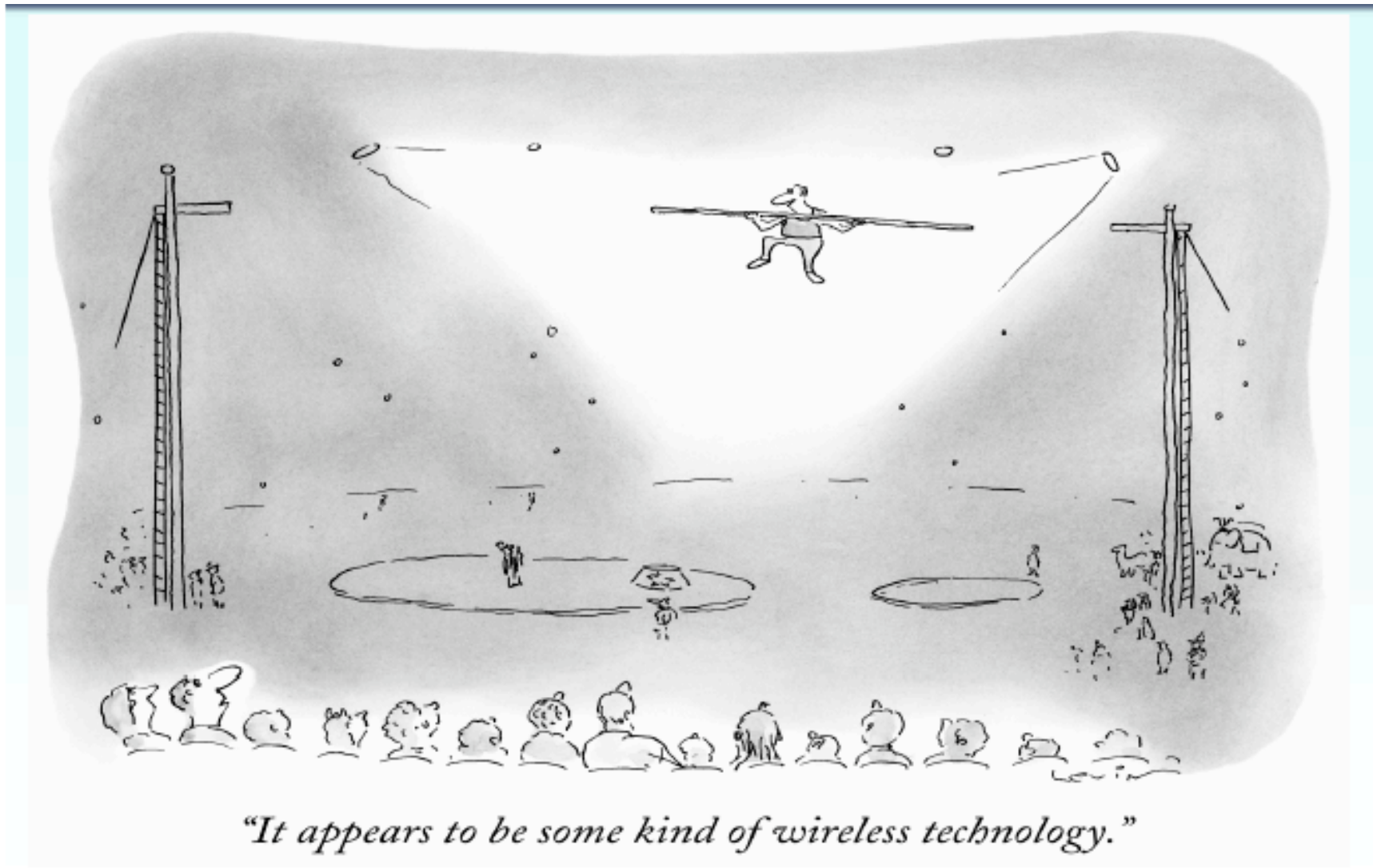


Mesh Networking: The Possibilities Are Endless

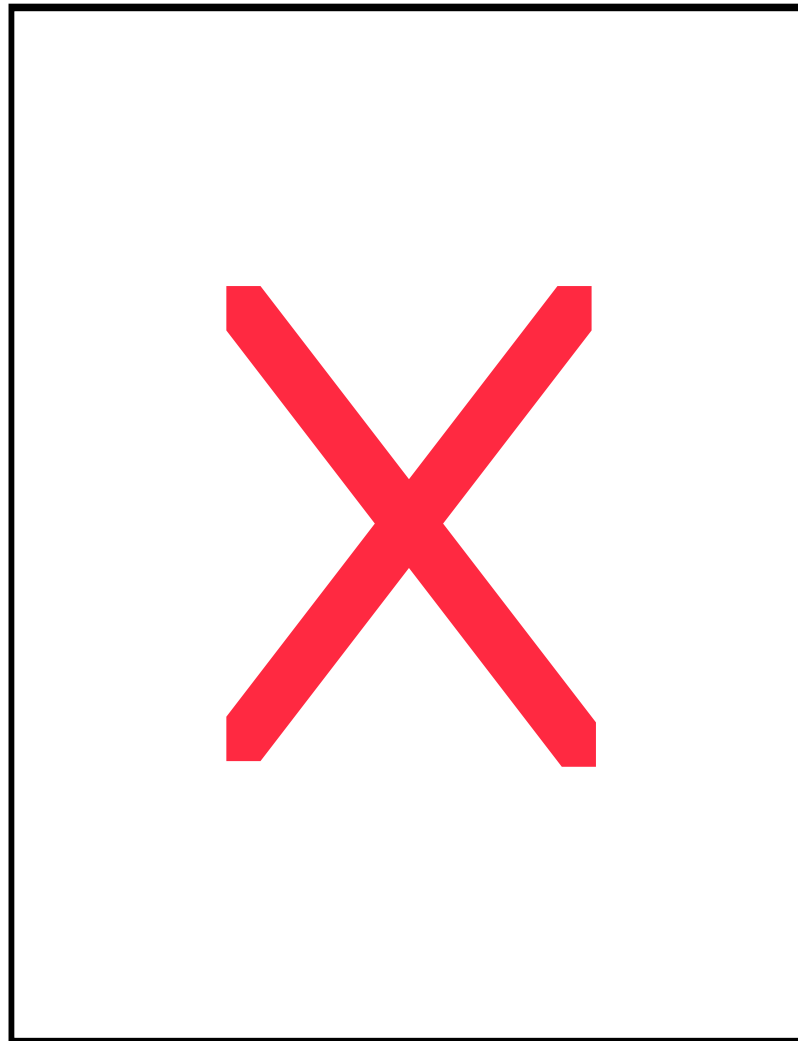
Ozzie Diaz, VP WW Bus Dev & International Sales



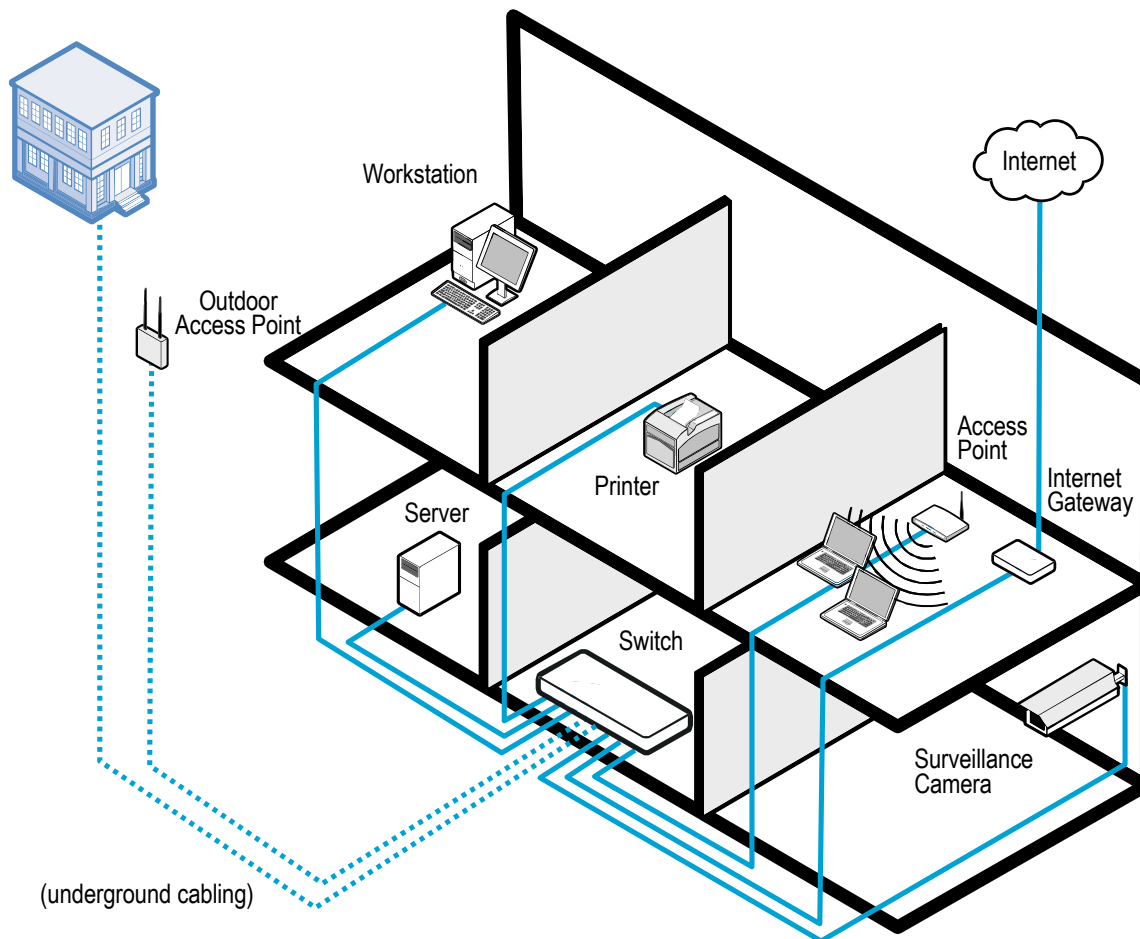
Icebreaker Slide #1 (no context, just funny)



