


CCPS

Collier County Public Schools



Preparing Your School District's Network for BYOD


David Stump Deputy Superintendent
Tom Petry Director of Technology
Cedar Kraus Assistant Director of Technology

© Collier County Public Schools 2015

Preparing your network for BYOD


Collier County Public Schools

- **45,000 Students**
- **7,100 Employees**
- **50 Schools**
- **2nd Largest land area county east of the Mississippi**
- **Over 2,300 square miles**



Today's Learners - Tomorrow's Leaders

© Collier County Public Schools 2015



CCPS

Collier County Public Schools


Preparing your network for BYOD

Technology at Collier County Public Schools

- **2-to-1 Student to computer ratio (over 28,000 district-owned computers)**
- **3 year technology plan which is updated annually**
- **5 year replacement cycle for technology**
- **Fiber optic network connecting all schools throughout the county at a minimum of 4 Gbps**

Today's Learners - Tomorrow's Leaders

© Collier County Public Schools 2015



CCPS

Collier County Public Schools


Preparing your network for BYOD

Technology at Collier County Public Schools

- **100% Wireless coverage in all schools (Over 90% of access points are 802.11 ac)**
- **10 Gb Internet Connection**
- **Digital Tech Books and many other Internet-based Instructional resources**

Today's Learners - Tomorrow's Leaders

© Collier County Public Schools 2015



CCPS | Collier County Public Schools

Preparing your network for BYOD

Core network infrastructure


- Needs to meet additional traffic requirements of BYOD
- Flexibility to increase speed as needed

Wireless Network

- Wireless network speed requirements
- Centralized wireless controllers
- Secure and authenticated wireless network

Today's Learners - Tomorrow's Leaders

© Collier County Public Schools 2015



CCPS | Collier County Public Schools

Preparing your network for BYOD

Internet Capabilities and Security

- Increased internet utilization for instructional applications and content
- Increased bandwidth needs for internet connection
- Internet content filtering
- Next generation firewalls to properly filter traffic


Federal and state goals

- Goal of 1Mb of internet access per student

Realistic Expectations

Today's Learners - Tomorrow's Leaders

© Collier County Public Schools 2015




CCPS | Collier County Public Schools

Preparing your network for BYOD

Network requirements for a successful BYOD program

Questions and Answers

Today's Learners - Tomorrow's Leaders
© Collier County Public Schools 2015



CCPS | Collier County Public Schools


Preparing your network for BYOD

Core network infrastructure

Needs to meet additional traffic requirements of BYOD

- Network connectivity across the wide area network (WAN) and local area networks (LAN) must meet capacity needs and expectations for BYOD as well as regular traffic
- 1 to 1 Device usage by students
- District-owned devices including desktop and laptop computers, as well as tablets and other devices

Today's Learners - Tomorrow's Leaders
© Collier County Public Schools 2015



CCPS | Collier County Public Schools


Preparing your network for BYOD

Core network infrastructure

Flexibility of network to increase speed as needed

- Instructional content, computer based testing, and other applications require a large amount of bandwidth
- Applications may have peak bandwidth utilization around certain critical times such as testing periods

Today's Learners - Tomorrow's Leaders
© Collier County Public Schools 2015



CCPS | Collier County Public Schools

Preparing your network for BYOD

Core network infrastructure

Flexibility of network to increase speed as needed (continued)

- Network design must accommodate for these increases in utilization
- Network equipment must be able to easily increase capabilities without having to replace infrastructure

Today's Learners - Tomorrow's Leaders
© Collier County Public Schools 2015



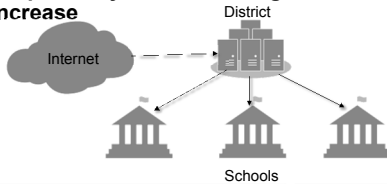
Collier County Public Schools

Preparing your network for BYOD

Core network infrastructure

Flexibility of network to increase speed as needed (continued)

Frequent increases in traffic in many different areas of the network require a flexible and adaptable system that can grow as needs increase



Today's Learners - Tomorrow's Leaders
© Collier County Public Schools 2015



Collier County Public Schools

Preparing your network for BYOD

Wireless Network

Wireless Network Speed Requirements

- BYOD connections and the rest of the wireless network are only as reliable as the wired network to which they are connected
- Ensure reliability, flexibility in increasing network speed, and the ability to support large numbers of devices simultaneously

Today's Learners - Tomorrow's Leaders
© Collier County Public Schools 2015



Collier County Public Schools

Preparing your network for BYOD

Wireless Network

Standard	Speed	Release Date	Frequency	Increase in speed
802.11b	11 Mbps	1999	2.4 GHz	0
802.11a	54 Mbps	1999	5 GHz	400%
802.11g	54 Mbps	2003	2.4 GHz	400%
802.11n	300 Mbps	2009	2.4 GHz / 5 GHz	500%
802.11ac Wave 1	800 Mbps	2013	5 GHz	250%
802.11ac Wave 2	6 Gbps	Summer 2015 (estimated)	5 GHz	700%

Today's Learners - Tomorrow's Leaders
© Collier County Public Schools 2015

CCPS Collier County Public Schools

Preparing your network for BYOD

Wireless Network

Centralized Wireless Controllers

- Deploy a centralized wireless controller solution to allow dynamic changes to wireless system based on need
- Also allows users to roam seamlessly throughout an individual location and the entire District

Today's Learners - Tomorrow's Leaders
© Collier County Public Schools 2015

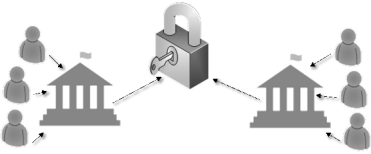
CCPS Collier County Public Schools

Preparing your network for BYOD

Wireless network

Secure and authenticated wireless network

- Use an authentication system to confirm students, teachers, and other individuals are permitted to use the BYOD network
- Have the ability for users to enter their network login information once and always be connected to the BYOD network



