

Got Enough Bandwidth?

SC EdTech 2013

Putting It Together

Session 24 - (MR101- B)



The State of Bandwidth in SC Public School Districts

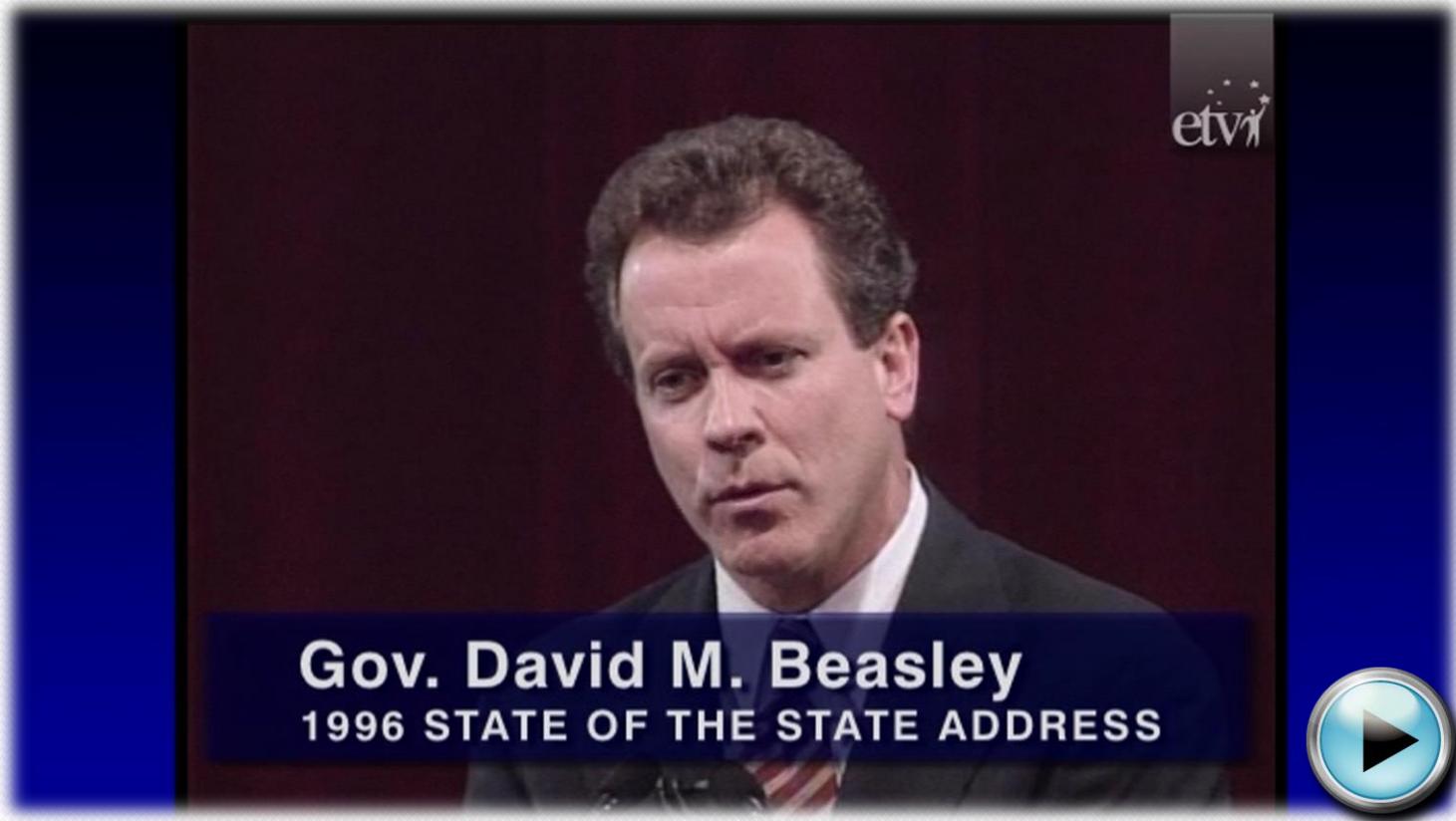
Presented by

Valarie D. Byrd

SC State E-Rate Coordinator



K-12 School Technology Initiative History



Gov. David M. Beasley
1996 STATE OF THE STATE ADDRESS

K-12 School Technology History

The South Carolina K-12 Schools Technology Initiative Committee

The South Carolina K-12 School Technology Initiative was founded in 1996.

