



Hendersonville Area Computer Society Newsletter

<http://hacs.org>

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November 2007

Meetings are held twice a month, January through November. We meet at the Opportunity House on the third Monday of the month with an educational meeting at 6:30 pm followed by a featured speaker presentation at 7:30 pm. Our SIG group normally meets the second Thursday of each month from 1-3 PM at the Henderson County Library.



GENEALOGY SIG Meeting

Thursday November 8th

1 to 3 PM at the Hendersonville Library in the Kaplan Auditorium

The uses and abuses of ANCESTRY.COM

Our own Maurice Sarles and Bill Muller will give you some clues as to how to use this wonderful resource. Come, share in learning about the wealth of information now available via the internet on your ancestors.



Monday November 19th Program

Come prepared for a little social time as well as our feature "Tips, Tricks & Issues" – member input!

This meeting will start at 6:30 PM with the first phase of our topic, break for a ½ hr social and conclude with a short business meeting and the last part of our topic.



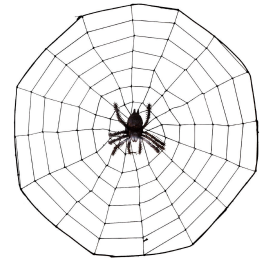
Web sites of the Month

Speech Recognition via BrightHub

<http://www.brighthouse.com/review/Microsoft/GlenSalzman/article/232.html>

Frequently asked questions blog

<http://itfaqs.blogspot.com/2007/10/what-is-new-in-windows-live-mail-beta.html>



Imagining Tomorrow's Future Today

By Art St. George and the 2007 EDUCAUSE Evolving Technologies Committee

“I skate to where the puck is going to be, not to where it has been.” This quote, attributed to Wayne Gretzky, is clearly applicable to a number of areas other than hockey. Those responsible for campus IT know that the trick is indeed to decide where the puck is going to be and to skate there—but also to keep an eye on the puck in the meantime. Unfortunately, as another saying goes, this is “easier said than done.” Today, at the end of 2007 there are evident consolidations in wireless, storage and visualization, and the path forward seems clearer now than previously. Trends from last year continue strongly, particularly Web 2.0 and the shift to user-driven environments and Internet sites where significant data and video processing is available to those without local resources. Yet forecasting is still as much of an art as a science. Campus IT “seers” will continue to work hard to stay in front of the experienced users who come to campus with high expectations of the academic environment, mirroring or exceeding their expectations of the private sector. IT has moved to a place where new technologies are not simply replacing older ones but are increasing in complexity and are interweaving themselves with other technologies as well as the social and economic systems that support them. Even a few years ago who could have imagined that library’s use of social tagging, accessible by multiple connected technologies, would develop into a significant research tool? And IT will continue to evolve. In imagining tomorrow’s future today, those of us in campus IT need to skate to the next new place—while keeping our eyes on the puck in the meantime.

Each year, the members of the EDUCAUSE Evolving Technologies Committee identify and research the evolving technologies that are having the most direct impact on higher education institutions. The committee members choose the relevant topics, write white papers, and present their findings at the EDUCAUSE annual conference.

This year, under the leadership of Committee Chair Art St. George, the committee selected seven evolving technologies, presenting a brief overview at EDUCAUSE 2007. Published below are excerpts from the white papers on each topic, written by individual members of the committee: the Web, by Malcolm Brown; Google Apps, by Sharon Collins and Carlos Morales; Web conferencing, by Kelvin Bentley and Sharon Collins; m-learning, by Saiid Ganjalizadeh; 3D printing, by Michael Berman; virtualization, by John S. Moses; and information lifecycle management and physical storage technologies for digital preservation, by Beth Forrest Warner.

The full white papers can be found on the Evolving Technologies Committee Web site (<http://www.educause.edu/EvolvingTechnologies> Reports). These white papers address many other strategic areas for each evolving technology: key questions to ask; the implementation challenges; the

major vendors and how to judge among them; how to proceed and the issues to be addressed; and the likely impacts in the next three to five years.

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The Web in 2007: It's Not Just a Browser, It's a Platform

Over the past year, the Web has clearly emerged as a platform. Paradoxically, this has happened within the browser but also outside the browser.

Why Is the Web Important to Higher Education?

The astonishing growth in application programming interfaces (APIs) and mashups represents a kind of Web 2.0 collective intelligence, one harnessed first and foremost for grassroots activities but now headed for institutional use in higher education. The Web site ProgrammableWeb.com provides a way to see and measure the rapid growth in mashups and APIs. As of this writing (late August 2007), the site documents over 2,200 mashups and 500 APIs. The growth rate at this same time was about 3.45 new mashups daily.

Of equal importance to higher education is the rapid and continuing emergence of rich Internet applications (RIAs) and the tools and platforms that support them. As stated on the ProgrammableWeb.com site: "Programmers are starting to write applications 'on Google' and 'on Amazon' the same way they used to write 'on Windows' and 'on Unix'" (<http://www.programmableweb.com/scorecard>). Recent developments are making it relatively easy to move these RIAs "out" of the browser and "onto" the desktop, prompting some pundits to declare that the browser is itself at the end of its useful life.

