**Smartbit: Running Smartschool Education Services from a Private Cloud with Puppet Enterprise**

**Challenge**
Managing a growing, complex cloud infrastructure with a small IT team.

**Solution**
Puppet Enterprise enables the team to manage infrastructure as code; take advantage of DevOps practices; and efficiently monitor and manage its private cloud infrastructure.

**Results**
Smartbit is able to provide uninterrupted services to the majority of Belgian schools and scale efficiently as Smartschool is adopted in the rest of the country’s education system.

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**Industry**
Education software

**Background**
Smartbit was founded in 2003 and is the creator of Smartschool, an online digital education platform used by 90 percent of Flemish-language schools in Belgium.
Automating first with open source Puppet, then Puppet Enterprise

Like so many organizations, Smartbit started out by automating with in-house scripts. As the company’s business grew, and its IT environment expanded to support that growth, Smartbit turned to open source Puppet to automate its mostly Linux infrastructure and a private cloud built on VMware vSphere technology. This private cloud supports delivery of services to the majority of schools in Belgium: e-learning, administration, reports, communication between students, teachers and parents, and a number of other services.

Open source Puppet worked well for Smartbit when its infrastructure was smaller. But the IT team was still building scripts by hand, and had limited visibility into the environment, especially as the infrastructure continued expanding to meet growing demand from more schools. Smartbit now manages several hundred nodes with Puppet Enterprise.

“Moving from open source Puppet to Puppet Enterprise has had a major impact on how we manage our nodes,” said Jan Schuer, the founder and owner of Smartbit. “For example, with open source Puppet, restarting services, upgrading software packages, forcing agent runs and more were performed by running custom-made scripts on the command line. Now all those tasks are executed using the Puppet Enterprise console.”

The console also created an opportunity for the IT team to monitor the environment with Nagios. Now the team receives SMS notifications when an agent run fails, or when a large number of nodes are changed.

Deployments, too, have improved. “The Puppet Enterprise console makes it possible to deploy both physical and virtual machines, and monitor deployments in a superior way,” said Jochen Billen, CTO at Smartbit. “Agent run failures are almost immediately detected, as are unexpected changes on nodes. This, in combination with the centralized reports, allows us to swiftly diagnose issues and react in an appropriate manner.”
Because the team has visibility into the state of the infrastructure, sysadmins can spend less time and energy on monitoring and reporting, diagnosis and remediation, and more time on the substantive, strategic work that equips Smartbit for growth.

“Time on reporting has been drastically reduced; reports are easily accessible with the Puppet Enterprise console,” Jochen said. “Since we are a rather small company, we want to make sure our efforts go into managing our IT infrastructure, and not the automation tool itself.”

**Employing infrastructure as code as the basis for DevOps**

“Puppet enables us to truly adopt the DevOps way of managing IT infrastructure,” said Jochen. “Before Puppet, we used a custom framework built on top of SSH, but with the growing size of our IT environment, we needed something more mature. Now we use Geppetto to write modules, then commit them to a Git repository that is in turn checked out on the Puppet master using r10k. That combination gives us control and visibility.”

Developers and admins are now able to work together on releases, which makes for faster deployments and fewer errors. Smartbit deploys its web application code with Capistrano, which performs a checkout of the master branch of the company’s Git repository on all relevant machines — both web and application servers.

“Since the introduction of Puppet software, deployments are less error prone,” said Jochen. “For the web application to work correctly, the correct web server configuration needs to be in place before deployment. With the Puppet Enterprise dashboard, we now have the right tool to make sure every single machine is configured the way it should be.”

**Getting up to speed with open source Puppet and Puppet Enterprise**

It wasn’t hard to get started with open source Puppet: In a couple of days, the sysadmins had become familiar with Puppet and were able to set up a test environment.

“The language itself is fairly easy,” Jochen said. “Writing mature Puppet modules, and learning how to handle, for example, dependencies and duplicate resource definitions, was more of a learning curve.”

Now, with Puppet Enterprise and established processes in place, it’s pretty easy for new people to get up to speed. “A new colleague without Puppet experience joined the admin team, and it took him a couple of weeks to get familiar and deploy his first Puppet-managed system in our private cloud,” Jochen said.
The value of professional support

Professional support is a benefit often cited by teams that decide to upgrade from open source to Puppet Enterprise, and Smartbit is no exception.

“Puppet rapidly became a mission-critical tool for the operations/DevOps team,” said Jan. “We wanted to make sure we have a go-to in case of issues or questions. And we expect to make use of support to help us reduce the time needed to build and integrate modules, especially as our environment grows and becomes more and more complex.”

Top Outcomes of Using Puppet Enterprise

• Improved monitoring of deployments to private cloud.
• Fast issue diagnosis and response.
• Developers and admins can work together on deployments.
• Admins have time to focus on more strategic work.

Starting Environment

• Linux on hundreds of machines.
• Custom framework built on SSH.
• Managed physical and virtual servers with custom scripts.

Why Puppet Enterprise?

• DevOps enabled by infrastructure-as-code philosophy.
• Provisioning and management of VMware virtual machines in private cloud.
• Visibility into state of infrastructure.
• Fast and effective remediation of infrastructure issues.
• Ability to scale as the business grows; now at several hundred nodes.