无线-安全-移动
Symbol

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内容

1. Symbol无线交换及移动计算技术发展概况
2. Symbol全方位的无线安全-入侵检测/保护系统
3. RFID无线射频识别技术

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IEEE 802.11 标准历史回顾

IEEE 制定了针对无线局域网的基本媒体接入控制方法

Symbol Technologies, Inc.、Xircom, Inc. 和 NCR Corp. 通过技术合作提交了 802.11 MAC 协议的建议书

1993 年 11 月 15 日，佛罗里达州西棕榈滩市 — 在 11 月的美国电气与电子工程师协会 (IEEE) 会议上，802.11 无线局域网委员会投票决定以 Xircom, Inc.、NCR Corp. 和 Symbol Technologies, Inc. 提交的建议书为基础，制订即将发布的媒体接入控制 (MAC) 协议。
IEEE 802.11 MAC 集团主席 David Bagby 说：“75% 的 802.11 投票成员表示赞成，我们认为这个建议是迈向创建高速、无线的全球标准的一个重大步骤。但是，也许本建议最伟大的成就是反映了竞争对手之间的协作。这种协作已经得到极大多数积极从事无线 LAN 开发的公司的支持。”
*支持者包括 **AT&T**、**AMD**、**Motorola**、**National**、**Toshiba**、**NEC**、**ICL**、**Norand** 和 **Telxon**（除了三个主办方之外： **Symbol**、**NCR** 和 **Xircom**）。*

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IEEE 802.11 标准历史回顾

93	94	95	96	97	98	99	00	01	02	03	04	05	06				

Wireless LAN, 802.11 b/ g / a /l / n / ……

AT&T **à** Lucent **à** Agere **à** Avaya **à** Proxim/ Orinoco **à** end

XIRCOM

SYMBOL **à** WLAN **à** Wireless Switch **à** WIPS **à** IP telephony

Intel / Nortel **à** OEM Symbol

3Com **à** OEM Symbol

Cisco **à** Aironet **à** Airespace **à** WLAN

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2005 年2季度: 全球无线交换机市场份额

2Q05 Total Worldwide WLAN Switch/Server/Appliance Market Leaders (by Revenue)

Vendor	Rank
Symbol	1
Cisco/Airespace	2
Aruba	3
Bluesocket	4

Total market value: $59 million

Source: Dell'Oro, August 2005

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部署无线网络现实面临的新挑战

- 处于接入层的移动应用多元化越来越普遍
- 管理成本越来越高
- 无线网络安全性受到不断挑战
- 接入级的纯AP解决方案的欠缺
- 漫游性能、可靠性、QOS
- 802.11协议的不断延伸 à 802.11a/b/g/x/n/i…

- 网络应用对无线网络的要求
  - 安全性、WIDS/WIPS
  - 与有线网络的集成
  - QoS管理，漫游管理
  - 强制性的应用策略
  - 移动接入设备的多元化
  - 设备的管理
  - 可靠的移动应用
  - 总体投资

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部署无线网络通常遇到的几个误区

- 无线网络技术就是无线电技术
- 无线网络的项目通常非常小、简单
- 好的无线网络设备，覆盖范围非常大
- 好的无线网络设备，功率非常大
- 无线网络就是AP
- 无线网络没有安全可言
- 规划无线网络没有什么可靠的工具

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新的多元化接入应用的要求

- WLAN 本身即支持便携性，*但仍需针对移动性进行设计*
- **移动性要求是便携性要求的前提**

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移动架构必须：

- 支持多元的接入层应用
- 提供无缝漫游
- 保护使用行业最佳实践的有线网络的完整性
- 模块化
- 易于管理
- 出现故障易于修复
- 可预测发展方向的
- 安全
- 价格可以承受

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导致无线网络技术的大变革：

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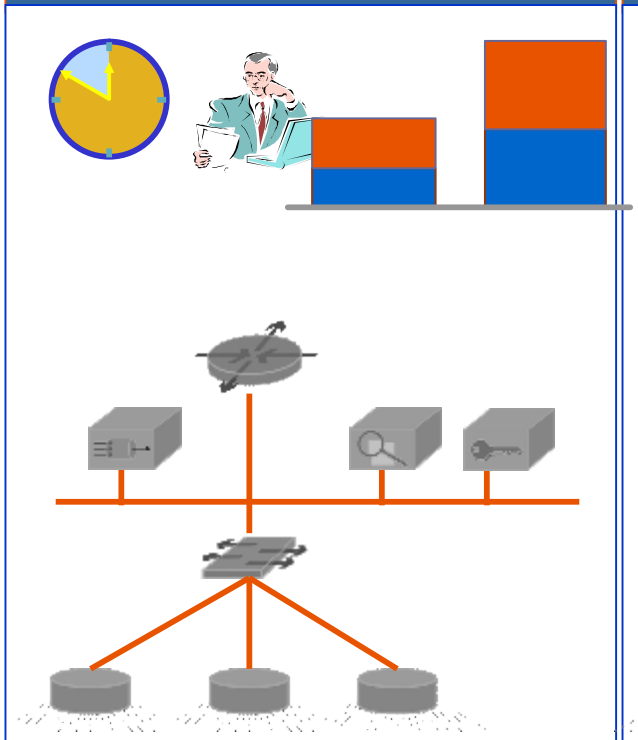
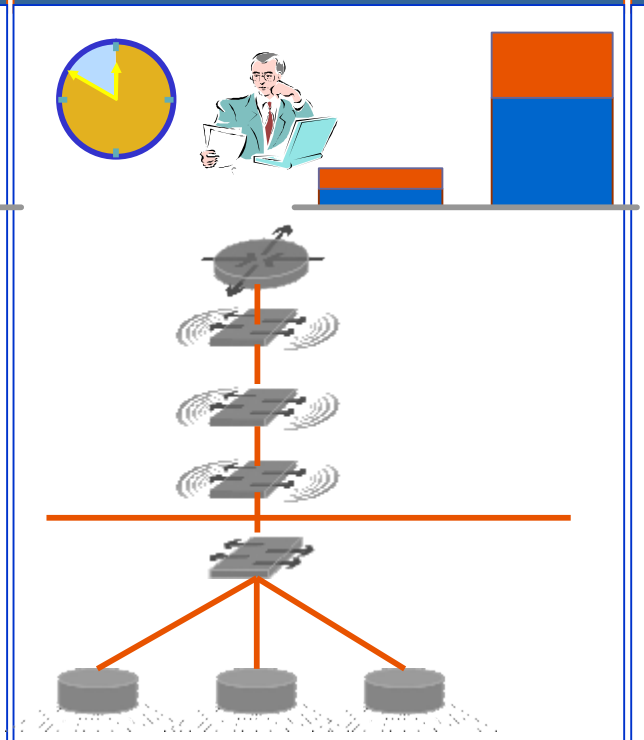
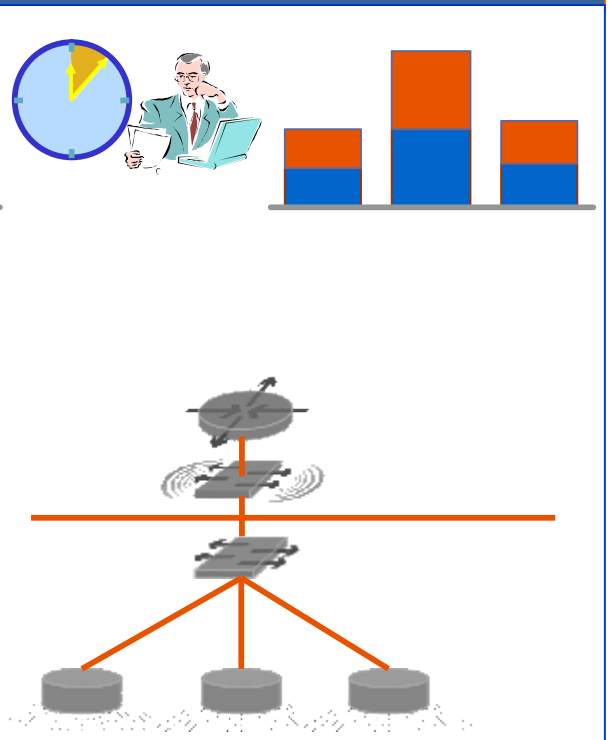
Capex
Opex

传统 APs	外加控制单元的胖AP	Wi-Fi 交换技术
		
g 分离的无线HUB g 难于管理和故障处理 g 无法实现整体的安全策略 g 家用级的解决方案	g 过渡型方案 g 成本很高 g 难于故障处理 g 没有体现高性能交换的特点	g 安全的多元接入应用 g 大大降低了接入层成本 g 易于整体管理和故障处理 g 实现真正的企业级无线交换

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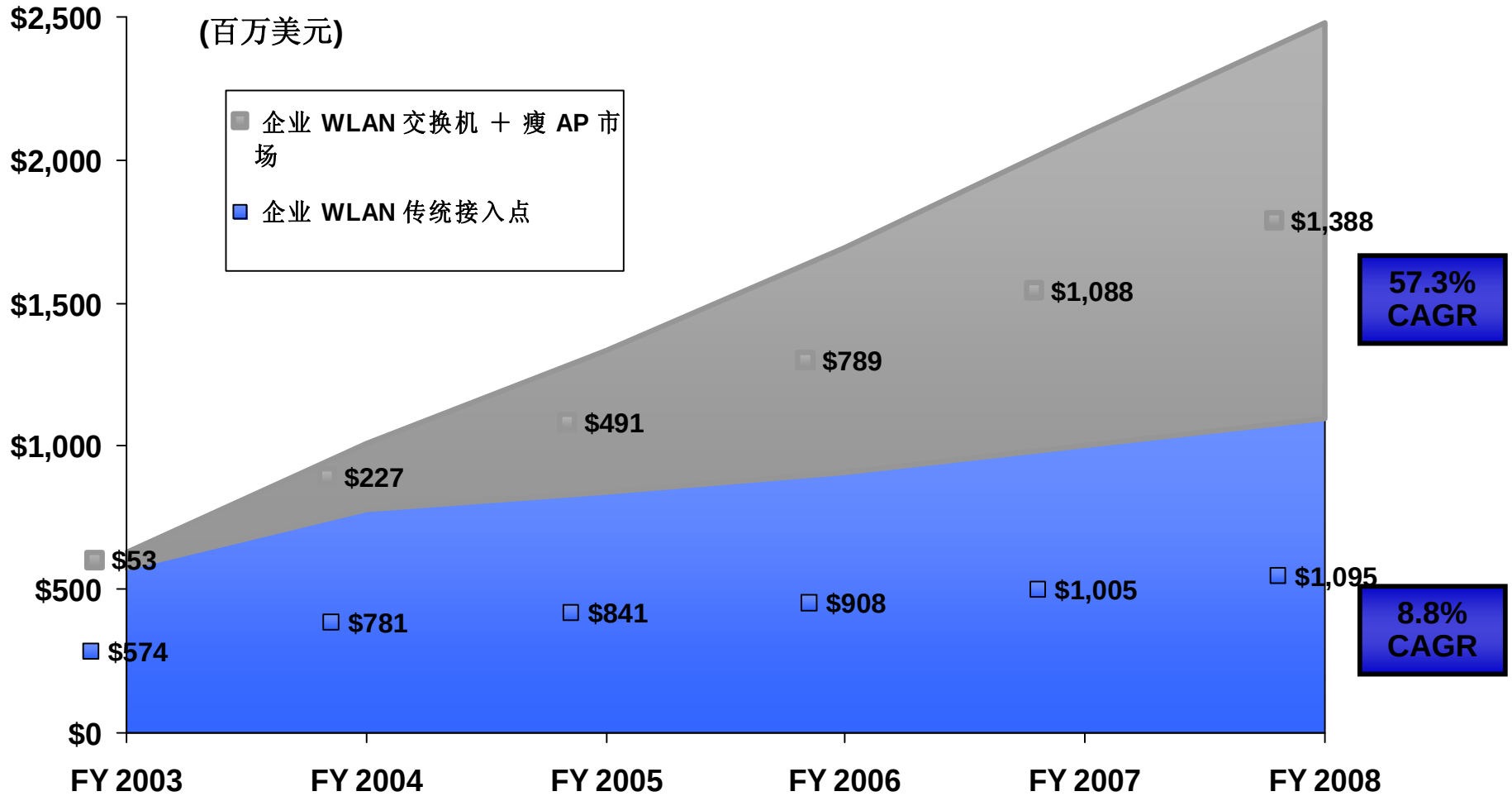
预计从 2004-2008 年，WLAN 无线交换机 + 瘦 AP 市场将增长到 13 亿美元，外包 AP 市场年复合增长率 (CAGR) 将从 8.8 % 增长到 57.3%



Source: Symbol Strategic Marketing, Synergy Research, Q404
信息来源：Symbol 战略营销， Synergy Research， Q0404

CAGR = Compounded Annual Growth Rates CAGR = 年复合增长率

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Symbol 面向多元化的“移动接入”应用无线网络解决方案

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Symbol
如何面对日益增加的多元化的接入应用

Symbol提供一种无线的应用方案，而非提供一种无线的接入方案

多元的接入层应用：数据采集服务	移动	管理
Cm2™ =	symbol® The Enterprise Mobility Company™	

有线网络 à 无线网络 ß 移动应用

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Symbol在无线网络业内的领先地位

- (1989) 全球首款商用扩频 WLAN (1989)
- 首款带有扩频无线电的移动终端 (1989)
- IEEE 802.11协会创始成员 (1993)
- 首款基于 PDA 的无线笔 (1994)
- 首个标准 802.11 FH AP (1995)
- WLANA 的创始成员
- 首款 VoIP WLAN 电话 (1998)
- Wi-Fi 联盟创始成员 (1999)
- 以太网供电
- 国际漫游
- 全球接近20%的WLAN市场占有率

技术领先地位

- 首款无线网络管理系统
- 首款 VoIP WLAN电话
- 首款基于浏览器的 AP UI
- 以太网供电
- 国际漫游
- 强制性漫游
- 负载平衡
- QoS 优先排序
- WLAN 排队公平性
- 交换网络支持
- 电源节省协议
- Kerberos 安全
- 等等

创新的无线交换技术

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先进的设计体系

- 无线接入部分(RF)
  - 802.11
  - 802.11b
  - 802.11a
  - 802.11g
- 交换计算控制单元(MAC)

