



5. How to sell your storage with Brocade Switch



BROCADE

The intelligent platform for networking storage

Agenda

- Sun/Brocade Relationship
 - Joint testing between Sun and Brocade
 - Sun Enterprise Services supported config
- Sun Specifics
- Sun “Qlogic” Switch vs Brocade
 - Feature comparison
 - Brocade differentiators
- Hitachi Updates



Sun/Brocade Relationship

- 2/6 Announcement of qualified configurations
- 4/9 Joint Metropolis development announcement
- 6/12 Announcement of Sun Support
 - Sun PS can resell all Brocade products including SW 3800
- 6/14 Revenue Release date
- 6/25 All Brocade switches will ship with v2.4.1c as standard product however v2.4.1a is currently the Sun supported qualified version.
- 8/8 Sun announces HDS 9960 and 9910 reseller agreement. Only Brocade switches supported by HDS



Sun 'Snakes' Configs

- Mamba
 - HA dual fabrics
 - Multiplatform
 - OS tested
 - Solaris 8 Update 2
 - HPUX
 - AIX
 - NT
- Python
 - Cascading limited to 2 switches
 - Long distance <10 km
 - SAN backup using Veritas NetBackup
- Viper
 - a subset of Python
 - 6 switch mesh, like the 6400 topology
- Boa
 - >10 km
 - Other features not defined