The Committee - Steered by a unique public/private partnerships.

- **Responsibilities** - Set forth by current Proviso and Laws.
- **Role** - Guides the distribution of funds appropriated by the Governor and General Assembly.
 - These funds collectively help to meet the state's schools need for software, hardware, connectivity, digital content, instructional technologies and professional development.

The Initiative

- **Progress** - Development and implementation of educational technology. Providing infrastructure initiatives designed to produce more successful students in South Carolina.
- **Future** - Hope that the leaders of the Palmetto State will continue their history of using this initiative to guide the provision of high-quality, information-rich education for all students.



K-12 School Technology History



What do we do ?

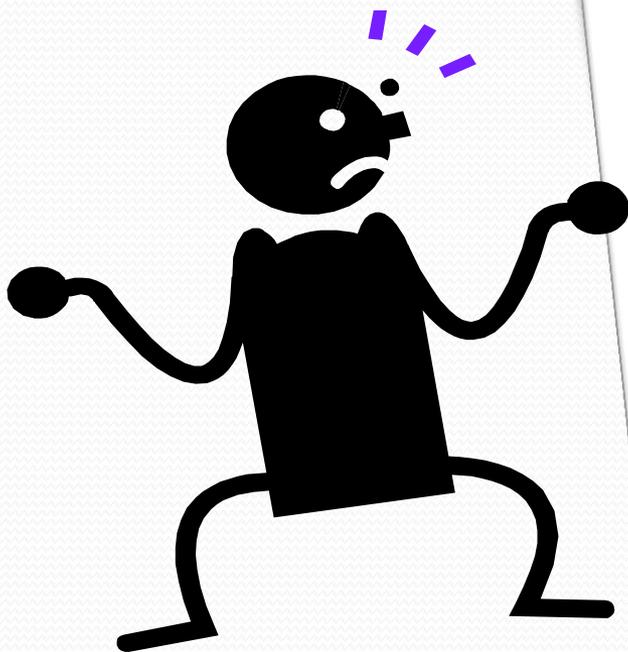
- **Collect, Evaluate and Approve Technology Plans**
- **Competitively Bid State Master Contracts**
- **Federal E-Rate Program SC State Consortium Administration**
- **Pilot Programs**
- **SC State K-12 Schools & Libraries Network Administration**





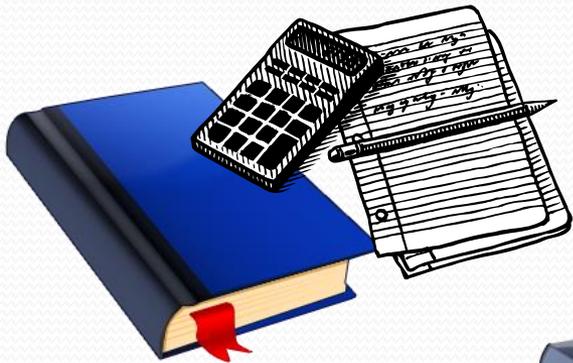
Got Enough Bandwidth?

Is this your situation?





K-12 Public Schools Learning Environment





How to minimize bandwidth usage?

