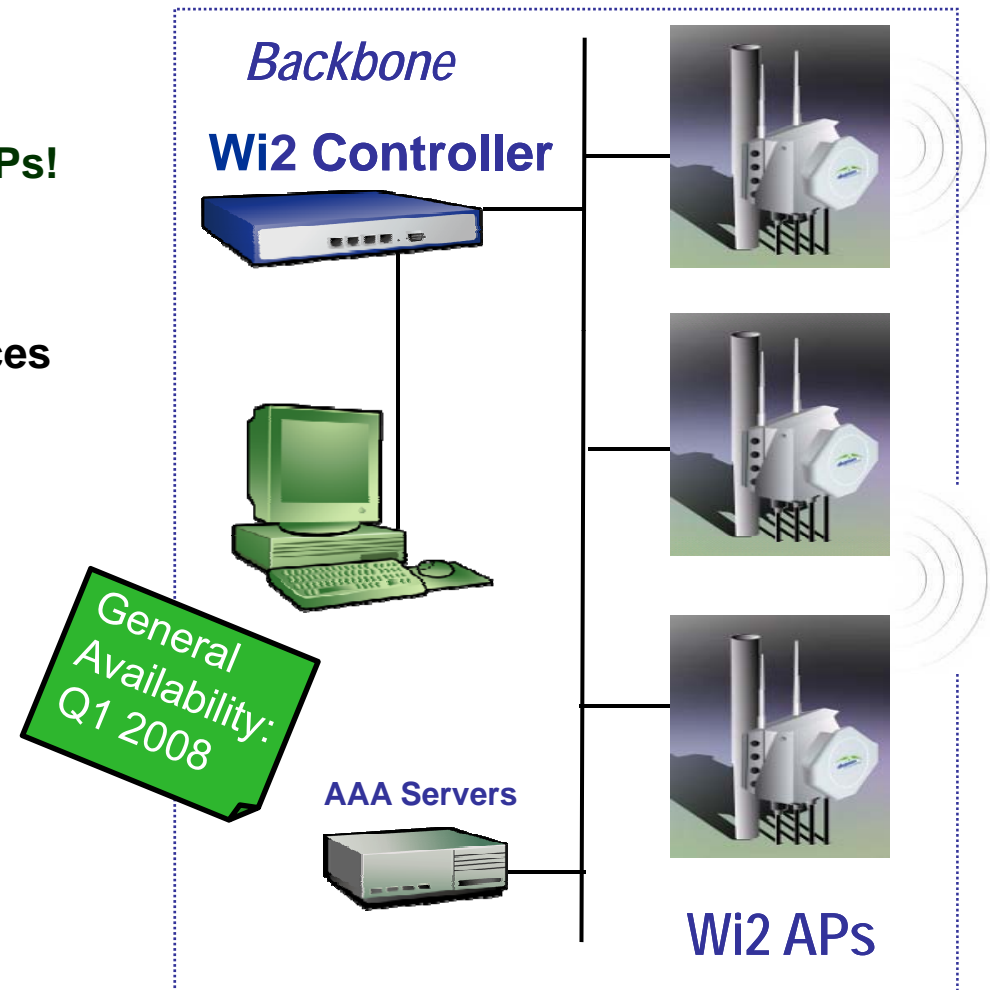
- Captive portal & guest access services
- Zero client configurations
- Radius authentication & accounting

● Mobility support

- Extended QoS and voice support

● Smart APs

- QoS & Security
- Advanced Diagnostics & Roaming
- Mesh unit



● 16 Virtual Service Community (16 SSID)

- DTIM
- Adjustable minimum data rate
- L2 isolation
- Configurable security (protocol) filter
- QoS
- VLAN tagging

● QoS

- Spectralink SVP
- WMM™ with trigger power save mode
- Service Aware QoS
- L2/L3/L4 Classifier

● Diagnostics

- Service sensor
- WLAN monitor mode, Remote packet capture (Ethernet and 802.11)
- Advanced network diagnostics –
client event logs, client data rate monitors

● Visitor access

- Captive portal
- Wireless encryption
- Zero configuration
- Adaptive NAT
- Firewall
- Flexible authentication schemes

● Full client mobility

- Complete client transparency
- Fast authentication
- Layer 3 roaming

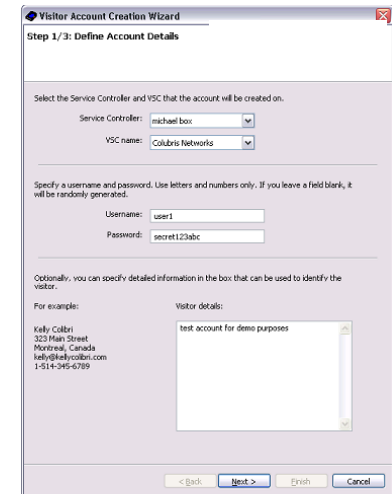
● Optimized deployments

● Plug and Play

- Automatic AP discovery
- Automatic firmware downloads
- Central configuration
- Certificate based mutual authentication with AP
- TLS management channel

● Full management capabilities

Model	Number APs	Maximum users	Concurrent Visitors
Wi2-CTRL-10	10	2,540	100
Wi2-CTRL-40	40	10,160	500
Wi2-CTRL-200	200	50,800	2,000

Visitor Account Creation Wizard
Step 1/3: Define Account Details

Select the Service Controller and VSC that the account will be created on.

Service Controller: michael box
VSC name: Colubris Networks

Specify a username and password. Use letters and numbers only. If you leave a field blank, it will be randomly generated.

