Washington Systems Center - Storage

SAN Health SAN Migration Tool

Modernize your Storage Infrastructure for High-Performance Business Continuity

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Accelerate with IBM Storage Webinars

The Free IBM Storage Technical Webinar Series Continues in 2020...

Washington Systems Center – Storage experts cover a variety of technical topics.

Audience: Clients who have or are considering acquiring IBM Storage solutions. Business Partners and IBMers are also welcome.

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Located on the Accelerate with IBM Storage Site: https://www.ibm.com/support/pages/node/1125513

Also, check out the WSC YouTube Channel here:
https://www.youtube.com/channel/UCNuks0go01_ZrVVF1jgOD6Q

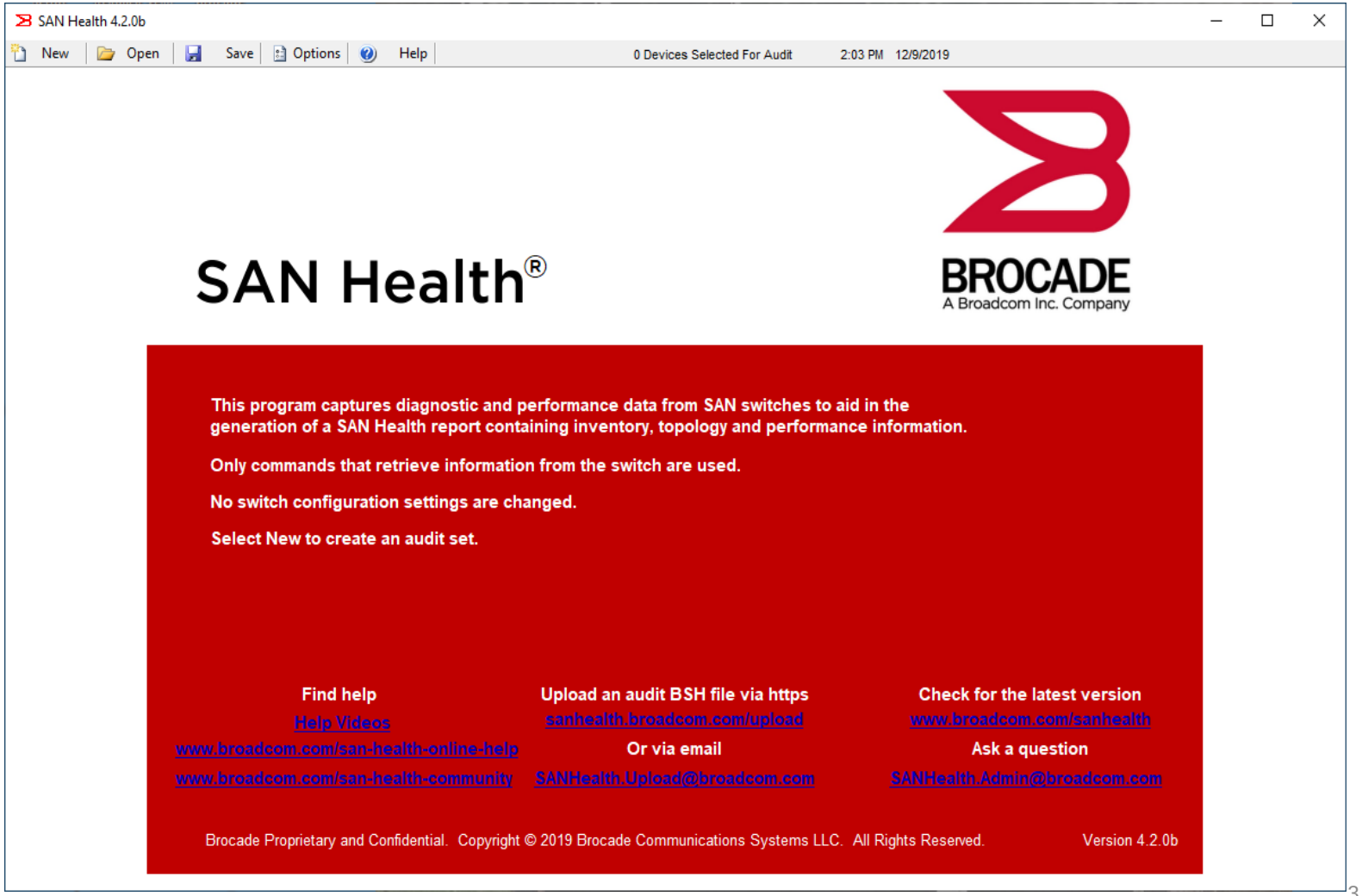
2020 Upcoming Webinars:

January 14 – Brocade / IBM b-type SAN Mondernization
Register Here: https://ibm.webex.com/ibm/onstage/g.php?MTID=ed703072fdd739b7e1384ed84869aed8d

January 21 - Cisco / IBM c-type SAN Analytics
Register Here: https://ibm.webex.com/ibm/onstage/g.php?MTID=eabc0e050b2ff8bdcea4e012c30dfbf71

Agenda

- SAN Infrastructure Time to Modernize
- Brocade/IBM EOL Products
- SAN Migration Guidelines
- SAN Health Output
- Additional Resources



Time to Modernize
EOS/EOL
Saying goodbye to old friends!

EOS in regard to GEN4!

Brocade 8 Gb/s products are going EOL

- BCN policy, all GEN4 products running in a multiple device fabric are not supported!
- EOS next up:
  - 5100 SAN40B-4 08/21/19
  - 5300 SAN80B-4 08/21/19
  - DCX SAN768B 11/14/19
  - DCX-4X SAN384B 11/14/19
  - 300 SAN24B-4 04/16/2024
  - 7800 SAN06B-R 10/31/24
  - FX8-24 FCIP Blade 10/31/24

Gen 4 Fibre Channel EOS for 8Gb Products

Time to plan for the future…

- Brocade-based Gen 4 (8 Gbps) products are “End of Support” (EOS) before the end of 2019

- EOS products introduces significant risk to the customer
  - No back end support if issues arise
  - 8 Gbps SAN will bottleneck new storage and server technologies

- Help customers avoid this risk and ensure optimum performance

- Impact on Customers
  All maintenance, engineering and support will soon cease.
  Replacement parts and components will no longer be available

- Time to plan for the future:
  - IBM SAN768B/384B(DCX/DCX-4X)End of Support is 11/30/19
  - SAN40B-4 (Brocade 5100) End of Support was 5/31/18
  - SAN80B-4 (Brocade 5300) End of Support is 8/1/19

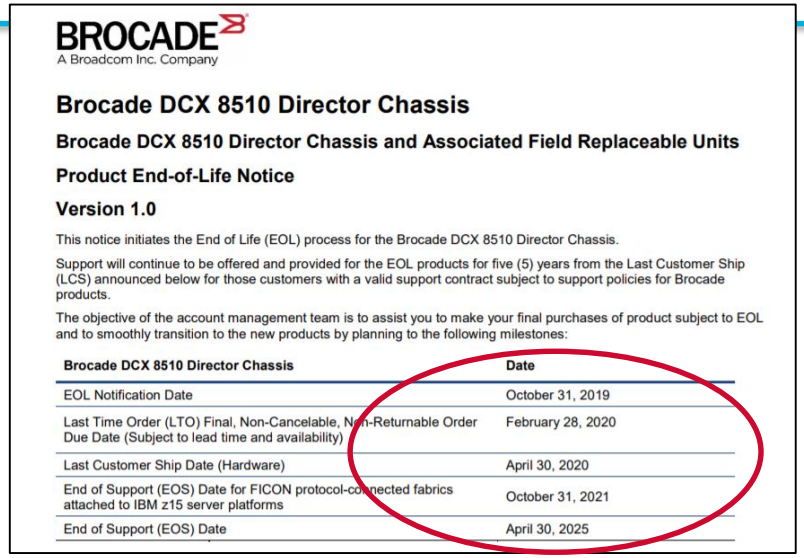
EOS =
No Hardware support
No FOS support
No FOS upgrades

Brocade Gen5 Products

EOL/EOS Announcements - 8510 & 6510 Platforms

- Brocade References
  - Gen5 Platform EOL/EOS (Open Systems) Gen5 FICON EOL/EOS
  - Notices: https://www.broadcom.com/support/fibre-channel-networking/eol

- FICON Qualification
  - Gen5 8510 Directors & 6510 Switch
    - IBM qualified with z15
    - EOS for z15 support with Gen5 – 10/31/21
    - Gen5 support for IBM z Processors prior to z15 are supported until platform EOS date
  - Brocade x6 Directors & G620
    - FICON support through EOL of platforms



BROCADE
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Brocade DCX 8510 Director Chassis

Brocade DCX 8510 Director Chassis and Associated Field Replaceable Units

Product End-of-Life Notice

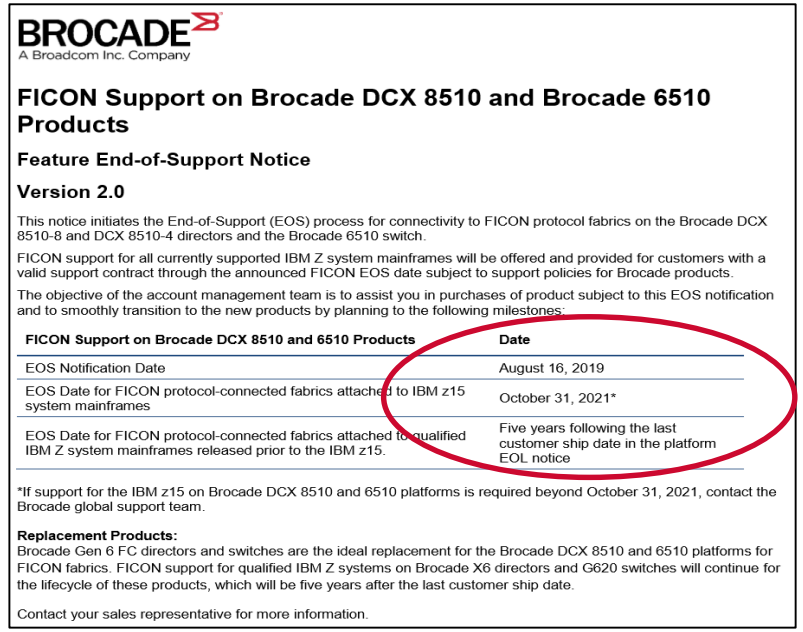
Version 1.0

This notice initiates the End of Life (EOL) process for the Brocade DCX 8510 Director Chassis.

Support will continue to be offered and provided for the EOL products for five (5) years from the Last Customer Ship (LCS) announced below for those customers with a valid support contract subject to support policies for Brocade products.

The objective of the account management team is to assist you to make your final purchases of product subject to EOL and to smoothly transition to the new products by planning to the following milestones:

Brocade DCX 8510 Director Chassis	Date
EOL Notification Date	October 31, 2019
Last Time Order (LTO) Final, Non-Cancelable, Non-Returnable Order Due Date (Subject to lead time and availability)	February 28, 2020
Last Customer Ship Date (Hardware)	April 30, 2020
End of Support (EOS) Date for FICON protocol-connected fabrics attached to IBM z15 server platforms	October 31, 2021
End of Support (EOS) Date	April 30, 2025



BROCADE
A Broadcom Inc. Company

FICON Support on Brocade DCX 8510 and Brocade 6510 Products

Feature End-of-Support Notice

Version 2.0

This notice initiates the End-of-Support (EOS) process for connectivity to FICON protocol fabrics on the Brocade DCX 8510-8 and DCX 8510-4 directors and the Brocade 6510 switch.

FICON support for all currently supported IBM Z system mainframes will be offered and provided for customers with a valid support contract through the announced FICON EOS date subject to support policies for Brocade products.

The objective of the account management team is to assist you in purchases of product subject to this EOS notification and to smoothly transition to the new products by planning to the following milestones:

FICON Support on Brocade DCX 8510 and 6510 Products	Date
EOS Notification Date	August 16, 2019
EOS Date for FICON protocol-connected fabrics attached to IBM z15 system mainframes	October 31, 2021*
EOS Date for FICON protocol-connected fabrics attached to qualified IBM Z system mainframes released prior to the IBM z15.	Five years following the last customer ship date in the platform EOL notice

*If support for the IBM z15 on Brocade DCX 8510 and 6510 platforms is required beyond October 31, 2021, contact the Brocade global support team.

Replacement Products:
Brocade Gen 6 FC directors and switches are the ideal replacement for the Brocade DCX 8510 and 6510 platforms for FICON fabrics. FICON support for qualified IBM Z systems on Brocade X6 directors and G620 switches will continue for the lifecycle of these products, which will be five years after the last customer ship date.

Contact your sales representative for more information.

Brocade Network Advisor EOL Communication

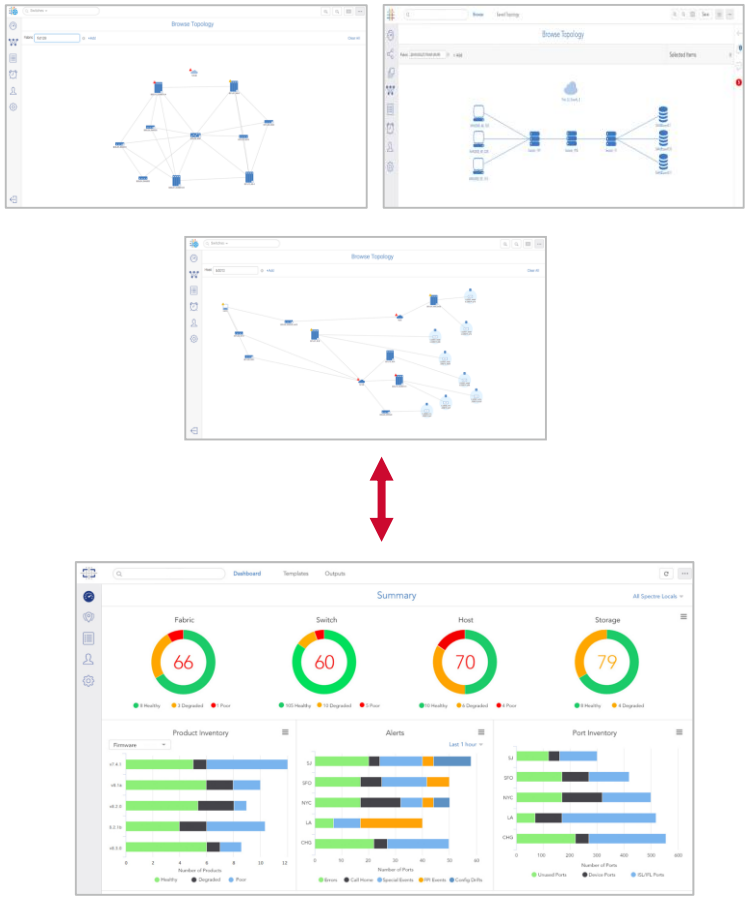
Software withdrawal and support discontinuance: IBM Network Advisor V14.x - No replacement available…. November 26, 2019…IBM

- Brocade Network Advisor is being replaced by Brocade's new SAN management offering, SANnav
- The BNA EOL communication process has commenced earlier than normal (notification on March 22, 2019 with Last Time Order of February 1, 2020) to ensure a seamless transition
- Brocade BNA customers will be supported until February 8, 2022
  - OEM customers should check with the OEM for End of Support dates
- SANnav 2.x will include outstanding core BNA capabilities including FICON support
- All OEMs are on track to have launched SANnav by end of year 2020
- Brocade offers only 2 years of EOL support compared to 5 years for hardware due to software's shorter life cycle. Old software versions rapidly become obsolete.

