



ISTAT CHOOSES RELIABLE AND EFFICIENT SOLUTIONS FROM RED HAT

FAST FACTS

Industry:	Istituto Nazionale di Statistica [National Statistics Institute]
Geography:	Italy
Opportunity:	New open source architecture for servers. Consolidation and integration of existing applications. And improvement of capacity (processing and disk space).
Solution:	Software: Red Hat Enterprise Linux 4 AS version , Red Hat Cluster and Red Hat Satellite, Apache, PHP, MySQL Hardware: 8 multiprocessor servers with x86 architecture (four database servers, two application servers, and two each for managing backups and testing)
Benefits:	Significantly increased capacity for analysis and skills of IT system managing staff. Significant improvements in speed of execution, performance, and considerable savings on software licences. The success of the project lead to all data and applications on old servers being migrated over to new multiprocessor servers with either 64-bit AMD/ Opteron or Intel Itanium2 technology and Red Hat Enterprise Linux 4 AS

BACKGROUND

Istituto Nazionale di Statistica is a public research body founded in 1926 and is the main producer of official statistics used by citizens and public sector decision makers. It operates autonomously and maintains constant interaction with the academic and scientific spheres.

ISTAT's official purpose is to produce and disseminate information that is reliable, impartial, transparent, accessible, and relevant in order to describe Italy's constantly changing social, economic, and environmental conditions, while maintaining confidentiality.

Its most important tasks include conducting general censuses: population and housing, industry and services, and agriculture. ISTAT also carries out most of the surveys included in the National Statistics Programme, a set of surveys and analyses of crucial importance to Italy.

Since 1989 ISTAT has been involved in policy-making, coordination, technical assistance, and training within the Sistema Statistico Nazionale [National Statistics System] (SISTAN). SISTAN was created to rationalize production and dissemination of information and to optimize the use of resources for official statistics. SISTAN includes ISTAT, the central and regional statistics offices of State administrations, local and regional bodies, the Chambers of Commerce, other bodies, and public administrations.

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ISTAT is fully involved in building a European statistical system (EC Regulation 322/97) and produces statistics that are guided by the fundamental principles of official statistics: impartiality, reliability, relevancy, efficiency, confidentiality, and transparency. As further evidence of ISTAT's exacting quality standards, in 2005 the European Commission adopted the European Statistics Code of Practice, which sets out 15 key principles that statistics institutes must adhere to in the production and dissemination of statistical information.

The ISTAT regional offices represent the institute throughout the national territory and conduct strategic activities such as supporting the production of statistics, disseminating and promoting information on the growth in the statistics culture, and providing assistance and training to the local bodies of the National Statistics System.

Each of the 18 regional offices has a Statistical Information Centre where private citizens, students, researchers, economic operators, and the public administration can receive skilled assistance in accessing statistical information.

OPPORTUNITY

The combination of lobbying by many technical staff who favoured open source solutions and the willingness of the new IT management initially led to the formation of an "official" work group on open source software, which then enabled a debate and approval of a proposal for new architecture for the institute's servers.

The decisive step towards distributed open source architecture involved a degree of pragmatism dictated by concerns over the guarantee of support, the certification of supported software

products, and economic considerations (in terms of the cost of licences and maintenance and assistance contracts).

At the start of the decade, ISTAT decided to concentrate on and invest in internal know-how and the growth of existing skills. After carefully weighing up the solutions on offer, they decided to invest in Red Hat as official Linux distributor.

The architecture developed by ISTAT evolved from being a centralized proprietary environment into a distributed open source system. The first step towards introducing distributed architecture was taken at the end of the 1990s with the transition from IBM mainframe architecture to distributed proprietary IBM architecture on multiprocessor servers with RISC technology and an AIX 4.3 operating system.

ISTAT felt this process necessary, in view of the technological evolution of both hardware and software in the 1980s-90s. A range of internal standards and software tools was defined for use in producing statistics: SAS, Oracle, Speakeasy, etc.

