From the Office of the Vice President for Information Technology

THE IT CONNECTION

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High-performance computing

BlueRidge is Virginia Tech's latest and largest computing asset. This Appro GreenBlade cluster was ranked in the Top500 list, the industry-standard ranking of the world's 500 fastest supercomputers. Its measured 86.3 teraflops—86.3 trillion floating point operations per second—is more than eight times the computing power provided by System X, which put Virginia Tech on the supercomputing map in 2003.

BlueRidge has 318 nodes (individual computers), each outfitted with two octa-core Intel Sandy Bridge central processing units (CPUs) and 64 gigabytes of memory. In addition, five nodes are equipped with 128 GB of memory for jobs that are especially memory intensive. The system-wide totals of 5,088 cores and 20.4 terabytes of memory are two and a half times as many cores and four times the memory of any other system at Virginia Tech. BlueRidge is also the first Sandy Bridge cluster at Virginia Tech. Sandy Bridge CPUs have the ability to do twice the number of double-precision computations in a single cycle as their predecessors, Intel Westmere CPUs.

By running massively-parallel simulations, Virginia Tech researchers will be able to tackle more complicated problems more quickly than they have before. And the system's huge memory footprint will enable faculty to investigate the kinds of big data subjects that are increasingly the focus of attention in computationally intensive arenas.

Along with HokieSpeed, a GPU cluster (a graphical processing unit cluster), and the shared-memory system HokieOne, BlueRidge provides researchers with options to address specific computing requirements arising from an array of research areas. The Advanced Research Computing website provides updated information on enhancements to these systems and news on current research (www.arc.vt.edu).

Hazard Mitigation

The Flood of 1943 (pictured at left) is just one of the events that have had an impact on campus. Natural disasters—tropical storms, droughts, forest fires, tornadoes, or winter storms—and emergencies caused by hazardous materials spills, power failures, resource shortages, criminal acts, and environmental contamination all have the capacity to impair the university's operations. Urban development in flood-vulnerable areas, industrial expansion, traffic congestion, and the widespread use and transport of hazardous materials are among the reasons that such vulnerabilities are increasing.

The Center for Geospatial Information Technology (CGIT) and the Office of Emergency Management secured federal funding to develop a new multi-hazard mitigation plan. In keeping with federal guidelines that emphasize using the best available data for this plan, CGIT used data from Facilities Services, the Virginia Agency Property System, FEMA's Flood Insurance Rate Maps, and historical hazard records, such as the National Climatic Data Center's storm event database. These records were supplemented with information specific to Virginia Tech through meetings with university officials, existing reports and studies on hazards, and other sources, such as aerial imagery and newspaper archives. CGIT compiled additional maps and databases.