Username: user1
Password: secret123abc

Optionally, you can specify detailed information in the box that can be used to identify the visitor.

For example:

Visitor details:
test account for demo purposes

Kelly Collier
323 Main Street
Montreal, Canada
kelly@alvarion.com
1-514-345-6789

< Back Next > Finish Cancel

⇒ Mainly used for large deployments

⇒ Can manage 200 controllers

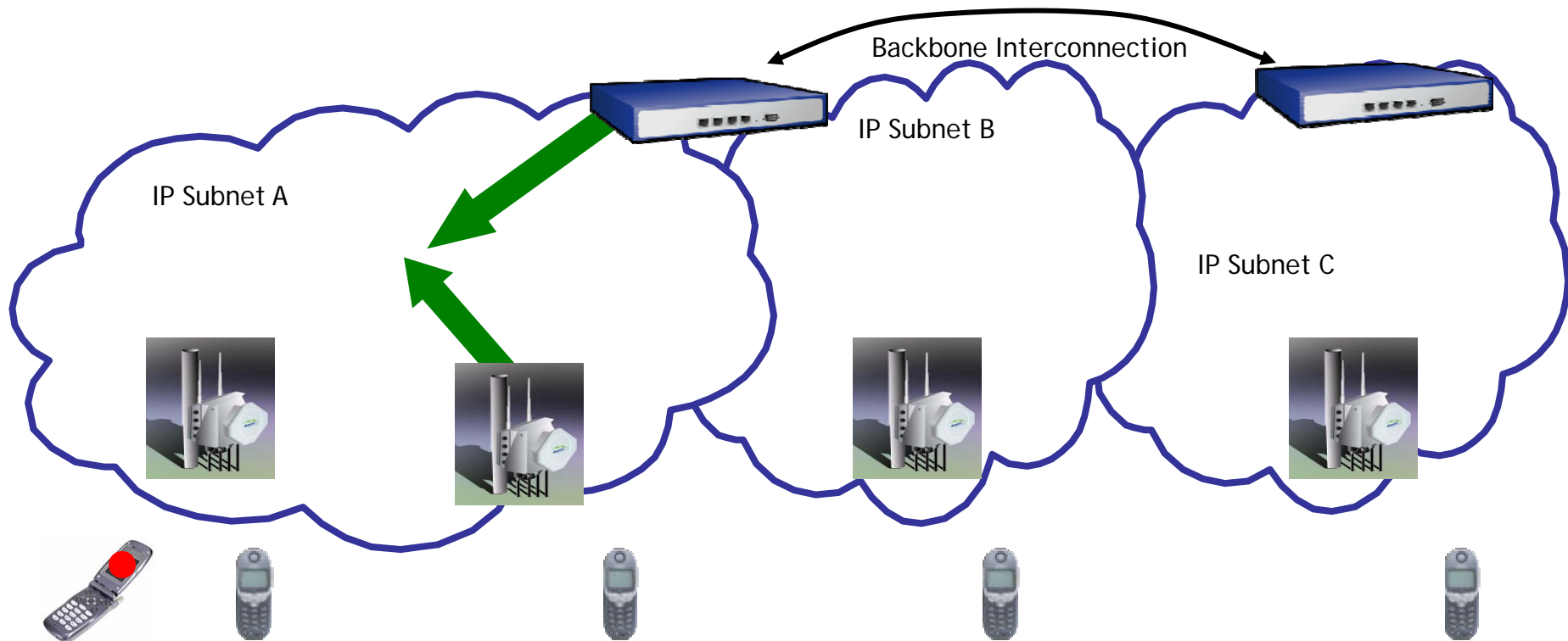
- Discovers and configures devices
- Real time troubleshooting data
- Continuously audits security policies
- Capacity planning and trending
- User-definable triggers & alerts
- Easy to use web-based User Interface
- Plug-in for HP Network Node Manager
- Integrated reporting package



When NOT working with Wi2-controller

- **Wi2-NMS-200**
can manage up to 200 (uncontrolled) APs
- **Wi2-NMS-1000**
can manage up to 1000 (uncontrolled) APs





Client roams to AP in foreign subnet.

Foreign AP sends L3 broadcast management packet to Foreign Cont.

Home Cont. sends L2 broadcast packet

Foreign Cont. sends L3 roam management packet to Home Cont.

- Voice Packet
- L2 Broadcast Packet
- Management Packet

Cont. = Wi2-CTRL

● Industry certified

- Certified WMM support
- VIEW Certified by SpectraLink

● Support for toll quality calls

- Sub 50mS AP to AP roaming
 - L2 and L3
- QoS at the AP
 - Priority, DSCP, 802.1p on wired links
 - WMM on wireless
 - SpectraLink SVP
- Low latency
 - Distributed switching
 - Sub 1mS per AP

● Strong security

- WPA and WPA2
- Real time sensor

● Enhanced handset battery life

- DTIM per VSC



● Session Security – Encryption

- IEEE 802.11i
- Wi-Fi Protected Access (WPA2) with AES support
- Wired Equivalent Privacy (WEP) using static or dynamic keys of 40 or 128 bits