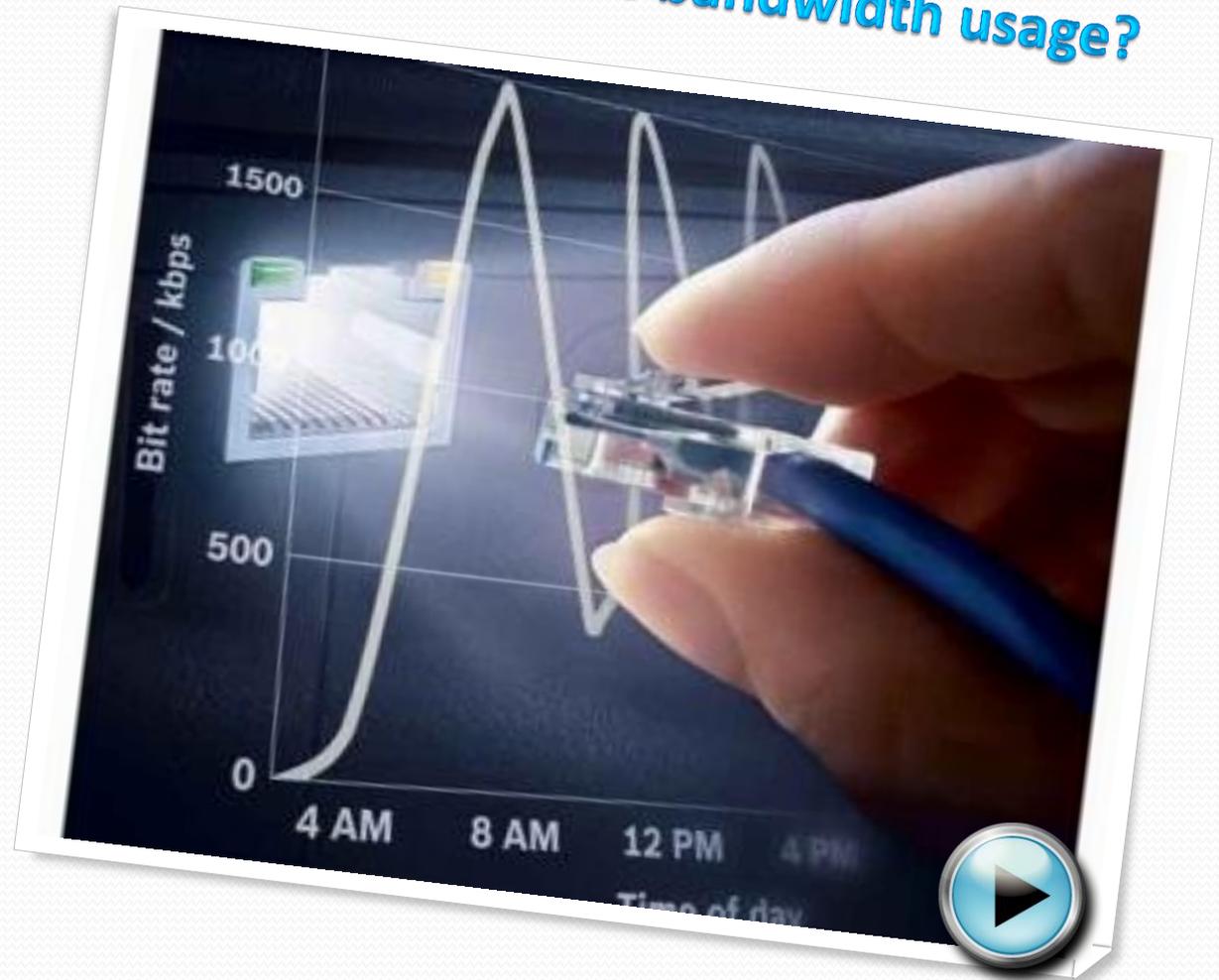


From A Student's Perspective...

The SPACE Program
Lexington High School
Lexington School District One

“Hopefully these tips will prevent the internet from being downgraded.”

-Hunter Bliss





Got Enough Bandwidth?

“The problem now is not connection, it’s capacity. We want to make sure that every school has really high-speed broadband. If we make some changes to the E-Rate program, we can do that.”

