Cisco Mobility and Wireless in Schools

Education in Motion
Agenda

- Introducing Council Rock School District
- Today’s K-12 school environment
- Challenges for educational institutions
  - Council Rock
  - K-12 schools
- Mobility and wireless solutions
  - Council Rock wireless history
  - Cisco Mobility Solutions
  - 802.11n
- Lessons learned at Council Rock
- Campus physical safety and security
- Future plans at Council Rock
- Why Cisco?
- Special Offer - Cisco Aironet 1140 Series

Matthew J. Frederickson
Director of IT, Council Rock School District, Pennsylvania

Cameron Spivey
Mobility, Product Specialist, Cisco
Council Rock School District

- Covers 72 square miles
  - 45 miles north of Philadelphia, Pennsylvania and 20 miles west of Trenton, New Jersey
- 12,600 students
- 1,500 staff and contractors
- 18 buildings
  - 2 High, 3 Middle, 10 Elementary, 1 Alternative Schools
  - 2 Administrative buildings
- Ninth largest district in Pennsylvania (out of 500)

http://www.crsd.org
Council Rock School District

Metrics

- $195,000,000 annual budget
- 83% for fixed/contracted expenses
- Total IT budget – 1.5%
  - About $2,900,000
- 5,500 desktop and laptop computers
- 14,500 users supported
- IT staff of 12
- WAN with shared Internet
  - Fiber between each building
  - 50 MB Internet Connection
A Connected Mobile Generation
Technology-Savvy Students

- Instant Messaging
- Music/Video
- Social Networking
- Cellular and Text Messaging
- Gaming
- Blogging/Wikis

© 2009 Cisco Systems, Inc. All rights reserved. Cisco Public
Schools Must Deliver

Interactive learning environments that teach 21st-century skills

Competitive student performance

Enhanced staff development and training

Transparent and effective communication

Productive, secure learning and work environment
Technology Challenges To Meet School Objectives

- Cost-effective scalable network connections
- Mobility-enabled teaching and learning devices
- Manage shifting student populations
- Limited equipment budget
- Campus safety and network security are a priority
Council Rock School District
Challenges Faced

- Aging equipment needed replacement
- No design standard for classrooms, buildings or network
- File access limited to teacher administrator home building
Council Rock School District

Why Wireless?

• Web 2.0
  – Interactive web sites (http://www.funbrain.com)
  – Virtual field trips (Alaska SeaLife Center)
  – Streaming video (http://unitedstreaming.com)

• Collaborative Learning

• Handheld electronics – PDA’s, iPOD’s – students and staff

• Personal computers - students

• Pennsylvania State One-to-One Initiative – Classrooms For the Future – High School Initiative

• Mobility for administration and maintenance staff
Meeting School Objectives with Wireless Networking

<table>
<thead>
<tr>
<th>Students</th>
<th>Teachers</th>
<th>Administration</th>
<th>Visitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Real-time learning indoors and outdoors</td>
<td>▪ Classroom and teaching tools</td>
<td>▪ Real-time data and information</td>
<td>▪ Substitute teachers</td>
</tr>
<tr>
<td>▪ Mobile collaboration</td>
<td>▪ Administration</td>
<td>▪ Mobile tools and communication</td>
<td>▪ Parents</td>
</tr>
<tr>
<td>▪ Classroom polling</td>
<td>▪ Communication</td>
<td>▪ Data security (Including HIPAA and PCI)</td>
<td>▪ Administrators</td>
</tr>
<tr>
<td>▪ Video-on-demand, multimedia, webcasts, podcasts</td>
<td>▪ Research and planning</td>
<td>▪ Campus safety</td>
<td>▪ Vendors and guests</td>
</tr>
<tr>
<td></td>
<td>▪ Campus safety</td>
<td></td>
<td>▪ Conferences</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>▪ After school events</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>▪ Sporting venues</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Students</th>
<th>Teachers</th>
<th>Administration</th>
<th>Visitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>▪ Substitute teachers</td>
<td>▪ Parents</td>
<td>▪ Administrators</td>
<td>▪ Vendors and guests</td>
</tr>
<tr>
<td>▪ Administrators</td>
<td>▪ Administrators</td>
<td>▪ Conferences</td>
<td>▪ After school events</td>
</tr>
<tr>
<td>▪ Vendors and guests</td>
<td>▪ After school events</td>
<td>▪ Sporting venues</td>
<td></td>
</tr>
<tr>
<td>▪ Conferences</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ After school events</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▪ Sporting venues</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

