ITS e-News
Information & Technology Services at the Rochester Institute of Technology

Internet2 Middleware and ID Management Leader to Speak at RIT Tech Seminar February 13

Keith Hazelton *to Discuss ID Management Technical Challenges and Current Network Authentication Trends*

Professor Keith Hazelton will present **"Identity and Access Management: Attaining the Promise, Navigating the Perils"** on **Tuesday, February 13 from 10 a.m. to noon at the Golisano College Auditorium**.

Hazelton is IT Architect at the University of Wisconsin-Madison. He will discuss understanding middleware technology and his work with services such as identification, authentication, authorization, directories, and security. Specifically, he will highlight:

- what makes identity and access management crucial and timely;
- models, roadmaps and resources for planners;
- extending your reach with identity federations.

The Internet2 Middleware Initiative (I2MI) promotes standardization and interoperability. The group is working toward the deployment of core middleware services at Internet2 universities, such as RIT.

The presentation is open to faculty, staff and students as well as off campus guests from area colleges and alumni from area IT organizations. The seminar is free and participants can register at http://www.rit.edu/its/events.

Hazelton is a member of the Internet 2 Middleware Architecture Council for Education (MACE), chair of the MACE-Dir Working Group, and a member of the Net@Edu PKI Working Group sponsored by Internet 2 and Net@Edu. Some of his previous presentations that might be of interest:

Campus Middleware in the Service of Science

Shibboleth: Linking Campus and Grid Infrastructures (PDF)

Microsoft Vista and Office 2007 Information and Support Available

By Kristi Ziehl, ITS Project Manager, kristi.ziehl@rit.edu

Microsoft has released Windows Vista along with Microsoft Office 2007. ITS, in collaboration with other RIT system administrators, has been testing the operating system (Beta and final release version) for several months. The main purpose of this effort has been to identify areas of potential impact to the RIT computing environment, conduct tests on the suite of supported applications, and document compatibility issues, and list applications that are not currently supported by Windows Vista.

In short, we are excited about Windows Vista and Office 2007 and expect that it will be a welcomed addition to the RIT computing environment. The question is when and on what computers? We anticipate the adoption will steadily increase with a majority of adopters being people with newly-purchased computers.

More information about Vista and Office 2007 can be found at: http://www.rit.edu/its/initiatives/vista.

Avoiding the Botnet Snare

By Ben Woelk, Information Security Office, ben.woelk@rit.edu

Introduction

"Why would anyone attack my computer? I don't have anything of value on it."

We hear this many times in the Digital Self Defense classes presented by the Information Security Office. Most attendees are aware of attacks from the Internet and are familiar with spam, phishing, viruses, etc. However, many attendees don't understand that their computers can be targeted in an attack.

Of the many types of malware (malicious software) attacks, one of the most serious is someone installing remote control software that allows them to install and run automated programs, making your computer into a *bot* or *zombie computer*. http://en.wikipedia.org/wiki/Botnet

Your computer becomes part of a bot network controlled by a *bot herder*. The bot herder can use your computer to conduct distributed-denial-of-service (DDoS) attacks, send spam and phishing email, and attack other computers. This article provides information on what bots are and how you can prevent your computer from becoming one.

