

Title: Technology Report

Objective: The objective of this document is to report the state of technology systems functionality and on strategic key measurements of student and staff technology access, identified by the Board.

Data: Data on percentage of staff and students reporting adequate access to technology is provided through the 2013-14 staff and student surveys. Note that with the exception of the category “% teachers reporting access to technology to support their instruction,” analysis by school level has been suppressed due to too few results. There were less than five schools that met the threshold for analysis. This is because the staff surveys have the option to select “Prefer not to say” when asked to identify the school in which they work. Additional data sources for this report include the Help Desk System, Asset Management System, Server and Networking system log files.

Measurements 1 and 2: Staff and student reporting access to technology

Measurement	2011/12	2012/13	2013/14	2014/15 Goal	2015/16 Goal
% teachers reporting adequate access to technology to support their instruction	--	--	46.5%	48%	60%
% students reporting adequate access to technology to support their learning	--	--	83.7%	88%	93%

% teachers reporting adequate access to technology to support their instruction

Beaverton School District	2011-12	2012-13	2013-14
All Teachers			46.5%
Male			50.2%
Female			47.7%
Other			
Asian			
Pacific Islander			
Black			
Hispanic			42.5%

American Indian/Alaskan Native			
White			50.2%
Multiracial			

% students reporting adequate access to technology to support their learning

Beaverton School District	2011-12	2012-13	2013-14
All Students			83.7%
Male			82.0%
Female			86.0%
Asian			84.4%
Pacific Islander			83.8%
Black			77.8%
Hispanic			84.2%
American Indian/Alaskan Native			80.4%
White			84.8%
Multiracial			79.6%
Heterosexual			80.3%
LGBQ			74.7%

Student responses by school

School Name	2011-12	2012-13	2013-14
<i>K-5 Schools</i>			
Barnes Elementary			86.6%
Beaver Acres Elementary			94.1%
Bethany Elementary			89.8%
Bonny Slope Elementary			95.9%
Cedar Mill Elementary			100.0%
Chehalem Elementary			86.6%
Cooper Mountain Elementary			92.5%
Elmonica Elementary			82.0%
Errol Hassell Elementary			93.4%
Findley Elementary			88.0%
Fir Grove Elementary			90.0%
Greenway Elementary			75.8%
Hazeldale Elementary			87.5%
Hiteon Elementary			95.7%
Jacob Wismer Elementary			88.2%

Kinnaman Elementary			92.5%
McKay Elementary			73.2%
McKinley Elementary			84.2%
Montclair Elementary			93.0%
Nancy Ryles Elementary			89.7%
Oak Hills Elementary			95.4%
Raleigh Park Elementary			89.7%
Ridgewood Elementary			97.6%
Rock Creek Elementary			95.3%
Scholls Heights Elementary			92.1%
Sexton Mountain Elementary			88.8%
Terra Linda Elementary			92.6%
Vose Elementary			
West Tualatin View Elementary			88.1%
William Walker Elementary			76.0%
K-8 Schools			
Aloha-Huber Park			
Raleigh Hills K-8			98.5%
Springville K-8			90.1%
6-8 Schools			
Cedar Park Middle			74.1%
Conestoga Middle			71.2%
Five Oaks Middle			66.3%
Highland Park Middle			86.4%
Meadow Park Middle			69.2%
Mountain View Middle			70.8%
Stoller Middle			64.1%
Whitford Middle			84.4%
6-12 Schools			
Arts & Communication Magnet Academy			84.9%
Health & Science			71.3%
International School of Beaverton			67.3%
9-12 Schools			
Aloha High			82.4%
Beaverton High			84.0%
Community School			81.2%

School of Science & Technology			63.8%
Southridge High			85.3%
Sunset High			89.2%
Westview High			81.2%

Successes:

- Student satisfaction levels high prior to 2014 -15 improvements.

Issues:

- Staff perception requires further research to determine factors contributing to lack of adequate technology to support their instruction. Examples could include: internet access, filtering settings, computer age or lack of peripheral equipment such as projectors and printers.

Action Plan:

- Work to increase technology support for students and staff began at the start of the 2014-15 school year and is summarized in this report. While not inclusive of all projects within IT, the projects below represent work aligned to increasing staff and student satisfaction of how technology supports their work.

Technology Systems – 2014/15 School Year

Infrastructure Improvements

Technology plays a vital role in student learning. Technology supporting instruction begins with a solid infrastructure. Work has begun on many projects designed to increase network connectivity and improve access for students and staff.

