Beyond Bandwidth: Caching Technology

Wanda Barker, Director
April 27, 2015
Poll: What level of education do you represent?
Agenda

• What is Caching, Types of Caching and Why is it Important
• What Does the FCC Say About Caching
• Why Install Caching
• How Caching is Closing the Digital Divide
• Distribution Challenges Before Caching
  • Outside the Classroom
  • Inside the Classroom
• How Caching Facilitates Learning in the Classroom
• Training Teachers to Integrate Caching into Their Classroom
• Questions
Speakers

Joe Freddoso - E-rate and Network Expert
Cindy Johnson - E-rate Expert and Former District Chief Technology Officer
Tammy Tucker - Mount Vernon Elementary Principal
Melody Faulkiner – Mount Vernon Elementary Teacher
Ashley White - Apex High School Teacher
Carla Bolick - Teacher and Advisor for URCast
Caching and the FCC

Joe Freddoso,
COO Mighty River, LLC
FCC Advisor
Former CEO MCNC
How Caching Works
How caching works

Caching Server
Internet PoP

ONE TIME

Internet

ONE TIME

Origin Server

ONE TIME
Classroom caching works this way

Teacher/Professor Builds Digital Lesson

Stored on standard server at Institution/School and teacher schedules for delivery

Internet

ONE TIME

Broadcast to students when they authenticate & stored on the hard drive of their device so they can take home
Caching saves bandwidth on metered connections

District WAN

School 1

School 2

School 3

K-12 District Hub

(Billed based on use)

Local Loop

Aggregation Network

Internet

(Billed based on use)
Caching is E-rate Eligible

• Modernization order #1 – July, 2014
• Flexible definition
• Standard is improved cost efficiency and better utilization of available bandwidth
• First applications under review
  • Feedback will be instructive
FCC Data and Changing Pedagogy

Cindy Johnson,
CEO E-Rate Services, LLC
Former Chief Technology Officer Lee County Schools
The Need for Caching

• Availability of digital content beyond the classroom is necessary for teachers to fully embrace a 1:1 instructional program
• High poverty students may not have Internet access at home
• Middle and upper class students often have activities beyond the school day and do not do homework at home
Spin-off Advantages

• Parents have an opportunity to learn
• Faster delivery of digital content in the classroom
• Less instructional time wasted while assisting young students obtain content
• Less time spent collecting students’ digital content
Digital Divide

Tammy Tucker, Mount Vernon Elementary Principal, Barbour County Schools, WV

Melody Faulkiner, Mount Vernon Elementary Teacher, Barbour County Schools, WV
Caching Enables Mount Vernon Elementary to Bridge the Digital Divide

• Many students have long school commutes and slow or no home Internet. Now all students, regardless of home Internet status, have access to our digital lessons whether at home, on the bus or anywhere else.
• Teachers send a cached lesson to each student’s device. The students can then view the cached content without an internet connection anywhere they have their computer, whether at home, on the bus, or in the car.
• Students can learn at their own pace and take what they have learned home and continue their work.
Caching use Outside the classroom

• In addition for regular homework we also use caching on snow or weather days. We send additional cached lessons to all student devices to work on during those days. Everyone has access to our digital lessons.
• We can use our managed caching tool to tell students what we want them to work on.
• Students can upload their weather day work when they’re back in school.
Other benefits

• Before caching we had trouble distributing large digital files, especially videos. The caching system enables us to send students almost any file and they can now access it anywhere.
• We can still distribute files even if our school Internet is down.
• Teacher supervision over Internet content means we don’t have to worry about student online wandering or distractions!
Distribution Challenges and Facilitating Learning

Ashley White, Apex High School
Teacher, Apex, NC
Classroom Experiences Before

- Procedures prior to caching
- “Forgot”
- Excuses
Classroom Experiences During

- Start time
- Remove students “getting” content
- Time on task
- Engaged and self pacing
- Content or enrichment
- Reactions
Teacher Training and Adoption

Carla Bolick, Teacher and URcast Advisor
Teacher Training and Adoption

• Learning a Managed Caching Tool
• Finding Resources
• Retrieving Rich Media from the Internet
• Sharing Among Peers
Questions?
Thank you for attending!

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