In later years, many of ISTAT's projects adopted a series of solutions which were either completely open source or partly based on OS systems. ISTAT's IT specialists maintain strong connections with the academic world and have always shown a keen interest in open source developments.

For example, the proprietary distributed IBM environment existed side by side with solutions based on Linux platforms for web caching services, intrusion detection systems, internal firewalls, and some websites, such as ISTAT's website for demographic statistics (<http://demo.istat.it/>).

The ISTAT transport network has the following structure:

- a geographic WAN that includes the regional ISTAT offices connected to the central headquarters in Rome
- a metropolitan MAN that includes all of the Roman offices connected to the central headquartersa secure network composed of various DMZs for accessing the Internet via the GARR network, exposed servers, and connections with other bodies through RUPA [Single Network of the Public Administration]





SOLUTION

In 2003, ISTAT initiated a project to evaluate the pros and cons of migrating to Linux, planning the new architecture for one of the Via Tuscolana offices, where around 400 employees are mainly concerned with preparing economic statistics.

This project also sought to consolidate and integrate existing applications and improve the capacity of processing and disk space.

Eight multiprocessor servers with x86 architecture were purchased, with four functioning as database servers, two as application servers, and one each for managing backups and testing.

The database servers were then configured according to the type of application being executed: “pure” OLTP applications, mixed OLTP-batch applications, and administrative data applications (large archives moved using batch procedures).

The application servers were used for executing SAS, in addition to C and COBOL applications. Red Hat Enterprise Linux 3 AS was chosen as the operating system.

Storage Area Network (SAN) architecture with total formatted capacity of around 7 terabytes, with mixed FC and SATA drives and technology was used for storage.

Once the installation and testing of the system had been completed, the Oracle, SAS, and COBOL environments were installed, as well as other additional software such as Apache, PHP, and MySQL. In this context, transition from technologically obsolete servers to new architectures also involved changing the software versions.

The project was successfully completed in a matter of months and represented the turning point initiating the change in ISTAT’s entire architecture.

After the successful completion of the test phase, the institute decided to adopt Linux solutions as standard for all ISTAT servers; it is currently completing the migration of all data and applications from the old servers by porting them onto around 30 new multiprocessor servers with either AMD/Opteron or Intel Itanium2 64-bit technology and Red Hat Enterprise Linux 4.

Data was stored on a number of SANs with a total formatted capacity amounting to dozens of terabytes with mixed-technology FC and SATA drives.

Proprietary products such as the backup management application (IBM Tivoli TSM) were also integrated into the new operating environment without problems, demonstrating the validity and openness of the adopted solutions.

Some servers providing critical services were given a high-availability configuration using Red Hat Cluster Suite. Red Hat Satellite was used for updating the operating system and applying security patches, which is particularly important given the high number of servers involved.

BENEFITS

This was a positive experience that involved costs in human resources training and a change in outlook regarding a new way of working and interacting with the open source community.

This was instrumental in increasing the capacity for analysis and the skills of operational staff responsible for managing IT systems. A training plan was developed in order to support the migration to Linux involving hundreds of employees such as system staff, application developers, and end users (statisticians). Training was mostly handled by staff from within ISTAT.

The new servers brought significant increases in speed of execution, both on batches that have been used for years and new interactive applications. The increase in performance, which on average is five times greater than with the previous system, is obviously due both to the performance of the operating system and the new hardware's architecture.

It is too soon to make a final evaluation of the financial costs, but the company undoubtedly made considerable savings on software licences. All servers in the Via Tuscolana office were acquired for a comparable cost to what was previously spent annually on hardware assistance and system software. Moreover, the adoption of open source software has allowed ISTAT to purchase high-quality hardware at competitive prices.

No serious problems were encountered in the installation and use of the commercial or open source products used in the institute, and the number of calls to the Red Hat support team were reduced and mainly related to minor problems.

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