

Grenoble Isère Report

THE GRENOBLE-ISÈRE ECONOMIC DEVELOPMENT AGENCY'S INTERNATIONAL NEWSLETTER - FRANCE > No. 56 < JULY 2011



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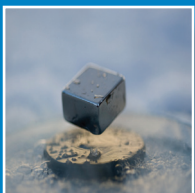
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Jez Wain, Unix Systems Infrastructure Architect at Bull in Grenoble

BULL R&D strives for greener data centers

Bull is not just Europe's leading provider of critical IT systems; the company also designed Europe's fastest supercomputer, capable of performing a quadrillion calculations per second. Bull's Grenoble-based R&D center has its sights set on boosting the energy-efficiency of data centers—a crucial element of today's increasingly connected digital world.

What is Bull's approach to Green IT?

Today's widespread computer use takes a heavy toll on the environment, especially when you factor in hardware manufacturing, system assembly, and the disposal of obsolete components—in addition to the energy consumed during day-to-day use. Statistics on IT system power consumption shows there are significant efficiency gains to be made; for instance:

- In traditional data centers, for every kilowatt required to run the servers, another kilowatt is needed for cooling;
- A computer on standby uses almost as much energy as a computer in use;
- In most data centers, servers use only 20% of their capacity.

Bull is working hard to make future IT systems greener by developing environmentally-friendly, recyclable hardware and coming up with more energy-efficient designs. For example, Bull has developed water-cooled doors and power modules that substantially cut the energy needed by data centers. On the software front, Bull has also come up with inventive ways to boost server performance and thus lower their energy consumption.

Bull is spearheading the EnergietIC [ICT Energy] project, a collaborative R&D project coordinated by the Minalogic competitive cluster. Can you tell us more about this project?

The goal of EnergietIC is to design an energy management system capable of continuously adjusting the power supplied by an electricity

grid to match the demand from a data center's applications and cooling equipment. In short, the system will ensure that servers are running at optimal capacity by migrating data from one server to another in order to free up certain areas of the data center, which could be put in energy-saving sleep mode when not in use. The idea is simple, but execution is complicated. It's like trying to arrange a carpool for people going to different places. Under the current set-up, critical servers are usually shared by different users and host multiple applications. The challenge will be to optimize server use without affecting service quality.

This means that the EnergietIC energy management system must let the IT system and power grid talk to each other to determine which servers have space available for additional data while ensuring that there is enough power to supply the area of the data center. Several of the industry's leading companies are working on the EnergietIC project, such as Bull, UXP, and LIG for IT; Schneider Electric for energy management; G2E Lab and G-SCOP for electrical engineering and modeling; and Business & Decision Eolas for full-scale testing on its data center.

What other Green IT projects is Bull currently working on?

Cooling remains a major issue. The next generation of Bull blade servers will be cooled by circulating room-temperature water between the electronic components. This will maximize the servers' energy efficiency.

A Raymond pursues international expansion

A Raymond, the world leader in automotive fasteners and connectors, recently opened a sales branch in Singapore ahead of the opening of its new Singapore plant. Founded in Grenoble in 1865, A Raymond also plans to open a large-component manufacturing facility in Mexico. These two new plants mark the first steps of the company's international expansion strategy, which will involve building a dozen new facilities around the world. A Raymond has 4,300 employees and generates annual revenue of €645 million. The company is also aiming to diversify its customer base by targeting the construction, solar energy, healthcare, and agriculture markets.

Grenoble academic programs rank high

When it comes to attracting graduate students, Grenoble's legendary quality of life is hard to resist. However, what often tips the balance in the city's favor is the high caliber of its learning institutions. Two of Grenoble's flagship universities have recently won kudos for their academic programs. After earning the top slot in 2010, Grenoble Institute of Technology came in first again in 2011 in *Industrie et Technologies*' ranking of 124 engineering schools. Grenoble Institute of Technology stood out for excellence in research, which the French magazine assessed according to the number of PhD students (1,031), patents filed (97), research contracts in place, and start-ups created.

For the second consecutive year, Grenoble Ecole de Management and Grenoble Graduate School of Business came in 47th in the *Financial Times*' global business school ranking for their executive education programs in France and abroad, evidence of the schools' outstanding teaching and partnerships.

iDevices for 3D vision without glasses

The human-machine interaction team at the Grenoble Information Technology Laboratory (LIG) has developed a technology that enables 3D images to be displayed on iPhone and iPad screens without the need for 3D glasses or other special equipment. Using a technology known as head-coupled perspective, these innovative iPhone and iPad applications use the devices' front-side cameras to track head movements in real time. The head-tracking information is used to identify the user's exact position and adjust the angle at which the 3D image is projected accordingly. Apple has approved the application, which is now available online at the App Store—where some 1.4 million users downloaded it in just ten days.