Trends

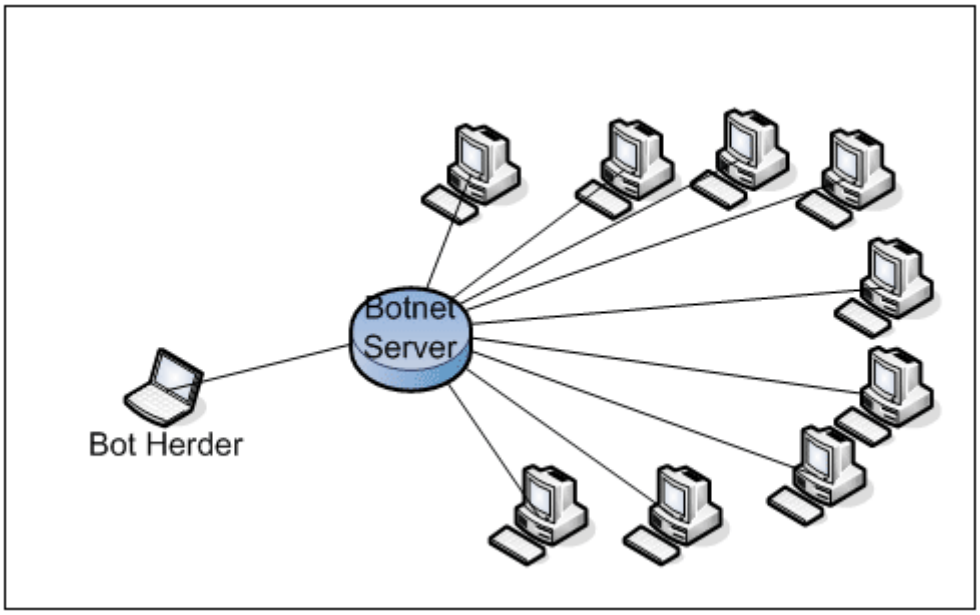
2006 has been described unofficially as the "Year of the Bot." Millions of computers are members of botnets—4.7 million according to the 2006 Symantec Internet Threat Report. Other estimates range as high as 7% of all computers (approx. 47 million.) Typically, bot networks

may contain as many as 80,000 computers. (There were even reports of a Dutch botnet of 1.5 million computers!)

How does it work?

Although bot methodology is evolving, the classic bot scenario is shown below:

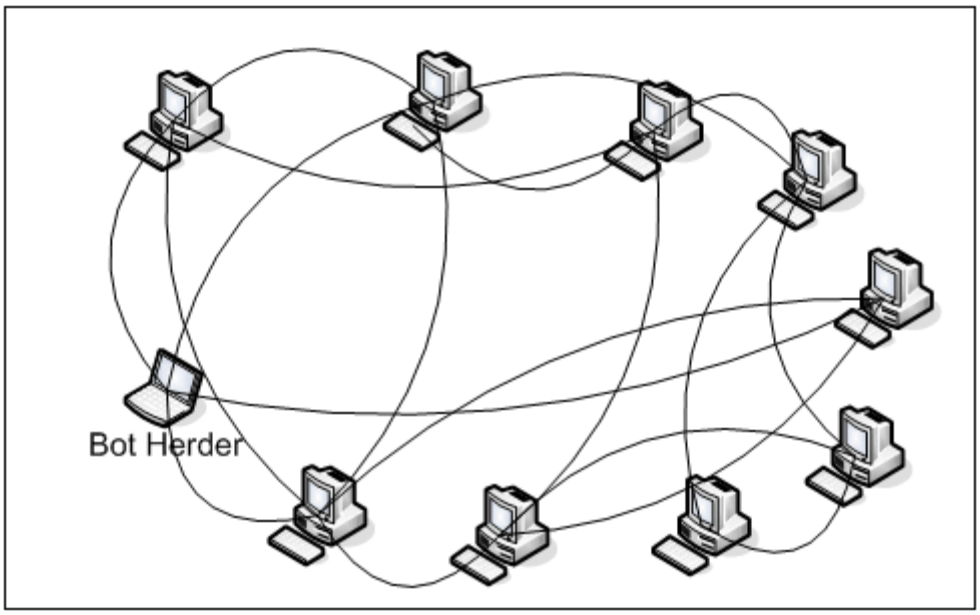
Typical Bot Network



IRC (Internet Relay Chat) has been the classic means of communications in bot networks. In this type of network, it is easier to shutdown the bot controller because communications would be easier to track back to their source.

Most recently, there are examples of bots using P2P (peer-to-peer) communications—"bots talking to bots". This creates a decentralized structure which is much harder to shutdown.

P2P Bot Network



How do I know if my computer is part of a bot network?

