

**Application for
The Northwest Academic Computing Consortium (NWACC)
Joanne R. Hugl Excellence Award**

TITLE: Managing P2P File Sharing on a Residential Campus
INSTITUTION: Central Washington University
DEPARTMENT: Information Technology Services
CATEGORY: Either: Technology Infrastructure or Business Processes & Systems

DESCRIPTION:

Illegal Peer-to-Peer (P2P) file sharing is a troubling situation at almost all Universities and Colleges throughout the United States. Historically, when the Recording Industry Association of America (RIAA) or the Motion Picture Association of America (MPAA) identified that illegal P2P sharing was occurring on a campus, their response was to forward a notification to the University requesting action be taken to stop the illegal activity. More recently, the RIAA tactics have increased to sending notices to the violating individuals, via the University, of their plans to take legal action and offering a settlement period by which the student could pay a fine, normally in the \$3,000 to \$5,000 range. Universities continue to struggle as to whether they have a responsibility to forward these notices or not, in addition to disagreeing openly as to the best ways to address the issue of illegal P2P sharing.

In addition, the Congressional Subcommittee dealing with this situation, in conjunction with the RIAA and MPAA, outlined three recommendations to combat this epidemic on campuses. These recommendations are:

1. Implementation of a legal music/movie download service as an alternative.
2. Education and Training on the impact and consequences of P2P sharing.
3. Utilization of technologies to prohibit illegal P2P sharing.

CWU is not exempt to the issues of illegal P2P file sharing. Starting in 2002 CWU (like many institutions) started receiving RIAA Notifications. CWU recognized the impact of P2P and investigated all 3 recommendations. Based on this investigation, the ITS Department in conjunction with CWU's Division of Student Affairs (Judicial and Housing) set a plan of action with 3 primary goals in mind: These goals were:

1. ***Eliminate RIAA/MPAA Violations/Notifications.*** These violations were viewed as a resource drain to investigate and contact students, as well as an embarrassment and potential legal liability to the University. In addition, CWU's ITS Department felt it had a responsibility to take proactive and

reasonable actions to prevent illegal student activities on campus, and using campus resources.

2. **Reduce the number of illegal P2P “attempts” by CWU students.** The problem of illegal P2P file sharing is growing exponentially as new students enter college and have expectations of unregulated access to the Internet. CWU has found that in High School and at home, there were no consequences or training on the illegality of P2P sharing. Students living in Residence Halls with significant bandwidth felt that illegal file sharing was acceptable. Stopping the illegal activity as it occurred was not enough.
3. **Reclaim ResNet Bandwidth:** Illegal P2P sharing is not only illegal, but at CWU and many other institutions, it placed an incredible demand on ResNet bandwidth, which at the time was very expensive. In 2003/2004, it was estimated that as much as 35% to 40% of the ResNet bandwidth was being used for P2P sharing. The result was that bandwidth was not available for legitimate purposes, and students complained regularly about slow Internet speeds. Reclaiming this bandwidth was critical.

After investigation, CWU settled on the following courses of action related to the 3 recommendations:

1. Implement a proactive and multi-faceted training and awareness program to educate students on the illegality of file sharing copyrighted material, and on the purposes of Intellectual Property.
2. Implement technologies designed to stop/eliminate illegal P2P file sharing, while providing resources necessary for legal P2P.
3. Initially CWU investigated options for providing legal music services to students, but changes in the legal music/movie download industries, combined with feedback from students on the CWU Student Technology Committee, quickly resulted in CWU discarding this as a solution or service. The majority of students made it clear that this was not what they wanted.

In fact, in early 2004, CWU was a beta-test site and one of the first two implementers of CopySense by Audible Magic. Are our solutions working? In a word ... YES! While many institutions struggle with continued notifications and stories in local papers about students being sued by the Recording Industry, CWU has not received a single RIAA/MPAA violation since implementing CopySense in FY04. No violations/notifications, despite the fact that attempts at illegal P2P file sharing are on the rise.

