



How IT monitoring supports École polytechnique organizational excellence, a world-leading tech graduate school.

“Public service, quality of delivery and user experience are our core values. About 6,000 people depend on constant IT service on campus: teachers, students, researchers, start-up incubation and acceleration program staff... We’re responsible for an extensive network that’s very much like a city grid. IT monitoring is critical to ensure everyone gets optimal service.”

Loïc Pasquier,
Manager, Networks and Telecoms at École polytechnique



The project in a few words

Business Objectives

- Preserve the School’s reputation and leadership
- Support the institutional policy for excellence in teaching, research and innovation
- Develop entrepreneurial activity at the innovation center

ITOM Challenges

- Secure the IT system
- Ensure infrastructure and network high availability
- Manage the obsolescence of older IT system layers
- Maintain the IT system operational
- Guarantee user experience excellence, aiming for flawless IT service quality
- Develop and operate a future-ready IT system, key to the school’s attractiveness

Main Benefits

- Secure the IT system
- Ensure infrastructure and network high availability
- Manage the obsolescence of older IT system layers
- Maintain the IT system operational
- Guarantee user experience excellence, aiming for flawless IT service quality
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Named among the top 100 best universities in the world according to the Times Higher Education's ranking, École Polytechnique, a.k.a. the X, combines on one campus the research, teaching and innovation that are at the forefront of scientific and technological development.

Devoted to progress and science, the X is driven by a vision of excellence supported by strong pillars:

- The graduate school, which offers high quality training programs and diplomas that are aligned with international standards.
- The research center, a formidable catalyst for discovery and innovation which is internationally recognized—as evidenced by the Nobel Prize for Physics in 2018 some of its researchers were presented with.
- The innovation center, providing a home for the technology start-up acceleration and incubation programs. Created in 2015, DRAHI—X Novation Center fosters growing entrepreneurial activity.
- A solid network of alliances, with other globally recognized universities.

École Polytechnique is also a founding member of the Polytechnic Institute of Paris (IPP), working alongside graduate schools to create a world-class institution devoted to science and technology.

Business Objectives: Excellence in teaching, research and innovation

Established in the greater Paris area, the campus of École Polytechnique is a small town in itself where converge 3,000 students, 450 teachers, 1,600 research center and start-up staff—(the acceleration and incubation programs host 30 to 60 start-ups per year).

In partnership with the CNRS (France's national research institute), the 23 laboratories housed in the X research center work on research projects relating to the major scientific disciplines taught at the school: biology, chemistry, computer science, economics, mathematics, applied mathematics, mechanics and physics. The Innovation Center includes the X-Up Incubator, the X-Tech Booster, the X-Fab Prototyping Space, training and exchange spaces, as well as the centers of excellence of large enterprises. Since 2018, over 60 start-ups were able to benefit from its acceleration and incubation programs.

“Our campus is home to highly strategic IT infrastructure, essential to teaching, research and start-up activities taking place in about a hundred buildings,” explains Loïc Pasquiet, Manager, Networks and Telecoms at École Polytechnique.

“About the size of a small city, our campus is comparable to an urban grid which needs constant monitoring to ensure all is going smoothly. In short, the IT system is a central tool to realizing the school's vision of excellence. The IT department serves 6,000 ‘customers’, all with a crucial need for IT to accomplish daily activities.”

ITOM Objectives: Protecting and ensuring availability of an IT system supporting the vision for excellence of a world-renowned institution

The School's IT Department employs some thirty people and is organized into two units, one responsible for analysis and development, the other for technology (including infrastructure), networks and telecoms, which is led by Loïc Pasquiet. On a daily basis, the IT department supports the School's policy of excellence. Safeguarding the reputation of the school is a primary objective, and it is the guiding principle in contingency plans for a potential cybercrisis. Maintaining a secure system is the other paramount objective. The IT department achieves this through its information system security policy (PSSI), robust integration initiatives, and an IT monitoring system covering all IT layers supporting the full scope of activities: teaching, research and start-up incubator.