● Access Security

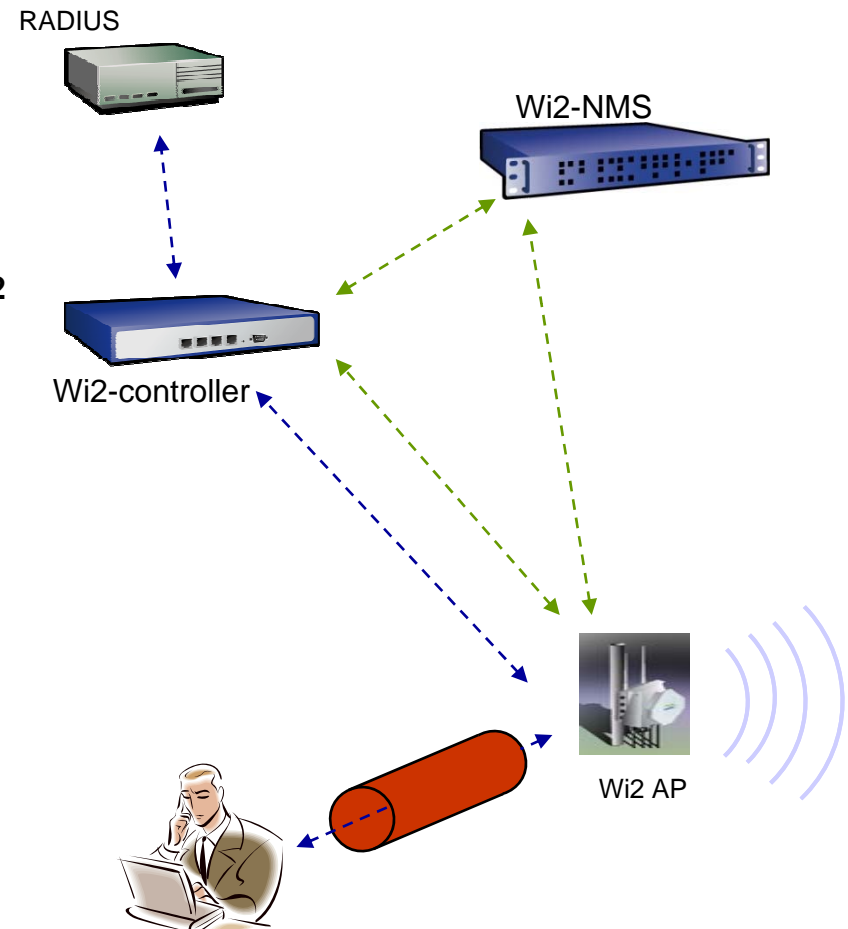
- Integrated RADIUS server in Controller
- RADIUS AAA using EAP-MD5, PAP, CHAP, MSCHAP v2
- 802.1x authentication using EAP-SIM, EAP-FAST, EAP-TLS, EAPTTLS
- MAC address authentication using local or RADIUS access lists and PEAP
- HTML, captive portal/web redirect

● Filtering

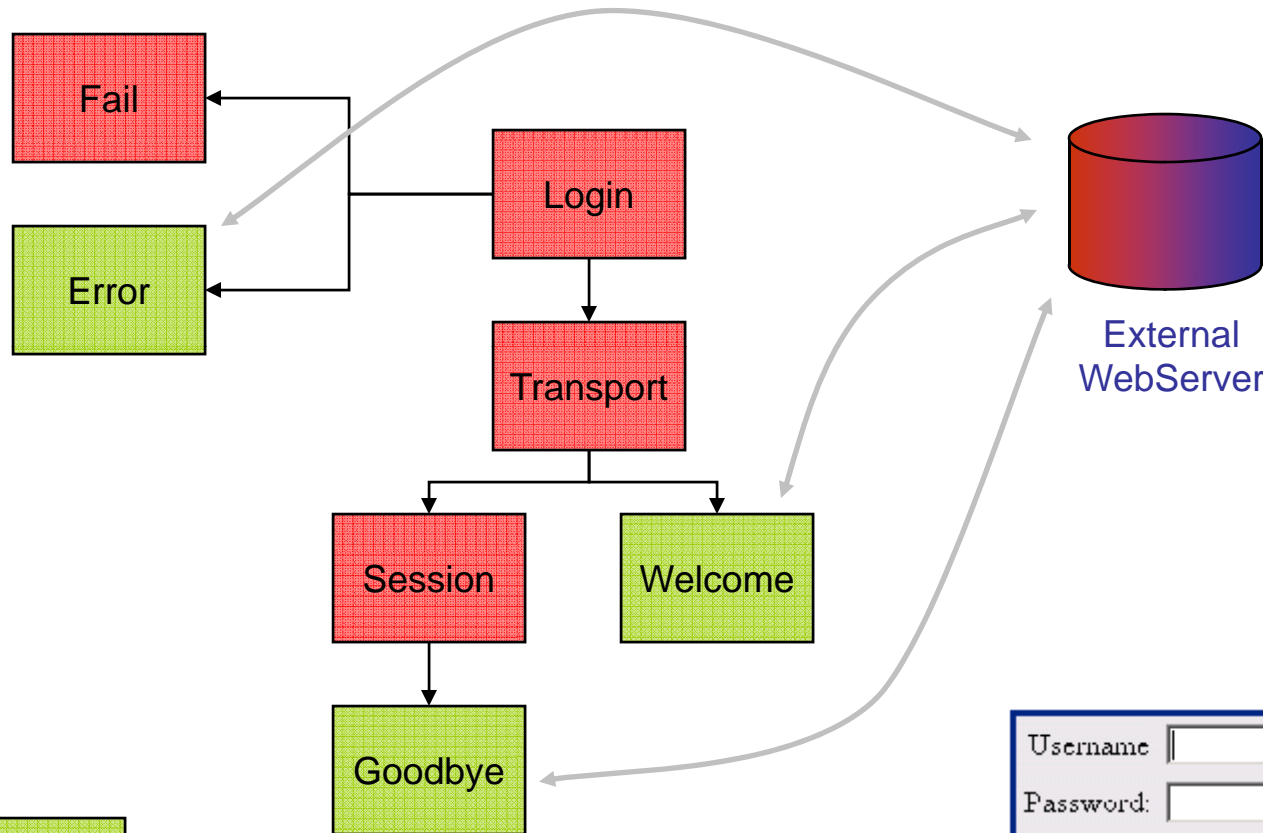
- Security Filter (in the AP)
- IP Filter (in the AP)
- Layer-2 wireless client isolation (in the AP)
- ACLs (Controller)
- Firewall (Controller)