INNOVATION:

As noted, while many institutions continue to struggle with receiving RIAA/MPAA notifications and legal threats to their students, CWU has not received a single RIAA notification since initiating its multi-faceted P2P program in early 2004. This doesn't mean that incoming students don't still attempt to download music and other material illegally, but they are no longer successful. This is accomplished by an innovative combination of education, technology and consequences.

TECHNOLOGY: One of the more innovative, yet controversial options for addressing illegal P2P file sharing is the use of technology to prevent students from downloading copyrighted material (without authorization). Many institutions feel that it is not their responsibility to implement these technologies, while others promote their use as a major deterrent to illegal P2P sharing. CWU chose to be an early adopter/innovator of one of these technologies called CopySense by Audible Magic, as was documented in an April 2004 Chronicle of Higher Education Article "[2 Universities Test Controversial Filtering to Fight Online Piracy](#)". In early 2004, CWU partnered with Audible Magic to beta-test the system and provide valuable feedback ... finally implementing the software into production on March 8, 2004, coinciding with the beginning for our Spring Academic Quarter. CWU combined Audible Magic with Packet Shaping on the Residential Network. This technology combination resulted in several major benefits which are outlined in the Benefits Section of this application.

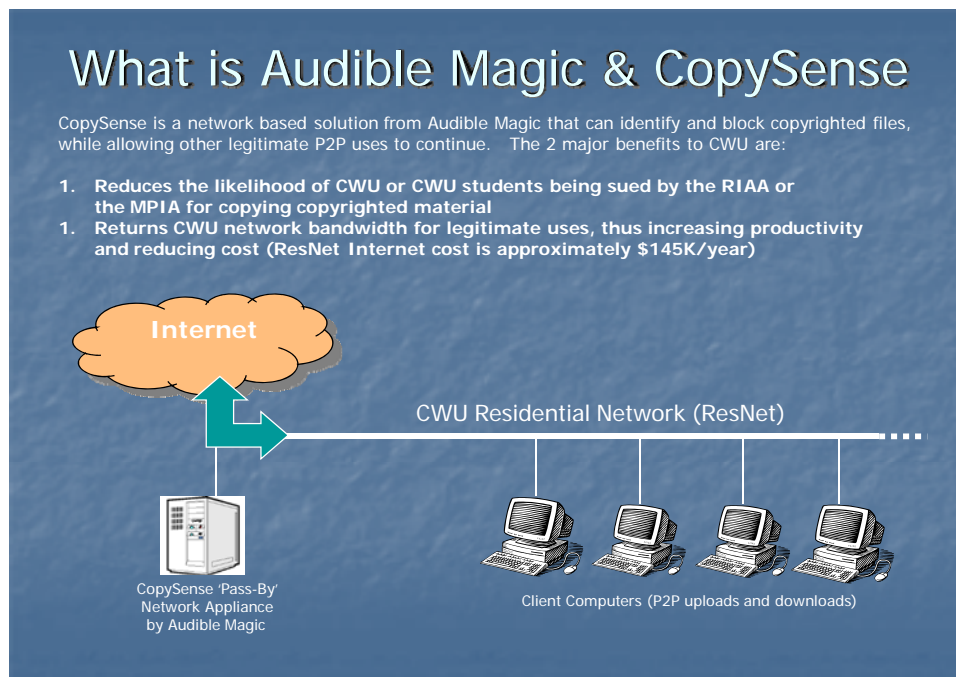


Figure 1: Audible Magic's CopySense Architecture

Figure 1 is a top level description of how Audible Magic's CopySense works. CopySense is a Network Appliance that resides on location at CWU and monitors all P2P traffic entering and leaving the University. Working much like anti-virus scanning, Audible Magic is continually updated with signatures of copyrighted files that are illegal to share except through authorized distributors. If a copyrighted file is detected, the transfer is blocked.

After implementing CopySense, the scope of the growing problem was evident. Figure 2 (Blocked P2P Transfers by Time of Day) is from one day (April 27, 2004), and shows the number of illegal P2P attempts that were blocked. It is recognized that many of these may have been "re-attempts" after the initial attempts were blocked, but it clearly shows that the problem is bigger than receiving a handful of RIAA/MPAA notices. At this same time, CWU was receiving an average of 5 RIAA/MPAA notifications each academic quarter.

