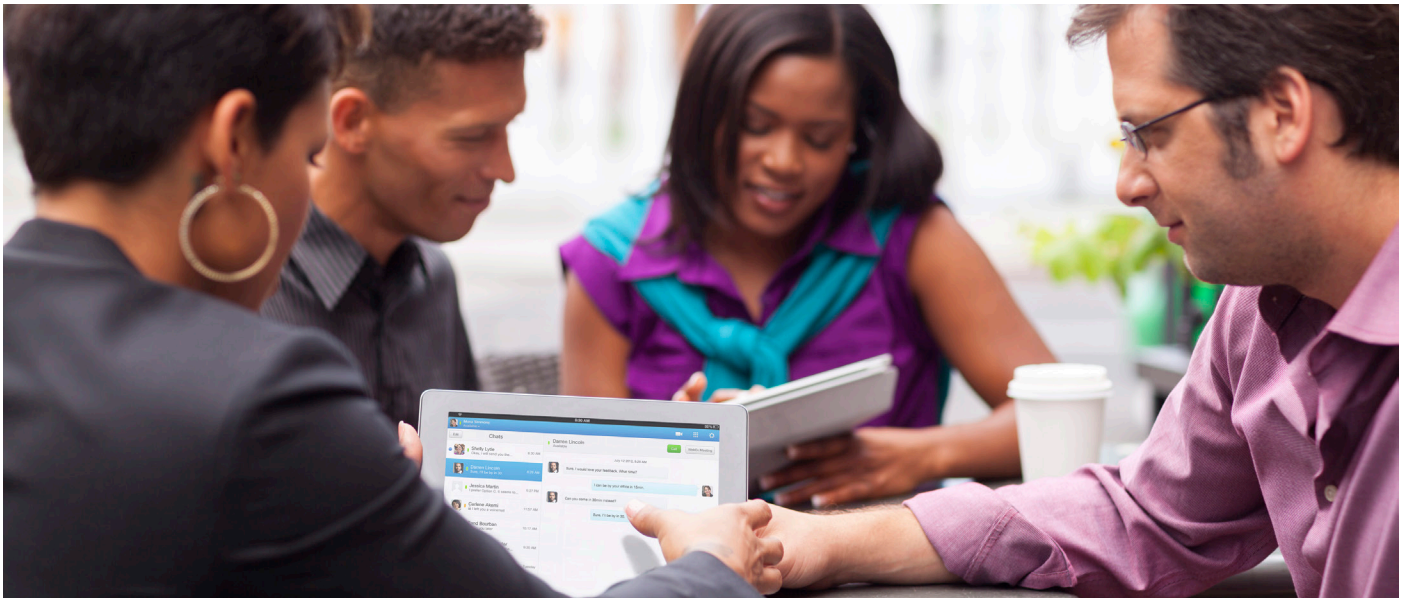
Software-Defined Networking Promises Competitive Advantage

Customer Case Study



Telecom Italia collaborates with leading Italian universities to shape tomorrow's networks and bring new innovation to marketplace

EXECUTIVE SUMMARY

Customer Name: Telecom Italia

Industry: Telecommunications

Location: Italy

Number of Employees: 82,000

Challenge

- Maintain innovation for next-generation advantage
- Reduce operating cost, and improve service provider agility
- Deliver new products and services

Solution

- Software-defined networking, initially based on OpenFlow implementation and Cisco Unified Computing System servers and cloud network foundation

Results

- Optimized potential for software-defined networking research
- Enabled network slicing for efficient network use
- Created stable environment for experimentation

Challenge

Telecom Italia is the largest telecom company in Italy, offering voice and broadband Internet services in Italy, along with mobile phone services in Italy and Brazil through its TIM subsidiary. As one of the first operators to route voice calls over a Cisco-based IP backbone, the company has a long history of innovation. Like all service providers, Telecom Italia is always looking for new ways to deliver superior customer service while reducing costs, and is also eager to improve margins in emerging markets like Brazil.

At the network level, one potential way to achieve cost reduction, among other business benefits, is through software-defined networking (SDN). Moving some specific network intelligence and policy-making to an application called a controller, this approach reduces administration by letting engineers make changes in software rather than configuring hardware directly or, alternatively, to automate these network management tasks.

SDN also promises to make it easier and more cost effective to carry out network upgrades and create new services. At the same time, SDN is an emerging technology with practically no real-world deployments within the service provider industry. Telecom Italia would have to break new ground and study the concept carefully before deciding on whether to commit to it.

