Customer Case Study

Research and Education Network Chooses the Cisco CRS-1

RENATER adopted initiative to boost network scalability and support grid computing while simplifying its infrastructure.

EXECUTIVE SUMMARY

RENATER

- National research and education network
- France
- Users at 800 sites

BUSINESS CHALLENGE

- Diverse community of researchers, educators, and government agencies
- Requirements for advanced carrier-class, always-on operation
- Support for new technologies (for example, IPv6), high performance, and scalability while simplifying infrastructure

NETWORK SOLUTION

- Grid computing with mesh network
- Cisco CRS-1 for its optical capabilities and consolidation within the core
- Cisco 12400 routers in the network core

BUSINESS RESULTS

- Ability to utilize strong Cisco relationships with other leading national research and education networks in Europe and Latin America
- Scalability within the RENATER core
- Strong platform for IPv6 and grid computing

BUSINESS CHALLENGE

The government-funded national research and education network in France – Reseau National de Telecommunications pour la Technologie, l'Enseignement et la Recherche (RENATER) – includes multiple networks supporting numerous bandwidth-intensive projects. More than 800 sites with activity in the fields of research, technology, education, and culture rely on the RENATER network for connectivity and collaboration over international networks such as GÉANT. The RENATER network includes a metropolitan infrastructure and international connections with very-high-speed links. RENATER also reaches the overseas French territories and departments.

The RENATER network management team must constantly evaluate and adopt emerging technologies to meet the needs of the community of users in France. In 2005, RENATER evaluated alternatives for consolidating its network infrastructure, while improving interconnectivity with other research networks. To enhance the backbone serving its community, RENATER required:

- Advanced carrier-class operation with "always-on" operation for the demanding networking requirements of intensive research efforts.
- An upgrade path for extending 10-Gbps coverage (and eventually 40 Gbps).
- Support for new Internet network technologies such as IPv6.
- Simplification of the existing network while helping ensure scalability for decades to come.
- Performance and flexibility for grid computing.
- Ability to enhance test environments for new applications and network capabilities.

The fourth generation of the network, called RENATER 4, primarily applies optical technologies and dense wave-division multiplexing (DWDM) within a full mesh topology. The main sites on the RENATER network – universities and primary research centers – are linked directly into the RENATER core network over 2.5-Gbps connections. The deployment of 10 Gigabit Ethernet has been carried out at approximately ten sites (about 30 percent of the network). Traffic from other sites – the majority of primary and secondary schools in France, government agencies, art institutes, hospitals, and private research organizations – is aggregated in regional networks that are funded and managed by regional authorities.

NETWORK SOLUTION

RENATER uses the Cisco® CRS-1 Carrier Routing System to boost network scalability within their core backbone and give more flexible support to research laboratories and universities throughout France. The Cisco CRS-1 will be part of an integrated system to consolidate several existing layers of the research network into a single core infrastructure while providing support for projects such as grid computing and those teams that require Ethernet over Multiprotocol Layered Switching (EoMPLS) service or MPLS VPNs. The RENATER core network also relies on other Cisco technology including:

PRODUCT LIST

Routing and Switching

- Cisco CRS-1 Carrier Routing System
- Cisco 12400 Series
- Cisco 7200 Series Routers
- Cisco 3800 Integrated Service Routers
- Cisco Catalyst 3750, 4500, and 6500 Series Switches

- Cisco 12400 routers for core backbone routing
- Cisco 7200 Series routers with NPE-G1 network processing engines, located mainly in the Paris POPs
- Cisco 3800 Series Integrated Services Routers (ISRs) for overseas territories
- Catalyst® 3750 Series to provide 10/100/1000M access on POPs, Catalyst 4500 (with Supervisor II-Plus 10 GE) Series on POPs that require many Ethernet and some Gigabit Ethernet connections, and Catalyst 6500 (with Supervisor Engine 720 and 10 GE linecards) Series Switches for high-density POPs with many 10 Gigabit Ethernet ports (such as Paris and Lyon).

The decision to use Cisco equipment gives RENATER both technology and relationship advantages. “Cisco innovations such as the Cisco Service Separation Architecture will help us layer the multiple RENATER research networks onto a single converged networking system, while logically isolating and protecting each distinct research network,” says Dany Vandromme, chief executive officer for RENATER. “It will also help underpin RENATER’s move toward a distributed grid computing infrastructure, and support our research projects that require advanced capabilities such as IPv6.”

Cisco proven experience with the leading European national education and research networks complements many RENATER collaborative projects. These networks include:

- DFN in Germany
- UKERNA in the UK
- CESNET in the Czech Republic
- HungarNet in Hungary
- SUNET in Sweden
- GRNET in Greece
- HEAnet in Ireland

In addition, DANTE, an organization that plans, builds, and operates pan-European networks for research and education, has selected Cisco Systems® technology for the development of the ALICE project, which is connecting National Research and Education Networks (NRENs) in Latin America. Cisco has also partnered with the research community in Europe through its coordination of a major research project cofinanced by the European Commission called 6DISS (www.6diss.org). Working with 15 NRENs and 15 universities, this project is testing and deploying IPv6 under realistic conditions and speeding up the implementation of new technology and features across European national research networks.