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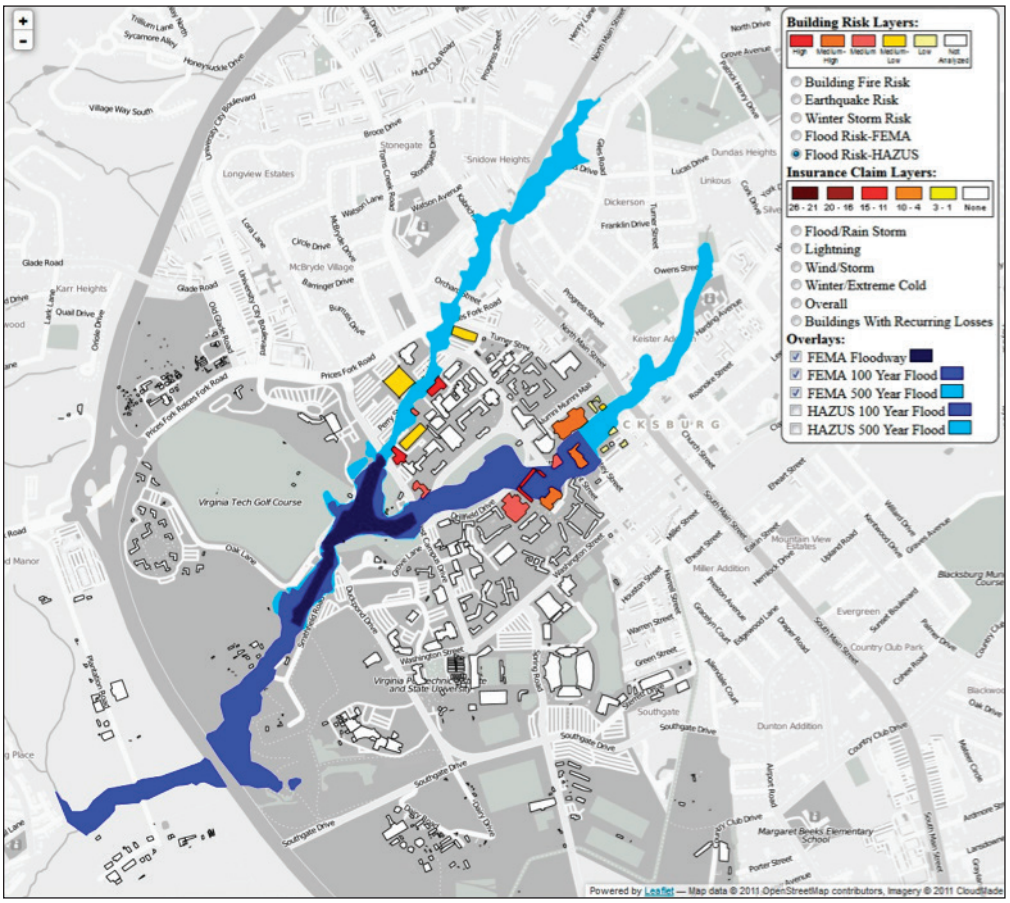


This new map displays the floodway, the 100-year floodplain, and the 500-year floodplain (shown in blue hues) as well as the flood risk analysis results for campus buildings in or near a floodplain (shown in yellow to red hues).

As the new plan is completed later this year, it will supersede the 2006 Virginia Tech Hazard Mitigation Plan and will work to help reduce the impact of disasters and disruption of the mission-essential functions. The new plan provides an all-hazards approach to mitigation planning to guide the university, informing decisions on land utilization, development, and infrastructure renovations.

▲ *Flooding in 2006*

eBook Pilot

The book is large and heavy. The reader is alone.

So many of our images of studying from textbooks fit this idea of solitary reading and studying. Learning, however, is not only a solitary pursuit. Teachers share their knowledge and tutors help us learn more effectively. We form study groups to share what we've learned, how we've learned, and identify what we need to learn. Are textbooks destined to remain solitary pursuits?

The eBook Pilot Project answers with a resounding, "No!" Electronic textbooks are not merely a format change, but an opening to using texts differently.

Virginia Tech is participating in an eBook pilot in conjunction with EDUCAUSE, Internet2, and McGraw-Hill Publishing, and in concert with two dozen other U.S. universities (www.internet2.edu/netplus/econtent/). eBooks are integrated into Scholar course sections that are participating in the project. In the fall semester, the pilot included 17 course sections and more than 1,300 students, and even more were involved during the current spring term. Courses included sections in aerospace and ocean engineering, electrical and computer engineering, international studies, and women and gender studies.

With the eBook text, students can annotate or highlight their texts in ways that help them learn. More importantly, they can share those notes and highlights with select study partners or with the entire section, and with the instructor. The instructor, in turn, can evaluate whether a student is selecting or missing the most important points, and can model critical reading skills through her own highlights and annotations. Instructors can also add information—clarifications, shortcuts to solutions, alternate interpretations, or updated findings.

One student noted that he read more of assigned readings because the eBook was always available on a mobile device, rather than the large, heavy—not very mobile—print book. In the near future, students may still be sitting in solitary spaces, but interacting with a learning group while reading a textbook electronically.

With the value-added by this new approach to eBook textbooks, how much more will textbooks cost? The university estimates average costs for books and supplies today at more than $1,000. Will this number increase?

Happily, the answer again is "no." eBook publishers look for predictable and continued sales to offset greatly reduced prices, saving individual students thousands of dollars over the course of their programs.