Icebreaker Slide #2 (The Wireless Paradox)

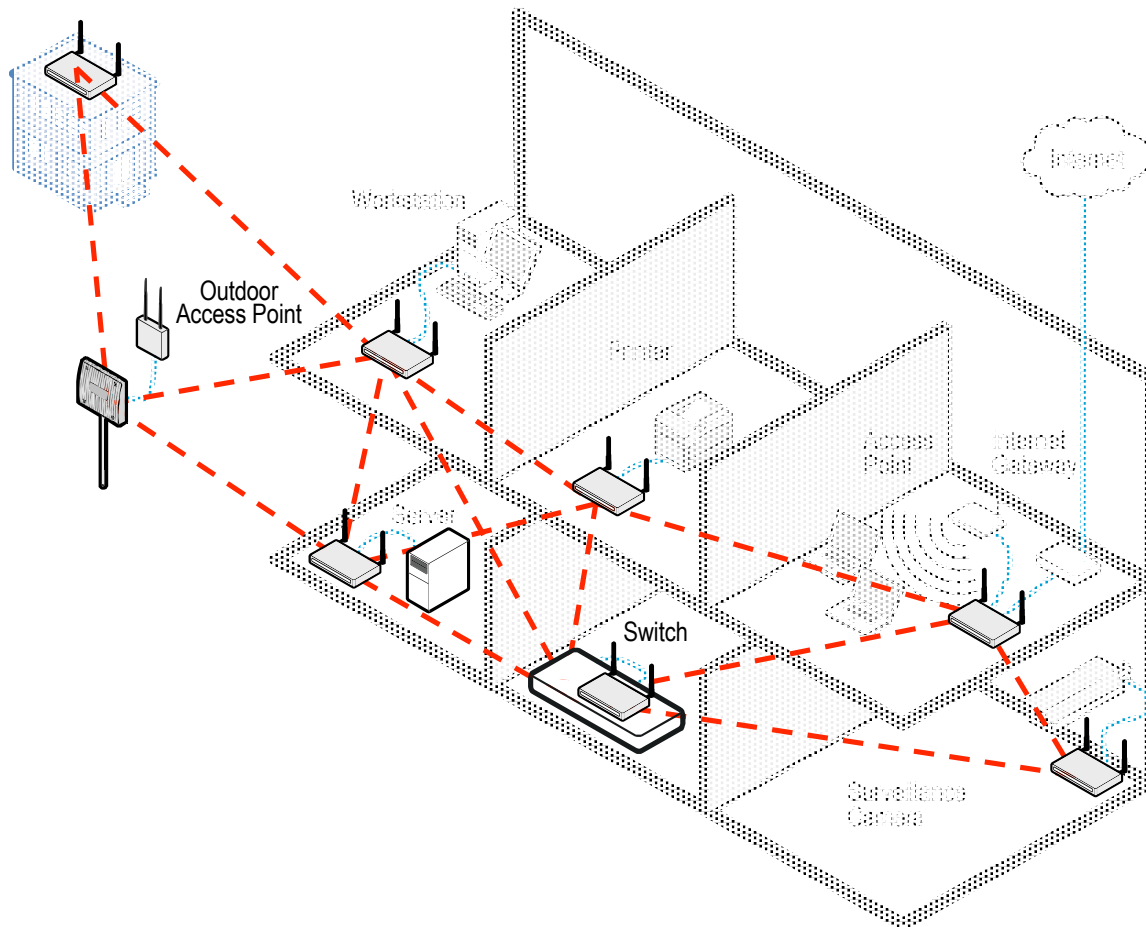


Network Cabling is Expensive and Difficult



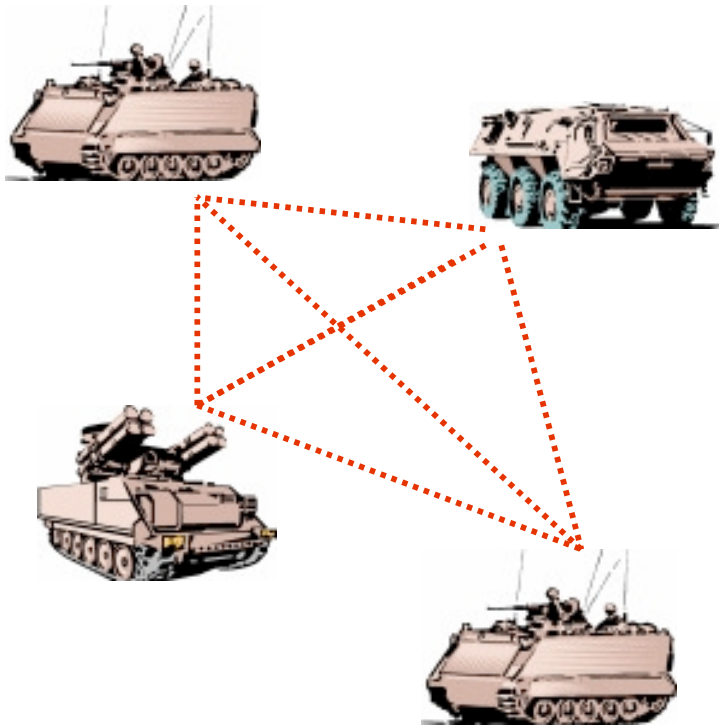
- Installing cable is costly and time consuming
- Inflexible and immobile
- *The wireless paradox* - even access points need cabling

Mesh Networks Simplify Installation



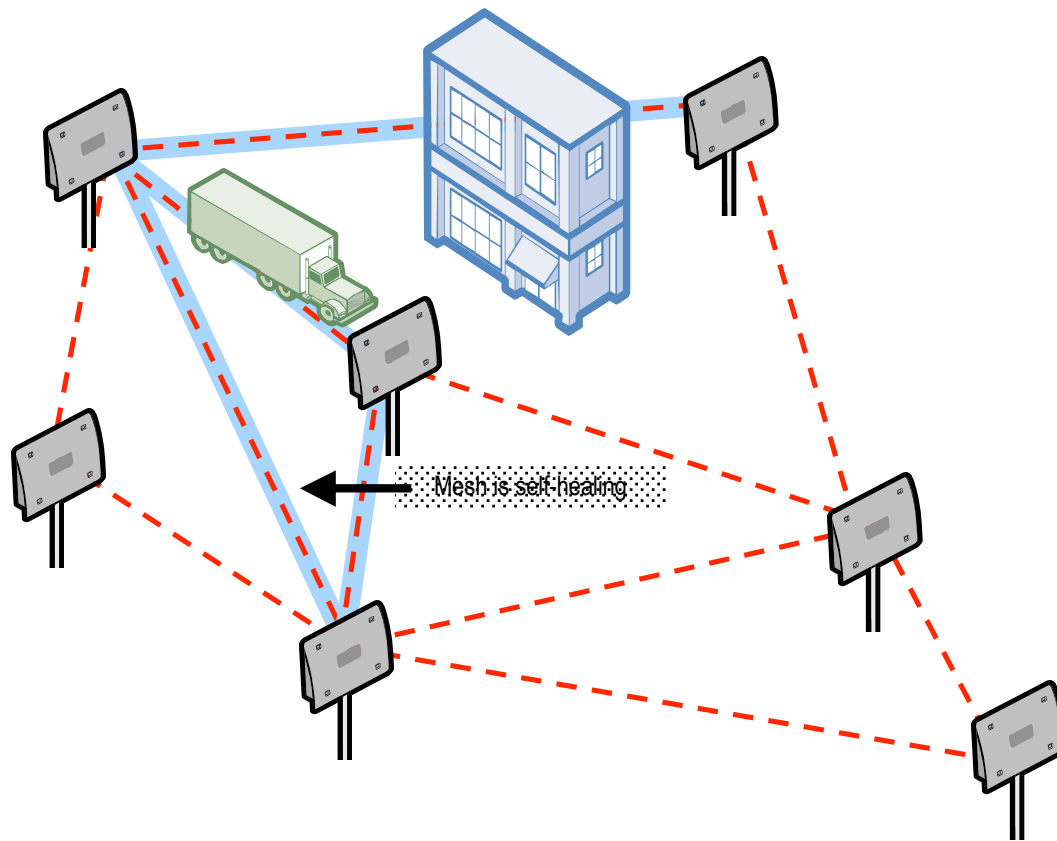
- Self-organize
- Self-configure
- Extends coverage

What is a Mesh Network?



