

Interconnects/Virtual Connect Script for Expert in A Box

Hi.

I'm Bill Dicke and I'm going to talk about the Interconnect options for HP BladeSystem.

- 1) One of the major benefits of HP BladeSystem is the ability to integrate network connections directly into the server system.
- 2) The new c-Class infrastructure greatly enhances this.
- 3)
With 2 or 4 NICs built into every server, 2 or 3 PCI- Express mezzanine cards on each server blade, and four independent, high-performance I/O channels running to the 8 interconnect bays, c-Class gives you unprecedented performance and flexibility for connecting to your servers.
- 4) (switches) HP BladeSystem has always offered world class Ethernet and Fibre Channel switches and will continue to do so.
- 5) BladeSystem switches are a terrific way to reduce cabling and extend your favorite networks right up to the server blades.
 - a) At c-Class Launch, we'll offer a Brocade 4 Gbps Fibre Channel switch.
 - b) It will come in 3 versions: 12 port, 24 port, and 24 port with Power Pack.
 - c) All ports will be 1/2/4 Gbps auto-sensing.
 - d) And, c-Class can support up to 6 switches per enclosure.
 - i) We also realize many customers have standardized on other fabric brands and we'll offer solutions for those needs before the end of the year.
 - ii)
 - e) c-Class will also offer Ethernet switches from Cisco and Blade Network Technologies (the new name for the Nortel spin-off company that makes switches for HP BladeSystem).
 - f)
 - i) The BNT offering is the GbE2c switch will have the same features as today's GbE2 Layer 2 switch plus be upgradeable to Layer 3 in the future.
 - ii) It will have 5 - 1GbE, RJ-45 uplink ports and is designed for low cost, high performance Ethernet connectivity.

iii) The Cisco switch will be a Catalyst 3020 switch with Layer 2+ functionality similar to our p-Class CGESM switch.

iv) It will have 8 configurable uplink ports that can all support copper media and 4 of which can support fiber media.

v) Customers will have the ability to buy support from Cisco and roll this switch under an existing support contract.

vi)

g) c-Class also offers a brand new choice – InfiniBand.

h) We'll offer a 12 port, 4X, Double-Data-Rate InfiniBand switch.

i) It will be the highest performance InfiniBand switch available in blade servers when we launch it in Q3 this year.

6) (pass-thru) We'll also continue to offer pass-thru modules that allow you to connect your server NICs and HBAs directly to outside switches in those special situations when you must have 1:1 connections.

7) Our HP BladeSystem Interconnect Options have been very popular in p-Class but some customers are not completely satisfied with the switch and pass-thru choices and so we've developed a new category of interconnect devices for those situations where the other offerings don't meet all of your needs.

8) (Virtual Connect) These new devices are called Virtual Connect Modules and we'll offer them for Ethernet and Fibre Channel connections.

9) We've designed a Virtual Connect Architecture into the c-Class BladeSystem infrastructure to enable these devices.

10)

11) Virtual Connect is the simplest and most flexible connection to your networks.

12)

(Show slide 1 – value proposition)

a) It simplifies your networks

by reducing the number of I/O cables without adding switches to manage.

b) It simplifies your connections

by cleanly separating the server enclosure from the LAN and SAN networks.

c) It allows you to change servers in minutes, not days

You can add, move, or replace a server without impacting the LAN or SAN networks.

d) It allows network and storage administrators to get out of the business of server maintenance.

(Remove slide 1)

13) Though BladeSystem Ethernet and Fibre Channel switches work very well and integrate completely with your data center networks, we continue to hear from customers that they feel that the only real choices they have with anyone's blade servers are:

Too Many Cables or Too Many Switches!

a) In a dense BladeSystem environment with lots of NICs and HBAs, you can easily have 300 or more interconnect cables coming out of a rack.

b) Besides being a mess to deal with, this is prone to human error as people have difficulty connecting or disconnecting the right cable without accidentally pulling the wrong one.

c) Pass-thru modules (or patch panels) are also the most expensive way to connect to your networks when you add up the cost of the many more switch ports you must buy at the other end of all of those cables for your large Ethernet or Fibre Channel director-class switches.

d) As great as our Cisco, BNT, and Brocade switches are, they also turn out to be too small for some data centers.

e) For example, a Cisco Catalyst 6513 standalone network switch is very popular and can connect to over 400 server ports in one switch to manage.

f) Our integrated BladeSystem switches can only connect to 16 server ports because that's as many servers as we can put in one enclosure.

g) Now HP BladeSystem switches are larger than our competitors can offer since they have fewer servers per enclosure, but they're still small.

h) It would take 26 of our BladeSystem switches to provide the number of server connections that a single Catalyst 6513 can and each switch must be managed individually by the network group, so sometimes our customers like our switches but don't buy them because they don't want to manage so many small switches.

i) Fibre Channel switches not only run into the same management challenge, they have a more concrete restriction.