How Is the Web Evolving?

The mashup is a kind of first-generation RIA. A mashup has three key aspects: (1) it collects (sometimes disparate) content from a variety of sources; (2) it organizes that collection into a new, "integrated" experience or Web site; and (3) it makes heavy use of APIs to collect its content, but it can also make use of XML feeds and even screen scraping. The introduction of asynchronous interactions into the Web environment—behind-the-scenes interactions that smooth out the choppy, client-server staccato rhythm of the original Web—has enabled developers to aspire to deliver user experiences that are more like those based on desktop operating systems.

The past year has seen a renewed interest in what we can call the desktop runtime environment (DRE). A DRE is a kind of mini-operating system that enables code developed for the Web platform to execute outside the Web browser. The DRE, like the Web platform, allows developers to write-once, execute-everywhere, but independently of Web browsers and their limitations and quirks. The idea is that

RIAs developed for the Web can be very easily moved to the DRE environment, without extensive recoding.

With respect to the DRE platform, 2007 has seen three announcements from major vendors. The first was from Adobe, which has augmented its Flash technology with Flex and Adobe Integrated Runtime (AIR).¹ Flex is Adobe's programming environment for the development of RIAs for the browser (the environment is called Flex Builder). Flex applications execute within the browser using the Flash Player plug-in. AIR is a runtime environment that enables these Flex-based RIAs to move out of the browser and onto the desktop. Adobe has created some excellent technology and, given the ubiquity of Flash and the Flash Player, is a very strong player in this area.

With the introduction of Silverlight, Microsoft has also made a major bid here. Silverlight seems to be Microsoft's attempt to catch up with and surpass Adobe. Silverlight has a long way to go—some estimate that the Flash plug-in is installed on more than 95 percent of desktop and laptop computers—but Microsoft, having lots of cash, can afford a long chase. Silverlight is a cross-browser, cross-platform plug-in. Microsoft asserts that Silverlight will be freely available for Internet Explorer and Mozilla Firefox and for Safari on the Mac. The focus of the Silverlight environment is to enable the development of media experiences and RIAs.

Sun also reinserted itself into the game with its announcement of JavaFX. Like the alternatives from Microsoft and Adobe, JavaFX will include support for execution within the browser, on the desktop, and on mobile devices. Major components of JavaFX include JavaFX Script, a second-generation scripting language; JavaFX Mobile, a kind of operating system for mobile devices; and JavaFX Designer, a set of tools and functions to facilitate building interfaces in JavaFX Script.

Conclusion

Adobe, Microsoft, and Sun—as well as Google and Facebook²—are all competing energetically in this space, which could well make the RIA the next dominant programming model.

Adobe, unlike Microsoft, appears to be pursuing two strategies for the development of RIAs: (1) to protect its investment in the Web with Flash Player and (2) to begin developing a DRE for the desktop (AIR). One could ask why Adobe would want to develop both a desktop platform *and* a Web platform. The rationale is that RIAs are even richer outside of the “limitations” of the browser. With AIR just getting going, we will have to wait to see if the advantages claimed for the desktop platform will be realized.

But no matter how the Web-versus-desktop RIA platform issue evolves, it is clear that the RIA is here and is increasingly garnering interest and developers' attention. Indeed, the RIA could become the balance point that joins the advantages of Web and Internet access with the “user experience” of desktop applications. As Steve Jobs stated at the All Things Digital conference: “The marriage of some really great client apps with some really great cloud services is incredibly powerful and right now, can be way more powerful than just having a browser on the client.”³

Integrating Google Apps for Higher Education

Check e-mail, schedule meetings, chat in real time, search maps, collaborate on documents and spreadsheets—the use of the Google suite of tools, commonly known as Google Apps, is causing quite a stir in the academic and corporate environments. Google Apps is free and accessible via the Web, so anyone can connect with others in an organization 24/7, no matter where they are. And since it is hosted by Google, there is no hardware or software to install or maintain, meaning that a user can get Google Apps up and running quickly.

Google for life, liberty, and the pursuit of happiness! Does using Google place academia in Thomas Friedman's *The World Is Flat* scenario, given recent acclaim with communities uploading and collaborating on online projects?

Why Is Google Apps Important to Higher Education?