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– Dany Vandromme, CEO, RENATER

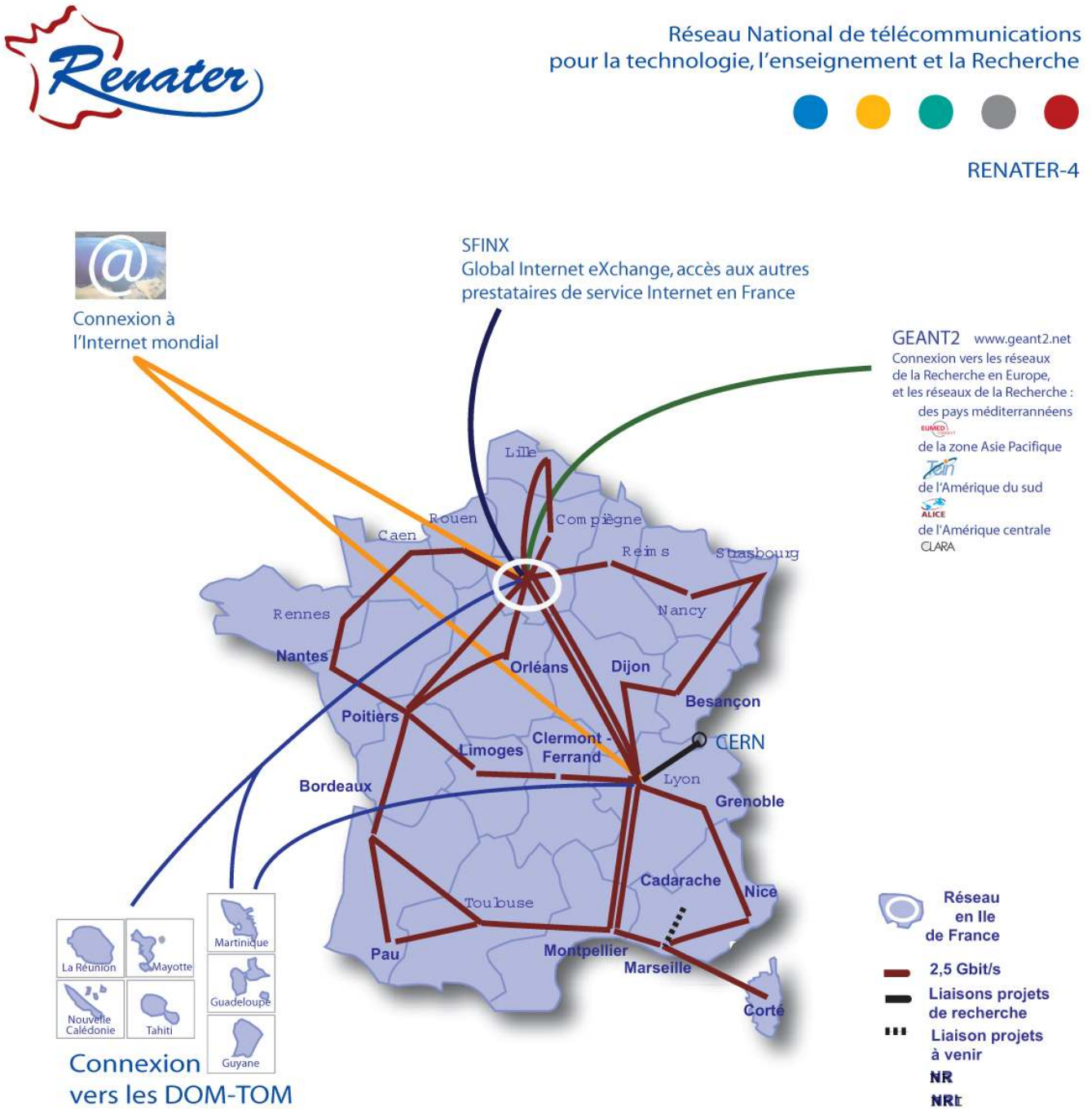
BUSINESS RESULTS

“The Cisco CRS-1 introduces many possibilities for meeting the future demands of our diverse user community,” explains Franck Simon, RENATER technical director. “We can both increase our capacity as well as increase the services that we provide over the evolving network.” The RENATER team today continues to explore the capabilities and features of the new Cisco CRS-1 routers, and the platform is being evaluated for support of both current and emerging research projects. With the existing core network based on Cisco 12000 Series and other Cisco platforms, the team can smoothly introduce the CRS-1 platforms wherever the increased capacity, optical capabilities, and support for advanced capabilities meet the needs of the users.

FOR MORE INFORMATION

To find out more about the Cisco CRS-1, go to: http://www.cisco.com/go/crs.

Figure 1. Network RENATER



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