© 2009 Cisco Systems, Inc. All rights reserved.
Wireless Supports a Safe and Orderly Campus

**Safety**
- Wireless video surveillance
- Physical safety
- Police and e911
- Mobile access to surveillance information

**Security**
- Secure data and communications
- Prevent hacking into restricted sites
- Monitor for unauthorized devices and users

**Communication**
- Voice, E911, video, SMS texts
- Detect incidents
- Trigger automated responses
Inspiring New Connections for the New Global Economy

Students are changing, and we are becoming one global economy. The education we deliver, therefore, must necessarily change.

- Education must adapt to provide students with the skills required to compete effectively in the 21st century.
- Cisco, a change agent in education, helps educational institutions build the right infrastructure and implement technologies that help create 21st century learning environments to meet the needs of the next generation of learners and the new global economy.
Flexible Wireless Solutions Support Education Initiatives

- Campus Wireless
- Wireless Bridging
- District-Wide Wireless
14

Council Rock School District
Wireless History

• 2005
  – Developed and began implementation of distributed computing architecture network plan (a plan to make things work)

• 2006
  – Board implemented four-year cycle for technology renewal
    • Provides fixed budget line item – no more single large expenses
    • Implemented standard configuration on all equipment (same experience for user regardless of location)

• 2007
  – Implement wireless cloud throughout entire building, for all buildings
  – Implement centralized wireless management
    • Cisco Wireless Control System (WCS), Cisco 6500 Series Wireless Services Module (WiSM)
2007/2008
- B/G bandwidth an issue – problems with streaming video/audio
- Begin testing “N” at high schools
- Plan for B/G replacements/expansion with 802.11N

2008
- “N” a big hit – 70 AP’s deployed at both HS
  - Streaming video and audio working great!
  - Classroom integration of multimedia now possible
- Add wireless video surveillance cameras – flexible and mobile
  - Immediate implementation proved effective
  - Improved campus safety and security
- Improve wireless security (WPA2)

2009 and Future
- When economical, continue 802.11N deployment and B/G replacement
- Add additional wireless video surveillance cameras
- Implement energy savings (EnergyWise)
# Cisco Mobility Solutions for 21st Century Schools

## Education in Motion

<table>
<thead>
<tr>
<th>Administrative Efficiency</th>
<th>Safety and Security</th>
<th>Next Generation Learning</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Pervasive Wireless on Campus</td>
<td>• Physical Safety and Security</td>
<td>• Learning and Collaboration Tools</td>
</tr>
<tr>
<td>• 802.11n High-Speed Wireless</td>
<td>• Video Surveillance</td>
<td>• Social Networking</td>
</tr>
<tr>
<td>• Mobile Voice Communications</td>
<td>• Network and Data Security</td>
<td>• Context-Based Learning</td>
</tr>
<tr>
<td>• Secure Guest Access</td>
<td>• Context-Aware Mobility</td>
<td></td>
</tr>
</tbody>
</table>

- **Administrative Efficiency**
  - Pervasive Wireless on Campus
  - 802.11n High-Speed Wireless
  - Mobile Voice Communications
  - Secure Guest Access

- **Safety and Security**
  - Physical Safety and Security
  - Video Surveillance
  - Network and Data Security
  - Context-Aware Mobility

- **Next Generation Learning**
  - Learning and Collaboration Tools
  - Social Networking
  - Context-Based Learning
802.11n High-Speed Wireless

- Higher speeds for bandwidth intensive applications (video streaming, video-on-demand, gaming, and multimedia)
- Enhance coverage and performance for 802.11a/b/g clients
- Predictable and continuous WLAN coverage for areas with dense wireless clients (classrooms, auditorium, library, and study centers)

Deliver Ubiquitous Mobile Access Everywhere on Campus
Council Rock School District
Lessons Learned

- Identify technology design standards/best practices first
  - What should be in every classroom?
    - Classroom is where the room use is 70% or greater for instruction
    - A gymnasium is NOT a classroom
  - What should the end user expectation be?
    - Now, three years from now, five years from now
    - What technology are they using outside the school?
  - Examples on the Internet