Internet Access Increase

District-wide, demand for internet access has been increasing steadily over time. At the end of June 2014, the District was regularly using 80% of a 1 Gigabit connection during the school day. For the start of the 2014/15 school year, the District internet connection was increased to a 2 Gigabit primary connection and a separate 1 Gigabit connection for redundancy purposes. The chart below shows peak and average internet usage for the past four months. While we have not yet lost service due to over-use, we have proactively increased our primary internet connection to a 3 Gigabit connection in April 2015 to ensure we are ahead of connectivity demands.

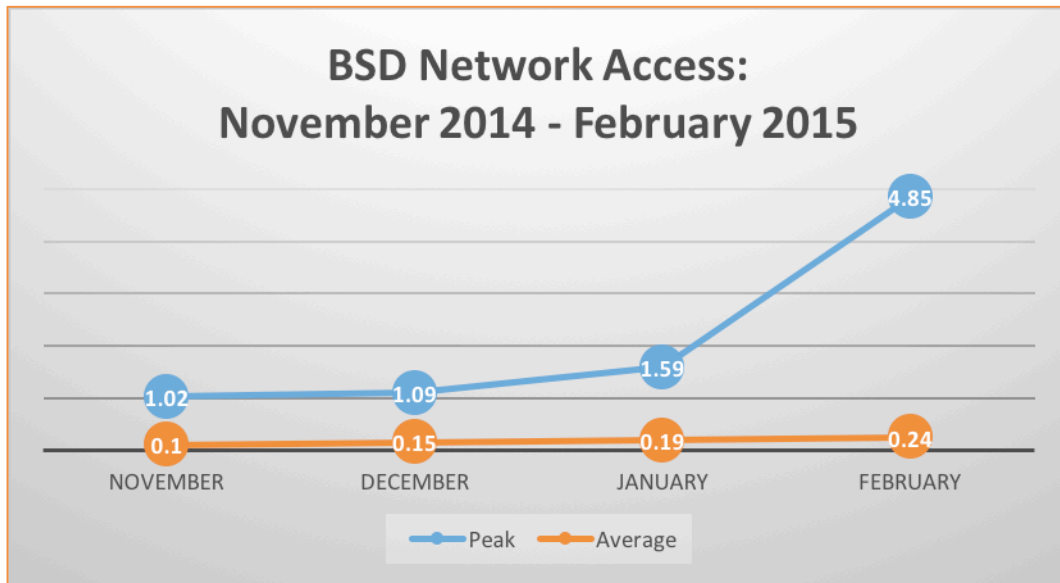


Figure 1: BSD Peak and Average Access. All values in Gigabit.

Enterprise Wireless Network Replacement

Wireless access is now the primary method used by students and staff to access the internet. In Fall of 2014 we began the replacement of the enterprise wireless network. The new network will provide increased coverage at all schools and will allow more students and staff to simultaneously access network and internet content. The project is in three phases, outlined below.

Enterprise Wireless Network Phases

	Timeframe	Actions
Phase One	Nov. 14 – May 15	Replace existing access points at all facilities. Expand capacity at Positive Change year 1 grant schools. Create District standard coverage for all schools.
Phase Two	June 15 – Oct. 15	Install District standard coverage for year 1 grant schools. Install District standard coverage for year 2 grant schools. Install District standard coverage for additional schools.
Phase Three	Nov. 15 – June 2016	Install District standard coverage for remaining schools. Install District standard coverage for ancillary sites.

When complete, this project will provide access for all students and staff at all school and ancillary sites. The enterprise wireless network is integral for students and teachers using instructional resources online and in digital formats.

Telecommunications System Replacement

The new Unified Communications system is much more than a replacement for the outdated telephone system. In addition to providing telecommunications functionality, the new system provides safety and security features that will increase student and staff safety in schools. One

of the most important new safety features is Enhanced 911 calling. Enhanced 911, or E911, will automatically associate the location in the building of a number that dials 911. This will allow first responders and the Public Safety Office to know the exact location, not just the building where there is an emergency, saving critical time.

One communications issue for parents and community members is that as the District has grown over time, the Beaverton School District had to utilize multiple prefixes (259, 591, 672, 533, 524). With the new system, we are purchasing telephone numbers that will all be in one prefix and allows us room to grow as we add additional schools in the future.