The name “Google Apps” is collectively used to describe the effort started by Google to provide users with additional tools to aid in the search for information. These tools, or applications, can be incorporated into classroom instruction in varying degrees: to coordinate students' homework assignments; to

collaborate with remote colleagues; to save and edit files; to print and/or e-mail revisions. The following are some of the applications and special utilities:

- Google Maps/Google Earth: find a location, get directions, pinpoint an area, and receive information
- Google Scholar/Google Book Search: search journals, books, and library sites
- Google Docs & Spreadsheets: collaborate on documents and spreadsheets
- Gmail: send and receive e-mail, which can be integrated with other Google Apps
- Google Video: find short video clips that augment a topic and can be used for instructional purposes
- Blogger: create, develop, and maintain blogs—includes access to audio blogger
- Google Page Creator: create and edit Web pages
- Google Mobile: view Web sites on mobile devices
- Google SketchUp 6: create 3D designs, which can be placed into Google Earth
- Google Talk: collaborate via VoIP
- Google Calendar: drag and drop events online and share with anyone
- Orkut: connect with people and engage in communities of common interest
- Google Groups: work as a group within a collaborative environment—participate in discussions, hold class, search other groups for information

As noted, since these applications reside on a Web server, users can avoid costly license, installation, and maintenance issues. In addition, instructors can benefit from the searchable aspects of the tools. We used Google Docs to collaborate in writing this article section for *EDUCAUSE Review*; we feel that we accomplished more than in other writing projects, without the complications associated with tracking e-mail versions and attachments.

Pedagogically speaking, Google Apps tools allow faculty to increase the productivity of their students while maximizing the use of learning objects based on visual, auditory, and tactile content. Faculty will be teaching with up-to-date content and, in many cases, with access to a wide variety of learning objects never before imagined. Google Apps can be used to demonstrate procedures regardless of the location on or off campus. For example, in collaborative learning, students can easily share documents online and track who did what. This method is much easier and efficient than e-mailing documents and dealing with multiple copies. Google Apps tools share a similar interface, which is important to minimize issues associated with learning the software. Google Scholar, Google Video, and Google Maps all have search boxes; Google Docs & Spreadsheets files have a common toolbar and features. The ubiquity of the Web can make students more independent and mobile by allowing them to create everything on Web-based applications and by freeing students of the need to carry USB flash drives or other physical devices. This will encourage and provide a user interface, never seen before, in which everything happens in one environment, in one space on the Internet, with one user ID and password.

The use of Google Apps comes as part of the more dynamic Web 2.0, where the user publishes, discusses, and becomes part of the content. The characteristics are especially appealing to Millennials, those students born between about 1981 and 1994 (also called the Net Generation). These students grew up accustomed to the Internet, DVDs, CDs, iPods, social Web sites, text messaging, cell phones, PDAs, and instant messaging. Millennials mostly access content on-demand as they communicate, interact, research, socialize, and learn with peers. Google Apps tools can help faculty reach out to these learners by using technologies and tools that allow the faculty to play on a leveled ground.

The idea of free services might sound appealing to institutions with lean budgets and limited resources, but other issues should be examined as well: security and privacy, server downtime, data backups, advertisements, misuse of collected data or pushes, support and training, FERPA and HIPAA concerns. Additional aspects to be considered include how efficient the applications are, problems or kudos that may be involved because the applications reside on a Web server that is not company-owned, costs related to licensing, installation and minimized maintenance issues, and enhanced pedagogy.

How Is Google Apps Evolving?

From an instructional technology standpoint, Google Apps provides instructors with an integrated set of tools that can enhance classroom instruction. Instructors and students can benefit from the ease of use of the applications, their searchable functions, the ubiquity of Web 2.0 technologies, and the independence of platform and storage media available only on the Web. Google continues to add applications and services that might be of interest to the higher education community. Google applications that are on the horizon may include the following: presentations capability; project management capability; file storage with Google Blogscope; communication in the form of additional discussion group capabilities and wikis; video chat, perhaps integrated into Google Talk; and Web conferencing. We expect that Google Apps will continue to grow in prominence at a time when higher education institutions are considering and evaluating other economical options for productivity software.

Conclusion

Google Apps is seen as a toolbox that provides the higher education community with the means to infuse today's classroom with Web 2.0 and Web-based applications that foster collaboration, creativity, and dynamism, thus taking the teaching and learning process to new dimensions.

The Evolution of Web Conferencing

The ability to communicate with others in real time has been enhanced by the availability of Web conferencing tools. Such functionality can be found on a basic level in instant messaging programs. For example, AOL Instant Messenger provides the ability for text messaging with friends and family along with additional tools such as Webcam and Voice-over-IP (VoIP) integration.

More-advanced Web conferencing tools can provide users with additional features that can enhance synchronous communication in small or large groups. Products such as Saba Centra, Elluminate Live, Wimba Live Classroom, and Adobe Acrobat Connect Professional allow users to share ideas with whiteboards, online polls, file and application sharing, and Web page "pushing." Such options expand the range of information that can be shared during online sessions, which can be archived using these Web conferencing programs.

Why Is Web Conferencing Important to Higher Education?

Web conferencing can be used in various ways to enhance students' experiences within higher education. An on-campus instructor could use Web conferencing to have additional class time with his or her students outside of the physical classroom. This could be useful when the instructor is unable to come to campus to hold regular class periods or when the campus is closed due to bad weather or an emergency. In addition, faculty could expand office hours by scheduling online time with students to answer questions about assignments or the course in general, to provide supplemental instruction, or to give feedback on course performance.

