



# PROVINCE OF GELDERLAND CASE STUDY

## FAST FACTS

<b>Industry:</b>	Government
<b>Geography:</b>	Netherlands
<b>Opportunity:</b>	The Dutch government must provide in-house IT facility services at market-standard rates. Requiring it to find cost-effective solutions. The Province needed to migrate a heterogeneous infrastructure based on Unix and MPE/iX to a standardized environment too. It also wanted to maintain or improve the functionality and level of its IT performance.
<b>Solution:</b>	Red Hat Enterprise Linux AS, Oracle, MySQL databases, VMWare ESX server, Nagios, and Galaxy Commvault  Twelve HP-Intel32 and four BL45 blade servers
<b>Benefits:</b>	The Province's IT management was drastically simplified as a result of selecting a single operating system.  Red Hat Enterprise Linux provided the Province with flexibility and choice with the ability to tweak and optimize processes.  The Province enjoyed a reduction of its total cost of ownership by four times. Including hardware, software, maintenance, and expansion costs.

## BACKGROUND

The Province of Gelderland is a governmental body that coordinates policy implementation by local councils, water boards, and other agencies. Based in Arnhem, the Province is also responsible for the financial management of the local councils in the region. It monitors the operations of the water boards. Enforces compliance with environmental permits. And acts as an intermediary in the case of conflicts between local councils and their inhabitants. The Province consists of both politicians—the Provincial Council and Provincial Executive—and

administrators. And employs a staff of around 1,500. Approximately two million people live in the Province of Gelderland, spread across more than 56 local councils.

All IT facilities for the Province's staff are accommodated in its DS/IT department with a staff of 50. As with other government organizations, the Province of Gelderland is obliged to operate in an increasingly commercial manner. All IT processes and costs are scrutinised to make sure that services are offered in line with market rates.

## OPPORTUNITY

The Province's IT department uses a range of platforms to run its IT services. Microsoft Windows is used as Operating System for workstations and most application servers.



Novell Netware and UNIX also play an important role on the server side. The UNIX components of the infrastructure are expensive in terms of licensing, maintenance requirements, and flexibility.

The Province decided to base all of its network services—DNS, email, and DHCP—on Red Hat Enterprise Linux as well as all Oracle databases. In order to achieve a more manageable and cost-efficient environment. In 2004, a comprehensive, long-term consolidation project cycle was started “A more commercial attitude is expected from our department. So we now aim to standardize where possible so that we can realize cost reductions and simplify management,” said André Dankers, Senior Infrastructure Manager and Coordinator at the Province of Gelderland.

Another deciding factor in the migration to Linux as a standard server operating system was the planned expansion of the Province’s Oracle Applications environment. This posed challenges in the field of performance that could be solved two ways. Either by an expensive expansion of the Province’s UNIX infrastructure. Or by a broader deployment of Red Hat Enterprise Linux.

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#### **SOLUTION**

Earlier positive Red Hat Enterprise Linux experiences with the Province’s network services encouraged Dankers and his colleagues to opt for a large-scale UNIX-to-Linux migration based on Red Hat products. Server applications and databases for the

Province are now run on Red Hat where possible. Those that aren’t using Red Hat Enterprise Linux will be migrated to this platform soon. This creates a standardized environment and allows the Province to leverage its existing in-house UNIX expertise in the new Linux-based infrastructure.

The Province’s broad adoption of Red Hat Enterprise Linux is based on a number of key factors. Including cost and the maturity of Red Hat’s offering in business environments. “UNIX remains an expensive solution,” says Dankers. “Apart from the license fees, there are substantial costs involved in expanding and modifying a UNIX environment. An ODBC driver for UNIX will easily set you back 1,500 euros. Whereas a comparable Linux driver can be downloaded from the Internet for free.”

Support has also been critical. “Red Hat has clearly evolved as a company and in its comprehensive software support offerings,” said Dankers. “Red Hat support in combination with the support offered by other Red Hat partners such as Oracle, creates a strong case for implementing the platform in business-critical environments such as ours.” Red Hat Enterprise Linux is now used by the Province of Gelderland for a wide range of different tasks and applications. All 1,500 of the Province’s Windows XP users actually rely on a Red Hat Enterprise Linux-based network.

The Province decided to standardize on Red Hat in all possible areas for IT management purposes. It was also decided to always install the latest updates. Red Hat’s subscription model and its traditional ease-of-installation contributed to the unanimous selection of Red Hat by the Province. “Red Hat is always quick to release ready-to-run installation packages for its operating system. While other Linux distributions often had to be unzipped and compiled first. That is an area in which Red Hat has more or less set the standard.”

Dankers and his end users are extremely happy with the Province’s network services—mail, DNS, NIS, DHCP, caching



proxy, reverse proxy, and SMS gateway—that run on Red Hat. The total infrastructure has been expanded too. It now consists of twelve HP-Intel32 servers and four BL45 blade servers. With Red Hat Enterprise Linux running in a virtualized environment under VMWare ESX Server. “We are investing in VMWare in addition to Red Hat products. We are using VMWare to further reduce costs and to increase flexibility,” said Dankers.

The combined virtualized Red Hat environment is used for the Province’s Oracle and MySQL databases. And to run the open source network management software, Nagios. The Province’s backup server from Galaxy Commvault and various third-party applications also run under Red Hat Enterprise Linux. “We first ran a test database on Red Hat Enterprise Linux. Everything went very smoothly and we were able to quickly migrate our production databases,” said Dankers.

## **BENEFITS**

Besides the flexibility that open source has given the Province of Gelderland, a number of clearly quantifiable benefits can be identified. Considerable cost reductions have been achieved. This enabled André Dankers and his colleagues to work in the commercial manner expected of the Province. “Although we have to invest a bit more in IT management, the total cost of ownership is now considerably lower than with our UNIX implementation. We previously spent half a million Euros per year on hardware and some €150,000 a year on maintenance. We’ve now reduced our total expenditure by a factor of four. And have been able to cut our support costs back to €30,000.”

The Province of Gelderland has also used Red Hat Enterprise Linux to accelerate a number of processes. “We aim to minimize changes to the basic operating system so as to maintain optimal manageability. For us optimization will always be done on a case-by-case basis,” said Dankers. “Instead of the standard EXT3 file system, we use the Journaled File System (JFS). The JFS kernel has already been prepared for multistream I/O. It has increased the performance of the system as a whole by a factor of three. As opposed to the previous setup.” JFS is a file system that allows the hard disk to retain its data integrity in case of a crash or another type of system failure.

The total migration cycle will take approximately four years. The coming two years have been reserved for a further phase-out of the HP-UX and RISC9000 equipment to a HP-Intel32/64 bit environment combined with Red Hat Enterprise Linux. The migration of the Province’s remaining Oracle Applications to Red Hat Enterprise Linux has been scheduled for the next period. This should further reduce the costs and increase flexibility.