



Wireless Network Infrastructure

Inscape Data Corporation
January 10, 2006



Introduction

Purpose

- Providing fixed wireless Internet connectivity to the general population from rural towns to densely populated metropolitan areas
- Equipment selection using AirEther Access Points, P-t-(M)P Bridges, and CPE
- Using IP68 outdoor certified reliable and cost effective AirEther wireless solutions

AirEther Product Line

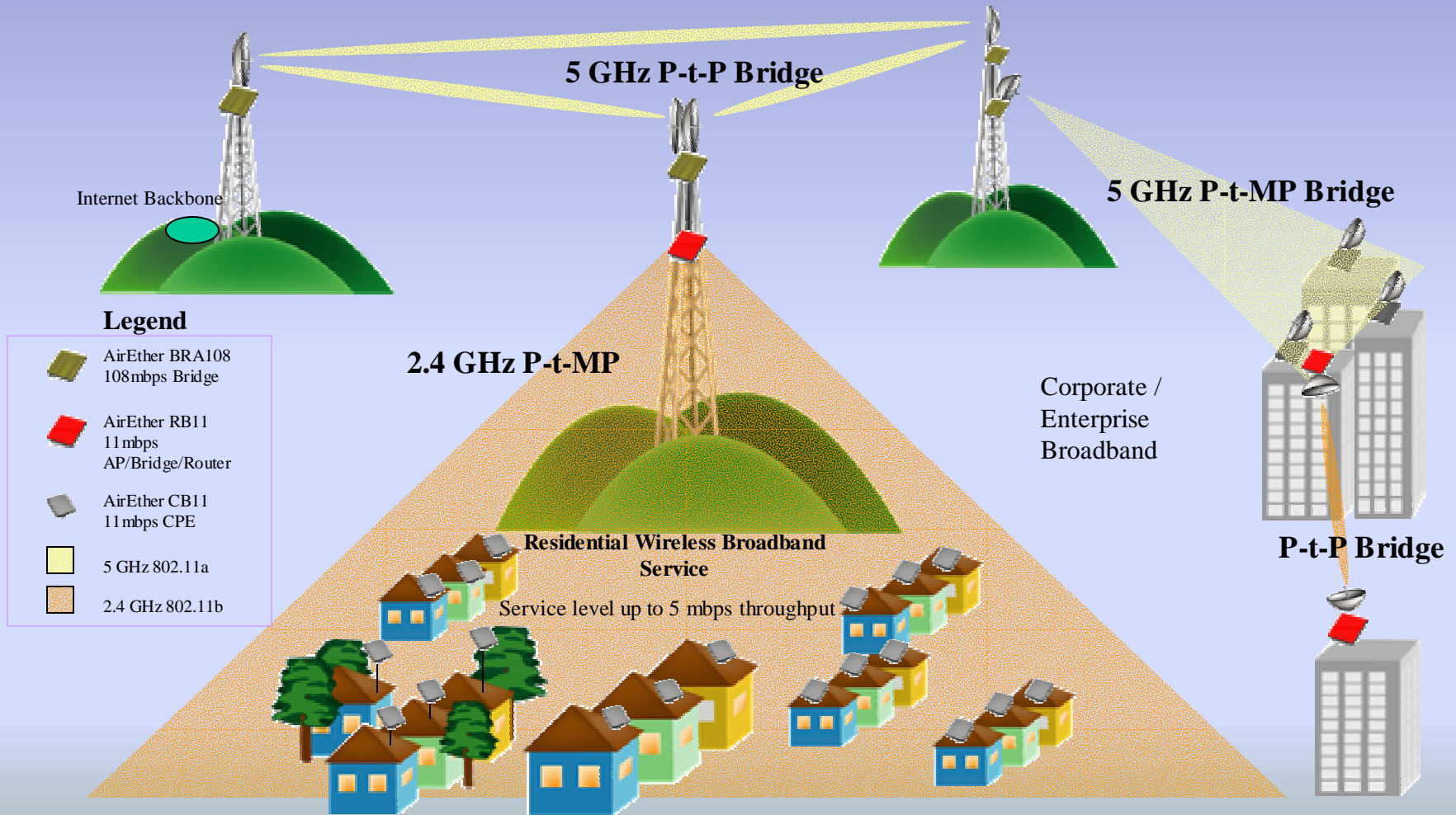
1. AirEther BR108a 5GHz Wireless Bridge – Backhaul systems
2. AirEther RB11 2.4 GHz Access Point/Bridge/Router – Last mile base stations
3. AirEther CB11 2.4 GHz Client Bridge – Last mile CPEs