“For all service hubs in the X, we provide full IT infrastructure which we control and manage tightly. We work closely with the chief information security officer (CISO) who drafted the school's PSSI and follows closely our initiatives. To ensure optimal service availability, our IT system presents a highly redundant architecture. Being part of a state-of-the-art science and technology institute makes the issue of IT obsolescence even more pressing for our department. Every day we strive to adopt the latest technologies, IoT included. We follow closely the most recent trends and advances for IT equipment and software solutions. We manage continuous update programs, a critical task considering that most of the solutions we use are deeply interconnected, from a network, Wi-Fi and security perspective notably. To maintain the same level of service, an impact study is an essential part of our updating processes,” explains Loïc Pasquiet, Networks and Telecom Manager, École Polytechnique.

“The School's activities are tributary to the level of quality and service delivered by the IT system. A slight glitch with Internet service or access to applications and you have thousands of people unable to do their work, among them the teachers and students that were selected among the very best and the first-class researchers working on high-value international research projects. Through IT monitoring with Centreon, we're meeting some of those important challenges in terms of IT availability.”

The Project: Modernizing IT monitoring to pave the way for next-level IT operations

Until the adoption of Centreon, the technical team was using a mix of Nagios and NagVis tools, but the team could barely keep it up to date. It was time to become more time efficient in maintaining the IT monitoring solution in working condition. Loïc Pasquiet thus decided to initiate a project to adopt a new IT monitoring platform following clearly defined criteria.

“We were looking for a packaged solution, easily customizable, with a simple versioning scheme, something more time-efficient in terms of maintenance. Technical support was another key criterion. But at a strategic level, we were also looking for an API-based platform, for build-in interoperability. Mapping and data visualization capabilities were also determining factors in the final choice of a solution. It’s actually part of what tipped the balance in favor of Centreon EMS.”

The Technology Division provides and manages all of the School’s IT infrastructure and is responsible for maintaining it in optimal condition. Therefore, the IT monitoring system covers a large scope: from wired networks in the 100 campus buildings, switches, Wi-Fi (700 terminals are monitored), IP telephony (a network of 2,500 telephones), to the research dedicated-data center supporting 23 laboratories up to the IT resources made available to the start-ups in the acceleration and incubation programs.

“Centreon EMS allows us to monitor our network-dedicated solutions, such as Cisco, Extreme Networks, Palo Alto Networks or even Avaya. With the integrated mapping module, Centreon MAP, we get real-time visibility into our extensive network,” adds Loïc Pasquiet.

As an efficiency measure, the Technology Division shares all relevant tools, including the IT monitoring solution with the helpdesk, entrusted with level 1 support. Level 2 support is escalated to specialized teams — system, application or network, based on the incident. *“Whenever possible, we delegate level 1 support to the helpdesk so that my team can better spend their time on more value adding projects.”*

“We share with the Service Desk detailed network maps displayed on large screens. The support teams benefit from a real-time view of the monitored infrastructure, which allows for optimized management of alerts and incidents.”

Benefits: More responsive IT teams and an improved user experience

Aside from the Service Desk, the Centreon EMS solution is used by the entire Technology Division. Loïc and his team of engineers can rely on a global monitoring view of all supported hosts on campus — a dynamic, ever-changing map, as the team shifts, modifies or adds new hosts, in sync with reorganizations, new offices being set up or new buildings being built on campus.

“Transitioning from an open source system to Centreon EMS, we were able to improve the monitoring of our extensive network. It is mapped and displayed on a large screen in our open-plan workspace. Everyone can keep an eye on the real-time status, which is strategic to ensuring smooth operations on campus — we’re much more responsive.”

Responsiveness is no luxury considering that IT service quality and availability condition in-class learning experiences. *“In the classroom, teachers often rely on remote resources through highly secured connections. Classrooms are thus essential service touch points, requiring seamless network and Internet connections to guarantee students an optimized learning experience,”* explains Loïc.

The same applies to DRAHI—X Novation, the start-up incubator and accelerator programs. *“The IT tools supplied to those start-ups are a structuring element of their business plan. Maintaining Internet connectivity is a critical part of our work.”* The laboratories housed in the research center have their own dedicated data center, also part of the perimeter. *“Here again, IT service availability is critical for the teams in the 23 research laboratories, whether they’re in need of computing power or 24/24 data exchange with their European colleagues. We can’t afford not to monitor this infrastructure,”* says Loïc.