- j) Every SAN fabric has an upper limit on the number of switches it can include.
 - k) The number varies depending on switch vendor, but limits of 24, 40, and 56 apply to the most popular fibre channel switch vendors.
 - l) In data centers with large SANs, these numbers are too small to accept a lot of small blade server switches.
 - m) So, even though our Fibre Channel switches work well, we have some customers who cannot use them.
- 14) The switch limitation I mentioned is a result of blade server architectures, but the next problem is true for all server systems, whether blades or not.
- 15) When a server is added, moved, or replaced the networks are affected and everyone must follow the moving server!
- a) Ethernet networks don't really know anything about servers, they just track the MAC addresses of the NICs on a server and make sure that data gets to and from those MAC addresses.
 - b) Likewise, Fibre Channel SANs don't know about the servers either, they just track the World Wide Names or World Wide IDs of the HBA (Host Bus Adapters) on the servers and make sure the data gets to and from those WWNs.
 - c) The makers of NIC chips embed a default MAC address in each chip.
 - d) It's registered with the IEEE and guaranteed to be unique.
 - e)
 - f) The same thing happens with World Wide Names and HBA chips.
 - g)
 - h) Usually, server makers use the default MAC addresses and WWNs on the NICs and HBAs.
 - i) So, when a server is removed, the MAC addresses and WWNs go with it and if another server replaces it, the new one will have different MAC addresses and WWNs.
 - j) (Show slide 2 animation)
This means that the LAN and SAN networks have to be told about these changes every time a server is added, moved, or replaced.
 - k) So, LAN and SAN administrators have to routinely be involved in Server Maintenance!

(Remove slide 2)

l) We don't think of it as unproductive, it's just the way it works with computer systems.

m) But, when you think about it this is terribly unproductive for everybody.

n) When a server needs to be added or replaced or moved:

i) The Server Administrator must deal with the server itself and whatever needs to be done.

ii) And, he must also schedule a meeting with the LAN and SAN administrators to explain what is needed and get it on their calendars so they can change the network connections.

iii) Then he has to get in line and wait for them to get to that task and get their work done.

iv) The LAN and SAN administrators must stop what they're doing and schedule this work into their busy calendars and then accomplish it.

v)

vi) All told, planning and executing the deployment of a new server or replacing one can take days to weeks or else they can do it in a hurry, but it's very disruptive to operations as LAN & SAN people drop what they're doing to help with the server change.

o) Something to think about is that Process speed often depends on how many people have to be involved.

p)

A 30 minute task isn't done in 30 minutes if it takes 3 people and 3 days to schedule it.

16) Virtual Connect solves these problems and makes your IT operations Change-Ready.

a) Virtual Connect –

i) Reduces the number of cables without adding switches to manage (and doesn't count against the FC fabric switch limit)

ii) Maintains end-to-end connections of your favorite brands of switches like Cisco, Nortel, Brocade, & McData.

iii) Cleanly separates the Server Enclosure from the LAN and SAN administration (no more switches in the same enclosure with the servers)

iv) Relieves the LAN and SAN administrators from server maintenance without affecting their authority and responsibility over the networks.

v) It makes your data center Change-Ready.

vi) You can add, replace, or move servers without affecting the LANs or SANs.

vii)

viii) With Virtual Connect, you can change servers when your business needs it, not just when you can fit it into everyone's calendar.

17) How does the Virtual Connect Architecture do this?

It has two elements to the solution:

- reduction of cables without adding switches and
- the server-edge virtualization that allows servers to change without affecting the networks.

a) The Ethernet cable reduction is accomplished with an Ethernet bridge that remains static after configuration.

b) It doesn't participate in Spanning Tree or other protocols that require network management.

c) It supports a variety of port aggregation technologies and VLAN tagging and looks like a group of NICs to the LAN.

d) The Fibre Channel cable reduction is accomplished with an HBA Aggregator that uses N_Port ID Virtualization (NPIV).

e) This is an ANSI T11 industry standard for Fibre Channel.

f) It's supported by all of the major SAN fabric manufacturers and its purpose is to allow multiple HBAs to connect to a single switch port, so it works very well as an HBA Aggregator.

g)

The SAN sees Virtual Connect ports as a group of HBAs.

h) In virtualizing the server-edge, Virtual Connect sets up an abstraction layer between a pool of up to 4 enclosures with 64 server blades and the external Ethernet and Fibre Channel networks.

i)

i) Instead of using the default MAC addresses and World Wide Names that the chip manufacturers provide, Virtual Connect applies another set of unique MAC addresses and WWNs and administers them locally.

ii) The VC modules hold these addresses constant so that as a server is added, moved, or replaced the networks don't see any change to the MACs and WWNs.

iii)

(Show slide 3 animation)

As far as the LAN and SAN are concerned, nothing has happened and nothing needs to be adjusted, so their administrators don't need to get involved.