Advantages of Outdoor WiFi Wireless

- Provides outdoor long range data connectivity solutions once very expensive
- Fast deployment times and added cost savings
- LOS advantage, Long Range and high data rate
- Wireless user mobility and portability for broad applications, e.g., VoIP and Video over IP
- High over the air data rates
- Low cost wireless broadband and proven ROI (Return on Investment), v.s. leased T1 line

Fixed Wireless System Architecture





Performance

- BR108a 5 GHz Point to Multipoint Bridge
 - Create Redundancy via Spanning Tree Protocol (STP)
 - Layer 2 Bridge (1 to 4 Max)
 - Up to 108 mbps data rate
 - Long range paired with high gain directional antenna
- RB11 Multi-functional AP / Bridge/ Router
 - Provides broadband access up to 5 mbps throughput
 - 100 wireless subscribers in AP mode
 - Layer 2 Bridge (central or remote bridge, 1 to 8)
 - Static or NAT routing
- CB11 Multi-client bridge Customer Premises Equipment
 - Multiple PC or LAN may share a single CB11
 - NAT routing support
 - Low cost layer 2 remote bridge (8 to 1) when used with RB11

Popular Application Scenarios

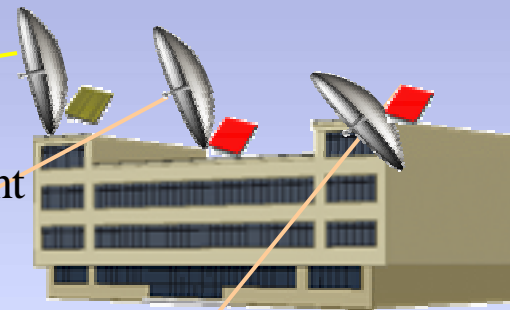
- Data connectivity
- Wireless Internet Service
- Wireless VoIP
- Wireless Wide Area Network
- Wireless Video Surveillance (Video over IP)
 - Traffic monitoring
 - Homeland Security
 - Remote infrastructure surveillance
- Wireless telemetry control

