



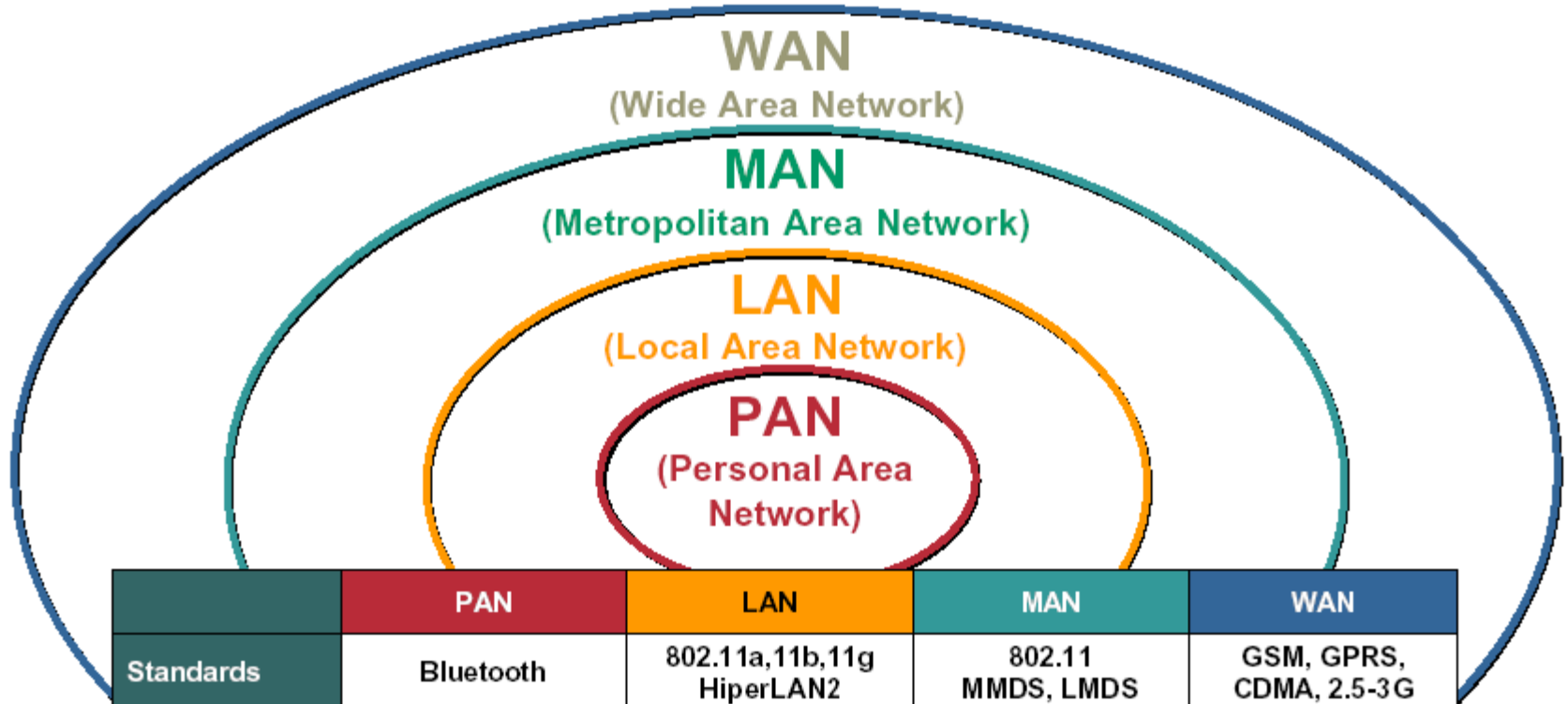
**Wireless Networking Update
for the
Colorado Springs Cisco User Group**

January 2004

Agenda

- Anyware Network Solutions Overview
- Cisco Aironet Market and Product Update
- AirMagnet Demo
- Vocera Demo

Wireless Landscape



	PAN	LAN	MAN	WAN
Standards	Bluetooth	802.11a, 11b, 11g HiperLAN2	802.11 MMDS, LMDS	GSM, GPRS, CDMA, 2.5-3G
Speed	< 1Mbps	2 to 54+ Mbps	22+ Mbps	10 to 384Kbps
Range	Short	Medium	Medium-Long	Long
Applications	Peer-to-Peer Device-to-Device	Enterprise networks	Fixed, Last Mile Access	PDA's, Mobile Phones, Cellular Access

ACC-2010

Anyware Network Solutions

What We Are NOT

- Wireless ISP
- Box-pushers
- “Wired”
 - Switch & Router designers or sales
 - IP telephony designers/sales
 - Optical network designers/sales
 - Security designers/sales
 - CAT-5, Fiber pullers

Anyware Network Solution

We're All About Wireless



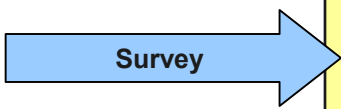




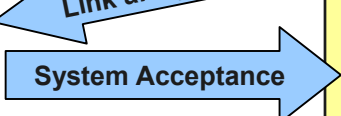
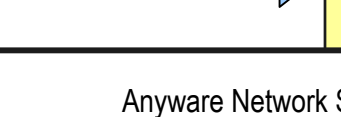
Networks

- Indoor WLANs
- Outdoor WLANs (campus hot-zones)
- Outdoor WWANs
 - PTP bridges between two sites
 - PMP connects remote sites to hub site

Services

- Technology Consulting & Needs Assessment
- Design & Engineering
- Sales
- Project Management
- Equipment Configuration & Installation
- Network Maintenance

Sales & Engineering Process

Sales Process		Engineering Process	Tools
Discovery - Needs assessment - Network goal definition		Viability analysis - Initial design options	Preliminary link analysis Pre-survey proposal
Pre-survey proposal review - Design review - Cost estimate review		Site survey - Site inspection - Spectrum analysis - Detailed RF design - Component specification	Micropath, Panterra Spectrum analyzer GPS, digital camera, etc. Radios, antennas Harnesses, climbing gear
Site survey report review Finance options review		Pre-construction meeting - Installation prep - Materials review	Leasing partners Supplier partners
Sourcing Project management Delivery logistics		Installation - Hardware configuration - Custom builds	OSHA certification 8 yrs installation experience
Customer follow up - System sign-off - Follow-on services offered		System Maintenance System Debug Technical Support	
			
			
			
			