To do this, it joined forces with five prominent Italian universities within the framework of an initiative called Joint Open Labs (JOL). Telecom Italia decided to build a shared network infrastructure, JOLnet, for SDN research. The purpose of JOLnet is to link the participating universities to each other and to the Telecom Italia lab in Turin. It was clear from the start that, as a research platform, JOLnet would be different from traditional infrastructures. Although scalability was not crucial, reliability was. Moreover, JOLnet switches needed open interfaces so that software could connect to them via the control plane.

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Paolo Fasano
Broadband Network Services
Innovation Manager
Telecom Italia

"Our experience is that when you try to adapt current market solutions to your needs, there is always a gap. Cisco has filled this gap better than others. That's why Cisco is the best partner for this kind of project."

Mario Ullio
JOLnet Project Manager
Telecom Italia

Solution

Telecom Italia asked four vendors to put forward SDN proposals based on a high-level architecture specification. "We selected Cisco technology as the most fitting for our needs in terms of functionality and sizing," says Paolo Fasano, broadband network services innovation manager.

Although JOLnet functions logically as a mesh, Telecom Italia has deployed a star topology with its Turin labs as the centerpiece. The Turin hub includes two Cisco® Unified Computing System™ (UCS®) B200 M3 Blade Servers, with Intel® Xeon® E5-2620 processors, mounted on a Cisco UCS 5108 Blade Server Chassis.

A VMware hypervisor on UCS supports a Cisco Cloud Services Router (CSR) 1000V Series platform used for Layer 2 Tunneling Protocol Version 3. The tunnels interconnect all the sites, so creating an overlay structure over the existing IPv4 connectivity. Cisco Catalyst® 3850 Series Switches, by means of OpenFlow support, enable the network to be segmented for each university or group of universities. UCS also hosts the Cisco eXtensible Network Controller (XNC), which is used to partition Jolnet network resources so the universities can run their applications over dedicated infrastructure in a secure and parallel way.

Each university also has two Cisco Catalyst 3850 Series Switches, with one acting as a local hub and the other as a node, plus a Cisco UCS C220 Series Rack Server. The servers host university specific applications, running on the dedicated links created by the XNC, which is managed on premise by Telecom Italia.

Results

With JOLnet not scheduled to launch until 2014, it is too early for Telecom Italia to confirm quantifiable benefits. However, the service provider expects to profit from at least two major values of SDN.

The first potential advantage involves the connection between applications and the OpenFlow controller, known as the northbound interface. "The opening up of the northbound interface might result in a number of new IT applications and increased business," says Fasano. "Today this is only a concept, but an exciting one. The next step is to create that interface and scope the applications that could run on it." These new applications can provide additional control, automation, security, and value for Telecom Italia and end user customers.

The second potential advantage is seen in cost reduction. "Creating a software model of the network would reduce the amount of human intervention needed, in turn improving service profitability," Fasano says. "We think this is the right approach to assess SDN-based networks. Cisco technology provides a stable network infrastructure to support the experiments we need to carry out and find the answers to the most pressing SDN questions."

Telecom Italia is already confident that the Cisco technology it has selected could help secure new competitive advantages.

Mario Ullio, JOLnet project manager, adds: "We see a lot of work taking place on SDN. There is a lot of hype, and each vendor has its own pitch. Our experience is that when you try to adapt current market solutions to your needs, there is always a gap. Cisco has filled this gap better than others. That's why Cisco is the best partner for this kind of project."

Next Steps

Telecom Italia-led SDN research by the JOL consortium involves several steps, beginning in August 2014 with an initial six months of functional testing. These results will help define later phases of the project, which may run until 2017. New products, such as the Cisco ASR 9000 Series Aggregation Services Router could also be implemented within JOLnet in the near future. Importantly, this approach means that Telecom Italia can make upgrades without replacing its entire infrastructure, in turn protecting investment.

For More Information

To learn more about the Cisco architectures and solutions featured in this case study please visit:

www.cisco.com/go/ucs

www.cisco.com/en/US/solutions/ns1168/fast_it.html

Product List

Data Center Solutions

- Cisco Unified Computing System (UCS)
  - Cisco UCS B200 M3 Blade Servers
  - Cisco UCS C220 Series Rack Server
  - Cisco UCS 5108 Blade Server Chassis

Routing and Switching

- Cisco Cloud Services Router 1000V Series
- Cisco Catalyst 3850 Series Switches

Processors

- Intel Xeon E5-2620 processors

Management

- Cisco eXtensible Network Controller

Services

- Cisco SMARTnet

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