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# *CASE STUDY*

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***Technology Refresh***

***Business Case Study***

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## Case Statement

In 2004, a reseller in the UK carried out a technology refresh upgrade for an end user by exchanging outdated 3COM<sup>®</sup> systems for a new Cisco<sup>®</sup> 6509 solution. The customer required an upgrade to the core and edge switching devices of the LAN infrastructure.

The following is a list of the aging 3Com equipment:

Quantity	Description
1	3Com Corebuilder 11
1	3Com Netbuilder 11
8	.21 cards
6	3Com advanced RPS units
29	3Com 100&1000 superstack 11 switches

For this trade-in equipment, <name withheld> wrote a check to the customer for £5,000!

The 3Com equipment was replaced with Cisco Catalyst<sup>®</sup> 6509 technology listed below:

Quantity	Description
1	WS-C6509
1	WS-X6K-S2-MSFC2
1	WS-X6K-S2-MSFC2/2
1	WS-X6516-GBIC
3	WS-X6516-GE-TX
1	WS-C6500-SFM
1	WS-X6182-2PA
2	PA-8T-X21
1	WS-CAC-1300W
1	WS-CAC-1300W

The total cost of implementing the above solution, including installation and services costs was £120,000. Notice this Catalyst is using Supervisor 2's so if this end user wanted to use 10 Gigabit in the future (or even VoIP with Gigabit), it would be necessary to upgrade to either a Supervisor 3 or Supervisor 720, a very expensive proposition.

Taking Cisco's list prices (at that time) and finding out the hardware component part of this deal reveals the following:

Quantity	Product	Extended List Price	Conversion \$/£ =/1.89
1	WS-C6509	\$9,995.00	£ 5228.00
1	WS-X6K-S2-MSFC2	\$34,995.00	£ 18,515.00
1	WS-X6K-S2-MSFC2/2	\$34,005.00	£ 18,515.00
1	WS-X6516-GBIC	\$24,995.00	£ 13,224.00

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## Raptor Solution

Quantity	Product	Extended List Price	Conversion \$/£ =/1.89
3	WS-X6516-GE-TX	\$47,985.00	£ 25,388.00
1	WS-C6500-SFM	\$7,495.00	£ 3965.00
1	WS-X6182-2PA	\$21,995.00	£ 11,637.00
2	PA-8T-X21	\$4,995.00	£ 2562.00
1	WS-CAC-1300W	\$3,995.00	£ 2,113.00
1	WS-CAC-1300W	\$3,995.00	£ 2,113.00
<b>Total Extended List Price</b>		<b>\$194,450.00</b>	<b>£ 102,883.00</b>

This part of the deal gives the end user 64 Gigabit ports, 16 1000BaseX fiber ports, and 48 ports 1000 BaseTX.

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### Note



There are no GBICs (GigaBit Interface Converter) or SFPs (Small-Form-Factor Pluggables) mentioned in the equipment list. These must have been on a different order or already owned by the end user and therefore are not included in our calculations below.

Part of the above equipment list does include a WAN card, but as the bandwidth features supported by the WAN piece can be obtained for less than \$1,000 elsewhere and is not included in any of the calculations.

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## Raptor Solution

If this reseller had used Ether-Raptor ER-1010 systems instead of the Cisco Catalyst 6509, the following more positive results would be:

- To support 72 Gigabit Ethernet ports, the Ether-Raptor ER-1010 systems would take only 3U of rack space, instead of the half-rack required for the 6509.
- Using three ER-1010s connected using the RAST system would have given the customer 72 ports of Gigabit, of which 24 are fiber using SFPs and 48 are 1000BaseX.
- The overall switching capability of the system would be 144 Gbps (72 ports x 2) and 214 Mpps of forwarding throughput.
- VoIP over this system does not require hardware upgrades, neither does Video or Storage over IP
- Adding 10 Gigabit only requires the addition of a 10GbaseX capable personality card, not the massive “forklift” that the Sup2 to Sup720 upgrade would cost.
- The end user now has a highly resilient network which allows his existing systems to connect to this backbone using IEEE 802.3ad to obtain instantaneous failover in case of a failure.
- The end user can expand this network easily to 384 Gigabit ports in a single switch solution, and can install 10GbaseX ports without forklifting the existing switch infrastructure.

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## Raptor Solution

The Raptor cost alternative to this implementation is:

Quantity	Product	Ext. List Price	Conversion \$/£ =/1.89
2	ER-1010 w/10/100/1000BaseTX cards	\$42,800.00	£ 22,645.00
1	ER-1010 w/ 1000BaseX fiber cards	\$22,900.00	£ 12,116.00
3	3 Port RAST (10 Gigabit) Copper insert	\$9,000.00	£ 4,761.00
9	1 Meter RAST cable	\$2,250.00	£ 1,190.00
	<b>Total Ext List Price</b>	<b>\$76,950.00</b>	<b>£ 40,714.00</b>

So what does all this mean?

- Choosing Raptor's Ether-Raptor product range is advantageous to the end user.
- More users can afford this kind of upgrade resulting in more business for the reseller.
- Margins obtained by selling Ether-Raptor products are much better than with Cisco products because the reseller is not fighting everyone for business.

Ether-Raptor is a family of Layer 2/3/4–7 switch systems that have changed the paradigm of network switching. The ER-1010 has a 1U (1.75-inch) high chassis with 24 ports of Gigabit Ethernet and up to six ports of 10-Gigabit. Ether-Raptor switches use a new innovative technology called Raptor Adaptive Switch Technology (RAST™) that operates at 10 Gbps and allows RAST-compatible switches to connect together and act as a single device

This network of ER-1010s are connected in a plug-and-play 20-Gbps ring topology.