WLAN Considerations

Design & Deployment

- Determine bandwidth needs
 - User density, shared medium
 - May effect technology choice
- Determine RF coverage requirements
 - UBIQUITY COSTS \$\$
- Evaluate existing RF equipment
 - Possible interference
- Determine security requirements
 - User & Server authentication
 - Data encryption
 - User access control
 - Physical security (lock up AP's)
- QoS requirements for voice, video, or special app
- AP mounting locations or antenna selection effected by
 - Aesthetics
 - Fire code (plenum-rating)
- Determine network management requirements
- Upgrade-ability to newer technologies

Wireless Case Study

Government

- Customer: Air Force Base, Arizona
- Problem: Obtaining and recording on-site, real-time maintenance information for over 5000 military aircraft
- Application: Outdoor wireless access network for aircraft regeneration facility over 4+ square miles
- Solution: (6) 802.11b PTP wireless links + (6) 0.5 mile-radius 802.11b "cells"
- Services: Consulting, survey, design, configuration, installation

Wireless Case Study

Healthcare

- Customer: Denver Hospital
- Problem: Increase patient care quality via better communications
Current communication methods difficult to use, expensive to repair, or obnoxious
- Application: Wireless, standards-based, instant communication system for doctors & nurses
- Solution: Vocera server + ~200 voice badges
802.11b WLAN on 5 floors
- Services: Consulting, survey, design, configuration, installation, training