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如果…

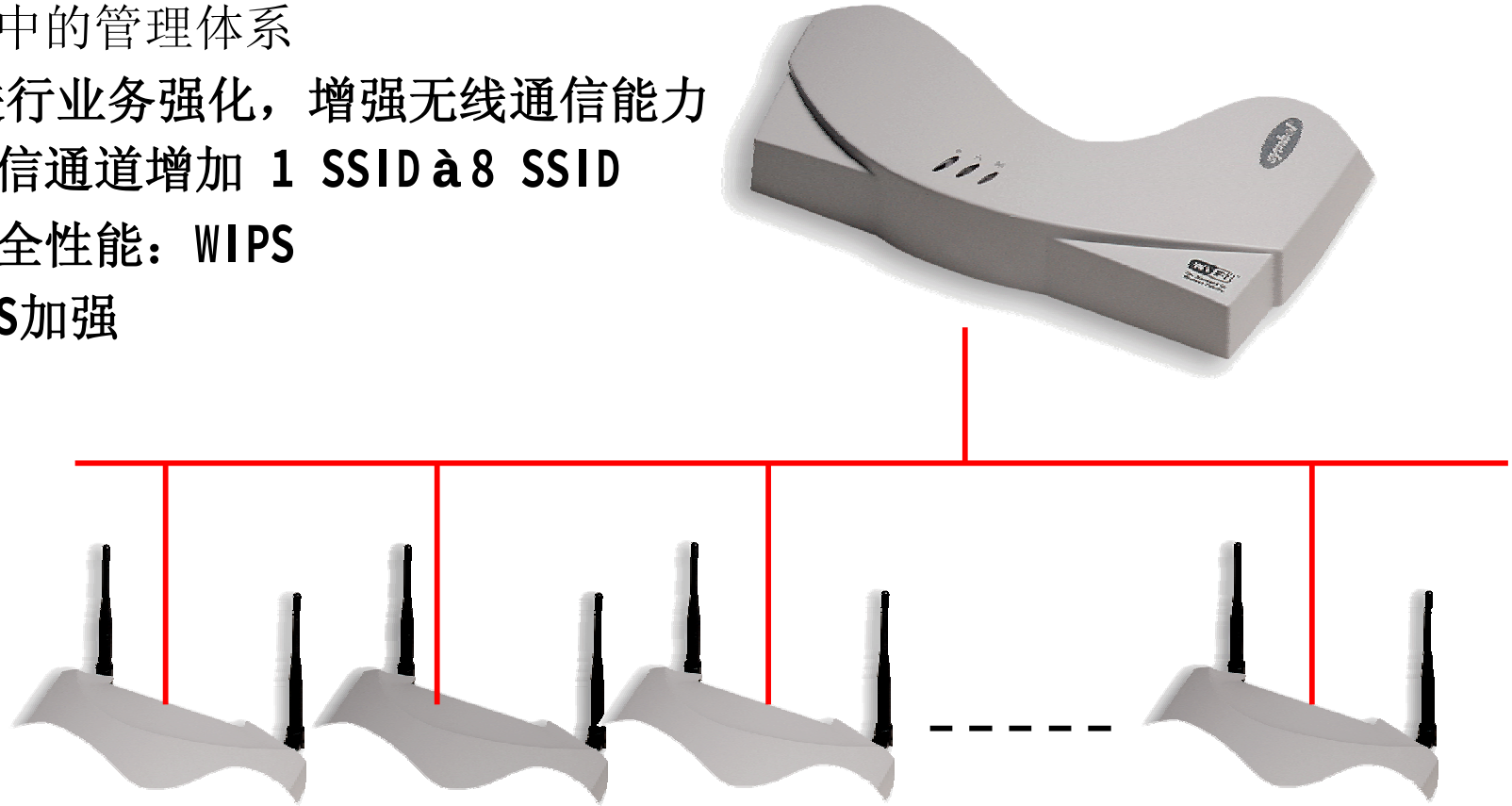
集中的MAC层管理

- CPU升级
- 内存扩展
- 集中的管理体系

RF层进行业务强化，增强无线通信能力

- **通信通道增加 1 SSID à 8 SSID**
- **安全性能：WIPS**
- **QOS加强**

独立的物理接入层



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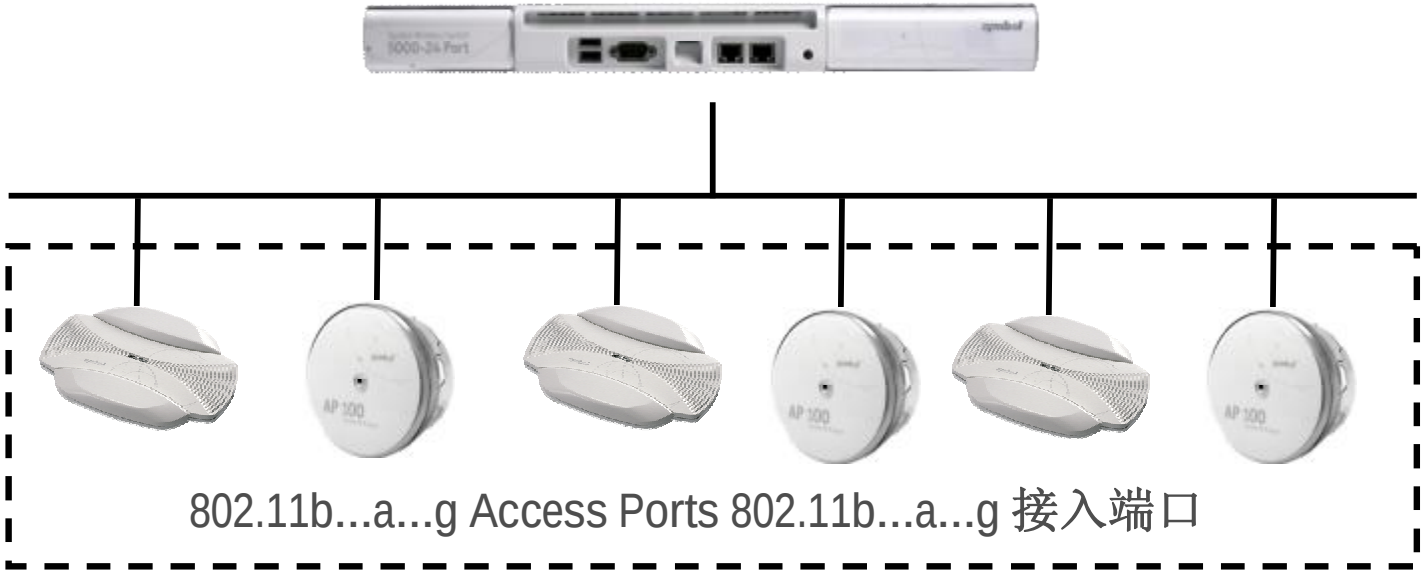
Symbol革命性的无线技术 — 无线交换

多业务无线交换

- 第 2、3 和 4 层交换
- 管理
- 安全性
- 无线业务
- 应用 API



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真正地……SMART 主张

- ü 安全性和可扩展性
- ü 可管理性和移动性
- ü 可用性
- ü 可靠性
- ü 节省 TCO

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Symbol无线产品组合

无线交换机 5000/510(

无线交换机 2000

5131 传统AP

APort 300 802.11a/b/g 接入端口与外部天线集成

以太网 POE 交换机 ES 3000

802.11abg Wi-Fi 客户端适配器

802.11B 接入端口与外部天线选件集成

CB 1000 以太网/串行客户端桥

W-Fi 客户端适配器

APort 200 802.11a/b 接入端口与外部天线集成

移动计算机 MC50/PPT8800

MSP 和 SEMM 管理软件 /IDS/IPS

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中小型无线交换机WS2000: Product Review & 2.x Update

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SYMBOL WS2000 无线交换机

解决方案

Right-sized, purpose-built 中小规模无线网络

Designed specifically for small to medium-size enterprises (SMEs) and branch offices of large enterprises 中小型企业和远程办公室

Security, system management, and wireless networking in one system 安全、管理、无线网络集中解决方案

- Enterprise-class wireless networking
- Familiar switch model
  - 中心管理
  - 零配置AP
- Remote configuration and management远程管理
- Enterprise-class security安全
- Wireless quality of service (QoS)
- Application storage and delivery
- Powerful, integral firewall and gateway services防火墙内置、网关服务

Benefits

Reduce operational expenses, improve productivity, and maintain absolute security

- WLAN deployment and management made simple 广域网接口
- Secure across wired and wireless domains安全
- Reduces capex and opex
- Scalable for future growth

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WS2000: New in v2.0版本

Solution Enhancements (v2.0)

- Fully integrated security throughout network, extending into branch offices
  - **Integrated authentication, authorization and accounting (AAA) server** 内置AAA计费和认证服务
- Further insurance that the network is always available
  - **Failover redundancy to another WS2000 Wireless Switch** 支持冗余服务，高可靠性
- Improved security management
  - **Enhanced rogue AP detection** 加强版非法AP入侵检测
- Additional means to integrate wireless with existing wired networks
  - **Virtual LAN (VLAN) tagging**
  - **Auto assignment of VLANs based on user credentials** 自动分配VLAN
- Simplified management of network at remote sites
  - **Auto-update of configuration/firmware files** 自动远程升级配置和软件

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WS2000: v2.1 Plans

Wi-Fi Multimedia Extensions WIFI多媒体协议WMM

Focus on Hotspot Deployments热点服务特征：

- Service Providers
- Hospitality

System Enhancements性能提升:

- 8 WLANs / 8 VLANs 一一对应
  - Opportunity with GAP (5000 stores through 2008)
- Redundancy 冗余
- VLAN Support (Support for 1 – 4096 VLANs)
- Auto Channel Select (ACS) 无线通道自动选择

DHCP Relay / DDNS Updates

- Requirement from Wal*Mart
  - Considering WS2000 for newer (smaller) International stores

Target Availability: November 2005

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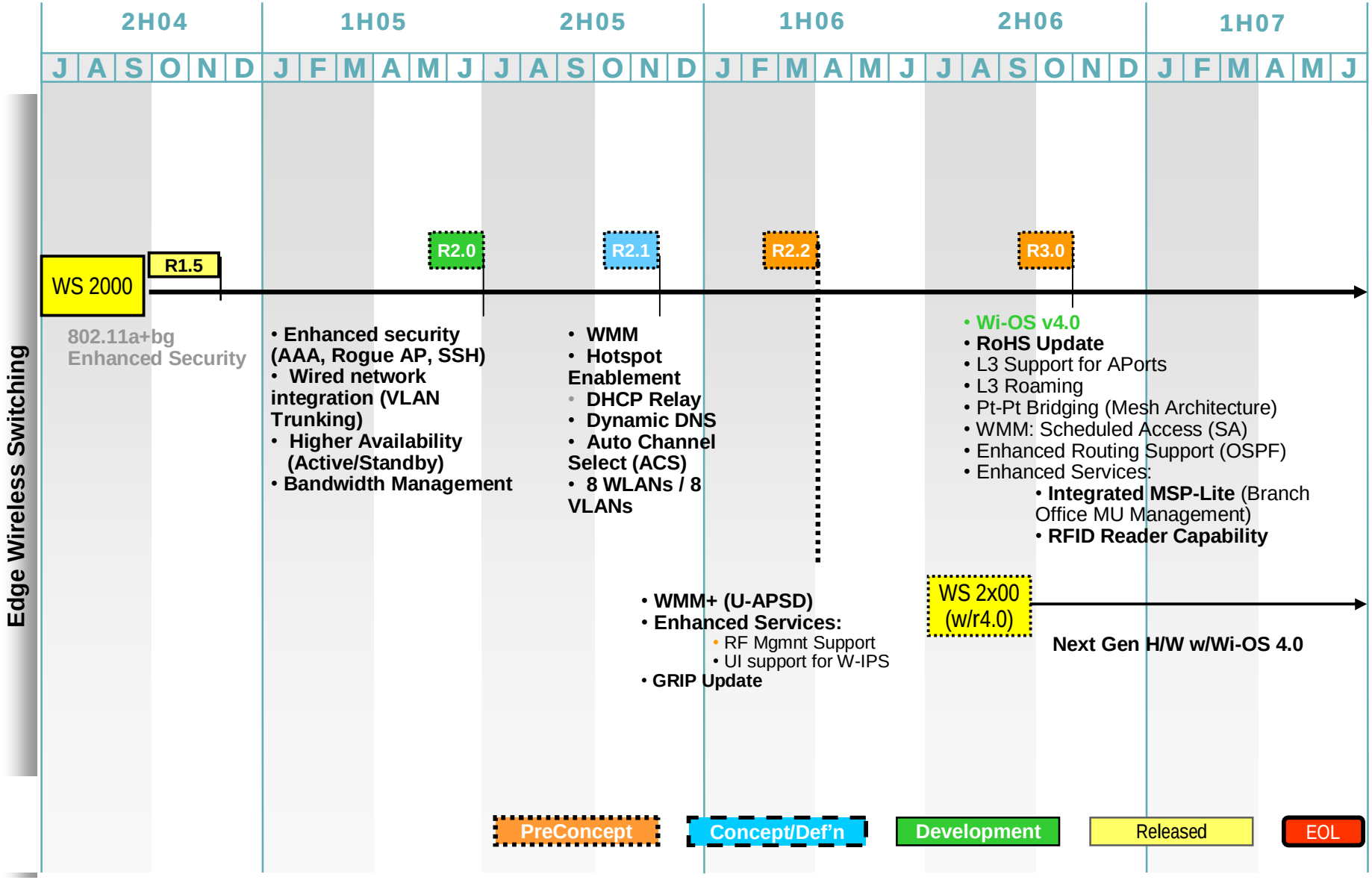
WS2000 Roadmap



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无线交换机WS5100:
Product Review & v2.x Update

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SYMBOL WS5100 无线交换机

解决方案

Application-aware Wireless Networks for mission-critical applications 核心业务系统

Centralized “switch” architecture中心交换架构:

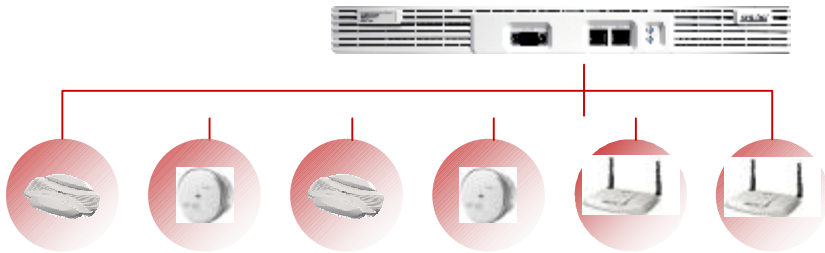
- Simplified deployment and network administration
- Support for multiple radio standards (802.11a/b/g)
- High Performance
  - Support for up to 49 Access Ports
- Highly Secure

Benefits

Scalable wireless switch architecture that easily integrates on top of an existing infrastructure

- Reduces OPEX, Lower TCO, Faster ROI
- Provides Investment Protection Enables Mobility
- High Availability HA

Investment Protection of legacy Access Points



802.11FH...b...a...g Access Ports

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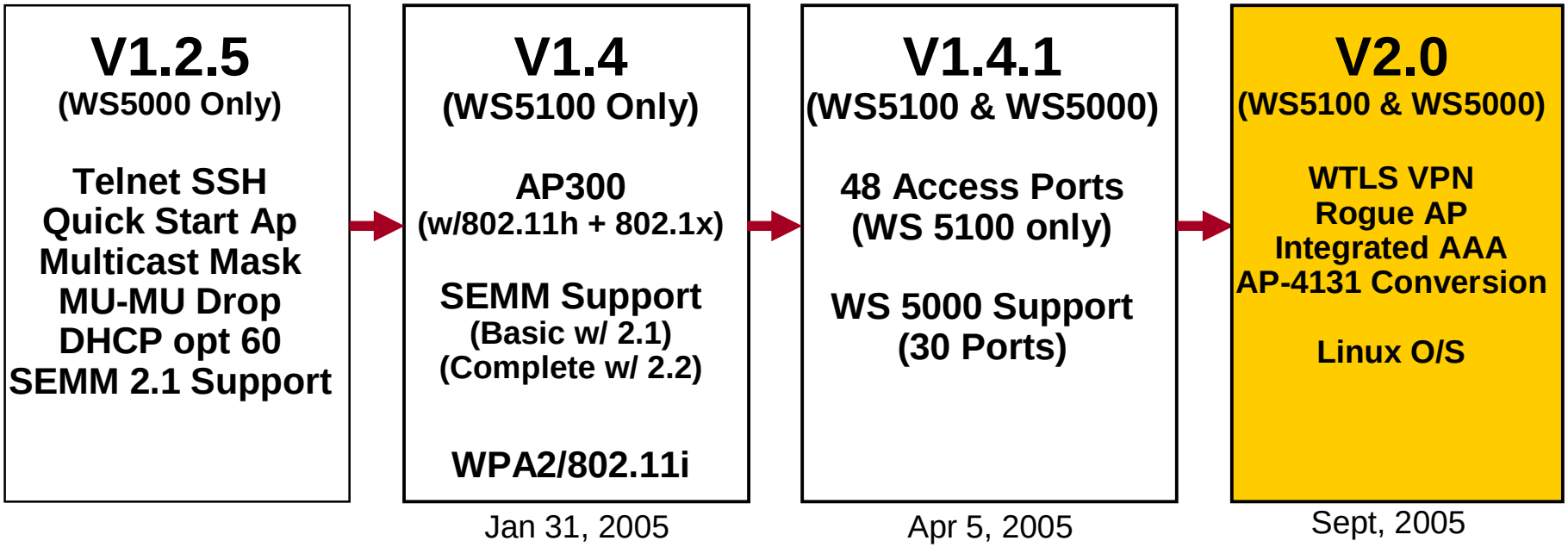
WS 5000 版本系列

V1.2.5 = Stabilize functionality and platform无线交换平台

V1.4 = Introduce high performance platform and maintain #1 market share扩展无线交换

V1.4.1 = Backward compatibility and scalability

V2.0 = Security Focus, Legacy AP-4131 Support; New Linux O/S



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WS5x00 v2.x: 关键特性

Top 2 key product requirements:

- AP-4131 Port Conversion 对传统AP的转化管理功能
- WTLS VPN 二层的VPN（类似L2TP）

Long time to reach a stable v1.4.x code base

- Customers / SEs reluctant to “rock the boat”

Number of issues with H/W: DOM Corruption

- 15% returns (average over the last 2 years)

Montavista Linux not the O/S in Wi-OS

- Customers would have to go through another major upgrade process

Business Issues:

- Wal*Mart plans to rollout v2.x only in Q1 2006
- Krogers pans to rollout with v2.x in Q1 2006
- Marks and Spencers does not have funding for a major rollout in FY2005

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V2.x Plans

Release v2.0 to manufacturing (along with v1.4.3)

- Customers will have a choice
- New customers to receive v2.0

Use v2.0 as the code base for Xfire 1.0

V2.0 Effort is not lost!!