Distance-learning courses could benefit from the occasional or regular use of Web conferencing. Online courses are popular because faculty and students can communicate asynchronously using e-mail and discussion boards. With Web conferencing, online students can give live presentations to either the instructor or fellow classmates, and the presentations can be recorded and archived so that students can review their presentations and learn ways to improve their performance. Such an outcome is easily possible given that Web conferencing tools can be integrated within an institution's learning management system. Professional development training for faculty and staff can be enhanced by the use of Web conferencing tools. Webinars can be created by a college or university to share important information about new policies and procedures or to help a center for teaching and learning conduct presentations for faculty about best practices in the organization and facilitation of on-campus and distance-learning courses and the assessment of learning in such courses. Web conferencing can be used to host such trainings, and audiences can be both face-to-face and online with prior planning around the use of such technology. In addition, the ability to share such information with faculty and staff is maximized because the presentations can be archived for later viewing.

How Is Web Conferencing Evolving?

The technology itself has changed from what was available only ten years ago. In the past, classroom video-conferencing equipment could be housed only in designated classrooms; today, software can be accessed from a server so that an individual can join a Web conference if he or she has a desktop or laptop computer, sharing audio and video with the addition of a microphone and a Webcam. Access is improved further by companies such as Elluminate, which has created vRoom, a free Elluminate Live version that can be used by up to three people for Web conferencing. Such tools will help increase the ubiquity of Web conferencing. Even basic instant messaging clients such as MSN and Google Talk now have the capability to launch video and audio instantaneously.

The uses for Web conferencing programs are evolving along with the technology. Student services are being offered through Web conferencing tools. Northampton Community College in Bethlehem, Pennsylvania, is using Web conferencing products such as Elluminate Live to host virtual open houses facilitated by admissions staff and faculty. Other institutions are using Web conferencing tools for course instruction. East Carolina University in Greenville, North Carolina, offers construction management, nursing, psychology, business, and safety classes with Saba Centra: students feel as if they are in a real-time environment, and Webcams are taken to job sites to provide a visual aid in learning. Finally, some colleges and universities are using Web conferencing to provide online tutoring services for their students: Northampton Community College and the Illinois Virtual Campus (which both use Elluminate Live); and the Connecticut Distance Learning Consortium (which uses Adobe Acrobat Connect Professional). Although online tutoring can be outsourced through companies such as Smarthinking, colleges and universities are finding ways to provide an existing student service with Web conferencing tools.

Conclusion

Web conferencing provides a way for individuals and groups to bridge distances and to communicate in exciting new ways. What feature applications will be added to Web conferencing in the future? It would be interesting to facilitate Web conferences over mobile devices such as cell phones and PDAs, which could provide a virtual space and also allow access to recorded Web conference sessions. Other options include entering the Web conferencing space as an avatar, which provides additional interactivity features, instead of using video.

Web conferencing will continue to be an evolving technology as long as it remains a viable option for education and industry to offer instruction and training in a way that reduces the time and money associated with face-to-face interaction.

M-Learning

“Mobile,” with respect to technology, means portable and personal. The use of mobile digital devices is not new. Since the release of the Walkman in Japan by Sony in 1979 until now, with the popularity of the Apple iPod, people have been using mobile devices for a variety of purposes. Mobile applications include text messaging, audio/video transmission, online banking and commerce—and also *m-learning*, or mobile learning. M-learning provides learners who are on the move with various opportunities to enhance their learning outcomes. Mobile technologies help students, teachers, employees, and customers become well educated and well informed—just in time and just enough.

Why Is M-Learning Important to Higher Education?

Mobile devices are popular because of characteristics such as portability, ubiquity, tangibility, instantaneous communication, and anytime/anywhere connectivity. These devices support short message service (SMS), used by many colleges and universities as an interactive mode of communication for point-to-point message delivery, voting, and assessments. Thus learners can access information through their mobile devices while they are in a bus or car, at a train station or airport, in a classroom, or at home. A recent study shows that the present generation of students embraces the use of wireless technology because it gives them more flexibility in accessing resources and more independence of classrooms, labs, and libraries (<http://www.ewh.ieee.org/soc/e/sac/meem/vol02iss02/MEEM020204.pdf>).

After the shooting tragedy at Virginia Tech, several studies suggested that campuses improve their emergency plans by taking advantage of mobile technology. The majority of students on campuses have

mobile phones. Campus and community officials are looking into how and to what extent, in case of emergency, a text message sent to cell phones could alert students and perhaps save lives. But cell phone communication on campus does not end with text messages. Other cell phone options—such as 911 emergency calls, GPS tracking, and photo transmissions—could be used by members of campus communities during an emergency.

How Is M-Learning Evolving?

Numerous studies have addressed the subject of m-learning in the past few years, especially in Europe. For example, in 2001 a three-year pan-European research and development program was launched, aimed at helping young adults aged sixteen to twenty-four who were considered most at risk of social exclusion in Europe (<http://www.m-learning.org/knowledge-centre/knowledge-centre.htm>).