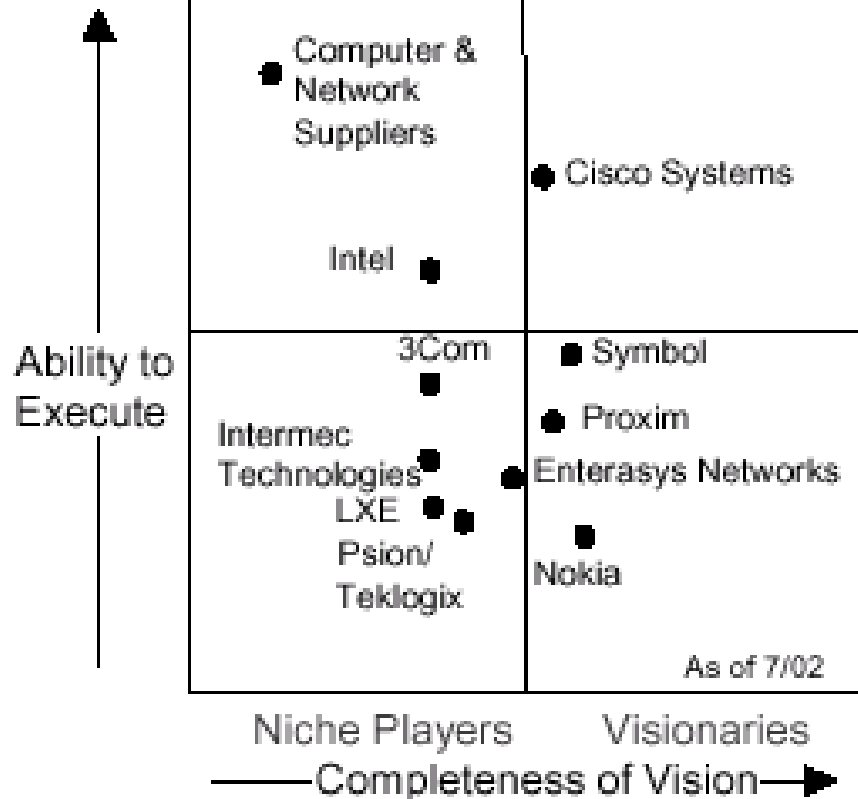
Agenda

- Cisco Aironet Market and Product Update

Gartner Magic Quadrant: Trends

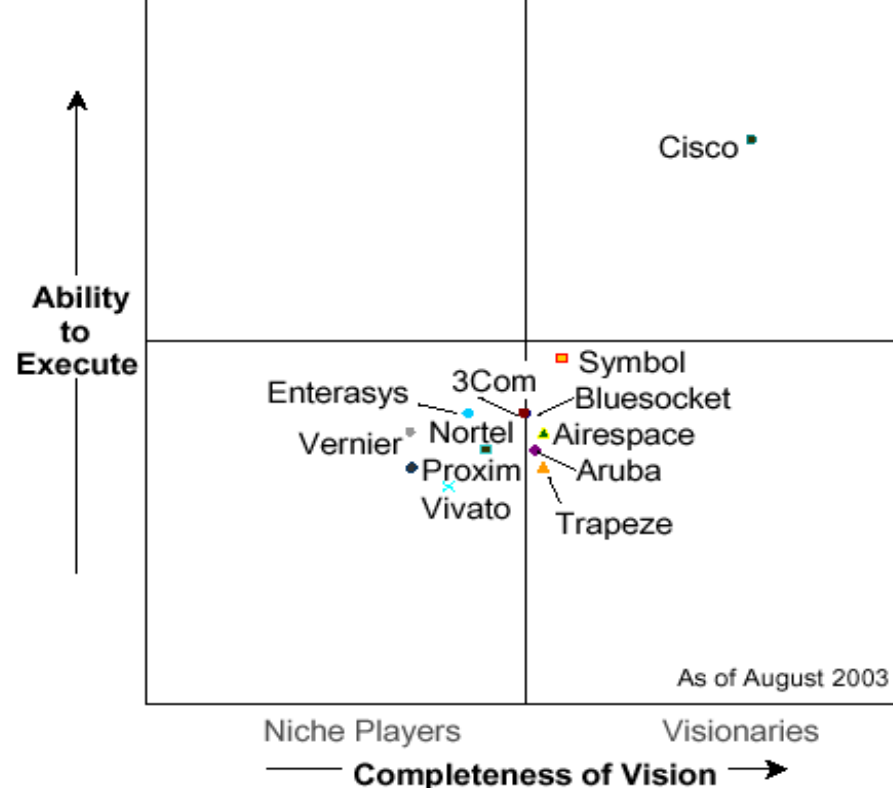
July 2002

Wireless LAN Vendor Magic Quadrant
Challengers Leaders



August 2003

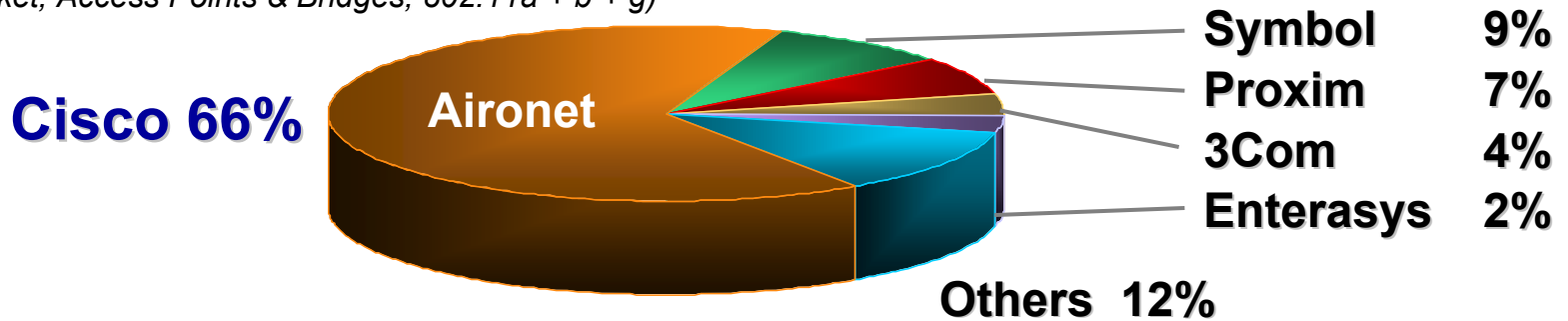
Wireless LAN Magic Quadrant
Challengers Leaders



Wireless LAN Market Share Data

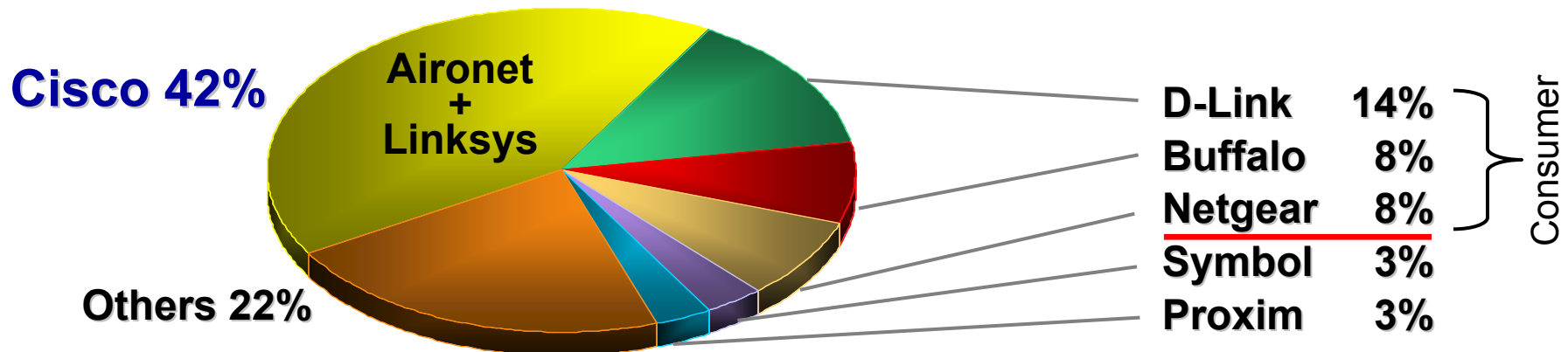
WLAN Enterprise Infrastructure Market

(Enterprise Market, Access Points & Bridges, 802.11a + b + g)



Total WLAN Market

(Consumer + Enterprise, Infrastructure + Clients, 802.11a + b + g)



Source: Dell'Oro, Nov.'03

Aironet vs. Linksys

Business

WLAN: Extension of network

Key requirements

- Security
- Ease of deployment
- Operations/management
- Investment protection
- Throughput
- Scalability