Grenoble secures France's top spot for nanoelectronics research



Cleanroom in CEA-Léti - ©Artechnique

Under the French government's economic stimulus package ("Invest in the Future"), six technology research institutes will be created to pool existing public and private research facilities and support them with new resources. These multi-disciplinary institutes will focus on developing marketable technologies. The international selection jury gave top marks to Grenoble's proposal for a nanoelectronics institute, confirming the city's leading position in this burgeoning field. The new institute will help Grenoble reach its goal of becoming one of the world's top three hubs for micro and nanotechnology.

A total of €460 million will be invested in the nanoelectronics institute over ten years. Half of the funding will come from the private sector. The institute will run three major research programs:

- The Core Technology Program, which will cover 3D assembly, nanophotonics on silicon, and liaison technologies, as well as a characterization platform for the research performed under the program
- The Technology Transfer Program, which will help bolster the economy by encouraging the creation of small businesses and the growth of medium-sized technology firms
- The Education and Training Program, which will help meet the industry's human resources needs

The institute is expected to create some 8,000 jobs in addition to the 39,000 hardware and software jobs already in the area. Thanks to the new research institute, Grenoble is well-positioned to remain Europe's leading center for micro and nanotechnologies.

Ineov, a two-day conference on user-centered innovation and Green IT

Innovation is changing. Now more than ever, we must place people at the center of the innovation process, taking into account factors like user needs and environmental impacts. Two Grenoble-Isère technology organizations—Inovallée, a high-tech business park focusing on sustainable innovation, and Grilog, Grenoble's IT professional association—joined forces in early June to host the first-ever Ineov conference. This conference aimed to put ICTS (Information and Communication

Over 700 people participated in the on-site conference and web event. Some 50 experts from France, the US, and China presented live or—in keeping with the event's green theme—by videoconference. Topics included the challenges and opportunities presented by user-centered innovation and Green IT, with ample time for discussion about how to better take people's needs into account when developing usage scenarios. Participants also had a chance to experiment with various tools and methods and share best practices.

The conference blog (<http://ineov.blogspot.com/>) provides a comprehensive run-down of the event, including videos and webcasts, presentation slides, and opportunities to keep the discussion alive with professionals from Grenoble and around the globe.



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Technologies and Sciences) on the path to environmentally-friendly growth by taking a user-centered approach to innovation and promoting Green IT. Participants left the conference with a deeper understanding of how these new approaches to innovation will affect the ICTS industry.



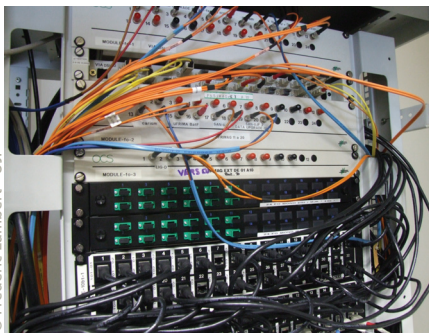
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> FEATURE <

IT is coming up green in Grenoble-Isère

Cost savings—in the form of lower energy bills—have generally come in ahead of environmental concerns as the main motivating factor for the development of green IT. That is, until now. Today, both IT developers and users are placing environmental concerns at the center of their IT development. And the benefits touch an increasingly wider community beyond IT professionals. It comes as no surprise that some of the latest advances in Green IT are made right here in Grenoble-Isère.

Grenoble-Isère is one of Europe's leading IT and software hubs. The local IT industry provides more than 12,000 jobs in business and another 2,000 in academic research. Each year, 2,200 students graduate with IT-related degrees from schools in Grenoble-Isère. In addition, major corporations like Bull, Hewlett-Packard, Oracle, Xerox, and STMicroelectronics have set up shop in Grenoble-Isère, drawn by its vibrant network of small businesses and publicly-funded research labs spanning all



© Frédéric Lambert - UJF

hardware and software fields. A booming digital economy has encouraged the local IT industry to pool their resources to move even higher up the IT value chain.