In the United States, both the secondary school and the higher education sectors have widely adopted elements of m-learning technologies. In 2001, the University of South Dakota began issuing new students PDAs preloaded with calculators, reference books, course organizers, and word processors. MIT has used a PDA-based, peer-to-peer, augmented reality (AR) system to simulate a toxic spill on campus (<http://education.mit.edu/ar/>). Since 2003, Coastline Community College (CCC) has offered complete courses on handheld Pocket PC devices (http://military.coastline.edu/pocket_ed.htm). Some colleges and universities are giving incoming students iPods preloaded with campus registration forms, policies, maps, organizations, class schedules, and library hours. Many institutions are using MP3 technology to provide students with access to course information and lecture recordings: Duke University (<http://www.duke.edu/ddi/itunes/>); University of California at Berkeley (<http://webcast.berkeley.edu/>); Stanford University (<http://itunes.stanford.edu/>); UCLA (<http://oid.ucla.edu/webcasts/>); Purdue University (<http://boilercast.itap.purdue.edu:1013/Boilercast/>). Podcasting lectures and putting them in learning management systems (such as Blackboard), so that students can download them before class, has become a routine task for many faculty, in order to save class time for more discussion. Finally, organizations and societies are using m-learning as well. For example, the American College of Physicians offers learning content through its PDA portal (<http://www.acponline.org/pda/>).

Conclusion

Academic institutions benefit from m-learning in many ways: just-in-time/just-enough content delivery, integration with social networking tools and learning management systems, assessment tools, increased efficiency in the use of time as well as in productivity, and reduced/eliminated barriers to learning. Furthermore, m-learning helps attract young learners and keep them interested in learning.

Issues surrounding the cost of hardware and software are no longer major concerns. The cost of hardware (cell phones, PDAs, high-speed processors, storage) is falling, due to emerging technologies. The cost of software is also lowering, since most applications (such as LMSs) and social software tools are Web-based. As a result, m-learning is anticipated to face a major and steady growth within the next few years.

3D Printing: Turning Virtual Models into Hard Copy

The term *3D printing* refers to lower-cost technologies for producing individual physical copies of three-dimensional objects, using a mathematical model of the object represented in software. 3D printing is a type of three-dimensional rapid prototyping, or 3DRP, technology. There are a number of different types of 3DRP machines, which can produce models at various speeds and cost points. These machines build parts using a range of materials; some parts are relatively fragile, whereas others are as strong as those parts created using traditional manufacturing techniques. 3DRP serves as a bridge between the virtual world of computer-aided design (CAD) and the physical, three-dimensional world.

Generally, as noted, 3D printing starts with a three-dimensional model of an object expressed in a software program. In most cases, these models are created using CAD tools such as SolidWorks or Rhinoceros 3D (“Rhino”). However, models may come from other sources, such as an equation or set of equations, an environment built with Google SketchUp, or an immersive or game environment such as Second Life, the Nintendo Wii, or World of Warcraft. In each case, there is a three-dimensional virtual representation of an object, and the user wants to have a physical “hard copy” model that can be examined or used in the real world. Motivations for creating the hard copy include testing a design model, creating a

piece of art or jewelry, building a real part that can be used in a larger assembly, or simply better understanding the geometry of a complex shape in three dimensions. It is even possible to use a 3D scanner to copy a physical object and print the copy in another location, a form of “3D faxing” or “replicating.”

Why Is 3D Printing Important to Higher Education?

3D printing influences the higher education world in several ways:

- 3D printing allows a relatively inexpensive method of constructing three-dimensional models that illustrate difficult-to-understand concepts in disciplines such as mathematics, biology, and chemistry. The tactile nature of a three-dimensional model in a student’s hands offers a mode of understanding that is unavailable when viewing an image on a screen.
- 3D printing offers a new medium for artists.
- 3D printing serves designers, architects, and engineers by allowing them to quickly build three-dimensional models and test parts from CAD data.
- 3D printing has applications in research, development, and education, all of which use three-dimensional models.

How Is 3D Printing Evolving?

High-end 3DRP has existed for more than ten years and has been present in educational institutions since that time. The first generation of 3DRP equipment sold for more than \$100,000, required trained technicians, and used highly toxic materials. In the last five years, companies such as Z Corporation, Stratasys, and Objet Geometries have introduced 3DRP machines that sell in the \$15,000–\$50,000 range, are low in toxicity, and are reasonably easy to use. As these machines have moved from being complex lab equipment to something more like standard office machines, the term *3D printer* has become common to describe them.

The new generation of 3D printers represents an even more accessible form of 3DRP. Recent innovations have dropped the cost of the least-expensive current machines to about \$10,000. 3D Systems, a leading innovator in the 3DRP world, has announced the V-Flash Desktop Modeler for “home, school, or office workstations” at \$9,900. The V-Flash uses resin, cured by ultraviolet light. The system from Desktop Factory, a small start-up, welds nylon and aluminum layers with a halogen light and will be offered at \$4,995. There’s even a “build it yourself” kit, the Fab@Home, which requires only about \$2,000 in parts. And at least one company’s business plan calls for producing sub-\$1,000 printers within the next four years. All of these machines use relatively benign materials and can sit on a desktop in an office environment. Many observers expect to see an exponential growth in this technology in the next few years as it becomes widely available, analogous to the availability of low-cost personal computers and laser printers.