E-Rate 2.0

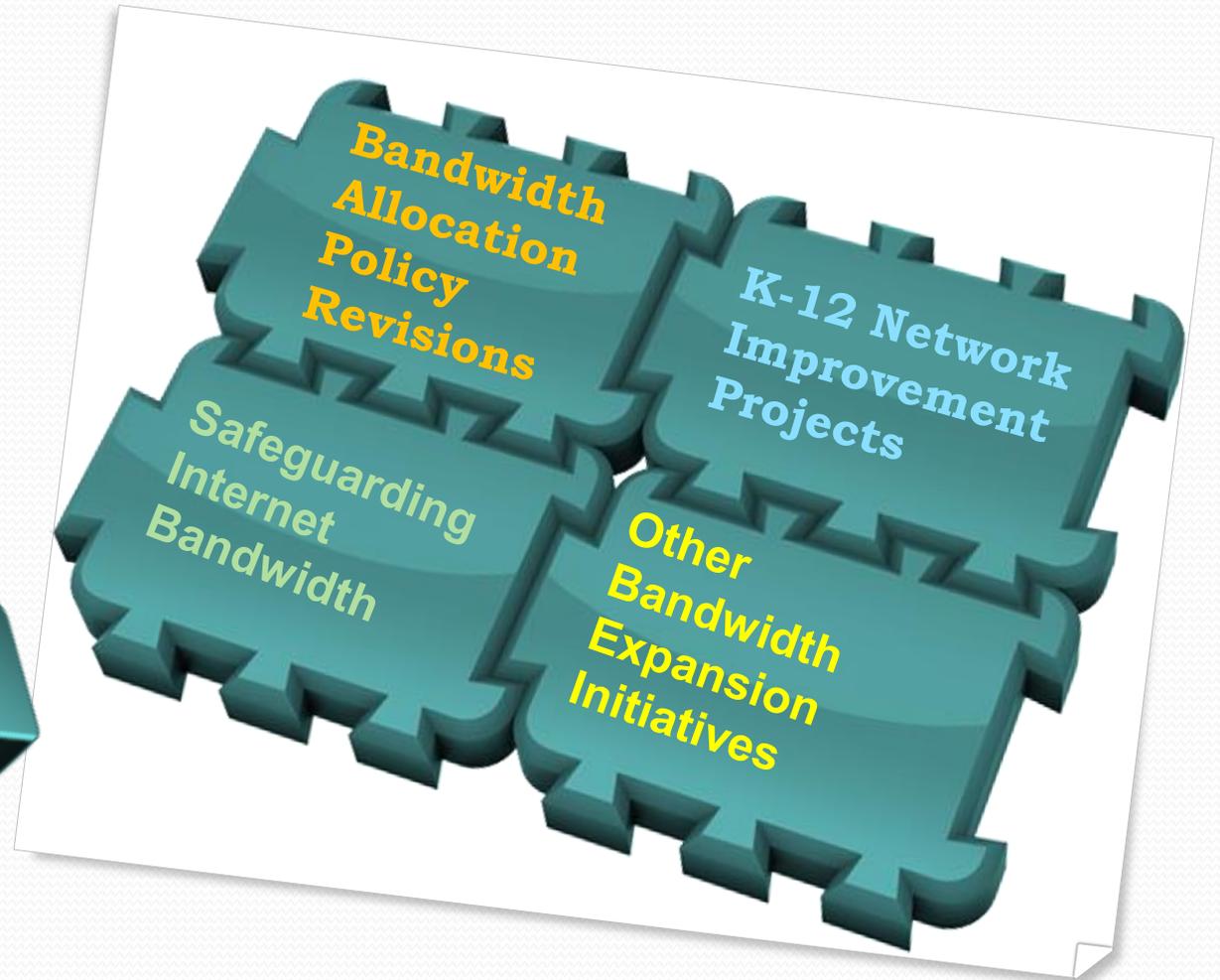
-Jessica Rosenworcel
FCC Commissioner

FCC Notice of Proposed Rulemaking (NPRM): Reply Comments Date Deadline 10/16/2013
To submit your comments go to: <http://apps.fcc.gov/ecfs/upload/display?z=xj9g5>.