What's New! Modernize SAN Management

BNA End of Life (EOL) process has already been announced!

- Brocade SANnav Management Portal
  - New next-generation SAN management application
  - Captures SAN telemetry data and contextualizes it into visual dashboards
- Brocade SANnav Global View
  - New global visibility, monitoring and troubleshooting
  - Summarizes the overall health and performance of all SAN resources with drilldown to individual fabrics and switches
- IBM SAN18B-6 Extension Switch
  - New Gen 6 extension switch for disaster recovery
  - Dramatically speeds up replication performance to move more data faster over distance



What does End-of-Support exactly mean?

- No more FOS Support
  - No FOS patches
  - No CVRs, no CCEs, no fixes will be provided
  - No Security updates
  - No Interoperability support

  - Any FOS code levels that were required to support this platform are retired and can no longer be compiled

- No more Hardware Support
  - Hardware will not provide Repair or Failure Analysis
  - Components & FRUs will not be available for purchas
  - Chassis' cannot be replaced
  - WWN cards cannot be re
  - No Hard ...bished Brocade equipment purchased from a third

Increased Risks in Client Production Environments

- ...s of Sustaining Support
  - TAC cases will not be opened for the product
  - No investigation into root cause will take place
  - No work-arounds provided
  - No license support
  - No communication about known defects
  - No communication about security issues
  - No fabric intermix support with EOS devices – a supported fabric intermixed with EOS devices invalidates support

Brocade Storage Networking Product Portfolio

Brocade®
GEN6
FIBRE CHANNEL

Brocade SAN18B-6 Extension Switch

Brocade 7840 Extension Switch

Brocade SAN128B-6 Switch

Brocade SAN512B-6/SAN256B-6 Directors

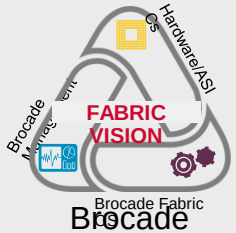
Brocade SAN64B-6 Switch

Brocade SAN24B-6 Switch

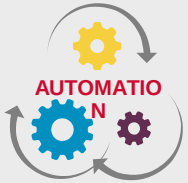
Brocade FC32-48, -64 Port Blades,
and SX6 Extension Blade

Brocade Gen 6 Blade Server Switches

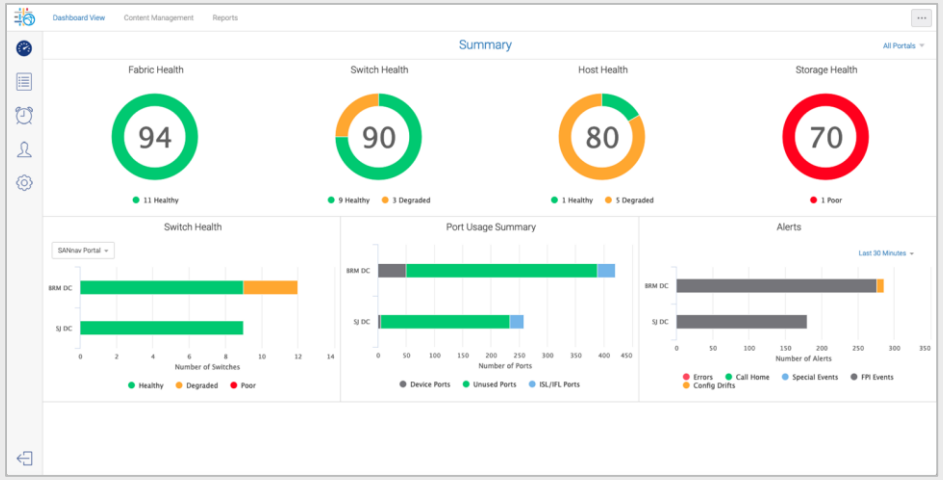
Brocade SANnav Management Portal

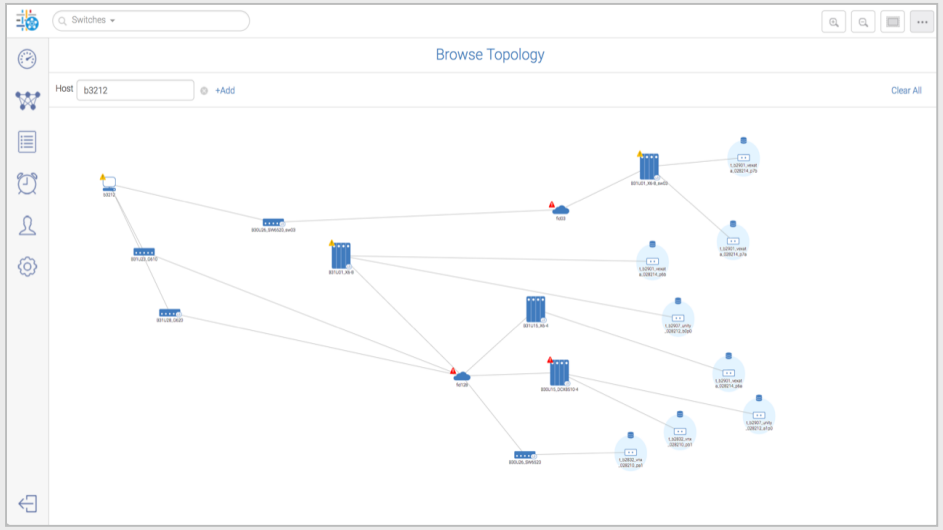


Brocade Fabric Vision



Rest API





Gen 5 vs. Gen 6 Fibre Channel Value

Feature	Brocade GEN5 FIBRE CHANNEL	Brocade GEN6 FIBRE CHANNEL
Flow-level monitoring for storage SLAs	Frame level	Device and application level
Automatically detects degraded storage performance with integrated network sensors for device latency and IOPS metrics with IO Insight	Not available	Available
VM or device connectivity scale	Accommodates high-density VM deployments	2x scale capability of Gen 5 VM deployments
Higher supportability, RAS features	Available	Enhanced
Forward Error Correction (FEC)	Available	Available
Maximum IOPS handling	10s of millions	100s of millions
Maximum port speed	Up to 16 Gbps	Up to 128 Gbps
More buffers per ASIC for congestion control	8,192	15,360
Avoids fabric problems with enhanced monitoring and diagnostics	Yes	Yes, with advanced IO metrics
Ensures application availability and performance by automatically recovering lost buffer credits	Yes	Yes
Monitors top bandwidth-consuming flows in real time with Fibre Channel Routing	Yes	Yes

Director Portfolio Comparison

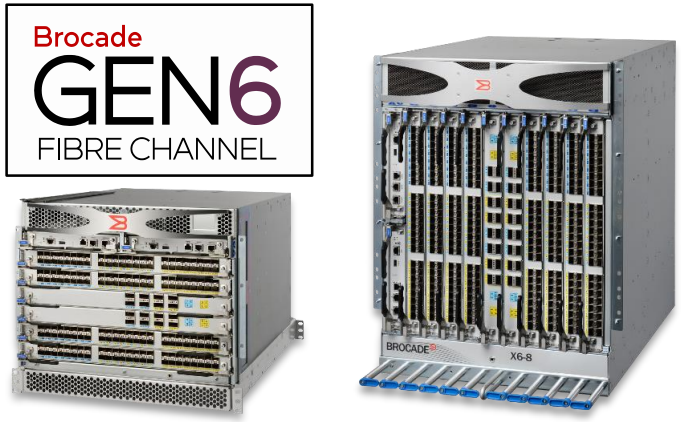
Feature	Brocade GEN5 FIBRE CHANNEL	Brocade GEN6 FIBRE CHANNEL / GEN7 F BRE CHANNEL
Product lifecycle status	Currently available	Currently available (Gen 7 upgrade in future)
Upgrade to next-generation technology	Not upgradeable	Easy upgrade to Gen 7
VM Insight	Requires host and target support	Requires host and target support (Gen 6) Only requires host support (Gen 7)
Brocade SAN Automation	Available	Available
Fabric-based analytics	Not available	Only available in Gen 7
Fabric Vision monitoring and diagnostics	Available	Available
IO Insight latency monitoring	Not available	Available, includes NVMe metrics
Flow-level monitoring	Frame-level	Frame and I/O-level
Latency (local switching) with FEC	1100 ns	<780 ns (Gen 6) ~500 ns (Gen 7)
Maximum supported speed	16 Gb/s	32 Gb/s (Gen 6) 64 Gb/s (Gen 7)
ICL architecture	32 optical ports, up to 2km	32 optical ports, up to 2km

Data Center Modernization Starts with Gen 6 Directors and Switches

Gen 7 Ready: 8/16/32/64Gbps

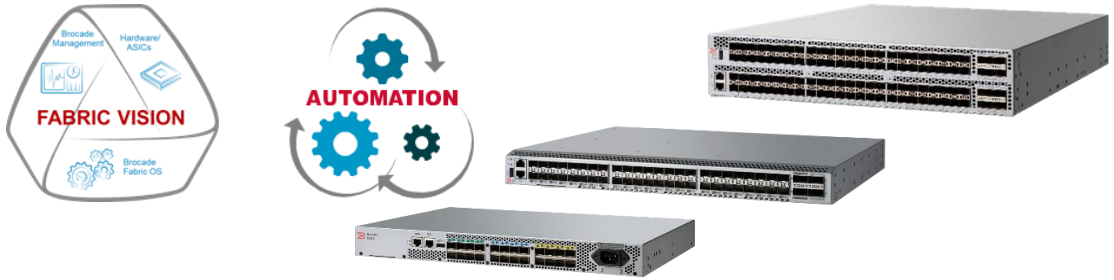
Investment protection: Gen 6 now, simple upgrade to Gen 7 in the future

- Simple Upgrade
  - Leverage existing chassis/components
  - Upgrade Software/add new core blades
  - Add GEN7 port blades
- Backwards Compatible
  - Works with existing GEN6 ports & extension blades
  - Connects to GEN6 directors via ICL ports
- Adds Advanced Functionality
  - Integrated SAN analytics
  - Doubles SAN Performance
  - Reduces network Latency
  - Enhanced virtualization monitoring



IBM Directors

SAN256B-6 SAN512B-6

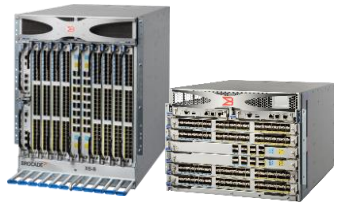


IBM GEN6 Switches

Gen 7 - FOS 9.0 Directors

Directors

- Two Gen 7 Director chassis models based on X6 chassis design
  - Same frame, PSUs & fans, but updated CP (in shipped Gen 7 chassis)
  - New Gen 7 Core blades
  - New 48p Gen 7 FC port blade with line rate backplane performance
    - Support for 8/10/16/32/64G FC speeds
    - 8-Slot director with 384 x 64G device ports
    - 4-Slot director with 192 x 64G device ports
  - New 48p 32G Condor 5-based Gen 6 FC port blade
    - Support for 8/10/16/32G FC speeds
    - Only 48p blade configuration option for factory Gen 7 chassis
    - Non-upgradeable to 64G speeds
- Consolidate all director offerings into Gen 7 director family
  - 64p and SX6 Gen 6 blades supported in Gen 7 Director base chassis
  - 48p Gen 6 blades supported in field upgraded Gen 7 chassis
  - Field upgradability from X6 to Gen 7 director with new Core Routing blade



Brocade Gen 7 Directors

48-Port Gen 7 blade

48-Port 32G Gen 7 blade

8-slot Core blade

4-slot Core blade

Brocade Storage Networking Product Portfolio

Brocade GEN 7 FIBRE CHANNEL

Brocade Gen 7 Directors (same chassis as X6)

Gen 7 Midrange switch

48-Port blade

8-slot Core blade

4-slot Core blade

Brocade GEN6 FIBRE CHANNEL

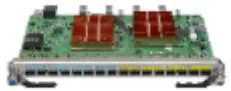
Brocade G630 Switch

Brocade G620 Switch

Brocade G610 Switch

Brocade Analytics Monitoring Platform

Brocade X6 Directors



Brocade FC32-64 Port Blade

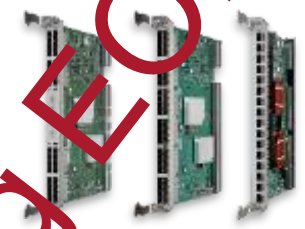
Brocade FC32–48 Port Blade

Brocade SX6 Extension Blade

Brocade GEN5 FIBRE CHANNEL

Brocade DCX 8510 Backbones

Brocade Analytics Monitoring Platform



Brocade FC16–32, –48, –64 Port Blades

Brocade 6520 Switch

Brocade 7840 Switch

Brocade 6510 Switch

Brocade 6505 Switch

Brocade Gen 5 Blade Server Switches

Reaching EOL

Brocade Network Advisor

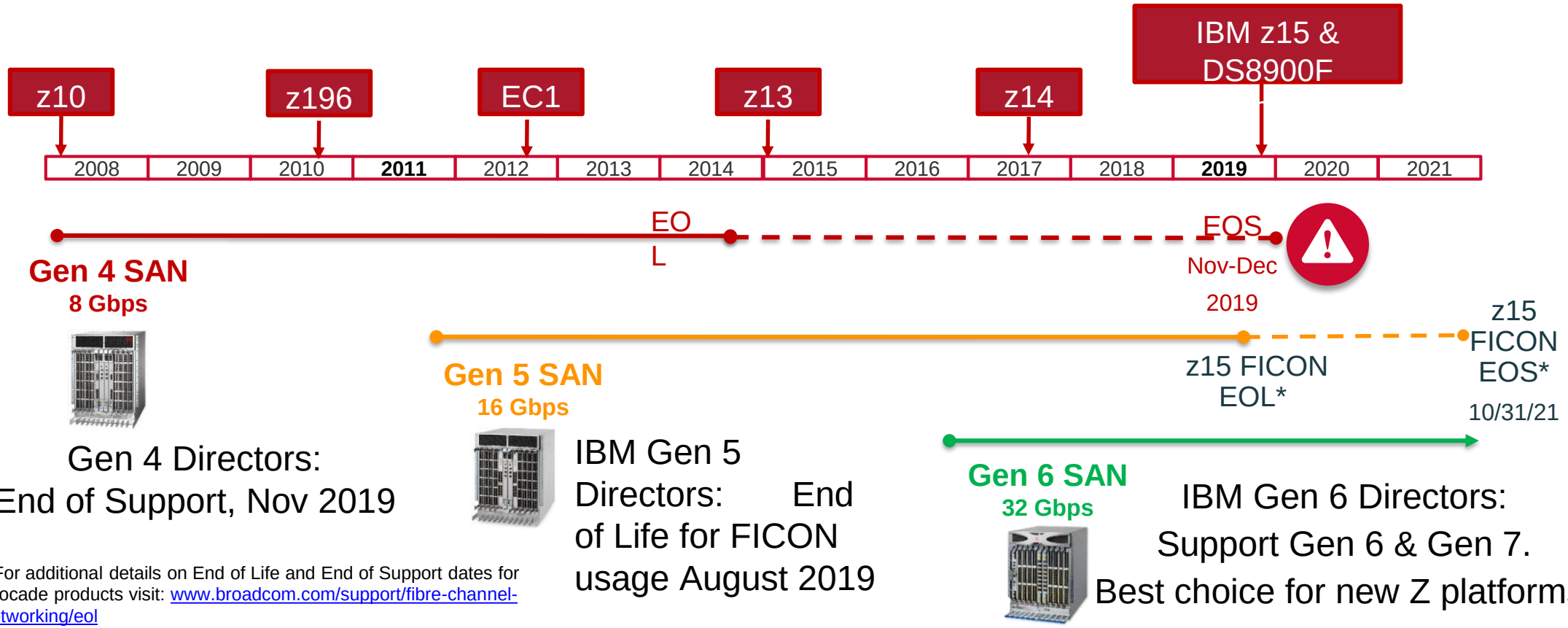
OpenStack

Rest API

Management and Orchestration Tools

It is almost 2020. Know the Technology Refresh Cycle

Why connect new platforms to a network that is 8 years old?



