Solution Brief

intel®

Simplify 10 Gigabit Migration

with Flexible, Cost–effective 10GBASE-T

Together, Intel and Panduit deliver innovative products and optimum performance for 10GBASE-T networks

PANDUIT®

Greater network throughput and bandwidth performance are critical for supporting today's bandwidth-intensive applications. For companies contemplating a transition to higher network speeds, moving from one Gigabit Ethernet to 10 Gigabit Ethernet can give your network a 10x performance boost, and that's a solid investment. Migration can be made even easier with 10GBASE-T products.

Challenge

As more applications converge on Ethernet, organizations are challenged with the task of deploying a cost-effective, scalable, and reliable network infrastructure. But with all the choices out there, where do you start?

Many companies begin transformation with server upgrades, but upgrading servers alone, when still running a one Gigabit (1000BASE-T) network, or using SAS storage, will simply lock performance in the server, creating new bottlenecks. When it comes to upgrades, storage and networking are often overlooked. Making even minor adjustments to component configurations can have a huge impact on network performance.

One of the most important decisions to be made when rolling out network upgrades is typically choosing the media type, BASE-T, Direct-Attach Copper (DAC), or Fiber. DAC is relatively inexpensive when compared to fiber, but its short reach limits deployment flexibility. Fiber offers the longest cabling distances, but is usually used for higher port speeds, as the cost is higher and it's more complex to install.

Solution Benefits

- Familiar RJ45 interface simplifies migration, is backwards compatible, and allows you to take a staged approach to migration

- 10X greater bandwidth when migrating 1000BASE networks to 10GBASE-T

- 10GBASE-T is the most budget-friendly 10GbE option, over DAC and fiber

Solution

Trends show that over 80 percent of 1000BASE-T networks upgrade to 10GBASE-T, and there's good reason for this: if you have a 1000BASE-T network, you're already wired for it. RJ45 is everywhere, and with field-terminated cables, it's easy to deploy and provides the opportunity to take a staged approach to migrating to 10 Gigabit Ethernet.

10GBASE-T

10GBASE-T is likely the most cost-effective and least-disruptive path for upgrading from 1000BASE-T. With a 10X performance improvement, it's a solid financial decision, and it's budget friendly. Also, because it uses the RJ45 connection, with field terminated cables, there's no steep learning curve to overcome.

Cabling Considerations

When migrating from 1000BASE-T to 10GBASE-T, you can reuse your Category 6A (Cat 6A) cabling, and save even more money. But, for any new cabling or cabling upgrades, there are several things to consider: Cable diameter, alien crosstalk, and electromagnetic interference (EMI).

Cable diameter

The size of the cable is important to ensure that cabling can fit in both new and existing pathways. Panduit's Cat 6A Vari-MaTriX cabling is industry leading, providing the smallest diameter cable available in the market today. With a diameter of .250", Vari-MaTriX cables provide 20-30 percent more capacity in pathways enabling customers to increase the number of cables they can safely pass through new conduit or cable trays. It also enables cost savings, allowing customers to seamlessly swap out existing CAT 6 or Cat 5e cables to Cat 6A in existing conduits and pathways.

Manufacturer	Cable Diameter	Conduit			Cable Tray
		3/4"	1"	4"	4"x12"
Vari-MaTriX	**0.250"**	4	7	119	484
Competitor A	0.285"	3	5	91	372
Competitor B	0.270"	3	5	98	400
Competitor C	0.265"	3	6	105	430
***40% fill per National Electric Code Guidelines (plenum)**					

**Vari-MaTriX
7 cables**
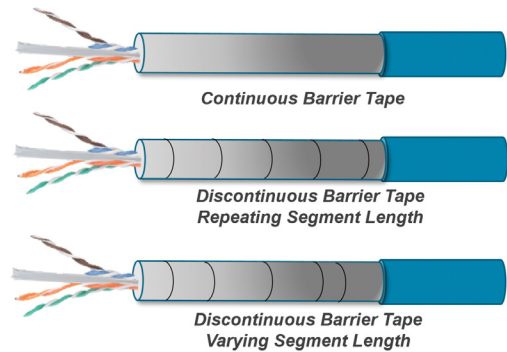
**Competition
5 cables**
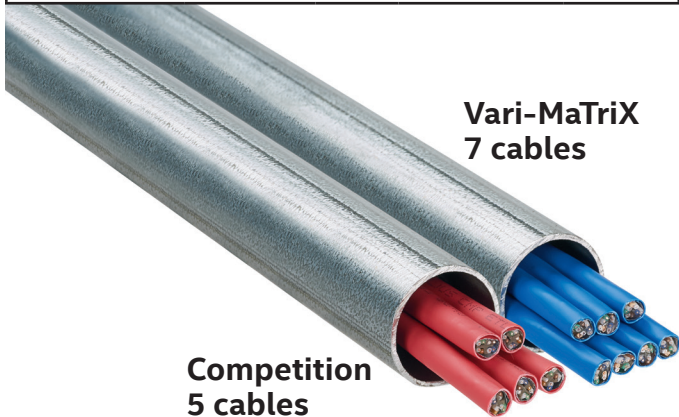
Intel and Panduit

Customers are achieving 10GbE performance more easily and cost-effectively than ever before with Intel and Panduit's next-generation 10GBASE-T products.

