CASE STUDY

Intel® Ethernet Converged Network Adapters X520-DA2

Communications/ Media
Enterprise Server

Networking the future

Intel® Ethernet Converged Network Adapters X520-DA2 offer Refer Telecom a viable and cost-effective upgrade path to 10 Gigabit Ethernet

Leading Portuguese Telco Refer Telecom carried out a proof of concept (PoC) to test the viability of transitioning network traffic to 10 Gigabit Ethernet (10GbE) using SFP+* Direct Attach Copper (DAC) network interfaces and Intel® Ethernet Converged Network Adapters X520-DA2. Not only did it find that this offered a viable upgrade path to 10GbE compared to optical network interfaces, it also found that it could significantly lower the total cost of ownership (TCO) of its network infrastructure.

refertelecom
telecomunicações seguras

"By offering a much more cost-effective upgrade path to 10 Gigabit Ethernet, SFP+ direct attach copper network interfaces, together with Intel® Ethernet Converged Network Adapters X520-DA2, significantly reduce the total cost of ownership of our network infrastructure."

Nassri Abokhalaf,
Technical IT manager
Refer Telecom

CHALLENGES

- **Network demands.** Refer Telecom needed a future-proof solution to accommodate increased demands on the network due to growth in data center virtualization and cloud computing services, among other things
- **Upgrading the future.** Its current 10GbE optical infrastructure added this much-needed bandwidth but was proving to be an unviable solution for upgrading the remaining 95 percent of its data center infrastructure. Refer Telecom needed a more cost-effective upgrade path

SOLUTIONS

- **Performance evaluation.** Refer Telecom ran a PoC comparing the performance of a 10 GbE infrastructure based on SFP+ DAC cables together with Intel Ethernet Converged Network Adapters X520-DA2 to that of its existing Gigabit Ethernet (GbE) environment

TECHNOLOGY RESULTS

- **Greater bandwidth.** It found that the system running Intel Ethernet Converged Network Adapters X520-DA2 transferred data at a rate of 9.6 GB/s, compared with just 3.2GB/s for the previous system[1]

BUSINESS VALUE

- **Viable upgrade path.** PoC proved to Refer Telecom that SFP+ DAC cables and Intel Ethernet Converged Network Adapters X520-DA2 offer a viable upgrade path to 10GbE
- **Lower TCO.** Not only that, it found they are also capable of significantly reducing TCO, equating to a reduction in the cost per port of up to 83 percent
- **No vendor lock-in.** Vendor neutrality enables Refer Telecom to choose best-of-breed solutions in the future and increases life expectancy of existing hardware

Networking expertise

Refer Telecom provides essential communications services to Portugal's railway. These include voice over IP (VoIP) and mobile telecommunications; data transmission, including high resilience networks to support critical signaling, control and railway telematics systems; and mobile networks to support operations. Additional services include video surveillance, video conferencing, and public address systems, among others.

It also offers cloud computing and managed information and communication technology (ICT) services to enterprises across Portugal from its three main data centers located in Lisbon, Porto and Viseu. These services include fiber optic networks, Internet access and virtual private networks, leased lines and Ethernet connections, virtual data center, storage, as well as disaster recovery.

The quality of these services is governed by strict service-level agreements (SLAs) and Refer Telecom seeks to offer the most up-to-date technologies to ensure that high levels of performance, reliability, availability and ultimately customer satisfaction are guaranteed.

Controlling costs

Growth in data center virtualization and cloud computing services has driven the need for more bandwidth per server, since VMs still require adequate network connectivity. Also, backup and storage are progressively shifting to Ethernet.

Intel® Ethernet Converged Network Adapters X520-DA2 significantly lower the TCO of the network

To accommodate these increased demands on the network, Refer Telecom had already migrated five percent of its data center from GbE to 10GbE using optical network interfaces and switches. While this added much-needed bandwidth, it also raised cost concerns.

The optical network interfaces used by Refer Telecom to connect 10GbE optical switches to each server cost around EUR 2,000 (USD 2,587) plus the actual cost of the switch itself. Factoring in redundancy on top of this, Refer Telecom estimated it was spending around EUR 6,000 (USD 7,762) to connect each of its 10 GbE optical switches to its servers. The cost of upgrading the rest of its three data centers from GbE to 10GbE was looking prohibitively expensive.