● Management

- SSL
- TLS
- IPsec



Captive Portal - Predefined Page Structure



Session

Please bookmark this page for logout

Status: **Logged in.**

Session Time (Cur/Left/Max): **292 / 0 / 0**

Idle time (Cur/Left/Max): **206 / 0 / 0**

Received Packets (Cur/Left/Max): **548 / 0 / 0**

Received Octets (Cur/Left/Max): **172127 / 0 / 0**

Transmit Packets (Cur/Left/Max): **632 / 0 / 0**

Transmit Octets (Cur/Left/Max): **88208 / 0 / 0**

[Logout](#)

Username:

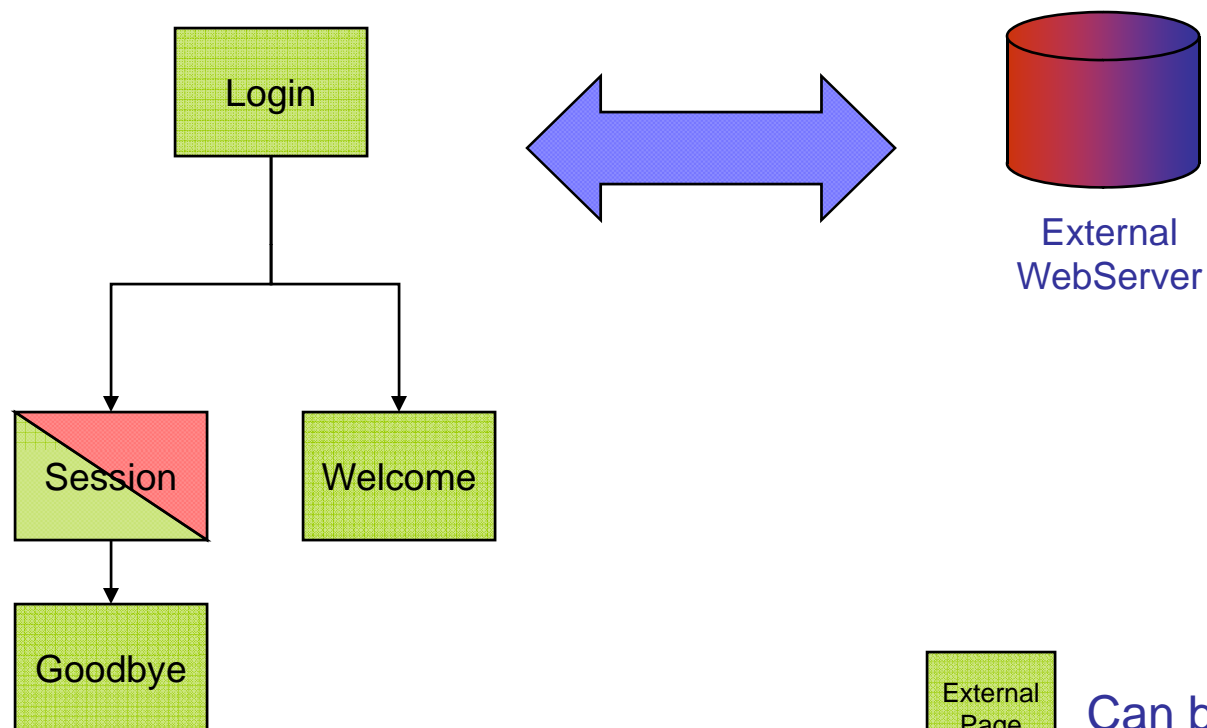
Password:

External Page

Can be defined per user

Internal Page

Defined per Controller/Network



External
Page

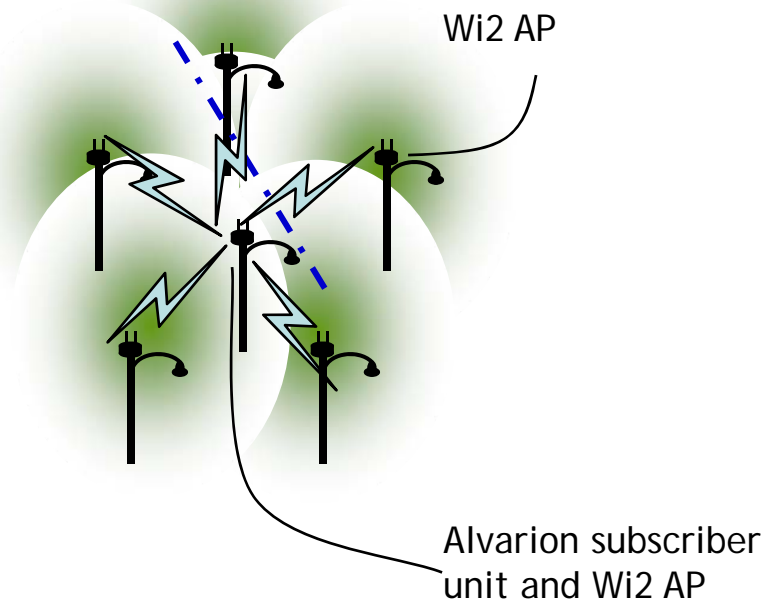
Can be defined per user

Internal
Page

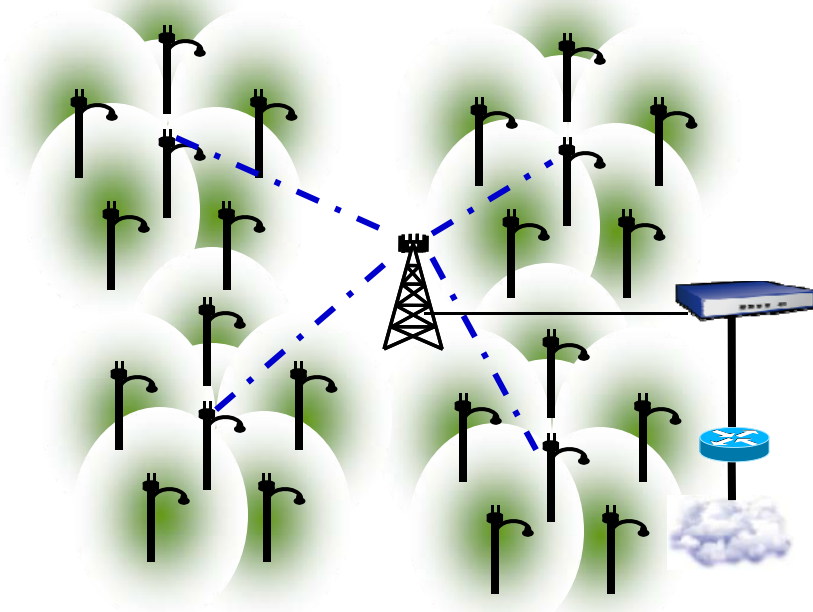
Defined per Controller/Network

● Cluster

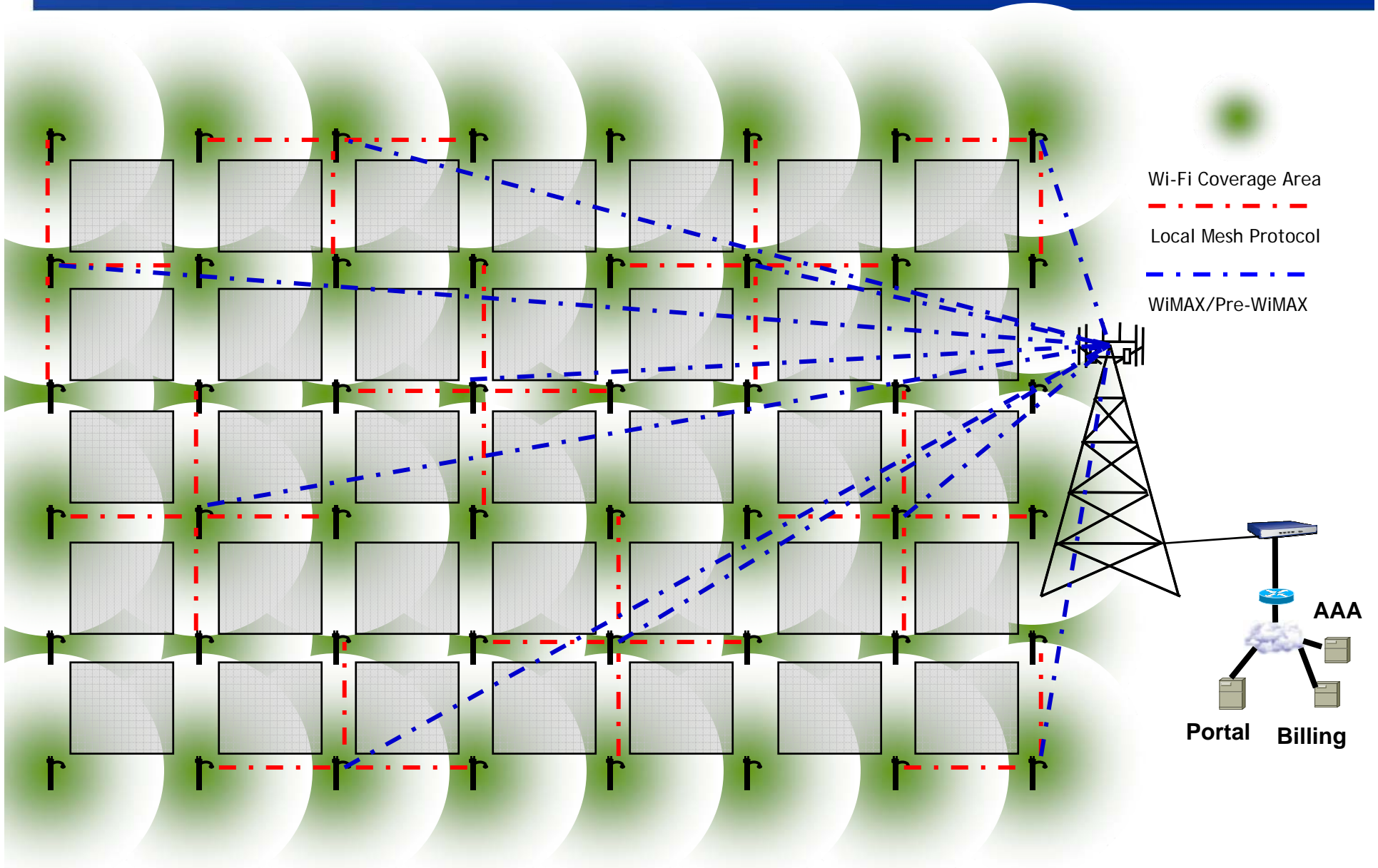
- Central AP collocated with BreezeMAX/ACCESS VL subscriber unit
- APs form LMP connection to central AP



