OPTIMIZING YOUR NETWORK for Common Core Online Standardized Testing
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Our Speakers Today

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Fullerton School District  
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Presenter  
*Network and Systems Engineer*  
Bryant Schools  
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Agenda

- Brief Update on Common Core and Online Standardized Testing
- Fullerton School District
- Bryant Schools
- Tips for Optimizing Your Network Now

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Let’s Begin with some Facts

Modern classroom technology is on the rise –
• Interactive Whiteboards
• AppleTVs
• eReaders
• iPads
• Smartpens
• Stationary gaming devices
  - Pearson Foundation (2012)

Students prefer learning from digital textbooks over learning from print textbooks
  - Pearson Foundation (2012)

2014-2015 will be the first year of full implementation of online standardized testing

Realistic to expect 60% of Students to have a school-provided device
  - IDC

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Where does the network cable go?

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The Solution  A Mobile-Centric Approach to Networking
Aerohive's Solution: Cloud-Managed, Mobile Networking Platform

- **Scalability: Unified Mobility Infrastructure**
  - Easily and quickly add coverage
  - Bring up a network just by plugging in the device!

- **Simplicity: Cloud Management**
  - Unified policy
  - Single pane of glass
  - For all your devices
  - For all your sites
  - Does not require RF expertise!

- **Control: Context-Based Access**
  - Easily grant differentiated access by user, device and location

- **Insight: Mobility Applications**
  - See and control the applications that are running on your network
Jay McPhail
Chief Technology Officer
Fullerton School District
Fullerton, CA

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History & Demographics

Formerly at Riverside Unified School District
• Deployed 28,000 student devices across 47 schools
• Device agnostic approach...
• Lessons learned:
  1. Not all wireless networks are created equally, and Wi-Fi is not enough!
  2. Equation must be WiFi + Bandwidth + Density

Fullerton School District
• K-8, 14,000 students
• 20 schools - Six are entirely 1-1, iPad rollout at all other sites.

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Recent History

- District was primarily Cisco and Apple Airports with insufficient bandwidth
- Bandwidth was at 45mgps
- Wireless Access Points were sporadically placed and not centrally managed
- Rollout of 300 iPads at one Junior High brought district to its knees
Recent Changes

• District replaced all Cisco and Apple access points with Aerohive
• Bandwidth bumped at all sites to 500mgps
• Wireless Access Points in every room including MPR’s

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Deployment and Testing

- Rollout of 3,500 iPads at 20 sites with little or no issues
  - Set-up by school with pre-loaded apps
  - Devices registered & managed via MDM
  - Devices preloaded with WiFi info per site
- **Pre-tested** test environment using a “Break the Internet” day
- Based on data from peak test, instituted a **QOS** template if traffic at 80%
- SBAC testing followed (in progress):
  - Bandwidth approx. 1/3 normal traffic
  - Still requires density solution (more access points)
  - Still were multiple glitches with devices, but **no network issues** with regard to density and bandwidth

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Unique Challenges

• iPads and an Apple infrastructure increases Bandwidth & Density Issues

• The reality is infrastructure has to handle at least 2-1 in terms of devices

• The ability to centrally manage multiple access points is critical

• Finding partners rather than vendors is critical as well

WiFi + Bandwidth + Density = Success

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What’s Next?

- District to expand wireless access points to 1-2-1
- Bandwidth will be bumped at all sites to 1Gps
- **Campuses hotspots** Outdoor Wireless Access Points
- Expansion of iPads to **all schools, all grade levels**
Jeremy Cunningham
Network & Systems Engineer
Bryant Schools
Bryant, AR

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Who is Bryant Public School District?

- Suburb of Little Rock
- 9,000 students
- K-12
- Premier district in Central Arkansas
- Technology focused
- Forward thinking

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• Approximately **150** 802.11 a/b/g APs
• Less than **1000** wireless devices
• **20 Mbps** Internet connection
• Poor centralized management
• Controller based with **single controller**
• Poor coverage/density
• No QoS
• **WPA** Encrypted without **RADIUS** authentication

Our Wi-Fi Network Pre-Online Testing (2009)
Our Wi-Fi Network Today (2014)

- **550+** 802.11 a/b/g/n APs
- **6000** wireless devices
- **300 Mbps** Internet connection
- Centralized management
- Controllerless
- Ample coverage/density
- **QoS** based on user, device, or application
- **RADIUS** authentication

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How did we get here?
Made a Plan, and Stuck to it!

- Made a Multi-year rollout schedule
- Chose the right solution providers
- Had excellent communication with administrators
- Started with coverage design

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Deployed for Coverage, Planned for Capacity

- AP placement wasn’t a guessing game
- Effectively planned for capacity
- Designed a network that fit our environment by using Aerohive’s FREE WiFi Planning Tool

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• Don’t rely on automatic channel planning or power levels
• Don’t over saturate your environment
• Do a post install site survey

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Now that our infrastructure was in place, we optimized it for testing
Quality of Service Policies

BPSD SSID

Rate Limited to 200Kbps

Unrestricted

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Quality of Service Policies

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Application Visibility 
& Control

- **Visibility** to see how much traffic testing consumes
- Ability to **provide QoS** on the application level
Testing Wireless Online... Testing
How Aerohive helped us accomplish this
“Wireless testing with Aerohive allowed us to bring the computer lab to the students instead of bringing the students to the computer lab.”

- Scott Curtis, Assistant Principal – High School
Who Needs Power???

Properly designed Infrastructure + horribly bad timing = SUCCESS!

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In Summary

- Make a plan for budget, infrastructure, and bandwidth
- Wireless Network design is imperative
- Provide QoS for testing traffic
- Do some trial runs in regards to testing
Sree Kannan
Sr. Solutions Marketing Manager
Aerohive Networks
Sunnyvale, CA

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Design around the USER – Not the Network

What’s Important to each user?

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How do you design your network..?
Use Context to Create Policies

User

Device Type and Ownership

Application

Location

School
Administration
Remote

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Plan for CAPACITY – Not just COVERAGE

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coverage vs. CAPACITY

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Not all devices are created equal
Not all devices are created equal

Audio Analogy

10W amp outputting 10W
Amplifier set to 10 = DISTORTION

100W amp outputting 10W
Amplifier set to 1 = MUSIC

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CONTROL the Student Experience

Enable preset lesson plan via pulldown

Turn Internet or intranet access on or off

List permitted websites

Force students to a selected site

Students' URL will change to match teacher's

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Do You Have Time To Become An RF Expert?

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Comprehensive Solution

- Coverage
- Reliability
- Capacity
- Security
- Scalability
- Cost
- Health

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Unified Deployment Architecture

CAMPUS
Guest, Student, Faculty
School deployed / BYOD
Performance, Unified Access Layer, MDM enrollment

Virtualized Mgmt & VPN Termination
Data Center

Class Room
Apple TVs
iPad1:1
Faculty, Guests
High Density, AD integration, Bonjour, TeacherView

Primary
Guest, Student, Faculty + Carts

Middle School
Guest, Student, Faculty + Library

High School
Guest, Student, Faculty + Field House

High School
Guest, Student, Faculty + Portable

Cloud Services Platform
ID Manager
Client Mgmt
Teleworker/Ext. Absence
Work, Home, 4G, Cloud Security

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Aerohive = Simplified School Networks

- Cloud-Managed
- Controller-less
- Unified Access Layer
- Context-based Enforcement
- Mobility Applications

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Questions?

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Thank You