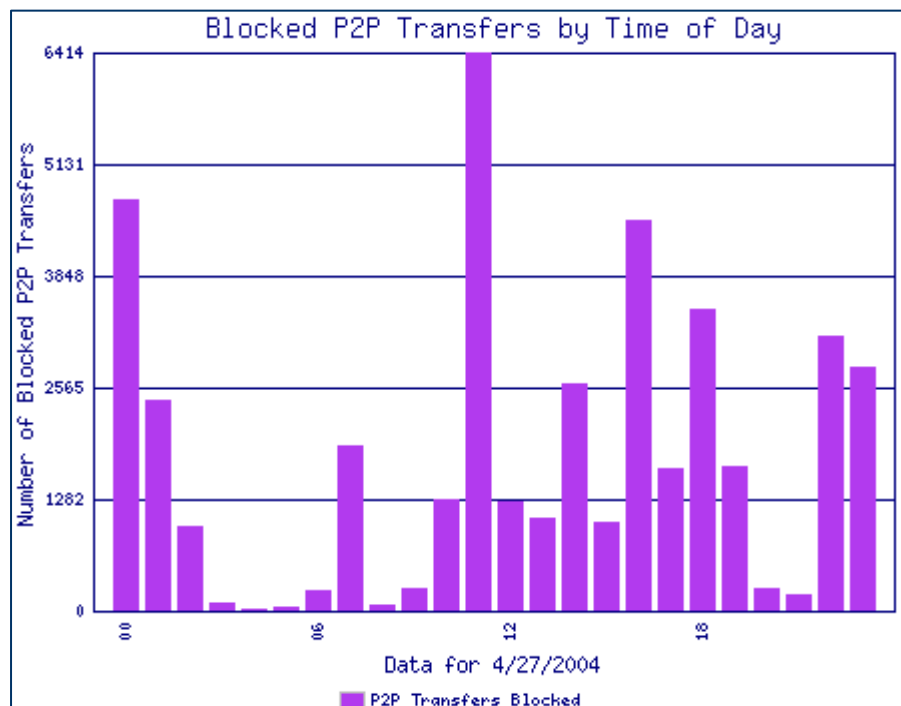


Figure 2: Blocked P2P Transfers by Time of Day (4/27/2004)

EDUCATION AND TRAINING: The second facet of CWU's program to combat illegal P2P file sharing came via a rigorous program of training and education, a program that must be repeated over and over again, as Freshman enter the University from a world where there has been literally no consequences for illegal P2P downloading. Education comes from a variety of methods, including:

1. On-line quiz for ResNet access: One of the most recent tools in the CWU educational arsenal (implemented fully in the fall of 2007) is the requirement for all students to take an online quiz as they are registering with ResNet.

This quiz selects 10 questions at random from a pool of over 50 questions, and students must receive an 80% on the quiz to pass. They are allowed to take the quiz multiple times, until they pass, but each time the questions are different than their previous attempt. The questions are related to the CWU Appropriate Usage of Technology (AUP) Policy, illegal P2P File Sharing, and other related topics. They have the ability to view the policies and guidelines while taking the quiz (it's Open Book). A screen-shot from this online quiz is below in Figure 3.