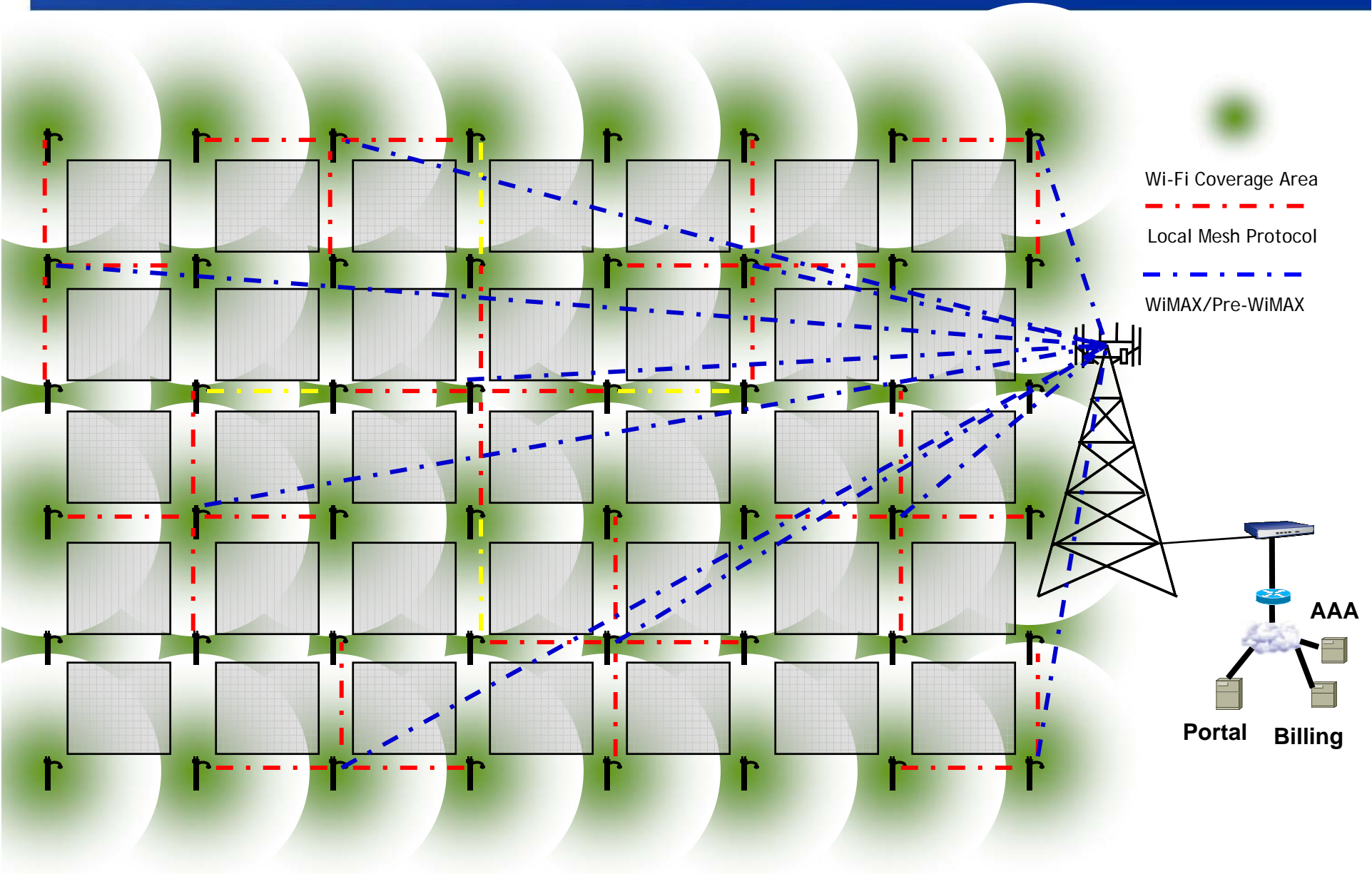
Base station and multiple WiFi clusters



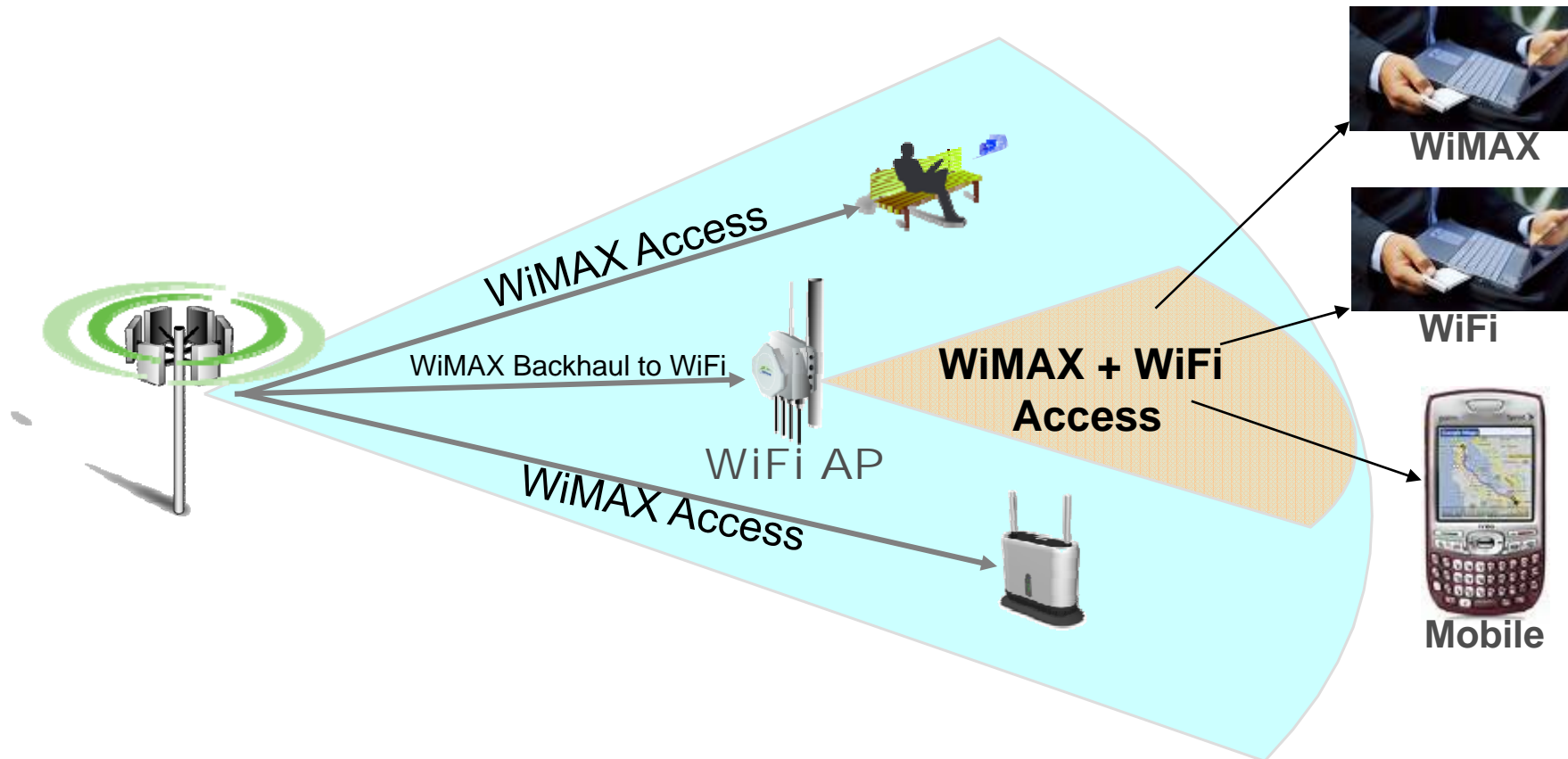
Wi2 – Next Generation City-wide Wi-Fi Coverage



Wi2 – Next Generation - Self Healing



Access Control	<ul style="list-style-type: none"> Full customizable captive portal Zero-client configuration Billing/RADIUS Accounting RADIUS Authentication Greater than 30 users per AP Configurable min and max connect speed
Mobility	<ul style="list-style-type: none"> Rail specific certifications for vibration and EMI Mobility client
Voice Support	<ul style="list-style-type: none"> QoS WMM QoS SVP QoS IP TOS/DSCP QoS 802.1p Configurable DTIM by service WMM Trigger Power Save Fast authentication L3 roaming
Ease of use	<ul style="list-style-type: none"> Complete solutions (integrated captive portal and APs) Central management Plug and Play
Security	<ul style="list-style-type: none"> 802.11 security - 802.1x, AES, WPA2 Wireless IDS/IPS Configurable L2 switching at the AP
Deployment	<ul style="list-style-type: none"> Mesh capabilities (LMP) DWDS Multi-radio



- **Alvarion is agnostic to access method (WiMAX or WiFi)**

- **The dual approach enables:**

- CAPEX & OPEX reduction – Due to less WiMAX BTS sites
- Increased customer exposure – both WiFi and WiMAX end-user devices
- Better use of spectrum – Overlay of services in the same coverage
- Tiered services option – e.g. WiMAX gets different tariff due to better QoS

Operator Case: A network for outdoor Hot zone services



● Assumptions

- Coverage area: 5km²
- 15 Wi2 per 1km² (usually will require less APs per 1km²)
- Total : 75 Wi2 per 5km²
- 10 Wi2 per BreezeMAX/VL sector

● Costs (list prices before discount!):

