

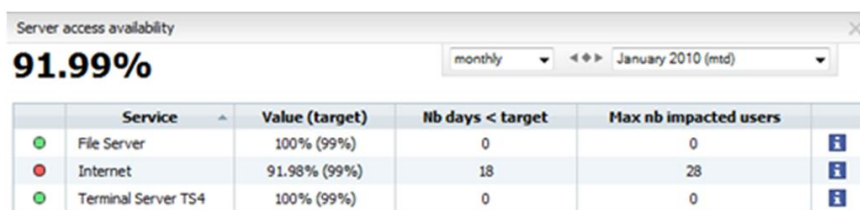
Case Study

CHUV enhances security and management of clinical information systems with NEXThink

The CHUV, one of Switzerland's five university hospitals (together with Basel, Berne, Geneva and Zurich), has chosen NEXThink to monitor the usage of its workstations and its critical applications and servers with an eye to enhancing the security, incident management, performance and availability of its clinical information systems. The ease of use of the information collated has allowed the CHUV to get a much clearer picture of how its infrastructure is

actually being used, which in turn has meant real gains in time and human resources. The one-click query functions and the ability to reuse query templates stored in the online library available with this solution afford all system administrators quick access to the information they require and a permanent overview of both their information system as a whole and specific aspects of it from the point of view of their users.

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Service	Value (target)	Nb days < target	Max nb impacted users
File Server	100% (99%)	0	0
Internet	91.98% (99%)	18	28
Terminal Server TS4	100% (99%)	0	0

Snapshot of user impact due to network, server or workstation downtime

The challenges

Like all major university hospitals, the CHUV faces the problem of maintaining complex, continuously evolving clinical systems to serve a highly diverse user population, all with a limited number of IT staff. As in the natural course of events medical staff use such services more and more regularly, it has become indispensable to bolster the security and availability of critical applications and break down the barriers between IT and medical staff. At the same time, however, legal and practical constraints must be strictly observed.

High-level control points that can be universally shared must be implemented in order to construct a dashboard for monitoring medical solutions such as RIS (Radiology Information System), PACS (Picture Archiving and Communication System), LIS (Laboratory Information Systems), EMR (Electronic Medical Record) and CPOE (Computerized Order

Physician Entries), among many others. The CHUV teams had been encountering difficulties using traditional IT management methods to track actual infrastructure usage, a must for measuring quality of service and responding quickly and precisely to security and availability problems with a view to improving user satisfaction. CHUV Network Manager Vincent Graf explains: "The quality of our infrastructure was being systematically called into question. When people would complain about problems with performance and availability, it used to be difficult for us to prove otherwise in short order with the kind of accuracy we wanted. Furthermore, we didn't have a precise tool for measuring quality of service." Graf and his colleagues had had to contend with the sort of problems that usually beset silo-type organizations: the use of a number of bespoke, non-shared tools makes internal and external communications hard because there is no common language.

NEXThink makes infrastructure usage more transparent

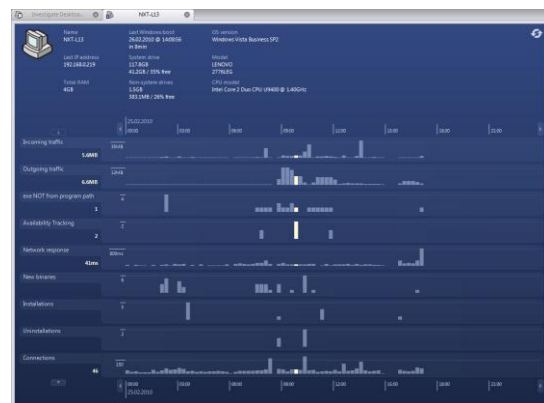
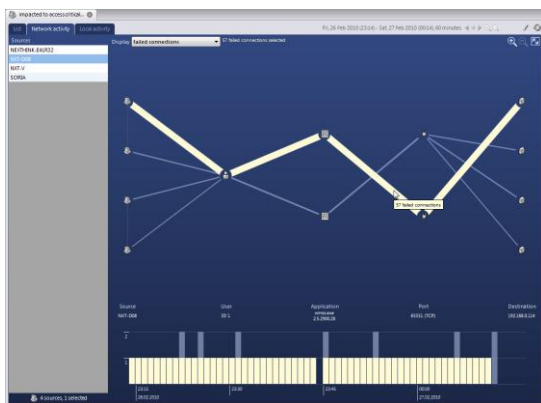
Of course, taking the users' point of view into account was not the prime concern of those responsible for managing the hospital's infrastructure. Nonetheless, Graf and his manager, Head of Infrastructure Stéphan Misteli, sensed that NEXThink could improve their visibility regarding the actual usage of the environments under their care. This prompted them to begin testing the solution with the recommended first step, namely the NEXThink service known as Endpoint Activity Baseline (EAB). A few weeks later, according to Graf, "The solution we'd installed helped us a lot by providing an accurate picture of the problems we knew were there. What's more, the information is available all the time without the need for any prior configuration work." Now, after working with NEXThink for two years, Graf notes that "in

contrast to solutions that entail an investigation via the network, the permanent real-time view of infrastructure usage has opened up a whole new range of possibilities for managing settings, changes and incidents. NEXThink has helped us improve our quality of service without needing extra staff."

Graf has this to say about the product's evolution: "I still have every faith in NEXThink's ability to master the various challenges we're constantly confronted with. Two years after our initial deployment, we remain highly satisfied with the solutions offered by NEXThink, which are being upgraded all the time. That's why I'll gladly recommend NEXThink to anyone in charge of information systems at a healthcare establishment, for deployment across their entire infrastructure."