Release v1.4.3 with AP-4131 support as the main feature

- GRE tunneling capabilities added for sustaining customer interest in L3 solutions

Release v2.1 in November with key focus areas being security and RF management:

- AP300 Sensor Conversion (W-IPS) 直接利用交换机转化AP300为WIPS传感器
- Enhanced RF Stats, AP-AP Beacons
- Also add Wal*Mart specific feature (Dual DHCP)
- **Wild Cards**: DTIM (move to WLAN context); Upgrade / Downgrade to v1.4.x

Marketing Message (v2.0, v2.1 Combined):

- Focus on Security (AAA, Rogue AP, WTLS VPN, AP300 Sensor Conversion…tie to W-IPS)
- Focus on RF Management (Enhanced RF Stats, AP-AP Beaconing (Wireless Valley Support), RF Hole Detection / Mitigation (MSP)
- Focus on L3 Support (GRE)
- Focus on Voice: Spectralink, Vocera, Avaya Dev Connect Certification)

Release v2.2 in January / February time frame:

- DDNS Support (Wal*Mart)
- Bug Fixes
- GRIP Update (Prioritized)

Accelerated focus on Wi-OS!!

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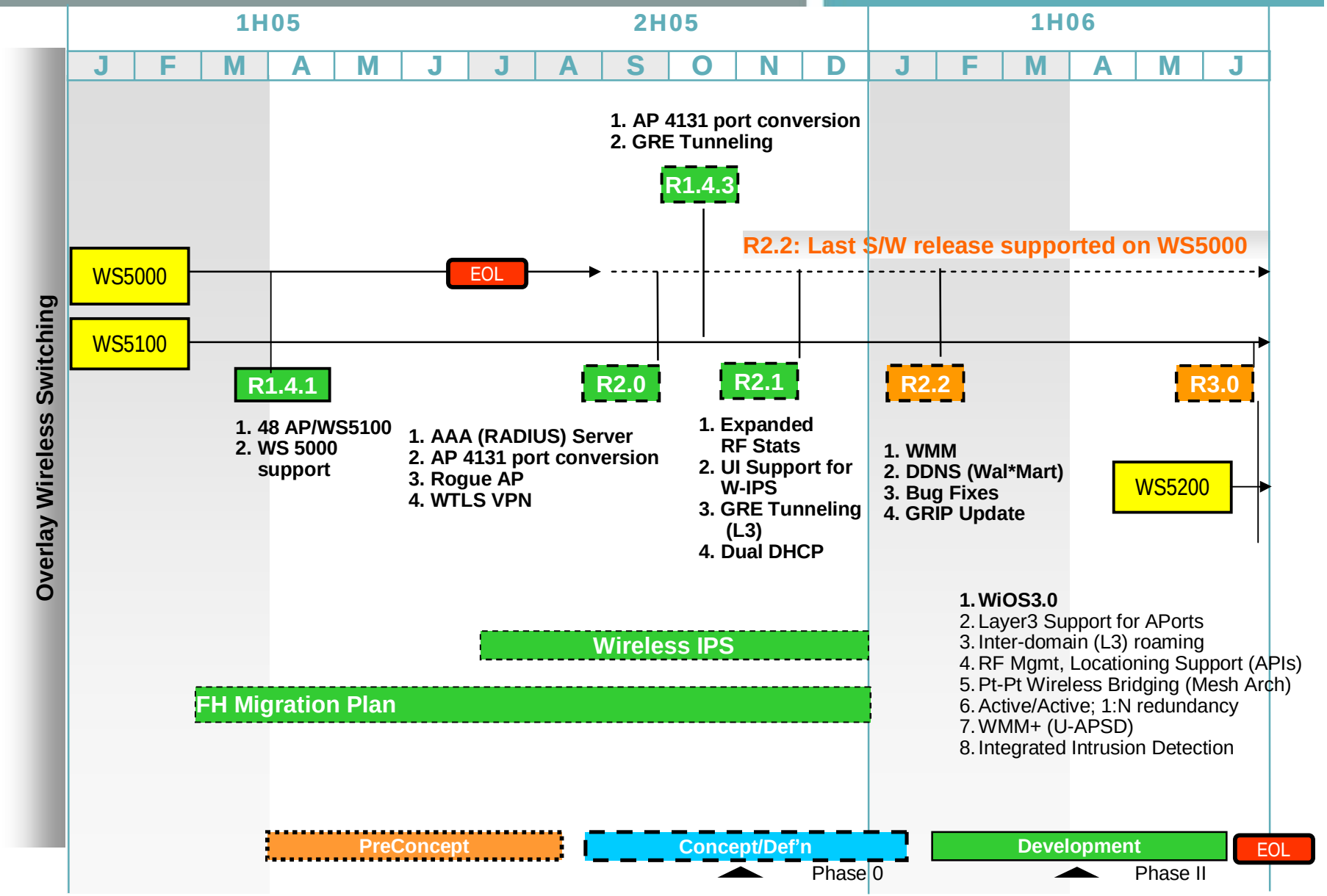
WS 5x00 Series Roadmap



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AP300:
8通道交换接入端口

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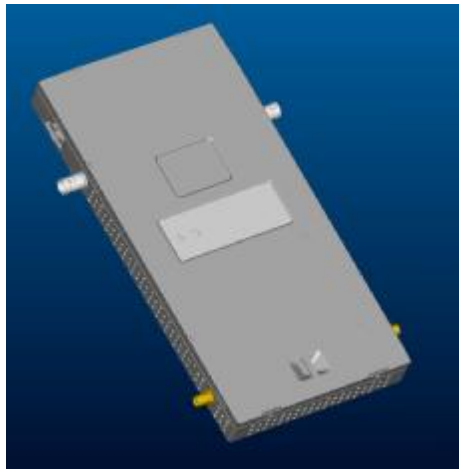
Symbol AP 300多通道接入端口功能特性



外置天线**AP300**
Plenum-rated
Metal Housing
External Antenna Connectors

- §10/100 Ethernet
- §802.11a + 802.11g radios
- §802.3af POE
- §UNI Band I, II, III
- §8个交换通道，独享带宽

内置天线**AP300**
Non Plenum-rated
Plastic Housing
Internal Antennas

应用加载

- **WISP (Wireless Switch Protocol)传感器**
- **802.11a/g Multi-BSSID**
- **802.11a DFS/TPC**
- **802.1x authentication**

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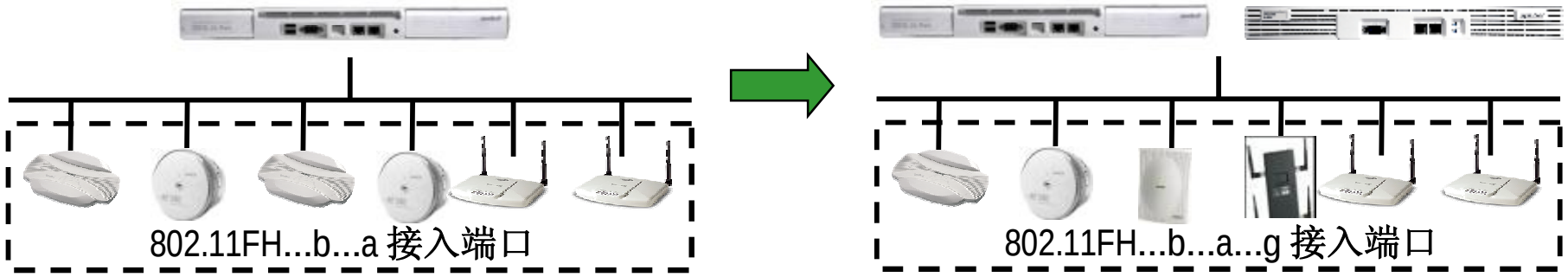
Symbol AP 300智能天线：多元接入应用的接入端口



关键指标：

双无线 Tri 模式接入端口

- 802.11a + 802.11b/g

“高效地”ERP 保护（向后 .11b 兼容性）

802.1x 端口身份验证

虚拟AP

802.3af POE

大数据包支持

支持国际 802.11a 使用的 DFS/TPC

支持RFID(AP400)

移动性支持：

- **多个使用虚拟 AP 流量分段的无线 LAN 广播**
- **8个 BSS/32 个 ESS，每个均支持 11a 和 11g**
- **Symbol 移动特性**

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Symbol AP 300智能天线功能特性

- 简单快速地安装, 只需要一个RJ45接口
  - POE: 以态网线供电
  - 内置通讯天线
  - 不需要布设电源线
  - 无需安装配置
  - 可在需要时外挂天线
- 阻燃材料
- 高亮度兰色指示灯

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AP-5131：单节点8通道无线交换设备

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AP5131: Centralized vs. Distributed WLAN Infrastructure

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‘Wireless Switch’-based (i.e. Centralized) infrastructures offer TCO advantages in multi-cell deployments.

Single-cell sites require:

- Highly-integrated, single-box solutions for wired and wireless infrastructure
- Versatile RF technology support
- Secure backhaul communication channels
- Low-cost solutions

一款真正8端口的无线交换机！

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Introducing the AP-5131

企业级/工业级 54Mbps 802.11a/g Access Point

Branch-office Wired/Wireless Solution

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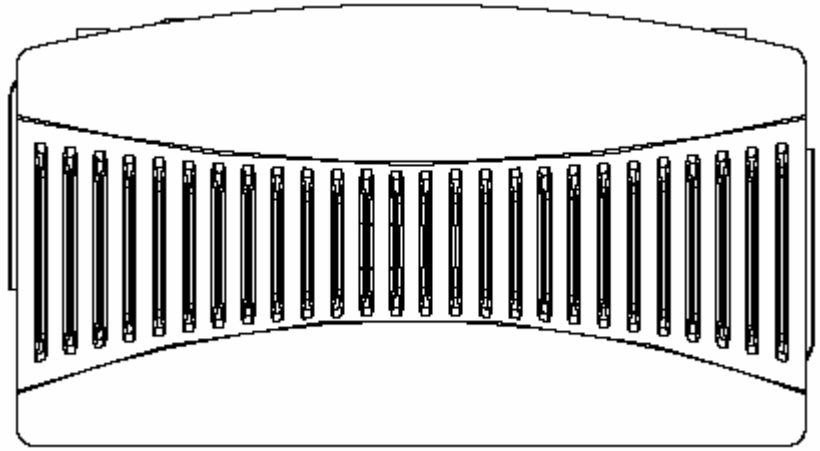
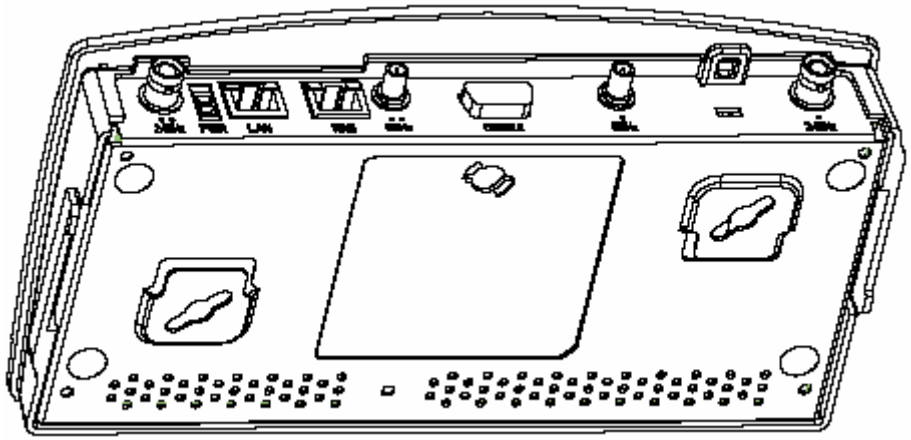
AP5131硬件设计

- Single or Dual-Radio configurations 双频率
- 802.11a/g or 802.11a+g
- 双 10/100 Ethernet (WAN & LAN)
- Four R-SMA antenna connectors 4个天线
  - (2.4GHz R-BNC antennas connected via adaptor)
- Metal/Plastic hybrid industrial-grade construction 工业标准
- Plenum Rated
- Extended Temp Range: -20 to 50 C 温度范围
- Below ceiling-tile, Above ceiling-tile and Wall mounting
- 50-24000-050 48V DC Power Supply
- 802.3af Power over Ethernet (LAN port) POE





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AP5131内核软件

Wired Features

- Router – WAN-LAN-WLAN Routing function 广域网-局域网-无线网络路由
- Firewall – Isolation of LAN-WLAN from WAN 防火墙—隔离广域网-局域网-无线网络
- DHCP & NAT – LAN IP Address Management IP地址管理
- PPPoE – Cable/DSL uplink Support
- 802.1x wired-authentication 认证协议
- 802.1q Trunking – VLAN support on LAN port
- IPSec VPN client – Secure backhaul to corporate network over WAN

Radio Features 无线特性

- 8 BSSIDs dul radio; 16 WLANs
- Wi-Fi certified
- WPA, WPA2, KeyGuard, Kerberos Security 加密协议
- WMM certified
- 802.11a DFS/TPC – Radar detection and avoidance