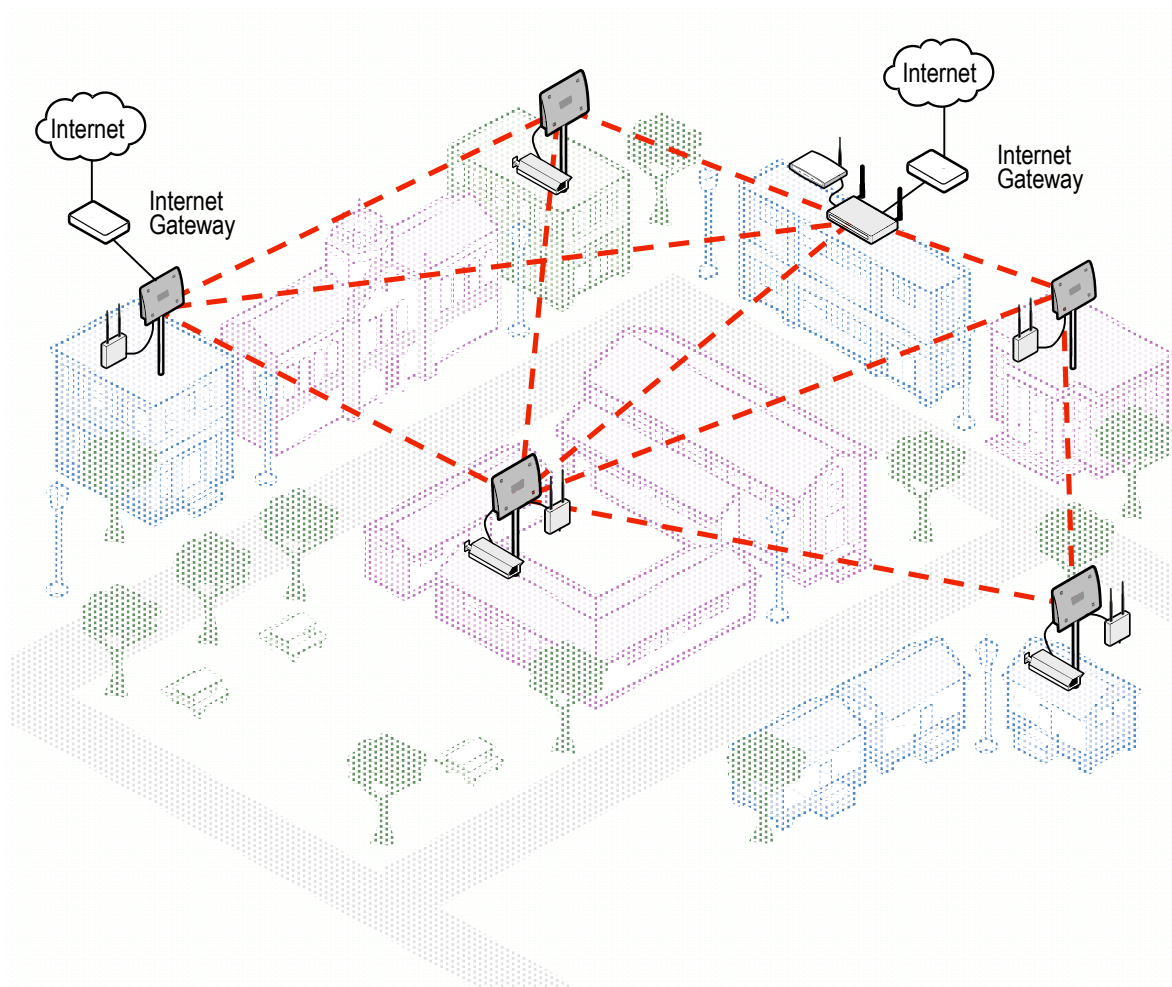
- **A Brief Mesh History**
Government funded through DARPA for the Global Mobile Information Systems (GloMo) program
- ***Ad hoc* Network**
 - Self-forming
 - Self-routing mobile network
 - Self-healing

Mesh Architecture Increases Reliability



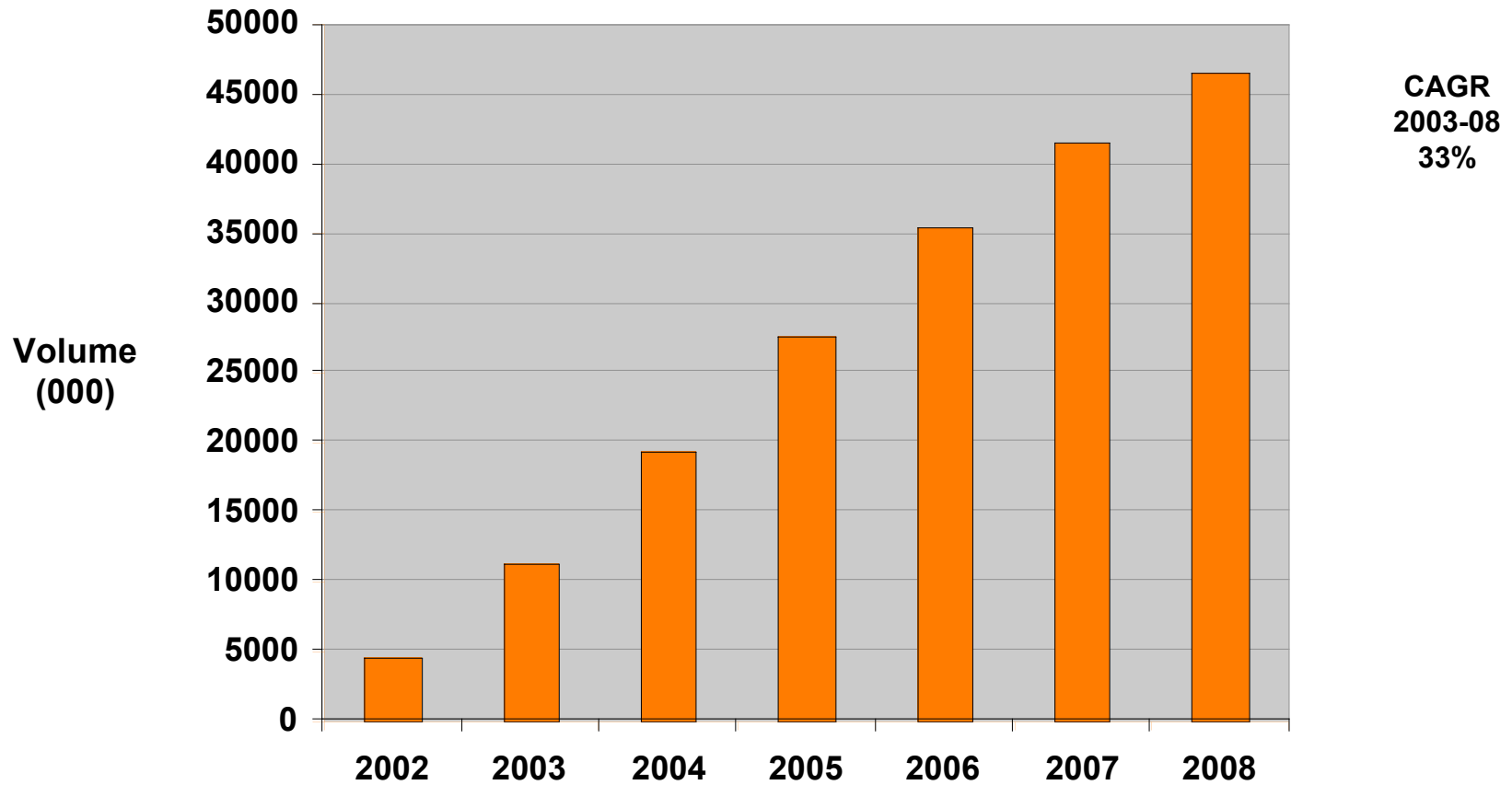
- Self-healing for resiliency
- No single points of failure
- Overcome line-of-sight issues with multiple paths
- Works seamlessly with existing wired LANs

Shared Infrastructure for Multiple Uses



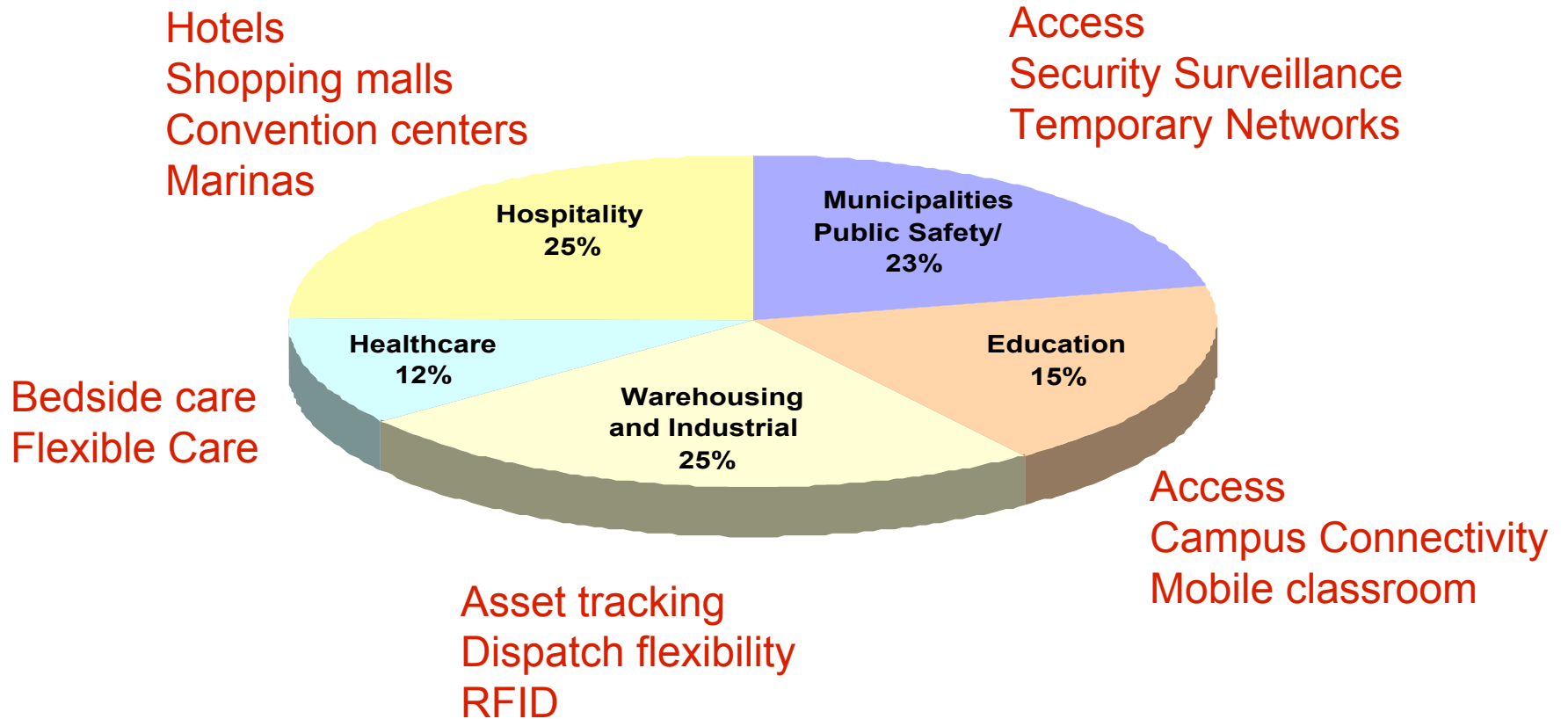
- Public Internet access
- Government communications
- Video surveillance for safety and security
- Business and education connectivity