NI&S

Network Infrastructure and Services

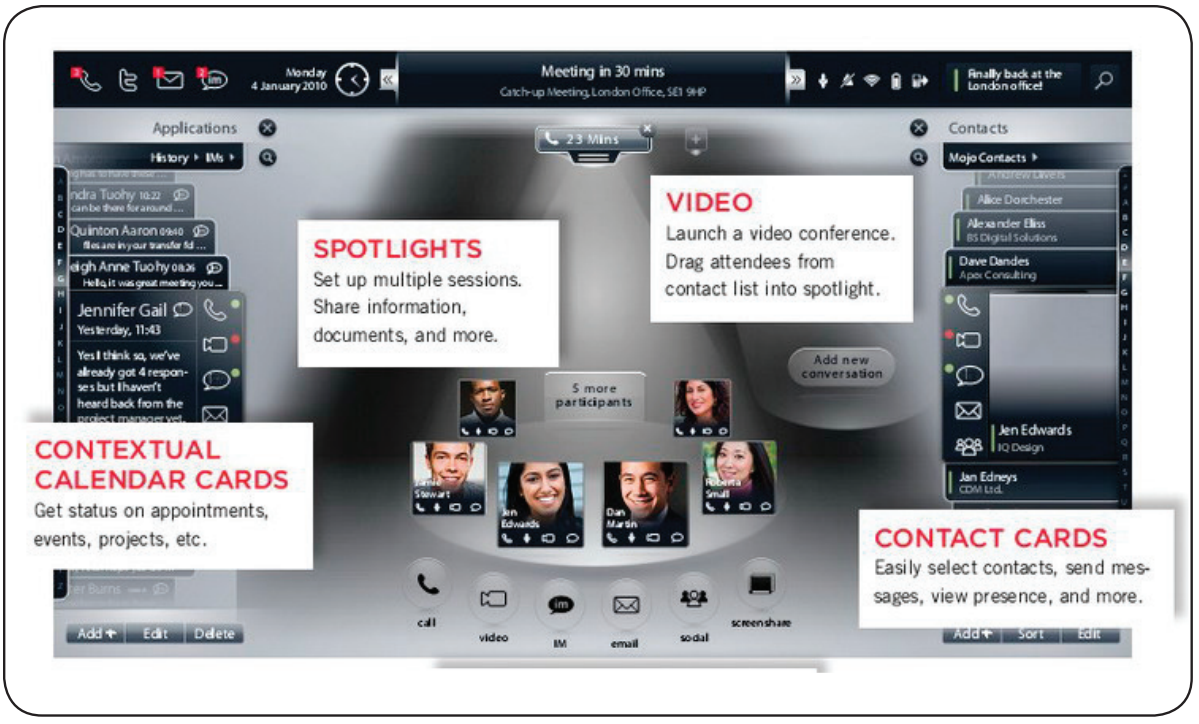
Unified Communications on-the-go

Does your last job site of the day take you far from where you would normally complete administrative tasks? Is that important phone call likely to come while you are in an equally important conference? Will you be working from home during bad weather? Or perhaps you ONLY work on-the-go—no desk, no office?

These are just some of the reasons that you might find mobile communications useful: you probably already have! But in our "legacy" or "old system" world, you likely need to have multiple devices and multiple phone numbers in order to move freely while staying in touch by audio, online, and possibly video communications. "Call me on my cell—I'm going to be out of the office," may be your message to a colleague. And while you are out of the office, you may be checking email on yet another device, like your tablet or laptop.

The Unified Communications project (UC) will offer the ability to carry out these multiple communications activities on one mobile device. Whether your preferred device is a smart phone, a tablet, or a laptop computer, with the One-X Mobile software, you can use your university phone number from wherever you go. One-X Communicator software adds messaging, "presence," and video capabilities to that mobile device. "Presence" is the ability to view whether colleagues are available, or whether they are already on a call, or have noted that they are not available. Project staff members in Network Infrastructure and Services are working now to ensure that supported devices transcend proprietary platforms: Macs, Windows, Linux, and versions of both Android and iPhone will be supported. The Avaya Flare device will also be available, integrating these applications along with email and directory support.

What will you need for mobile communications? Contribute your ideas and visions on the UC blog—www.nis.vt.edu/uc/mobile.



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