



TSF selects Cisco for a unique Data Centre

At the heart of a new project for business critical applications for the FS group lie TSF's enhanced ICT capabilities and Cisco's Data Centre, Disaster Recovery and Business Continuity solutions.

Executive Summary

Customer Name

Tele Sistemi Ferroviari S.p.A.

Industry

ICT services for the Transport and Logistics sector

Business Challenge

- Unify some different data transaction channels, previously developed and administered separately, and with separate operational costs for their management, production and maintenance.
- Guarantee Business Continuity and Disaster Recovery for business critical applications for the FS group.

Business Results

- The high level of technological skill within TSF and Cisco's Data Centre and Application Control Engine (ACE) solutions made it possible a 'zero time' redundancy network architecture, in order to provide 24x7x365 Business Continuity.

Tele Sistemi Ferroviari, TSF S.p.A., is the country's leading company in the development and management of ICT services for the Transport and Logistics sector. Founded in 1997 as a spin-off of the State Railways (FS) Group's ICT division, TSF's activities in the market involve the broadening of the range of services that it offers, as well as its principal activity of managing the outsourcing of the FS Group's Information Technology. TSF has about 700 employees distributed among its branches in Rome, Florence, Bologna, Genoa and Turin, whose professional, technological and processing skills acquired through years of experience, combined with the number and the complexity of the projects carried out in the diverse and manifold fields of the transport sector, make TSF the ICT partner of choice for large and medium sized operators active in the Transport sector. TSF's offering covers the entire spectrum of ICT, with technological and applications platforms based on all the principal market standards, and with ad hoc solutions for the Transport sector; moreover the company boasts a leading edge ICT technology infrastructure and provides a wide and diversified range of services from process analysis through to complete operational management.

Among the major projects developed for the State Railways Group, an architecture orientated towards the FS group's business critical applications was created, that is one of the most innovative Data Centre, Business Continuity and Disaster Recovery architectures ever produced in the transport and logistics field anywhere in the world. The objective is business efficiency, since it involves the unification of different data transaction channels, previously developed and administered separately, and with separate operational costs for their management, production and maintenance. A project that is anything but simple, as confirmed by Marco Barbalinardo, Design and Service Manager for TSF's network-data-telephony. "We were aware of the prerequisites that a project of this kind imposed. The use of a number of channels gave the architecture an inherent

reliability: in the event of downtime on one channel, the others continued to guarantee continuity of service. A single system therefore had to have the highest reliability characteristics 24x7x365." But that is not all: unlike a data load distributed over different systems, it had also to guarantee levels of performance capable of coping with centralisation onto a single channel, as well as a high level of flexibility and scalability depending on the continual changes in the number of users and clients. But the high level of technological skill within TSF made it possible to optimise the architecture of the pre-existing Data Centre in order then to perfect a winning solution, thanks to Cisco's solutions.

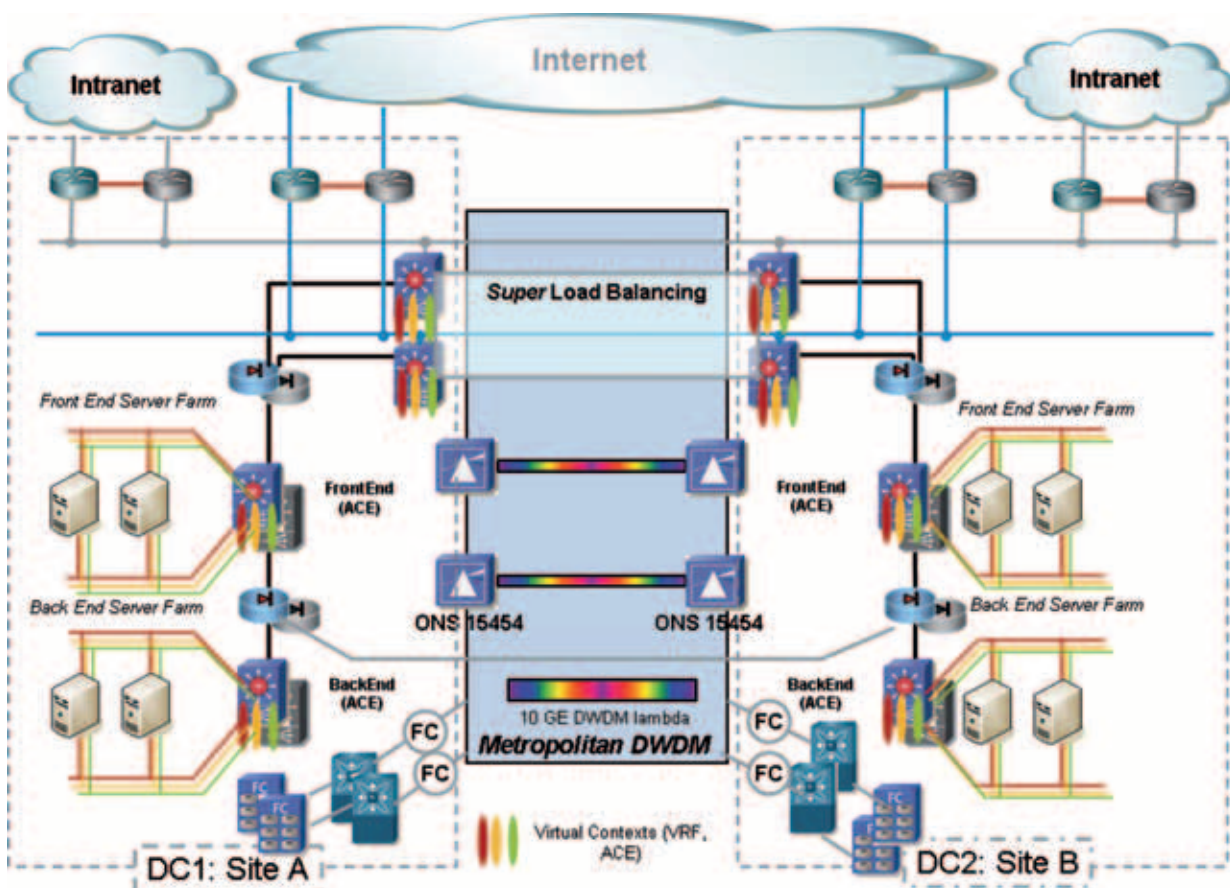
Francesco Barbieri, Project Manager, goes into detail. "The TSF Data Centre was subdivided into 5 physically separated CEDs, each one of which was dedicated to the servers that host the numerous applications servicing the different computer systems of the FS Group. We have provided for a progressive virtualisation of the Data Centres, subdividing the CEDs in question into 16 virtual CEDs." This choice made it possible right from the start to meet the demand for scalability and flexibility for managing changes, while in order to satisfy the requirements for reliability and zero downtime, a Disaster Recovery site situated externally was chosen to support the virtual CED. However, the co-primary CED also had to ensure Business Continuity, meaning continuous operational service also during the switch between sites in the event of an interruption to the service on the principal site. "To this end we designed a system of active/active load balancing between sites. Often for Disaster Recovery and Business Continuity environments heavy investment is made in a secondary site that is then never used. We have therefore created a network architecture for the simultaneous use of the two sites, whose active/active balancing guarantees an intelligent protection of the investment, as well as permitting a saving on the equipment made available, with the acquisition of only 80% of the hardware resources that would have been needed to