Consumer

WLAN: Shared broadband

Key requirements

- Price
- Ease of installation and use
- Availability for purchase

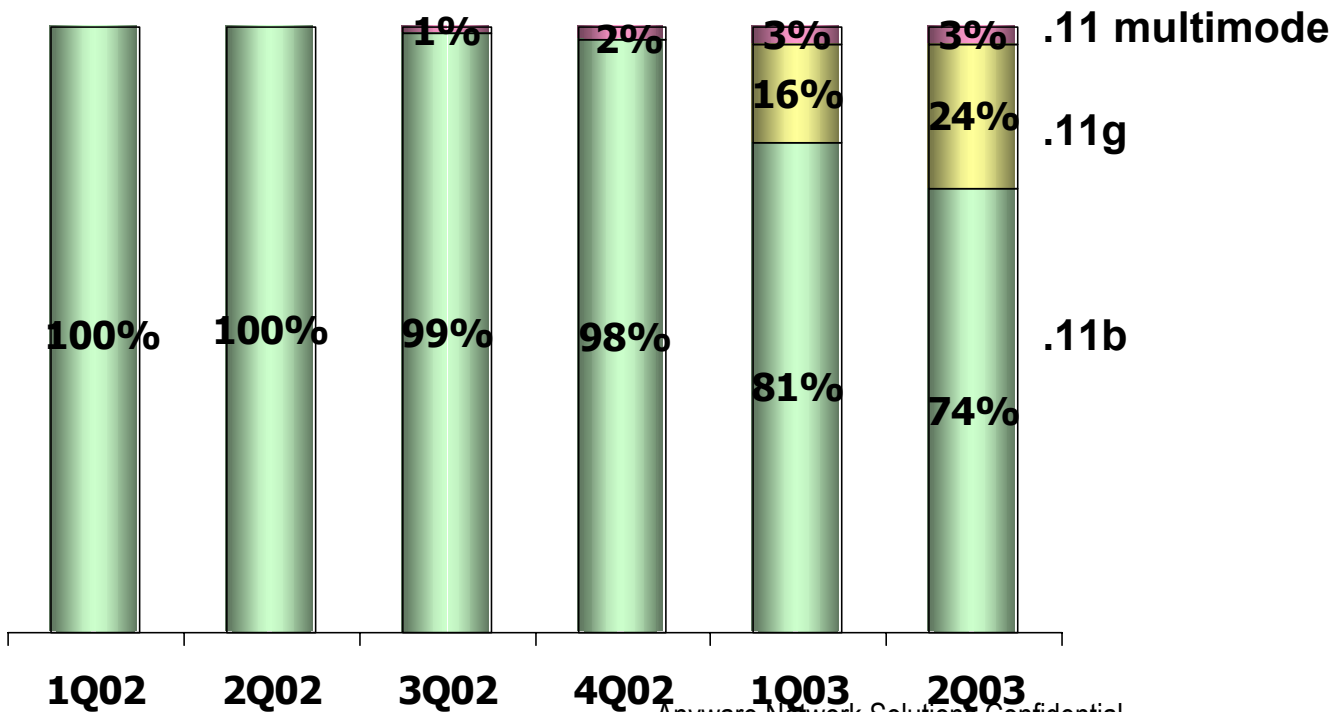


Comparing the AP1100 and AP1200

Cisco Aironet 1100 Series	Cisco Aironet 1200 Series
Intelligent enterprise services at a lower total cost	Intelligent enterprise services with the greatest flexibility
Single 802.11b radio (upgradable to 802.11g with AES)	Dual-mode 802.11a and 802.11b (upgradable to 802.11g with AES)
Integrated diversity dipole antennas for simplified deployment	Two 2.4 GHz antenna connectors for high-gain diversity antennas; integrated 5 GHz antennas
Durable plastic case for indoor environmental requirements	Rugged metal case for Industrial environmental requirements
Extra memory and system capacity for future releases	Extra memory and system capacity for future releases
Inline and local power	Inline and local power
Cisco IOS operating system	Cisco IOS operating system
Latest enterprise-class features, such as VLANs and QoS	Latest enterprise-class features, such as VLANs and QoS

802.11g on Cisco Aironet APs

- Cisco is shipping 1100 and 1200 Series AP models with 802.11g radios
- Cisco is selling 802.11g upgrade modules for 1100 and 1200 Series access points



802.11g Throughput Compared

	Data Rate (Mbps)	Approximate Throughput (Mbps)	Throughput as % of 802.11b Throughput
802.11b	11	6	100%
802.11g (802.11b clients in cell)	54	8	133%
802.11g (no .11b clients in cell)	54	22	367%
802.11a	54	25	417%

- "G" throughput increase relatively modest in mixed-mode (B + G) operation

Cisco Aironet Wireless Bridge Portfolio

Cisco Aironet 350 Series	Cisco Aironet 1400 Series
Wireless Bridging at a lower total cost	Wireless Bridging with outstanding performance
Single 802.11b radio with data rates up to 11 Mbps	Single 802.11a radio with data rates up to 54 Mbps
7.5 miles typical point to point range with directional antennas at 11 Mbps	7.5 miles typical point to point range with directional antennas at 54 Mbps
Two 2.4 GHz antenna connectors for high-gain diversity antennas	Single 5.8 GHz integrated patch array antenna or antenna connector for remote antennas
Indoor industrial environmental specifications, rugged metal case	Outdoor environmental specifications, tested to NEMA 4
Inline and local power	Inline power via Power Injector LR
VxWorks operating system	Cisco IOS operating system
QOS, VLANs, and Proxy Mobile IP	QOS, VLANs, and Proxy Mobile IP
Statistics via telnet	Antenna Alignment feedback via LEDs and RSSI port and statistics via telnet

Cisco Compatible Program ("CCX") for WLAN Clients

Security
VLANs and QoS
Mobility
RF scanning

- No-cost **licensing** of technology for use in WLAN adapters and devices
- Independent **testing** to ensure interoperability with Cisco infrastructure
- **Marketing** of compliant products by Cisco and product suppliers under "Cisco Compatible" brand

18 CCX Silicon Partners



CCX V1 Laptops Available

<http://www.cisco.com/go/ciscocompatible/wireless>



invent



nx7000



tc1100

zd7000
nx7000
nc4000
nc6000
nc8000
tc1100
nc4000 Centrino
nc6000 Centrino
nc8000 Centrino
tc1100 Centrino



R40
R50
T40
T41
X31



Inspiron Notebooks
500M, 600M, 1100, 5100,
5150, 8500
Latitude Notebooks
D400, D500, 600, D800

 **Note: all of the IBM and Dell notebooks are available in Centrino options as well.**

Ideal Solution for WLANs

Structured Wireless-Aware Network (SWAN)

WLAN system that uses market-proven technology to:

- Minimize costs of **deploying** optimal number of APs in any environment
 - Support day-to-day **operations** from central point of control, with automation to minimize intervention
 - Provide industry-leading, standards-based **security** for all client devices and applications
 - Be **flexible** enough to grow as network needs evolve
- ...and is backed by **support** services of most trusted name in networking industry

Cisco SWAN: For Today and Tomorrow

Components

Benefits

CiscoWorks WLSE
Cisco Aironet AP1100s and AP1200s
Wi-Fi client adapters
802.1X authentication server (like ACS)

Full set of features for deployment, management, security, mobility, QoS, etc.
Reliability and innovation through Cisco IOS® Software running on market-leading, multi-function APs

**AVAILABLE
TODAY!**

Cisco Aironet client adapters
Cisco Compatible (CCX) clients

Expanded security options
Greater range for RF measurements

Cisco switches and routers with wireless-aware
Cisco IOS Software

**FUTURE
2004**

Fast, secure L3 roaming
Increased scalability
Integrated CLI
Tighter wireless/wired integration

**Evolving
Network
Needs**

Cisco SWAN

Complete System View of WLAN via WLSE

Rogue AP Detection

Wireless LAN Solution Engine - Netscape

Wireless LAN Solution Engine

Overview | Help | About | Logout

Display Faults - Manage Fault Settings - Manage Network-wide Settings - Notification Settings

Filter Faults: Devices: All Severity: All State: Active Name/IP: Refresh(Sec): 30 Apply