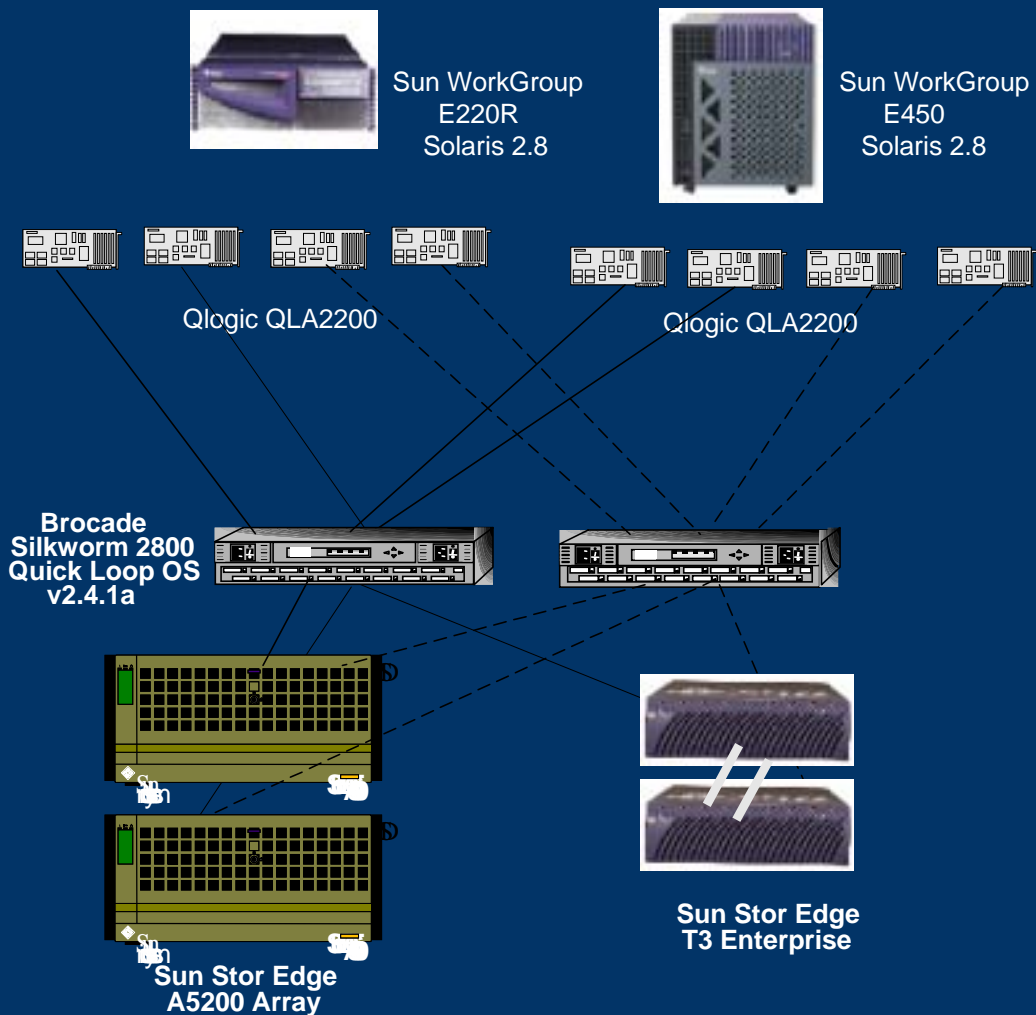


ES “Mamba” Qualified Hardware

- Workgroup Servers
 - Ex50, Ex20R
- Enterprise Servers
 - Ex500 and E10k
- HBA(Host Bus Adapter)
 - X6799A Single port Optical QL2200 with Fcode 1.10
 - Code name amber
 - X6727A Dual port Optical QL2202 with Fcode 1.10
 - Code name Crystal plus
 - Sbus is not supported
- Storage
 - T3s
 - A5200s
 - A3500FC EOL



Mamba Qualification Configuration



Silkworm 2800/ 2400

- Pre-configured with Dual power supplies
- Super Software bundle
 - WebTools
 - Zoning
 - Quickloop
- No GBICS supplied as Sun will sell their own IBM branded GBICs
 - Note: Extended fabrics and Fabric Watch software is not included
 - Effective 6/25 Switches will ship out with v2.4.1c Fabric OS.
 - v2.4.1a is Sun's qualified firmware, the current supported config.
 - Currently regression testing with v2.4.1f.
- All of Brocade's product line can be sold by Professional Services



Brocade Manuals

- Brocade SilkWorm® 2800 Hardware Reference Guide
Brocade Publication Number 53-0001534-01
- Brocade SilkWorm® 2400 Hardware Reference Guide
Brocade Publication Number 53-0001533-01
- Quickloop User's Guide Version 2.2
Brocade Publication Number 53-0000068-02
- BROCADE WEB TOOLS User's Guide Version 2.3
Brocade Publication Number 53-0000067-02
- BROCADE ZONING User's Guide Version 2.2
Brocade Publication Number 53-0001555-02
- Fabric OS Reference Manual Version 2.4
Brocade Publication Number 53-0001569-01



Sun OS

- Solaris 8 Update 2 (10/00)
- Solaris 8 Update 6 (10/01)
- OBP patches
 - 106503-04 Enterprise 250
 - 106455-09 Ultra 60 ; E220R
 - 106122-06 Enterprise 450
 - 109082-02 Ultra 80 ; E420R
- Volume Manager v3.0.4
 - 110259-01 obsoleted by 110263-03



QuickLoop tips

- Private storage (T3) is visible to Public Hosts (JNI or Emulex)
- All ES qualified configs require QuickLoop software
- Public storage (A5200) is not available to private hosts
 - Due to certain Seagate FW, public loop is not supported
 - Storage is quicklooped in order for private hosts to access
- Up to two switches can form a QuickLoop
 - Limited to 126 devices in arbitrated loop
- Zoning tips
 - Quickloop zoning allows you to segment a quickloop into separate loops
 - QL zoning isolates LIPs within respective zone
 - Hard zoning for security



Mixed Mode

- Allows SAN administrator to individually Qloop ports
- Other Fabric aware HBAs such as JNI/Emulex can coexist on switch but will not be ES supported
- Telnet command qlportenable <port #>
- To disable, qlportdisable <port #>
- Qlshow
- To enable entire switch: qlenable
- Disable switch: qldisable
- Qlpartner command for two switches



Storage

- T3 Enterprise
 - T3 firmware v1.16a qualified. Regression testing on v1.17b and v2.4.1f
 - Patch # 109115-09 to obtain latest T3 fw
 - With 1.17b fw, Brocade's translative mode works for private storage
- A5200
 - JBOD with 22 disks
 - FW 1.09
 - Logs in as public loop but not supported
 - Make sure most current fw on seagate disks
 - Disk dependent
 - Patch #109962-04 for 18 GB FC seagate disk
- A3500FC
 - End of Life
 - Sun oems this box from LSI



Mamba rules

- No switch to switch connections
 - Two independent fabrics
 - One zone per port
 - Hosts must be same family (workgroup or enterprise)
 - No mixing workgroup or enterprise servers
 - Maximum initiators per zone 2