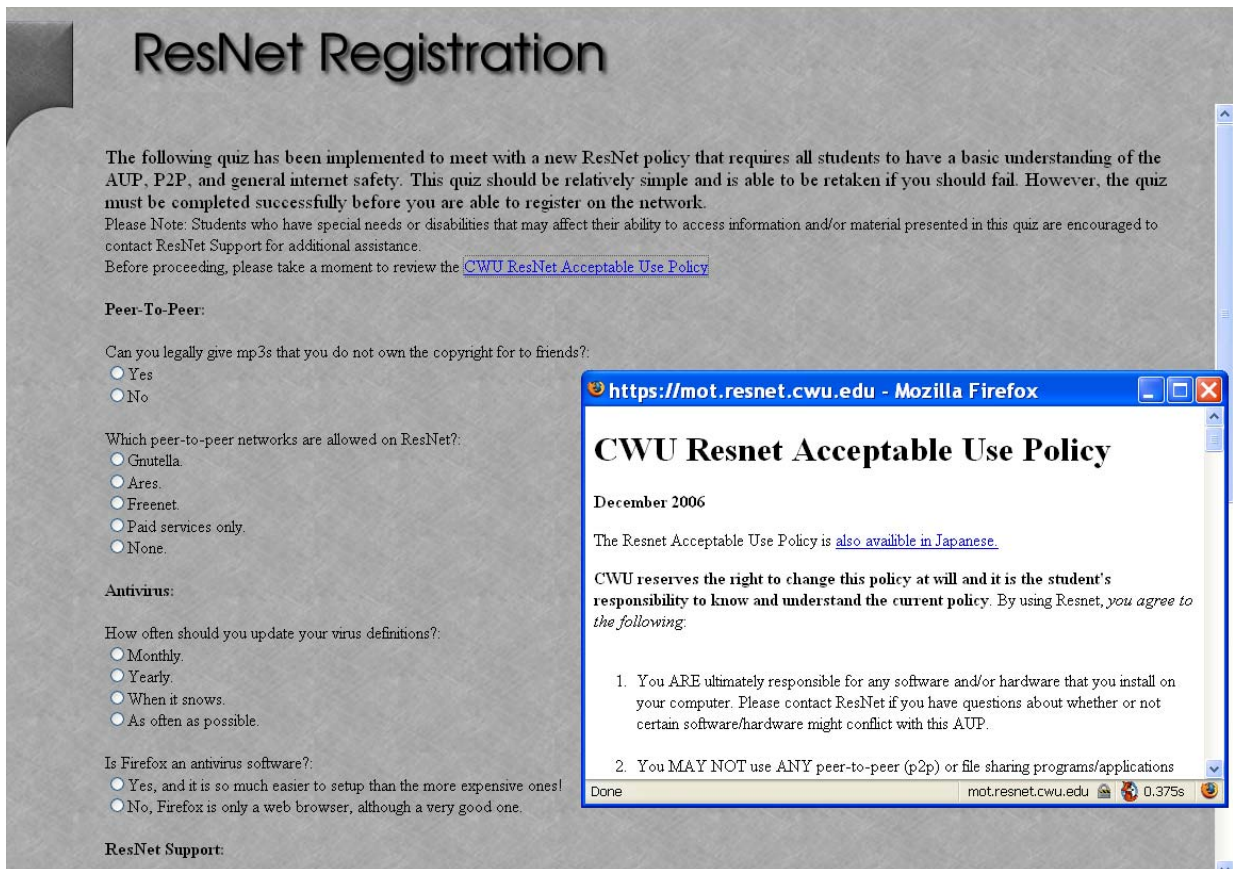


Figure 3: ResNet Online Quiz Screen-Shot

2. **ResNet Overview & Information Sessions:** ITS Staff partner with Housing and present information on numerous topics, including illegal P2P sharing, at Housing Orientations which all students living in Residence Halls must attend. In addition, pamphlets, posters and other information are posted in all Residence Halls outlining the issues and consequences of this illegal activity. This information is also shared with students and parents during Freshman Orientations.
3. **Online Information and Educational Videos:** In early 2007, CWU launched its online awareness campaign to help educate students on the illegality of P2P file sharing copyrighted material, the consequences of this activity at CWU, and why Intellectual Property exists. This website is not only

advertised to all incoming students and parents at orientation sessions, ResNet meetings, and other opportunities, but it is a focal-point on the CWU Student Intranet Portal (Wildcat Connection) that students must navigate each time they login to CWU. Because the portal requires authentication, it can not be accessed by non-CWU students, faculty or staff. The program is called “LEARN TO BE LEGAL” and includes much information, including a link to videos regarding IP and P2P sharing. This can be viewed at <http://www.cwu.edu/~its/property.html> . CWU’s “icon” for this program is:



4. Consequences: While education may make students aware of the issues of illegal P2P file sharing, and while technology may prevent “successful” illegal P2P sharing, neither of these methods will totally eliminate some students attempting this anyway. There are always those who feel that “it’s free, it’s OK and I won’t get caught”. At CWU, they’re wrong. CWU is able to readily identify those students who attempt illegal P2P sharing. When caught, they are notified and the following escalation of consequences occurs:
 - a. *First Offense*: The user's internet/network access will be disabled for one week after which they will be automatically re-enabled.
 - b. *Second Offense*: The user's internet/network access will be disabled for two weeks after which they will be automatically re-enabled.
 - c. *Third Offense*: The user's internet/network access will be disabled until the student schedules a judicial review with Student Affairs for potential disciplinary actions.