Address	Name	Family	Product	Type	Description	Severity	State	Timestamp
00409654b725	00409654b725	IEEE802dot11	Unknown AccessPoint	L2Device	Device state is rogue access point	P1	Active	17:50:10 09/04/2003
00409654becb	00409654becb	IEEE802dot11	Unknown AccessPoint	L2Device	Device state is rogue access point	P1	Active	17:49:50 09/04/2003
00020a97cb1	00020a97cb1	IEEE802dot11	Unknown AccessPoint	L2Device	Device state is rogue access point	P1	Active	17:48:10 09/04/2003
004096546ae7	004096546ae7	IEEE802dot11	Unknown AccessPoint	L2Device	Device state is rogue access point	P1	Active	17:47:50 09/04/2003
0040965482ca	0040965482ca	IEEE802dot11	Unknown AccessPoint	L2Device	Device state is rogue access point	P1	Active	17:47:50 09/04/2003
0007eb312374	0007eb312374	IEEE802dot11	Unknown AccessPoint	L2Device	Device state is rogue access point	P1	Active	17:47:32 09/04/2003
00028a97d5	00028a97d5	IEEE802dot11	Unknown AccessPoint	L2Device	Device state is rogue access point	P1	Active	17:47:32 09/04/2003
00020a97d44	00020a97d44	IEEE802dot11	Unknown AccessPoint	L2Device	Device state is rogue access point	P1	Active	17:47:32 09/04/2003
0008213189c4	0008213189c4	IEEE802dot11	Unknown AccessPoint	L2Device	Device state is rogue access point	P1	Active	17:47:32 09/04/2003
000750cae1b5	000750cae1b5	IEEE802dot11	Unknown AccessPoint	L2Device	Device state is rogue access point	P1	Active	17:47:32 09/04/2003
0040965409a1	0040965409a1	IEEE802dot11	Unknown AccessPoint	L2Device	Device state is rogue access point	P1	Active	17:47:32 09/04/2003
00409654c17f	00409654c17f	IEEE802dot11	Unknown AccessPoint	L2Device	Device state is rogue access point	P1	Active	17:47:32 09/04/2003
004096546b60	004096546b60	IEEE802dot11	Unknown AccessPoint	L2Device	Device state is rogue access point	P1	Active	17:47:32 09/04/2003
00020a97c720	00020a97c720	IEEE802dot11	Unknown AccessPoint	L2Device	Device state is rogue access point	P1	Active	17:47:32 09/04/2003
004096551d96	004096551d96	IEEE802dot11	Unknown AccessPoint	L2Device	Device state is rogue access point	P1	Active	17:47:32 09/04/2003
0040963614ac	0040963614ac	IEEE802dot11	Unknown AccessPoint	L2Device	Device state is rogue access point	P1	Active	17:47:32 09/04/2003

Assisted Site Survey

Wireless LAN Solution Engine - Netscape

Assisted Site Survey Wizard

Participating AP Selection

Select APs that will participate in this procedure. To add all APs in a building to the list, select the building from the tree, and then click **Add**. To add all APs in a floor to the list, select the floor from the tree, and then click **Add**. To add individual APs to the list, select the AP from the tree, and then click **Add**. To remove from the list, select the AP from the list and then click **Remove**.

AP Selection

- Select AP

AP Radio Scan

- Check Previous Data

Client Walkabout

- Confirm Walkabout

Radio Parameter Generation

- Set Constraints & Goals
- Review & Apply Parameters

Building N

- Floor 1
 - ap1100-3
 - ap1100-2
 - ap1100-4
 - ap1100-1

Wireless LAN Solution Engine - Netscape

Location Manager

Building N Floor 1

Zoom: Normal Show Map Contrast

ap1100-3 100mW 11Mbps

ap1100-2 100mW 11Mbps

ap1100-4 20mW 11Mbps

ap1100-1 100mW 11Mbps

Unknown Radios: None Options Coverage Display: All Options

Connected to: 64.172.18.10 Edit Location: Disabled, Distance Measure Tool: Off

Location Manager

Cisco Works WLSE 2.5

Rogue AP Details Screen

WLSE Rogue AP Detail - Microsoft Internet Explorer

[Help](#)

Rogue AP Details

BSSID	State	Vendor	
0040965b477e	Rogue AccessPoint	Aironet Wireless Communication	<input type="button" value="Change To Friendly AP"/> <input type="button" value="Delete"/>

Location Estimation

Location	Timestamp	
Estimated location Building 14/Floor 1, based on top 2 reporting AP location(s)	Thu May 15 20:49:29 GMT+00:00 2003	<input type="button" value="Re-Compute"/> <input type="button" value="View in Location manager"/>

Beacon Information

Ssid	Beacon Interval	Channel	Data Rates
tsunami	100	6	Basic: 1.0Mbps, Basic: 2.0Mbps, Basic: 5.5Mbps, Basic: 11.0Mbps

Switch Port Tracing

Switch IP	Switch Port	Traced MAC Address	Timestamp	
12.10.30.3	FastEthernet0/3	0040965b477e	Thu May 15 20:49:29 GMT+00:00 2003	<input type="button" value="Re-Trace"/> <input type="button" value="Shutdown Switch Port"/>

Reporting APs

IP	RSSI	Reported Channel	Reporting AP Location
12.10.30.33	-30	6	Building 14/Floor 1
12.10.30.31	-34	6	Building 14/Floor 1
12.10.30.32	-46	6	Building 14/Floor 1