ES Supported Specific Versions

Qualified Component	Version	Patch #
Solaris 8	10/00 Update 2	Latest Recommended
Sun HBA X6799A	Fcode 1.13	108982-08 108983-08 108984-05
Brocade Silkworm 2800/2400	v2.4.1a	v2.4.1f in testing
T3 fw	1.16c	109115-09 1.17b works now with Brocade translative mode 1.18 in testing
A5200	Rev 1.09	
Seagate ST318304FC (18GB disk)	0726	109962-04
Veritas Volume Manager	v3.0.4	110263-03



Python Rules

- Switch to switch is supported for long distance
- Maximum cascade distance is 10km
- Storage and Host may NOW exist on same switch as well as across 10 km link
- No limit on max number of ISLs
- Solaris 8 Update 6 and greater
- Support for FC tape
- MPxIO and Tapestry support
- Volume Manager 3.2



Sun HBAs

- X6729A QL2100
 - Not supported fcode 1.9 patch 109399-03
- X6730A SOC+
 - Not supported fcode 1.13 patch 109400-03
- X6799A QL2200 single optical port
 - Fcode 1.12
- X6727A QL2202 dual optical port
 - Fcode 1.13
 - Patch 111853-01 for latest fcode 1.13
- X6748A QLogic cPCI (compact PCI)
 - Used for Sun fire x800 servers
 - Uses native Solaris 8 drivers
 - Must use QuickLoop currently

http://www.sun.com/storage/t3es/multi_platform.html



T3 Tips

- T3s connected to Switch have to be unique
- The target id for each T3 tray must be unique
- T3 command *port list to check*
- *Portcfglport* locks Brocade port to loop/private
 - Not supported... This is a Brocade feature
- T3 storage logs into Brocade switch as Public loop

Why can't I see storage?

Based on QL2100 chip on controller, T3 logs into switch as public, however the drivers for T3 are 8bit Private addressing

T3 FW 1.17b corrects this and Brocade's translative mode is transparent



T3 Tips (Latest Update)

Brocade have tested both HBAs with Brocade switches.

X6727A with fcode 1.13

X6799A with fcode 1.12

For T3 firmware:

Original FW tested was 1.16.

Regression testing was done with 1.17b which now allows translative mode to work. We have T3Bs in SQA - OEM lab with latest 2.01 firmware. With this new firmware, the T3Bs log into Brocade as public loop.

For the T3Bs, our python test configuration consists of:

E220R, E450s

Sun HBAs X6727A, X6799A with Fabric leadville 5A drivers

Brocade 2400/2800 with v2.4.1f

T3 1.17b and T3B 2.01



Long Distance Proof of Concept

Sun does not support QLFA. Our python configuration uses Leadville Fabric drivers. Network storage "mamba" config only uses Quickloop.

For Python, we jointly test with Network storage using 10 km distances and fabric drivers with T3s.

Solaris 8 10/01

Volume Manager 3.2

SUNWSAN package

Silkworm 2400/2800 v2.4.1f



A5200 Tips

- Quickloop only allows 126 devices
 - A5200 consumes 24 ALPAs per box
 - 22 disk
 - 2 SENA board
- ES only supports A5k in Quickloop
- BoxIDs of 0,1,2,or 3
- Box IDS should be unique per switch
- Connected to Brocade switch, need to add Veritas Volume Manager license
- Make sure latest disk fw is loaded
 - Patch 109962-04
- Mixing T3s and A5200 on switch, power on T3 first then A5200
- Split loop is not supported



Top Telnet Commands

- switchShow
- qlShow
- portPerfShow
- licenseShow
- supportShow
- fastBoot
- firmwaredownload
- loopPortTest



Brocade Advantages

- Overlapping zones
 - Good for sharing tape devices
- No limit to number of zones
- Ability to extend the fabric
 - Does not disable ports
 - Buffers are greater
- Web Tools interface
 - Zoning drag and drop
 - Administrative GUI
 - Any browser running java plug-in
 - 1.2.2-02 supplied with Solaris 8
- Telnet
 - Unix power users prefer the command line
 - Scriptable with expect scripting language
 - Over 150 commands and with v3.0 up to 214
 - Invoke help at telnet prompt



Scaling the Fabric

BROCADE Unique Differentiators

- BROCADE Fabric Management Services
 - Fabric Manager 3.0 is available on Brocadeweb site for free evaluation till 2 Feb 2002
- BROCADE WEBTOOLS
- Proactive Monitoring via Fabric Watch
- Universal Port Support
- BROCADE Simple Name Server
- BROCADE Zoning
- BROCADE Translative Mode
- BROCADE Cascading
- Fibre Channel Shortest Path First
- 100 Kilometer support with Extended Fabrics
- Migration Support – support for legacy storage and HBA



