Novosti u području bežičnih mreža

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It is a bit freaky with this wireless technology
Business Mobility Trends

Proliferation of Wi-Fi Devices

Businesses deploying wireless pervasively

Expect wireless performance close to wired for business applications

Over 1.1 billion Wi-Fi clients will ship within the next 3 years
IDC

Business mobility delivered with next generation wireless
Wireless Challenges

- Enabling Collaborative Apps
- Capacity for High-Bandwidth Applications
- Support for New Wave of Mobile Clients
- Interference and Challenging RF Environments
The diversity and growth of mobile applications is driving the need for increased wireless bandwidth. The introduction of real-time collaborative applications like voice and video requires low latency wireless connections. The increase in interference demands more predictable coverage to reduce dead spots for consistent connectivity.
802.11n Drivers

**Wireless Refresh and Expansion**

11n provides investment protection for refresh and new installations.

3-4 year laptop refresh cycle

**Bandwidth Intensive and Real-time Applications**

Real-time collaborative applications like voice and video require reliable coverage for low latency.

Synchronous apps that require a pulse demand predictable performance.

**Flexibility and Cost Efficiency**

Save time and money by avoiding labor intensive moves adds and changes.

Save in cabling costs for new or wired buildings.
802.11n solution
Wireless has Become Business Oxygen

- Business applications have gone mobile
- Wireless is evolving to meet needs for high performance, pervasive connectivity

Point Applications
- Inventory Management
- Barcode Scanning

Mobile Data
- Email
- Web browsing

Business Ready
- Voice, Video, Data

Next Gen Wireless
- Ubiquitous mobile computing

Wi-Fi Device Proliferation

802.11a
54Mbps

802.11b
11Mbps

802.11
2Mbps

802.11n
600Mbps

802.11ag
54Mbps

Business Ready

Wi-Fi Compatible

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What Painpoints Does 802.11n Solve?

Better end-user experience for data, voice and video

- Throughput—Up to 6 times greater than existing networks
- Reliability—Fewer packet retries
- Predictability—Consistent coverage and throughput
- Compatibility—Backwards support for 802.11a/b/g clients
- Future-Proofing—Guaranteed Interoperability –Tested/Validated
802.11n Technical Update
Technical Elements of 802.11n

- MIMO
- 40Mhz Channels
- Packet Aggregation
- Backward Compatibility
Aspects of 802.11n

MIMO (Multiple Input, Multiple Output)

Perform...
Aspects of 802.11n

40Mhz Channels
Packet Aggregation
Backward Compatibility

MIMO (Multiple Input, Multiple Output)

Beam Forming
Maximal Ratio Combining
Spatial Multiplexing

Performed by Receiver (Hear Better)
Combines Multiple Received Signals
Increases Receive Sensitivity
Works with non-MIMO and MIMO Clients

With MRC
Multiple Sensors Sent
One Signal Chosen
Fidelity

MIMO AP

MIMO AP

Performance
Aspects of 802.11n

MIMO (Multiple Input, Multiple Output)

Information Is Split and Transmitted on Multiple Streams

Transmitter and Receiver Participate
Concurrent Transmission on Same Channel
Increases Bandwidth
Requires MIMO Client

Beam Forming
Maximal Ratio Combining
Spatial Multiplexing

- 40Mhz Channels
- Packet Aggregation
- Backward Compatibility

Performance

MIMO AP

stream 1
stream 2
Aspects of 802.11n

MIMO

40Mhz Channels

Packet Aggregation

Backward Compatibility

40Mhz Channels

Moving from 2 to 4 Lanes

40-MHz = 2 aggregated 20-MHz channels—takes advantage of the reserved channel space through bonding to gain more than double the data rate of 2 20-MHz channels
Aspects of 802.11n

- MIMO
- 40Mhz Channels
- Packet Aggregation
- Backward Compatibility

Packet Aggregation

Carpooling Is More Efficient Than Driving Alone

Without Packet Aggregation

- 802.11n Overhead
- Data Unit Packet
- 802.11n Overhead
- Data Unit Packet
- 802.11n Overhead
- Data Unit Packet

With Packet Aggregation

- 802.11n Overhead
- Data Unit Packet
- 802.11n Overhead
- Data Unit Packet
- 802.11n Overhead
- Data Unit Packet
Aspects of 802.11n