Example 1- Long Range Wireless Data Communications



Communications Tower

①
AirEther BR108a
5GHz point-to-point
bridge



Surveillance Monitoring HQ

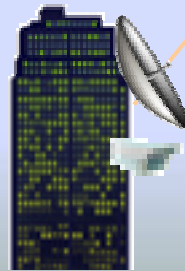
②

AirEther RB11
2.4GHz point-to-
point bridge



Government Buildings

③

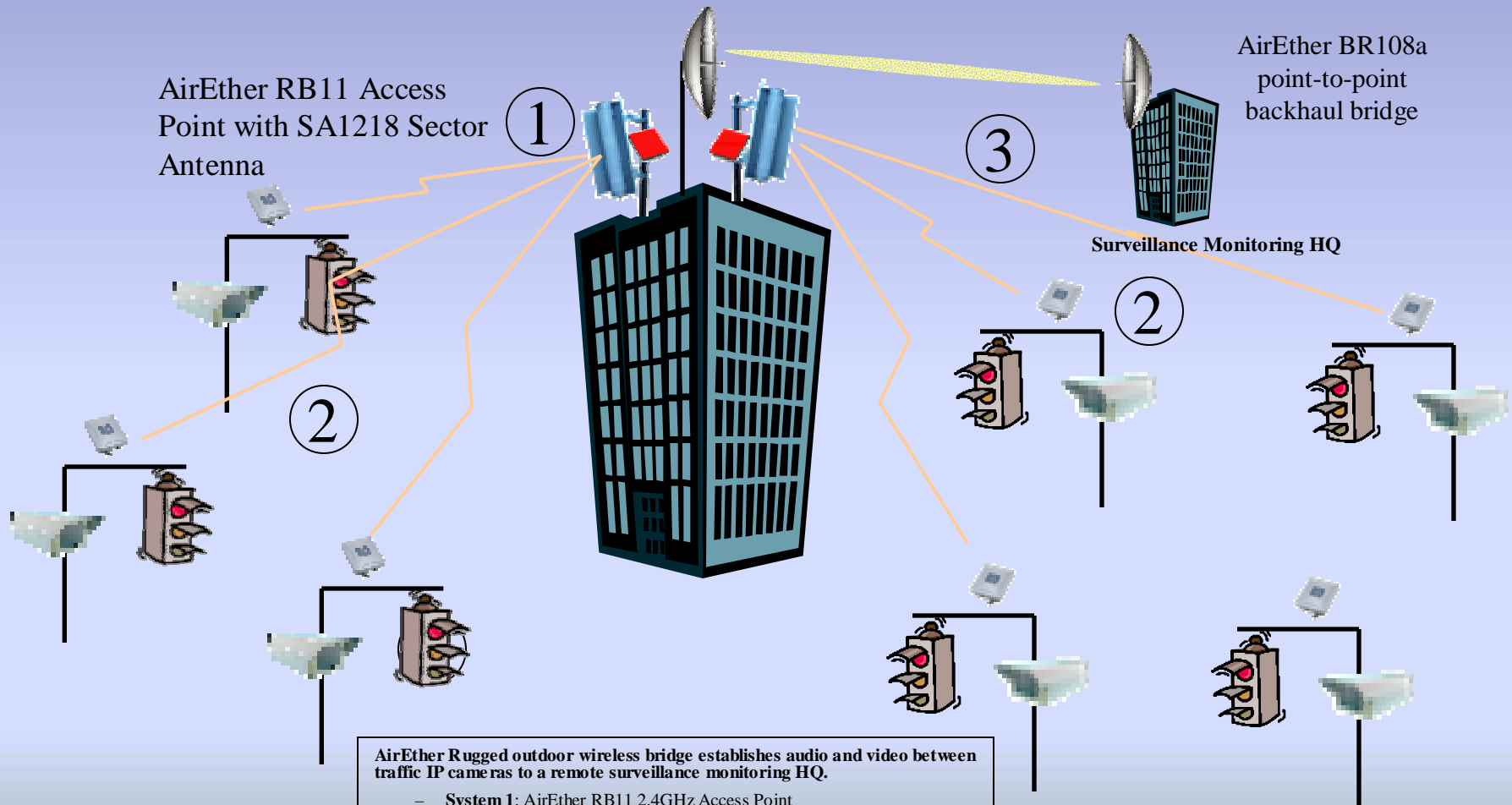


Skyscrapers or Commerce Buildings

AirEther Rugged IP68 Certified outdoor wireless radios establishes audio and video location to a centralized surveillance and monitoring location

- **System 1:** AirEther BRA108 5GHz point-to-point bridge up to 108Mbps
- **System 2:** AirEther RB11 2.4GHz point-to-point bridge up to 11 Mbps
- **System 3:** AirEther RB11 2.4GHz point-to-point bridge up to 11 Mbps