Management 管理

- Web-based Java UI
- CLI
- SNMP v3
- Symbol Mobility Services Platform

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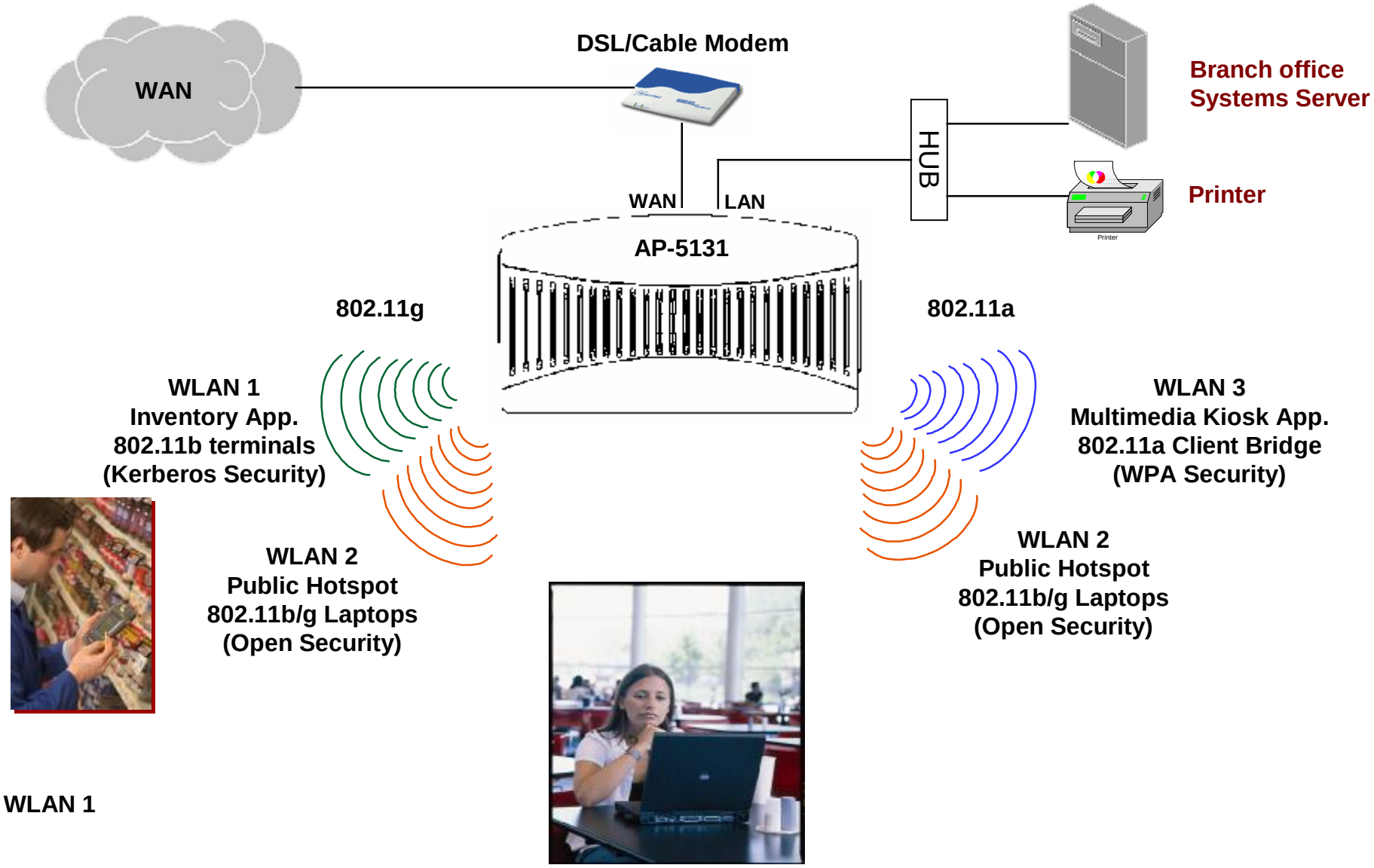
中小型案例示意图



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CB3000 Client Bridge 无线桥设备

symbol
The Enterprise Mobility Company™

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What is the Client Bridge 3000?

- **An enterprise-class workgroup bridge that provides wireless network connectivity to Ethernet devices that cannot negotiate a WLAN connection**
  - Point of Sale
  - Printers
  - Scales
- **Cost Effective Deployment and Management of Business Systems**
  - Eliminates need to pull cables to point of installation
    - Lower cost of Deployment
      - Wiring Ethernet: $400-$500 per drop
      - Compare to CB3000: $285 per register
      - Multiple device coverage further extends savings
    - Flexibility
  - Extends the value of infrastructure investment
  - Remote configuration and monitoring

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CB3000: Bringing wireless life to an array of stationary Ethernet devices…

Printers

POS Systems

IP-based Video Cameras

Weight Scales

Handheld Cradles

Data Capture Devices

Machinery

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CB3000 关键特性

Connectivity to Business Systems

- 802.11a and 802.11b/g Infrastructures
- Multiple Ethernet Clients (16)
- Works with IBM POS systems
  - RPL & PXE protocols

Management

- Easy to use embedded web server can be accessed from any browser
- Device Management Utility to identify all CB3000s on a network
- SNMP v2 support for monitoring through enterprise management consoles

Industry Standard Security

- WEP 40 & 128
- WPA-PSK (WPA1)
- WPA-AES (WPA2)
- 802.1x

Flexible Deployment Options

- Infrastructure Mode
- Adhoc Mode

Software

- **CB3000 Firmware: 1.0.0.3**

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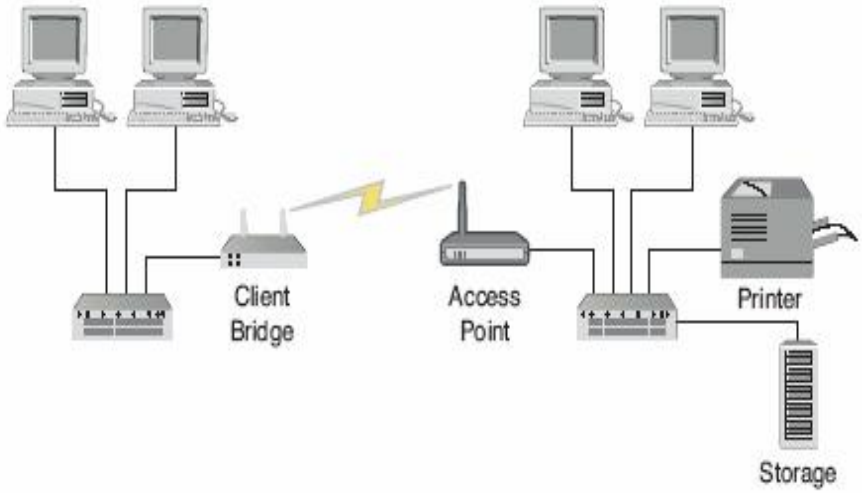
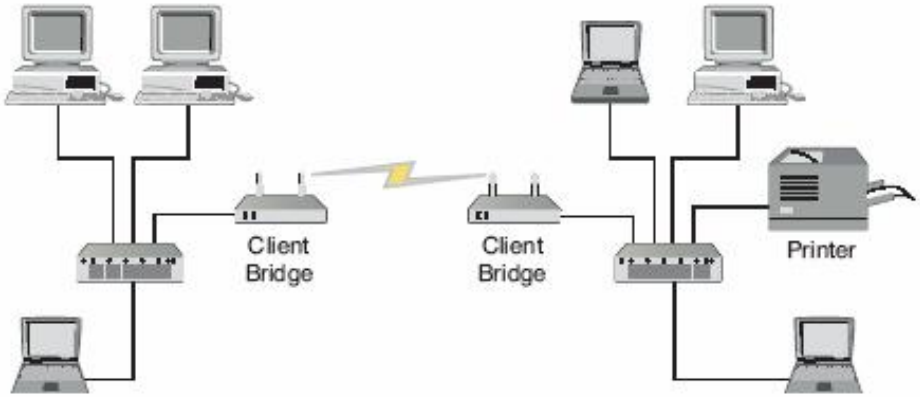
Multiple Connectivity Modes



Infrastructure Mode AP模式



Adhoc Mode 桥接中继模式

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Pricing and Availability

- **CB-3000-0010-WW**
  - Single Worldwide SKU
    - Approvals in US, Canada, EU, Japan
  - List Price: $285
  - Discount Category: 1A
  - Channel-ready packaging
    - Power Supply, CD, Quick Install Guide, Mounting Hardware, Ethernet Cable, Omni-directional antenna

- **General Availability: July 20, 2005**
- **Replacement Parts:**
  - Antenna ML-2452-APA2-01 $15.00
  - Power Supply 1AIU15-2120100-WP $30.00

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无线网络天馈线系统
--如何解决信号覆盖和性能问题

Solutions for Optimal Coverage and Performance

symbol
The Enterprise Mobility Company™

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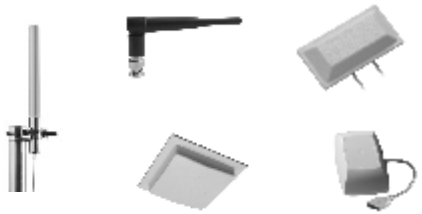
Symbol's Antenna Portfolio at a Glance



Omni-directional Antennas 全向天线

Various models offering a range of options for 360˚ coverage for indoor and outdoor settings.

Directional Antennas 定向天线

Expanded line of antennas with coverage radiating in a specific direction or shape for use in environments with irregular shape coverage areas.

Bridge Antennas 点对点，点对多点桥天线

Point-to-Point and Point-to-Multipoint antennas designed for long distance transmission

Accessory Products 附件产品

Full suite of Lightening Arrestors, pre-fabricated low-loss jumper cables, antenna pigtail cable, and mounting brackets to simplify antenna deployment.

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天馈线系统的关键特性

各种环境的解决方案

- Indoors and Outdoors 室内、室外
- Single-site and Campus-wide, Multi-site Deployments 单点、园区、多点部署

Many Options to Choose From

Multiple Mounting Methods 多种安装方法

Expanded Line of Accessories

All antennas support 2.4 GHz infrastructures

- One 5.4 GHz omni-directional antenna available for use with 802.11a Access Ports

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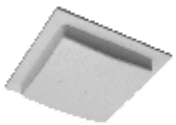
Omni-directional Antennas 全向天线

High Performance Fixed Point Dipole

Indoor/Outdoor High Performance Dipole



Low Profile Ceiling/Surface Mount

Low Profile Dual Integrated Diversity

PCI Wall and Desk Mount

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Directional Antennas 定向天线

Heavy-duty H-Plane Directional Panel

H-Plane Diversity Directional Panel

H-Plane Directional Panel

High Gain H-Plane Directional Panel

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Bridge Antennas 桥天线

Heavy-duty High-Gain Outdoor Directional Yagi

Heavy-duty Indoor/Outdoor High-Gain Directional Panel

Heavy-duty Directional High-Gain Parabolic Dish

Heavy-duty High-Gain Outdoor Mast Mount OD & 8 dBi

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合理部署一个强大的无线网络

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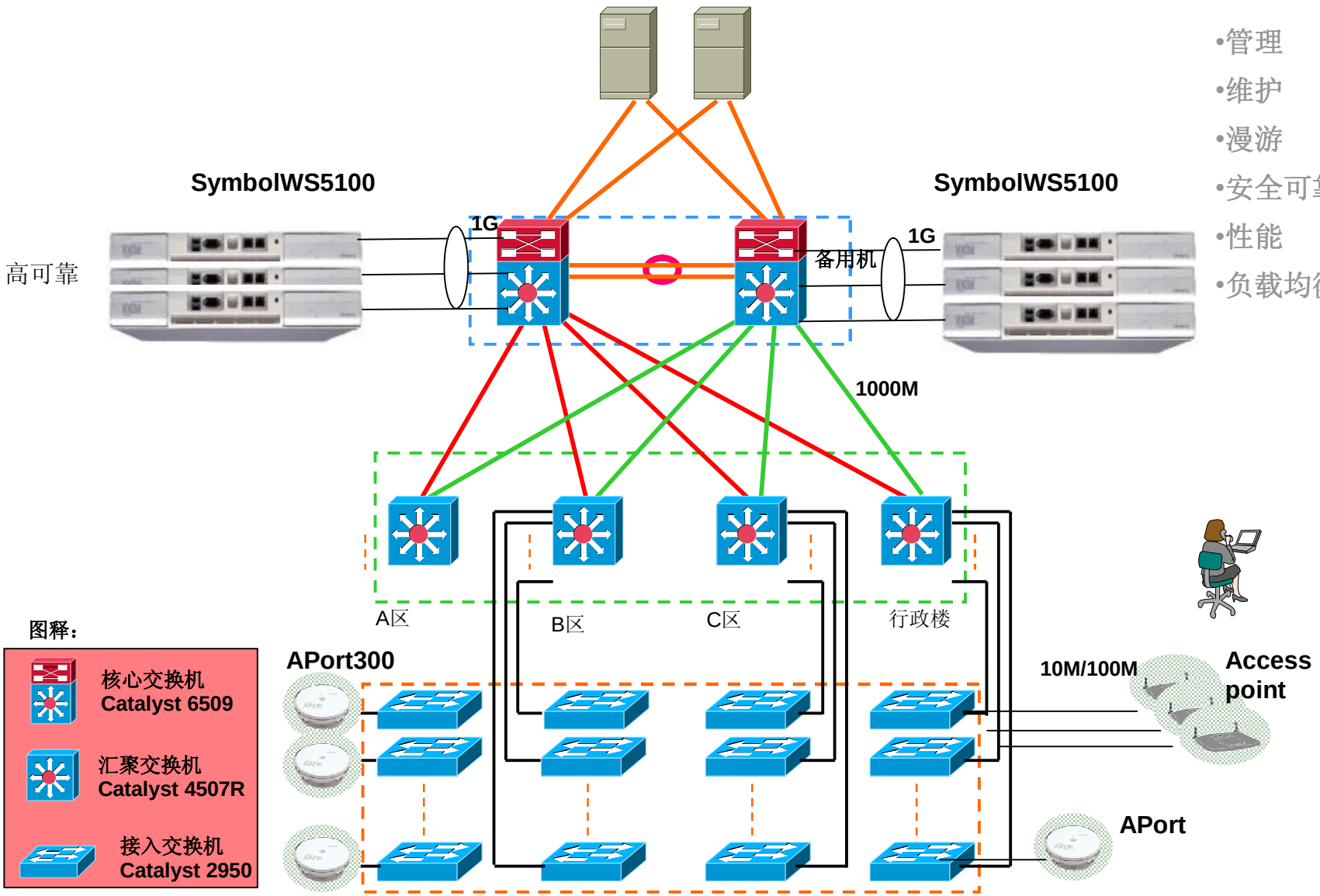
典型案例（大学）



- 管理
- 维护
- 漫游
- 安全可靠性
- 性能
- 负载均衡

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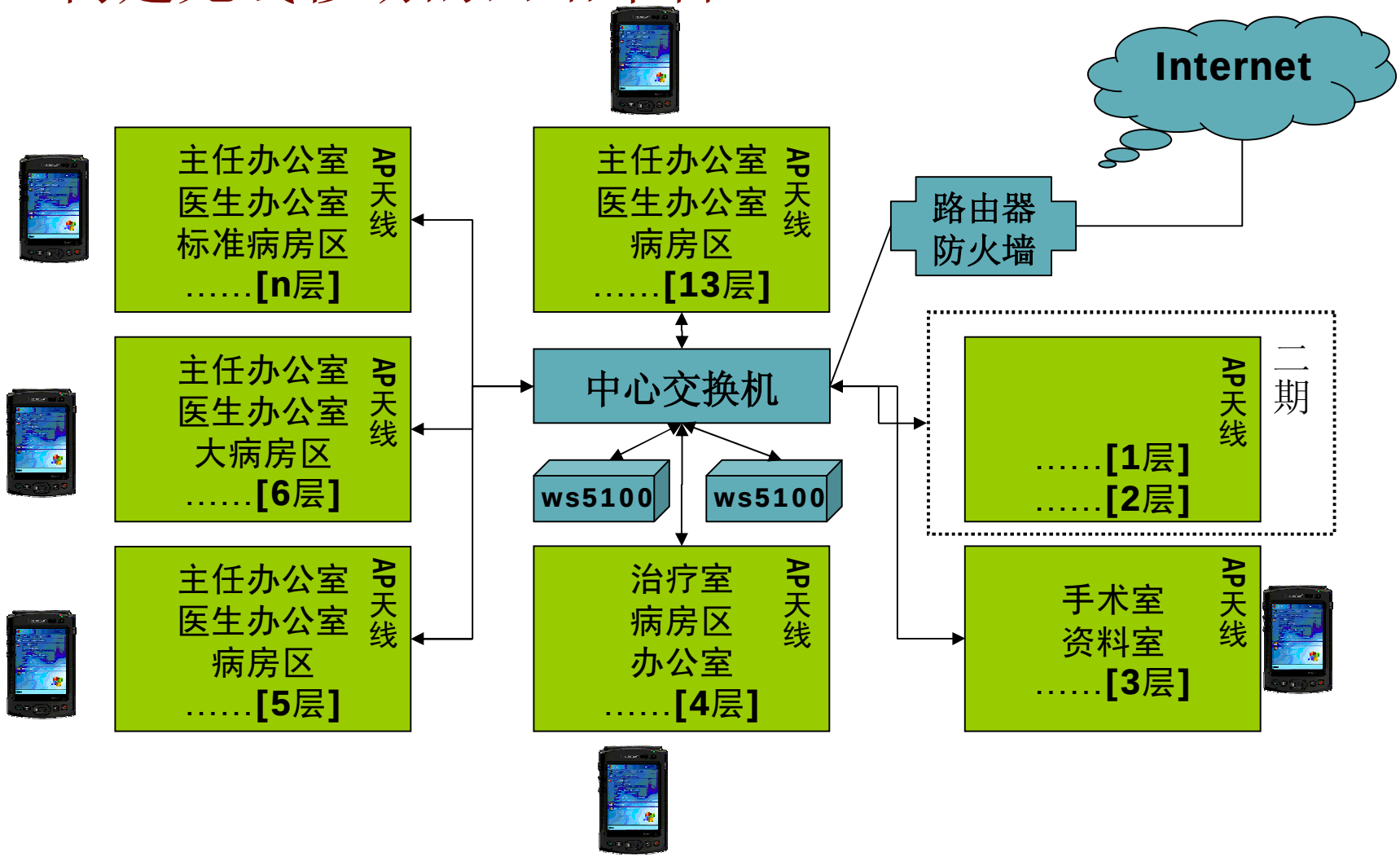
医院解决方案