Wi-Fi Access Devices Continue Healthy Growth



Source: IDC

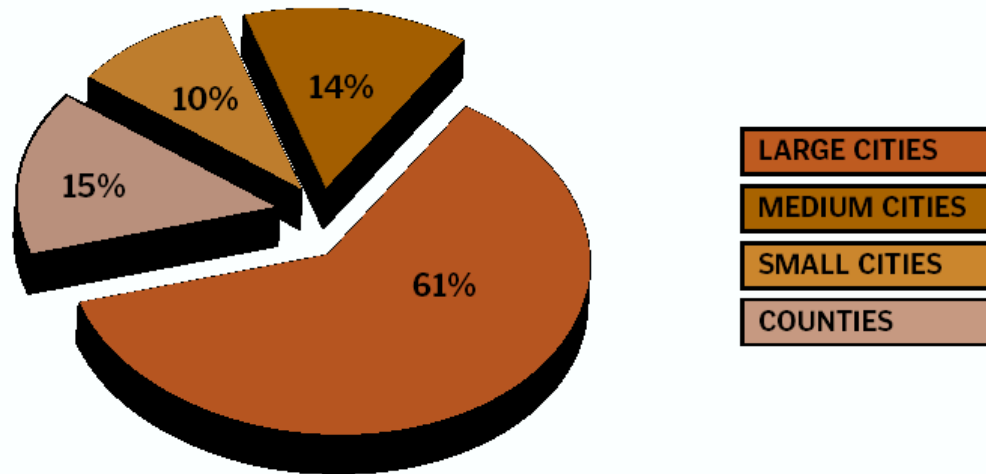
The Mesh Opportunity – a \$1B Market 2009



Source: IDC, ABI

Mesh a Critical Cost Factor in Evolving the Wireless Muni

2005 MUNICIPAL WIRELESS SPENDING BY MUNICIPALITY TYPE



SOURCE: 2005 MUNICIPAL WIRELESS STATE OF THE MARKET REPORT (MUNIWIRESLESS.COM)

2004-2007 U.S. SPENDING FOR MUNICIPAL WIRELESS NETWORKS

	2004	2005	2006	2007
Spending (\$ millions)	\$31.5	\$76.5	\$177.7	\$405.6
YTY Growth Rate	N/A	142%	132%	128%

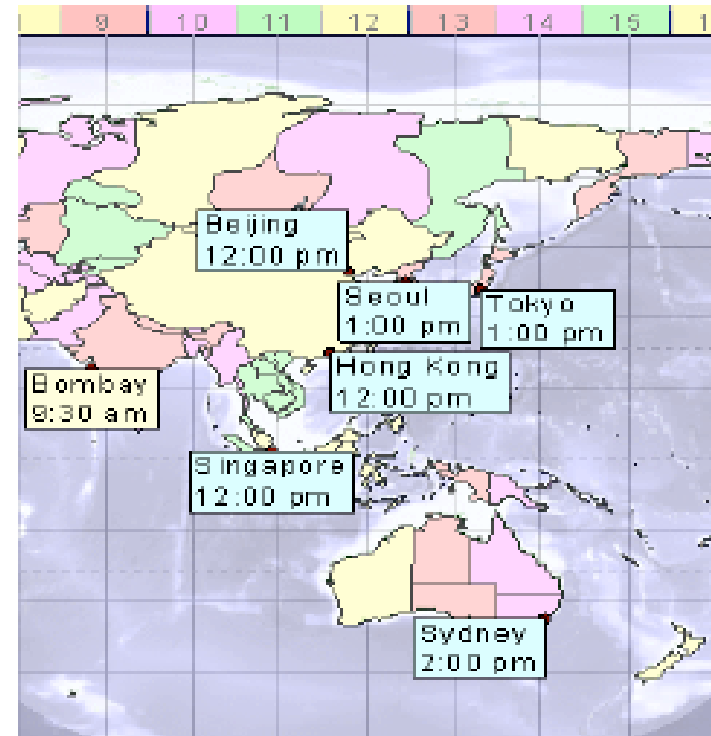
SOURCE: 2005 MUNICIPAL WIRELESS STATE OF THE MARKET REPORT (MUNIWIRESLESS.COM)

Asia Pacific Summary



Asia Pac Unique Characteristics

- Not one single region but 6 different sub-regions
 - ASEAN, Australasia, Greater China, India, Japan, Korea
- Significant differences: language, culture, business environment, regulations, geopolitical situation
- **One size will NOT fit all**
- Meeting local requirements is critical
- High business growth rate (e.g. China)
- From New Zealand to Pakistan: 6 time zones
- Australia = size of North America with 20 Million inhabitants

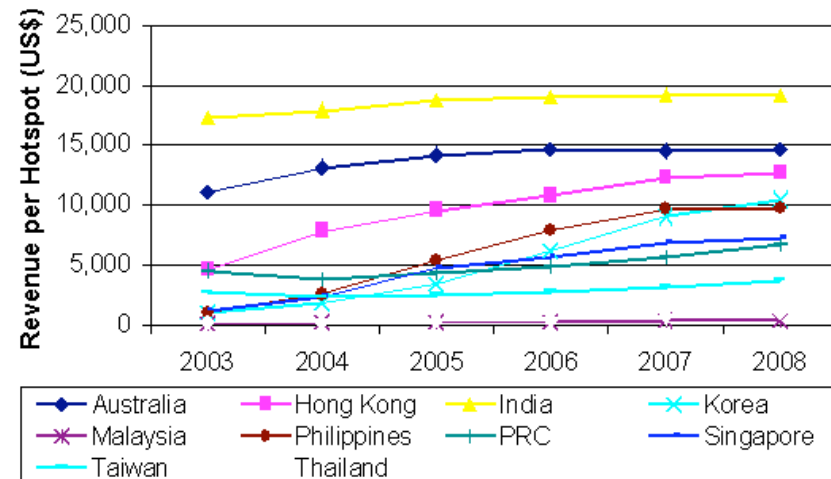


Both a Challenge AND an Opportunity!

Asia Pacific – Market Dynamics

- Market size and growth
 - Rapid HotSpot and subscriber growth
- Key trends
 - Revenue per HotSpot rising over the next 3-4 years
 - Significant drive towards ubiquity
 - 5 carriers across China, Korea, Singapore, Malaysia, and Australia provide roaming across >20K HotSpots
 - Carriers dominate the HotSpot rollout
 - From 2005-2009, will represent 45% of WiMax market (~ US\$2B)!

(IDC 2003)	2002	2003	2004	2005	2006	2007	CAGR
Spots (000s)	14	34	48.2	67.1	80.9	89.2	44.7%
Users (000s)	158	539	1374	2961	5518	7405	115.0%
Rev. (\$M)	14.3	65.9	172.5	358	630.9	921	129.9%



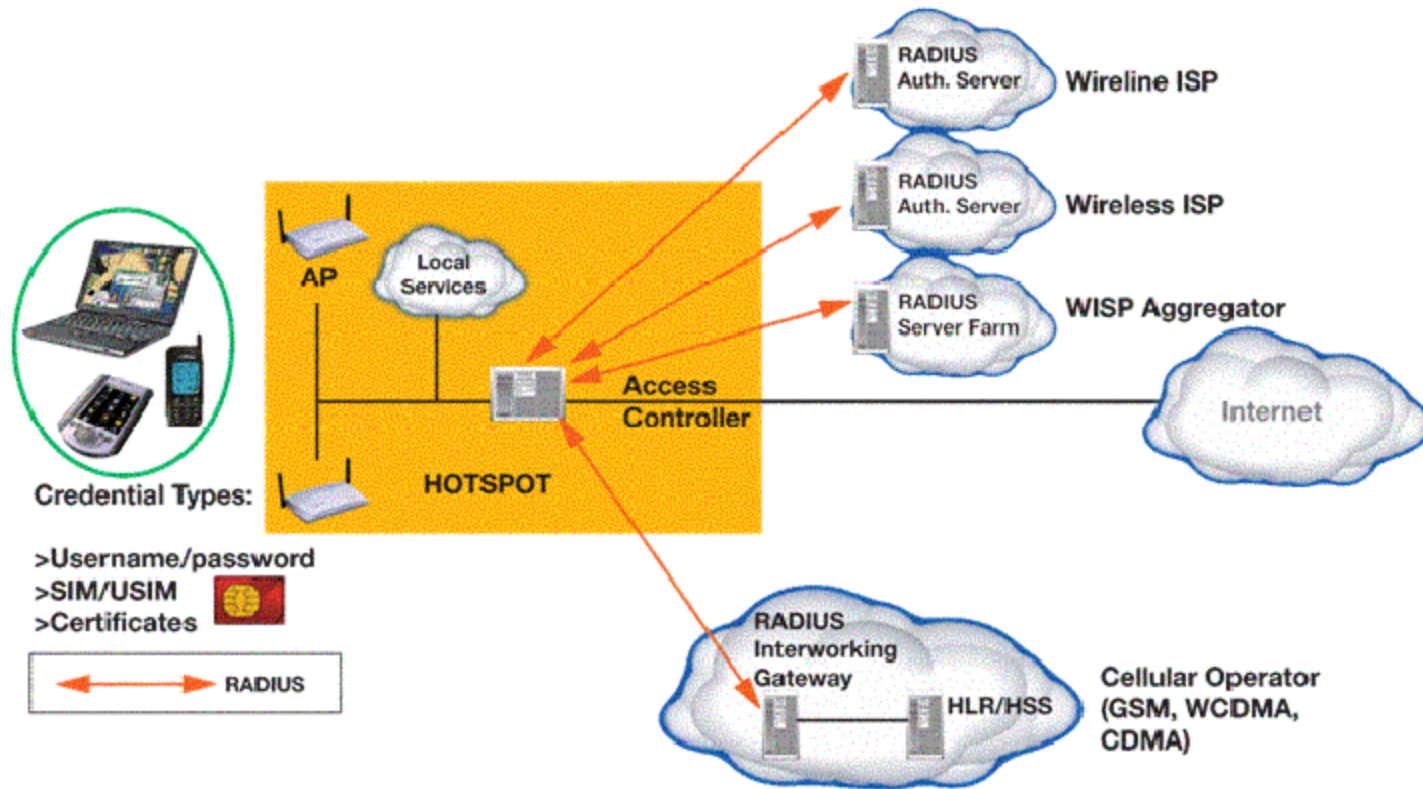
Source: IDC 2003

Key Vertical Markets & Applications

- China
 - Industrial
 - Public Safety/Security
 - Municipalities
 - Hospitality
- Japan & Korea
 - Municipalities
 - Supply Chain/Manufacturing
 - Hospitality
- SE Asia (SG, MY, TH)
 - Security/Surveillance
 - Transportation
 - Hotzones
 - Industrial
- SE Asia (PH, IN, Vietnam)
 - Rural Broadband
 - Municipalities