Example 2- Traffic Video Surveillance

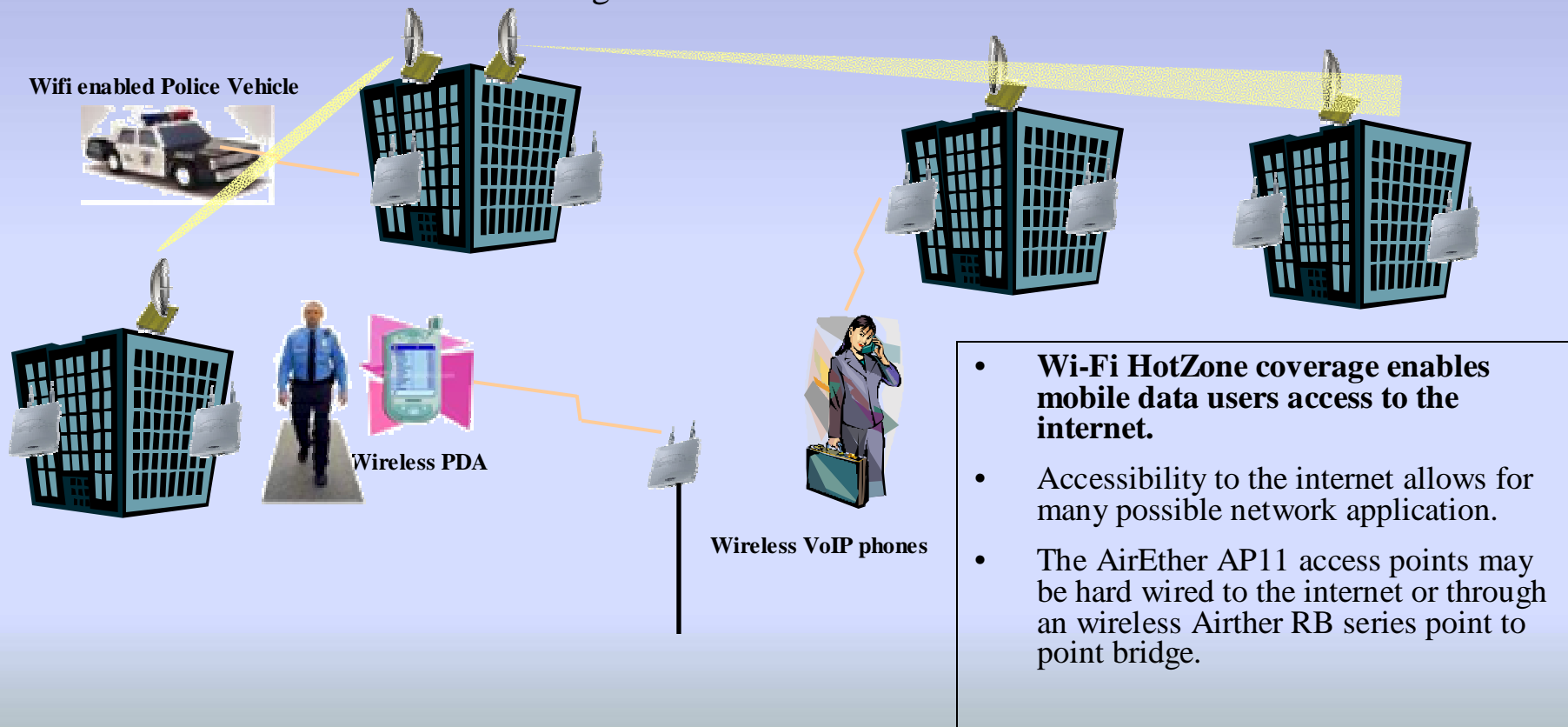


AirEther Rugged outdoor wireless bridge establishes audio and video between traffic IP cameras to a remote surveillance monitoring HQ.

