Thin Client Report

Canyons School District

Education Technology Department

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OVERVIEW

Thin Clients, also known as "dummy terminals," allow users access to computer programs with a much lower cost than traditional computers. Thin clients are remotely managed at a server at the Canyons District Data Center. This allows for faster response to troubleshooting, software management, and setting local profiles.

This report describes why Thin Clients are an effective use of technology funds. This report will demonstrate specific examples of how the Thin Clients are currently being used in the Canyons School District pilots at Altara and Oakdale Elementary Schools.

HOW ARE THIN CLIENTS MORE COST EFFECTIVE?

With no hard drive or motherboard at the local machine, thin clients reduce long-term cost by approximately 50% due to their expected life span. The only real replacement parts needed are mouse, keyboards, speakers, and monitors.

Thin clients take up much less space than traditional computers, since there is no CPU attached.

Thin clients reduce the cost of man-hours. Since thin clients are managed at a district level, any administrator can log in from anywhere in the district to manage the thin clients. This reduces the cost of man-hours because administrators no longer have to travel to the sites to manage incidental issues or load/remove software programs.

Examples of Management

Thin clients can be remotely managed in the following ways:

- installation of software
- troubleshooting
- manage user accounts for:
    - individualizing desktops
    - specific software
    - internet access levels and bookmarks
    - management of folders (turn in and hand out)
    - restrict users to:

- specific sites on the internet
- specific software access

Thin clients are managed through Active Directory/Open Directory credentials. Students can only access items allowed through their user profiles.

Once a user logs into a thin client, the desktop is set specifically for that user. A teacher can request items to be available on the students' desktops, hand out folders, or the students' My Documents folders. The available and restricted resources can be easily changed or amended remotely by the thin client administrators. These changes can be done for specific users or user groups.

Thin clients allow more access to technology tools in classrooms and throughout the school and district. Students can do research, complete online assessments, thereby giving their teachers immediate results and real data. Students can create projects that they can work on in both their classrooms and the schools' computer labs. Students have folders on the network allowing them access to work on their projects on any device on the network anywhere in the district. This allows for the students to easily engage in more collaborative projects and assignments.

HOW CAN THIN CLIENTS BE USED TO IMPROVE STUDENT ENGAGEMENT?

Each classroom has five thin clients for student use. When students use thin clients, learning is more seamless as the students do not need to leave the traditional classroom to go into a computer lab. Thin clients are a part of the curriculum areas, especially the language arts block. At Oakdale, the students rotate through stations during the language arts block, and thin clients are one of the stations.

Students are engaged and in charge of their learning more with thin clients, as they are free to choose from a variety of activities (the students call them "games") and stay engaged for longer periods of time than seat work during rotations.

Students can use the same programs in the classroom as the computer lab, and save the documents/projects to work on in both the classroom with thin clients and also the computer lab. Students can also go from classroom to classroom and finish projects, activities, or documents.

SPECIFIC IDEAS AND EXAMPLES

Checking for participation and understanding

Students using Thin Clients for English Language Arts Rotations

Pros:

Thin clients are good for checking for understanding when students are completing assignments in Pearson SuccessNet. The students receive immediate feedback and individualized learning paths that can be completed using thin clients.

Students can create documents for teachers to grade by putting the assignments into the teacher's drop box or district folder. The teacher grades the assignment, then places the feedback into students' folders.

The third graders at Oakdale use the thin clients for math and language arts practice. The teachers have a blog set up for students to log onto for practice, and the students are assigned which activities to participate, again with immediate feedback being provided to the students.

Many of the same projects and applications that students use in the creativity lab can be used with thin clients.

Students can use thin clients for research projects or other online learning platforms.

Cons:

There is limited amount of time that teachers can use thin clients as part of their rotations for math and english/language arts. A bulk of this time has been spent in troubleshooting students' ability to log on through Active Directory. Because they have had difficulty logging in, they typically don't use them as they should.

Thin clients operate on a windows platform, so some of the applications and resources in the school creativity labs can not be accessed.

There are issues with headphones. Many of the users cannot connect headphones and this issue cannot be resolved on local machines. This is a concern due to the fact that if headphones are not used, other students in the classroom become distracted from their assigned learning activity.