Unfortunately, there is no easy way to tell. You may notice unusual activity if you leave your computer on, you may be contacted by your Internet service provider (ISP), or you may find that your computer is quarantined/blocked from the campus network.

If you are following the requirements of the Desktop Standard and you have run a virus scan and a spyware scan with no reported infections, it is likely that your computer is not part of a botnet. Follow the steps below to make sure you don't become part of a botnet.

Protection

The key to preventing your computer from becoming a bot is to use a combination of technical and process protections. You'll need to make sure you've got the right software enabled and you may need to change the account you use to check email or browse the Internet. Here's what you can do to protect yourself against bots:

- Don't use your administrative account for daily activities
    - Use A Limited User Account instead. A limited user account is a special type of account that does not allow the user to install software or make system configuration changes. If you browse the web using a limited user account and accidentally visit a malicious web site, no software can be installed without your permission because your user account is not capable of installing software. To learn more, visit http://security.rit.edu/dsd102.html and select either the "limited account" simulation or handout.
- Follow the requirements of the Desktop Standard (http://security.rit.edu/articles/desktopstandard-plain_english.pdf). These requirements provide a "defense in depth" which will protect your computer against a variety of attacks.

- Install **antivirus software**, keep it up to date, and scan your system at least weekly. RIT provides McAfee antivirus software free for both home and campus use at (www.rit.edu/its/services/security/). Make sure you turn on its auto-update feature.
- Make sure the Operating System (Windows, Macintosh, Linux, etc.) is **up to date with its patches** and has **auto-update** turned on. The average time between the discovery of a vulnerability and the availability of instructions to exploit it is now less than seven days.[1]
- If it is available, install software that provides **Buffer Overflow (memory) protection**. McAfee 8.5i antivirus software for Windows has built-in Buffer Overflow protection. (Buffer overflows are one of the most common attacks.)
- Use a **personal firewall**. Firewalls protect you from outside intruders and also can prevent programs on your computer from inappropriately connecting to the Internet
- For RIT-owned or leased computers, contact ITS to get McAfee Firewall.
- For personally-owned or leased Windows computers, a good choice is ZoneAlarm (www.zonealarm.com)
- Macintosh users can use the built-in firewall in OSX.
- Linux users should choose an appropriate firewall.
- A hardware firewall can also be used to protect desktop computers.

Use **anti-spyware** (where available). Spyware sends personal information to other people without your knowledge. For Windows, Spybot Search & Destroy (www.safer-networking.org) and Ad-Aware (www.lavasoft.de) (free for personal use only) are good choices. You will find that it is best to use more than one product. You can also use products from reputable vendors such as Microsoft, McAfee, Symantec, and Javacool Software. (Be careful of downloading other anti-spyware products. Some of them actually install spyware on your computer.) Researchers estimate that 89 percent of home computers are infected with multiple instances of spyware, averaging about 30 spyware components each.[2]

[1] "State of Spyware Q2 2006" Webroot Software Inc.

[2] Symantec's *Internet Threat Report, July 1, 2005 to December 31, 2005*

Macworld San Francisco 2007

Apple Computer Showcases iPhone and Shift in Company Focus

By Reid Blondell, Mac/PC technician, NTID, rebncs@rit.edu

Apple Computer, Inc. is a much different company than it was a few years ago. In recent memory, Macintosh computers were portrayed as overpriced machines only justifiable for graphics professionals. Their long-established ease-of-use did little to sell computers, even in longtime strongholds like higher education, when compared to other reputable brands with excellent service which offer their computers at undeniably lower purchase prices.

Apple needed to remind computer users why a Macintosh was a good choice. The start of that was bringing back co-founder, Steve Jobs. Within months of his return, Apple introduced the iMac, a whole computer system in one box. This was back-to-basics for the Macintosh line. The original Macintosh computer introduced in 1984 was very similar in concept. The iMac was well received but it was not enough.