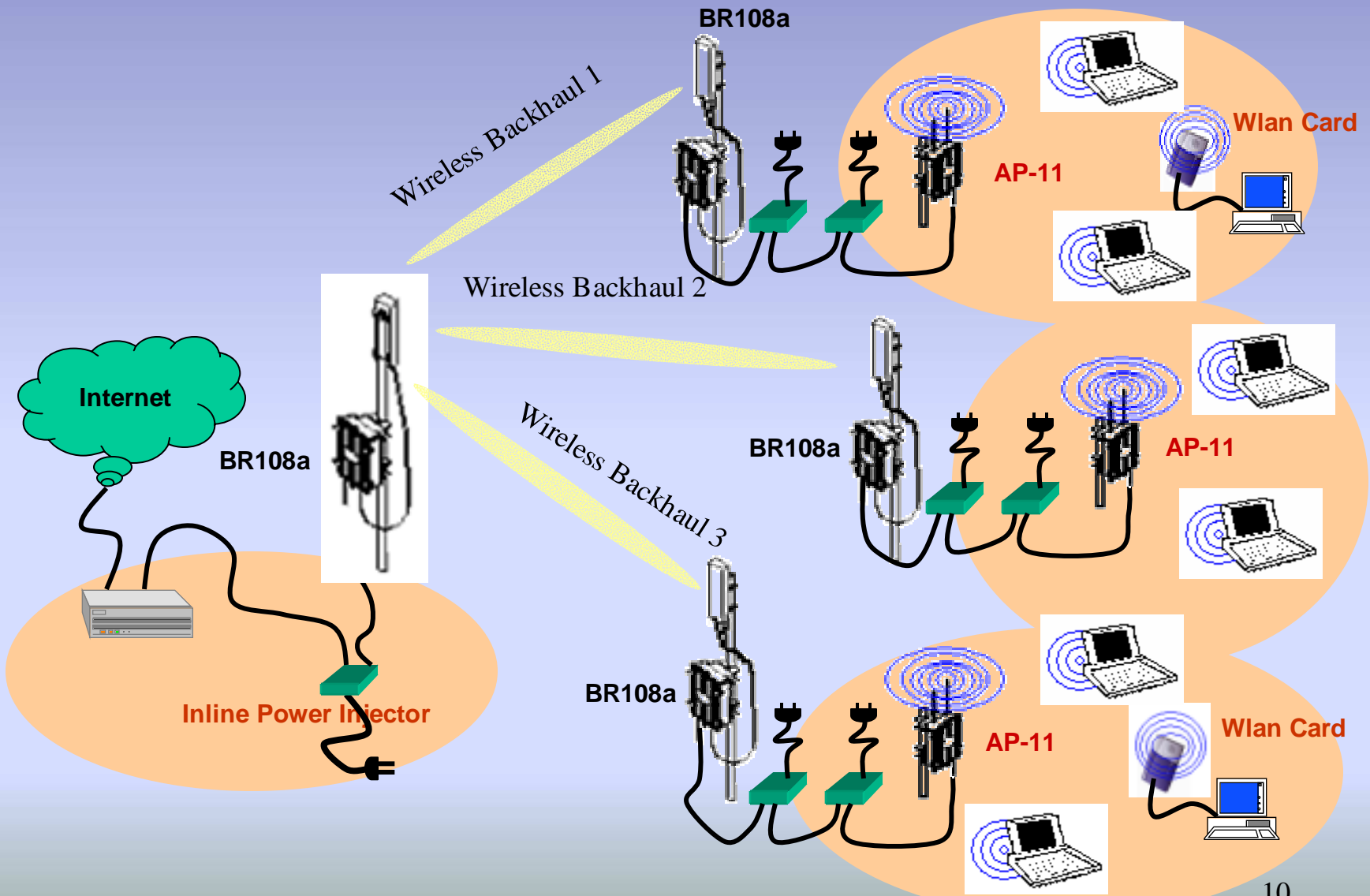
- System 1: AirEther RB11 2.4GHz Access Point
- System 2: AirEther CB11 2.4GHz wireless client bridge.
- System 3: AirEther BR108a 5GHz backhaul point-to-point bridge