Comparison to Sun Switch

	Sun Qlogic Switch	Brocade
	SL - Segmented Loop	Quickloop
	TL - Translated Loop	Fabric Assist
	T-Port	E-port
	Buffer Credits 8 per port	Shared Buffer Pool of 112 for 4 ports
Latency	Best Case < 0.6 usec	<2 usec
FW dnld	TFTP	Rsh or FTP
Mgmt	SANsurfer	WebTools
Zoning	Limited to 16 per switch	Unlimited and Overlapping



Web Resources @ Brocade

- <http://www.brocade.com>

– Partner login

- User : sun
- Password : silkworm

– Contact webmaster@brocade.com

- Best Practices Guides
- Solutionware
- Firmware
- Email alias: sun-support@brocade.com
- FTP site: <ftp.brocade.com>



Pre-Sales Sun Brocade Experts

- Philip Kao Storage Technologies Engineer
 philip.kao@sun.com
- Valdis Filks Solution Architect
 valdis.filks@uk.sun.com
- Peter Murphy Storage Architect
 peter.c.murphy@aus.sun.com
- Sun PS SAN/Solution Architects
- Sun Network Storage SEs



Web Resources @ Sun Internal

- Sun Internal Web Site for testing Brocade switches:
 - sse.ebay.sun/interop/brocade.html
- SAN Design Guidelines by SUN PS EMEA
 - sunps.emea/Solutions/Storage/SAN_Design_Guidelines/SAN_Design.htm



Review

- Name the snake config that ES supports?
- Which Brocade products can Sun PS sell?
- What Brocade software feature is required for Sun ES supported HBA and T3 storage?



Sun Hitachi Global Relationship



Sun's Focus and Investment

- Massive Scalability
- Continuous Real-Time computing
- Integrated Stacks
 - Tightly integrated and tested systems
- Sun will distribute and co-label HDS 9900 storage as
- Sun StorEdge 9900 series
 - Position 9900 series as high-end “Glass house” data center
 - Extreme Availability and Extreme Manageability
 - Position T3 as Enterprise and Mid-range Applications
 - High Availability
 - Based on Hitachi Freedom Storage Lightning 9900
 - 9200 will not be sold by Sun, competitive with T3

Announced August 8th

<http://www.sun.com/smi/Press/sunflash/2001-08/sunflash.20010808.1.htm>



Sun SE9900 series

- StorEdge 9960
 - Scales to 37 TB raw max 496 disks
 - Internal Bandwidth 6.4 GB/sec
 - 32 direct Host connections (max 192 in a SAN)
 - Max cache 32 GB
 - Up to 6 Array frames
- StorEdge 9910
 - Single cabinet up to 3.5 TB raw - max 44 disks
 - Internal Bandwidth 3.2 GB/sec
 - 24 Direct connections (up to 144 in SAN)
 - Max cache 16GB
- Disk
 - 18, 73 GB capacities
 - 10k rpm



<http://www.sun.com/storage/highend/comparison.html>

SE9900 Supported HBAs and Switches

- JNI Host Bus Adapters
 - Sbus
 - FC64-1063-N
 - FCE1063 -N
 - PCI
 - FCE-6410 -N
 - FCE2-6412
 - FCI-1063
- Brocade Silkworm 2400 and 2800
 - Dual PS and GBICs included
 - FW v2.4.1c is qualified with SE9900
 - Must purchase redundant switches to ensure availability
- Brocade in Sun Price Book !



Brocade in Sun Price Book

Silkworm 2400, Dual PS, SWL GBIC	XT8-BR-2402-0013
Silkworm 2800, Dual PS, SWL GBIC	XT8-BR-2802-0008
Brocade Web Tools Software	XT8-SW200007-02
Brocade Quickloop Software	XT8-SW200008-02
Brocade Fabric Watch	XT8-SW228001-01
Brocade Long Wave Laser GBIC	XT8-XBR-000011
Brocade Short Wave Laser GBIC	XT8-XBR-000025
Silkworm Rack Mount Kit	XT8-XBR-000016
NEW! Silkworm 6400	XT8-BR-6400-0000