构建无线移动的网络平台



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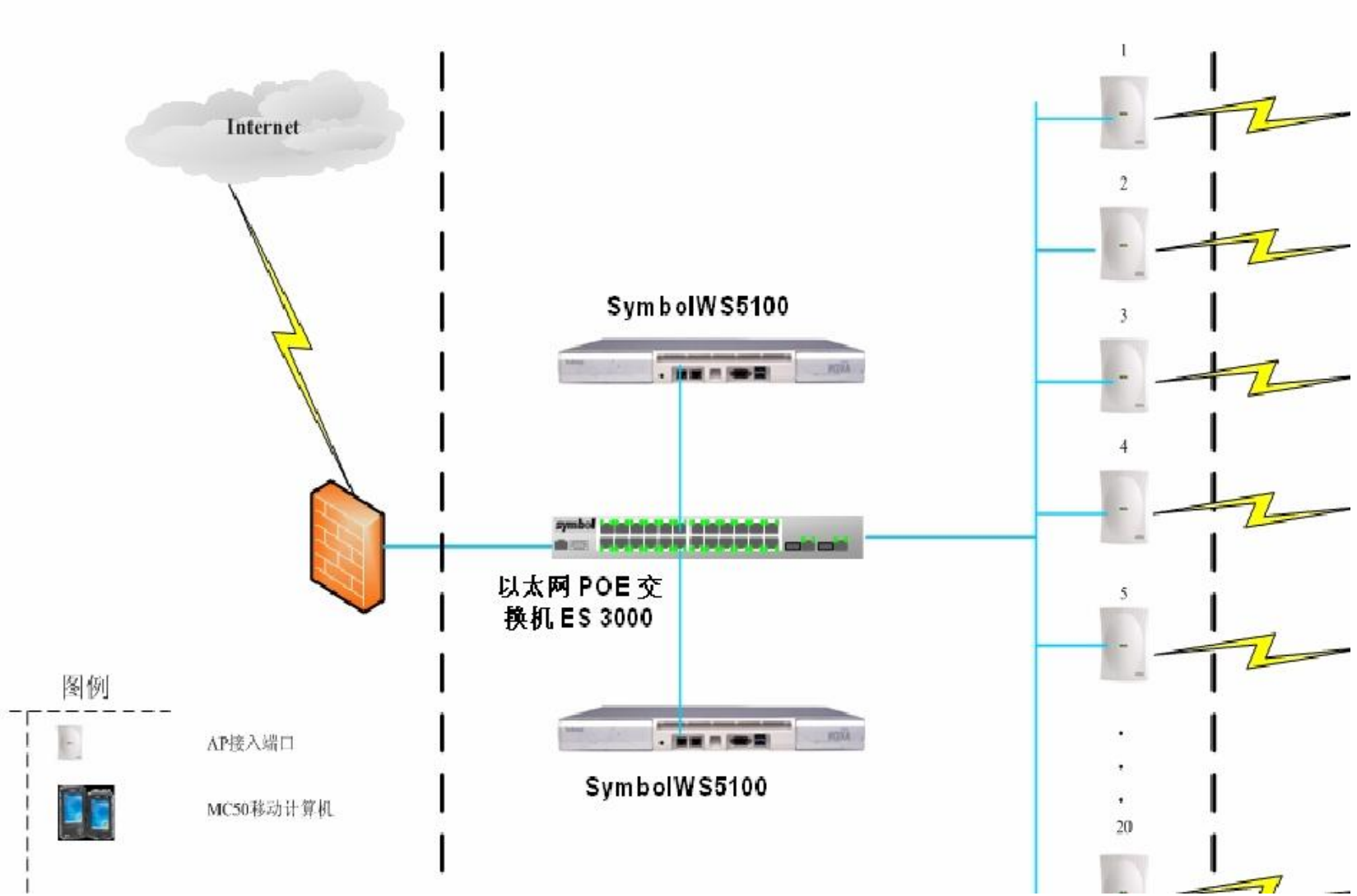
典型方案（智能建筑）



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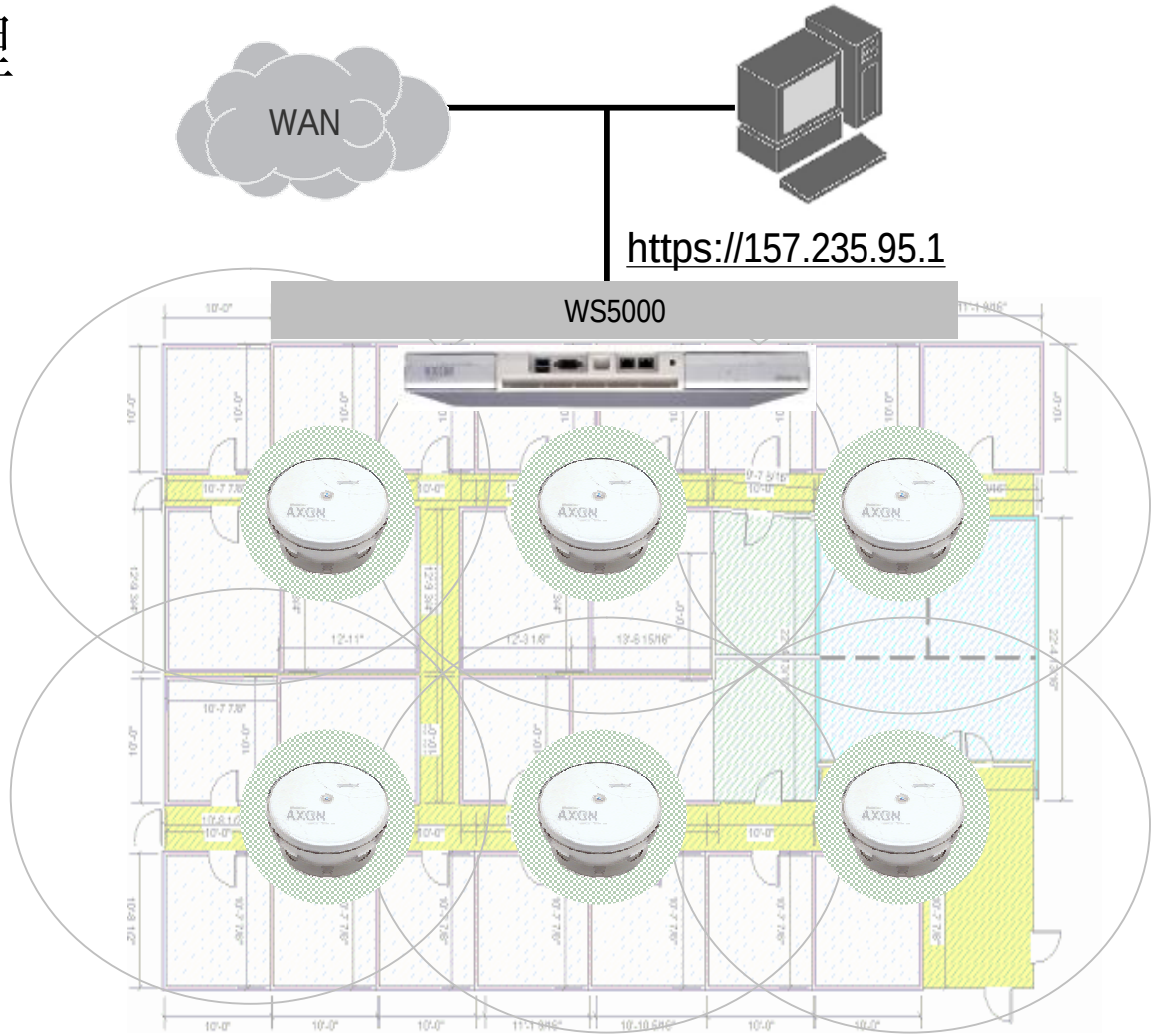
真正的一步到位管理界面

- 基于一个IP的管理
  - 基本配置
  - 组策略管理
  - 安全性能
  - CoS
  - QoS



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移动手持终端解决方案

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Symbol“无线交换”解决方案的关键特性
--平滑漫游的应用效果

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WS5000 Wireless Switch

Wireless LAN control, performance and **management simplicity**.

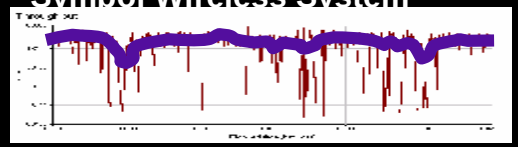
- 802.11x
- WiFi
- Bluetooth
- Wireless Switch
- CDMA
- GSM
- GPRS

Access Points

2.4 GHz band at speeds up to a fast 11 Mbps — untethered **secure access** to vital network resources

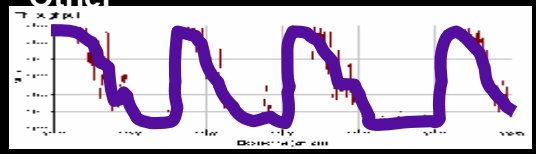
- Equals Application Persistence
- Equals Increased Efficiency

Symbol Wireless System

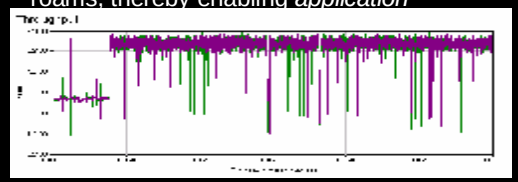


Graph illustrates several pre-emptive roams, thereby enabling *application*

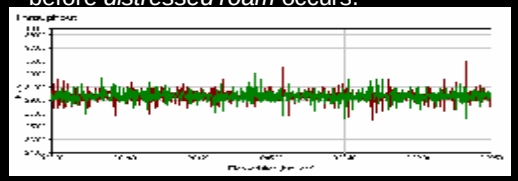
Other



Graph illustrates severe signal degradation before *distressed roam* occurs.



Graph illustrates MUs distributing themselves on different Access Ports



Graph illustrates MUs remaining on same AP despite availability of other APs, resulting in

tch
ess
tion

ss Ports
mixed

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系统比较

功能、特性	Symbol交换架构	高端AP	低端AP
802.11bg	yes	yes	yes
802.11a	yes	需要附加模块	Most not
Multi BSSID	Yes,最多8个	需要附加模块	no
9个MAC地址	yes	no	no
防水防尘设计	yes	部分支持	no
802.1x	yes	yes	部分支持
802.11i, WPA2	yes	yes	no
虚拟AP功能	yes	yes	no
WIPS/IDS	Yes	no	no
可靠性	支持双机容错	不支持双机	不支持双机
可维护性	零配置维护	需专业人员维护	需较专业人员
无线交换技术	yes	no	no
价位	Low-mid-high	high	Very low

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Symbol RF/无线 入侵保护系统IPS
Intrusion Protection System

不间断的RF 监控 可以有效降低无线网络的安全风险

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无所不在的攻击—all fire

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无线IPS 能为我们解决的问题

处理各类非法的无线设施

- 硬件 APs
- 软件 APs
- 具备攻击性的桌面设备
- 具备攻击性的桥接设备
- Ad-Hoc Clients
- Wi-fi Spy Cameras with Audio

网络弱点/策略的加强

- 外部 AP的非正常联接
- 外部客户端的非正常联接
- 不可靠的加密系统
- APs Advertising Slow & Unsafe Data Rates
- Nonstandard WLAN Access Cards
- Default SSIDs or Too Much Detail in SSID
- 不安全的Windows XP 设置
- Off-Hours Traffic

黑客攻击…

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各种各样的 802.11 攻击Hacker Attacks

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- **探测攻击源 – e.g. 伪AP, AirJack（无线探点）, NetStumbler, Wellenreiter**
- **Identity Attacks特征攻击 – e.g. AP honeypot, man in the middle attacks**
- **拒绝服务攻击 (DoS) – e.g. storms, WLAN-jack attack**
- **协议广播– e.g. Air Snort, ASLEAP attacks**
- **网络入侵**
- **客户端入侵**

Once a Hacker Breaks in:

- *从桌面系统或网络盗取数据*
- *摧毁你的网络操作*
- *输入蠕虫或特洛伊木马*
- *将你的网络变成攻击平台*

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如果没有一个安全的WLAN

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Detroit Free Press

高科技黑客黑了商店文件

联邦检察官周一称，在过去两周内，两个年轻人坐在南菲尔德市 Lowe 家装建材商店停车场的一辆轿车中，不断入侵该公司的国内计算机网络，获取了信用卡号码和其他信息。

The Sentinel

计算机盗贼监视企业

因为低级的公司网络安全，北斯塔福德郡的数百名员工受到敏感的个人信息被计算机盗贼盗取的威胁。

UNSTRUNG
tied to nothing but the future

对大学的 WLAN 警告

纽约 — 无线和移动客户端设备技术开始在大学环境中广泛应用。然而，在能够发挥全部增长潜力之前，必须解决麻烦的数据安全问题。

COMPUTERWORLD An IDG company

第三次 WLAN 战争；恶意的攻击

对无线 LAN 接入点的禁令不能使员工删除未经授权的 AP。实际上，他们将添加新的 AP。

WIRED NEWS

联邦将 Wi-Fi 贴上恐怖分子工具的标签

克拉拉市 — 注意，Wi-Fi 用户们：国防部将无线网络技术视为恐怖分子的威胁。

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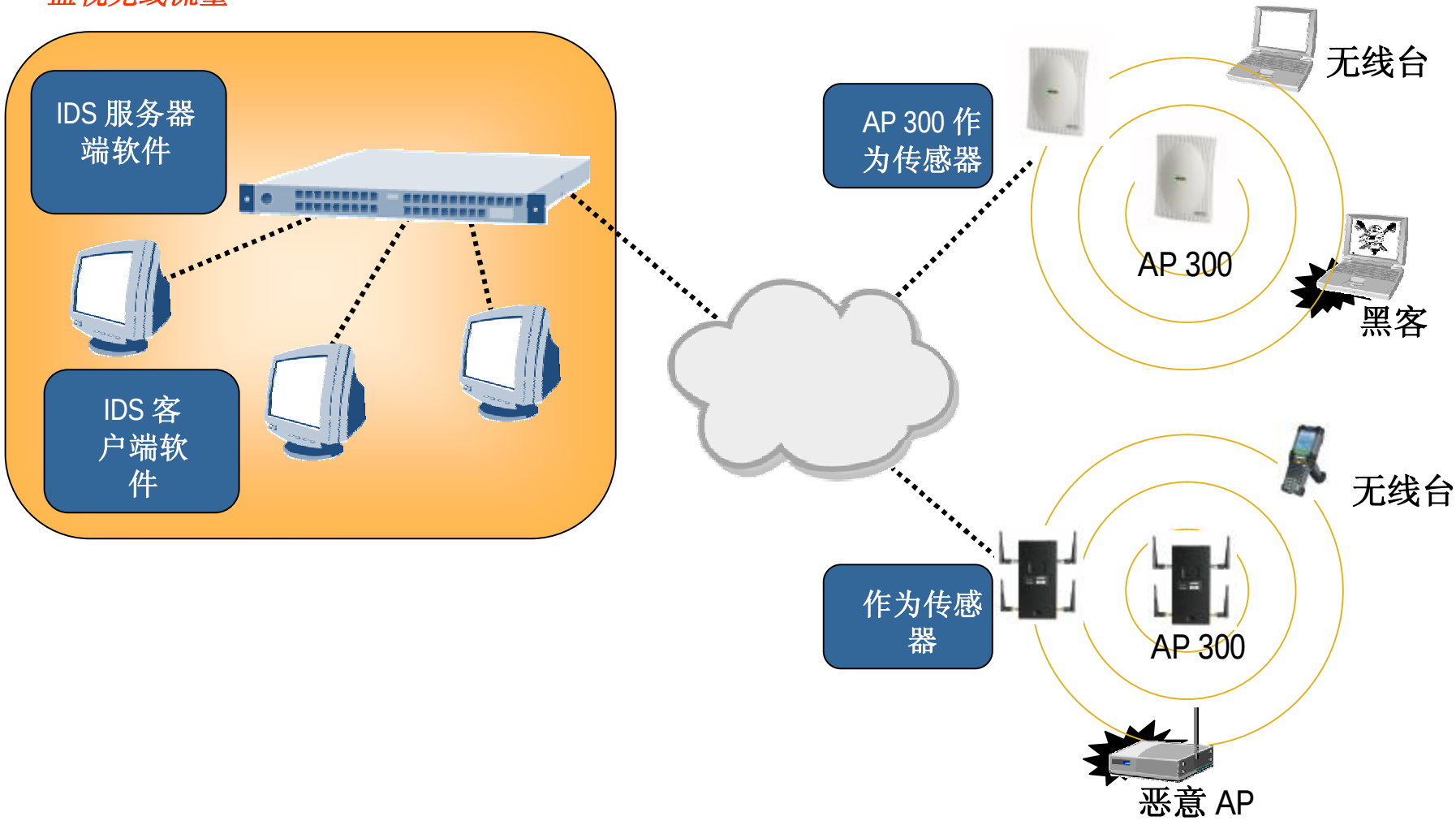
Symbol无线 IPS解决方案图表　WIDS/WIPS