create 2 twin sites.” In this way, in addition to the savings, a system with zero risk of downtime was developed. “The most advanced Business Continuity techniques guarantee a switch between 2 sites in a time always greater than zero, and often greater than 15 minutes, bearing in mind also the authorisation processes of switching.” Those conditions were unacceptable for an organization of the size of the FS Group. “Thanks to the active/active system”, Barbieri continues, “there is an inherent 'zero time' redundancy in the system because the 2 sites are always active. In the event of a stoppage, the network automatically transfers 100% of the traffic to the other site”.

The pre-existing architecture was already based on Cisco equipment, and the new project confirmed the choice of Cisco 6500 switches and routers. But that was not all. The requirements for performance and scalability, as well as the need for virtualisation of the CEDs, compelled TSF to use new technologies such as Cisco's Application Control Engine (ACE), the solution for applications distribution that offers high performance with a throughput capable of reaching 16 Gbps, multi-layer safety and virtual partitioning functionality. “In view of the number of users”, adds Barbieri “the architecture has to use mechanisms to channel the traffic in an equitable way within the Data Centres, which requires that each DC is equipped with its own balancing equipment. In addition to these, there are two super-balancers whose purpose is to distribute the traffic between the 2 sites,

and that are interconnected by means of Dense Wavelength Division Multiplexing (DWDM) on dark fibre.” This is a really innovative and unprecedented method of balancing between 2 Data Centres. “By shifting the balancing logic onto the network and onto the transport, we have excluded any problems that appear on the network arising from the specific configurations of the clients, bearing in mind that part of the traffic comes from the world of the Internet.”

This was a really demanding project, that went through various phases not lacking in complexity. The entire process started with the updating of the network devices of the CEDs to the new architecture, with Cisco 6500 Switches and the implementation of Cisco ACE, in order to put the virtual CEDs of the primary site into service. This was followed by the creation of the co-primary CED and the putting into service of the connection between the 2 sites in very broad band, with the installation of Cisco ONS 15000 equipment. “Thanks to the technology chosen,” Barbieri underlines, “the sites communicate without any appreciable transmission delay, as if they were situated in the same place, even though the data travels along a good 35 km of metropolitan fibre.” Then the tuning was carried out to establish the balancing logic. “Cisco ACE constantly checks the correct functioning of the applications hosted on the two sites, simulating transactions that are very similar to those carried out by the users. This provides a true perception of the state of health of the systems,



unlike the traditional techniques used by other balancing technologies.” Of the 9 months of planning, a good 5 were spent in laboratories for testing, which made it possible to release the architecture free of all risks. “Cisco provided us with demonstration equipment, giving us the capability of developing all the tests possible and of developing the configurations that we then put into service.”

The benefits of the particular network architecture chosen are tangible as also are the improvements that the virtualisation and “multi-homing” will have from a commercial point of view: once again, technology and business go hand in hand, as Barbalinardo concludes, “The consolidation of the technological assets will generate substantial savings in operating costs, as well as

the obvious advantages deriving from the significant increase in the availability of the applications. At the same time, the high reliability of the system offers us the possibility of going ahead with operations for upgrading or patching the effectiveness of the equipment, as well as low operating costs owing to the absence of a service provider for the connection between the two sites, and, not least, the scalability and expansibility of the architecture at marginal costs.”

By choosing Cisco, TSF has confirmed its own commitment towards innovation and an avant-garde approach to making farsighted technological investments, developing in fact an innovative model of Data Centre architecture that will also be capable of replication in other contexts.

For Further Information

Cisco Systems

<http://www.cisco.com>

Data Center Solutions

<http://www.cisco.com/go/datacenter>

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