Panduit has validated its Vari-MaTriX cables with Intel's latest generation of 10GBASE-T adapters to ensure customers can realize the performance benefits of 10GBASE-T, thereby avoiding network bottlenecks and difficult-to-diagnose dropped packets.

Alien crosstalk and EMI

Alien crosstalk results from unwanted electromagnetic coupling between conductors in adjacent cables tightly bundled or packed together. Both alien crosstalk and EMI lead to difficult-to-diagnose dropped packets on the network.

Some cable companies add additional space to create physical separation between the conductors of the cables. But this results in larger cable diameter. Some cables use a solid foil barrier for mitigation of alien crosstalk in bundles. But, solid foil barriers can act as an antenna which increases susceptibility to alien crosstalk and EMI.

Continuous Barrier Tape

*Discontinuous Barrier Tape
Repeating Segment Length*

*Discontinuous Barrier Tape
Varying Segment Length*

With Panduit's Vari-MaTriX design, the discontinuous metallic foil barrier provides superior EMI and alien crosstalk performance, thereby removing the traditional constraints on cable size.

In addition, all Panduit plugs and jacks are designed to prevent damage on the critical plug and jack mating point when arcing occurs at removal in systems carrying Power over Ethernet. This is important to ensure reliability of a physical network system.

Intel® Ethernet Network Adapter X710-T2L/T4L

Intel's newest generation of 10GBASE-T adapters simplifies technology transitions by providing auto-negotiation between port speeds for maximum flexibility; multi-port speed support for 10GBASE-T, 5/2.5GBASE-T, and 1000BASE-T. This feature enables customers to take a staged-approach to network upgrades.

Intel Ethernet 700 Series 10GBASE-T adapters (X710-T2L/T4L) deliver up to 88 percent[1] lower cost-per-gigabit than one Gigabit Ethernet adapters.

The adapters work in concert with Intel® Xeon® Scalable processors and Intel® Solid-State-Drives to unlock the full performance potential of your server:

- Upgrading to 10GbE enables up to a 60 percent[2] increase in the number of virtual machines supported per server – and more efficient server utilization within the same budget
- Alleviating the network bottleneck allows for other performance-improving component upgrades, including processor and storage, to further increase overall system performance

These low-power adapters also support Energy Efficient Ethernet to reduce power consumption during periods of low data activity, and include all the features of the Intel® Ethernet 700 Series Network Adapters:

- Flexible and scalable I/O for virtualized infrastructures
- Enhanced Network Virtualization Overlays (NVO)
- Flexible Port Partitioning (FPP)
- Greater intelligence and performance for NFV and cloud deployments
- Intelligent offloads to enable performance on servers with Intel Xeon processors

Panduit Part numbers

Unshielded Models	Product code
Cat 6A Jack Module	CJ6X88TG**
Cat 6A 28 AWG Patch Cord	UTP28X^^%%
24-Port Patch Panel	CPP24FMWBLY
TX6A Field Term Plug	FP6X88MTG
Cat 6A Horizontal Cable	See below for the correct cable for your region

** = Jack Module Color Code (BU = blue, BL = black, WH = white)
^^ = Length in Feet (3, 5, 7, 10, 15). Length in meters (1M, 2M, 3M, 5M)
%% = Patch Cord Color Code (Empty = White, BU = blue)
Example: UTP28X3 = White 3-foot patch cord.
UTP28X3MBU = Blue 3-meter patch cord.

Unshielded Cat 6A Cable Flame Rating	Product code
Plenum (CMP)	PUP6AV04BU-G
Riser (CMR)	PUR6AV04BU-G
CM	PUC6AV04BU-G
EuroClass Cca	PUY6AV04WH-EG
EuroClass Dca	PUL6AV04WH-EG
LSZH	PUL6AV04WH-EG

Intel® Ethernet Part numbers

Intel® Ethernet Network Adapter	Configuration	Product code
X710-T2L	Dual port for PCIe	X710T2L
X710-T4L	Quad port for PCIe	X710T4L
X710-T2L	Dual port for OCP NIC 3.0	X710T2LOCPV3
X710-T4L	Quad port for OCP NIC 3.0	X710T4LOCPV3

Summary

Intel and Panduit have make it easy and cost-effective to migrate from 1000BASE-T to 10GBASE-T, providing optimal network performance, scale, and reliability.
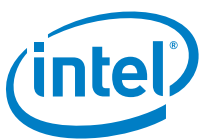
Learn More

Contact your Intel and Panduit resellers for more information, or visit these informative sites:

intel.com/Ethernet

panduit.com

scaleitup.intel.com