Telecommunications System Phases

	Timeframe	Actions
Test Phase	Nov. 14 – Feb. 15	Installation & configuration of servers and controllers. Tie new and existing phone systems together. Pilot testing.
Phase One	Feb. 15 – May 15	Central Office training & installation of new phones. New phone numbers installed. All staff moved to new voicemail system. Testing at pilot schools. Installation of Phase 1 schools.
Phase Two	June 15 – Sept. 2015	Installation of Phase 2 schools.
Phase Three	Oct. 2015 – March 2016	Installation of Phase 3 schools. Installation of ancillary sites.

Server and Core Network Equipment Replacement

Internet usage has dramatically increased during the 2014-15 school year, and will continue to increase as more mobile computing devices are used in schools and classrooms. During the Winter of 2014, we replaced critical server and network equipment, including:

- **Firewall** – The firewall provides security by controlling incoming and outgoing network traffic. The old firewall was unable to keep up with current demand.
- **Filters** – A filter is a security device that provides the ability to restrict certain web traffic, based upon rules. We are required by the Children’s Internet Protection Act (CIPA) to filter harmful or explicit web sites for students using District computers.
- **Core Router** – The core router is the connection between the Beaverton School District and the internet. Our existing router was unable to keep up with 2014/15 traffic levels. We also only had one device, meaning when it failed, all schools lost access to the internet. We have replaced the core router with two, much larger capacity systems. They operate in fail-over mode, meaning that if one were to fail, the other system would take over control and schools would not experience any loss of connectivity.

The District experienced significant connectivity issues in January 2015, as the enterprise wireless replacement and the core network equipment replacement were being implemented simultaneously. Configuration and existing equipment capacity issues caused network slowness, and even loss of connectivity for schools and District sites. The installation of the new core network equipment has resolved capacity issues and we are prepared for growth over time to meet increased network demands.

Enterprise Applications

HR/Finance System

The largest project supporting enterprise applications in the past year has been the migration of the HR/Financial System from Oracle to Microsoft SQL. This was an extremely complex project, as it was critical that the District maintained functionality and data integrity during and after the migration. The project took almost a year of planning and testing, involving most staff in HR, the Business Office and IT. The project timeline was adjusted earlier to support HR needs and was accomplished in January of 2015. This move puts the Beaverton School District on the most used platform for the HR/Finance system, simplifying support issues with the vendor. The move is also cost-effective for the Beaverton School District.

Business Continuity / Disaster Recovery Planning

In August of 2013, we experienced an event in our data center that highly impacted business functions for the District. In Spring 2014, we began a discovery process with a vendor partner to inform the creation of Business Continuity (BCP) and Disaster Recovery (DR) plans. When complete these plans will document essential business functions and outline processes to ensure continued operation during any type of emergency situation. The Disaster Recovery plan will articulate resources and time needed to bring critical systems online. Phase 1 of the BCP/DR process will begin in May and should be complete in Fall 2015.

User Experience Improvements

There are a number of factors that together, form a user experience for staff and students. This user experience contributes to staff and students reporting adequate access to technology. Below are three changes made this past year to improve user experience for staff and students.

Access To Adequate Computing Devices

After the bond passed, we were able to purchase 1,957 computers for student use, improving the number of available computers providing an adequate user experience. Despite that progress, we still have many machines in use that are 8 years or older. These machines do not provide an adequate user experience. The chart below provides detail on the age of desktop and laptop computers used by students and staff. Note that we do not have the capability to automate reporting on Windows computers, so they are not included the counts below. Preliminary examination reveals roughly the same age breakdown for our 3,000 windows machines.