HOW CAN THIN CLIENTS BE USED TO…

improve skills?

Students using thin clients for Pearson SuccessNet Reading Street

The ability for thin clients to improve skills is vast. Students can work on assignments such as practice, remediation, or assessments, all with immediate feedback. Teachers can very easily assign skills or activities in which students complete. This takes very little work on the part of the teacher. The documentation/data is also easily managed for the teacher to disaggregate for reteaching , reinforcement, and enrichment.

Specific Curriculum Areas, Web Sites and Learning Examples

Language Arts:

- Pearson Successnet (http://pearsonsuccessnet.com)
- ReadWriteThink (http://readwritethink.org)
- Pioneer Library
- UEN
- Writing projects through Microsoft Word

Mathematics:

- Pearson SuccessNet (http://pearsonsuccessnet.com)
- A+Math
- UEN
- FASTT Math

Social Studies:

- Culture Grams
- World Book Online (http://worldbookonline.com)
- Google Earth

Science

- Classroom Blogs with links to web sites such as "Bill Nye," "Try Science," and "How Stuff Works"
- Youtube videos such as "The Scientific Method for Kids"
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HOW CAN THIN CLIENTS BE USED FOR...

differentiated instruction

Students using thin clients for individualized learning

As thin clients are, for all intents and purposes, computers, with access to the internet. This makes them ideal for differentiated learning, as they allow students to participate in individualized learning paths through internet activities and assignments. Teachers can assign activities suited specifically for individualized learning paths for students. If students need remediation, teachers can assign activities (using both intranet and internet) which will maximize achievement and success for all students. Students can also collaborate with other students and teachers through internet resources such as Google Docs and Dropbox.

Remediation

As thin clients are utilized during language arts and mathematics rotations, students are able to complete activities which reteach the curriculum areas needed. For example, in language arts and mathematics, a teacher can assign a specific activity within Pearson's SuccessNet designed for individual students. Both the teacher and student receive immediate feedback and alternate learning paths are assigned as necessary.

Extension

For students who perform at above average levels, a teacher can assign activities at specific leaning paths designed to meet the needs of the students. In language arts and mathematics, enrichment activities can be assigned to meet the needs of those students to maximize success.

Assessment

Students and teachers can use thin clients for the following types of assessment tools:

- UTIPS
- UtahWrite
- Pearson SuccessNet
- DWA
- CRT

HOW CAN THIN CLIENTS BE USED FOR..

creativity?

Students engaged in partner activities

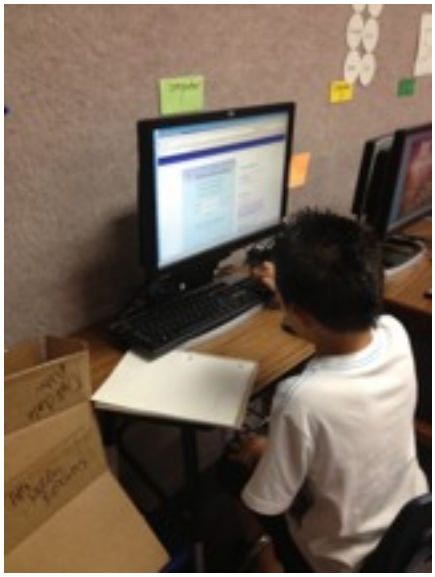
Thin clients, like any other computer in the district, can be used for creativity. Students can create spreadsheets, mind maps, comics, presentations, and many other items by using thin clients. The items can start a project and come back to it at a later time, as needed.

Examples

- Inspiration
- Kidspiration
- ComicLife
- Microsoft Office Suite
- Internet sites such as Thinkfinity and Google Earth
- Google Docs
- Dropbox

HOW CAN THIN CLIENTS BE USED TO...

change the current school culture and administrative process?



There is a huge emphasis placed on the "bottom line." The bottom line is "getting the most bang for your buck." With thin clients, the return on investment is immeasurable, due to the fact that users can access most internet and intranet resources. Thin clients allow for users to collaborate with each other through skype and productivity sites such as Google Docs.

