



Problem Solved.

Achieve Unified Networking with 10GbE

Solve the problem of costly, separate storage and network infrastructures with unified networking on 10GbE Intel® Ethernet.

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Organizations with legacy data center infrastructures typically run two separate networks: an Ethernet-based local area network (LAN) to connect servers and clients to the Internet; and a Fibre Channel (FC)-based storage area network (SAN) to connect servers to disk arrays and block-level data storage. If it sounds complex, it's even more complicated to set up and deploy, but there is a simpler and easier way.

Fibre Channel over Ethernet (FCoE) enables data centers to run FC protocols over a robust and reliable 10 Gigabit Ethernet infrastructure. At the heart of the solution are the 10GbE Intel® Ethernet Converged Network Adapter (CNA) X520 and X540 product families, which combine both LAN and SAN connectivity on the same adapter with FCoE. This unified networking solution saves your customers time and money while delivering the 10GbE performance they need to leverage modern business tools and maintain a competitive advantage.

The Problem

Ethernet LANs and FC SANs perform essentially the same function – connecting users to devices, networks, and data – but each uses an entirely different set of technologies and hardware. This adds a lot of unnecessary adapters, switches, and cabling while using up valuable floor space and cooling resources. The expertise required to support each network is also different.

And the burden only increases when you consider that business requirements for the network are growing. Organizations are looking to adopt virtualization and remain competitive by using modern business tools such as social media, mobile workforces, big data analytics, and hybrid or private cloud computing IT service delivery models. Moving to 10GbE will allow enterprises to exploit new capabilities such as FCoE.



The Opportunity

There is an appetite among IT managers and professionals for a unified networking solution. A recent survey demonstrates that 77% of IT managers and staff say it is important for 10GbE vendors to offer a network interface card (NIC) with both LAN and storage connectivity (such as FCoE), while nearly half of respondents (43%) say it is critically important.¹

What does this mean for you and your customers? As data centers make the move to 10GbE and look to upgrade their hardware, this is a prime opportunity to also transition to a unified network. Doing so will save your customers money with fewer CAPEX investments in host bus adapters (HBAs), switches, and cables.

As an added bonus, this can potentially lead to upsell opportunities by expanding your technology offerings with the ecosystem of Intel® Server Products, including Intel® Xeon® processors, Intel® Server Boards and Systems, Intel® Solid-State Drives, Intel® RAID, and more.

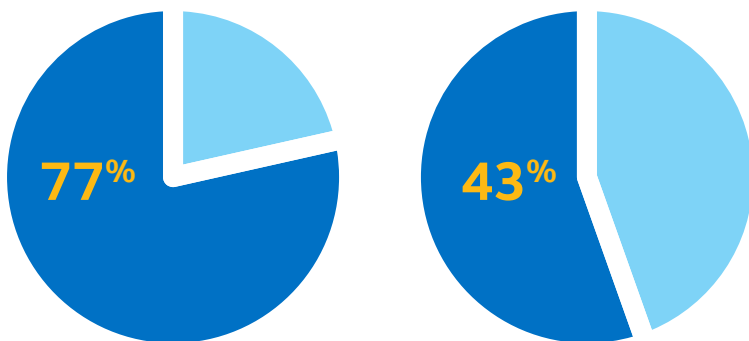
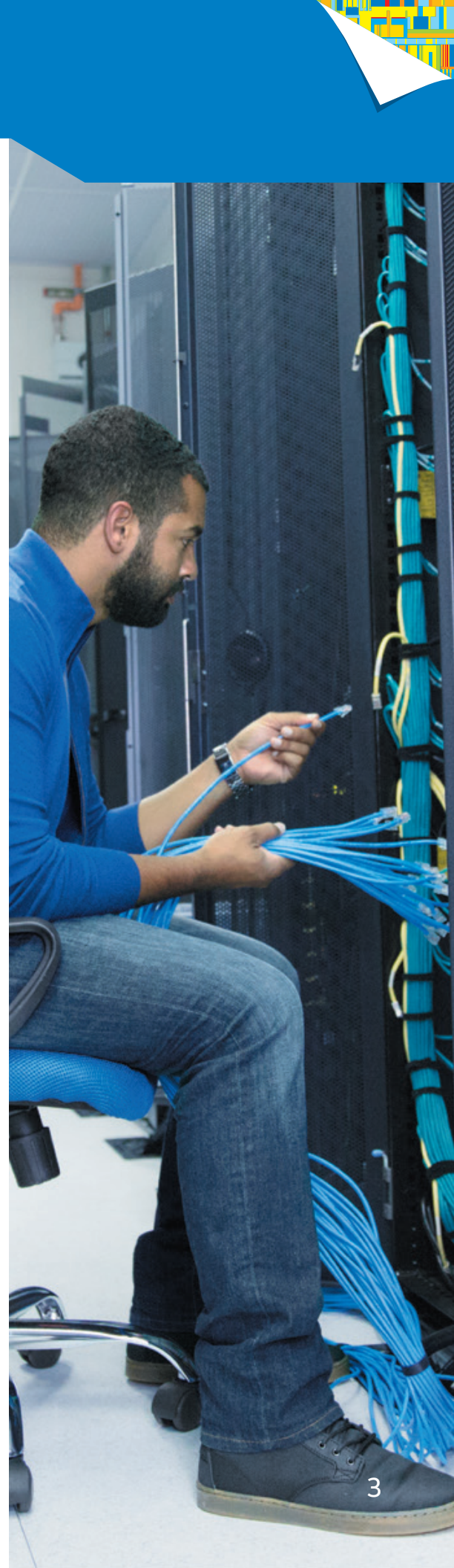