Network Convergence will Boost Overall Growth

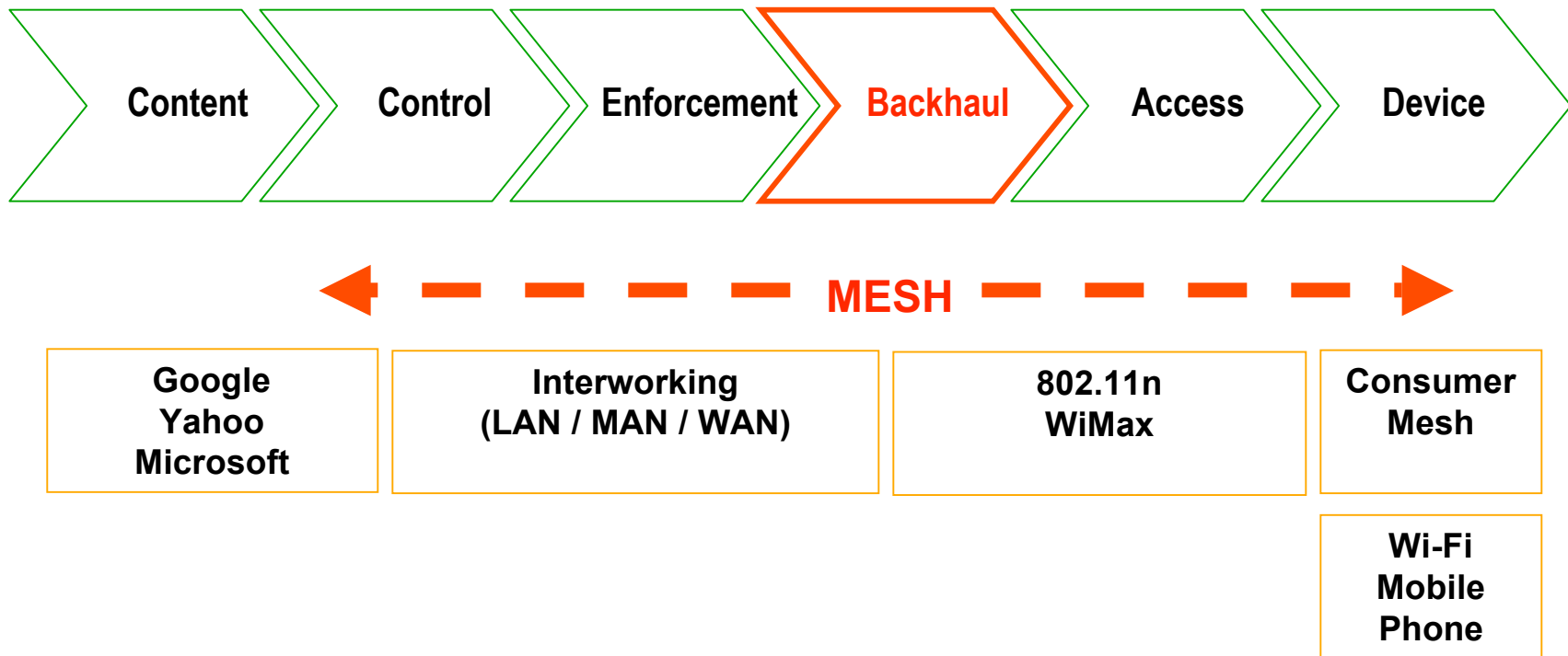
ATAWAD



Source: Intel/iDA – Public WLAN Interworking Study Sep -04

Mesh Enabling the Evolution of the IP Based Ecosystem

The Bridge to Convergence



Mobi-quitous Connectivity for Multiple Markets

Continuity of Services



Mesh Networks Expanding into Hot Regions



Wi-Fi Access
Video Networks
LAN Connectivity
Temporary Networks
Voice over IP

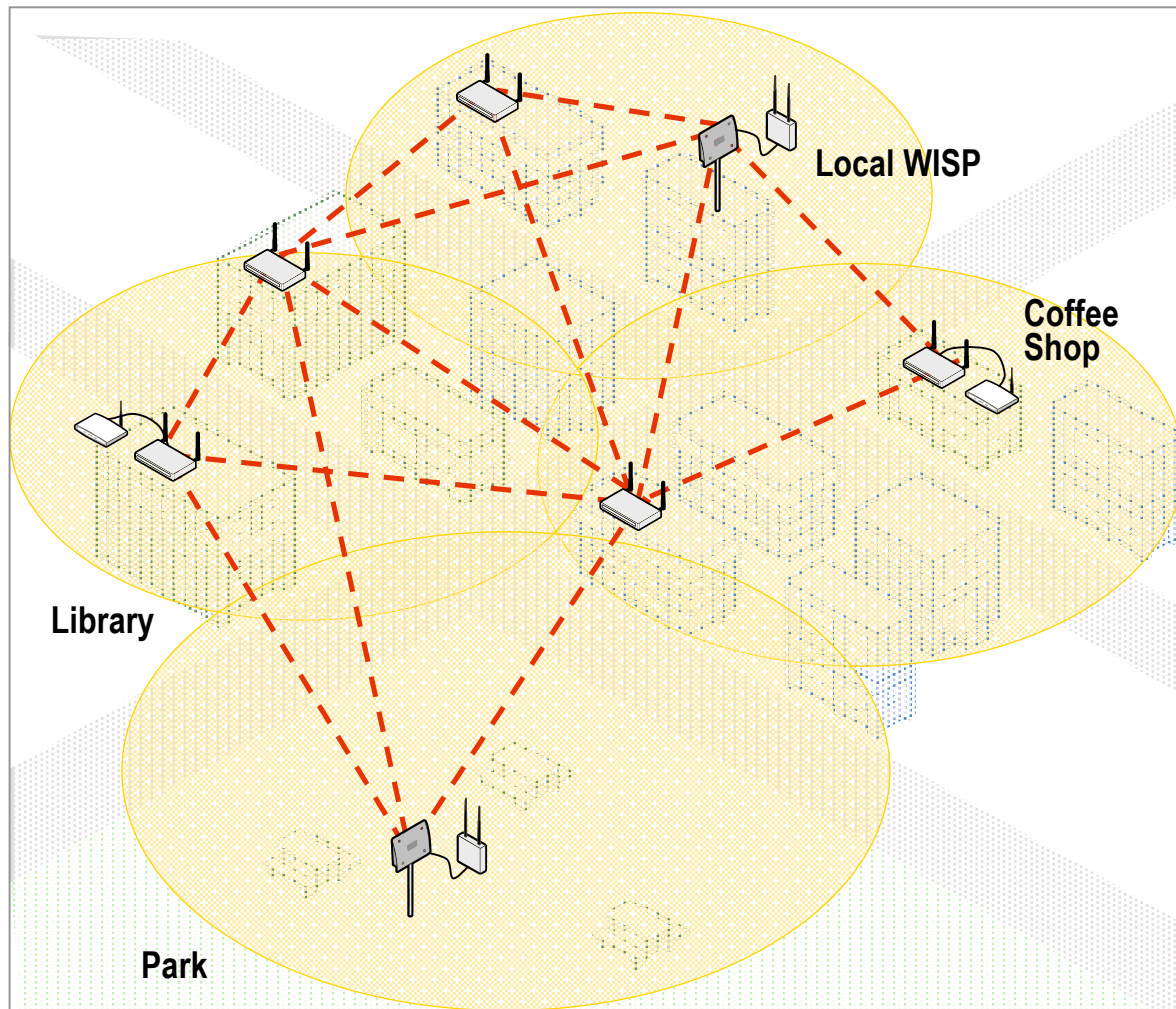