Later this year, CWU will be implementing its “P2P Remediation Quiz”. This quiz is based on the online videos regarding IP and P2P, and can be taken by students to reduce their 1st or 2nd offense “penalty” for violating CWU P2P policies. This is a 1-time deal, and the better they do on the quiz, the more their penalty is reduced.

BENEFITS:

The benefits of the CWU program to curb illegal P2P File Sharing have been outstanding, and we have achieved the goals which we set when this effort was initiated.

1. **Eliminate RIAA Violations/Notifications:** As Figure 4 (RIAA Notifications Fall 2003 thru winter 2008) shows, CWU's RIAA/MPAA notifications dropped from around 5 to 6/quarter to "0" immediately after CopySense and Packet Shaping were implemented. CopySense was implemented to catch and eliminate successful illegal P2P activity, but it does not stop students from trying. Packet Shaping limited the bandwidth available for P2P sharing to a level that was adequate for legal activities, but placed an additional deterrent on illegal activities, which were the greatest bandwidth consumers.

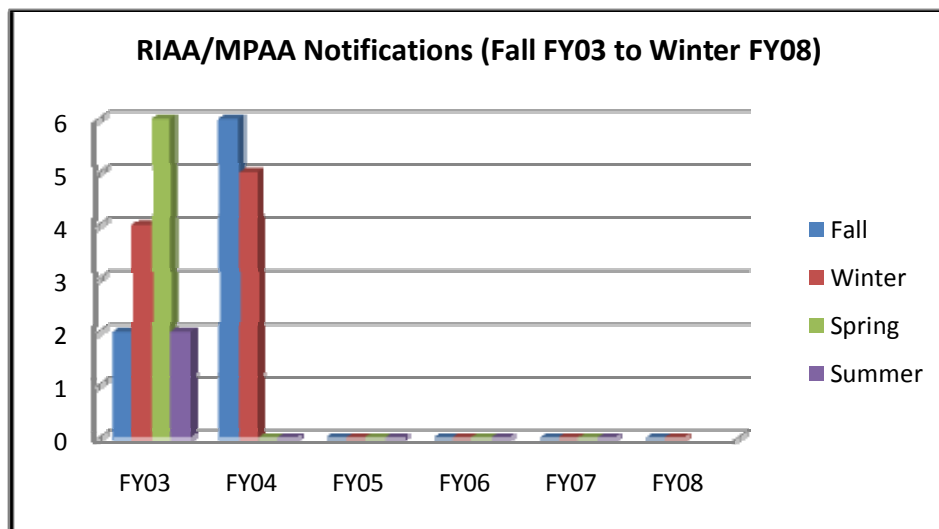


Figure 4: RIAA Notifications Fall 2003 thru Winter 2008

2. **Reduce Illegal P2P Attempts:** At first glance, the number of attempts documented in Figure 5 seems to indicate that CWU has not been successful in this area. However, a closer look and analysis of trends results in 2 key assessments. These are:
 - a. CWU did not have a good tool to measure the "attempts" at illegal P2P sharing prior to CopySense.
 - b. Incoming freshman in 2006-2008 have a much higher expectation and propensity to attempt illegal P2P sharing than earlier students, due to technologies and their experiences prior to college.
 - c. As is evident by the sharp reduction between fall 06/07 and fall 07/08, it is clear that the educational program and "quiz" requirement had a significant impact. Our assessment is that without our multi-faceted approach, the number of illegal attempts would be

significantly higher, as can be viewed in Figure 2, earlier in this application.