Figure 1 : 77% of IT professionals say it's important for vendors to offer NICs with both LAN and SAN connectivity, 43% say it's critically important.



The Unified Networking Solution

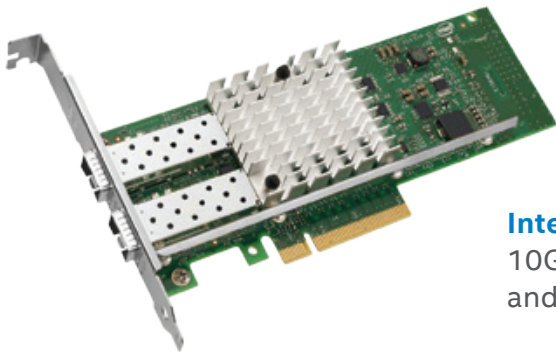
FCoE enables data centers to map FC protocols over an Ethernet infrastructure, meaning that your customers' storage data arrays are connected to their Ethernet-based networks rather than connected to a separate SAN. In a unified networking environment, because both LAN and SAN operate using the same Ethernet fabric, the data center can forego the hardware required to maintain a separate SAN altogether.

The benefits of a unified network also positively impact data center scalability. IT managers no longer have to maintain and upgrade two separate networks; because all of their resources are pooled into one infrastructure, upgrades to the Ethernet infrastructure affect both the LAN and SAN.

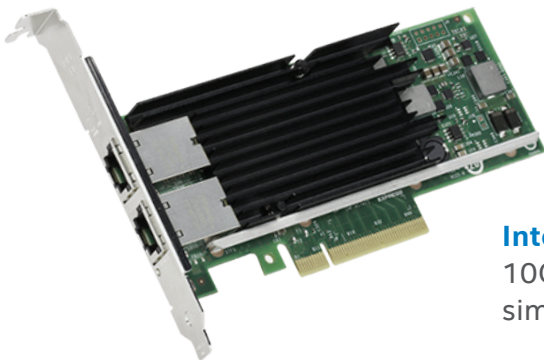


The Cornerstone Component

The 10GbE Intel® Ethernet CNA X520 and X540 families include both FC HBA and Ethernet NIC hardware components on the same adapter, enabling a unified networking solution based on FCoE and 10GbE. These adapters also support advanced virtualization capabilities, enabling data centers to run a high volume of virtual machines on multi-core servers.



Intel® Ethernet Converged Network Adapter X520:
10GbE SFP+ connectivity provides ultimate flexibility and scalability in a unified networking environment.



Intel® Ethernet Converged Network Adapter X540:
10GBASE-T provides backwards compatibility to simplify the migration to 10GbE.



Maintaining Quality of Service

One of the primary concerns with deploying FCoE is that storage data is especially sensitive to packet loss on congested networks, which can happen if the LAN is experiencing workload spikes. Typically, the SAN would be isolated on a separate network so this wouldn't be a problem.

To address this issue, the 10GbE Intel® Ethernet CNA X520 and x540 product families feature built-in Quality of Service (QoS) mechanisms such as Data Center Bridging to ensure lossless Ethernet. QoS mechanisms work by assigning higher or lower priority to different traffic types. This means that your customers can ensure a certain percentage of bandwidth is allocated for storage traffic alone, which insulates the SAN from congestion on the LAN.