HotZones

- Hospitality
- Airports
- Campuses
- Warehousing

HotRegions

- Communities
- Resort Areas
- Metro Area Networks

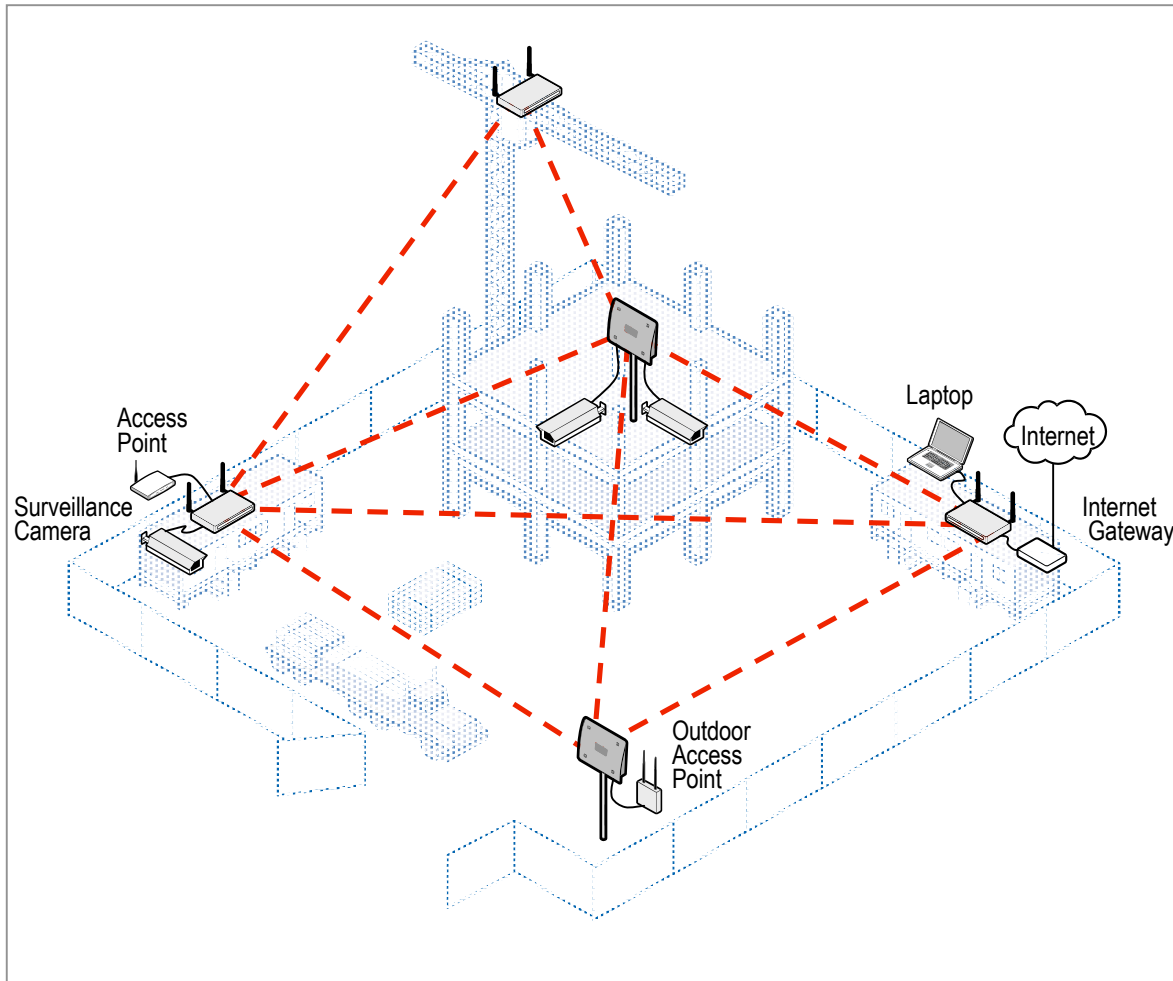
Metro Area Wi-Fi



- Multiple Hot Spots Create Hot Zones

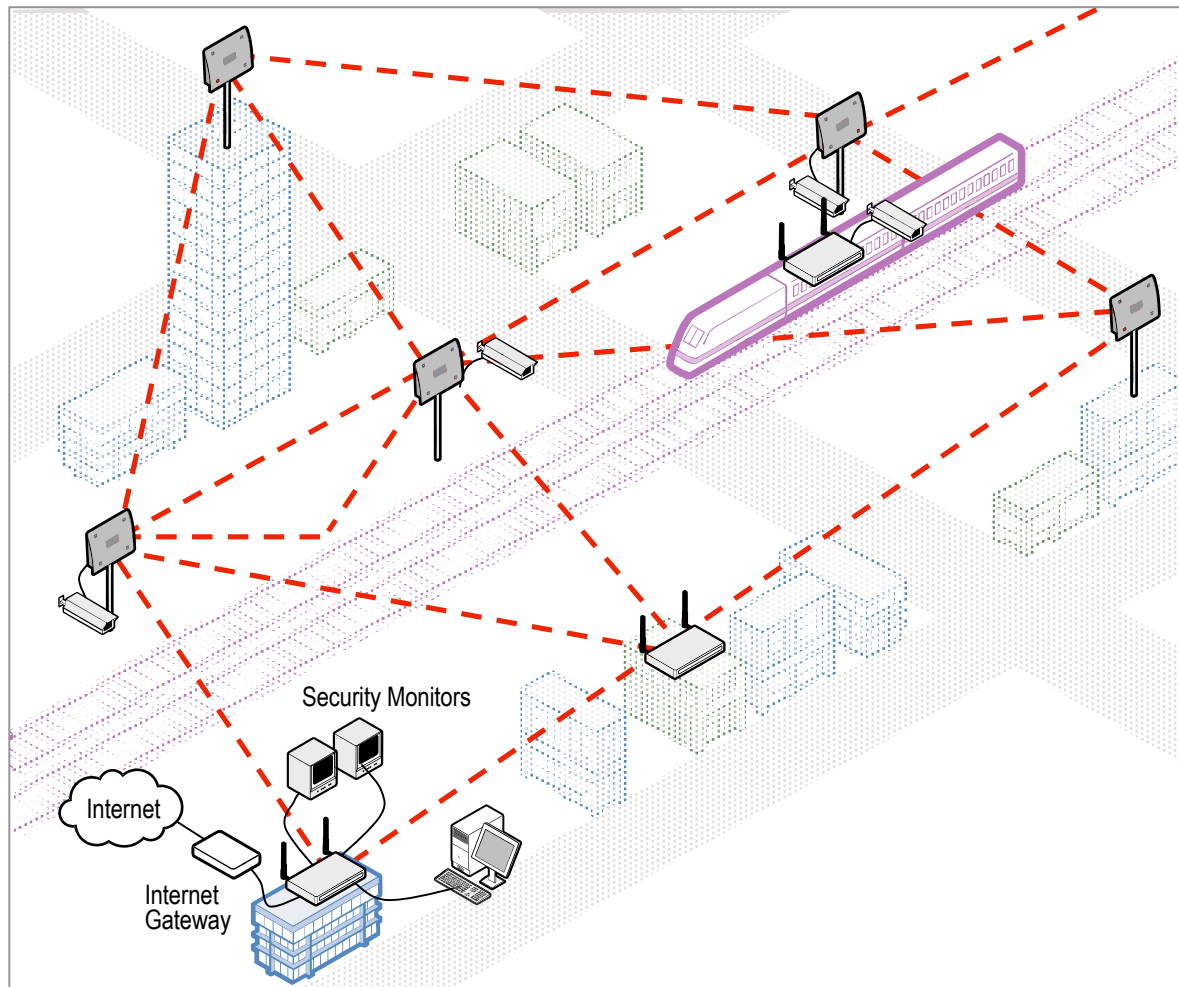
Temporary Networks

Construction Sites, Festivals, Fairs...



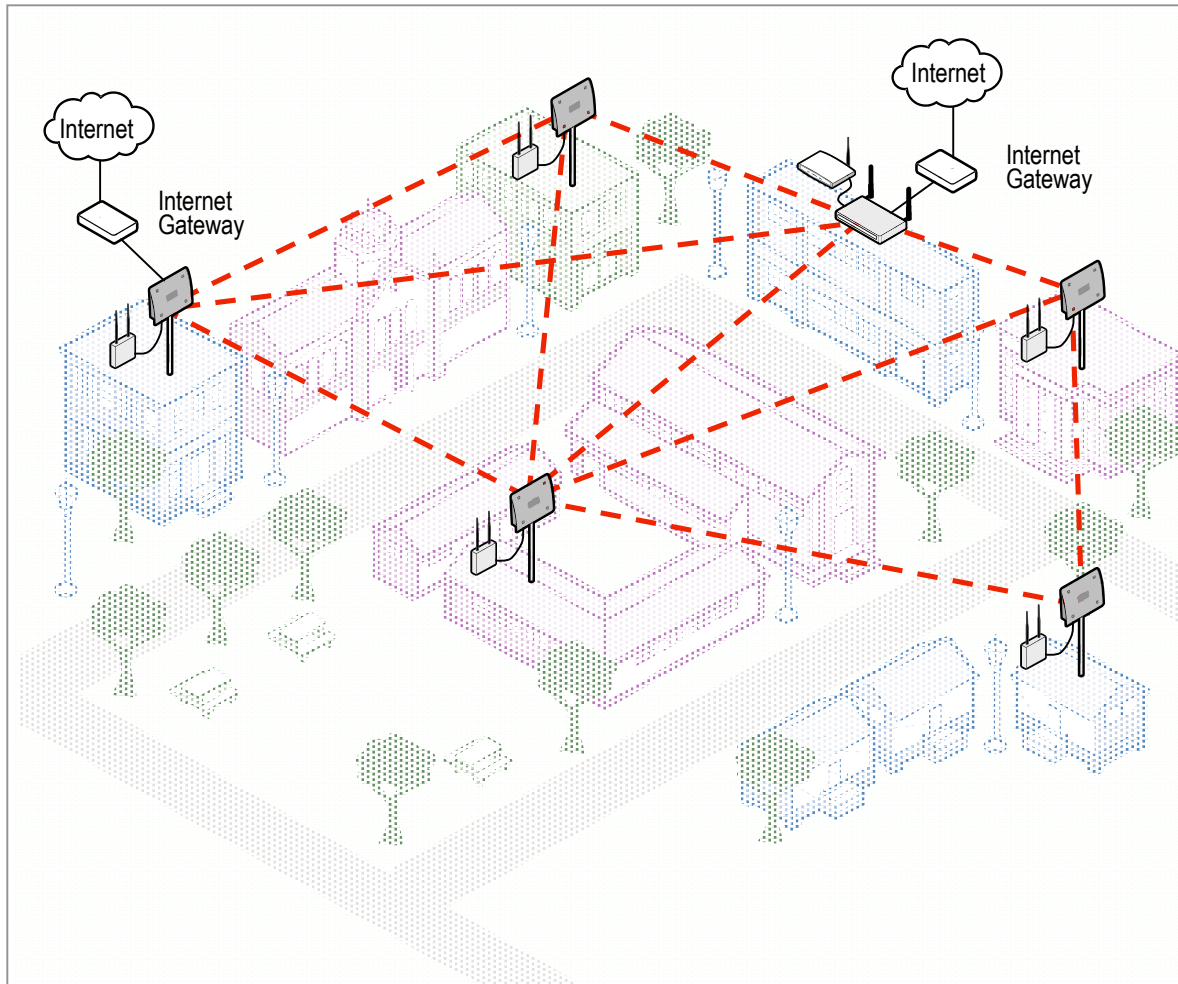
- Video surveillance
- Email & Internet
- Flexible and mobile network infrastructure