Conclusion

3D printing offers a new way to create objects, bridge the virtual and real worlds, and improve the understanding of difficult concepts, from mathematics to aesthetics. 3D printers can be found today in many engineering labs and design schools and scattered among other outposts in higher education. However, as these machines continue to become more effective, easier to use, and lower in cost, they will become common not only on campus but also in secondary schools. IT leaders would be well-advised to begin to understand the implications of this technology, which has the potential to grow quickly and to offer new educational and research opportunities as well as new support challenges.

Virtualization: Applications, Systems, and Beyond

In simple terms, *virtualization* refers to a layer of abstraction between the underlying hardware and any application or system that seeks to use that hardware. This is not a new concept. Early implementations included the Compatible Time-Sharing System (CTSS) developed by MIT on the IBM 700/7000 series in the 1960s.

These days, when people refer to virtualization, they are primarily concerned with hardware (server/desktop) virtualization. Hardware virtualization involves “host” and “guest” operating systems. There are several guest operating systems (Windows, Linux, Solaris) on a single host. This host could be

running either a “hypervisor” software layer (e.g., VMware, Citrix/XenSource) or an operating system (e.g., Virtuozzo, Solaris Containers) in which guest virtual machines reside. Other kinds of virtualization include application virtualization (the abstraction of the application from the operating system), storage virtualization (the abstraction of storage components from the operating system or network), and network virtualization (the existence of multiple virtual networks on top of a single physical network). It should be noted that there are several interpretations of these terms, and it would not be surprising if these differences continue to persist as this space evolves.

Why Is Virtualization Important to Higher Education?

The concept of a single piece of hardware hosting several virtual machines is attractive from a management, flexibility, and cost perspective. The first area to benefit from this technology is the data center. Within virtualized data centers, requests for new servers can be turned around in a much shorter time using predefined templates. Another benefit is the lower costs incurred for data center power, heat, and space allocation—lower costs that come via a reduction in the number of physical servers.

Hardware virtualization could be used in learning environments that need to offer customized desktops for different courses or organizational uses. Similarly, application virtualization deals with the abstraction of applications from the underlying operating system. An application and all its system modules can be encapsulated into a wrapper, then delivered to a client desktop that either does not have this application installed or has other applications that may conflict with it if it were installed locally on that desktop. A variation on this theme is application streaming, where the application resides centrally on a server but is streamed to the desktop temporarily or for a given period of time (e.g., Microsoft SoftGrid). The flexibility, manageability, and cost savings that can be gained from the use of these tools would be an asset for academic and research environments.

How Is Virtualization Evolving?

The use of hardware virtualization technologies (e.g., VMware, Parallels, Virtual PC) is widespread. With each new iteration, these implementations add features and become more manageable. VMware and Virtual Iron/Xen offer the capability to move virtual machines from one hardware node to another either ad hoc or based on performance or hardware issues. Similar feature commoditization may be seen elsewhere, with closer integration into existing management tools. Outside the data center, virtualization engines may make an appearance in major operating systems, both on desktops and servers. With the advent of chips that are specifically designed for virtualization—for example, Intel Virtualization Technology (Intel VT) or AMD Virtualization (AMD-V) chips—the paradigm of client-server computing may change. Desktops may be the mere containers on which the entire application environment is provisioned when needed—similar to thin-client computing. These technologies contribute to a change in the nature of the IT landscape.

Conclusion

Virtualization delivers a compelling use-case for academic institutions that struggle with delivering both commodity and customized applications to community members while providing for their hosting, administration, and disaster recovery needs. The rate of data generation at institutions continues to grow, and the repositories are often distributed. Institutions looking for new models to address application hosting, data storage, and data backup/archiving should consider a virtualization strategy. Such a strategy could allow for the tailoring of particular virtualization technologies to meet particular needs. There is no one-size-fits-all in this space. For example, databases may not be a good fit for certain hardware virtualization environments, based on their intended use. Challenges posed by these technologies include handling the proliferation of virtual servers, applications, and desktops and meeting the security and network connectivity needs associated with the environment. These concerns can be mitigated via existing tools and technologies and should not be viewed as game-stoppers.

The growth of data and the need for new services do not appear to be slowing. A virtualization strategy that takes into account the collective needs of the institution may greatly benefit the community as higher education transitions to a new way of allocating and managing IT resources.

Information Lifecycle Management and Physical Storage Technologies for Digital Preservation

A couple years ago, Galen Schreck wrote in “Building the 100-Year Archive”: “Although corporate and legal issues have recently brought data archiving to the light of day, the problems associated with preserving digital information are not new. Archiving for a few years is hard enough, but when requirements dictate that data be retained for longer, problems with media deterioration and technology obsolescence can seem insurmountable.”⁴

Digital preservation is the ongoing process of managing electronic data for continued access and use. Ensuring that access and usability over the long term—that is, longer than fifteen years—requires more than simply extending traditional print preservation practices to digital information or performing regular media backups. Digital preservation is a whole complex of roles and operations designed around the management of information for long-term accessibility and usability and is the outcome of an institution’s successful day-to-day management of its digital assets. This means consciously investing in the appropriate technologies and processes for retention and use over the entire lifecycle of the data.