Gen 4 Directors: End of Support, Nov 2019

IBM Gen 5 Directors: End of Life for FICON usage August 2019

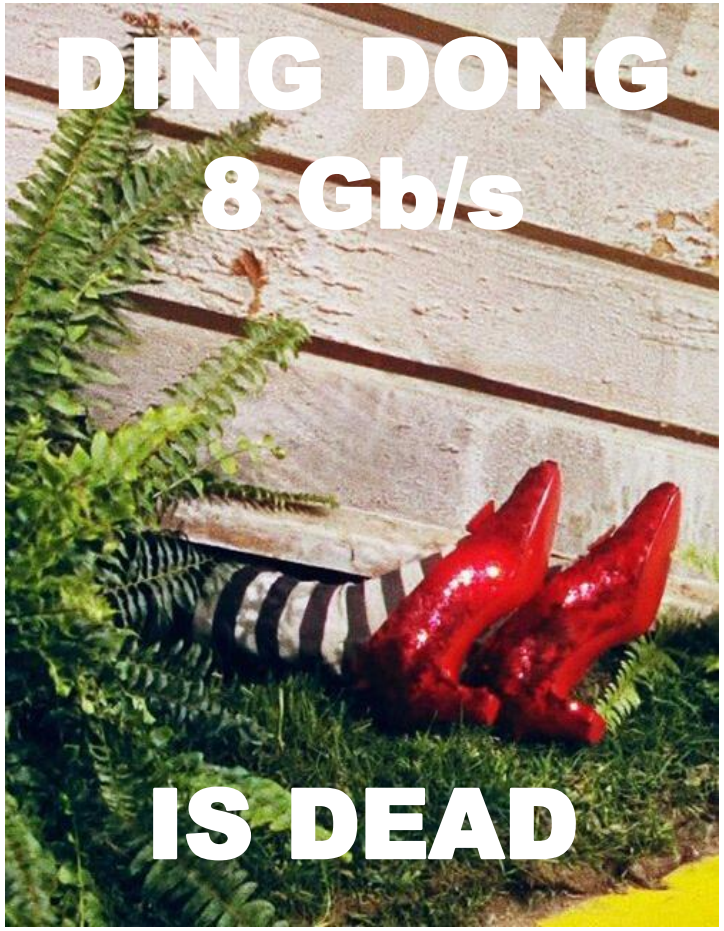
IBM Gen 6 Directors: Support Gen 6 & Gen 7. Best choice for new Z platforms.

* For additional details on End of Life and End of Support dates for Brocade products visit: www.broadcom.com/support/fibre-channel-networking/eol

Ding Dong 8 Gb/s Is DEAD!

Finally, the last Brocade 8 Gb/s products are going EOL

- Both the SAN06B-R Extension Switch and the FX8-24 Extension Blade are the last remaining 8 Gb/s platforms and EOL is long overdue
- EOL notices to OEMs and posted on Broadcom.com on 4/30/19
  - Last Time Order (LTO) date is 8/31/19
  - Last Customer Ship (LCS) date 10/31/19
  - End of Support (EOS) date is 10/31/24
- Customers who require additional units need to place their orders by 8/31/19
- SAN06B-R and FX8-24 upgrade and license SKUs will be available for another 2 years until 8/31/21



IBM SAN GEN 6 Extension Platform Summary

Provides Predictable and Stable Data Transfers

- **IB b-type SAN Extension is designed for Enterprise solutions**
  - Proven support of all of IBM's most critical BC/DR and Tiering offering for 25+ years
- **IBM b-type SAN Extension provides:**
  - Predictive performance
  - Stability of the IP WAN
  - Automatic Failover to reduce interruption
  - Deep Insights for Troubleshooting
- **Enterprise Client Value Includes:**
  - Flexibility in solution design
  - Protecting their data virtually anywhere in the world
  - Save infrastructure cost through consolidation and adding new workloads requiring distance connectivity

Global 1000/ Large Enterprise

SX6 Extension Blade
X6 Directors
16×32 Gb/s FC ports
16×1/10 GbE FCIP WAN ports
2×40 GbE FCIP WAN ports

SAN06B-R
EOL
8 Gbps, 1 GbE,
FCIP Only

Large Enterprise

SAN42B-R
Extension Swithc
24×16 Gb/s FC ports
16×1/10 GbE FCIP WAN ports
2×40 GbE FCIP WAN ports

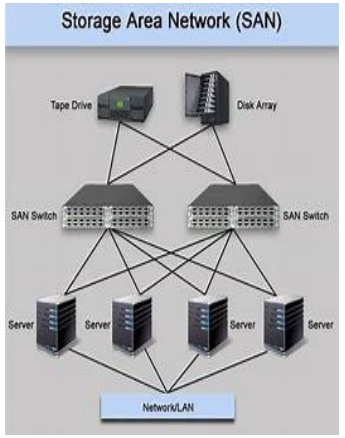
Small to Medium Enterprise

SAN18B-6
Extension Switch
12×32 Gb/s FC ports
6×1/10 GbE FCIP WAN ports

SAN Migration Guidelines

SAN Migration

- Today's SAN Administrator's are faced with the need for more storage capacity and Speed…
- They require high-performance and redundant SAN Networks that can both meet their current demands and scale for growth in the near future!
- To accommodate these new requirements, SAN Admins often need to migrate and upgrade from their existing storage networks…
- Migrating from older SAN's to newer SAN technology requires a plan that includes…. Design, Configuration, and implementation processes along with a post migration analysis.



SAN Migration Preparation

- A fabric migration can be done both offline and online, depending on the application or project requirements.
- Rip and Replace/Offline Fabric Migration
  - ➢ Simply replace the old switches with new preconfigured switches
  - ➢ Careful planning is required
- Online Redundant Fabric Migration
  - ➢ In many environments, planned downtime is not possible.
  - ➢ An online migration in a SAN fabric requires careful evaluation of the applications availability, and currently deployed topology.

SAN Migration Process…. Run SAN Health

- Factors to consider, migration approach
- Assessing the existing Fabric Topology, Inventory the network

➢ Application failover considerations

➢ Storage failover considerations

➢Topology Changes

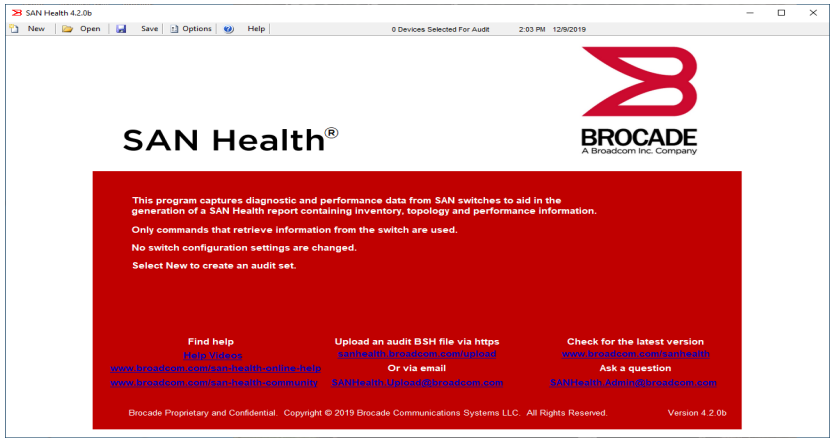
➢ID critical servers, storage arrays, and applications.

➢Zone configurations export/import strategy

➢Ensure Correct licensing sets are included

➢Software interoperability Planning

➢Prepare/Update SAN/Storage Diagram to meet new requirements



The SAN Summary is your starting point

SAN SUMMARY DETAILS FOR SAN_EXAMPLE

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SWITCHES IN SAN SAN_Example

Fabric Name	Switch Name	Domain	IP Address	World Wide Name	Model	Speed	OS Ver	Ports	Unused
Storage_Edge	sw3200_32	32	192.168.163.32	10:00:00:60:69:c0:06:55	3200	2G	3.2.1a	8	1
Storage_Edge	sw4100-41	41	192.168.163.41	10:00:00:05:1e:34:56:5e	4100	4G	5.1.0d	32	24
Storage_Edge	sw3850-50	50	192.168.163.50	10:00:00:05:1e:34:12:20	3850	2G	5.0.1a	16	10
Backbone	sw7500-75	75	192.168.163.75	10:00:00:05:1e:37:39:16	7500	4G	5.1.0d	32	28
Server_Edge	sw3800_38	38	192.168.163.38	10:00:00:60:69:50:08:7e	3800	2G	3.2.0a	16	4
Server_Edge	sw48000-48	48	192.168.163.48	10:00:00:60:69:e4:25:18	48000	4G	5.1.0d	48	39
Server_Edge	sw200e-20	20	192.168.163.20	10:00:00:05:1e:02:30:f3	200E	4G	5.1.0d	16	8
Server_Edge	sw24000-24	24	192.168.163.24	10:00:00:60:69:e2:03:b0	24000	2G	5.1.0d	32	21
Server_Edge	sw3900-39	39	192.168.163.39	10:00:00:60:69:90:0c:a3	3900	2G	5.1.0d	32	23

HEALTH AND MONITORING STATUS FOR SAN_Example

	Switch State		Power Supplies			Fans			Temp Sensors			Errors		SNMP		SysLog	
Fabric Name	Marg	OK	Bad	Marg	OK	Bad	Marg	OK	Low	OK	High	Lvl1	Lvl2	No	Yes	No	Yes
Storage_Edge	0	3	2	0	2	0	0	12	0	12	0	0	0	3	0	3	0
Backbone	1	0	1	0	1	0	0	3	0	6	0	0	0	1	0	1	0
Server_Edge	3	2	1	0	7	0	0	19	0	17	0	0	0	5	0	5	0
TOTALS	**4**	**5**	**4**	**0**	**10**	**0**	**0**	**34**	**0**	**35**	**0**	**0**	**0**	**9**	**0**	**9**	**0**

SUMMARY FOR 9 SWITCHES TOTALING 232 PORTS THAT ARE 32 % UTILIZED

	Switch Count				Port Count				Port Use Metrics			
Fabric Name	1G	2G	4G	Total	1G	2G	4G	Total	ISL Ports	Devices	Unused	Utilization
Storage_Edge	0	2	1	3	0	24	32	56	16	5	35	38%
Backbone	0	0	1	1	0	0	32	32	4	0	28	12%
Server_Edge	0	3	2	5	0	80	64	144	32	17	95	34%
TOTALS	**0**	**5**	**4**	**9**	**0**	**104**	**128**	**232**	**52**	**22**	**158**	**32%**

DEVICE COUNT FOR ALL FABRICS

Device Description	Count	Device Description	Count	Device Description	Count	Device Description	Count
Emulex HBA			8	Qlogic HBA			9
Seagate Disk Drive			5				

PORT USE

	Port Use						Fan Out Ratios			Port Long Distance Modes				
Fabric Name	Disk	Tape	Host	ISL	Free	Total	Host: Disk	Port: ISL	Device: ISL	10km	25km	50km	100km	Auto
Storage_Edge	5	0	0	16	35	56	0: 5	2.5:1	0.31:1	56	0	0	0	0
Backbone	0	0	0	4	28	32	0:0	7:1	0: 4	32	0	0	0	0
Server_Edge	0	0	17	32	95	144	17:0	3.5:1	0.53:1	144	0	0	0	0
TOTALS	**5**	**0**	**17**	**52**	**158**	**232**	**3.4:1**			**232**	**0**	**0**	**0**	**0**

BANDWIDTH UTILIZATION STATISTICS

	Device Bandwidth Utilization (per port)									ISL Bandwidth Utilization (per port)								
	Dev.	0 - 25%		25-75%		75-100%		Average	Max	ISL	0 - 25%		25-75%		75-100%		Average	Max
Fabric Name	Count	Av	max	Av	Max	Av	Max	MB/s	MB/s	Count	Av	max	Av	Max	Av	Max	MB/s	MB/s
Storage_Edge	5	5	5	0	0	0	0	17.6	46	16	15	15	1	1	0	0	16.3	68
Backbone	0	0	0	0	0	0	0	0	0	4	2	2	1	1	1	1	44.2	118
Server_Edge	17	17	17	0	0	0	0	5.1	36	32	31	29	1	3	0	0	9.6	105
TOTALS	**22**	**22**	**22**	**0**	**0**	**0**	**0**	**7.6**		**52**	**48**	**46**	**3**	**5**	**1**	**1**	**23.4**	

LICENSE SUMMARY

Full Fabric	8	WEB TOOLS	9	Zoning	9	Trunking	9	SES	8
Perf. Monitoring	9	Fabric Watch	9	Extended Fabric	9	Remote Switch	9	Secure FOS	7
Quick Loop	7	VL2 Upgrade	0	VL4 Upgrade	0				

ZONING METRICS

	Zone	Aliases Statistics				Zone Statistics				Config Statistics			
Fabric Name	Database Use	Aliases	AvMem	MaxMem	Hanging	Zones	AvMem	MaxMem	Hanging	Configs	AvMem	MaxMem	Hanging
Storage_Edge	0.8% of 258k	24	1	1	19	11	4.5	15	1	1	10	10	1
Backbone	Not Active												
Server_Edge	0.9% of 258k	30	1	1	11	11	4.9	20	1	1	11	11	1
TOTALS		**54**	**0.7**	**1**	**30**	**22**	**3.1**	**20**	**2**	**2**	**7**	**11**	**2**

In this example, three SANs were audited.