To ensure fully transparent operations, Loïc’s team created a map of the monitored infrastructure for the benefit of end users. *“We’ve made available to our 6,000 users a simple, three-color coded monitoring view showing the real-time status for Internet, Wi-Fi and email service. Any user on campus, student, teacher, researcher or start-up staff can access it from the School’s portal. When we’re anticipating maintenance, all users are reminded to use this resource for an instant ‘weather report’ on the IT system. The IT department adopted this approach to help highlight the value its expertise and professional solutions bring to the campus,”* explain Loïc Pasquiet.

“By making a simplified IT monitoring view accessible, we’ve significantly improved communications with the 6,000 users on campus, among them students, teachers, researchers or start-ups part of the school’s incubation and acceleration programs.”

Next Steps: Building the future—today

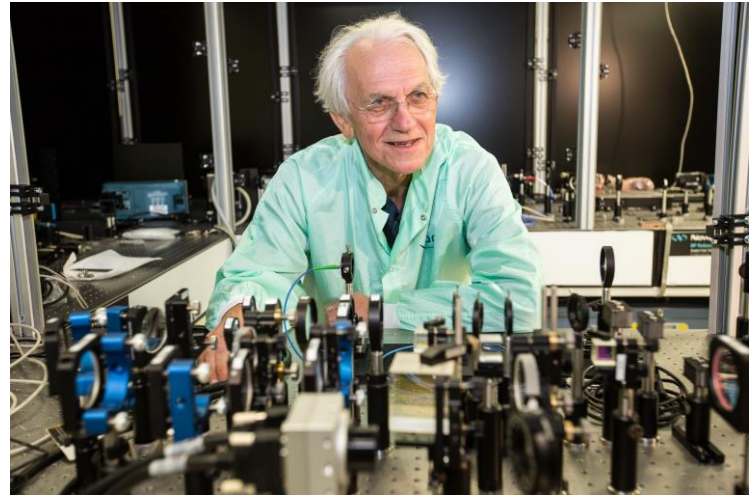
As the Polytechnic Institute of Paris (IP Paris) develops, the X, one of its co-founders, will see its campus grow to integrate a total of 7,500 students and 30 research laboratories by early next year.

“At the IT Department we believe that new IT possibilities will be in store when the four other founders of the Paris Polytechnic Institute move in our campus vicinity. It may be through initiatives aiming at pooling resources.”

Meanwhile, the IT Department is working on other modernization projects, one of them is the delivery of a connected building by the end of this year. The building will offer students housing, co-working spaces, meeting facilities, auditoriums, etc.

“Through connected buildings, we’re exploring new territories, IoT and BIM (Building Information Management). It’s exciting but it’s also a new level of complexity. The three letters in IoT really hide infinite possibilities. In just a year we can expect multiple, rapid and possibly unforeseen technological evolutions. Intelligent building management (IBM) in itself marks an interesting evolution, with emerging open standards on which each builder or supplier is required to contribute IT solutions, be it for HVAC, power or plumbing, that are fully controllable, monitorable, and interconnected.”

“In the case of the upcoming connected buildings, we’re integrating an IT monitoring perspective right from the earliest designing phases. The goal is to be able to guarantee optimal maintenance and operations at a level of performance that’s determined at the conception stage. In other words, we’re already selecting Intelligent Building Management (IBM) solutions that will easily be integrated seamlessly into the Centreon monitoring platform.”



A propos de Centreon

Centreon is a trusted software provider for enterprise IT monitoring of converging and hybrid infrastructure across a wide range of public and private sectors. Centreon’s flagship solution delivers unified views and streamlined, interoperable monitoring for business-aware IT operations management, eliminating costly downtime and boosting performance analysis. Centreon partners with resellers, enterprise system integrators and SMB service providers, offering on-the-ground technical support and training certification. Founded in 2005, Centreon is a growing reference with head offices in Paris, France, and Toronto, Canada. For more information, to [request a demo](#) or [read more monitoring success stories](#): please [visit our website](#)