Enter the iPod. Apple's iconic music player needs no description here. Initially, the iPod only worked with Macintosh computers. The angle was to entice people to buy Macintosh computers by adding an advantage to owning one. The original iPod was also well received but when later models were made to work with Windows-based computers as well, Apple and iPod became household names. Suddenly, everyone knew of Apple as a creator of an innovative and easy to use product – and had the opportunity to try one without buying a new computer.

The results speak for themselves. Apple has gained not just a definitive majority of portable music player sales, but a massive number of consumers who now recognize their brand. This has lead to a significant number of people buying Macintosh computers that had never owned one before. But it has also shifted Apple's business strategy. Steve Jobs hammered that point home when he announced that Apple was officially dropping the word "Computer" from the company's name. Apple is now officially "Apple, Inc."

The shift in focus was obvious in Jobs' keynote address at Macworld this year. While he mentioned the Macintosh, it was in the context of the success of the recent transition to Intel processors, and that there were great things coming for the Macintosh this year. This was within the first four minutes of the two-hour presentation. Then, Jobs quickly said, "And that's all we're going to talk about the Macintosh today."

The "AppleTV" was formally introduced and demonstrated. It is intended as the ultimate interface between your digital media (photos, video, and music) and your home entertainment system. A prototype had been demonstrated in September and the final version looks very similar. Any media you have on your home computer will synchronize with the AppleTV automatically. If you have a home network with wires running between your computer(s) and other devices, it will use that; it can also connect using wireless networking. Like the iPod, it will work with both Macintosh and Windows computers. It also allows you to easily view or listen to media on a friend's laptop they might bring by, if they have it loaded into iTunes. (iTunes is available for free from apple.com)

Next, Jobs went on to introduce the iPhone. The iPhone combines a cellular phone, an iPod, and Internet capabilities, into one device. It takes the workspace, with pictures (icons) you interact with in a way that the average person understands without training, from the desktop to a handheld device. Most cell phones have icons to tell you what menu option you are selecting. The iPhone actually takes the icons you are used to using on your desktop and puts them in your hand. The iPhone will not be available until June, costs $499-$599, and requires a two year contract with Cingular (AT&T).

The iPhone runs a version of Mac OS X, and thanks to that and an incredible engineering effort by Apple, it looks to be an amazing device. It has sensors that let it know whether you are

holding it vertically or horizontally, and its display changes accordingly. It also only has one button on its face. The rest of the controls, including the keyboard, are accessed via its touch-sensitive screen. One of Apple's innovations here is the ability to zoom in and out using a natural gesture of "pinching" or "stretching" using two fingers on the touchscreen.

The iPhone can be used for web browsing. It is also capable of accessing your email using the IMAP and POP protocols, which are supported at RIT. Although IMAP is not as responsive as you may be familiar with when using Entourage or Outlook on your computer on campus, it is quite usable. Since the iPhone and its final details are not yet available, RIT cannot make an official statement on how fully its use will be supported.

The keynote speech by no means represented the depth of activity at Macworld. The rest of the Macintosh community had much more on their mind than consumer devices. There were five days of educational sessions directly focused on Macintosh computers, including everything from helping those who maintain many Macintosh computers on campus to do so more effectively, to taking better digital photographs.

There were hundreds of vendors on hand to show off their latest products and answer questions about them. All of the big names were there, such as Adobe, Epson, Microsoft, and Xerox. One day is nowhere close to enough time to see all of the vendors, but if you take advantage of all of the educational opportunities available at the conference, you get about that much time to walk the show floor. The best part is that you can pick and choose your own experience, and there is something for everyone.

Commentary:
College Campuses Become Breeding Grounds for Shifting Technology Culture

By Donna Cullen, ITS Computer Policy Analyst, Donna.Cullen@rit.edu

Culture or civilization, taken in its wide ethnographic sense, is that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society.[1]

Adults, powerful companies, governments, parents, teachers and other "top dogs" expect to set the trends and have others follow. Our school systems, advertising, legislation, political parties and policies are modeled within the tenets of top down culture. Niche markets, political parties, fashions – often influenced by smaller groups - appear and fade with minimal impact on the culture.

