My college’s data network is on fleek!
Supporting devices, connectivity, and coverage for the ultimate compliment
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My college’s data network is on fleek! Supporting devices, connectivity, and coverage for the ultimate compliment.
Agenda

- Webinar Sponsors
- Digitalization and Enterprise Mobility
- Mobility trends in Higher Education
- Wired and Wireless Network Solutions
- Infrastructure Connectivity
- Partner Considerations
- Discussion and Q&A
Vision Technologies

- Service-Disabled Veteran-Owned Small Business (SDVOSB)
- Integrated Technology Design & Delivery
- Design/Build Capabilities for:
  - ✓ DAS / WLAN / PON ✓ Access Control/Security
  - ✓ IP/Converged Systems ✓ Data Center Mgmt.
  - ✓ Audio Visual ✓ Structured Cabling
- Dedicated Engineering for all Technologies
- Technology Certified: CIBET, RCDD, PMP, CM-BIM
- OEM Certified in all Solutions
- “Company Behind the Company” Business Model
  – We only succeed when you succeed!
- National Delivery
- Federal Contract Vehicles
Corning Incorporated

**Founded:**
1851

**Headquarters:**
Corning, New York

**Employees:**
34,800 worldwide

**2014 Sales:**
10 billion

**Fortune 500 Rank (2014):**
343

- Corning is one of the world’s leading innovators in materials science. For more than 160 years, Corning has applied its unparalleled expertise in specialty glass, ceramics, and optical physics to develop products that have created new industries and transformed people’s lives.

- Corning succeeds through sustained investment in R&D, a unique combination of material and process innovation, and close collaboration with customers to solve tough technology challenges.
Corning: A Culture of Innovation

1879
Glass envelope for Thomas Edison’s light bulb

1915
Heat-resistant PYREX® glass

1934
Dow Corning silicones

1947
Processes for mass producing the television bulb

1952
Glass ceramics

1964
Fusion overflow process

1970
First low-loss optical fiber

1972
Ceramic substrates for automotive catalytic converters

1977
Ceramic substrates for automotive catalytic converters

1982
Active matrix liquid crystal display (LCD) glass

1990
Environmetally conscious LCD glass

2006
Label-free screening platform for drug discovery

2007
Thin, lightweight cover glass with exceptional damage resistance

2010
Ultra-bendable fiber
Exponential Growth in Traffic Shifting Indoors

Trends

- Global IP will increase threefold over the next five years
- Exponential growth of mobile data traffic between 2014 and 2019
- Wi-Fi and Mobile Devices ~55% of all IP traffic in 2017
- Nearly half of all IP traffic will originate with non-PC devices
- Significant growth in cellular network speed in 2014
- Traffic from wireless and mobile devices will exceed traffic from wired devices by 2019.

Global IP Traffic – 23% 2014-2019

Fixed vs. Wireless

Devices Connection Growth

Source: Cisco The Zettabyte Era – Trends and Analysis, Cisco VNI 2013 and 2015
Enterprise and Campus networks are at a “tipping point” and outdated for today’s needs.

The challenges are reflected in a number of IT trends

- **User Experience** - Rich media, mobile learning, mobile gaming requires strong QoS
- **Scaling Out not Up** - Increasing reliance on Cloud for storage, computing and services
- **Breaches from Within** - BYOD (“bring-your-own-disaster”) poses severe security issues
- **Capacity Saturation** - By 2015, 80% of the wireless LANs will be obsolete (Gartner)
- **Driving Down Cost** - CAPEX and OPEX reduction, systems convergence, green buildings

63% of workloads will be cloud based by 2017

50x growth in information managed by the enterprise, by the next decade

11.5 billion mobile devices by 2019, or 1.5 mobile devices per capita
A paradigm shift is required to address key trends and align network characteristics with education needs.

**Mobile as the Norm of User Access**
The ability to handle high volume, high density, and high mobility traffic

**Cloud as the Norm of Back Access**
High performance and high availability connectivity to the cloud

**Master Mobile Management**

**Become Energy Efficient**
Low OPEX, reduce energy footprint, less materials, - LEED credits

**Green Operations**

**Support Scaling Out To Cloud**
Co-deployed network infrastructure (BMS, surveillance, Wi-Fi, VLAN, VPN, SAN, IoT, etc.)

**Rationalize Connectivity**

**Be Business Essential**
Support Agile Business Cycles
Rapid Add/Move/Change network connectivity, configuration, and management capabilities

**Increasing Network Density while Driving Down Cost**

**Vision Technologies**
Making Vision Reality
The Changing Learning Environment

“The students' experience is enhanced when they're able to bring their personal devices into the classroom to interact and capture ideas from key conversations.”