Transportation Networks



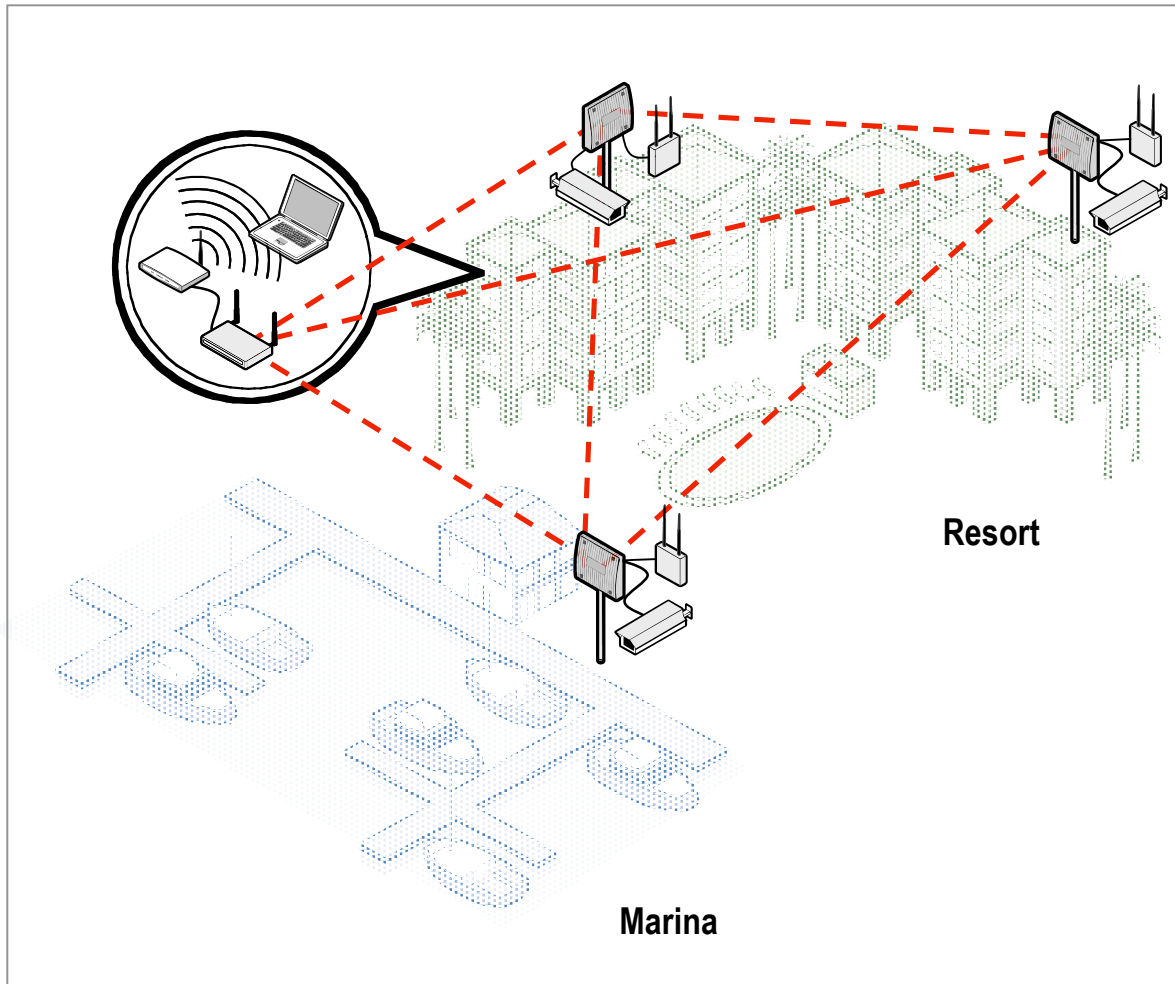
- Mobile surveillance and access on trains and busses

The School Campus



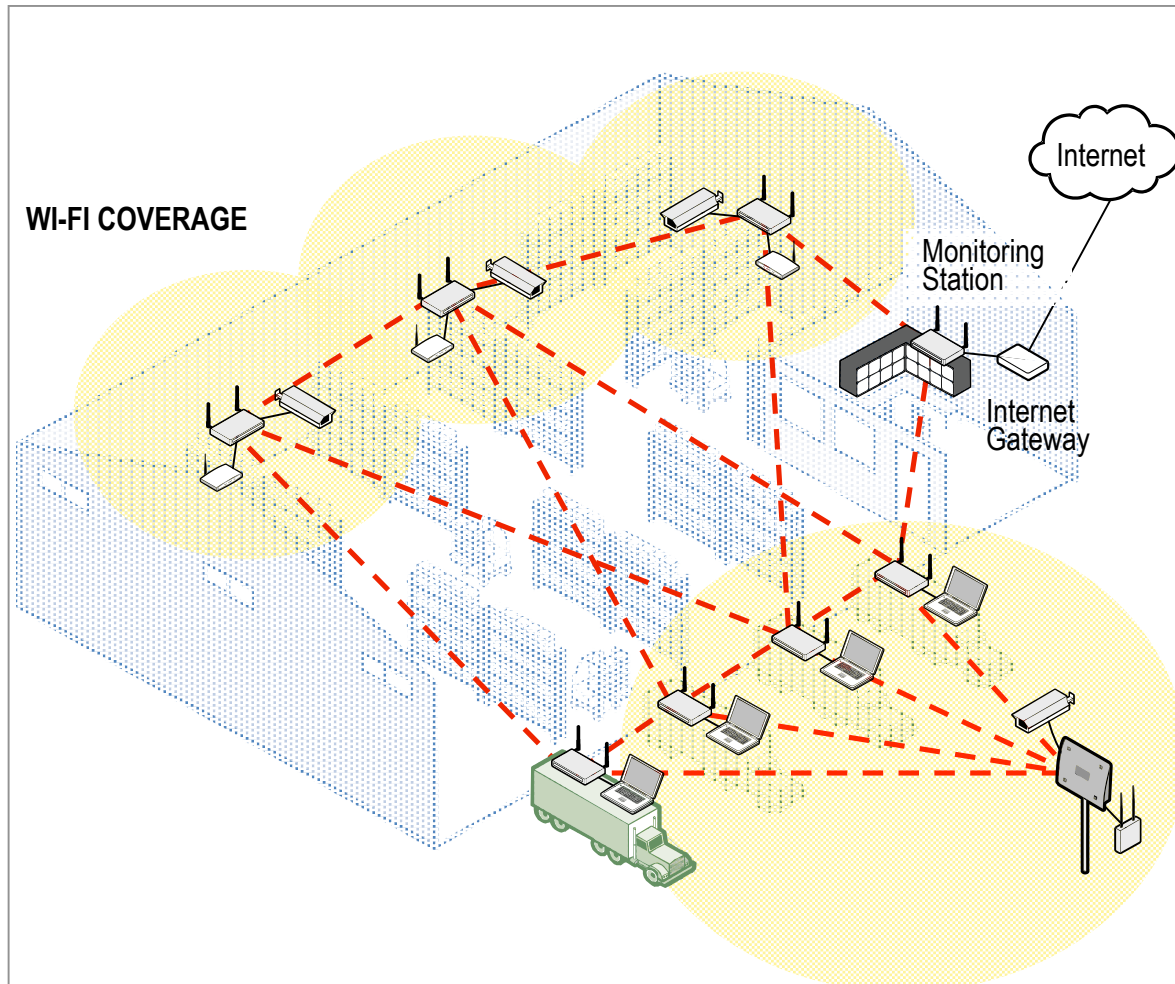
- Wi-Fi services
- Video surveillance
- Network extensions
- Safe for old and historic buildings
- Temporary events