Enter the 28% of American who are ages 10-29 (US Census, 2004). Perhaps one of the biggest culture shocks in history is happening now. This group of Americans is the population who is in, about to enter, or just leaving university. Some 80% of these students are from families with only 1-2 children at home. For these students, nearly 60% experienced a home where they could be home alone from 3:30-5:30 pm.

For a growing percentage of college students, what they know about technology is largely learned outside the traditional classroom. They learn from their experts – peers, people they meet on the Internet, and Google. How, when, and where they use technology is dictated not by the people who create the technology or the content providers. Why?

Witness the traditional technology culture. You were "hooked up" if you carry a pager (or two), a laptop, and a cell phone – and travel to home or some other outfitted area to watch a movie, TV or listen to music. You are comfortable with a separate device for each purpose – at least until you can no longer manage to tote around all the items you need to stay connected. The technology is actually driving what you can do and how, when, and where you use it.

Make the shift to today's student. Your relationships are with the people you are with each day *and* with a host of people you have met through electronic mediums such as Facebook. A large portion of your communication is carried out electronically, often in broken English or "blog-speak". Your information for where to eat downtown, how to download music and what is legal/ethical online is often from the website or blog of someone you do not know. You can find "soul mates" and diversity from a population that resides anywhere the Internet reaches. You do not need to depend on a parent, corporate giant, mentor for information or instruction – in essence you are empowered. Technology is the means to your ends. You expect it to be fast, easy and integrated. You want TV, movies, music, content, friends, and even family to be integrated into your pocket device.

The impacts and challenges are evident on campuses. An astonishing array of resources is available to a student. A challenge that college campuses, including RIT, are seeing is the gap between technical prowess and what I term "ethical intelligence." Provided with the technological means for probing the Internet, duplicating media (music, video, TV, etc.) and creating and obtaining information outside the influence of guidelines or ethical decision making is a breeding ground for innovation and creativity as well as what could be seen as a "civil war" in the making.

The most commonly seen example on college campuses is the "war" between copyright holders and the people who are sharing music, movies, software and TV shows. College students come to campus with five or more years of unbridled access to whatever media they could find on the Internet. Under the scrutiny that copyright holders apply to university settings, these behaviors have the potential to call attention to the illegal use of copyrighted material. Some portion of the student body knowingly engages in civil disobedience, as did the students of earlier generations who protested segregation and the war in Vietnam.

I argue that there is no fundamental truth in this situation. There are the facts. A student does not hold the copyright, the student is sharing the material and the law protects the rights of the copyright holder. The law requires universities to respond to notices of violations in an expeditious manner. The emerging fact is that the purchasing power of the 28% of the American population between 10 and 29 is likely to influence what is considered the "truth" about copyright.

To take this example further, the culture of the American college campus is in the process of being "rocked" by seemingly the first generation in which the experts are in many cases younger than their mentors. The traditional mentors with vast experience do have as much to offer this generation of college students. Repackaging material in forms understood by the student or in a manner that addresses their fundamental needs for relationships, relevance and integration is more likely to breed success. Colleges that are poised to offer variety, diversity, tools, and resources packaged for the emerging culture are experiencing a phenomenal learning curve in the process of achieving success.

Change is not for the faint at heart. There is the bleeding edge for those attempting to change the culture and those attempting to keep it the same. I expect, for example, there will be a host of students who are subjected to subpoenas and fines based on their Internet behavior. There will be corporate media giants that will lose customers and ultimately lawsuits. In the end, the laws will adjust to what culture deems is just. Markets will reflect the demands of the customer. And not for the first time, the university will take on the role of hosting the stage where the battle was initially fought.

From these "civil wars" emerge universities that are the centers of learning and growth. We are indeed privileged to witness the civil unrest for it is in such a forum we learn and grow.

[1] Arnold, Matthew. 1869. Culture and Anarchy. New York: Macmillan. Third edition, 1882.