Agenda

- AirMagnet Demo



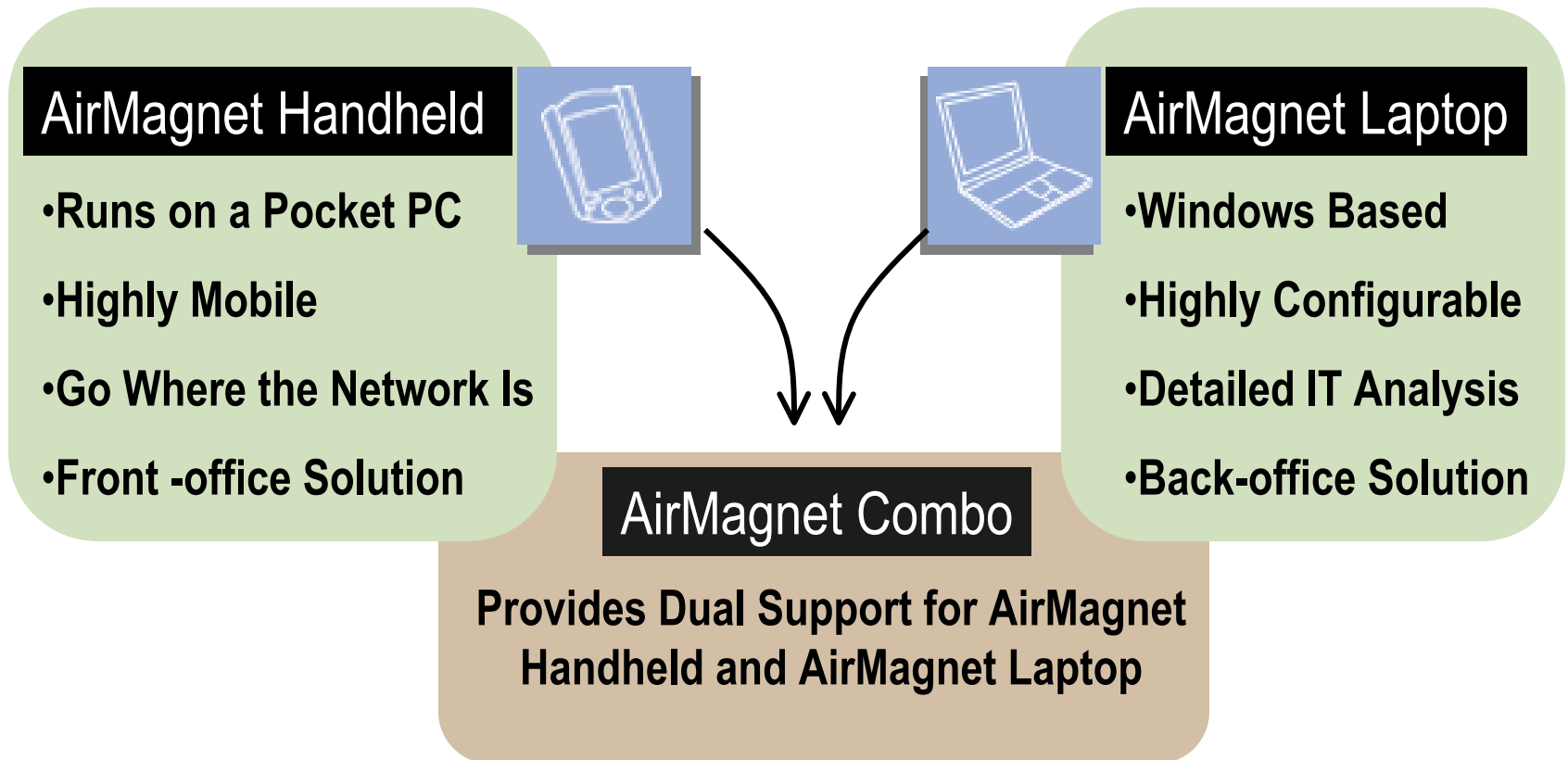
Technology Spotlight

AirMagnet

- Application: WLAN Analyzer for 802.11b, a, and g
- Value: Provides top-down mission-critical wireless LAN administration and diagnostics to help deploy, administer and secure wireless networks