Hospitality - Cost Effective Value-Add Services



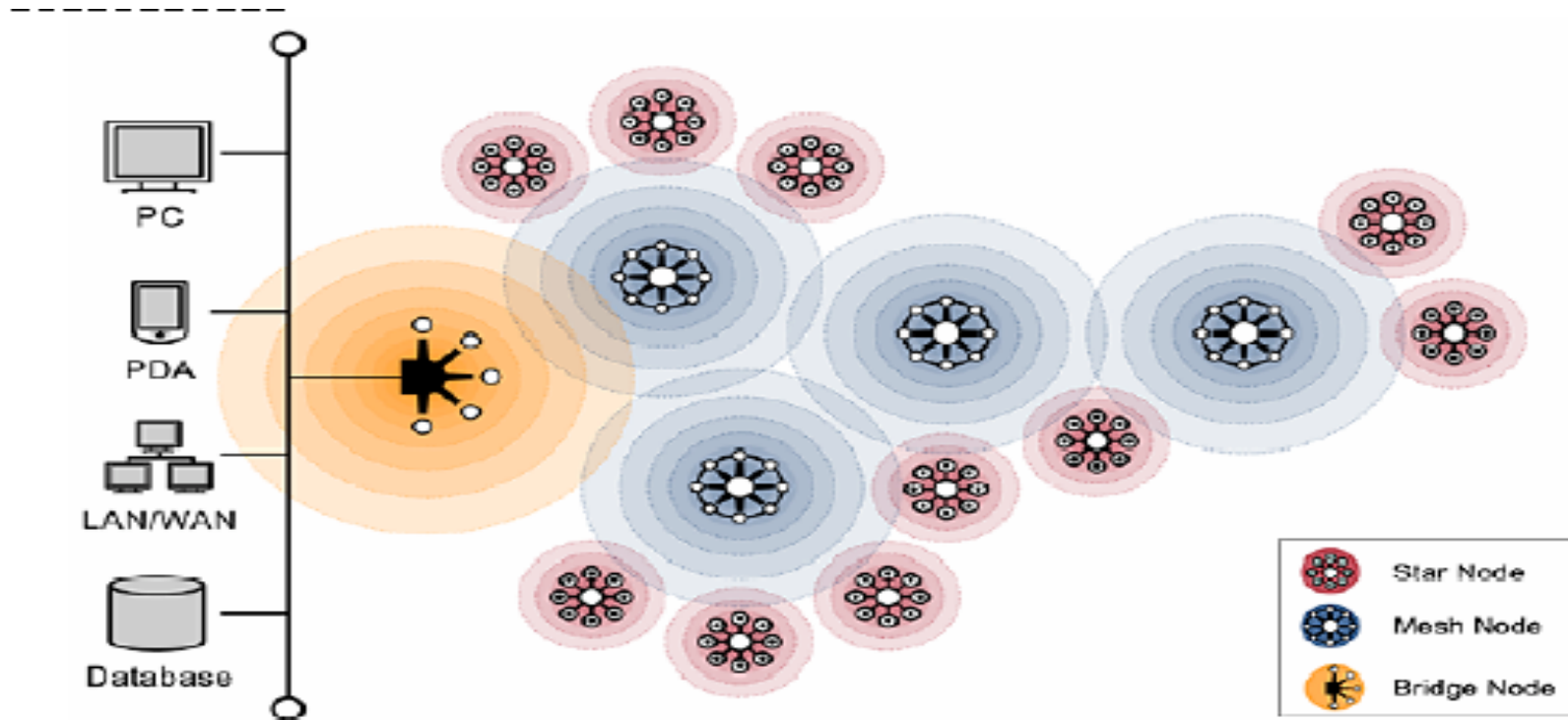
- Quick and cost effective installation
- Flexible video surveillance
- WI-Fi access for guests and staff

Warehousing - Redundant Multi-Service Support



- Multiple services
- Video surveillance
- Inventory management and RFID systems
- Dispatch and inventory control
- Network flexibility for changing warehouse layouts

Macro-Mesh Bridging *Micro*-Mesh Sensors



The Next Generation of Mesh – The Home

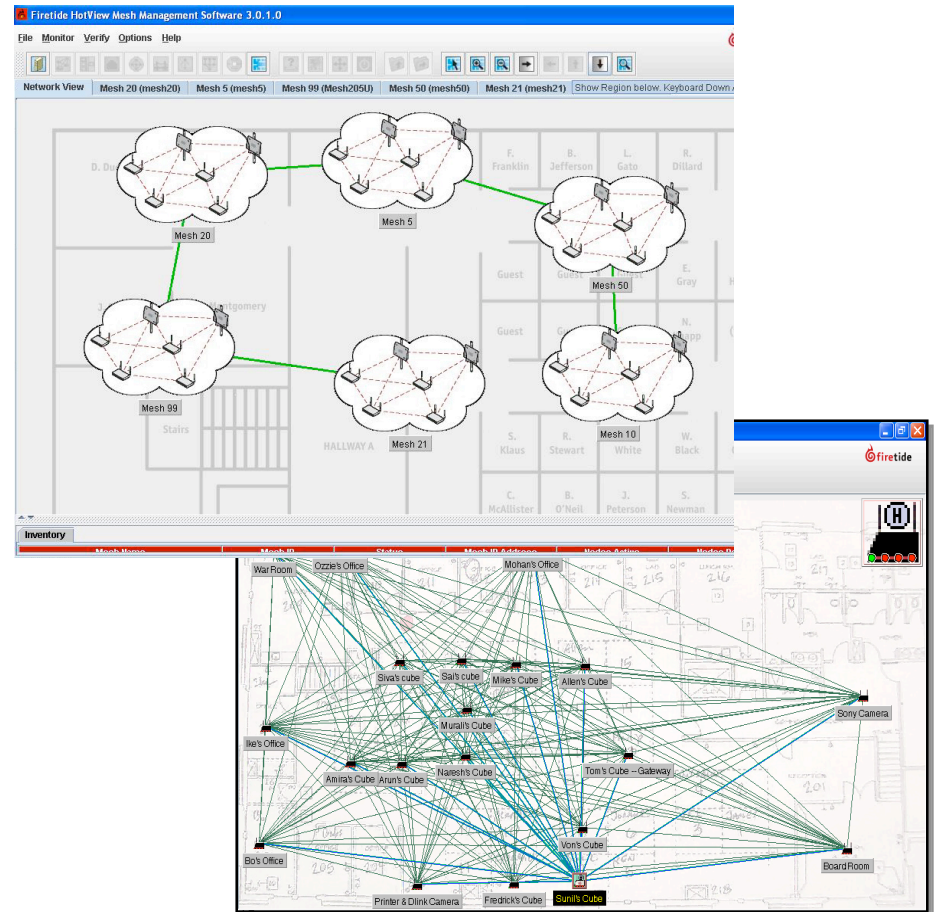
Consumer Applications Extended with Mesh

- Extending triple play in the consumer segment
- Redundant wireless music and video services throughout your home
- Improving reach compared to a more centralized network



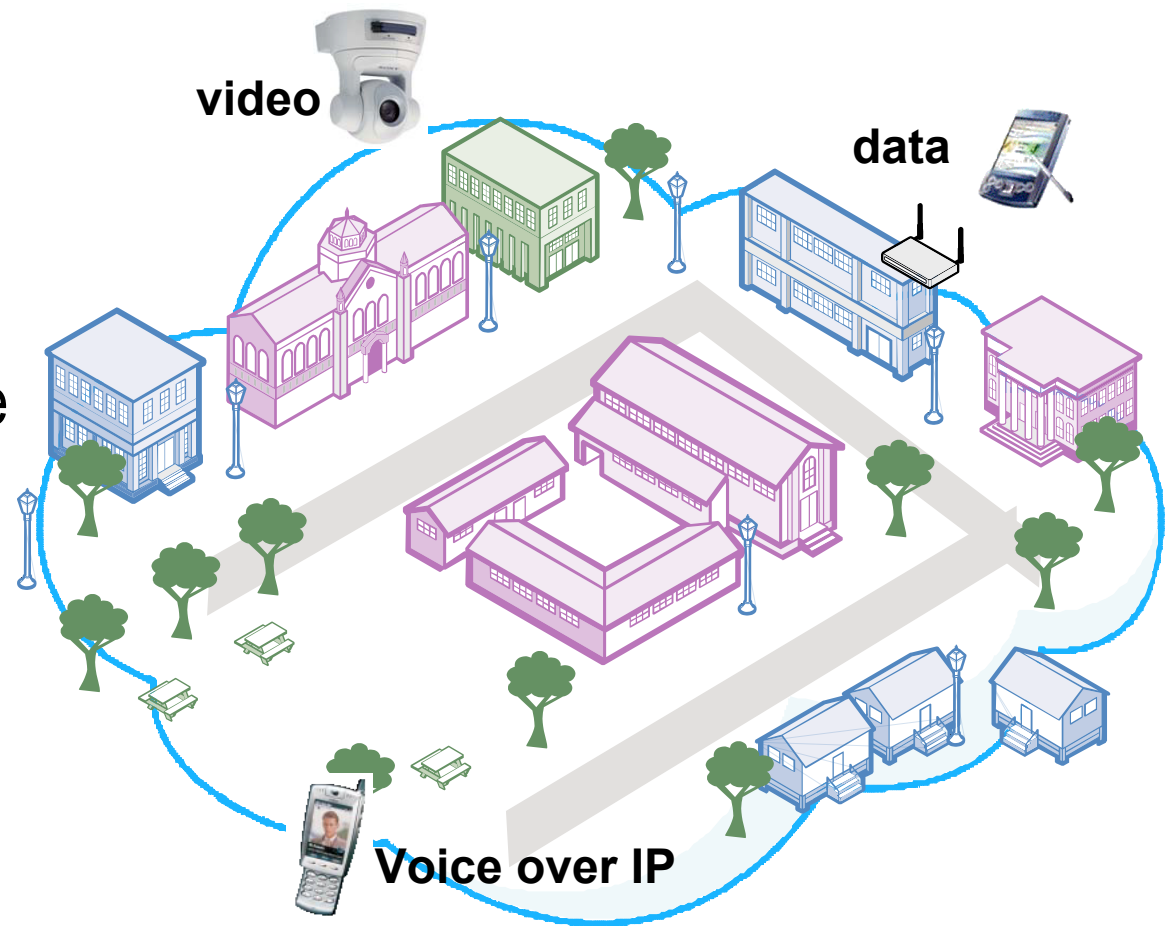
Centralized Mesh Network Management

- For scalable public access solutions
- Overview and node level management
- Local or remote management
- Radio power controls
- Traffic prioritization
- VLAN and security.



Multi-service Broadband Connectivity

- Triple play (VVD)
- Scalability
- Seamless connectivity
- Low CAPEX and OPEX
- Secure and manageable



Evolution of Mesh Technology

- Standards – 802.11s early 2008
 - Interoperability and Scalability
- Convergence of Network Technologies
 - 3G, WiFi, WiMax, UWB, ...
- Large Diversified Market, room for variety of network vendors
 - RFID networks, Mobile/WiFi Phones, Consumer applications
- \$\$\$ B equipment market in 4 years !

A photograph of the Great Wall of China winding across a mountainous landscape. In the foreground, a red duck with a yellow beak and black accents sits on a large, dark stone block of the wall. A light blue speech bubble with a black border is positioned above the duck, containing the text "Thank You!". The background shows rolling green mountains under a hazy, overcast sky.

Thank You !