Commentary:
Grid Computing Initiatives Launched

RIT Hosts NYSGrid Participants for Quarterly Meeting

By Michelle Cometa, ITS Administrative Services, macits@rit.edu

"Not only is the time ripe for a coordinated investment in cyberinfrastructure, progress at the science and engineering frontiers depends upon it." NSF's Cyberinfrastructure Vision for 21st Century Discovery, July 2006

RIT is part of the NYSGrid, a consortium of New York State universities and educational organizations established to build and share high performance computing capabilities across the state. This article is an overview of the recent consortium meeting at the RIT Inn & Conference Center and the steps the group is taking to harness the collective computing power at colleges and universities for scientific research.

Interspersed with the meeting news are excerpts from the National Science Foundation's (NSF) recent White Paper, *NSF's Cyberinfrastructure Vision for 21st Century Discovery* delivered in

July, 2006. Also added are excerpts from a recent presentation by NSF Director Arden Bement entitled *Cyberinfrastructure: The Second Revolution.*

The big picture vision proposed by the NSF is being met by the NYSGrid founders; this ITSeNews article details some of the directions and plans for this newest state computing environment to be made available, as one founding member said, "for scientists to do great science."

"NSF's Cyberinfrastructure Vision for 21st Century Discovery"

I. DRIVERS AND OPPORTUNITIES

How does a protein fold? What happens to space-time when two black holes collide? What impact does species gene flow have on an ecological community? What are the key factors that drive climate change? Can we create an individualized model of each human being for personalized healthcare delivery? These questions – and many others – are only now coming within our ability to answer because of advances in computing and related information technology. Once used by a handful of elite researchers in a few research communities on select problems, advanced computing has become essential to future progress across the frontier of science and engineering. Coupled with continuing improvements in microprocessor speeds, converging advances in networking, software, visualization, data systems and collaboration platforms are changing the way research and education is accomplished.

In the arena of grid computing, the latest in sustained performance belongs to those who can control, and share, *teraflops* and *petaflops*. While these may sound more like terms for the latest in designer beachwear, they refer to the remarkable volume of shared computing power that is inherent in the grid computing world.

At the recent NYSGrid meeting, the developers of the newest entrant into grid computing consortia gathered to refine further how this integrated resource will be used across the state. More than 50 participants from universities in New York State met to continue work on building the sophisticated and interconnected network of computers "for scientists to do great science," said Dr. Russ Miller, Executive Director of the NYSGrid and current Director of the Center for Computing Research (CCR) at the University of Buffalo (UB).

There are a lot of computing resources around New York State such as high performance computing clusters, sensors and electron microscopes, Miller added as well as the need for high end, super-computing functions. Four months ago, at a meeting at Rensselaer Polytechnic Institute, the NYS Grid Computing Consortia was established. The goal of the NYSGrid is to develop a "computational infrastructure to enable world class science – and make it easy to do that." (Science to Miller and the NYSGrid participants is used in the broadest sense to include research and scholarship.)

The NYSGrid consists of 21 universities and several educational and/or research organizations, including those listed here. Each has agreed to devote resources to share in a state-wide grid.

SUNY Albany	SUNY Binghamton
SUNY Stonybrook	SUNY Geneseo

Columbia University	Cornell University
Niagara University	New York University
Syracuse University	Marist College
Rochester Institute of Technology	Rensselaer Polytechnic Institute
Univeristy of Rochester	Brookhaven National Laboratory
Internet2	NYSERnet
Open Science Grid	National Lambda Rail
Cornell University - Weill Medical College	Hauptman-Wodward Medical Research Institute
Memorial Sloan-Kettering Cancer Center	

"NSF's Cyberinfrastructure Vision for 21st Century Discovery"
Today's scientists and engineers need access to new information technology capabilities, such as distributed wired and wireless observing network complexes, and sophisticated simulation tools that permit exploration of phenomena that can never be observed or replicated by experiment.