SE9900 Supported Sun Servers

- Enterprise 10000
- Enterprise 220R, 250,440R, 450
- Enterprise 3500,4500,5500,6500
- Ultra 1,2
- Sun Cluster 2.2 and 3.0 supported with specific servers
- May coexist with StorEdge arrays
- VCS 1.1, 1.3
- VxVM 3.02, 3.04, 3.1



Countries Supporting SE 9900

- Argentina
- Australia
- Austria
- Belgium
- Brazil
- Canada
- Chile
- Denmark
- France
- Germany
- Hong Kong
- Israel
- Japan
- Malaysia
- Mexico
- Netherlands
- New Zealand
- Norway
- Scotland
- Singapore
- Spain
- Sweden
- Switzerland
- England/Wales
- United States
- Venezuela



SE 9900 Operating System Support

- Solaris 2.6, 7, and 8
- MVS
- S/390
- Windows NT and 2000
- Novell NetWare
- Linux
- HP-UX
- IBM AIX
- Compaq Tru 64
- SGI IRIX



Key Takeaways

- Available NOW
 - HDS management software available through Sun
- Brocade in price book NOW
- Sold with JNI and Brocade only
- Jointly develop storage software
- 9900 StorEdge Supported by HDS currently
- Sun and HDS will develop a Joint Escalation Center
 - 3 yr warranty on 9960 and 9910
 - 2 yr on switches





End User Wins

Todd Kirkpatrick



BROCADE

The intelligent platform for networking storage

Rogers

- Second largest Telco in Canada
- 3 Divisions

– Wireless

– Cable

– Media



- Large EMC Customer - 40 TB (Excellent relationship with EMC)
- HDS Arrays for specific applications
- Large STK environment
- @Home wireless group - scaling from 4TB to 50TB in one year
- Brocade Team: Dave Fleury/Glen Lomond



Pre-Brocade

- Selected STK SN 6000 for Tape Virtualization
 - SN 6000 positioned at the core
 - Brocade switches positioned at the edge
- The Brocade Strategy
 - Establish Brocade as the only SAN infrastructure provider that can address all their application needs
 - Targeted Rogers Shared Services Group
 - Tasked to evaluate Core SAN infrastructure
 - Foundation for future SAN applications
 - Internal SSP



How we did it?

- Sold to both User and Economic Buyers
- User Buyer
 - Sold them on Brocade as the foundation solution for all their SAN applications
 - High Availability (Clustering)
 - Consolidation
 - Disaster Recovery
 - Backup
- Economic Buyer
 - Greg Reyes met with CIO and Directors
 - Brocade market leadership and vision



Results

- STK SN 6000 thrown out as Core SAN infrastructure
- Replaced by 2 Brocade SW6400s



Bristol-Myers

- BRISTOL-MYERS SQUIBB is a pharmaceutical and related health care products company
- Brocade Team: Mark Kotch/Charles Wagner
- Partner: HP/EMC
- Sold: 30 SW2800 (25-EMC, 5-HP)
- SAN Solutions: Data Mirroring, Server/Storage Consolidation
- 120TB going to 320 TB, 6 SAN Islands, Managed by 3 people
- Goal: 1 SAN



How we did it?

- EMC led with McData
- HP Brought in Brocade for SAN Infrastructure Decision
 - HP led with aggressive pricing
- Ultimately, EMC won the business with DS-16b
- Other Factors leading to Win:
 - Leveraged Corporate Executives to sell market leadership and vision
 - Leveraged Executive Briefing Center and Lab Tours
 - Charles Wagner for SAN Design
 - The Brocade Intelligent Deal pulled in the order
 - Very positive advocate at BMS – Vinny DeLucia
 - Serve as Brocade Reference account in NE