This page provides a fast glimpse into which switches were audited

- Switch models/generation
- FOS Levels
- Available ports
- Overall Health

Current Fabric Assessment Topology, Inventory the SAN network

SAN SUMMARY DETAILS FOR WSC - NETWORK

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SWITCHES IN SAN WSC - Network

Fabric Name	Switch Name	Dom	IP Address	World Wide Name	Model	Spd	OSVer	Status	DaysUp	Pwr(W)	Serial Numbers	Ports (Total p	Unusd	UnLicnd
ratssw03	ratssw03	1	9.5.101.132	10:00:00:05:33:7c:72:fc	300	8G	7.4.2d	Healthy	216	48	ALJ2521G0BF	24 (24)	18	0
ratssw04	ratssw04	1	9.5.101.135	10:00:00:05:33:75:69:74	300	8G	7.4.2d	Healthy	217	48	ALJ2521G0BA	24 (24)	18	0
ratsssw05	ratssw05	1	9.5.101.192	10:00:50:eb:1a:98:7b:1f	6505	16G	8.2.0b	Healthy	217	99	CCD2520L043	24 (24)	9	0
ratssw06	ratssw06	1	9.5.101.196	10:00:50:eb:1a:99:29:08	6505	16G	8.2.0b	Healthy	217	99	CCD2520L042	24 (24)	11	0

SUMMARY FOR 4 SWITCHES WITH 96 PORTS THAT ARE 42 % UTILIZED

	Switch Count							Port Count							Port Use Metrics				
Fabric Name	2G	4G	8G	10G	16G	32G	Total	2G	4G	8G	10G	16G	32G	Total	ISL Ports	Device Ports	Devices	Unused	Utilization
ratssw03	0	0	1	0	0	0	1	0	0	24	0	0	0	24	0	6	12	18	25 %
ratssw04	0	0	1	0	0	0	1	0	0	24	0	0	0	24	0	6	14	18	25 %
ratsssw05	0	0	0	0	1	0	1	0	0	4	0	20	0	24	0	15	38	9	62 %
ratssw06	0	0	0	0	1	0	1	0	0	4	0	20	0	24	0	13	32	11	54 %
TOTALS	**0**	**0**	**2**	**0**	**2**	**0**	**4**	**0**	**0**	**56**	**0**	**40**	**0**	**96**	**0**	**40**	**96**	**56**	**42 %**

DEVICE COUNT FOR ALL FABRICS 96 (Including all NPIV and Loop Devices)

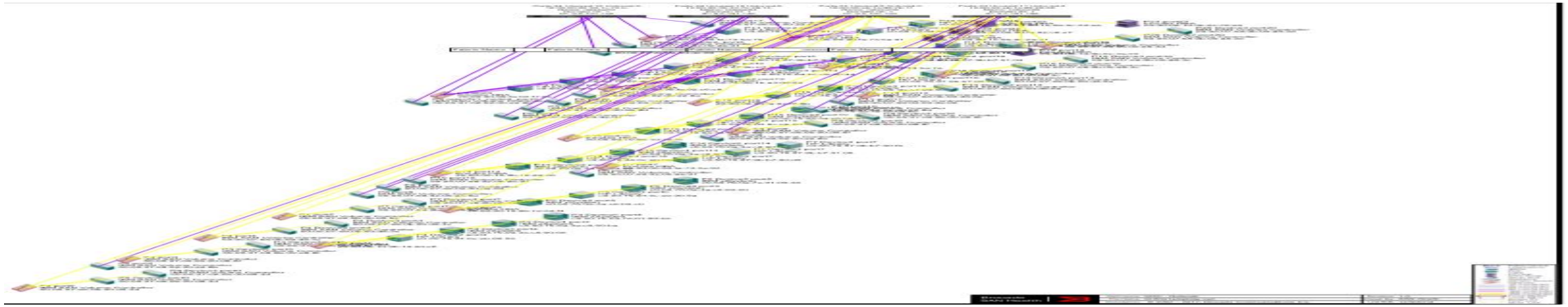
Device Description	Count	Device Description	Count	Device Description	Count
Emulex HBA	16	HP Library	26	IBM SAN Volume Controller	40
IBM zSystem	14				

PORT USE

	Port Counts			Attached Device Types					Inter Switch Links				Fan Out Ratios			Long Distance Modes					
Fabric Name	Total	Unusd	Unlcd	Disk	Tape	Host	Appliance	Gateway	ISLs	IFLs	Trnk Mstr	Trnk Slv	Host:Disk	Non-ISL:ISL	Device:ISL	10km	25km	50km	100k	300k	Auto
ratssw03	24	18	0	0	6	0	4	2	0	0	0	0	0:0	24:0	12:0	24	0	0	0	0	0
ratssw04	24	18	0	1	7	0	4	2	0	0	0	0	0:1	24:0	14:0	24	0	0	0	0	0
ratsssw05	24	9	0	7	8	3	12	8	0	0	0	0	0.43:1	24:0	38:0	24	0	0	0	0	0
ratssw06	24	11	0	6	5	2	12	7	0	0	0	0	0.33:1	24:0	32:0	24	0	0	0	0	0
TOTALS	**96**	**56**	**0**	**14**	**26**	**5**	**32**	**19**	**0**	**0**	**0**	**0**				**96**	**0**	**0**	**0**	**0**	**0**

LICENSE SUMMARY

Fabric Name	License Name	Count	License Name	Count	License Name	Count	License Name	Count	License Name	Count



SAN Fabric Summary Details, ports, switches, fabrics, sites, etc.

Fabric Name	Switch Name	Dom	IP Address	World Wide Name	Model	Spd	OSVer	Status	DaysUp	Pwr(W)	Serial Number	Ports (Total	Unusd	UnLicnd
Fabric A	CBCDIRA30	30	192.168.1.30	10:00:00:27:f8:a2:d8:84	DCX-8510-8	16G	7.4.1d	Healthy	106	1813	AFX2533J01E	240 (368)	92	0
Fabric A	CBCEDGA32	32	192.168.1.32	10:00:00:27:f8:bf:6b:35	6520	16G	7.4.1d	Healthy	106	99	CHQ2543J00G	96 (96)	27	24
Fabric A	RDCDIRA40	40	192.168.1.40	10:00:00:27:f8:a2:e2:84	DCX-8510-8	16G	7.4.1d	Healthy	106	1813	AFX2533J017	240 (368)	76	0
Fabric A	CBCBLD04A	N/A	161.222.100.30	10:00:00:05:33:5f:7f:6c	5470	8G	6.4.2b4	Healthy	348	52	BBS0406G0A8	20 (20)	15	0
Fabric A	RDCBLD04A	N/A	161.222.10.142	10:00:00:05:33:bc:07:94	5470	8G	6.4.2b	Healthy	189	52	BBS0447G0KR	20 (20)	2	15
Fabric B	RDCBLD04B	1	161.222.10.143	10:00:00:05:33:ef:0f:a1	5470	8G	6.4.2b4	Healthy	179	52	BBS0414H00M	20 (20)	2	15
Fabric B	CBCDIRB31	31	192.168.1.31	10:00:00:27:f8:a5:fd:9c	DCX-8510-8	16G	7.4.1d	Healthy	113	1813	AFX2539J004	240 (368)	92	0
Fabric B	CBCEDGB33	33	192.168.1.33	10:00:00:27:f8:b7:10:e0	6520	16	1d	Healthy	113	99	CHQ2537J002	96 (96)	27	24
Fabric B	RDCDIRB41	41	192.168.1.41	10:00:00:27:f8:a4:3a:00	DCX-8510-8	16G		Healthy	113	1813	AFX2534J008	240 (368)	76	0
Fabric B	CBCBLD04B	N/A	161.222.100.31	10:00:00:05:33:bb:f1:d1	5470	8G	6.4.2b4	hy	293	52	BBS0447G0KX	20 (20)	6	10

SUMMARY FOR 10 SWITCHES WITH 1232 PORTS (LICENSED PORTS - 1144) THAT ARE 64 %UTILIZED

	Switch Count							Port Count							Port Use Metrics				
Fabric Name	2G	4G	8G	10G	16G	32G	Total	2G	4G	8G	10G	16G	32G	Total	ISL Ports	Device Ports	Devices	Unused	Utilization
Fabric A	0	0	0	0	3	0	3	3	75	257	0	217	0	576	16	365	347	195	65 %
Fabric A	0	0	1	0	0	0	1	0	0	20	0	0	0	20	0	5	5	15	25 %
Fabric A	0	0	1	0	0	0	1	0	0	5	0	0	0	20	0	18	3	2	60 %
Fabric B	0	0	1	0	3	0	4	3	71	260	0	223	0	596	20	379	344	197	65 %
Fabric B	0	0	1	0	0	0	1	0	0	10	0	0	0	20	0	14	4	6	40 %
TOTALS	**0**	**0**	**4**	**0**		**0**	**10**	**6**	**146**	**552**	**0**	**440**	**0**	**1232**	**36**	**781**	**703**	**415**	**64 %**

DEVICE COUNT FOR ALL FABRICS 703 (Including all NPIV and Loop Devices)

Device Description	Count	Device Description	Count	Device Description	Count
3PAR Data	232	Access Gateway	6	Brocade Switch	6
Data Domain VTL (Qlogic)	2	EMC Clariion	4	Emulex HBA	411
IBM SAN Volume Controller	8	NPIV Host	10	Qlogic HBA	24

End of Service Support additions SAN Health

SAN SUMMARY DETAILS

Fabric Name	Switch Name	Dom	IP Address	World Wide Name	Model	Spd	OSVer	Status	DaysUp	Pwr(W)	Serial Number	Ports (Total	Unusd	UnLicnd
I-Series Test	COSBRKDESW03	2	204.135.49.65	10:00:00:05:33:bc:40:ba	7800	8G	7.4.1d	Healthy	168	99	ASS2551G005	24 (24)	12	0
FXS MF DIR 80	EDCW_2499.80	80	204.135.50.208	10:00:00:05:33:56:3a:00	DCX	8G	7.4.1d	Healthy	155	1157	AFX2514G018	192 (256)	89	0
FXS MF DIR 81	EDCW_2499.81	81	204.135.50.211	10:00:00:05:33:57:1f:00	DCX	8G	7.4.1d	Healthy	154	1157	AFX2515G00X	192 (256)	88	0
FXS MF DIR 82	EDCW_2499.82	82	204.135.50.214	10:00:00:05:33:80:c2:00	DCX	8G	7.4.1d	Healthy	154	1157	AFX2523G002	192 (256)	88	0
FXS MF DIR 83	EDCW_2499.83	83	204.135.50.217	10:00:00:05:33:80:66:00	DCX	8G	7.4.1d	Healthy	154	1157	AFX2523G00B	192 (256)	88	0
FXS MF DIR 84	EDCW_2499.84	84	204.135.50.220	10:00:00:05:33:57:0f:00	DCX	8G	7.4.1d	Healthy	155	957	AFX2515G012	96 (160)	68	0
FXS MF DIR 85	EDCW_2499.85	85	204.135.50.223	10:00:00:05:33:37:80:00	DCX	8G	7.4.1d	Healthy	155	957	AFX2515G01A	96 (160)	69	0
FXS MF EDCW to WTC 8C_	EDCW_2498.8C	140	204.135.50.202	10:00:00:05:33:7f:d2:d5	7800	8G	7.4.1d	Healthy	134	99	ASS2523G035	24 (24)	3	0
FXS MF EDCW to WTC 8C_	WTC_2498.9C	156	199.81.3.149	10:00:00:05:33:86:3d:7d	7800	8G	7.4.1d	Healthy	134	99	ASS2523G034	24 (24)	8	0
FXS MF EDCW to WTC 8D_	EDCW_2498.8D	141	204.135.50.203	10:00:00:05:33:7b:d6:a3	7800	8G	7.4.1d	Healthy	134	99	ASS2523G03D	24 (24)	5	0
FXS MF EDCW to WTC 8D_	WTC_2498_9D	157	199.81.3.150	10:00:00:27:f8:3f:f3:e3	7800	8G	7.4.1d	Healthy	134	99	ASS2550H018	24 (24)	9	0
FXS MF EDCW to WTC 8E_	EDCW_2498.8E	142	204.135.50.204	10:00:00:05:33:7b:e6:82	7800	8G	7.4.1d	Healthy	134	99	ASS2523G03E	24 (24)	5	0
FXS MF EDCW to WTC 8E_	WTC_2498.9E	158	199.81.3.151	10:00:00:05:33:86:9b:8a	7800	8G	7.4.1d	Healthy	134	99	ASS2523G036	24 (24)	10	0
FXS MF EDCW to WTC 8F_	EDCW_2498.8F	143	204.135.50.205	10:00:00:05:33:7d:99:1f	7800	8G	7.4.1d	Healthy	134	99	ASS2523G03F	24 (24)	7	0
FXS MF EDCW to WTC 8F_	WTC_2498.9F	159	199.81.3.152	10:00:00:05:33:86:25:21	7800	8G	7.4.1d	Healthy	134	99	ASS2523G030	24 (24)	11	0
FXS WTC DIR 90	WTC_2499_90	90	199.81.3.153	10:00:00:05:1e:e5:97:00	DCX	8G	7.4.1d	Healthy	156	846	AFX0615F00L	64 (128)	12	0
FXS MF WTC DIR 91	WTC_2499_91	91	199.81.3.156	10:00:00:05:1e:d1:75:00	DCX	8G	7.4.1d	Healthy	155	846	AFX0652E00G	64 (128)	12	0
FXS MF WTC DIR 92	WTC_2499_92	92	199.81.3.159	10:00:00:05:1e:d1:2b:00	DCX	8G	7.4.1d	Healthy	155	846	AFX0651E029	64 (128)	15	0
FXS MF WTC DIR 93	WTC_2499_93	93	199.81.3.162	10:00:00:05:1e:d0:bb:00	DCX	8G	7.4.1d	Healthy	155	846	AFX0651E00Z	64 (128)	15	0
FXF MF HRO to EDCW A P	IBM2498_R06_HRO_A	1	10.10.4.167	10:00:00:05:33:d1:b2:22	7800	8G	7.4.1d	Healthy	137	99	ASS2511H00R	24 (24)	12	0
FXF MF HRO to EDCW A P	freight2498a	220	204.135.50.206	10:00:00:05:33:d7:9e:4a	7800	8G	7.4.1d	Healthy	137	99	ASS2511H00L	24 (24)	14	0
FXF MF HRO to EDCW B P	IBM2498_R06_HRO_B	2	10.10.4.168	10:00:00:05:33:d6:72:21	7800	8G	7.4.1d	Healthy	137	99	ASS2511H00C	24 (24)	12	0
FXF MF HRO to EDCW B P	freight2498b	221	204.135.50.207	10:00:00:05:33:d7:9e:ca	7800	8G	7.4.1d	Healthy	137	99	ASS2511H00V	24 (24)	14	0
FXF MF DIR 5	FICON5	5	10.10.4.161	10:00:00:05:1e:e2:fe:00	DCX-4S	8G	7.4.1d	Healthy	137	848	ANN0609F00A	128 (160)	58	0
FXF MF DIR 6	FICON6	6	10.10.4.164	10:00:00:05:1e:75:b7:00	DCX-4S	8G	7.4.1d	Healthy	137	848	ANN0609F00J	128 (160)	58	0
FXG I Series Prod DIR	COSBRKDESW01	1	204.135.49.63	10:00:00:05:33:83:2f:00	DCX-8510-8	16G	7.1.1b	Healthy	1052	2168	AFX2527G00H	256 (384)	120	0
FXG I Series ProTec Tier DIF	COSBRKDESW02	2	204.135.49.64	10:00:00:05:33:83:18:00	DCX-8510-8	16G	7.1.1b	Healthy	1052	2168	AFX2527G00F	256 (384)	88	0

SAN Health Tech Alert

Old Firmware Levels

A non-ideal version of firmware is in use on one or more switches. It is strongly recommended that you migrate to a designated Target Path release.

Understanding "Target Path"

Target Path is a set of guidelines for use when trying to determine the ideal firmware version to implement. A target path release is a version of firmware that was created primarily for stability and reliability, and not for the introduction of new features. This version of firmware may contain RAS (Reliability, Availability, and Serviceability) improvements and enhancements, but it typically will not contain any new software features or support for new hardware. The specified code level (or an earlier patch at the same release level) must be deployed in a sufficient number of end-user production environments for a period of at least three months and must have no known critical issues or defect. The Target Path release recommendations should be used in conjunction with advice and guidance from your support provider, as well as any special requirements and needs of your particular environment. Always refer to the Brocade FOS Release Notes documentation and carefully review the "Important Notes and Known Defects" information prior to selecting and installing any version of FOS on a switch.