Example 3- Wireless deployment for Data Mobility

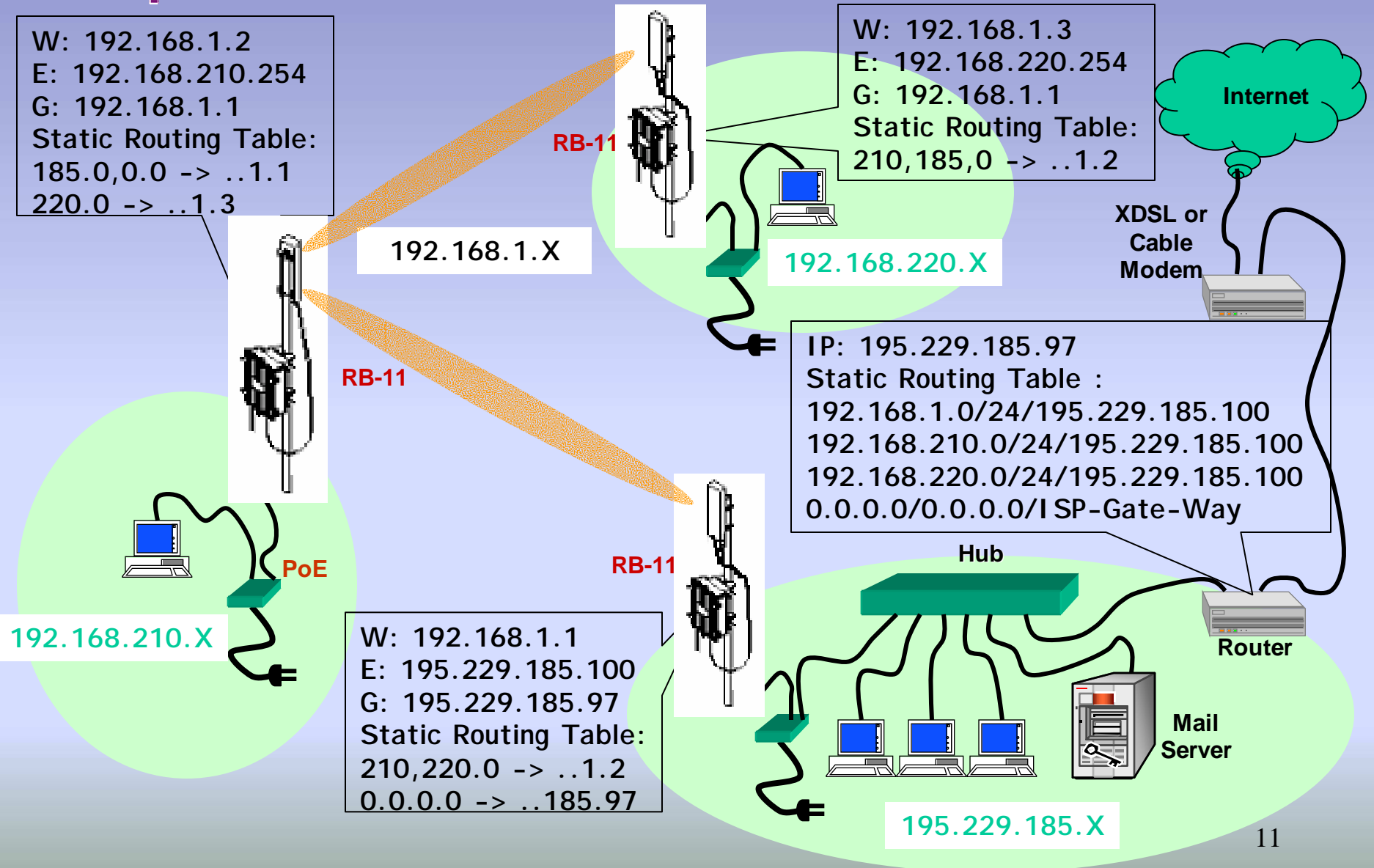
WiFi Hot Zones using AirEther AP11 2.4 GHz outdoor Access Point



Example 4- Wireless Campus



Example 5 – Routed Wireless Networks





System Overview

AirEther BRA108 Backhaul Wireless Bridge



**AirEther BR108a
Wireless
Bridge/Backhaul**

Specification	
Standards Compliance	IEEE 802.11a
	IEEE802.3
	IEEE 802.3u
Radio Frequency Type	Direct Sequence Spread Spectrum (DSSS)
Frequency Band	5.15~5.35GHz
	5.50~5.70GHz
	5.725~5.85GHz
Operating Channel	9 non-overlapping channels
Transmit output Power	Up to 100mW (software provisionable)
Transmission Rate	108(Turbo mode)/54/48/36/24/18/12/6Mbps auto fallback
Physical Interfaces	10/100Base-TX: RJ-45
	Radio Wave: Antenna N-Male
Sensitivity (@PER 10 %)	6Mbps:-88dBm;12Mbps:-87dBm;18Mbps:-84dBm;
	24Mbps:-81dBm;36Mbps:-76dBm;48Mbps:-72dBm;
	54Mbps:-68dBm
Antenna Type	External high gain antenna
Security Systems	64-bit/128-bit/152-bit WEP encryption
Software Support	Web-based GUI interface
	SNMP network management interface
	FTP
Operating Environment	Operating Temperature:-30 ~ +70°C
Power	DC 48 Volt + 5% ; 2A (Max.); AC adapter AC 100V ~ 240V
Regulatory Approval	FCC Part 15 B (US); CE
Network Management	Windows 95/98/Me/NT4.0/2000/XP
System OS Support Warranty	One year limited