To define a comprehensive strategy for digital preservation and information management, an institution must pay careful attention to its fundamental technical infrastructure, beginning with appropriate physical storage technologies as well as information lifecycle management (ILM) processes. In addition, legal compliance requirements are driving new standards for information retention and disposition.

Why Are ILM and Physical Storage Technologies for Digital Preservation Important to Higher Education? ILM and the preservation of digital content are critical, emerging aspects of higher education’s stewardship responsibilities. Digital content permeates every aspect of the academic enterprise and includes both scholarly content (e.g., research papers, syllabi, experimental datasets) and administrative content (e.g., enrollment data, financial data, personnel records). This information is not only critical to current operations; its long-term accessibility and usability is necessary to ensure administrative integrity and to meet institutional responsibilities as stewards of intellectual and cultural heritage.

In addition, legal compliance requirements such as HIPAA, FERPA, Gramm-Leach-Bliley, and PCI-DSS (Payment Card Industry Data Security Standards) are forcing higher education institutions to deal with new standards for record keeping, records retention, information security, and privacy protection. And although Sarbanes-Oxley rules for legal discovery of documents (e-discovery) do not currently apply to colleges and universities, these rules reemphasize principles for oversight and best practices for financial operations.

ILM and physical storage technologies for digital preservation are rapidly evolving areas that are beginning to address long-term preservation needs as well as daily operational requirements in a cost-effective fashion. The implications are of critical importance for campuses today.

How Are ILM and Physical Storage Technologies for Digital Preservation Evolving?

How do you store, organize, and access 100 million things over the long term? Trying to answer this question raises issues of performance scaling, data organization, search capabilities, reliability, availability, costs, and technology refresh. It also highlights the critical conceptual differences between *backup* information can change over time and seeks to automate methods to manage, retain, and migrate information as its value changes.

Fundamental to any ILM strategy is the practice of information classification, which is the process of assigning value to information associated with a business process in order to produce requirements for the management of this information. Classification can be based on a variety of activities including records management, document/content management, knowledge management, security and privacy, disaster recovery, and storage management. Information can also be classified based on the application used to create it, on metadata such as file attributes and access patterns, or on content using indexes, lexicons, and taxonomies.

Conclusion

Offering continued access to digital content is fundamental to an institution’s fulfillment of its mission as an administrative entity, as a custodian of the record of scholarship, and as a creator of new knowledge. As the volume of information to be managed has increased, and as the requirements for accessing and using

that information over longer and longer periods of time have come into sharper focus, changes in ILM and physical storage technologies for digital preservation have started to give institutions a stronger basis for developing realistic approaches to managing that content in ways that will make possible new practices of scholarship and teaching in the digital academy and new business services that will continue to support the needs of the institution—well into the twenty-first century and beyond.

Notes

1. AIR was formerly code-named Apollo.
2. At the time this article was written, Google had just announced Google Gears, a DRE-like browser extension allowing some Web applications to run without an Internet connection. Similarly, Facebook announced Facebook Platform, a development and runtime environment for Facebook applications.
3. “Transcript: Bill Gates and Steve Jobs at D5,” May 31, 2007, <<http://d5.allthingsd.com/20070531/d5-gates-jobs-transcript/>>.
4. Galen Schreck, “Building the 100-Year Archive,” *Forrester.com*, August 24, 2005, <<http://www.forrester.com/Research/Document/Excerpt/0,7211,36239,00.html>>.

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Microsoft Vista Keyboard Shortcuts

Save time with Keyboard shortcuts.... (Windows vista)

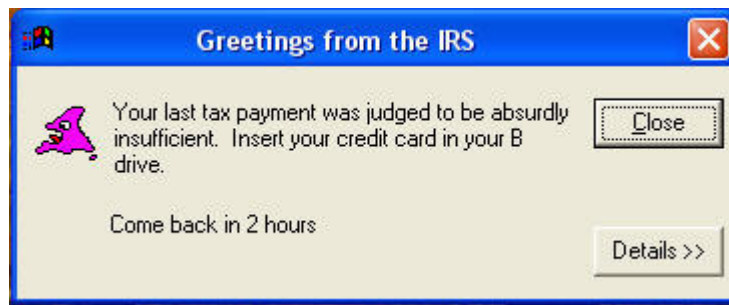
Windows Key Shortcuts	
Windows logo key	Open or close the Start menu
Windows logo key + #	Launches shortcut in Quick Launch with the position corresponding to the # entered. (eg. Winkey + 1 to launch first item in quick launch menu)
Windows logo key + BREAK	Display the System Properties dialog box
Windows logo key + D	Display the desktop
Windows logo key + M	Minimize all windows
Windows logo key + SHIFT + M	Restore minimized windows to the desktop
Windows logo key + E	Open Windows Explorer navigated to Computer
Windows logo key + F	Search for a file or folder
CTRL + Windows logo key + F	Search for computers
Windows logo key + L	Lock your computer
Windows logo key + R	Open the Run dialog box
Windows logo key + T	Cycle through programs on the taskbar