Moves Taken to Address K-12 Broadband Needs

**The K-12
Committee**
Various
Initiatives
In Progress.





Bandwidth Allocation Policy Revisions

Internet Access

● **Baseline Maximum Methodology**

- School Districts
 - ▣ Minimum 10 Kbps/ per student (100 Mbps /per 1,000 students) provided via a tiered approach based on district necessity
- Library Systems
 - ▣ Minimum 10 Mbps provided and upgrades will be provided based on library/system necessity
- Approach used to provide ample coverage to all districts to support both current and future technologies
- Bandwidth tracking measures taken to prevent over allocation of this resource, promote efficient usage

Note: Current WAN network policy provides 100 Mbps standard for districts and 10 Mbps to each library system (Where Available).



Bandwidth Allocation Policy Implementation

Internet Access

10/19/2012-Projected

VS

10/01/2013-Actual*

District Internet Bandwidth	Number of Districts
Below 100 MBPS	0
100 - 150 MBPS	69
200 -500 MBPS	6
550 - 1,000 MBPS	7
1,500 - 3,000 MBPS	0
Total Districts	82

District Internet Bandwidth	Number of Districts
Below 100 MBPS	3
120 - 150 MBPS	48
200 -500 MBPS	22
550 - 1,000 MBPS	6
1,500 - 3,000 MBPS	3
Total Districts	82

* Including Upgrades In Progress

Note: Not all districts participate in the State Consortium for Internet Access.



Bandwidth Allocation Policy Implementation

WAN Network Access

10/19/2012-Projected

VS

10/10/2013-Actual*

District WAN Bandwidth	Number of Sites
Below 100 MBPS	10
100 MBPS	759
250 MBPS	20
500 MBPS	48
1,000 MBPS	86
Above 1,000 MBPS	0
Leased Dark Fiber	53
Total Locations	976

District WAN Bandwidth	Number of Sites
Below 100 MBPS	0
100 MBPS	689
250 MBPS	33
500 MBPS	31
1,000 MBPS	102
Above 1,000 MBPS	3
Leased Dark Fiber	106
Total Locations	964

* Including Upgrades In Progress

Note: Not all districts participate in the State Consortium for school WAN service.



K-12 Network Improvement Projects

Underserved Bandwidth Locations

● Non Fiber WAN Locations

- Wireless Towers and Access Points

● Costly Multiprotocol Label Switching (MPLS) Service

- Multiple T-1s (12 Mbps Max)
- Metro Ethernet or Direct Fiber Preferred



K-12 Network Improvement Projects

Direct Fiber Placement & Entrance Facilities

Bandwidth Allocation Policy-Phase IV

- Direct Fiber Placement
 - ▣ Decrease statewide network cost
 - ▣ Improve bandwidth availability