SWITCHES THAT ARE NOT ON TARGET PATH RELEASES								
Fabric Name	Switch Name	Domain	IP Address	World Wide Name	Model	Current OS Ver	Target Path OS Version	FICON in use
DCX_A	HD_DCX_A	8	10.128.25.235	10:00:00:05:33:1a:ee:00	DCX	7.3.1c	8.0.2c, 7.3.1d, 7.3.1e, 7.4.1b, 7.4.1c, 7.4.1	
DCX_B	HD_DCX_B	12	10.128.25.236	10:00:00:05:33:1b:82:00	DCX	7.3.1c	8.0.2c, 7.3.1d, 7.3.1e, 7.4.1b, 7.4.1c, 7.4.1	

SAN Health Tech Alert…. Continued

SWITCHES THAT ARE NOT ON TARGET PATH RELEASES								
Fabric Name	Switch Name	Domain	IP Address	World Wide Name	Model	Current OS Ver	Target Path OS Version	FICON in use
DCX_A	HD_DCX_A	8	10.128.25.235	10:00:00:05:33:1a:ee:00	DCX	7.3.1c	8.0.2c, 7.3.1d, 7.3.1e, 7.4.1b, 7.4.1c, 7.4.1	
DCX_B	HD_DCX_B	12	10.128.25.236	10:00:00:05:33:1b:82:00	DCX	7.3.1c	8.0.2c, 7.3.1d, 7.3.1e, 7.4.1b, 7.4.1c, 7.4.1	

MAINTENANCE SUPPORT ENDING SOON								
Recommended Replacement	End of Support Switch	Model	Ports	Unused Ports	IP Address	World Wide Name	Serial Number	Date Support Ends
Active	HD_DCX_A	DCX	192	109	10.128.25.235	10:00:00:05:33:1a:ee:00	AFX2501G009	Nov-14-2019
Active	HD_DCX_B	DCX	192	107	10.128.25.236	10:00:00:05:33:1b:82:00	AFX2502G01A	Nov-14-2019

Replacement Products Click Here

Tech Alert End of Support Page… Replacement Solutions

UNMATCHED RELIABILITY, SIMPLICITY, AND 32 GBPS PERFORMANCE

Upgrade Now

You will soon lose support for the noted director/ backbone products. Refreshing your aging infrastructure with Brocade Gen 6 Fibre Channel products and Fabric Vision technology, future proofs your data center and:

Provides more bandwidth and port density in less footprint at a lower power cost

Provides **Fibre Channel SAN visibility** from VMware vCenter Operations Management Suite (vCOPS) to focus troubleshooting and quickly isolate problems.

Using UltraScale ICLs:

Simplifies SAN scalability with 33 percent more ports and up to 70 percent fewer cables and optics

Minimizes latency between chassis and **maximizes load balancing and availability**

Eliminates the need for expensive third-party monitoring, diagnostics, and test equipment through built-in flow monitoring, flow mirroring, and flow generator capabilities

Enables the ability to configure ports as 10 Gbps to **maximize connectivity** with DWDM in MANs **without the need for another box**

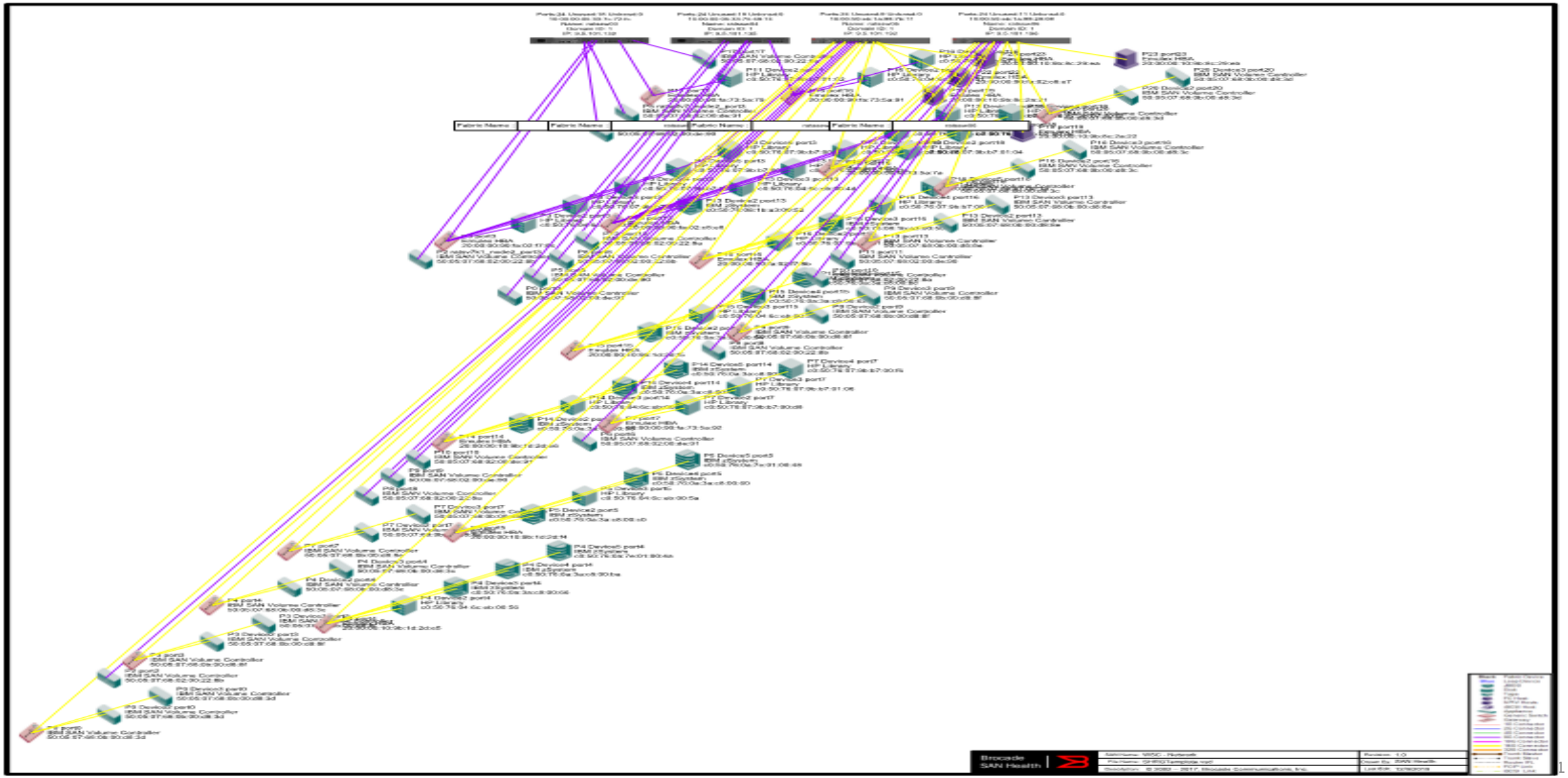
Provides **optimized bandwidth and added security, at no additional cost**, through Native in-flight compression and encryption

Assesses overall health of the SAN through a **customizable dashboard**, pinpointing problems faster and enabling trend analysis

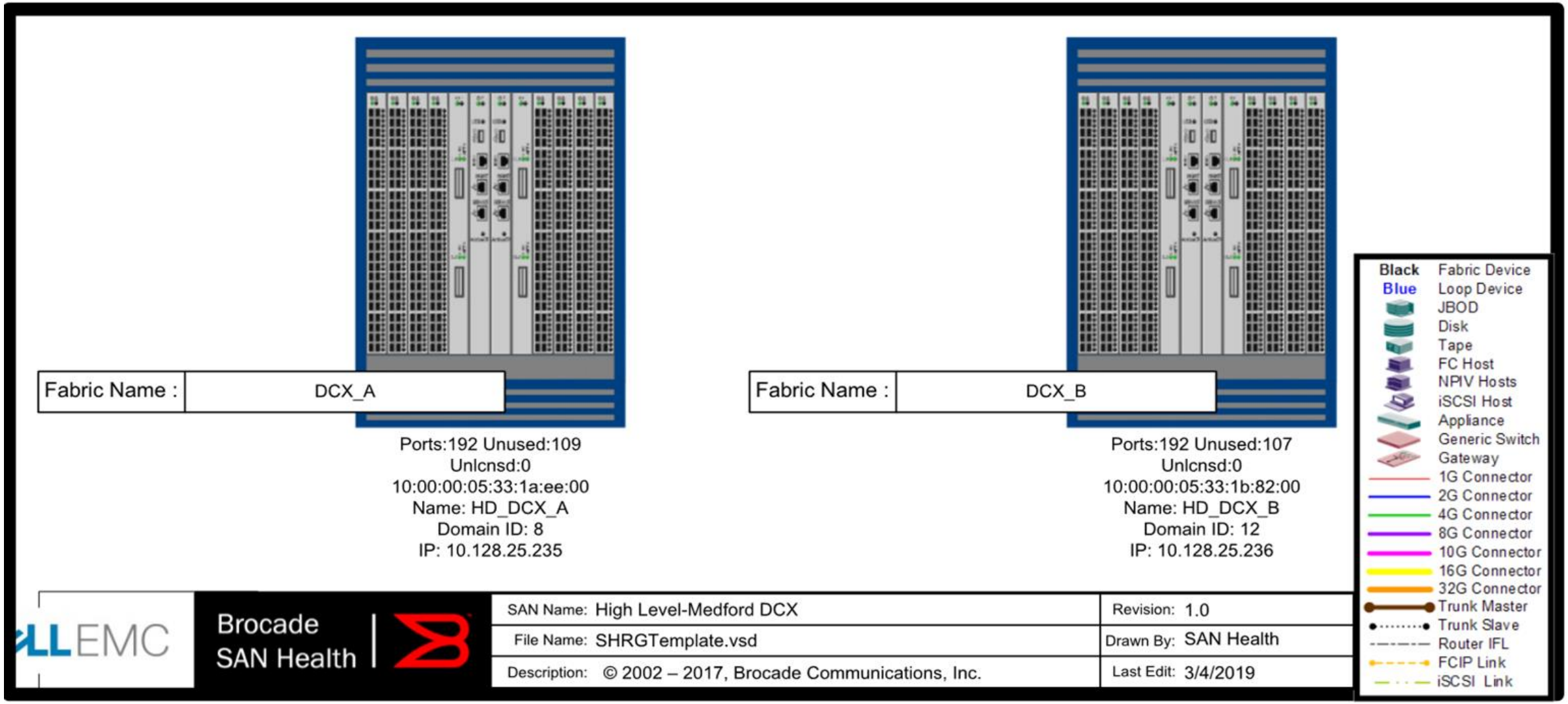
What is GEN 6 Fibre Channel With Fabric Vision Technology

Gen 6 Fibre Channel unleashes the full potential of high-density server virtualization, cloud architectures, and next-generation storage. Brocade Fabric Vision technology extends Gen 6 capabilities with diagnostic and management features that greatly simplify SAN deployment, reduce costs, and increase visibility across storage networks.

Storage/Application failover considerations, device mapping, redundancy, Hbas, application details, etc.



Topology Changes, New Designs, Device Placements, etc.



ID critical servers, storage arrays and applications

DEVICE MAP FOR WSC - NETWORK

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ratssw03

Dom	Area	Slot/Port	Speed	ID	Description	Name / Alias/ Zone	Model	Firmware	Driver	Port World Wide Name	Additional Information
1	2	2	8 G	010200	IBM SAN Volume Controller	ratsv7k1_node2_port3				50:05:07:68:02:30:22:8b	
1	3/1	3	8 G	010300	Emulex HBA	NPIV_port3				10:00:00:90:fa:02:f7:8c	N Port + 5 NPIV public
1	3/2	3	8 G	010302	HP Library	port3				c0:50:76:04:6c:eb:00:53	
1	3/3	3	8 G	010303	HP Library	port3				c0:50:76:07:9b:b7:00:d6	
1	3/4	3	8 G	010319	HP Library	port3				c0:50:76:07:9b:b7:00:16	
1	3/5	3	8 G	01031a	HP Library	port3				c0:50:76:07:9b:b7:00:17	
1	3/6	3	8 G	010348	HP Library	port3				c0:50:76:07:9b:b7:00:d2	
1	4	4	8 G	010400	IBM SAN Volume Controller	port4				50:05:07:68:02:30:de:90	
1	5	5	8 G	010500	IBM SAN Volume Controller	ratspfv7_node2_port3				50:05:07:68:02:30:de:91	
1	11/1	11	8 G	010b00	Emulex HBA	NPIV_por11				10:00:00:90:fa:73:5a:79	N Port + 1 NPIV public
1	11/2	11	8 G	010b01	HP Library	por11				c0:50:76:07:9b:b7:01:02	
1	17	17	8 G	011100	IBM SAN Volume Controller	port17				50:05:07:68:02:30:22:8a	

ratssw04

Dom	Area	Slot/Port	Speed	Port ID	Description	Name / Alias/ Zone	Model	Firmware	Driver	Port World Wide Name	Additional Information
1	0	0	8 G	010000	IBM SAN Volume Controller	port0				50:05:07:68:02:40:de:91	
1	5	5	8 G	010500	IBM SAN Volume Controller	port5				50:05:07:68:02:40:de:90	
1	8	8	8 G	010800	IBM SAN Volume Controller	port8				50:05:07:68:02:40:22:8b	
1	12	12	8 G	011200	IBM SAN Volume Controller	port12				50:05:07:68:02:40:22:8a	
1	13/1	13	8 G	010d00	Emulex HBA	NPIV_port13				10:00:00:90:fa:02:c8:e8	N Port + 6 NPIV public
1	13/2	13	8 G	010d05	IBM zSystem	port13				c0:50:76:08:1b:a3:00:52	
1	13/3	13	8 G	010d10	HP Library	port13				c0:50:76:04:6c:eb:00:4d	
1	13/4	13	8 G	010d13	HP Library	port13				c0:50:76:07:9b:b7:00:da	
1	13/5	13	8 G	010d18	HP Library	port13				c0:50:76:07:9b:b7:00:e8	
1	13/6	13	8 G	010d19	HP Library	port13				c0:50:76:07:9b:b7:00:18	
1	13/7	13	8 G	010d5f	HP Library	port13				c0:50:76:07:9b:b7:00:ce	
1	16/1	16	8 G	011000	Emulex HBA	NPIV_port16				10:00:00:90:fa:73:5a:91	N Port + 2 NPIV public
1	16/2	16	8 G	011001	HP Library	port16				c0:50:76:04:6c:eb:00:51	

Infrastructure Insight Example

- Quick Analysis of Attached devices

FABRIC SUMMARY FOR FABRIC B

Table Of Contents

SUMMARY FOR Fabric B (4 SWITCHES IN FABRIC)

Switch Name	Dom	IP Address	World Wide Name	Model	Spd (Switch Speed)	OSVer (Operating System Version)	Status	DaysUp	Pwr(W) (Power used, in watts.)	Mode	Serial Number	Ports(Total ports including ICLs)	Unused (Unused Ports)	Unlicnsd (Unlicensed Ports)
RDCBLD04B	1	161.222.10.143	10:00:00:05:33:ef:0f:a1	5470	8G	6.4.2b4	Healthy	179	52	Native	BBS0414H00M	20 (20)	2	15
CBCDIRB31	31	192.168.1.31	10:00:00:27:f8:[illegible]:9c	DCX-8510-8	16G	7.4.1d	Healthy	113	1813	Native	AFX2539J004	240 (368)	92	0
CBCEDGB33	33	192.168.1.33	10:00:00:27:f8:b7:10:[illegible]	6520	16G	7.4.1d	Healthy	113	99	Native	CHQ2537J002	96 (96)	27	24
RDCDIRB41	41	192.168.1.41	10:00:00:27:f8:a4:3a:00	[illegible]-8510-8	16G	7.4.1d	Healthy	113	1813	Native	AFX2534J008	240 (368)	76	0

ATTACHED DEVICE COUNT 344 (Including all NPIV and Loop Devices)

Device Description	Count	Device Description	Count	Device Description	Count
3PAR Data	116	Access Gateway	2	Data Domain VTL (Qlogic)	1
EMC Clariion	2	Emulex HBA	203	IBM SAN Volume Controller	4
NPIV Host	4	Qlogic HBA	12		