Windows logo key +TAB	Cycle through programs on the taskbar by using Windows Flip 3-D
CTRL+Windows logo key +TAB	Use the arrow keys to cycle through programs on the taskbar by using Windows Flip 3-D
Windows logo key +SPACEBAR	Bring all gadgets to the front and select Windows Sidebar
Windows logo key +G	Cycle through Sidebar gadgets
Windows logo key +U	Open Ease of Access Center
Windows logo key +X	Open Windows Mobility Center
Login Screen Shortcuts	
ALT+S	Power Menu
ALT+W	Switch user
Arrow keys	Navigate between user tiles
Security Screen Shortcuts	
ALT+K	Lock machine
ALT+W	Switch user
ALT+L	Log off
ALT+C	Change Password
ALT+T	Task Manager
General Shortcuts	
CTRL+C or CTRL+INS	Copy
CTRL+X or SHIFT+DEL	Cut
CTRL+V or SHIFT+INS	Paste
CTRL+Z	Undo
CTRL+Y	Redo
F1	Help

CTRL+SHIFT while dragging an item	Create shortcut to selected item.
CTRL+SHIFT with any of the arrow keys	Highlight a block of text.
CTRL+RIGHT ARROW	Move the insertion point to the beginning of the next word.
CTRL+LEFT ARROW	Move the insertion point to the beginning of the previous word.



Computer Humor



Program	Version	Name	E-mail	Phone
WORD	Ver. 2002 SP-1	Maurice Sarles	maurices1931@bigfoot.com	685-7263
	2000	Carl Christiansen	arlchristiansen@bellsouth.net	692-7273
Excel	Ver. 2002 SP-1	Maurice Sarles	maurices1931@bigfoot.com	685-7263
	2000	Carl Christiansen	arlchristiansen@bellsouth.net	692-7273
Front Page		Ray Pierce	repierce@brinet.com	697-7732
Dreamweaver		Jerry Liedl	jerry@liedl.org	692-4855
Quicken		Jim Bailes	jimbailes@highstream.net	693-6990
Photoshop		Chris Ring	eykonic@yahoo.com	685-9031
Imaging in general		Chris Ring	eykonic@yahoo.com	685-9031
Family Tree Maker	v-10	Maurice Sarles	maurices1931@bigfoot.com	685-7263
	2005	Bill Muller	muller1938@yahoo.com	684-6899
Roots III		Maurice Sarles	maurices1931@bigfoot.com	685-7263

Personal Ancestry File		Maurice Sarles	maurices1931@bigfoot.com	685-7263
Installing/setup Windows XP		Chris Ring	eykonic@yahoo.com	685-9031
Installing/setup Windows 2000		Chris Ring	eykonic@yahoo.com	685-9031
Installing/setup LINUX		Chris Ring	eykonic@yahoo.com	685-9031
Building Computers		Chris Ring	eykonic@yahoo.com	685-9031



HACS News

November is the time to elect our officers for 2008!! The slate of officers reported to you by the Nominating Committee for 2008 is:

President- Joy Capps
Vice President- Lamar Miller
Secretary – Maurice Sarles
Treasurer – Jim Bailes

November is the time for you to shine!! It is **“Tips, Tricks and Issues”** month. This is the time for all of us to share our favorite **TIP or TRICK** that we use for the computer or raise an **Issue** we need to address. Send yours to me (jerry@liedl.org) and we will integrate them all into a PowerPoint show and you get to explain yours as it comes up. So, let’s see what we can generate. Do not hold back because you think everyone knows it. Most likely they do not and we all can learn from each other.

SIGs for 2008??? We want to try having the SIG group topics change every few months. What do you want to see addressed and who should lead the sessions? Some ideas have been to run Turbo Tax/ Tax Cut SIG for the first part of the year and perhaps go to Vista for a few months or Image Processing software. Get your input into the cue and jump in to lead a SIG group.

We are still looking for volunteers to offer help on specific software applications (when we published the “A:Prompt” there were people listed for a variety of programs and one could contact them via phone and/or e-mail) We would like to have such a list on the member’s only part of the web site and published it in the newsletter. This is a way to share our collective knowledge. **Send the information of what software you would be willing to be a resource person. Send it to jerry@liedl.org**

Member Profiles (NEXT?)

Still looking for someone to fill this void!



HACS Officers/Executive Committee

President - Jerry Liedl - jerry@liedl.org
 Vice-president – Jack Sokol docsok225@bigfoot.com
 Past-president – Brian Fifield - brian@cyberclix.com
 Secretary – Joy Capps - joycapps@tds.net
 Treasurer – Jim Bailes - jimbailes@highstream.net
 Public Relations – Fred Haddad - f.haddad@mchsi.com
 Program Committee – Interim chair is the Vice President
 Membership – Interim chair is the Treasurer
 Door Prizes – Bill Muller - muller1938@yahoo.com



THE **END**