- Entrance Facilities
 - ▣ Replace copper facilities with fiber

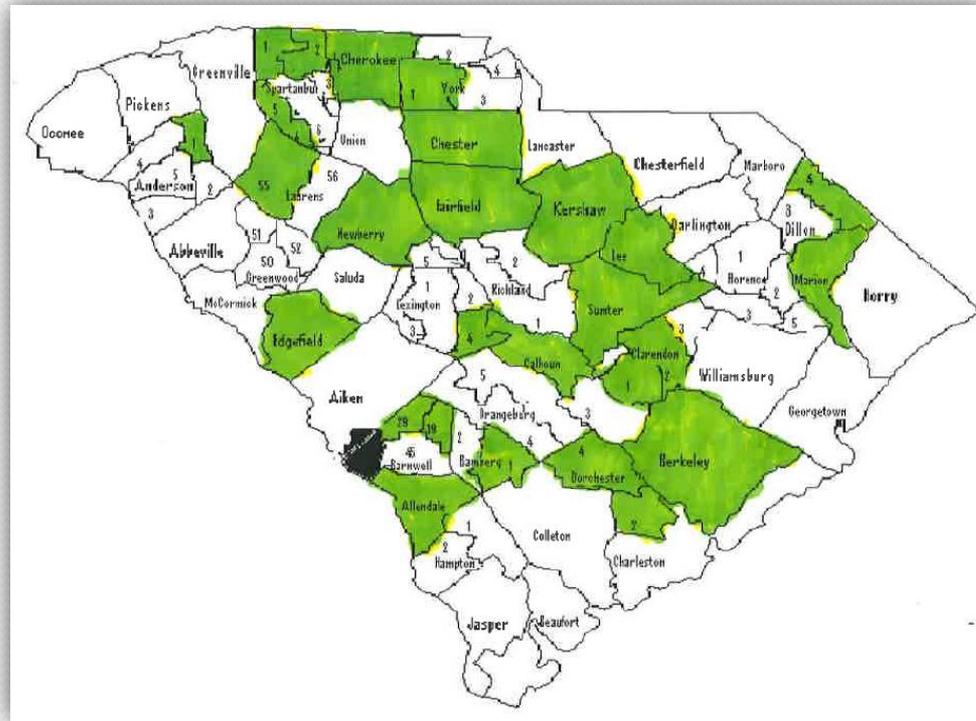


K-12 Network Improvement Projects

Direct Fiber Placement & Entrance Facilities

Bandwidth Allocation Policy-Phase IV

Progress





Safeguarding Internet Bandwidth

K-12 Schools & Libraries Network Security Project

Bandwidth Monitoring (SC-ISAC)

- Three Main Objectives
 - ▣ Promote bandwidth efficiency (legitimate traffic)
 - ▣ Improve management of potential security threats
 - ▣ Minimize unauthorized traffic and malware



<https://sc-isac.sc.gov/>



Safeguarding Internet Bandwidth

K-12 Schools & Libraries Network Security Project

● Current Project Status

■ CyberSentry Sensors (*Upgrades*)

- Hardware and Software Upgrades
- Upgrades will provide better IDS malware detection, sensor efficiency, updated bandwidth evaluation tools
- About 30 district upgrades haven been completed
- **Districts are being contacted for scheduling...**
I.E. Avery Lyde, Devin Davis, Mark Hinsch

Important Note: PRIOR to the upgrade, SC-ISAC would like to see existing sensors working and receiving the correct span data and firewall logs from districts. This will drastically speed up and simplify things for the district on the day the sensors are swapped.



Safeguarding Internet Bandwidth

K-12 Schools & Libraries Network Security Project

■ CyberSentry Sensors (*Current Status Checklist*)

How do you know if things are working properly?

Look at your daily reports sent to: securityalerts@DistrictMailDomain

- A blank report is not always a good sign.
- If your critical (or at least "Malicious/Suspicious") section looks a bit like the one below, that is a good sign.

Event Name	Source IP	Destination IP	Destination Port	Source Port (Unique Count)	Protocol (Unique Count)	Start Time (Minimum)	Count
ET TROJAN MS Terminal Server User A Login, possible Morto inbound	81.38.164.8	10.47.1.32	3389	Multiple (55)	tcp_ip	2013-10-08 18:08:02	55
ET CURRENT_EVENTS Large DNS Query possible covert channel	10.43.1.63	63.99.29.69	53	Multiple (8)	udp_ip	2013-10-08 00:28:27	8
ET TROJAN MS Terminal Server User A Login, possible Morto inbound	91.183.81.57	10.47.1.32	3389	Multiple (6)	tcp_ip	2013-10-08 00:00:07	7
SERVER-OTHER Citrix Provisioning Services multiple opcode integer overflow attempt	10.9.1.23	64.28.196.27	80	Multiple (7)	tcp_ip	2013-10-08 08:06:14	7

Note: Look for suspicious gaps in coverage. For IDS monitoring, this might be okay.