- Conduct a thorough wireless survey
  - School construction NOT wireless friendly
    - Overlap best practices of coverage areas MUST be followed (based on planned usage – voice, data and/or video)
    - Plan for centralized control and management of wireless
    - Cisco WiSM – one change, 5 minutes to deploy to 211 access points - $3.75 labor cost
    - Same change deployed to each access point individually - $1,582.50 labor
Integrate technology deployments
- Synchronize desktop/laptop deployment with access points to support 802.11n
- Leverage advantage of Cisco M-drive technology for 802.11n access points to support legacy B/G clients more effectively

Energy Management (EnergyWise)
- Wireless access points turned off when NOT in use
  - About $1,200 per year in savings (230)
- Phones when not in use
  - About $2,800 per year in savings (350)
- PC’s when not in use*
  - About $100,000 per year in savings (2,000)

* Enough electricity to power 480 homes for one year, 700 tons of greenhouse emissions, Equivalent to removing 120 cars from the road
Campus Physical Safety and Security

- Maintain safe buildings and grounds
- Improve response times of campus security and first responders
- Communicate quickly to students, faculty, staff, and surrounding community during a safety incident

Enhance Student Safety and Protect Assets
• Centralized management and control of physical building entrance and exit by ID card
  – User or roll based access
  – Standard access policies
• Reduces costs
  – Single door, card access system typically requires power
  – Cisco Gateway feeds low-voltage to door – saves an average of $250 to $325 per door
  – Hardware agnostic
• Integrates with Cisco Video Surveillance Manager
  – Support video capture of entrance and exit triggered by ID
Location Tracking and Context-Based Applications

Monitor, Track, and Secure Valuable Campus Assets

- Vehicles
- E-Tablets
- Projectors
- VoWLAN Phones
- Library Assets
- Computer Carts
• **Why implement?**
  – Theft prevention
  – Asset tracking and accountability
  – Safety and security
  – Supports long-term strategic plan

• **Wireless infrastructure exists to support**
  – No new major costs
  – Adding Mobility Services Engine (MSE) with Context-Aware Software

• **Provides additional tools for reduced resources**
  – Security and administrators
Outdoor Wireless Mesh Bridging
Connect Portables and Re-Locatable Classrooms

- Cost-effectively extend the network
  Temporary classrooms, maintenance buildings, remote sites, and athletic facilities
- Avoid leased-line fees
- Quickly adapt to shifting school populations
- Easily deliver high-bandwidth access anywhere on campus
Invest in an infrastructure that is adaptable and will provide for future investments

- Flexible (modular) core equipment
- Centralized control and management
- Proven track record of support and integration
- Recognize what gets used at home ends up in the classroom
- Form strategic partnerships for enhanced expertise (ePlus)
- Leverage the network!
Why Cisco?
Education in Motion

- Integrated, open, extensible platform for mobility applications
- Unifies Wi-Fi, Ethernet, Cellular, and WiMAX

- Broadest array of business-grade mobility services
- Established leader in next-generation 802.11n technology

- Stringent platform, client, and application interoperability testing
- Cisco Compatible Extensions, M-Drive, ClientLink, CleanAir, Cisco AssureWave, Intel, and 3rd party applications

- Delivers true Layer 1 to Layer 7 enterprise-class security
- Powerful IPS, world-class firewall, threat assimilation, threat mitigation, and Network Access Control (NAC)
Q & A
Special Offer
Cisco Aironet 1140 Series 10-Unit Eco-Pack

- Cisco® Aironet® 1140 Series
- 10-unit Eco-Pack
- Up to 10 Percent Off the List Price
- Available Worldwide
- Promotion Valid Through July 31, 2009
- Contact your Cisco representative

For more information visit:
http://www.ciscogoeducation.com/offer_form.html

6X Performance of A/B/G
Additional Information

- Cisco Mobility and Wireless Solutions for Schools

- Cisco Unified Wireless Network

- Cisco Aironet 1140 Series 10-Unit Eco-Pack

- Cisco M-Drive Technology

- Cisco ClientLink - Optimized Device Performance with 802.11n