Green IT for environmentally-friendly technology

The miniaturization of electronic components—which is possible thanks largely to R&D carried out in Grenoble-Isère—has spurred the widespread adoption of mobile devices, a trend that has forced engineers and manufacturers to come up with increasingly energy-efficient systems. The energy challenge starts at the chip design phase, where embedded systems can provide the advanced architectures needed to make a real difference in terms of energy savings. Organizations like STMicroelectronics, Orange, INRIA, CEA, Tiempo, Dolphin Integration, and Docea Power offer architectures that leverage developments like asynchronous technology to cut power consumption.

Technologies like server virtualization and cloud computing can help save energy by reducing the amount of hardware needed; they can also help minimize the use of paper and curb travel by facilitating remote communication. And Grenoble-Isère's software developers and cloud computing engineers are poised to take full advantage of the cloud computing trend. For example,

Usharesoft offers a range of operating systems, middleware, and open source applications that place cloud computing just a few mouse clicks away.

Publicly-funded research labs are also striving to make IT greener. GSCOP and G2Elab have joined forces on the EnergieTIC project (see interview), where they will create resource-consumption models to develop decision-making tools for data migration, whether planned (such as for a decrease in demand after working hours) or responsive (such as for occasional peaks in demand). The world-class research done at France's labs has attracted the attention of Google, which has formed a partnership with CNRS to study IT resource optimization. Five labs will be working on the project, including Grenoble-based LIG.



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Green IT opens the door to new applications

Buildings are the world's leading consumers of energy, second only to farming. By optimizing how buildings use energy, we could shrink global energy consumption by 15%. Effective building management systems, when combined with environmentally-friendly building design, can play a key role in lowering buildings' energy use. Grenoble-Isère is home to a number of businesses working to develop better building management systems. The Minalogic competitive cluster is involved in a number of energy management initiatives, such as Schneider Electric's Smart Electricity project which aims to develop a smart electrical switchboard capable of communicating with its environment in order to manage a building's electricity use more efficiently. These new systems will even be able to adjust energy consumption to building occupation patterns. On a larger scale, Orange Business Labs is engaged in the Sensity project to develop management systems for cities of the future. The goal is to design an open, standardized (to ensure system

compatibility and facilitate widespread adoption) ICTM2M (Information and Communication Technologies for Machine-to-Machine) platform that can manage services like public lighting so as to help city planners reach their sustainable development goals.

Of course, these projects are dependent on convergence across multiple fields like electricity, automation, and communication. And convergence simply cannot happen without the right hardware and software in place.

These technologies are just the beginning. Green IT has a bright future ahead of it, and Grenoble-Isère is well-positioned to help build that future for the IT industry and technology users.



© Bull



Electronics go green, inside and out

The Minalogic competitive cluster, which specializes in smart miniaturized systems for industrial applications, has developed an environmental certification process for its technologies. An evaluation committee awards the Minalogic Green Certification to cluster projects that have come up with a new technology that either boosts energy efficiency (cutting energy consumption by at least 30%) or mitigates the environmental impact of micro and nanotechnologies. 17 projects have currently been Green certified. They include technology that makes embedded software more environmentally-friendly—such as by using enhanced architectures that improve performance while lowering energy requirements—or shrink the energy consumption of IT infrastructure.

> TIME OFF <

Grenoble to host the individual time trial for the 2011 Tour de France



2011 Tour de France map

The individual time trial for the 98th Tour de France will take place in Grenoble on July 23. The hilly 42.5-kilometer route for this trial contains two major challenges, including a loop at the foot of Chamrousse ski area (home of the 1968 Winter Olympics). This year cycling fans seem to be placing their bets on an all-around strong cyclist



rather than a time-trial specialist. But as always, the Tour de France is sure to be chock full of surprises, so it is anyone's race!

Grenoble has been a regular feature on the Tour since 1905, earning a special place in the history of the legendary cycling race. It was in Grenoble that the famous yellow jersey first appeared in 1919. Since then, 267 cycling greats have worn the yellow jersey, leaving their mark on cycling history.

Superconductivity in the spotlight



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To celebrate the 100th anniversary of the discovery of superconductivity, CCSTI (the Grenoble science education organization) and CNRS are teaming up to put on a special exhibit on an unusual—and still somewhat mysterious—phenomenon.



Superconductivity is the fascinating capability of some materials to conduct an electrical current with zero resistance. The uses for superconductivity stretch across multiple fields such as medicine, electricity, and transportation, where applications include Japan's famous MAGLEV ultra-high-speed train. The exhibit will give visitors a chance to test various superconducting systems including levitation—which they will be able to experience first-hand!

The exhibit will also address the future of superconductivity, which is expected to play a key role in overcoming some of today's environmental and technological challenges. The exhibit will run through July 31, 2011.



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