PORT USE

Switch Name	Port Counts			Attached Device Types					Inter Switch Links			Fan Out Ratios		Port Speeds							Long Distance Modes					
	Total number of ports	Unusd (Unused /free ports)	Unlcd (Unlicensed Ports)	Disk	Tape	Host	Aplnc (Appliances)	Gtwy (Gateways)	ISL	TrkMst (Trunk Masters)	TrkSlv (Trunk Slaves)	Hst:Trg (Total number of hosts compared to the total number of targets)	Dvc:ISL (Total number of devices compared to the total number of ISLs)	2G	4G	8G	16G	32G	1GE	10GE	10km	25km	50km	100k	300k	Auto
RDCBLD04B	20	2	15	0	0	1	0	0	2	0	0	1:0	0.5:1	0	0	5	0	0	0	0	20	0	0	0	0	0
CBCDIRB31	240	92	0	68	0	68	4	3	8	5	3	0.91:1	8.94:1	1	34	99	106	0	0	0	240	0	0	0	0	0
CBCEDGB33	96	27	24	0	0	41	0	0	4	2	2	41:0	5.13:1	0	8	34	30	0	0	0	96	0	0	0	0	0
RDCDIRB41	240	76	0	51	0	107	0	1	5	3	1	2.06:1	15.9:1	2	29	122	87	0	0	0	240	0	0	0	0	0
TOTALS	**596**	**197**	**39**	**119**	**0**	**217**	**4**	**4**	**20**	**10**	**6**			**3**	**71**	**260**	**223**	**0**	**0**	**0**	**596**	**0**	**0**	**0**	**0**	**0**

SWITCH COMPONENTS

Define and upload the zone DBs
Get zoning sets from SAN Health, shown in SAN Health Zoning Report

ZONING DETAILS FOR RATSSW04

Table Of Contents

CONFIG "One… …S ACTIVE

Zone Database Use	Alias Statistics Total	Avg Mems	Max Mems	Hang Mems	Zone Statistics Total	Avg Mems	Max Mems	Hang Mems	Config Statistics Total	Avg Mems	Max Mems	Hang Mems	Zones in Active Config
0.3% of 1045274B	0	0	0	0	17	5.76	24	48	3	6.33	15	19	15

0 ALIASES

Alias Name	Alias Member(s)
None Defined	

17 ZONES

Zone Name	Zone Member(s)				
AllPorts	1,0	1,1	1,2	1,3	1,4
	1,5	1,6	1,7	1,8	1,9
	1,10	1,11	1,12	1,13	1,14
	1,15	1,16	1,17	1,18	1,19
	1,20	1,21	1,22	1,23	
MetroMirror04	1,22	1,23			
wervc_AIXV71TL3SP5G_8994b2f3_00000018_c0507605e5a5009a	50:05:07:68:02:40:22:8a	50:05:07:68:02:40:22:8b	c0:50:76:05:e5:a5:00:9a		
wervc_AIXV71TL3SP5G_8994b2f3_00000018_c0507605e5a5009b	50:05:07:68:02:40:22:8a	50:05:07:68:02:40:22:8b	c0:50:76:05:e5:a5:00:9b		
werv_AIXV71TL3SP5G_8994b2f3_00000018_c0507605e5a500a0	50:05:07:68:02:40:22:8a	50:05:07:68:02:40:22:8b	c0:50:76:05:e5:a5:00:a0		
wervc_AIXV71TL3SP5G_8994b2f3_00000018_c0507605e5a500a1	50:05:07:68:02:40:22:8a	50:05:07:68:02:40:22:8b	c0:50:76:05:e5:a5:00:a1		
ervc_AIXV71TL3SP5W_779de3ae_0000001c_c0507605e5a500ca	50:05:07:68:02:40:22:8a	50:05:07:68:02:40:22:8b	c0:50:76:05:e5:a5:00:ca		
ervc_AIXV71TL3SP5W_779de3ae_0000001c_c0507605e5a500cb	50:05:07:68:02:40:22:8a	50:05:07:68:02:40:22:8b	c0:50:76:05:e5:a5:00:cb		
ervc_AIXV71TL3SP5W_779de3ae_0000001c_c0507605e5a500d0	50:05:07:68:02:40:22:8a	50:05:07:68:02:40:22:8b	c0:50:76:05:e5:a5:00:d0		
ervc_AIXV71TL3SP5W_779de3ae_0000001c_c0507605e5a500d1	50:05:07:68:02:40:22:8a	50:05:07:68:02:40:22:8b	c0:50:76:05:e5:a5:00:d1		
powervc_ratspvc1_c05076079bb70026	50:05:07:68:02:40:22:8a	50:05:07:68:02:40:22:8b	c0:50:76:07:9b:b7:00:26	50:05:07:68:02:40:de:90	50:05:07:68:02:40:de:91
powervc_ratspvc1_c05076079bb70027	50:05:07:68:02:40:22:8a	50:05:07:68:02:40:22:8b	c0:50:76:07:9b:b7:00:27	50:05:07:68:02:40:de:90	50:05:07:68:02:40:de:91
powervc_ratspvc1_c05076079bb700c2	50:05:07:68:02:40:22:8a	50:05:07:68:02:40:22:8b	c0:50:76:07:9b:b7:00:c2		
powervc_ratspvc1_c05076079bb700c3	50:05:07:68:02:40:22:8a	50:05:07:68:02:40:22:8b	c0:50:76:07:9b:b7:00:c3		

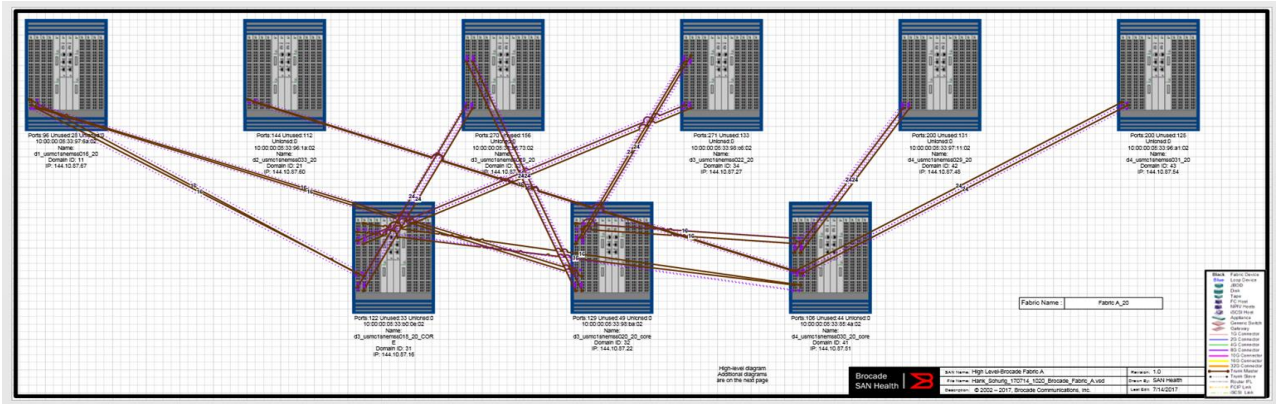
Ensure correct licensing sets are included

LICENSE SUMMARY										
Fabric Name	License Name	Count	License Name	Count	License Name	Count	License Name	Count	License Name	Count
I-Series Test	AdvancedExtension	1	EnhancedManagement	1						
FXS MF DIR 80	AdaptiveNetworking	1	EnhancedManagement	1	icWatch(FabricVisionCapable)	1	FabricWatch	1	FICONCUP	1
	LongDistance	1	Obsolete	1	ceMonitorFabricVisionCapable	1	PerformanceMonitor	1	SAO	1
	Trunking	1								
FXS MF DIR 81	AdaptiveNetworking	1	EnhancedManagement	1	icWatch(FabricVisionCapable)	1	FabricWatch	1	FICONCUP	1
	LongDistance	1	Obsolete	1	ceMonitorFabricVisionCapable	1	PerformanceMonitor	1	SAO	1
	Trunking	1								
FXS MF DIR 82	AdaptiveNetworking	1	EnhancedManagement	1	icWatch(FabricVisionCapable)	1	FabricWatch	1	FICONCUP	1
	LongDistance	1	Obsolete	1	ceMonitorFabricVisionCapable	1	PerformanceMonitor	1	SAO	1
	Trunking	1								
FXS MF DIR 83	AdaptiveNetworking	1	EnhancedManagement	1	icWatch(FabricVisionCapable)	1	FabricWatch	1	FICONCUP	1
	LongDistance	1	Obsolete	1	ceMonitorFabricVisionCapable	1	PerformanceMonitor	1	SAO	1
	Trunking	1								
FXS MF DIR 84	AdaptiveNetworking	1	EnhancedManagement	1	icWatch(FabricVisionCapable)	1	FabricWatch	1	FICONCUP	1
	LongDistance	1	Obsolete	1	ceMonitorFabricVisionCapable	1	PerformanceMonitor	1	SAO	1
	Trunking	1								
FXS MF DIR 85	AdaptiveNetworking	1	EnhancedManagement	1	icWatch(FabricVisionCapable)	1	FabricWatch	1	FICONCUP	1
	LongDistance	1	Obsolete	1	ceMonitorFabricVisionCapable	1	PerformanceMonitor	1	SAO	1
	Trunking	1								
FXS MF EDCW to WTC 8C_9C	7800Upgrade	2	AdvancedExtension	2	AdvancedFICONAcceleration	2	EnhancedManagement	2	FICONCUP	2
FXS MF EDCW to WTC 8D_9D	7800Upgrade	2	AdvancedExtension	2	AdvancedFICONAcceleration	2	EnhancedManagement	2	FICONCUP	2
FXS MF EDCW to WTC 8E_9E	7800Upgrade	2	AdvancedExtension	2	AdvancedFICONAcceleration	2	EnhancedManagement	2	FICONCUP	2
FXS MF EDCW to WTC 8F_9F	7800Upgrade	2	AdvancedExtension	2	AdvancedFICONAcceleration	2	EnhancedManagement	2	FICONCUP	2
FXS WTC DIR 90	AdaptiveNetworking	1	EnhancedManagement	1	icWatch(FabricVisionCapable)	1	FabricWatch	1	FICONCUP	1

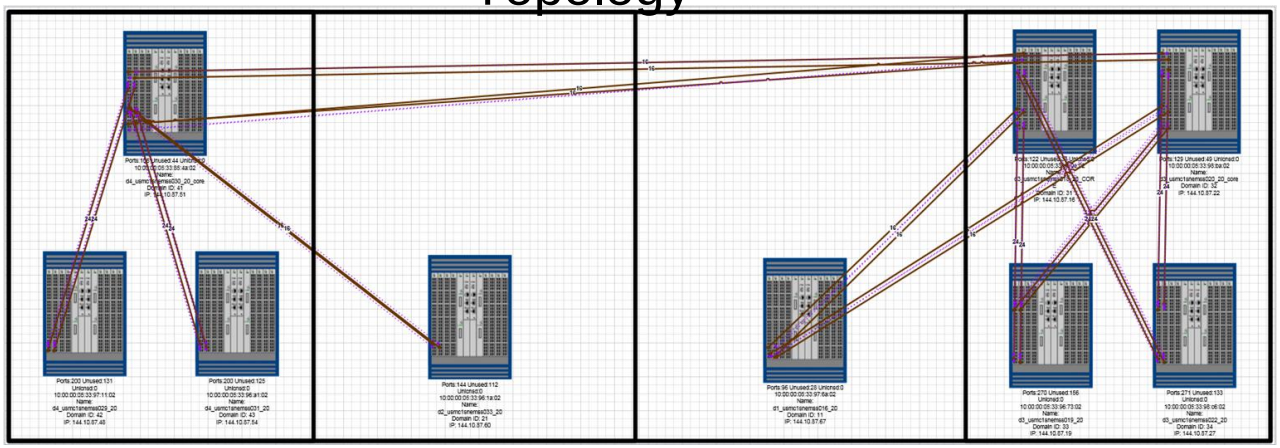
Prepare/Update SAN/Storage Diagram to meet new requirements

- **Determine the current topology:**
  - Started with the high-level SAN Health Visio diagram
- **Model the new Topology**
  - Rearrange the switches as needed
  - Insert newly proposed server & arrays to the SAN Health Report
  - Optimize the configuration for any-to-any connectivity