Mark Askren, Vice Chancellor for Information Technology and CIO, University of Nebraska-Lincoln

Among the Top 10 Higher Ed IT Issues

- Providing user support in the new normal — mobile, online education, cloud, and BYOD environments
- Optimizing the use of technology in teaching and learning in collaboration with academic leadership
- Developing an enterprise IT architecture that can respond to changing conditions and new opportunities
- Improving student outcomes through an institutional approach that strategically leverages technology

http://www.educause.edu/ero/article/top-10-it-issues-2015-inflation-point
Connected Content Replacing Traditional Textbooks

Device Use Among College Students

- **Laptop**
  - 2014: 90%
  - 2015: 91%

- **Smartphones**
  - 2014: 83%
  - 2015: 90%

- **Tablet**
  - 2014: 43%
  - 2015: 50%

Students that used devices to read digital course material

- **2014**
  - 60%

- **2015**
  - 87%

Students that frequently used devices to read digital course materials

- **2014**
  - 48%

- **2015**
  - 78%

Enterprise Mobility Trends in Higher Education

• Broad adoption of Bring Your Own Device (BYOD) by student, staff and faculty

• Cell Phones - Primary Communication Device

• Multiple devices and multiple connection per person

• Mobile Network Operator Trends - High Speed networks and voice over LTE

• Students and parents expecting connectivity across campus and not only in specific areas
Network Evolution = Constant Growth

Growing Data Consumption, Application Demands, and New Services

**Cloud & Devices**
- Increase in cloud based learning & more devices

**Infrastructure**
- More infrastructure for more data and networks
- Increasing bandwidth for content access and delivery
- System security for large-scale, mobile-based deployments

**Congestion**
- More hardware to support devices & applications
- Complex infrastructure design, deployment and management
- Accessibility compliance and implementation of new services and MACs
Infrastructure Connectivity Requires Advanced Capabilities
Bandwidth Demands Drive the Need for IT Overhaul

1. **Simplified**
   - Simplified infrastructure management capability to provide the operational insights

2. **Converged**
   - Converged infrastructure approaches to align the physical infrastructure with the logical infrastructure

3. **Advanced**
   - Advanced optical solution for virtually unlimited bandwidth to support all network needs, capacities and backhaul
Wireless Requirements - Design

Ubiquitous Coverage
- 95% coverage at proper signal strength
- WLAN, Cellular, Public Safety

Manageability
- System Specific and Centralized Management
- Graphical / Ease of Use
- Structure Cabling

Capacity Planning
- 10 – 50 simultaneous WLAN users per WAP
  - Requires Channel Planning
- 32 – 500 simultaneous Cellular connections per RF Signal Source

Supportability
- WAP and Application deployments per OEM Guidelines
- Legal agreements from WSPs
Wireless Requirements - Installation

Venue Considerations
• Access to Students & Staff
• Asset Protection
• Technology Refresh / Advancement
• Cost

Diverse Applications & Technologies: Common Requirement is “Connectivity”
• Ethernet Connectivity
• Wireless LAN Connectivity
• Cellular Connectivity

Implementation Considerations
• Industry Codes and Standards
• Regulated vs. Unregulated Frequencies
• Interoperability

Convergent Network Benefits
• Shared Cabling
• Shared Equipment Locations
• Supportability – OEM & Application Vendors
Features and Benefits of a Converged Fiber-based Solution

• PON: Passive Optical Networks
  – Provides Ubiquitous Ethernet Connectivity
  – High Capacity with Small Cable Footprint
  – POE Support
  – WLAN Compatible
  – Fiber to the Edge

• Optical DAS
  – Shares PON Optical Cabling
  – Traditional DAS Coaxial Cable Issues Eliminated
    • Distance & Noise
  – Bandwidth Benefits
  – Ethernet and WLAN Compatible
    • Supported by OEMs
PON & DAS Infrastructure (Shared Fiber)

Campus Resources
- Voice
- IP / Ethernet Applications
- RF Video
- Mobile Network Operator

Integrated Services
- PoE Support
- BYOE – Phones, Tablets, etc.
- WiFi / WLAN Access Points
- Video Applications
- Security & Surveillance
- Computers Desktop / Dept. Servers
- Access Control Remote Locks
- Phone Support Analog or VoIP

Shared Fiber Infrastructure
Campus benefits achieved with Converged Networks

- **Scalability** and **Stability** across an all-fiber network infrastructure
- **Simplify** with converged services enabling lowest CapEx and lowest OpEx
- **Efficiency** in solutions that enable campus-based, cloud-based and WAN applications
Implementation Process

- **Document**
  - Current Environment
  - Future Needs
  - Critical Drivers
  - Objectives for Near and Long Term Improvements
- **Develop a Comprehensive Strategy**
- **Partner with Experienced Professionals**
- **Define Deployment Process**
Vendor Selection

• Key Vendor Considerations:
  - Specialization
  - Certifications
  - Professionalism

• Proper System Design and Installation
  - Especially Public Safety

• Vendor Consolidation is an Important Consideration

  ✓ PON ✓ RF & System Design
  ✓ DAS / WLAN ✓ Cable Plant Installation
  ✓ Audio Visual ✓ Security / Access Control
Key Attributes in a Vendor Relationship

• Solutions Focus
• Technology Focused Engineering
• Project & Program Management Experience
• Team / Win-Win Mentality
• Service and Support Capabilities
• Responsive
• Communicates
• Flexibility
• Past Experience & Performance
Q&A:
Devices, Connectivity, and Coverage

- Mobility and BYOE
- High Speed Networks and Voice
- Cloud Applications
- Student Safety and Alerts
- Multiple Devices, Multiple People
- Vendor Partnership and Integration
Presenter Contact Information

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Audience Q & A

Sponsored by:
Thank you for attending!