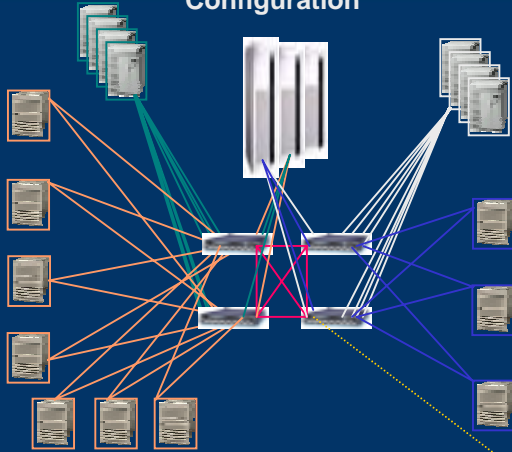


Storage Engineering Engineering Services Proposed SAN TOPOLOGY

Storage Engineering

Storage Area Network Fabric_1

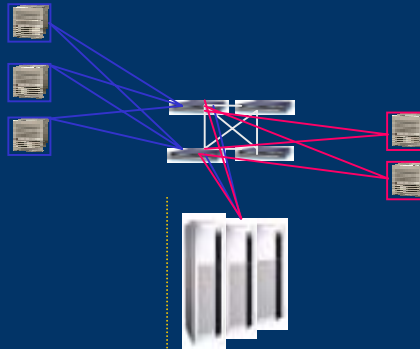
Configuration



Storage Engineering

Storage Area Network Fabric_5

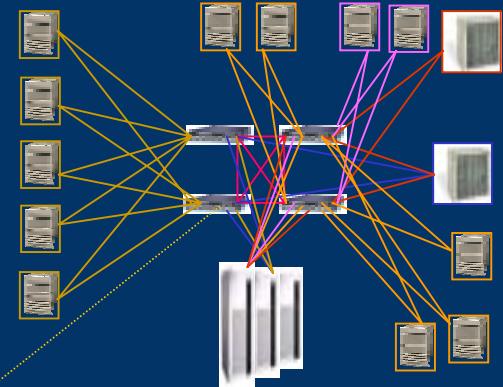
Configuration



Storage Engineering

Storage Area Network Fabric_2

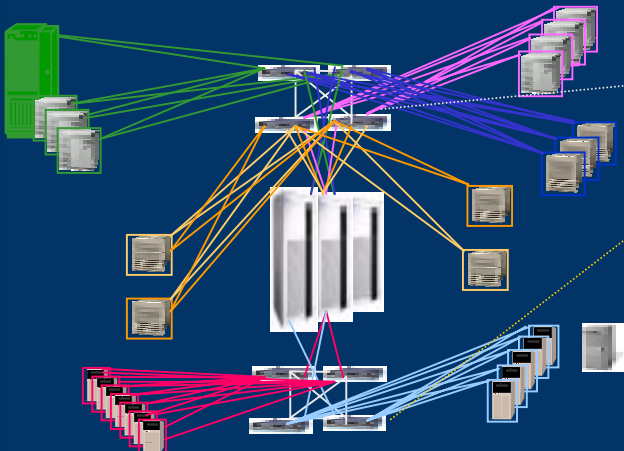
Configuration



Storage Engineering

Storage Area Network Fabric_3&4

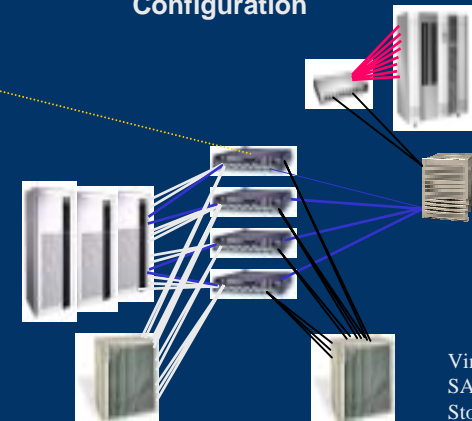
Configuration



Storage Engineering

Storage Area Network Fabric_SAP

Configuration



Storage Engineering
Administration Server



End User Wins

Jim Zigmant



BROCADE

The intelligent platform for networking storage

Discover Card

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- Plus Many More Platinum Privileges



Discover Financial Services/ A business unit of Morgan Stanley (Formally Dean Witter)



Discover Card/Business Challenges

- To consolidate (12) RS6000, (20) Sun and (40) NT servers across (2) EMC Syms and (2) IBM Shark frames. Backup to an STK L700 w/ (2) FC 9840 drives and (10) Direct Attached DLT's currently running Legato Networker
- Manage from a “networked” prospective 24/forever
- Provide heterogeneous support IBM,EMC,SUN,STK
- Introduce 2GB to Discover's on line applications
- Develop a “core” backbone
- Build two new (NOC's) with 2GB FC 2002
- Incorporate existing (10) SW2800's footprint