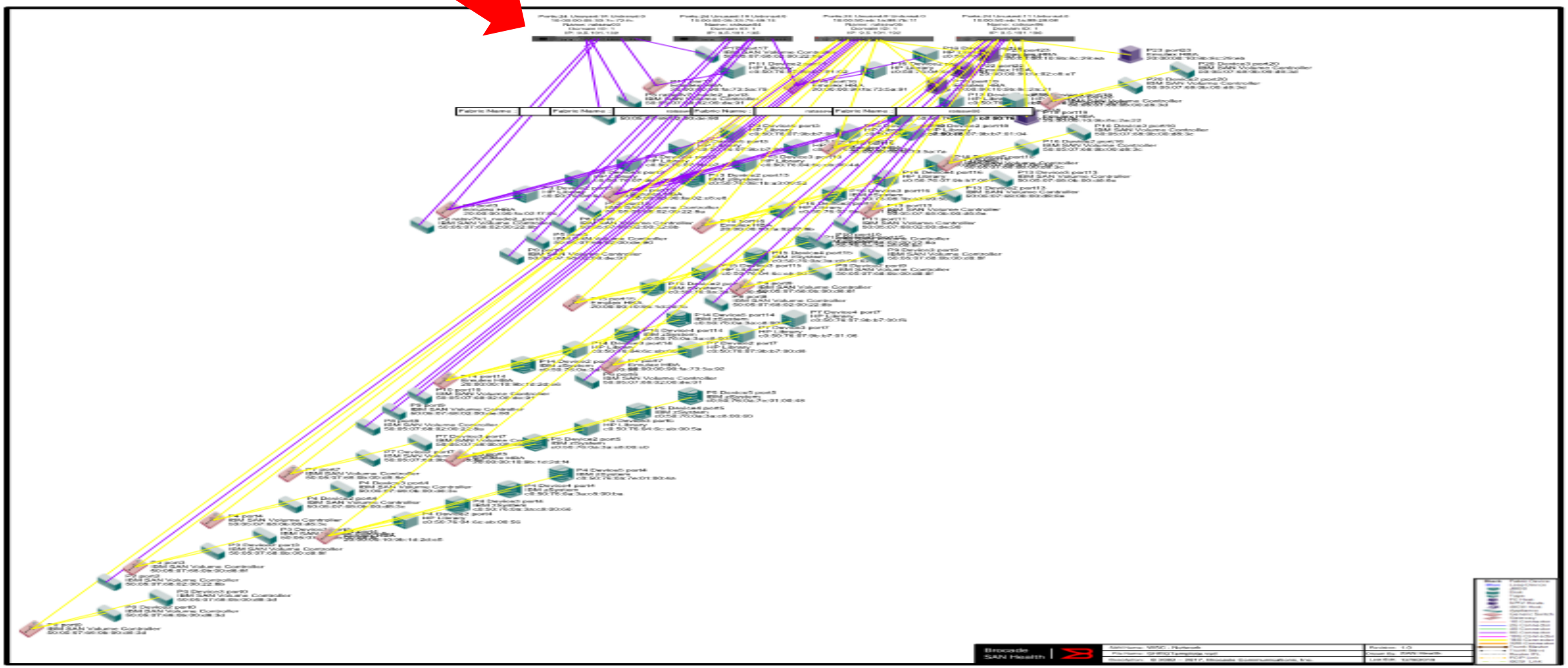
Current Topology



New Topology

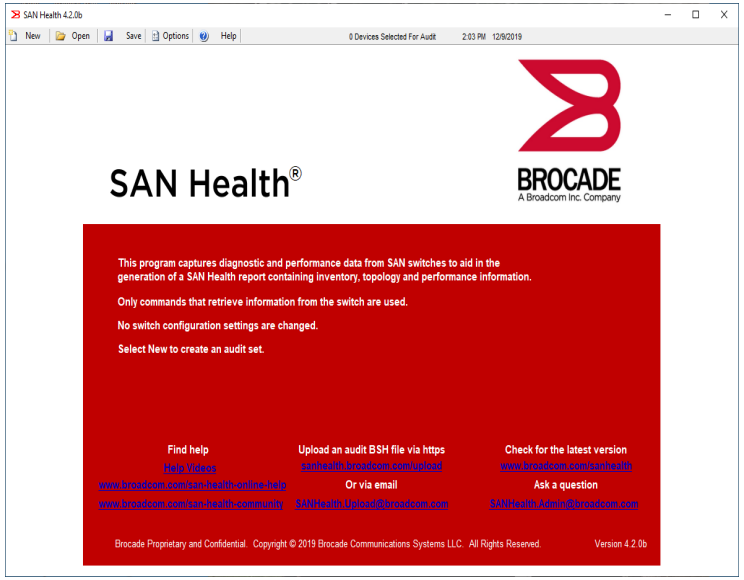


Prepare/Update SAN/Storage Diagram to meet new requirements



Modernizing Your Storage Infrastructure Using Analysis Tools

Brocade's SAN Health Tool

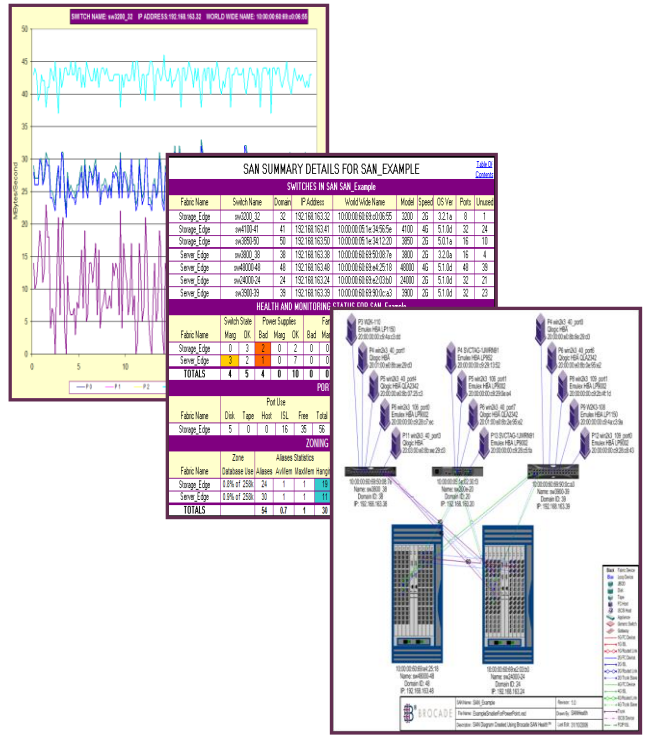


Brocade SAN Health

Free Tool, to securely capture, analyze, and report comprehensive information about ALL SAN fabrics. Performing tasks:

- Taking inventory of devices, switches, firmware versions, and SAN Fabrics
- Captures & displays port utilization, ISL/Trunk details,

  bandwidth utilization statistics
- Multiple Protocols (FCP, FICON, NVMe-oF)
- Long Distance Architectures
- Accessing performance statistics and error conditions
- Producing detailed reports and fabric topologies



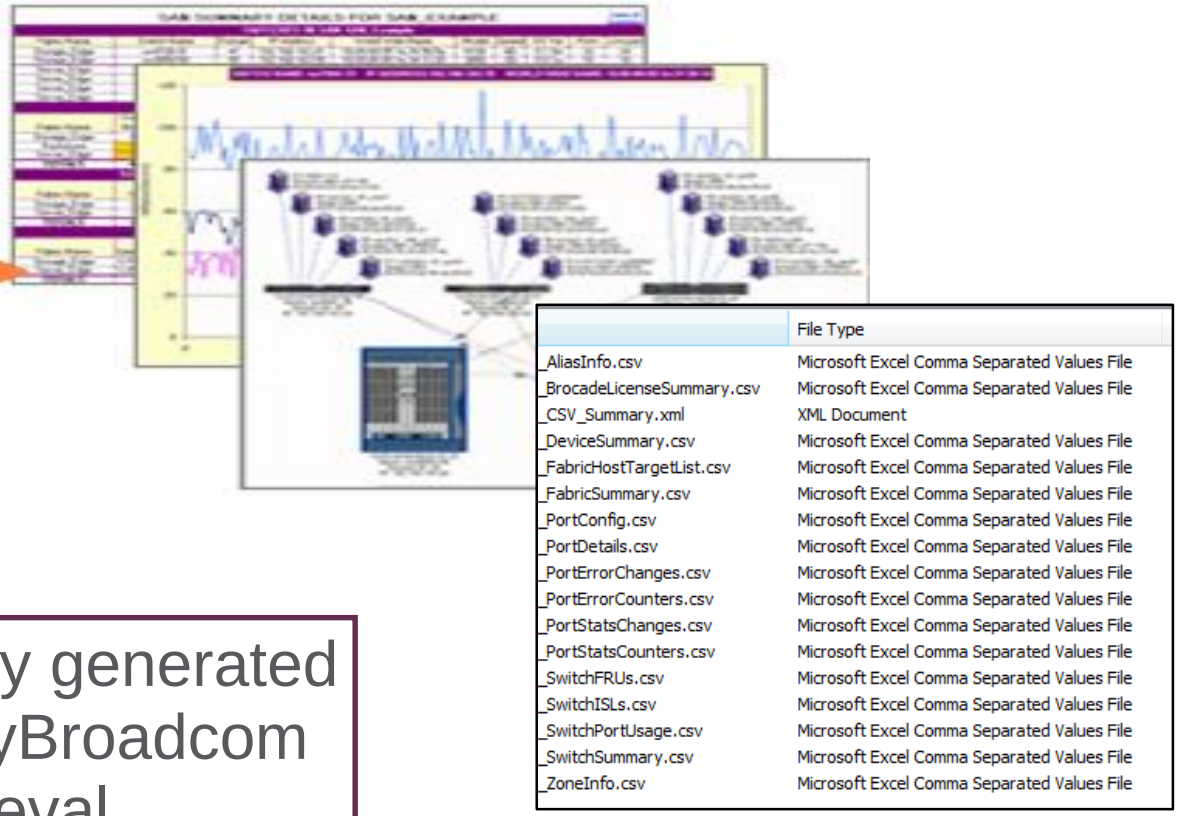
SAN Health Audit Process

Run the Audit Tool

Upload the Audit

Download the report

Explore the report



	File Type
_AliasInfo.csv	Microsoft Excel Comma Separated Values File
_BrocadeLicenseSummary.csv	Microsoft Excel Comma Separated Values File
_CSV_Summary.xml	XML Document
_DeviceSummary.csv	Microsoft Excel Comma Separated Values File
_FabricHostTargetList.csv	Microsoft Excel Comma Separated Values File
_FabricSummary.csv	Microsoft Excel Comma Separated Values File
_PortConfig.csv	Microsoft Excel Comma Separated Values File
_PortDetails.csv	Microsoft Excel Comma Separated Values File
_PortErrorChanges.csv	Microsoft Excel Comma Separated Values File
_PortErrorCounters.csv	Microsoft Excel Comma Separated Values File
_PortStatsChanges.csv	Microsoft Excel Comma Separated Values File
_PortStatsCounters.csv	Microsoft Excel Comma Separated Values File
_SwitchFRUs.csv	Microsoft Excel Comma Separated Values File
_SwitchISLs.csv	Microsoft Excel Comma Separated Values File
_SwitchPortUsage.csv	Microsoft Excel Comma Separated Values File
_SwitchSummary.csv	Microsoft Excel Comma Separated Values File
_ZoneInfo.csv	Microsoft Excel Comma Separated Values File

Your report is automatically generated and stored into your MyBroadcom account for retrieval

Infrastructure Insights

- Server Insight
  - # of Server ports
  - HBA Type
- Storage Insight
  - # of Storage ports
  - Storage Type
- Fabric Insight
  - # of ports active and inactive
  - Configuration anomalies
  - Port performance & alerts

DEVICE MAP FOR SAN_EXAMPLE (Table Of Contents)

Storage_Edge

Dom	Port	Speed	Description	Name / Alias	Model	Firmware	Driver	Port World Wide Name	Additional Information
32	3	2G	Seagate Disk Drive	jbod_32_port3_1	ST336605	Unknown	Unknown	22:00:00:20:37:e6:02:1b	36G
32	4	2G	Seagate Disk Drive	jbod_32_port4_1	ST336605	Unknown	Unknown	22:00:00:20:37:42:3e:df	36G
41	4	2G	Seagate Disk Drive	jbod_41_port4_2	ST336605	Unknown	Unknown	22:00:00:20:37:15:08:bb	36G
41	5	2G	Seagate Disk Drive	jbod_41_port5_3	ST336605	Unknown	Unknown	21:00:00:20:37:15:17:05	36G
41	7	2G	Seagate Disk Drive	jbod_41_port7_2	ST336605	Unknown	Unknown	21:00:00:20:37:15:09:76	36G

Backbone

Dom	Port	Speed	Description	Name / Alias	Model	Firmware	Driver	Port World Wide Name	Additional Information
			No Devices Attached To This Fabric						

Server_Edge

Dom	Port	Speed	Description	Name / Alias	Model	Firmware	Driver	Port World Wide Name	Additional Information
38	0	2G	Qlogic HBA	win2k3_40_port2	Unknown	4.00.23	9.1.2.19	21:02:00:e0:8b:ce:29:d3	(w32)
38	1	2G	Qlogic HBA	win2k3_40_port5	QLA2342	3.03.19	9.1.2.19	21:01:00:e0:8b:27:25:c3	(w32) 133MHz PCI-X Dual Port
38	2	2G	Qlogic HBA	lnx_port0	QLE2462	4.00.23	8.01.06	21:00:00:e0:8b:88:a3:2b	2.5GHz PCI-Express Dual Port
38	3	2G	Emulex HBA	W2K-110	LP1150	2.10A5	5-2.41a1	10:00:00:00:c9:4a:c3:dd	Win 2000/3 x86 FC Port
38	4	2G	Qlogic HBA	win2k3_40_port1	Unknown	4.00.23	9.1.2.19	21:01:00:e0:8b:ae:29:d3	(w32)
38	5	2G	Qlogic HBA	win2k3_40_port4	QLA2342	3.03.19	9.1.2.19	21:00:00:e0:8b:07:25:c3	(w32) 133MHz PCI-X Dual Port
38	6	2G	Emulex HBA	win2k3_106_port0	LP9002	3.90A7	7-1.03M9	10:00:00:00:c9:28:c7:ec	Win 2003 x64 Storport Miniport
38	11	2G	Qlogic HBA	win2k3_40_port3	Unknown	4.00.23	9.1.2.19	21:03:00:e0:8b:ee:29:d3	(w32)
20	4	2G	Emulex HBA	SVCTAG-1JWRN91	LP952	3.82A1	5-2.41a1	10:00:00:00:c9:29:13:52	Win 2000/3 x86 FC Port
20	5	2G	Emulex HBA	win2k3_106_port1	LP9002	3.81A3	7-1.03M9	10:00:00:00:c9:29:0e:e4	Win 2003 x64 Storport Miniport
20	6	2G	Qlogic HBA	win2k3_40_port7	QLA2342	3.03.19	9.1.2.19	21:01:00:e0:8b:2e:95:e2	(w32) 133MHz PCI-X Dual Port
20	13	2G	Emulex HBA	SVCTAG-1JWRN91	LP9002	3.81A3	5-2.41a1	10:00:00:00:c9:28:c5:fa	Win 2000/3 x86 FC Port
39	4	2G	Qlogic HBA	win2k3_40_port0	Unknown	4.00.23	9.1.2.19	21:00:00:e0:8b:8e:29:d3	(w32)
39	6	2G	Qlogic HBA	win2k3_40_port6	QLA2342	3.03.19	9.1.2.19	21:00:00:e0:8b:0e:95:e2	(w32) 133MHz PCI-X Dual Port
39	8	2G	Emulex HBA	win2k3_109_port1	LP9002	3.82A1	5-5.10A10	10:00:00:00:c9:2b:4f:1d	Win 2000/3 x86 SCSIport Miniport
39	9	2G	Emulex HBA	W2K3-108	LP1150	2.10A5	5-2.40a3	10:00:00:00:c9:4a:c3:9a	Win 2000/3 x86 FC Port
39	12	2G	Emulex HBA	win2k3_109_port0	LP9002	3.81A3	5-5.10A10	10:00:00:00:c9:28:c8:43	Win 2000/3 x86 SCSIport Miniport

SAN SUMMARY DETAILS FOR SAN_EXAMPLE (Table Of Contents)

SWITCHES IN SAN SAN_Example

Fabric Name	Switch Name	Domain	IP Address	World Wide Name	Model	Speed	OS Ver	Ports	Unused
Storage_Edge	sw3200_32	32	192.168.163.32	10:00:00:60:69:c0:06:55	3200	2G	3.2.1a	8	1
Storage_Edge	sw4100-41	41	192.168.163.41	10:00:00:05:1e:34:56:5e	4100	4G	5.1.0d	32	24
Storage_Edge	sw3850-50	50	192.168.163.50	10:00:00:05:1e:34:12:20	3850	2G	5.0.1a	16	10
Server_Edge	sw3800_38	38	192.168.163.38	10:00:00:60:69:50:08:7e	3800	2G	3.2.0a	16	4
Server_Edge	sw48000-48	48	192.168.163.48	10:00:00:60:69:e4:25:18	48000	4G	5.1.0d	48	39
Server_Edge	sw24000-24	24	192.168.163.24	10:00:00:60:69:e2:03:b0	24000	2G	5.1.0d	32	21
Server_Edge	sw3900-39	39	192.168.163.39	10:00:00:60:69:90:0c:a3	3900	2G	5.1.0d	32	23

HEALTH AND MONITORING STATUS FOR SAN_Example

Fabric Name	Switch State		Power Supplies			Fans			Temp Sensors			Errors		SNMP		SysLog	
	Marg	OK	Bad	Marg	OK	Bad	Marg	OK	Low	OK	High	Lvl1	Lvl2	No	Yes	No	Yes
Storage_Edge	0	3	2	0	2	0	0	12	0	12	0	0	0	3	0	3	0
Server_Edge	3	2	1	0	7	0	0	19	0	17	0	0	0	5	0	5	0
TOTALS	**4**	**5**	**4**	**0**	**10**	**0**	**0**	**34**	**0**	**35**	**0**	**0**	**0**	**9**	**0**	**9**	**0**

PORT USE

Fabric Name	Port Use						Fan Out Ratios			Port Long Distance Modes				
	Disk	Tape	Host	ISL	Free	Total	Host:Disk	Port:ISL	Device:ISL	10km	25km	50km	100km	Auto
Storage_Edge	5	0	0	16	35	56	0: 5	2.5:1	0.31:1	56	0	0	0	0