While hardware performance has been growing exponentially – with gate density doubling every 18 months, storage capacity every 12 months, and network capability every 9 months – it has become clear that increasingly capable hardware is not the only requirement for computation enabled discovery. Sophisticated software, visualization tools, middleware and scientific applications created and used by interdisciplinary teams are critical to turning flops, bytes and bits into scientific breakthroughs. The exploration of new organizational models and the creation of enabling policies and processes are also essential. It is the combined power of these capabilities and approaches that is necessary to advance the frontiers of science and engineering, to make seemingly intractable problems solvable and to pose profound new scientific questions.

Grid Computing 101

But what is grid computing and how does it differ from clusters of computers often found in colleges and corporate settings?

What makes grid infrastructure that much more powerful is the interconnectedness of some of the most powerful computer systems, made available, often from a distance. The scientist working at his or her desktop computer can command multiple dual processor nodes and gigabytes (or more) of computing power to 'crunch numbers' - the impossibly large data sets that make science today more than single test tubes and Petri dishes. As is often the case, the megabyte options have been replaced by petascale terminology – sustained computer speeds 10^{15} operations per second (petaflops).

"***Cyberinfrastructure: the Second Revolution"***
Like other infrastructure — the electric power grid, the national highways — cyberinfrastructure combines complex elements to create a dynamic system. It eclipses its many hardware and software components to enable people and their interactions with technology to become the

central focus. At the heart of the cyberinfrastructure vision are cultural communities that support peer-to-peer collaboration and new modes of education. They are distributed-knowledge communities in an institutional context, not of bricks and mortar like the traditional university, but rather virtual organizations that work across institutional boundaries — and ultimately around the globe.

To create and use cyberinfrastructure, learning and work-force development initiatives will be the most important requirements.

The power of cyberinfrastructure to enhance education and provide new learning opportunities is such an expansive and beneficial feature that we must be sure to create the conditions for synergy between research and education from the outset. That means that developing these strategies at the very core of our cyberinfrastructure enterprise, rather than as an afterthought, is critical.

“You can connect the computers but they all have to work together,” said Miller in his opening address to the NYSGrid participants. “All the computers on the grid have to work together, thus the need for the glue, or middleware.”

The prerequisite for grid computing is the ability to connect multiple computer processors at several locations, by way of integrated software that allows all the computers to ‘talk’ to one another in a concerted way.

Today, the main gateway for the NYSGrid can be accessed through a link on the consortium’s new website. The resources have, to date, been centrally managed by SUNY Buffalo and the Center for Computing Resources. Scientists can log into the NYSGrid system, through a web-based portal, authenticate and begin their work. Through the portal they are connected to resources by way of established templates listing available hardware and software packages needed to process large-scale data sets. As the NYSGrid is opened to the broader community, and the grid infrastructure grows, the NYSGrid leadership expects central management to be shared across the universities participating and to include a refined intake process, job scheduling and increased storage capacity.

RIT, New York State and the NYSGrid

The NYSGrid, at four months old, is well on its way to being a strong player in the grid computing arena. Already established grid consortia such as TeraGrid and Open Science Grid have been offering scientific resources for the last several years. Today, with the growth of the NYSGrid, computing resources will be available closer to home and offered by some of the top technology universities in New York State. “Are we ready,” one participant asked at the meeting. A resounding "Yes," came the answer.

Contributions for this article came from Diane Barbour, Chief Information Officer at Rochester Institute of Technology and members of the Communications Working Group of the NYSGrid Consortium

The educators and researchers of the state will have some of the best computing resources, literally at their fingertips. For more information about grid computing and the NYSGrid, check out these web sites:

http://www.nysgrid.org
http://www.rit.edu/~rc

National Science Foundation – Cyberinfrastructure Vision for the 21st Century Discovery
http://www.nsf.gove/od/oci/ci-v7.pdf

Chronicle of Higher Education: 1/5/07 issue – Cyberinfrastructure: the Second Revolution (subscription required)

SUNY Buffalo – Center for Computing Research & NYSGrid Information – general
http://www.ccr.buffalo.edu/grid/content/nysgrid.htm