- MIMO
- 40Mhz Channels
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- Backward Compatibility

**Backward Compatibility**

11n Operates in Both Frequencies

2.4GHz  
5GHz

802.11ABG Clients Interoperate with 11n AND Experience Performance Improvements
Backward Compatibility & Co-Existence

- Co-existence of ABG/N APs
- Benefits of 11n accrue to ABG clients
  MIMO benefits ABG clients on the AP receive side from MRC
3 Modes of operation supported
- Legacy
- Green Field
- Mixed

Mixed mode experiences slight performance impact due to ABG clients

- 11n clients still transmit at full performance
- PHY and MAC for 11n provides co-existence and protection for ABG clients
Network Capacity and Scalability

- Plan for system level capacity, not per AP capacity
- Additional controller increases capacity and improves availability
- Typical Ethernet network oversubscription is 20:1
- With 1250 APs at full capacity, Cisco WLAN controllers reach 12:1
Voice over 802.11n
802.11abg Performance Still Benefits from MIMO

A Higher MOS Score Delivers Better Voice Quality
802.11n
Cisco Solution
Delivering Business Mobility
The Cisco Unified Wireless Network

**Client**
- 90% of laptops Cisco compatible
- Secure Services Client (CSSC)

**Access Points**
- Indoor and Outdoor
- 802.11a/b/g/n
- Only 802.11n Draft 2 support with PoE

**Wireless LAN Controllers and Management**
- Centralized management
- Flexible, scalable (1000s of APs)
- Radio resource management

**Wired Network Services**
- Unified Security and Management services
- Mobile Unified Communications

**Mobility Services**
- Mobility Services Engine
  - Guest Access
  - Security
  - Spectrum Intelligence
  - Voice
  - Context-Aware
  - Mobile Intelligent Roaming

**Unified Wired and Wireless Network**

**Device**

**Access**

**Control and Visibility**

**Service and Performance**

**Mobile Applications**
Cisco Unified Wireless Network

**Features**
- Enterprise scalability and reliability
- Real-time RF Management
- Multi-layered security
- Mobility management
- Standalone and integrated options

**Benefits**
- Up to 1500 APs per Cat 6K chassis
- Cost-effective solution for main, branch, and remote campuses as well as SMB
- Ideal for data, voice, and video
- Wired and wireless integration
Wireless Controller Product Portfolio

- 5508-12, 25, 50, 100, 250 (LICENSE-BASED)
- 5508-12, 5508-25, 5508-50, 5508-100, 5508-250, 500
- 4402-12, 25, 50
- 4404-100
- 3750G-25, 50
- 2106, 12, 25
- WLCME-6, 8, 12, 25
- WiSM-300
- H-REAP

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Cisco Unified Wireless Network

Product Description

Indoor Access Points

1140 AGBN

Indoor Rugged Access Points

1250 AGBN

1240AG

Outdoor Access Points/Bridges

1500

1520

1400

1300

Access Points

Features

- Industry’s best range and throughput
- Enterprise-class security
- Only 802.11n Draft 2 support with PoE
- Simultaneous air monitoring and traffic delivery
- Wide area networking for outdoor areas

Benefits

- Zero-touch management
- No dedicated air monitors
- Supports all deployment scenarios (indoor and outdoor)
- From secure coverage to advanced services
Cisco Aironet 1260 Series

- Think “Ruggedized 1140 with antennas”
- Dual band 802.11n performance under 802.3af PoE standard
- Leverages current antenna portfolio including new 11n MIMO options
  - AIR-LAP1262N-x-K9
- Easy retrofit to installed 1130/1240 mounting brackets

Industry Leading 802.11n Performance
Proven, Modern and Lightweight Form Factor
- BandSelect
- ClientLink+
- VideoStream
Cisco Next-Generation Wireless Portfolio

- **Cisco Aironet 1040 Series**
  - Entry level 802.11n access point
  - Carpeted Indoor Environments
  - Easy to Deploy-Sleek design with integrated antennas
  - 2x2 MIMO
  - 802.11n performance with efficient 802.3af power
  - Blends seamlessly into the environment
Additional Resources

• Cisco Next Generation Wireless
  http://www.cisco.com/go/nextgen-wireless

• Cisco Aironet 1140 Series Access Point

• Cisco Aironet 1250 Series Access Point

• Cisco Unified Wireless Network