监视无线流量



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Symbol IPS: 主要特点

- 利用智能天线作为传感器--AP300, 来确保全频率全方向的覆盖保护.
- 适合于分散的环境
- 在多个传感器之间能将攻击关联起来，以利于采取措施
- 更易集中实现签名系统的管理和更新
- 能通过改变工作状态将AP300由传感器改回成AP
- Low TCO

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IDS 传感器（AP300）

802.11a/b/g

Enterprise Class 802.11 a/b/g hardware

无法被其他无线系统探测到

Initial analysis performed in Sensors

- Splits computations with Server for high scalability and performance

Coverage for multiple APs

- ***能够监控4000-6000平方米范围内的所有无线/移动设备***
- *Typically one deployed for every 4 APs*

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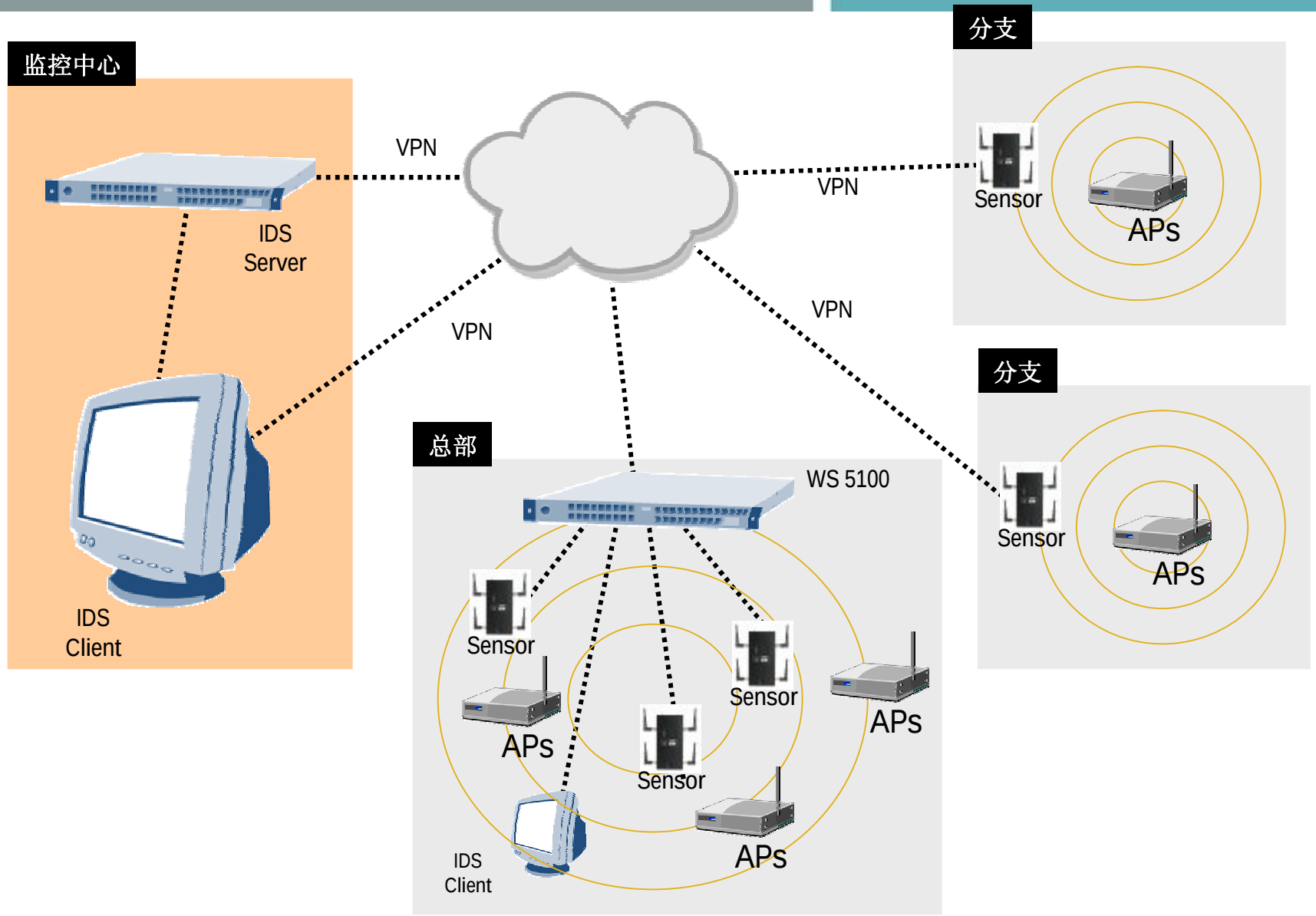
Symbol IDS/IPS可以基于广域网进行部署



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Wireless Intrusion Prevention: Critical WLAN Risks无线如侵保护

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Shifting Relationships

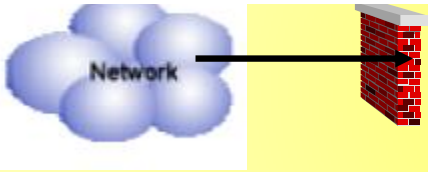
- Accidental Associations
- Probing Stations
- Ad-hoc

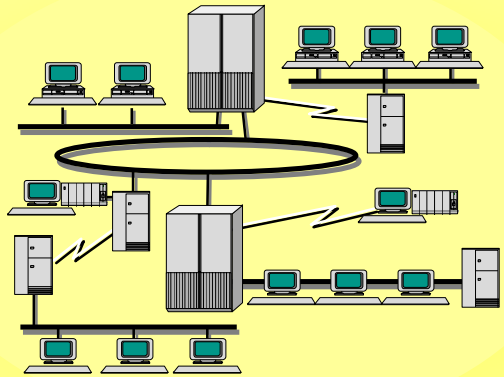
有线网络的物理保护并不周全

无线网络对传统安全概念提出的新挑战Wireless Eliminates Traditional Security Barriers and Introduces New Challenges

Rogue Devices非法设备

- 软AP, 硬 AP
- Laptops笔记本电脑
- Scanners, Projectors





Threats & Attacks入侵和攻击

- Reconnaissance
- Identity Theft
- DoS

Exposed Wired Network

- Multicast data
- Wired data
- Credentials

Operational Issues管理

- Off-hour activity
- Data rates, Interference
- Connectivity

Network & Device Vulnerabilities

- Default AP
- Mis. Stations
- Crackable Encr/Auth

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Total Wireless Intrusion Prevention:
5 Key Areas无线入侵保护系统的5个领域

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Threat-based Rogue Management
伪装和非法设备管理

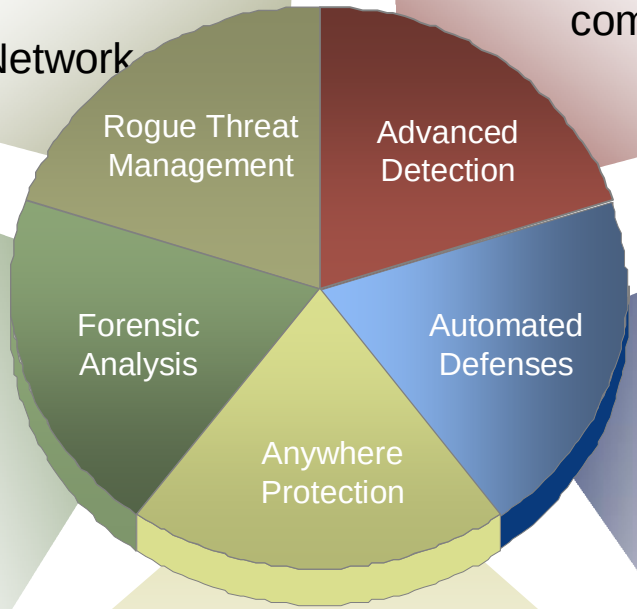
1

Analyze real rogue threats
(vs. long list of rogues)
Pinpoint Rogue on my Network
Locate, Terminate

Attack/ Threat Detection
攻击和伪装的检测

2

Most accurate &
comprehensive detection



Forensic Analysis
事件分析

5

Incident analysis
What, when, how, who?

Automated Defenses
自动防御

3

Automated, policy-based
Active Defenses
Wireless or wired-side
mitigation

Anywhere Protection
全方面保护

4

Threats to mobile users
Notify, enforce policy
Enterprise Integration

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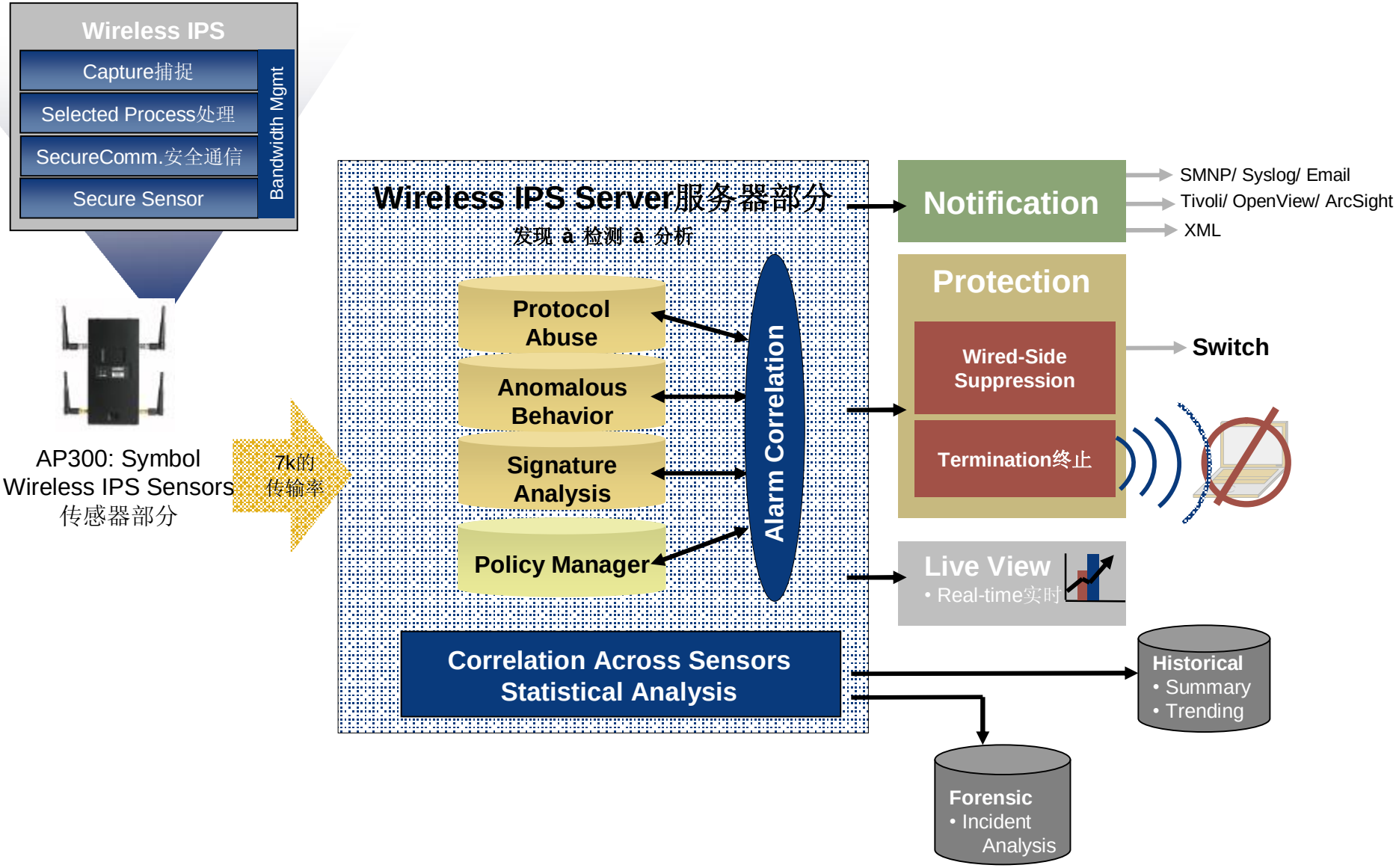
Symbol Wireless IPS: A True IPS System 一个真正的入侵检测保护系统