Nassri Abokhalaf, technical IT manager at Refer Telecom, explains: "Network demands are driving the need to upgrade our networks from GbE to 10GbE. However, we needed to find ways to make our upgrade path much more cost effective. We needed to address this issue sooner rather than later."

For these reasons, Refer Telecom decided to carry out a PoC to ascertain the benefits of transitioning network traffic to 10 GbE using SFP+ DAC network interfaces and Intel Ethernet Converged Network Adapters X520-DA2, rather than the optical network interfaces and switches it had been using. Refer Telecom and Intel already had a long-standing relationship with the telecommunications provider, having deployed the Intel® Xeon® processor E5 family-based servers throughout its data centers.

Trailing benefits

Working with Intel, Refer Telecom evaluated the performance of two Intel Ethernet Converged Network Adapters X520-DA2 in one of its customer environments. SFP+ DAC cables were used to connect two Cisco Nexus* 5000 series switches to two HP ProLiant* DL380 G7 servers running a CheckPoint GAiA* unified secure operating system. It then compared the performance of this system against its existing GbE set up using Intel® Gigabit ET2 Quad Port Server Adapters and the same network interface, switches and servers.

Refer Telecom measured the success of the PoC using iperf 2.0.5* to measure the network speed between the two servers. It found that the system running Intel Ethernet Converged Network Adapters X520-DA2 transferred data at a rate of 9.6 GB/s, compared with the 3.2GB/s for the previous system. To achieve this maximum performance with Intel Ethernet Converged Network Adapters X520-DA2 Refer Telecom used Peripheral Component Interconnect (PCI) 2.0 with eight lanes (x8) to connect the hardware. It found using other configurations, for example PCI 1.0 or four lanes (x4), could narrow the output.

The results were much higher than expected for a real-life scenario and proved to Refer Telecom that SFP+ DAC network interfaces, together with Intel Ethernet Converged Network Adapters X520-DA2, offered a viable upgrade path to 10GbE. Not only that, they were also capable of significantly reducing the TCO of the data center infrastructure.

Refer Telecom estimates that by upgrading to 10GbE based on much more cost-effective SFP+ copper network interfaces and Intel Ethernet Server Adapters X520-DA2 rather than optical network interfaces and switches will reduce switch costs by up to 90 percent, while networking interface costs will be reduced by 75 percent. This equates to a reduction in the cost per port of up to 83 percent.

Vendor neutral

A further benefit of upgrading with SFP+ DAC network interfaces and Intel Ethernet Converged Network Adapters X520-DA2 is that there are no compatibility issues and therefore no vendor lock-in. Refer Telecom can select the best-performing and most cost-effective technologies to run its data center environment.

Lessons learned

SFP+ DAC network interfaces and Intel Ethernet Converged Network Adapters X520-DA2 offer a viable and much more cost-effective upgrade path to 10GbE than optical network interfaces. They can reduce TCO significantly, equating to a reduction in the cost per port of up to 83 percent. What's more, the Intel solution offers vendor neutrality, enabling Refer Telecom to choose best-of-breed solutions in the future and increase life expectancy of existing hardware.

Abokhalaf explains: "As long as we stick to each vendor's compatibility matrix we are able to pick and chose the server, switch and network technologies we use. This has many benefits. Not least, we are able to improve connectivity without having to replace hardware which may still be performing well in terms of speed, efficiency and memory capability. By increasing the life expectancy of our hardware, SFP+ DAC network interfaces and Intel Ethernet Converged Network Adapters X520-DA2 are able to drive down costs even further."

Future networking

Following the PoC, Refer Telecom has already upgraded eight more servers to 10GbE using SFP+ DAC network interfaces and Intel Ethernet Converged Network Adapters X520-DA2. This is now the solution of choice for future upgrades. Over the coming years, Refer Telecom plans to upgrade its remaining GbE infrastructure to 10GbE as and when demand requires.

Finally, Refer Telecom is now looking into future upgrade scenarios combining link aggregation on the network interface and the switch to achieve up to 20GbE per adapter.

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