(Remove slide 3)

iv) The LAN and SAN administrators are relieved of unnecessary work and the Server administrator can make all changes very quickly, by himself using the Virtual Connect User Interface.

j) Fundamentally, the Virtual Connect Architecture doesn't eliminate the work that LAN and SAN administrators do; it just allows them to do everything at one time during configuration and deployment and then doesn't require them to get involved when servers need to be changed.

k) So, their work flow is more efficient and they can spend more of their time building and maintaining the networks instead of accommodating server changes.

i) During deployment, the LAN and Server administrators decide which subnets might ever need to be available to a pool of up to 64 servers and those networks are connected to the Virtual Connect Ethernet Modules.

ii) Likewise, the SAN and Server administrators decide which SANs might sometime be needed for the pool of servers and those connections are made to the Virtual Connect Fibre Channel Modules.

iii) The Server administrator then uses the Virtual Connect user interface to make the connections from each NIC and each HBA on each server to the LANs and SANs needed at the time.

iv) Later, if he needs to move a server or add network connections, he can do it with a simple point and click interface.

v) He can install and make any changes he wants whenever he wants to without the LAN or SAN seeing any change.

vi) He can do it without needing to schedule time or interact with the LAN and SAN people.

vii) The job is done more quickly and everyone is more productive.

18) Examples

a) In your particular situation, you may not think you change servers very often.

b) Well, server change is about frequency of changes but it's also about the speed of changes.

c) Both are very important.

i) You may be thinking that you don't need to deploy, remove, replace, upgrade, or add a new server very often.

ii) But as most companies are pushing their IT staffs to manage more servers per person you may find that you have more of these actions than you realize.

iii) But also, think about actions that could make you more effective if you had a way to do them.

iv) For example, most enterprise IT operations have separate environments for application development, test, and production.

v) The new application must meet certain quality and stability criteria to move from one environment to another.

vi) But each time you need to move a server from development to test or back again, the server admin needs help with the LAN and SAN changes.

vii) With Virtual Connect, all three environments can be connected to the Virtual Connect Domain and then the server administrator can move the network connections from one environment to the next with a keystroke.

viii) And, move it back and forth as needed just as easily.

ix) Server change is also about how fast it can be done.

x) The normal approach today takes at least days and often weeks to make the most routine of changes.

xi) That time can be reduced to minutes when the server administrator has all of the controls at his fingertips.

d) When I talk with IT departments about Virtual Connect and what it can do, they often come up with applications that solve major problems for them.

e) One example is a large company that deploys lots of new servers.

f) They like to buy a rack, fill it with enclosures, partially fill it with server blades, and wire everything up so that they are as close to "wire-once" as possible.

g) The thing that stands in the way is that every time they buy and add a new server later, they need to get help connecting the LANs and SANs.

h)

With Virtual Connect, they told me they would do all of these steps up front plus they would assign the MAC addresses and WWNs for all server slots even if they were empty.

i) Then, when a new server is added later, the server administrator can install it, make the network connections, and put it into service all by himself.

j) A huge savings in time and labor.

k) Another company told me how they have a network operations center and 7 regional data centers.

l) Each data center has a SAN but no storage administrator because they are very lightly staffed.

m) So, when a server needs to be changed at any regional center, they have to fly a storage specialist to that location just to update the SAN.

n) With Virtual Connect, they can keep the storage specialist home, keep him more productive, save travel expenses, and make the server change faster.

o) A major win on all counts!

19)

So, what are the product features?

a) There are 2 orderable Virtual Connect products, the Virtual Connect Ethernet Module and Virtual Connect Fibre Channel Module.

b) They plug into the interconnect bays instead of Ethernet or Fibre Channel switches or pass-thru modules.

(Show slide 4 – Ethernet module)

c) The Virtual Connect Ethernet Module has 16-1GbE connections running across the signal mid-plane to the servers, 1-10GbE cross connection across the mid-plane for stacking purposes, 8-1GbE RJ45 copper Ethernet ports and 2-10GbE CX-4 copper Ethernet ports on its back panel.

d) All are live at the same time and if you use one of the ports as a stacking connection to another module, you can make 4 enclosures into a single Virtual Connect domain where any NIC on any server can pass signals through any external port.

e) This provides a very high performance, flexible connection to all of your LAN subnetworks.

(Remove slide 4)

(Show slide 5 – Fibre Channel module)

f) The Virtual Connect Fibre Channel Module has 16-4Gbps FC connections running to the servers and 4-1/2/4 Gbps auto-sensing FC connections available to connect with your data center SANs.

(Remove slide 5)

g) There is much more to say about Virtual Connect but I've run out of time.

h) Just please remember that Virtual Connect:

i) It simplifies your networks

by reducing the number of I/O cables without adding switches to manage.

ii) It simplifies your connections

by cleanly separating the server enclosure from the LAN and SAN networks.

iii) It allows you to change servers in minutes, not days

You can add, move, or replace a server without impacting the LAN or SAN networks.

iv) It allows network and storage administrators to get out of the business of server maintenance.

20) Conclusion – I haven't had time in this presentation to cover all of the details of our c-Class network interconnect options.

21) We offer industry-leading switches that can integrate smoothly and directly into your networks.

22) And, we offer Virtual Connect, the simplest and most flexible connection to your networks.

23)

24) So, please contact your HP BladeSystem sales person for more information and help in choosing the best options for your situation.

25) Thank you.

(SMILE and Keep looking HERE)