"NEXThink has helped us improve our quality of service without needing extra staff."

- Vincent Graf, Network Manager, CHUV



Sophisticated visualisation tools for real-time and historical comparisons and diagnostics of all hardware and infrastructure usage

NEXThink makes managing quality of service easier

When Misteli and Graf decided that they needed a platform for measuring quality of service to prove compliance with service level agreements (SLAs), they looked at a number of different offerings. Budget restrictions meant that most of these were based on open-source tools. The solution they initially opted for, based on Nagios, sadly failed to live up to its promise, especially when it came to providing an overview of service levels. Since Nagios is nevertheless an effective and flexible solution for

monitoring infrastructure elements, Graf came up with the idea of using NEXThink to integrate Nagios checks geared to each service into a dashboard that displays metrics for the various service levels, their interdependencies, and the impact problems have on users when they arise. The SLA Cockpit project was launched in spring 2009 with the presentation of a prototype focusing on critical CHUV services to the IT product management team.

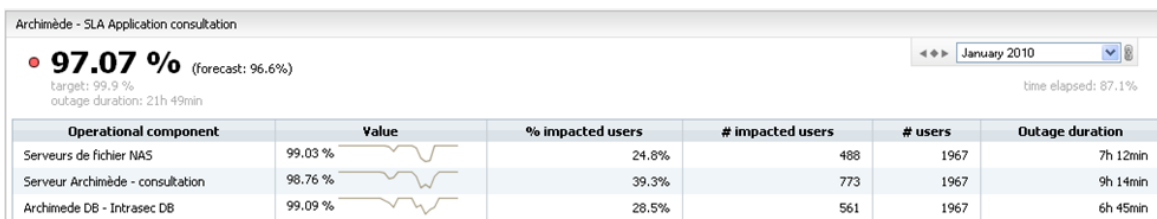
The initial aim of Graf's SLA Cockpit was "to generate in real time the control points we need for instantaneous measurement of the availability of critical applications and the users who may be affected by a specific instance of downtime."

Graf spelled out the goals for his SLA Cockpit at the project kick-off meeting:

- ▶ Facilitate reliable communication between the various IT managers and those in charge of infrastructure, applications and support, with a view to identifying, collectively and with an optimized turnaround time, the causes of faults reported by users
- ▶ Foster a proactive approach that makes it easier to anticipate problems not yet reported by users
- ▶ Speed up the adoption of new services by application owners
- ▶ Check that services are used in accordance with the rules applicable to a given medical solution

CHUV Product Manager Thomas Andrieu, who is in charge of block management software and the software that handles electronic notes files for intensive care patients, notes: "Thanks to the SLA Cockpit solution, we can automatically check for faults in the blink of an eye, usually even before users become aware of them. Without this solution, it would take us ten minutes to identify problems by consulting the logs, assuming we had access to both the logs and the appropriate tools when the fault occurred." He adds that "in view of the high level of availability required by these applications, we're better placed to manage problems that arise outside normal working hours because we can instantly call up the relevant service component views and see how many users are affected."

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Web 2.0 dynamic dashboard for tracking SLA service levels

Pascal Duvoisin, Product Manager in charge of the Medical Archive and Patient Notes product, adds a further argument: "The SLA Cockpit solution lets us identify faults affecting hidden service components at the earliest possible stage, before users tell us about them."

Jean-Claude Martin, responsible for managing chemotherapy preparation and cytotoxic recovery, stresses "the benefits of SLA Cockpit in detecting

problems that may occur when new versions of existing products are deployed."

Last but not least, the product managers and Vincent Graf agree that the rapid provision of these indicators in summary form will be beneficial for user support, as is already the case for second-level service support, thus making it possible to meet users' demands even more effectively.

SLA Cockpit: a solution in three modules

1. **SLA Application & Resources.** Status of the SLA associated with the application for the current period and prior periods. Report detailing results obtained in prior periods and current status, including up-to-date and forecast values calculated on the basis of past experience. This module can be configured very easily to create or modify the settings of a service. It also includes the option to receive real-time alerts via e-mail and/or text message when problems occur. Finally, it indicates the number of users affected by faults in each service component.



As a complement to the Web dashboards, the SLA levels and statuses can be reported automatically in the form of PDF reports and e-mail alerts.

2. **Surveillance.** Dashboard for monitoring the application and its resources. Real-time view (refreshed automatically every five minutes, or manually on demand) of the status of the service and its operational components. When downtime occurs, details of checks and user impact are shown, upon which a first or second-level support engineer can immediately assess the impact of a technical problem on the services and respond with the suitable level of priority.

SLA Application						
status at		period				
05.11.2010 @ 11:44		29.03.2010 - 04.04.2010 (3164.7% elapsed)				
Out of service time		forecast				
for 7h 52min and still for 5h 37min		61.4% (target: 99.999%)				
		Operational component	Current status for	# impacted users	# status changes (last 24h)	
●	1	Molis front-end	36min	20	3	i
●	2	Orade database	5d 19h 2min	N/A	0	i
●	3	Network switches	3d 6h 59min	N/A	0	i

Real-time tracking of current service status and user impact with one-click history access

3. **Blog.** Collaborative space for maintaining and improving service modelling.

About NEXThink

NEXThink was founded in 2004 and is based in Lausanne, Switzerland. It is a market leader in workstation activity monitoring. Its innovative, patented technology is employed in a number of solutions, including system usage mapping, security and compliance management, and quality of service metrics. All of these have one thing in common: they provide instantaneous, constantly updated overviews and detailed breakdowns of information system usage. They also share a common objective, namely to enhance quality of service without the need for additional staff.

N.B.: None of the screenshots in this document contain genuine CHUV data.