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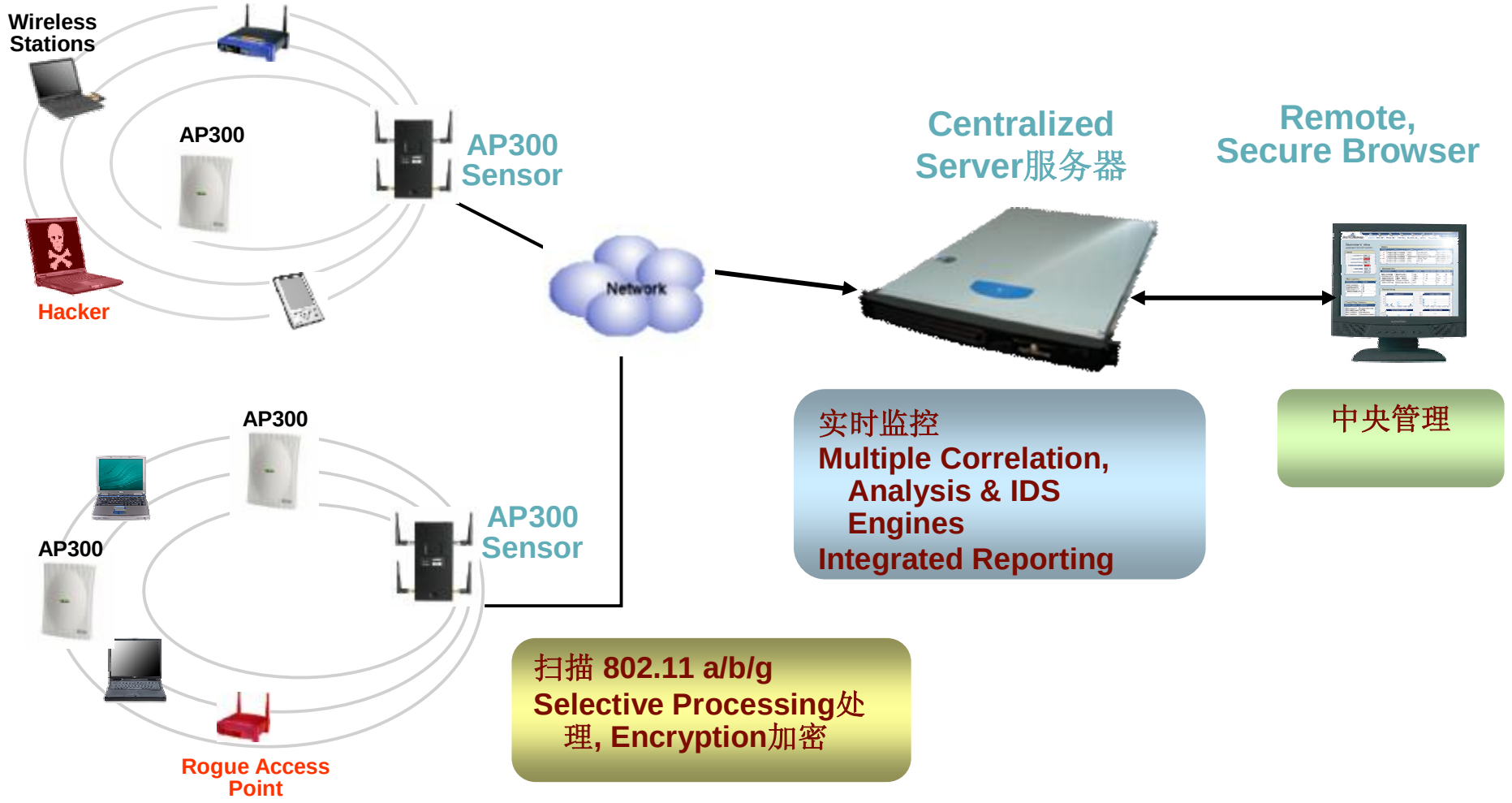
Symbol Wireless IPS Solution 解决方案



Designed for Enterprise Scalability & Central Management

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利用AP300作为 传感器sensors

- **Symbol ships AP300 as a single SKU**
- **AP300 能从普通AP到传感器之间来回转化**
- **Enterprise Class 802.11 a/b/g hardware**
- **Sensors are independent of wireless switch**
  - 传感器的firmware存储在flash中
  - Sensor is IP addressable – can be used across LAN 有IP，能跨网络
- **2-radio design allows for better scanning, or scan while terminate**
- **Coverage for multiple APs**
  - *Monitors all devices in 40,000 – 60,000 square feet range*
  - *Typically one deployed for every 4 AP's*

AP300: 802.11a/b/g

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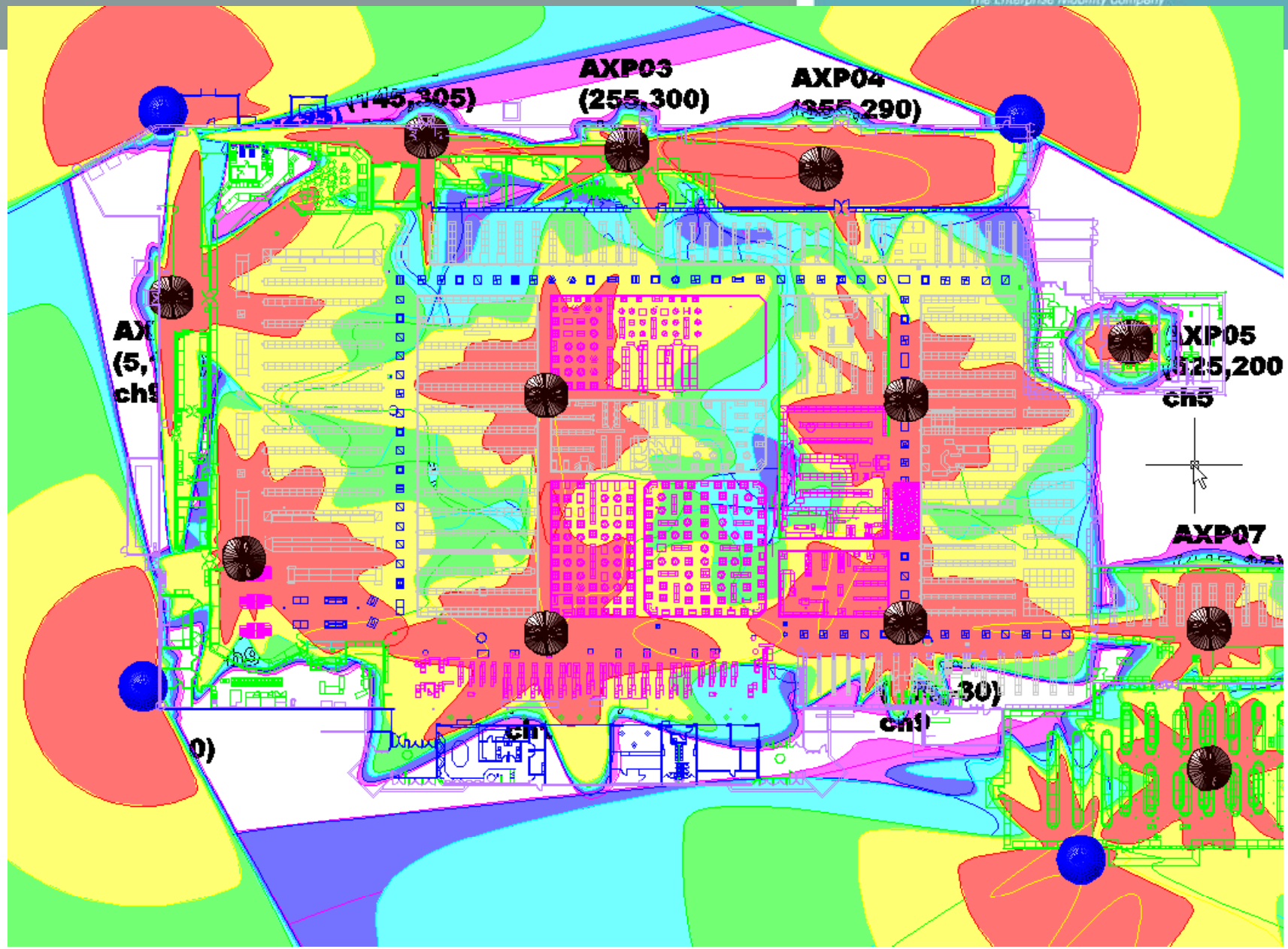
RF无线频率管理工具



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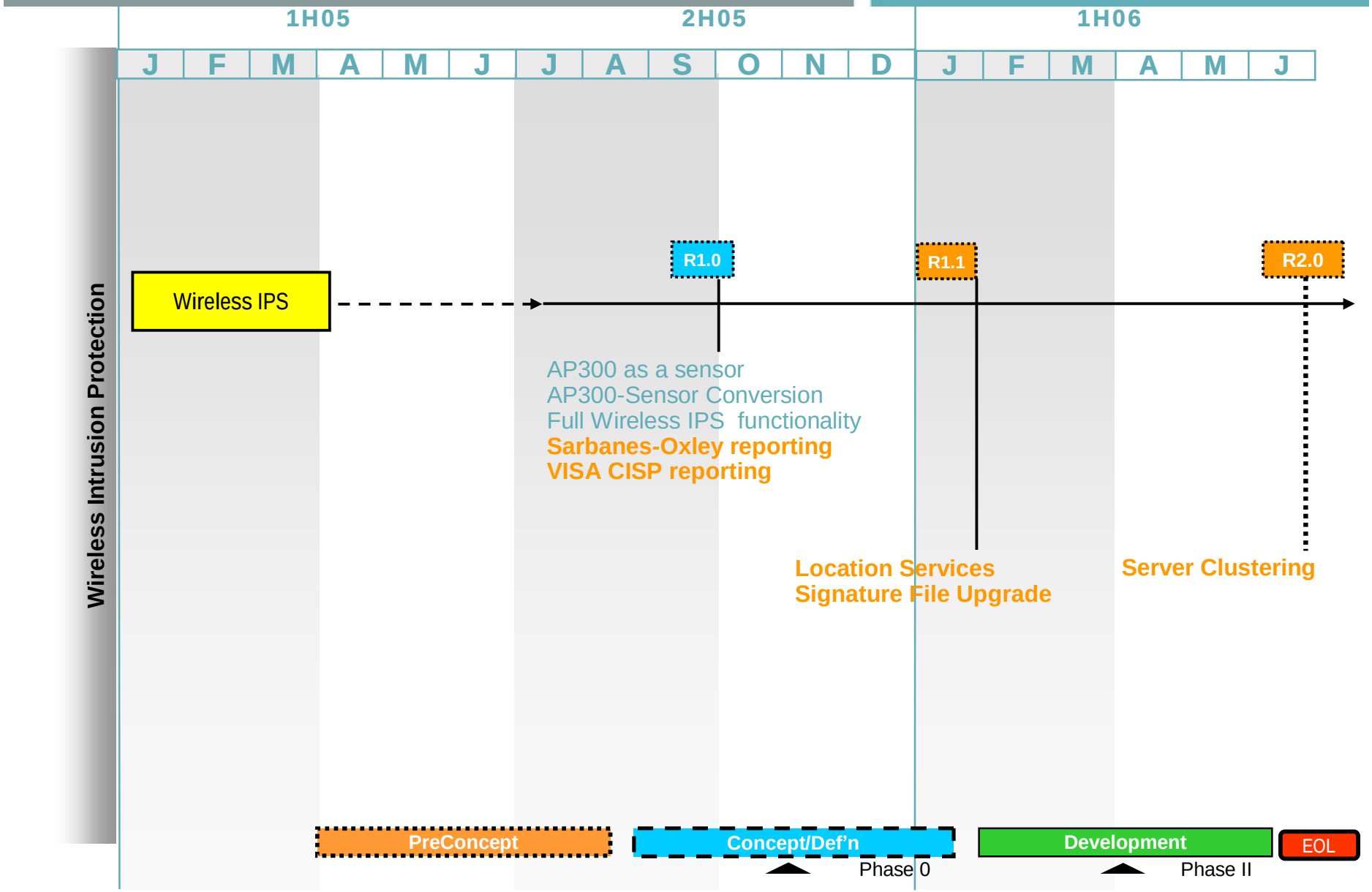
Wireless IPS 计划



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RF Site Planning and RF Management

Zhang Huan

8 September 2005

symbol
The Enterprise Mobility Company™

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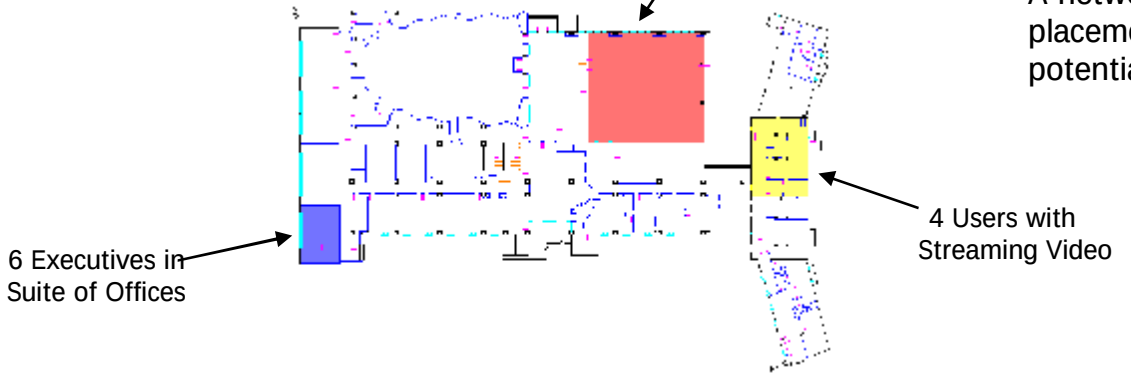
Sample Design: Automatic AP and Sensor Placement

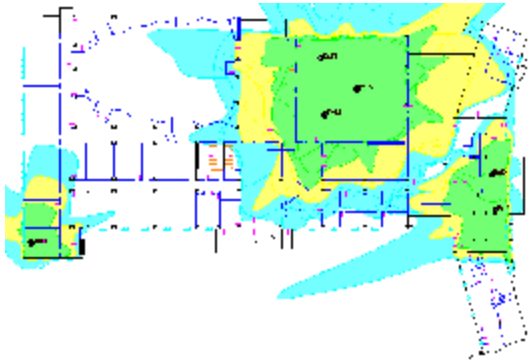
1. Initial Facility Floorplan

Walls, windows and support beams each have a unique impact on your wireless signal.

2. Enter Proposed User Requirements

With LANPlanner, the unique user requirements of each part of the facility can be documented to ensure proper coverage.





3. Software Automatically Recommends Optimal AP and Sensor Placement

- LANPlanner software evaluates the impact of BOTH the floorplan and the proposed user requirements to recommend the best placement of access points in your facility.
- A network designer can than adjust the placement and view the impact of any potential changes.

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Design Functionality Details

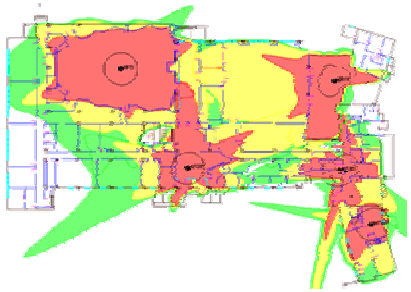
Prediction: You can predict vital information such as RSSI (Received Signal Strength Indicator), SIR (Signal to Interference Ratio), SNR (Signal to Noise Ratio), throughput and bit error rate and visualize the impact of these measurements on a map of your facility with **no site survey required!**

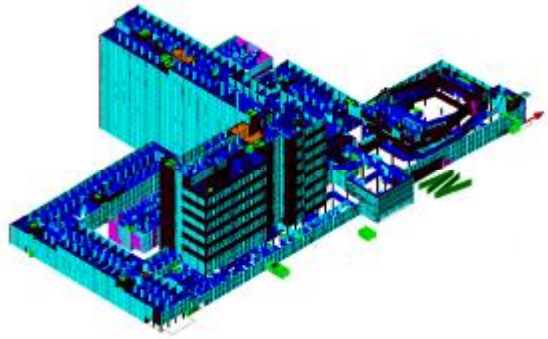
2D/3D Modeling: Wireless Valley's software quickly constructs a 2D or 3D representation of the environment that conveniently captures and organizes all relevant information regarding both the wireless network and the physical environment in which it resides.

Bids and Proposals: Quickly generate formal bids and create specification documents for proposals.

Asset Documentation: Vital asset location, configuration information, and maintenance records are stored in a flexible 2D/3D model for troubleshooting, simplified network management and network upgrade planning.

Bill of Materials: Project documentation is also stored and can be easily shared and e-mailed. A highly accurate bill of materials can also be generated for the purchase of equipment and materials avoiding time consuming implementation delays, additional unplanned purchases, budget overruns and excessive paperwork.