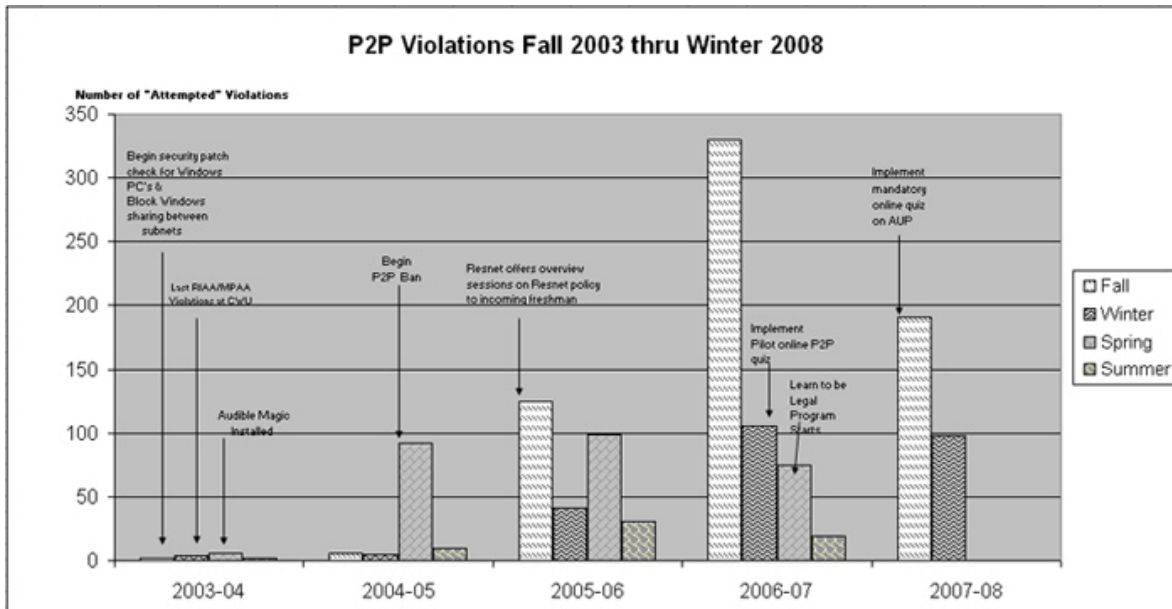


Figure 5: P2P "Attempts" Violations Fall 2003 thru Winter 2008

NOTE: In Figure 5, there have been no "RIAA/MPAA" violations since Winter Qtr 03/04, as CopySense was implemented spring 03/04. The high "bars" in 2005-2008 are the P2P attempts. These are attempts that would have easily led to numerous violations and threats, but were stopped by CopySense. While the attempts are high, they are not as high as would have resulted without training and education, and have actually been reduced dramatically since implementation of the online ResNet quiz.

Students are getting the message. In the fall of 2007, there were 191 "attempts", down from 330 in the fall of 2006. Of these 191 attempts:

- 83% were the student's "1st attempt"
- 14% were the student's "2nd attempt"
- 3% were the student's "3rd attempt" (referred to Judicial)

3. **Reclaim ResNet Bandwidth:** As noted earlier, CWU estimated that approximately 40% of ResNet bandwidth (prior to our P2P program) was being used for P2P activity. Immediately after the implementation of Audible Magic's CopySense, this dropped to around 20%, as is documented in Figure 6.

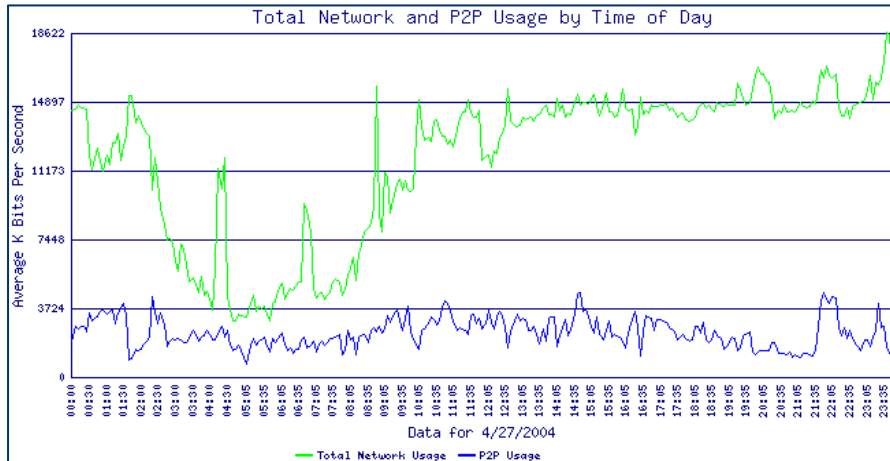


Figure 6: Total Network & P2P Usage (4/27/2004)