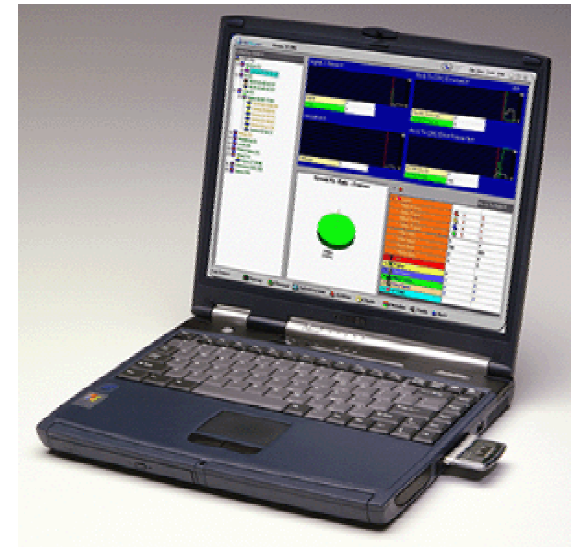
AirMagnet Mobile Suite



Top-down WLAN Analysis

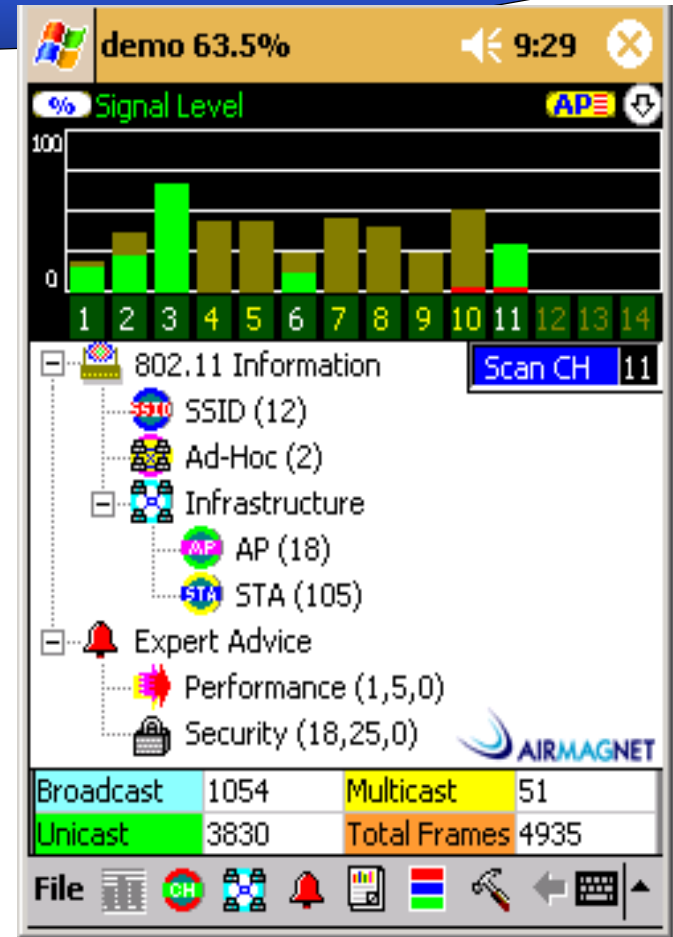


- Wireless RF Status
- SSID's, AP's, and Stations
- View Expert Advice Summaries



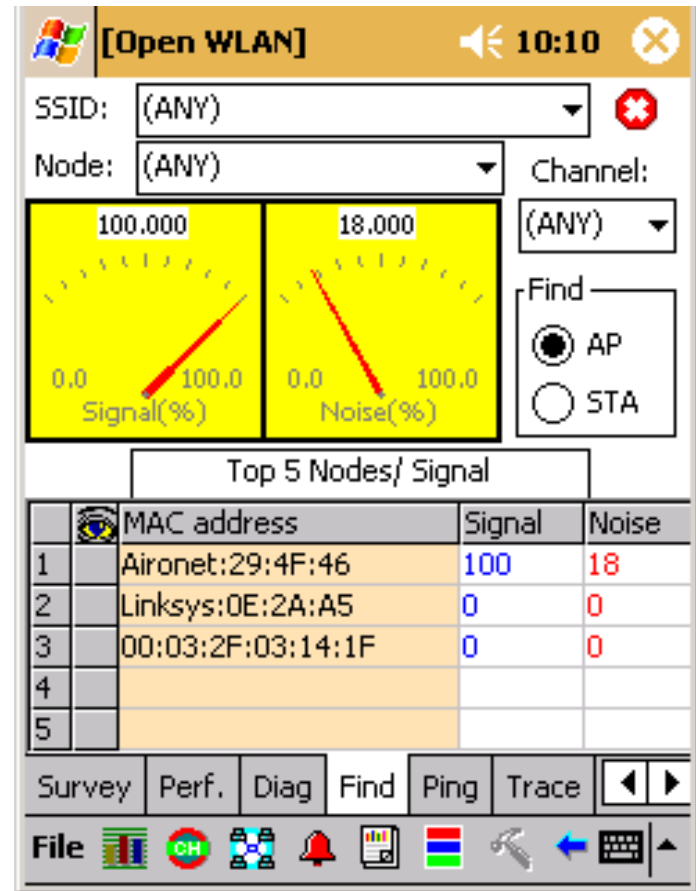
Performance Analysis

- Network Summary View
- Automatic generate 20+ network performance alarms
 - CCI interference
 - Too many AP's in one channel
 - Low speed transmission
 - Excessive CRC errors
 - Excessive retries
 - Total 20 alarms
- Drilldown to pinpoint source of problem
- Provide suggestions for fix



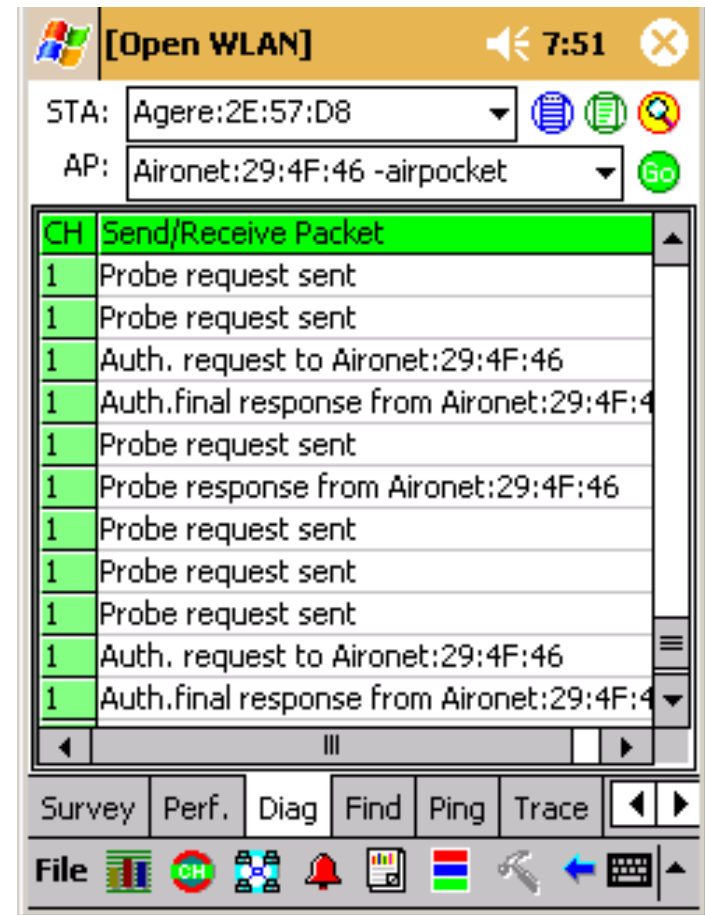
Security Assessment

- Rouge AP & client detection
- AP Impersonation (Mac spoofing)
- Unconfigured AP
- WEP disabled
- Weak encryption used
- War driving detection
- Flooding of association tables
- 802.1x/LEAP/TKIP/MIC validation
- Many more...



Connection Troubleshooting

- Identify mismatched configuration
- Locate source of transmission failure
- Provide ping, traceroute for remote connection test