- Wi2: \$150,000 (5x 15 x \$2000)
- CPE: \$67,500 (5x 15x \$900)
- Sector: \$75,000 (7.5x \$10,000)
- Management (Controller): \$30,000
- Total: \$323,000

● Revenues

- 8 users per day per AP (modest estimate)
- 240 users per month per AP
- Total of 18000 users per month (for all 75 APs)
- \$5 per user
- Total: \$90,000 revenue per month

● ROI within 3.5 months!

● Practical ROI expected < 1 years

- considering sites acquisition, backhauling, peering, OPEX etc...

● Robust proven solution

- Work in outdoor extreme temperatures (-40c - +70c)
- Self healing capabilities (reduce technical support necessity)
- Can be installed anywhere including small roofs, walls and light poles (minimal rent)

⇒ **Reduce OPEX**

● Easily manage and bring up large networks

- Automated SW download & system configuration
- Plug & Play installation - Smart APs
- Single screen to control EVERYTHING
- Detailed statistics , easily evaluate network performance and required changes

⇒ **Reduce OPEX**

● Mobility ready solution

- Supply outdoor WiFi phones for areas / entire city

⇒ **Additional revenues using existing infrastructure!**

● Scalable network

- Pay as you grow strategy – no added/incremental costs
- Operator can first deploy small test network and only decide later

⇒ **Reduce risks**

● Support Virtual Service Communities

- De facto up to 16 different networks using the same infrastructure
- Support a variety of application (video, voice, mobility, internet access...) with their own specific QoS, security, guest access services and billing definitions
- Wholesale model
- Customer pays according to needs
- Flexible revenue schemes – per hour/day/vouchers/credit cards...