Examples:

Saving Documents:

- Students and teachers can save documents in the My Documents folders. Assignments that have traditionally been turned in on paper are now placed in the students' and teachers' hand out/turn in folders. This makes for easy grading for the teacher and feedback for the students.

- Students can collaborate and save documents through google docs. They can work on projects and documents together simultaneously.

Connecting with Others

Students and teachers can collaborate and connect with others through internet sites using thin clients. Some examples are:

- YouTube
- Skype
- Google Sites
- Google Cal
- Twitter

RECOMMENDATIONS FOR STUDENT BEHAVIOR AND CLASSROOM MANAGEMENT

Thin clients are no different than any other resource in the classroom. Classroom management for thin clients is just as important as that of books, pens, and paper. Students need clear expectations and consequences for the use of this resource.

The use of thin clients may reduce negative behaviors in the classroom because:

- students are more focused on tasks
- students are "in charge" of their learning
- students are active
- students enjoy learning activities that allow for multi-modality

Procedures and Expectations

Teachers need to provide clear expectations , especially at the beginning of the school year. The expectations and procedures for thin clients should be given as much focus and attention as any other type of learning activity in the classroom.

Examples of specific expectations teachers may want to consider:

- use and care of equipment, such as keyboard, monitor, and headphones
- logging in and out of thin clients
- maximizing use of time
- starting and stopping at appropriate times
- keeping the workspace clean and neat for the next user
- intranet and internet responsible use

Digital Citizenship

As "Spiderman's" uncle said, "With great power, comes great responsibility." This can be said for using any type of technology. The world is now a very small place compared to even ten years ago. It is vital that students understand and accept digital responsibility, just like they would accept responsibility with any other type of equipment used in school.

The following are important considerations for teachers and administrators using any district-owned technology devices:

District Responsible Use Policy (this policy is signed by all students in the district)

- Using appropriate sites
- Respecting others online
- Staying on task
- CyberBullying
- Online safety
- Protecting personal information
- Do not interact with people you don't know

RECOMMENDATIONS FOR INVESTMENT

While thin clients are a lower cost investment than stand alone computers, there are many concerns about implementation on a district-wide level, particularly in the elementary school setting.

Pros:

The lower cost is a definite benefit. For the same cost as one computer, a district can purchase at least four units. Over time, the cost equivalent would be approximately one thin client unit to at least five computers.

The benefit of lifetime use cannot be overlooked. While computers traditionally are rotated out on a two to three year basis, the expectation for a typical thin client rotation is approximately ten to twelve years. This is a long term return on investment.

The manageability factor is a benefit because a field technician is not required to install software, run updates, or fix incidental issues, such as imaging. All of those can be done remotely.

All data is stored on a district server. Therefore, if a thin client unit goes down, the concern for losing data is eliminated.

Cons:

In the elementary setting, it has been our experience that the thin clients have not been as effective as they could have been. As a result of the concerns, many teachers have stopped using the thin clients due to the lost instructional time.

There have been many lost hours of instructional time due to problems logging into the thin client units through Active Directory.

While thin clients should be used for rotations, individual research, or assessments, students spend a majority of their time trying to log into the computers through Active Directory. These issues are not associated with the thin clients, but rather, problems associated with logging into the thin client units. Because of these issues, many teachers have stopped using the thin clients because of lost instructional time.

Headphones have been another concern. Frequently, the students cannot use the headphones due to security restrictions. These can't be fixed on the local machine, therefore, students using programs requiring sound cause disruptions to the rest of the class.

Saving documents should be reliable, but many times, when students save documents in the creativity labs, they cannot retrieve them on the thin clients.

Students cannot log into machines on a reliable level. Many times, a student has to log in to multiple machines. This causes an extreme negative impact on the learning.

While teachers should be able to use thin clients as part of the regular rotations during the english/language arts rotation, they can't depend on them. Teachers should be able to teach in their small groups while other students should be able to complete individual learning activities through Pearson SuccessNet. When they can't get logged into the computer, they lose valuable instructional time.

The bottom line:

At this time, administrators and teachers do not recommend the district invest in any more thin clients. Before investing in any more, the Active Directory log in issues need to be resolved, and the technology needs to be reliable for students and teachers.