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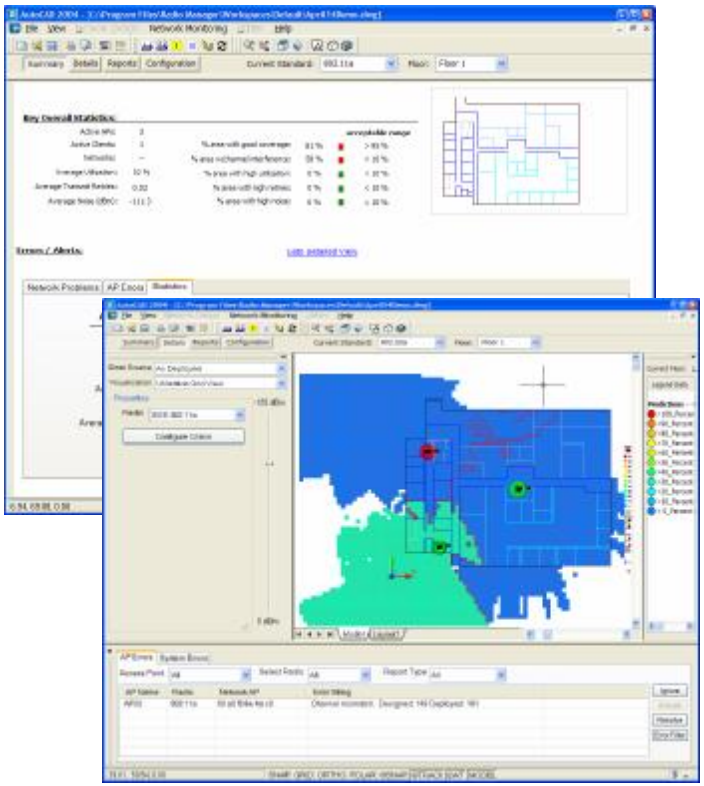
RF Manager Key Capabilities

A well-designed system and site-specific knowledge from the design process are key to effective network performance and management.



Visualize RF activity

- Monitor and guarantee the availability and performance of mission critical business applications delivered via WLAN
- Evaluate bandwidth usage and capacity utilization

Detect wireless network issues

- Identify coverage holes
- Detect areas with interference
- Locate equipment outages

Remotely resolve problems

- Change hardware configuration
- Add or remove APs from the network

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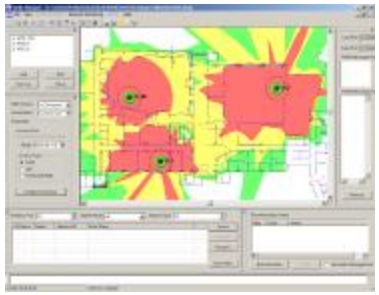
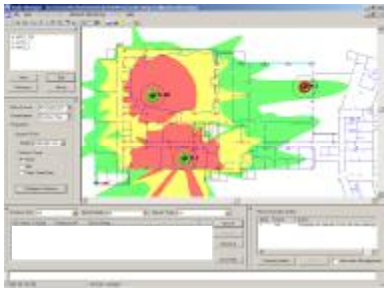
Management: Solve Coverage Problems



Original Design



Network Issue

An access point is not functioning properly

Implemented Solution

Turn up power on functional APs for temporary coverage while AP problem is resolved

Legend:
Green = average throughput
Yellow = good throughput
Red = high throughput

Install a new access point

Turn up power on functional APs

Simulated Solutions

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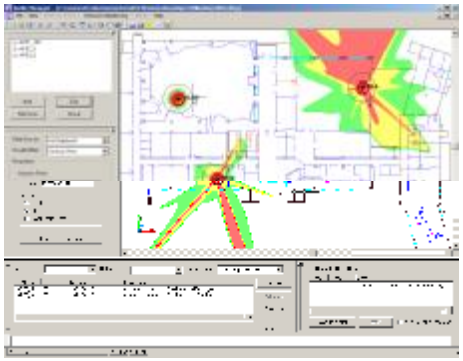
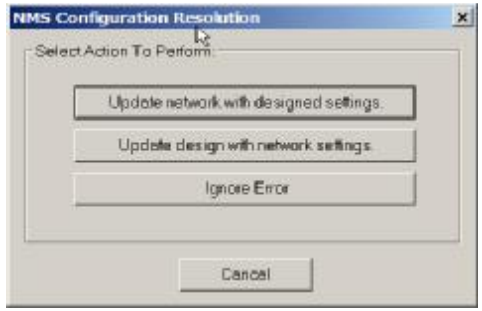
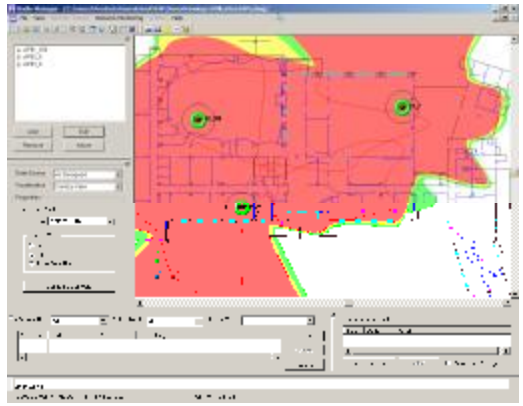
Management: Resolve Interference Issues



Real-Time Network View

Interference makes the current network ineffective.



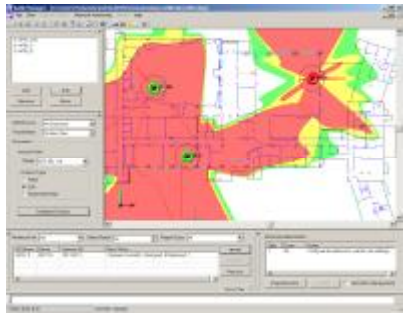


Implemented Solution

The Management System adjusts the APs and the interference problem is solved.

Simulated Solutions

Legend: Interference
White=High
Green = Average
Yellow = Partial
Red = Minimal



With one manual access point channel adjustment, effectiveness is improved.

The Wireless Valley RF Management tool recommends a change for optimum network performance.

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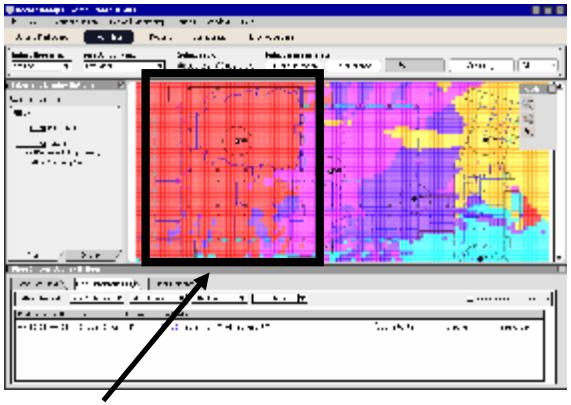
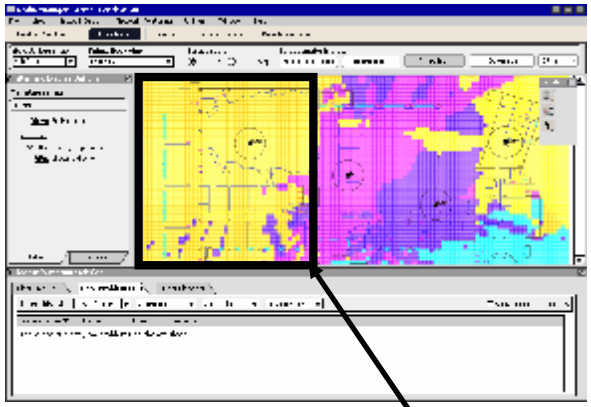
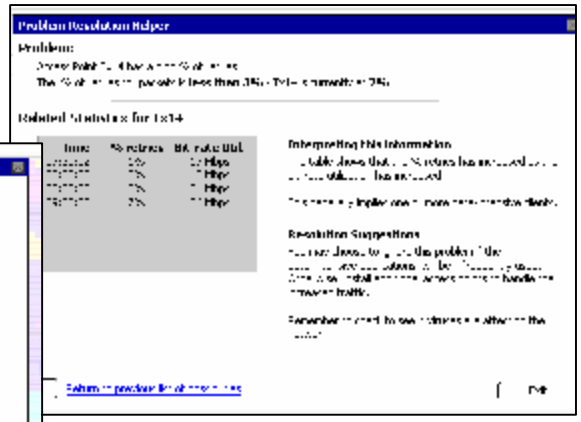
Management: Visualize Capacity Utilization

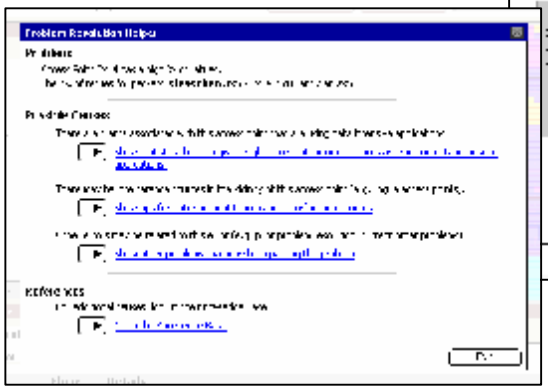


High Number of Retries on an AP



Issue resolved





Troubleshooting Wizard Provides Possible Causes

Along with additional statistics to help identify the root cause

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Symbol RFID
新一代的无线射频识别技术

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RFID – Symbol对RFID的策率

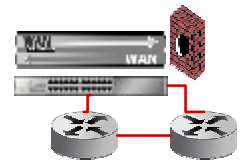
采集

\+ 移动

\+ 管理

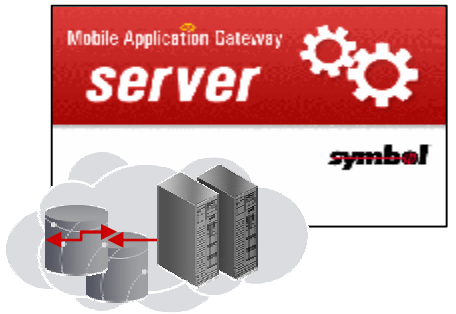
企业移动方案

RFID
技术



无线交换器

移动设备服务
管理器



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企业RFID方案架构

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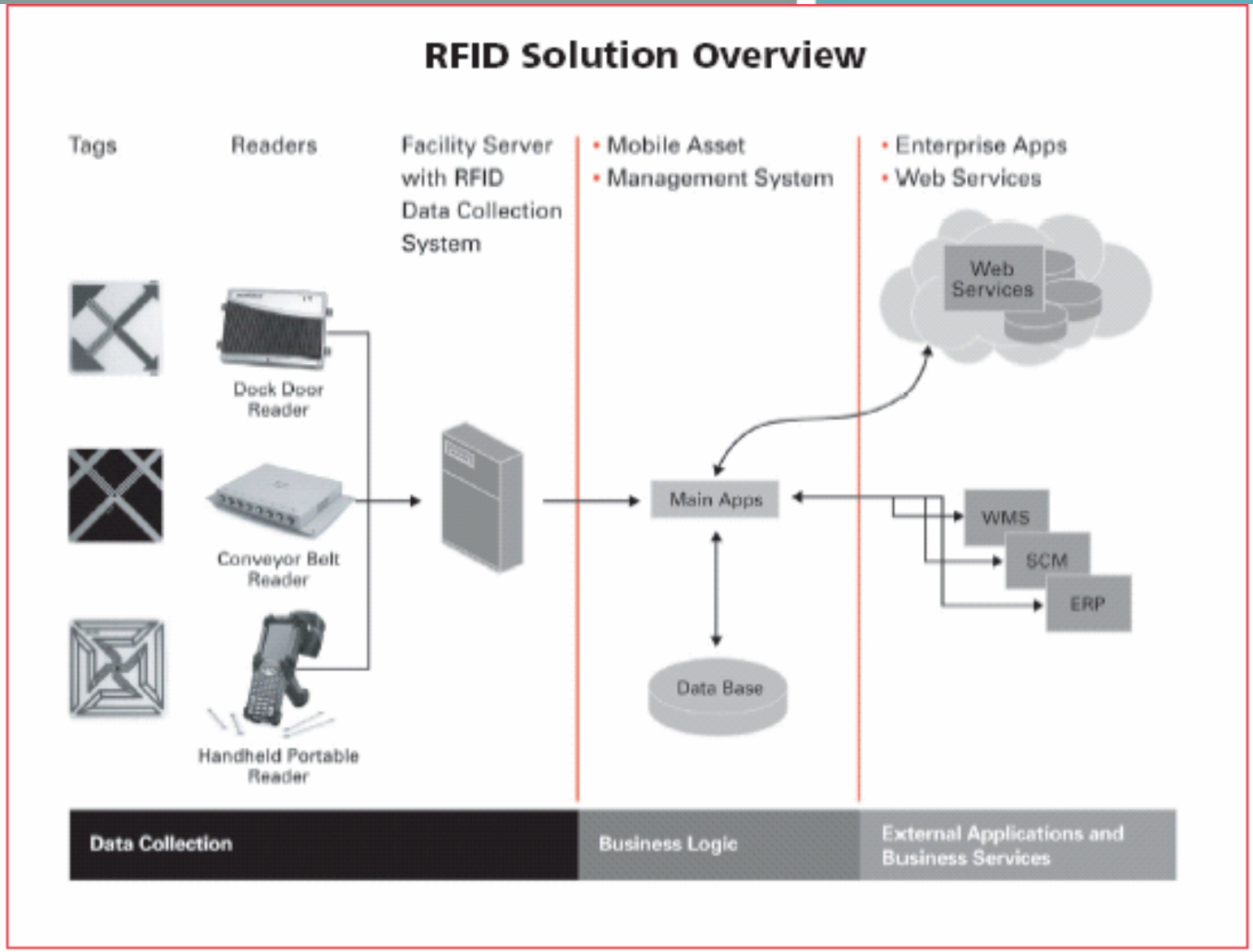

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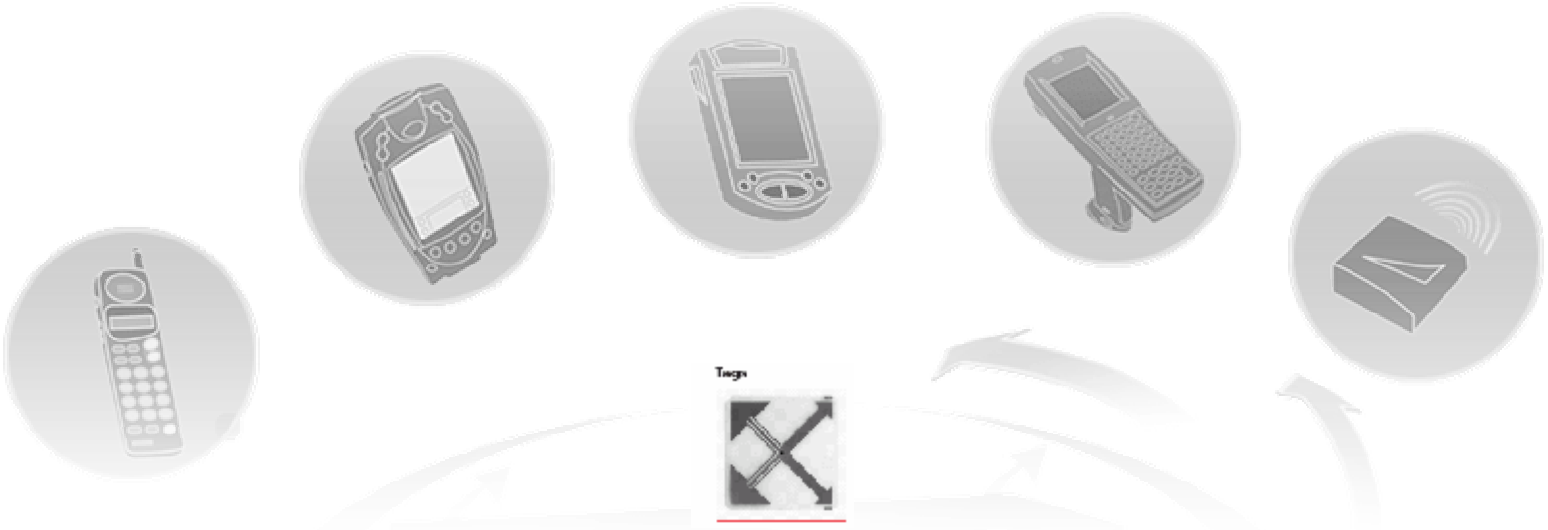
Symbol对RFID的认识和策率

香港机场
上海邮政EMS
沃尔玛
高速公路收费系统
……

AR400



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移动解决方案

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