Today's Learners - Tomorrow's Leaders
© Collier County Public Schools 2015

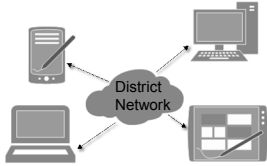
CCPS Collier County Public Schools

Preparing your network for BYOD

Internet Capabilities and Security

Increased internet utilization for instructional applications and content

- Many more devices are deployed on a network by implementing BYOD
- Increased usage of instructional applications and content



Today's Learners - Tomorrow's Leaders
© Collier County Public Schools 2015

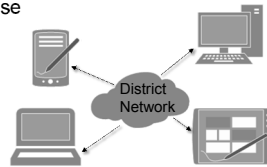
CCPS Collier County Public Schools

Preparing your network for BYOD

Internet Capabilities and Security

Increased internet utilization for instructional applications and content (continued)

- Increased use of both internal and external online resources
- Internal network and internet speed requirements increase



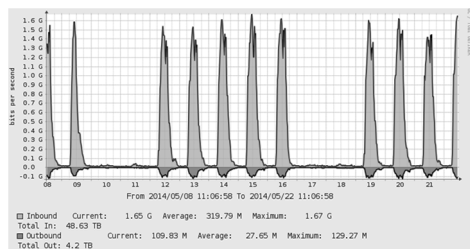
Today's Learners - Tomorrow's Leaders
© Collier County Public Schools 2015

CCPS Collier County Public Schools

Preparing your network for BYOD

Internet Capabilities and Security

CCPS internet usage has doubled year over year for the last three years



Today's Learners - Tomorrow's Leaders
© Collier County Public Schools 2015

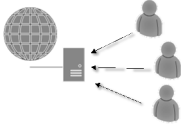
CCPS Collier County Public Schools

Preparing your network for BYOD


Internet Capabilities and Security

Internet Content Filtering

- Ensure District internet filter can meet increased traffic requirements of BYOD
- Have a plan for expansion of internet and filter usage



Today's Learners - Tomorrow's Leaders
© Collier County Public Schools 2015




Preparing your network for BYOD

Internet Capabilities and Security

Internet Content Filtering

- Strong need for in-line filtering appliance
- Internet content filters are available in many different forms
 - District firewalls
 - Dedicated appliances
 - Software installed on individual computers

Today's Learners - Tomorrow's Leaders
© Collier County Public Schools 2015




Preparing your network for BYOD

Internet Capabilities and Security

Next generation firewalls to properly filter traffic

- Internet Filtering alone is no longer sufficient (Over 50% of the District's traffic is Secure Socket Layer (SSL) encrypted)
- Encrypted traffic cannot be read using normal internet filter techniques
- Search engine results are using SSL

Today's Learners - Tomorrow's Leaders
© Collier County Public Schools 2015



Preparing your network for BYOD

Internet Capabilities and Security

Next generation firewalls to properly filter traffic

- Malware and viruses are also undetected by normal firewalls and filters
- Require next generation or layer 7 firewall
- Ability of firewall to do deep packet inspection and SSL decryption

Today's Learners - Tomorrow's Leaders
© Collier County Public Schools 2015



Collier County Public Schools

Preparing your network for BYOD

Federal and state goals

Goal of 1Mb of internet access per student

- Goals have been set at 1 Mbps per student
- CCPS would require a 45 Gbps internet connection (1 Mbps X 45,000 students)
- Need creative solutions to meet goal
- Also need proper devices to route and filter traffic which helps control utilization

Today's Learners - Tomorrow's Leaders
© Collier County Public Schools 2015



Collier County Public Schools

Preparing your network for BYOD

Realistic Expectations

- Networks will take time to evolve
- CCPS deployed BYOD in 3 Phases spread 6 months apart for an 18 month deployment strategy
- Wired and Wireless networks must simultaneously increase speed

Today's Learners - Tomorrow's Leaders
© Collier County Public Schools 2015



Collier County Public Schools

Preparing your network for BYOD

Realistic Expectations

- Increased network utilization with the possibility of each student bringing a device
- Greater bandwidth usage in secondary vs elementary schools

Preparing your network for BYOD

Realistic Expectations

- Increased wireless usage and speed (802.11 ac Waves 1 and 2) will drive the increased need for internal and external bandwidth on wired networks
- Districts will need to meet the needs of today while being able to easily expand in the future

Preparing your network for BYOD

Network requirements for a successful BYOD program

- Solid and well established core and wired network infrastructure
- Capability to meet exponential increases in demand for bandwidth both for internal applications and internet access
- Wireless network potential to handle thousands of devices per school


Preparing your network for BYOD

Network requirements for a successful BYOD program

- Flexibly deployment with the ability to scale wired and wireless networks as needed
- Secure wireless access for BYOD users and reliable internet filtering

Today's Learners - Tomorrow's Leaders

© Collier County Public Schools 2015



CCPS | Collier County Public Schools


Preparing your network for BYOD

Questions


- David Stump Deputy Superintendent
stumpda@collierschools.com
- Tom Petry Director of Technology
petryth@collierschools.com
- Cedar Kraus Assistant Director of Technology
krausce@collierschools.com

Today's Learners - Tomorrow's Leaders


© Collier County Public Schools 2015



CCPS | Collier County Public Schools



CCPS | Collier County Public Schools



Preparing Your School District's Network for BYOD

David Stump Deputy Superintendent
Tom Petry Director of Technology
Cedar Kraus Assistant Director of Technology

© Collier County Public Schools 2015