Safeguarding Internet Bandwidth

K-12 Schools & Libraries Network Security Project

■ CyberSentry Sensors (*Current Status Checklist*)

- If reports are erroneous or unavailable note the following instructions.

For current report subscribers...

- Make sure the sensor is powered on.
- If sensor is powered up, a report on part of the day in the next day's report should be received.
- If no report is received contact SC-ISAC at (803) 896-1650

For inactive or nonsubscribers...

- Contact SC-ISAC at 803-896-1650 for setup instructions and configuration.



Safeguarding Internet Bandwidth

K-12 Schools & Libraries Network Security Project

■ CyberSentry Sensors (*Enhanced Monitoring Tool*)

- **Dragon Intrusion Detection System (IDS)**
 - After upgrades, Districts will receive console logins to view the same performance data as SC-ISAC.
 - More beneficial to districts because IDS events in combination with the use of firewall logs can help correlate events which require more extensive analysis.



Safeguarding Internet Bandwidth

K-12 Schools & Libraries Network Security Project

Current Project Status (Cont.)

Proxy Servers

- SC-ISAC support is being phased out
- Existing combined proxy/sensors and SC-ISAC owned proxies will be End of Life (EOL) when the sensor is upgraded.
- District-owned proxies built with SC-ISAC assistance will remain at the same support level until EOL



Other Bandwidth Expansion Initiatives

● **Proposed ConnectED Initiative**

- Three core area's of concentration
 - ▣ Upgraded Connectivity
 - ▣ Teacher Training
 - ▣ Build on Private-Sector Innovation

● **National Broadband Plan**

- ▣ Broadband Technology Opportunity Program (BTOP)
 - Oconee County \$9.6 Million BTOP Grant

● **Federal E-Rate Program (Education Rate)**

- ▣ Since 1997 help to provide connectivity nationwide
- ▣ Revamping Program: E-Rate 2.0



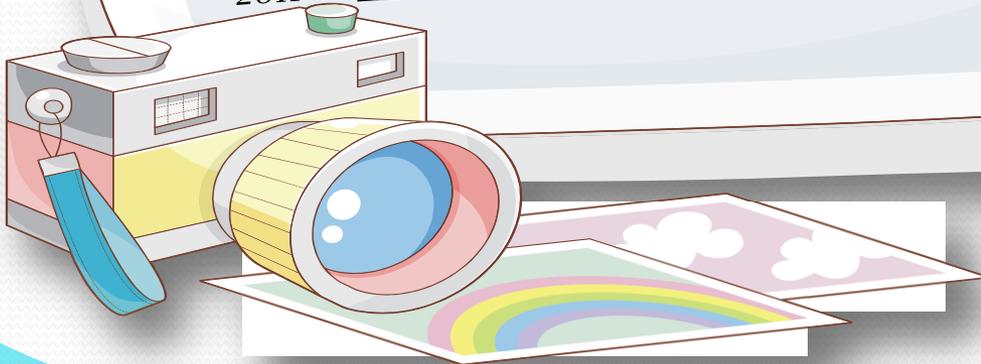
Successful School: Digital Learning & Connectivity

Loris Elementary School

Loris, South Carolina

- A Title 1 school located in a small town that uses technology to meet personalized learning needs of each student.
- Variety of technology tools and customized content for each student based on real-time assessment data
- Provide engaging and appropriately-challenging learning content
- Allow teachers to manage and enhance online learning experience and hold student accountability
- All grades 3-5 students have laptops and various learning software
- The school rose from 41st in state ranking of similar elementary schools in 2011 to 19th in 2012 after adding its blended learning program

ConnectEd Initiative
www.TheWhiteHouse.gov



http://le.horrycountyschools.net/pages/Loris_Elementary



Got Enough Bandwidth?



We are up to the challenge!

The fight continues...Round 3 "2014"



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