With packet shaping, and the success of our educational programs, CWU has been able to further reduce P2P bandwidth usage. Figure 7 documents that the current ResNet bandwidth utilized for P2P is approximately 5% of total usage. Without this reduction in P2P, the amount of bandwidth allocated to ResNet would be predictably higher, resulting in significant cost to Housing (see COST).

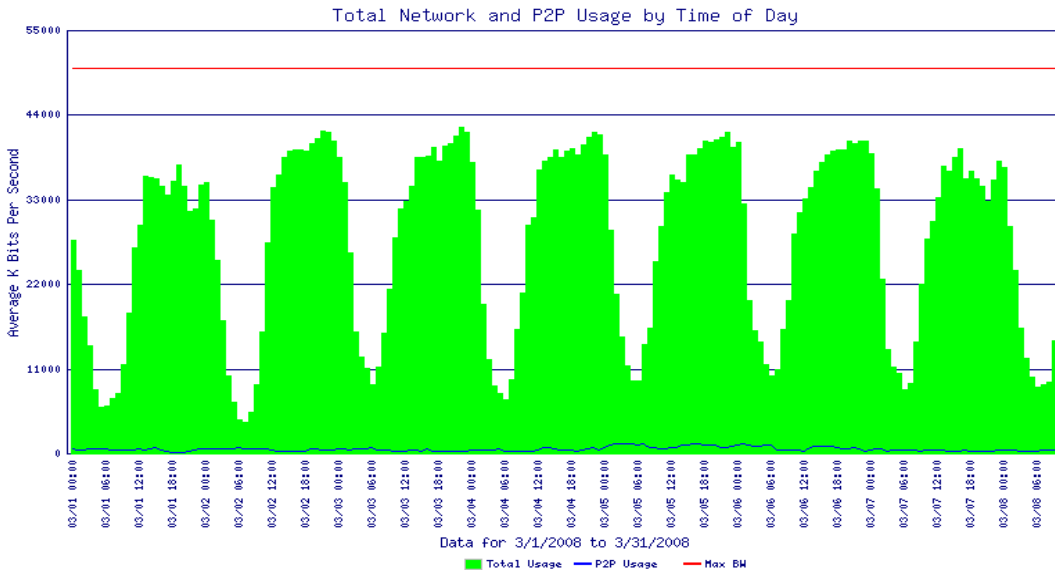


Figure 7: Total Network & P2P Usage (March 2008)

While the tracking information is excellent proof of the benefits of our actions, the ultimate success of our program is documented in the comments of ResNet users, before and after implementation of CopySense. Figure 8 documents a few of these comments from our customers, the students:

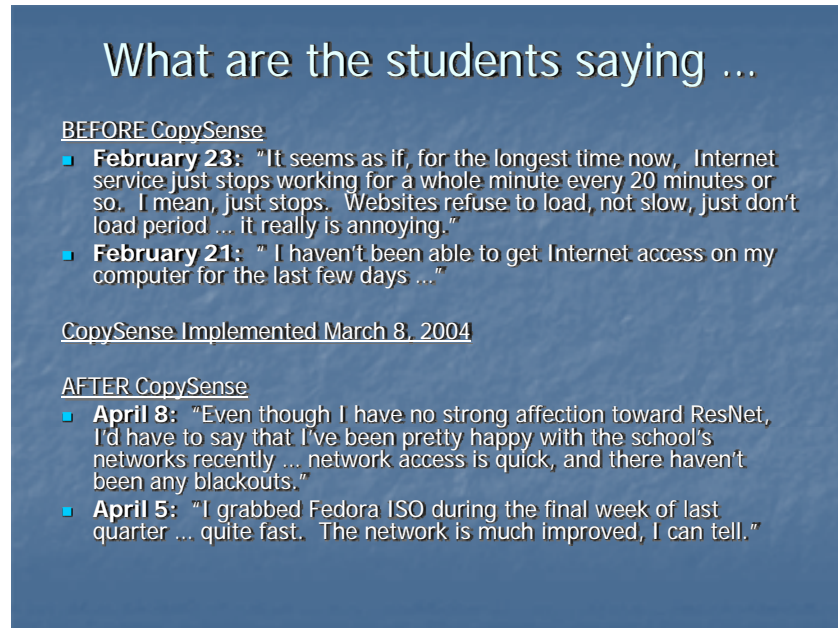


Figure 8: What ResNet Users (Students) Said Before & After CopySense

REPLICABILITY:

Anyone and any school can easily replicate the P2P Program (Learn to be Legal) that CWU has implemented. As noted at the beginning of this application, CWU was one of the first two schools to test and deploy CopySense. CWU began testing CopySense (as a beta site) in January of 2004, and fully implemented the system just 2 months later (March 8, 2004). In addition, our education and training program has been a gradual implementation, which is set to take another step forward later this year (Spring Quarter 2008). Here's what's needed:

1. **ADMINISTRATION:** An administration willing to support the initially and potentially "controversial" solutions proposed and tested by their IT Department, in an effort to achieve necessary goals.
2. **STUDENTS:** An ITS and Housing partnership that educates the students on CopySense prior to deployment, and addresses the advantages that all students will realize (better bandwidth performance, etc.).
3. **STUDENT ADMINISTRATION:** A Student Administration Division that understands its role in partnering with ITS and Housing, to implement real consequences for illegal P2P file sharing at the University.

The ITS Staff, Housing and Student Administration have worked extremely close together in implementing all of the solutions (technical and awareness). This partnership, along with communication to students, was critical to CWU successfully achieving the goals established.

Sharing the Quiz: CWU has been asked by several institutions to share the process and questions we use for our online quiz. CWU willingly shares this so that this process can be replicated by anyone.

COST:

The training and educational programs, including the online ResNet access quiz, website and other awareness literature have only required staff time to accomplish. An accurate accounting of the exact time required to put all of these training and awareness initiatives in place is not readily known, however it is considered to be minimal, based on the benefits being realized. In addition, this is viewed as a responsibility of the University to provide this awareness to students, faculty and staff.

With regards to the implementation of CopySense to address successful P2P file sharing, and eliminate RIAA/MPAA notifications, in addition to the initial staff time to test and implement (which was accomplished between January and March of 2004), the cost is outlined below:

<i>The initial cost to purchase CopySense at CWU:</i>	<i>\$16,000</i>
<i>Annual Maintenance for CopySense (\$3,000/yr. x 4 years):</i>	<i>\$12,000</i>
<i>Staff time to manage CopySense since implementation:</i>	<i><u>\$ 00</u></i>
<i>TOTAL COST SINCE IMPLEMENTATION (4 years):</i>	<i>\$28,000</i>
<i>Estimated total <u>savings</u> of reclaimed bandwidth (4 years):</i>	<i>\$60,000</i>
<i>Not receiving any RIAA/MPAA notices or threatening letters:</i>	<i>Priceless</i>

The estimate in bandwidth savings is extremely conservative, and could realistically be much higher. It also must be pointed out that responding to RIAA/MPAA notifications take time. Since implementing CopySense, CWU has received no violations or letters to students. The time that would have been spent on responding to these situations has been utilized in prevention and technology implementation, not reaction.

CONTRIBUTORS/CONTACTS:

Mr. Steve Breyfogle, Manager of Auxiliary Computing

- Phone: 509-963-2936
- Email: breyfogs@cwu.edu

Mr. Chris Timmons, Senior Network Engineer

- Phone: 509-963-2947
- Email: cwt@networks.cwu.edu

Other contacts:

Mr. Jason Gerdes, ResNet Specialist

- Phone: 509-963-2995
- Email: jgerdes@cwu.edu