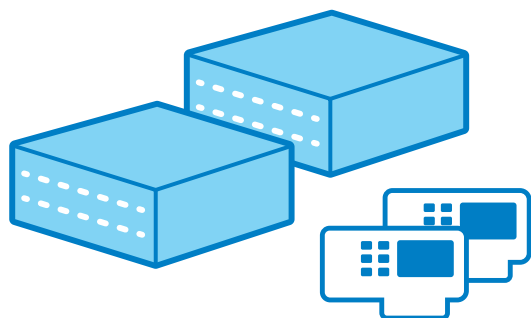
QoS mechanisms are vital to the unified networking solution. Not only do they enable IT managers to fine-tune the division of bandwidth between storage and network traffic, but they also guarantee the delivery of storage packets and protect the SAN from busy Internet Protocol traffic.

Benefits: A Closer Look

Transitioning to a 10GbE unified network delivers immediate cost benefits in the form of CAPEX savings. Whereas a typical legacy configuration would require separate switches and adapters, the unified networking solution offers the opportunity to minimize hardware investments with FCoE switches and FCoE CNAs.

In a recent case study, Intel IT deployed a unified networking solution and substantially reduced their per-rack implementation costs.² The legacy configuration utilized two switches (LAN and FC), a NIC (quad port) and an HBA (dual port). With a unified networking setup, Intel IT was able to reduce this to just one LAN switch (with FCoE support) and the Intel® Ethernet CNA X520 or X540. They also cited additional OPEX savings through reduced energy and cooling costs, as a result of less hardware to maintain.

Separate LAN and SAN:
LAN Switch, FC Switch, 1x NIC, 1x HBA



Unified Network:
1x LAN Switch with FCoE Support,
1x Intel® Ethernet CNA X520 or X540

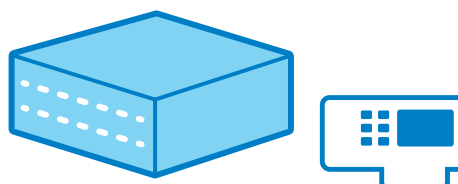


Figure 2: Intel IT deploys unified networking to substantially reduce their networking hardware.

Comparable Performance

In the same case study, Intel IT pitted the 10GbE Intel® Ethernet CNA X520 against an 8Gb FC HBA to test whether or not the unified networking solution could deliver comparable performance. Their benchmark testing demonstrated that the Intel® Ethernet CNA X520 family-based solution delivered up to 22% to 35% higher throughput when testing with 32 kilobyte (KB) to 128KB data blocks on the storage layer.²



Your customers may ask if the unified networking solution can deliver the same performance level of separate networks. As this example shows, the unified network not only meets, but exceeds performance expectations. On top of this, Intel IT's testing also demonstrated increased response times (measuring with data blocks of 128KB) up to 35% faster.²

Fast, Efficient, and Unified

The era of separate networks is coming to an end. As more and more data centers look to adopt 10GbE unified networking solutions, you can be poised to offer expert advice and speak directly to the efficiency and performance gains, along with savings to the bottom line, that data centers will get from a unified network.

Help your customers plan and deploy a 10GbE solution today.

Intel® Ethernet. It just works. Learn more at www.intel.com/go/10gbe

Acronyms

CAPEX – Capital Expenditures

CNA – Converged Network Adapter

FC – Fibre Channel

FCoE – Fibre Channel over Ethernet

HBA – Host Bus Adapter

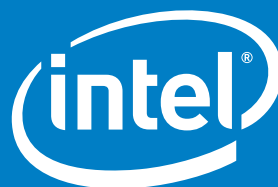
LAN – Local Area Network

NIC – Network Interface Card

OPEX – Operating Expenditures

QoS – Quality of Service

SAN – Storage Area Network



Look Inside.™

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more information go to <http://www.intel.com/performance>

1. "Market Pulse: 10GbE Adoption" survey conducted by IDG Research Services on behalf of Intel, March 2014. 10GbE Survey Methodology: The goal of this research was to determine the extent to which organizations have deployed, or plan to deploy, 10 Gigabit Ethernet (10GbE), as well as the adoption drivers, specific products/vendors in use, and potential benefits organizations have experienced or expect as a result of deploying 10GbE. Survey Duration: March 3-13, 2014. Audience Profile: InfoWorld and NetworkWorld readership. Qualifier: Have deployed or plan to deploy 10GbE. Respondent Characteristics: 183 qualified respondents; Titles: 63% IT/Network Management, 29% IT/Network Staff; Company Size: 26% 10,000+ employees, 26% less than 500 employees.

2. "Using Converged Network Adapters for FCoE Network Unification." Intel, 2012. http://www.intel.com/converged_adapters_FCoE

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