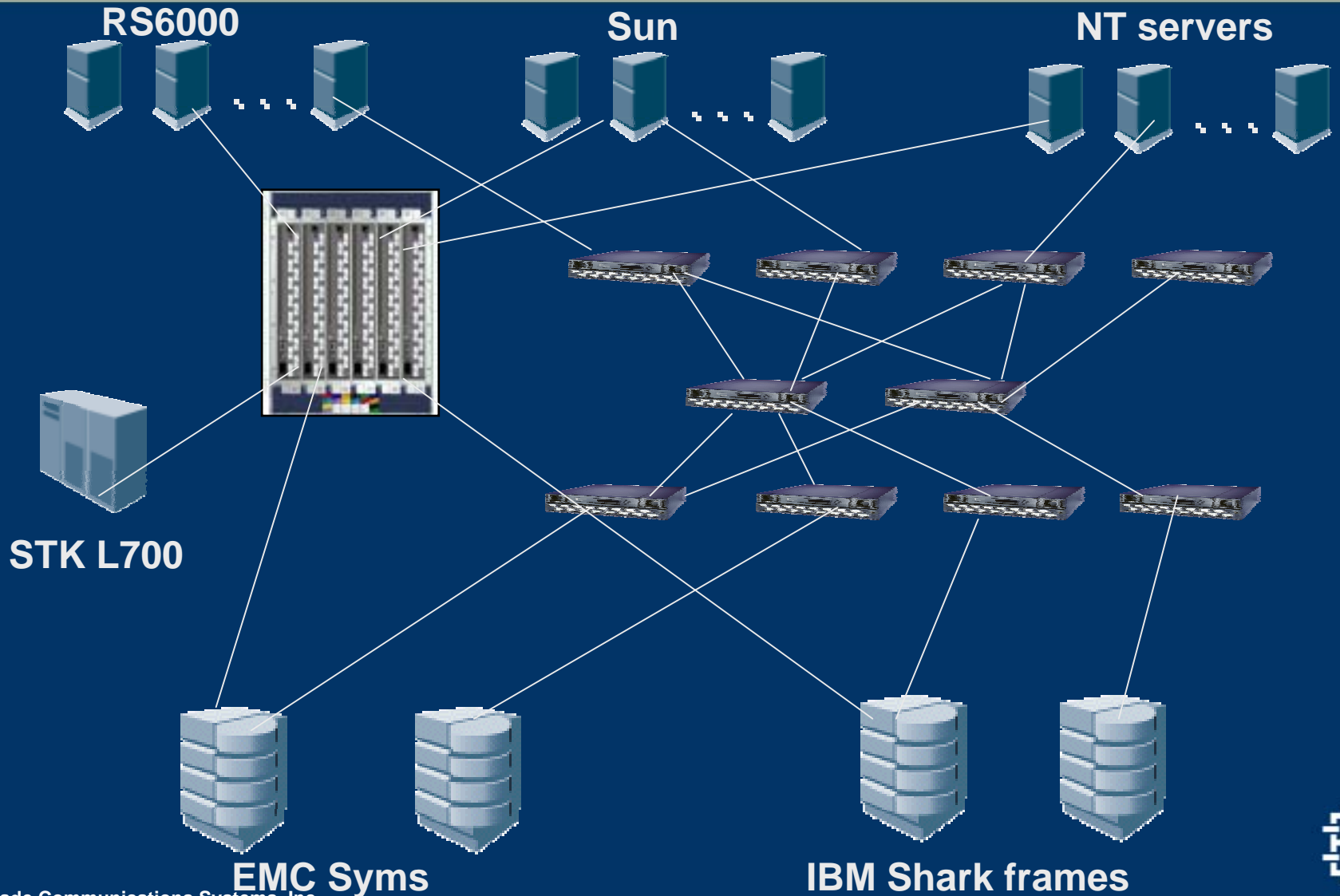


Discover Card/Action Plan

- Blue Sheet the opportunity
- EMC/McData strong with account
- Qlogic announced 2GB offerings
- Partnered with local FI (Technology Exchange) to support the implementation of a SAN design
- Provide the TB with a SAN analysis showing (2) 6400 integrated fabric(s) and our Coach with our 2GB strategy allowing for “edge” connectivity once the 12000 is GA for their two new (NOC’s) next year.
- Had corporate briefing in San Jose
- Forced the detailed plan to EB showing partnership with Discover’s preferred vendors showing TCO