**FIGURE 1. Plug-and-Play 20-Gbps Ring Topology**

Ether-Raptor allows this network to “look and act” as a single switch because the switch fabric in each device merges with the others to become a single fabric. This allows industry standards to act in unique ways. The IEEE 802.3ad standard can now let servers, workstations, Layer 2/3/4 switches or even routers, NAS heads, iSCSI systems, in fact any IEEE802.3ad capable device to link aggregate over multiple hardware devices.

For example, a server with three Gigabit NIC cards can connect to each of these switches and aggregate over all the links to be an ultimately resilient connection. All three switches would need to fail to prevent access to that server. Existing Layer 2 switches (IEEE802.3ad-capable) can also link aggregate over multiple devices to give end users high levels of network availability, for less cost.

## Raptor Solution

Other benefits of a single-switch solution include:

- Network-wide port mirroring  
Remote sites can be monitored for a single central site.
- Network-wide VLAN creation  
Creation of a VLAN with ports from any device on the network without trying to remember which ports need to be set up for tagging.
- Network-wide routing/QoS/ACL assignment  
Start routing, apply security ACLs, or assign QoS parameters for an entire cluster with one command.
- Single-hop routing over the entire network  
A cluster can be set up with 16 devices (soon to be 64), and each device is 40 km away from its neighbors. We now have a single-hop network of 656 km (2560 km later). Each switch device carries out its own routing requirement in the local hardware.
- End-to-end flow control  
An Ether-Raptor Gigabit Ethernet port upon receiving a pause frame will echo that pause frame to all ports in the cluster that is contributing to the traffic on that port. Finally flow control can actually work.
- Robust, high availability network design construction  
Ring, complex mesh, mixed ring, tree, and mesh topologies can be created with ultimate levels of network resiliency and redundancy available.

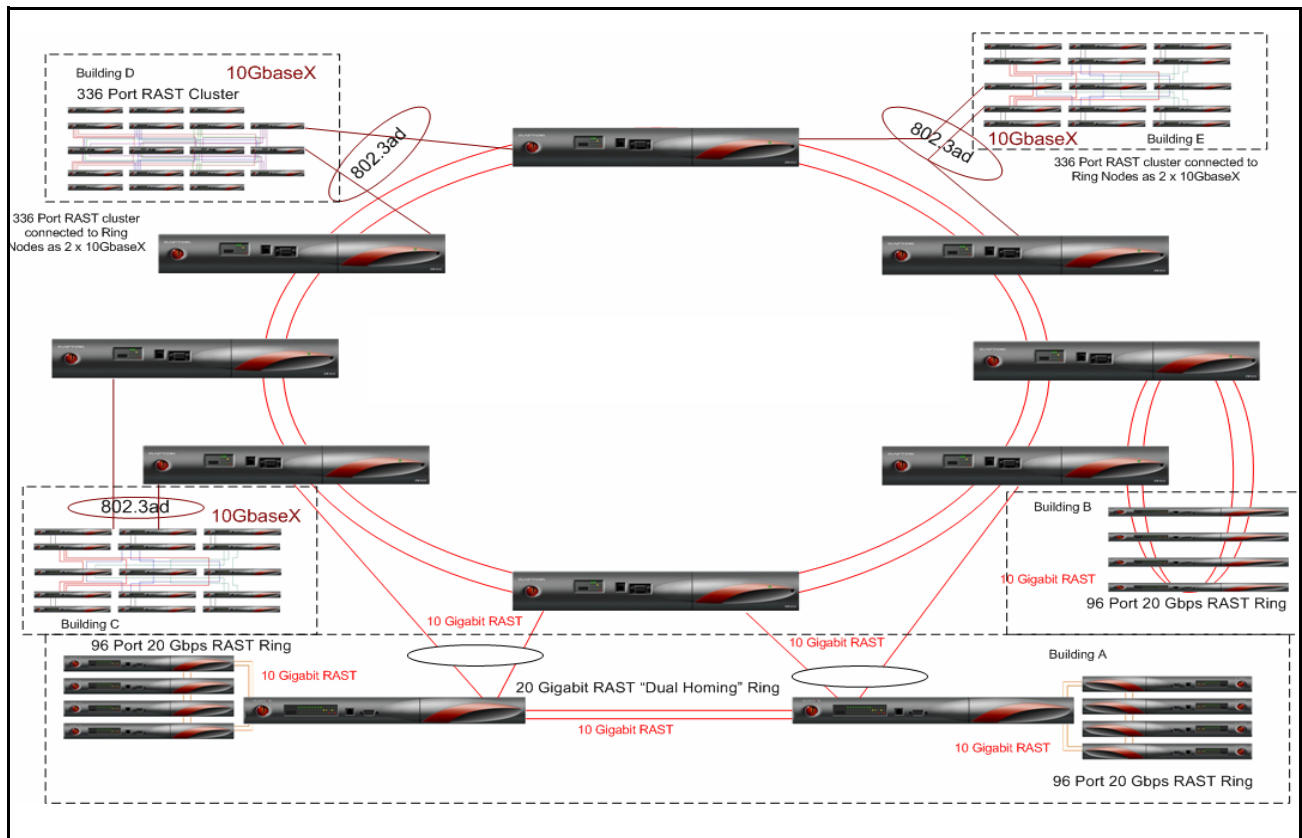


FIGURE 2. 20-Gigabit RAST Ring

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## *Summary*

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It is easier to specify Cisco Catalyst 6509 to a customer due to the Cisco name recognition. However, if potential customers know that the Ether-Raptor exists and offers a lower-cost solution, it is ultimately to their advantage and to the reseller who specifies Raptor Networks technology products.

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