System Overview

AirEther RB11 AP/Bridge/Router



- **IEEE 802.11b**
 - 2.4 GHz license exempt
- **Networking**
 - DHCP client or server
 - PPPoE
 - DNS relay
 - Virtual Server
- **External Antenna Connector**
 - Type N RP female connector
- **Transmit Power**
 - 200mW (23 dBm)
- **PoE**
 - 48VDC 0.7A proprietary
- **Enclosure Design**
 - IP68, All weather
 - Unique die-cast metal housing, functioning as ground plane for increased antenna performance.
 - RF immunity
- **Operating Temperature**
 - -20 C ~ 70 C (Cold Boot)
 - -55 C ~ 70C (Warm Boot)
- **Lightning Protection**
 - 20KA current, Built-in arrestor located at base of antenna port.
- **Security**
 - Client to Client blocking in AP Mode [enable/disable]
 - 802.1x Port-based Network Access Control
 - Radius Client
 - Built-in Database
 - PPPoE authentication PAP/CHAP
 - MAC Filter by Interface
 - WEP 64 bit or 128 bit
 - Hide SSID (Site Survey Prevention) [enable/disable]
 - Deny “ANY” [enable/disable]
- **Firewall**
 - NAT
 - IP based access control
 - DoS
- **Mode of Operation**
 - Access Point
 - Layer 2 Bridge (1 to 8 Point to Multipoint)
 - Remote Bridge
 - Central Bridge
 - Router
 - Static or NAT



System Overview

AirEther CB11 Client Bridge



- IEEE 802.11b
 - 2.4 GHz license exempt
- Mode of Operation
 - Infrastructure client
- External Antenna Connector (CB11e Only)
 - Type RP-SMA
- Built In Antenna Type (CB11 Only)
 - CB11, 9 dBi Patch (Up to 3~5 miles range in low noise environment)
- Transmit Power
 - 200mW (23 dBm)
- PoE
 - 24VDC 0.8A non-802.3af
- Enclosure Design
 - IP67, All weather
- Operating Temperature
 - -20 C ~ 60 C (Cold Boot)
 - -55 C ~ 60 C (Warm Boot)
- Security
 - MAC Filter on wireless Interface
 - WEP 64 bit or 128 bit
- Firewall
 - NAT
 - IP based access control
 - Denial of Service
- Network Bridge support
 - Client Bridge or L2 Transparent
 - NOTE: Proprietary Transparent bridge link to AirEther RB11 require w/ FW version 208T401 upgrade. Allows up to 8 point to multipoint low cost Layer 2 Bridge.
- Routing
 - NAT
- Networking
 - DHCP client
 - DNS relay
 - Virtual Server (NAT Inbound)



AirEther™ Wireless System features & Advantages

- Complete 5GHz and 2.4GHz end to end wireless system solutions
- Ruggedized IP67/68 weatherproof Point to Point backhaul with static and NAT routing capability
- Enterprise Point to multipoint bridge/router
- Reliable cost effective point to multipoint bridge
 - Layer 2 Transparent bridge
 - 4 Remote bridges & STP for BR108a and 8 remote bridges for RB11
- High Power 2.4 & 5.x GHz 802.11b, and 802.11a Access Points and Bridges
- Hardware (KIT) inclusive in-the-box package ready for immediate installation
 - Built-in lightning surge arrestors, PoE, RF Coax Cables (RBA108 & RB11), Antennas(AP11), 100 feet outdoor shielded CAT5



Summary

Critical Outdoor Application Consideration

- Weatherproof outdoor equipment reliability and dependability
- Features and operation
- Power accessibility
- Ease of installation
- Low cost professional wireless solutions

Key Features of Inscape Data's Solutions

- Complete 5GHz & 2.4 GHz Carrier Class WiFi system solutions
- Lab certified "IP" 67/68 rated ruggedized weatherproof outdoor wireless equipments protecting your investments
- Built in Bridge and Routing functions
- Long range capability with integrated 200mW and 400mW high power radio
- Versatile and cost effective for all deployment scenario
- Dependable and reliable hardware platform
- Scalable, easy to integrate, and cost effective solution to meet every project budget