Discover Card SAN Implementation

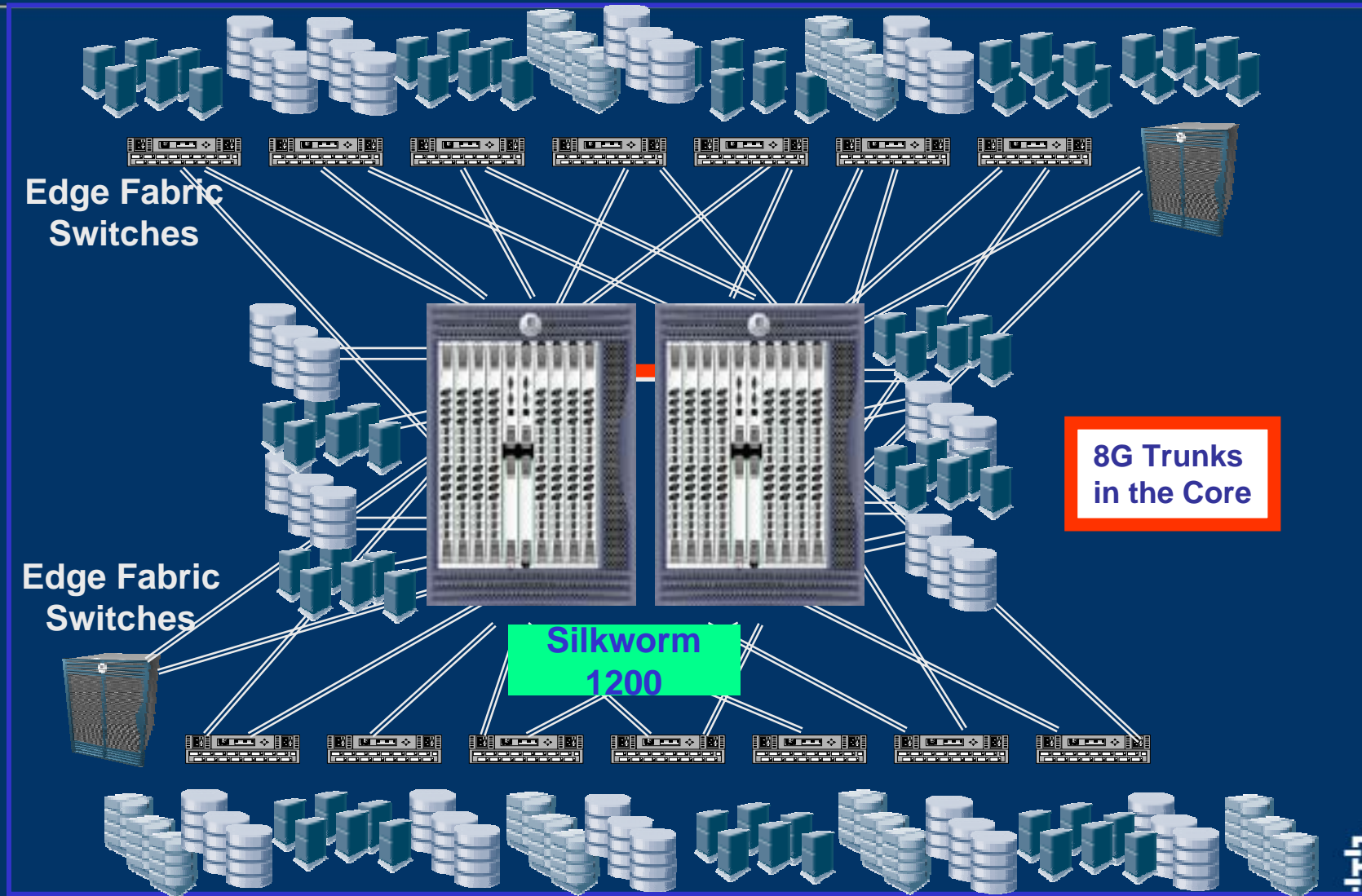


Discover Moving Forward

- Adding (2) 12000's next year
- Many more “edge” switches, Cylon and Terminator
- Will join our customer council
- Hosting our user group meeting (speaker) **OUR Second !!!**
- Great reference account
- Loves the attention
- A key win based on their results and buying influences



Highly Scalable Edge-Core Network Model



Lessons Learned

- Always engage directly with the end user hopefully through Brocade Partners
- Don't forget the basics(Network Concepts) in your messaging
- Work with all of the potential partners on a deal
- Sell the Platform – not the product
- 12000 bridging strategies are complex → have a plan!



Thank You