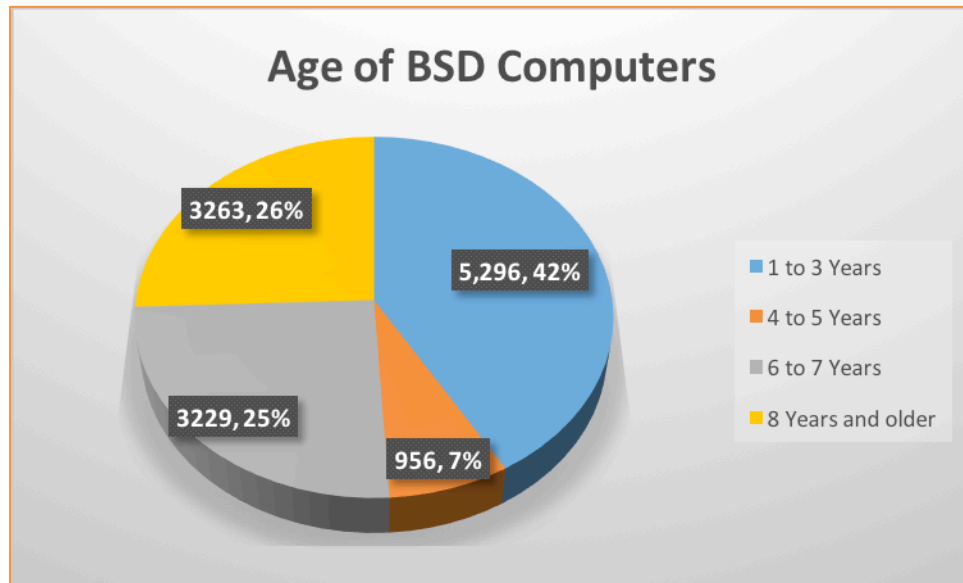


Figure 2: Age of student and staff computers

Use of mobile computing devices by students and staff is increasing, both with District purchases and students using their own devices in school. There are 3,254 iPads and 2,107 Chromebooks currently in schools and moving forward, mobile computing device usage will continue to increase dramatically with additional purchases and students using their own devices in their learning.

Filter Changes

At the beginning of the 2014 school year, and acting on feedback from many staff stakeholders, IT changed the filtering policy to allow greater access for students and staff. The Children's Internet Protection Act (CIPA) requires schools participating in the Federal eRate program to block content that is: a) obscene, b) child pornography, or c) harmful to minors. Web sites are filtered by categories. There has long been debate about which categories are blocked and no formal process to determine if a category should be open or blocked. The end result was that teachers might have experienced a web site they planned on using for instruction being blocked, just by virtue of the category and not necessarily the content of the site. In the summer and fall of 2014, a team of educators met and determined categories that needed to be blocked to comply with CIPA and other categories that could be opened. This change was shared with staff in Fall 2014, with links to resources for teachers having questions. Feedback has been very positive on providing greater access for students and staff while still having protective measures in place.

Staff Administrative Rights

The final user experience change for the 2014-15 school year was a decision to allow staff members to have administrative rights on their primary District-issued computer. All teachers have a District-issued laptop for their work. Previous best practice in IT security was to restrict administrative access on computers to prevent installation of unlicensed software, or allow

installation of malicious internet applications. The result of this practice was protection for the District, but it prevented staff from fully utilizing their equipment. For example, staff were unable to install a home printer driver to allow them to print while at home. After researching and mitigating security concerns, we crafted a process that would allow staff to take a short course on responsible use and then be granted administrative access on their machines. To date, 570 staff members across the District have participated in this program. This approach has worked well, allowing staff to choose what best fits their needs.

Instructional Support for FutureReady at BSD

The 2014-15 school year has been the beginning of great change with the introduction of mobile computing technologies through our first year of Positive Change grants. These grants went to 17 teacher teams so they could begin together to change how instruction is delivered and understand how students can use technology tools to demonstrate learning in new ways. Teachers worked with instructional technology staff beginning Fall 2014 around instructional strategies and in November, they began receiving their devices. Student devices were delivered in December and January. 1,664 Chromebooks and 1,430 iPads were provided for student use in classrooms across the District. The FutureReady planning team is busy preparing for expansion of year 1 of the grants, starting work in additional classrooms for the year 2 grant process, and looking to scale instructional change supported by technology to schools throughout the District.

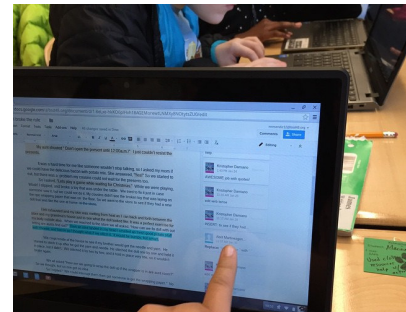


Figure 3: Students peer editing at Kinnaman Elementary

Looking Forward

We are busy preparing for Fall 2015 at this time. When school begins next year, much of our infrastructure will be in place throughout the District. We will have year 1 Positive Change grant teachers entering their second year of using mobile computing devices in their instruction, and will have a larger group of year 2 Positive Change grant teachers beginning this work. The network, infrastructure, and teacher teams will be in a great place to begin to scale our digital transformation of teaching and learning.