⇒ **Generate revenues according to application with no extra costs**

● Capture revenues from both WiFi & WiMAX clients

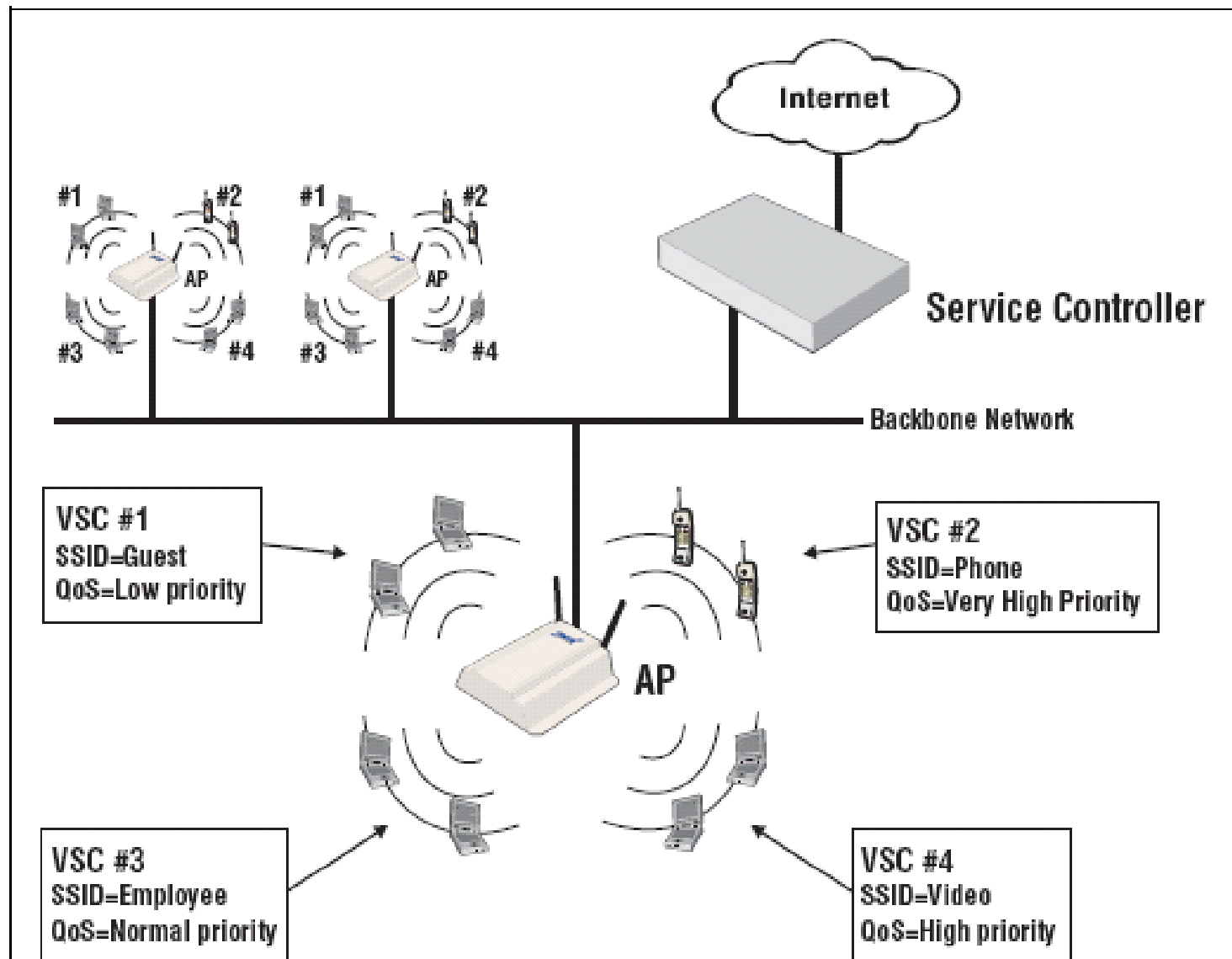
- Significant parts of the network already deployed
- One stop shop solution / complete end-to-end solution for the operator
- Future ready support for WiMAX

⇒ **Reduce CAPEX to existing WiMAX operator**

● Stand alone Wi2 AP available

- Not always need full AP capability
- Mesh supported – AP can also backhaul other APs
- Some cases can deploy just the AP (without the WiMAX CPE)

⇒ **Reduce CAPEX**



● Segments to target

- **Outdoor businesses**
 - Can offer the service to it's customers using the already deployed network
 - Outdoor businesses or close to the street

- **Outdoor WiFi for business man / Outdoor WiFi for tourists**
 - WiFi connectivity available where ever needed
 - Short access periods, very high portability

- **Low cost Indoor coverage for multi tenants building**
 - 'Zero' price CPE – laptop / very low cost window antenna (<100\$)
 - Projects / areas where no infrastructure available – supply data & voice

- **Outdoor WiFi for municipalities**
 - Verticals: city workers, video surveillance, traffic safety, education...
 - In some cases offer as a service to the public (5th utility)
 - Required but no BC just for this – city can not do this on it's own
 - Guaranteed income

Variety of revenue sources using the same network



Thank You