Agenda

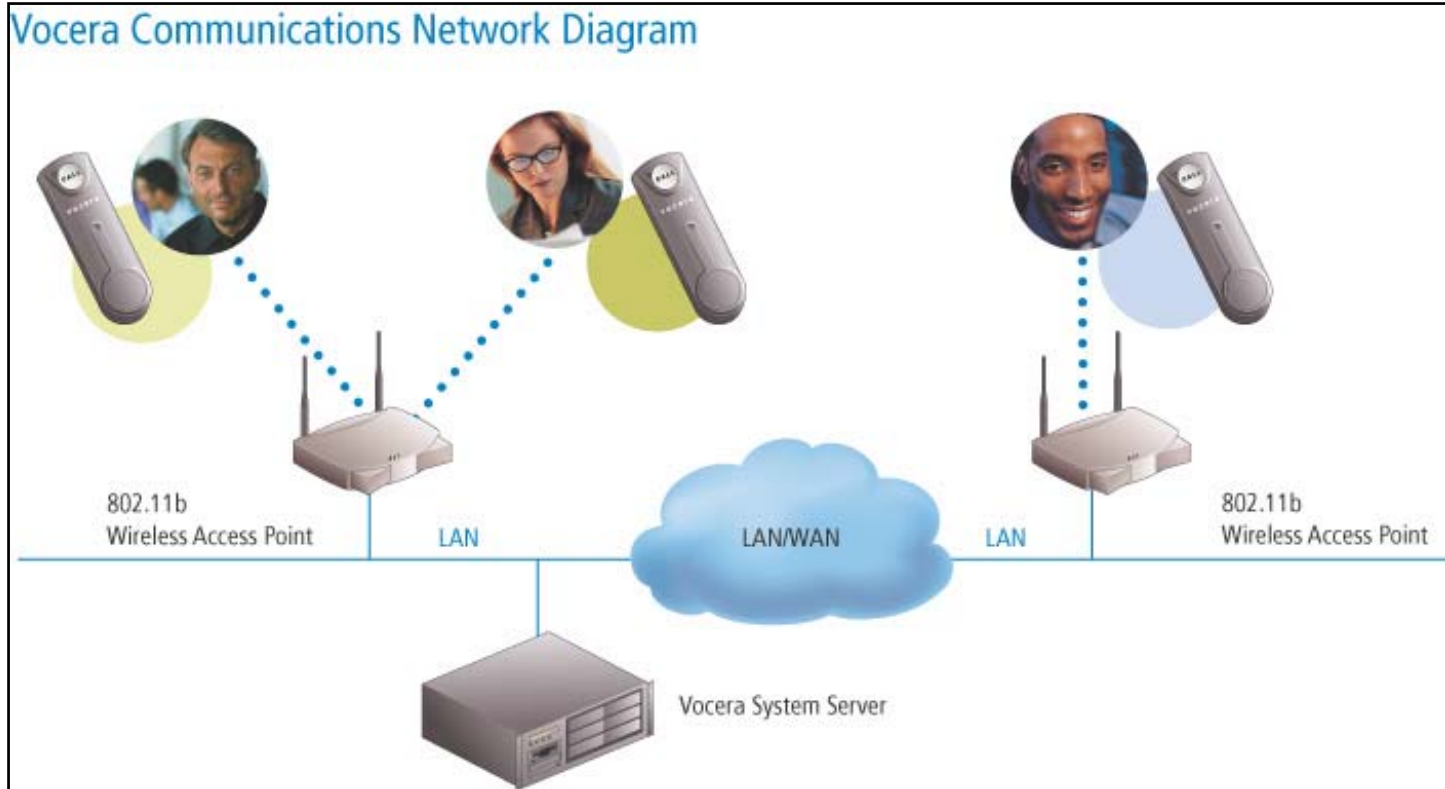
- Vocera Demo



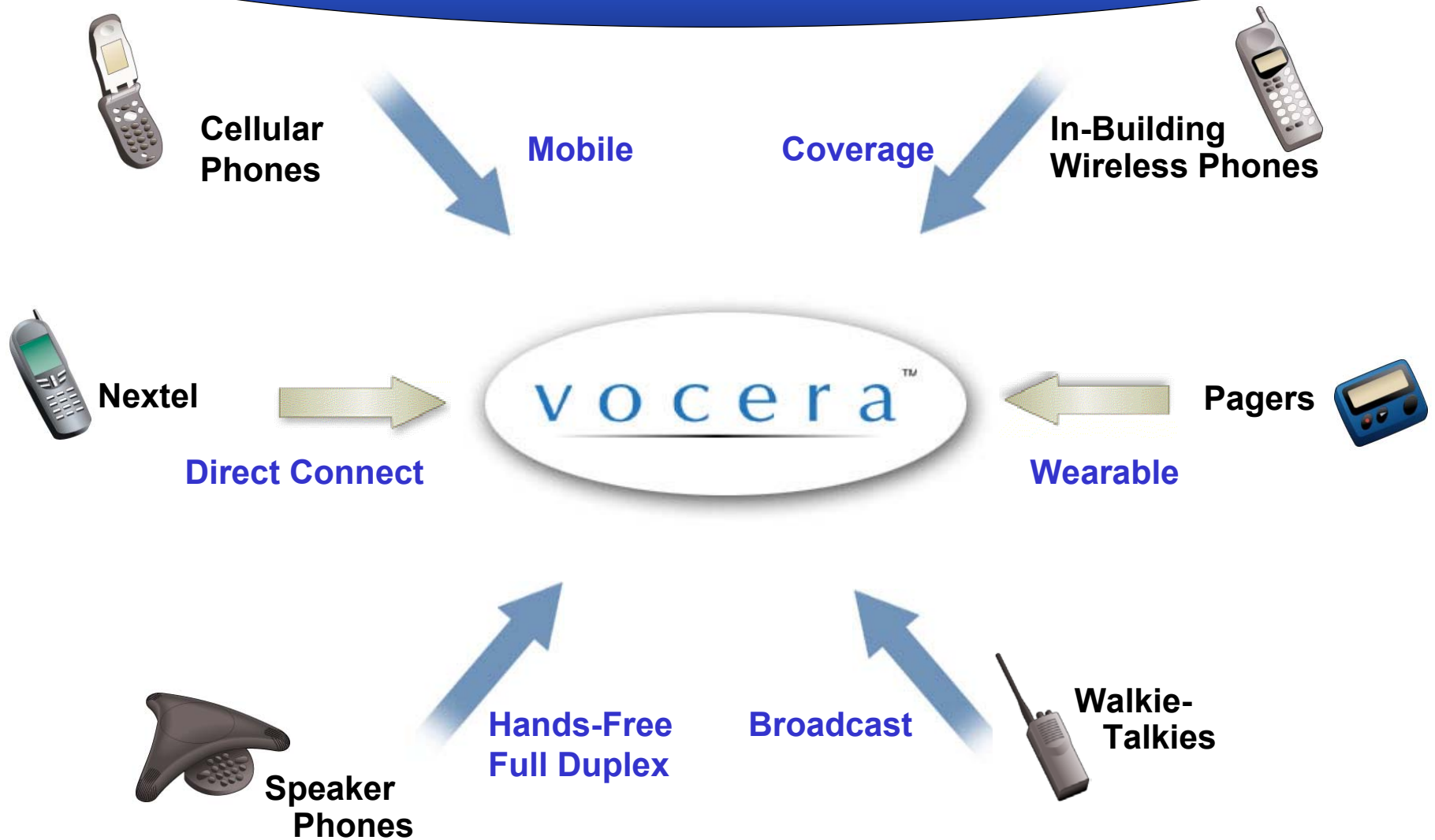
Technology Spotlight

Vocera Communications

- Application: 802.11b-based instant voice messaging system
- Value: Enhance business productivity, teamwork, and service levels
Replace walkie-talkie, paging system, cell-phone



Vocera Value Proposition



Key Vocera Differentiators

Differentiator	Proof Points
Wearable	<ul style="list-style-type: none">• Weighs less than 2 oz• Multiple Wearing options
User Centric	<ul style="list-style-type: none">• Badges can be shared• User preference profiles stored on server• Call by name, group, function (not just extension number)
Cost Effective	<ul style="list-style-type: none">• No monthly service fees (pagers, cell phones)• Less expensive than in-building wireless phones
Ease of Use	<ul style="list-style-type: none">• Voice controlled, speaker independent• Hands free conversations
Messaging	<ul style="list-style-type: none">• Broadcast messages to groups• Text messages to badge LCD

Vocera Voice Features

Feature

- Call by Name
- Call by Function
- Call by Group
- Broadcast
- Group Messaging
- Call Screening
- Play Messages

Spoken Command

- "Call Dr. XXX"
- "Get Chief Nursing Officer"
- "Find a Board Member"
- "Broadcast to Board Members"
- "Record message for managers"
- "Block all calls except Dr. XXX"
- "Play old messages"

Agenda

Q & A