ZONING METRICS

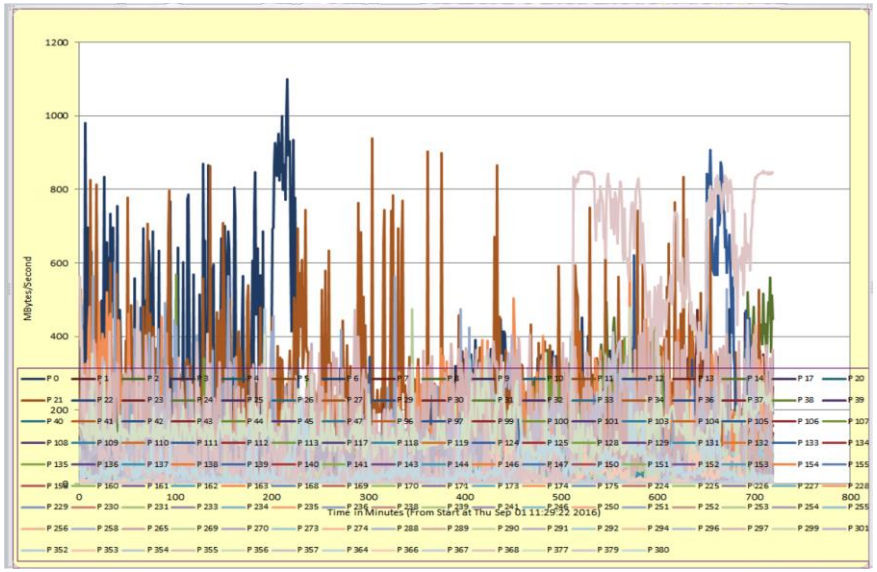
Fabric Name	Zone	Aliases Statistics				Zone Statistics				Config Statistics			
	Database Use	Aliases	AvMem	MaxMem	Hanging	Zones	AvMem	MaxMem	Hanging	Configs	AvMem	MaxMem	Hanging
Storage_Edge	0.8% of 258k	24	1	1	19	11	4.5	15	1	1	10	10	1
Server_Edge	0.9% of 258k	30	1	1	11	11	4.9	20	1	1	11	11	1
TOTALS		**54**	**0.7**	**1**	**30**	**22**	**3.1**	**20**	**2**	**2**	**7**	**11**	**2**

SAN Utilization...Assessing the SAN Fabric

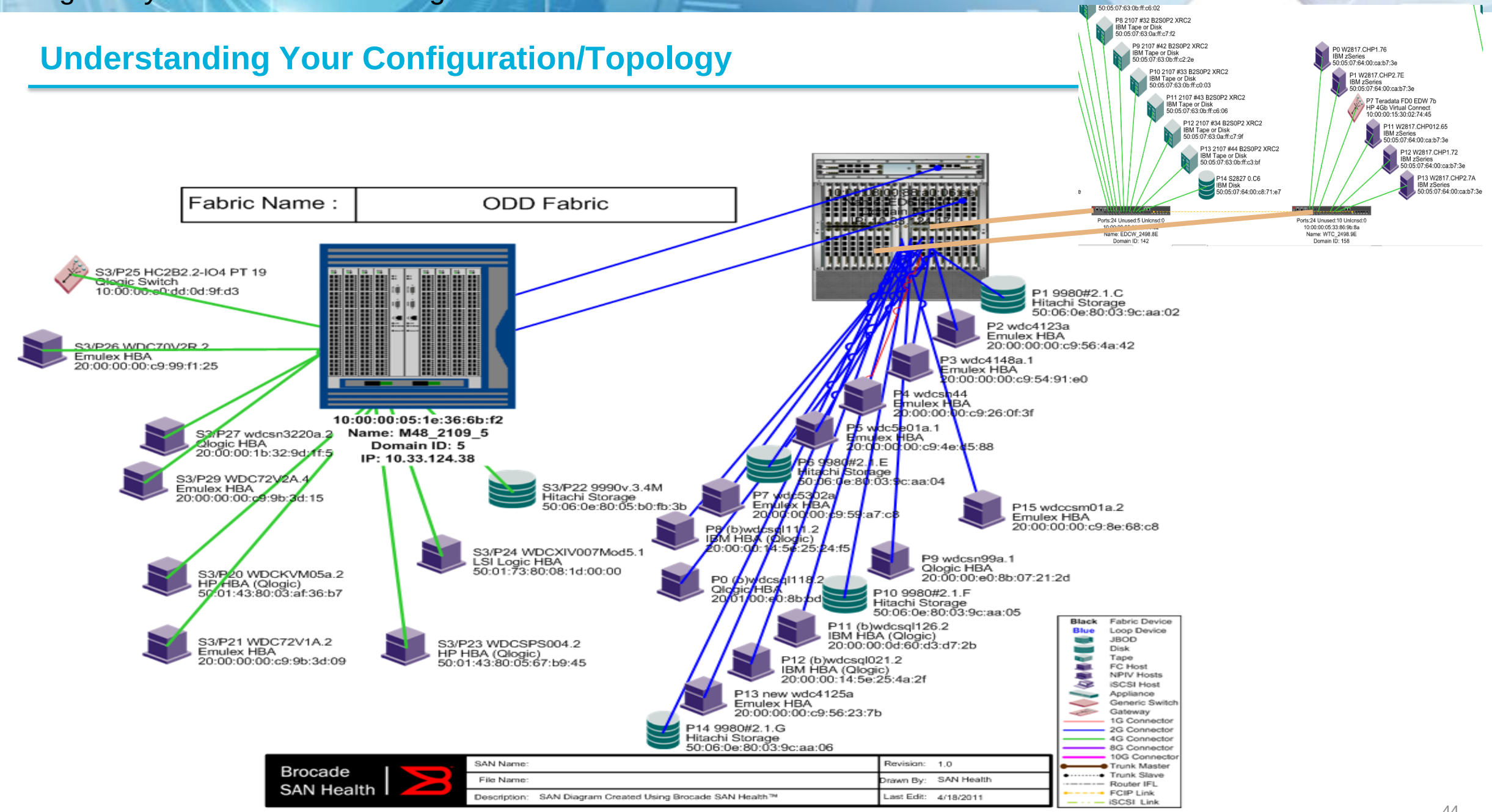
Current State:

- Current SAN utilization ranges from 300MB to 825MB (100% Utilized)
- IBM Proposed adding TB's of FLASH arrays to the existing SAN Fabric!
  - Fabric is Heavily Utilized and Approaching Max Capacity
    - A substantial number of ports are over 75% utilized
    - Some ports are already operating at maximum utilization
    - This is a well-tuned and utilized 8Gb fabric
  - There is just enough available "headroom" for a fabric fail-over
    - Any port that is over 50% utilized may not support seamless fabric failover
    - In the event of fabric failover, the current performance data indicates there is adequate available bandwidth to accommodate the additional I/O load

SAN Performance Graph... 8GB Switch



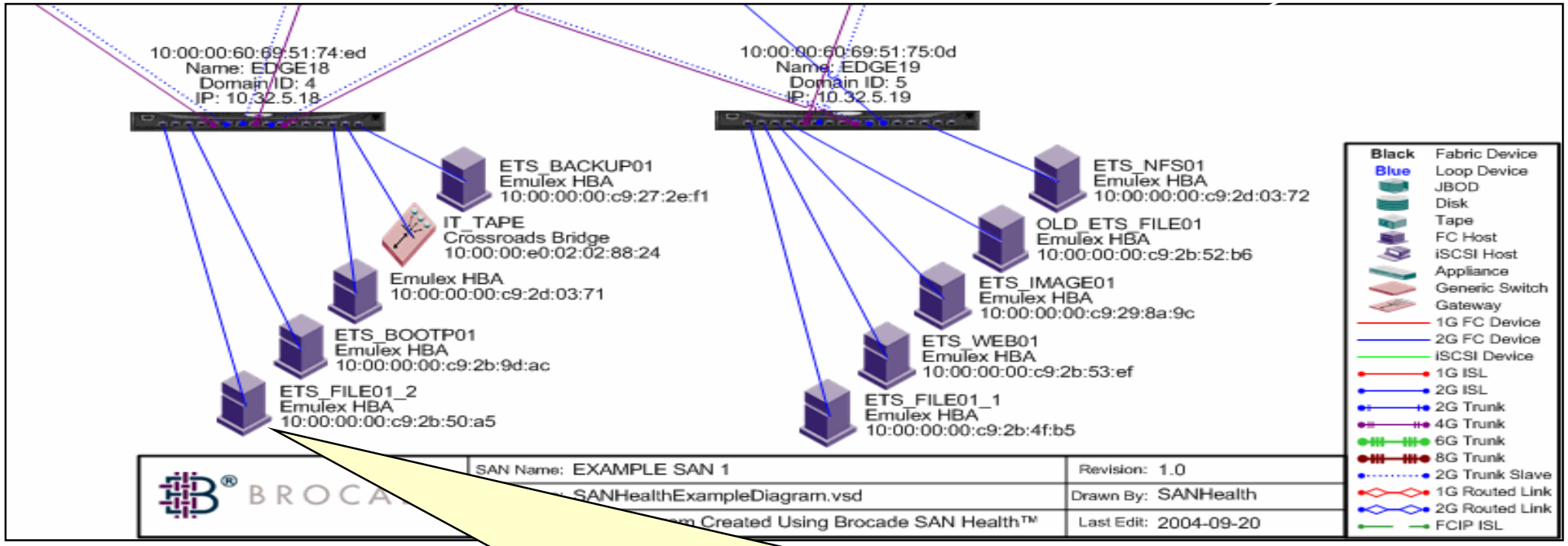
Understanding Your Configuration/Topology



SAN Health Report Sample

Detailed SAN Topology Diagrams

Color coded connectors that represent the link's bandwidth



Custom Properties Window displays the attributes of every component in the diagram

Custom Properties ...

Zone_Aliases	ets_hsg80_1
Member_Of_Zones	FILE01_ZONE; IMAGE01_ZONE
Device_Description	HP xA8000
Name_Server_Information	DEC HSG80 V87P
Device_Port_World_Wide_Name	50:00:1f:e1:00:15:70:b1
Device_Node_World_Wide_Name	50:00:1f:e1:00:15:70:b0
Speed_Of_Port_Connection	1 Gbps

SAN Health 7800 Audit Output….Port Use, ISL/Trunk Summary, Bandwidth Utilization

SUMMARY FOR FXF MF HRO to EDCW A Pair (2 SWITCHES IN FABRIC)

Switch Name	Dom	IP Address	World Wide Name	Model	Spd	OSVer	Status	DaysUp	Pwr(W)	Mode	Serial Number	Ports(Total ports	Unused	Unlicnsd
IBM2498_R06_HRO_A	1	10.10.4.167	10:00:00:05:33:d1:b2:22	7800	8G	7.4.1d	Healthy	137	99	Native	ASS2511H00R	24 (24)	12	0
freight2498a	220	204.135.50.206	10:00:00:05:33:d7:9e:4a	7800	8G	7.4.1d	Healthy	137	99	Native	ASS2511H00L	24 (24)	14	0

PORT USE

	Port Counts			Attached Device Types					Inter Switch Links			Fan Out Ratios		Port Speeds							Long Distance Modes					
Switch Name	Total	r Unusd	Unlcd	Disk	Tape	Host	Aplnc	Gtwy	ISL	TrkMst	TrkSlv	Hst:Trg	Dvc:ISL	2G	4G	8G	16G	32G	1GE	10GE	10km	25km	50km	100k	300k	Auto
IBM2498_R06_HRO_A	24	12	0	4	0	0	0	0	0	0	0	0:4	4:0	0	4	12	0	0	0	0	16	0	0	0	0	0
freight2498a	24	14	0	2	0	0	0	0	0	0	0	0:2	2:0	0	0	16	0	0	0	0	16	0	0	0	0	0
TOTALS	**48**	**26**	**0**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**			**0**	**4**	**28**	**0**	**0**	**0**	**0**	**32**	**0**	**0**	**0**	**0**	**0**

ISL / TRUNK SUMMARY

From Switch				To Switch				ISL or	FSPF	Farthest	Dynamic	Available Bandwidth and Utilization					
Name	Dom	Area	Slot/Port	Name	Dom	Area	Slot/Port	Trunk Type	Cost	Pnt (Hops)	or Static	Speed	BW	Average	(I % Use	Peak	(D % Use
IBM2498_R06_HRO_A	1	16	16	freight2498a	220	16	16	FCIP ISL	500	1	D	2 Gbps	6	40.3 MB/s	-	94.7 MB/s	-

BANDWIDTH UTILIZATION STATISTICS

	All Active Ports			% BW used			All ISL Ports			% BW used			All Host Ports			% BW used			All Target Ports			% BW used		
Switch Name	Count	Avg	Peak	0-25	26-75	76-100	Count	Avg	Peak	0-25	26-75	76-100	Count	Avg	Peak	0-25	26-75	76-100	Count	Avg	Peak	0-25	26-75	76-100
IBM2498_R06_HRO_A	4	8.6	33	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	8.6	33	4	0	0
freight2498a	2	8.2	15	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	8.2	15	2	0	0
TOTALS	**6**	**8.4**		**6**	**0**	**0**	**0**	**0**		**0**	**0**	**0**	**0**	**0**		**0**	**0**	**0**	**6**	**8.4**		**6**	**0**	**0**

PORT MAP

Brocade 7800 Name:IBM2498_R06_HRO_A WWN:10:00:00:05:33:d1:b2:22 IP Address:10.10.4.167 Domain ID:1

Area	Slot/Port	Port ID	Status	Type	Speed	Name / Alias / Zone	ZonedTo	Model	Description	Port World Wide Name	Node World Wide Name	Media	SFP Type	Bound	Lng Dst	PERF CAPTURE (Duration se Avg Perf	Max Perf
0	0	010000	Online	F	4 G AN	port0	0	2107 DS8000	IBM TotalStorage DS8000	50:05:07:63:0a:33:46:e1	50:05:07:63:0a:ff:c6:e1	Long	BROCADE	SCSI	L0	16.4MB	30MB
1	1	010100	Online	F	4 G AN	port1	0	2107 DS8000	IBM TotalStorage DS8000	50:05:07:63:0a:38:46:e1	50:05:07:63:0a:ff:c6:e1	Long	BROCADE	SCSI	L0	17.8MB	33.4MB
2	2	010200	Online	F	4 G AN	port2	0	2107 DS8000	IBM TotalStorage DS8000	50:05:07:63:09:33:45:dc	50:05:07:63:09:ff:c5:dc	Long	BROCADE	SCSI	L0	0MB	0MB
3	3	010300	Online	F	4 G AN	port3	0	2107 DS8000	IBM TotalStorage DS8000	50:05:07:63:09:38:45:dc	50:05:07:63:09:ff:c5:dc	Long	BROCADE	SCSI	L0	0MB	0MB
16	16		Online	VE	2 Gbps	freight2498a		7800	Brocade Switch	10:00:00:05:33:d7:9e:4a					L0	40.3MB	94.7MB

Brocade 7800 Name:freight2498a WWN:10:00:00:05:33:d7:9e:4a IP Address:204.135.50.206 Domain ID:220

Area	Slot/Port	Port ID	Status	Type	Speed	Name / Alias / Zone	ZonedTo	Model	Description	Port World Wide Name	Node World Wide Name	Media	SFP Type	Bound	Lng Dst	PERF CAPTURE (Duration se Avg Perf	Max Perf
0	0	dc0000	Online	F	8 G AN	DS8800 B0C4P0	0	2107 DS8000	IBM TotalStorage DS8000	50:05:07:63:03:03:13:e6	50:05:07:63:03:ff:d3:e6	Long	BROCADE	SCSI	L0	8.5MB	15.2MB
1	1	dc0100	Online	F	8 G AN	DS8800 B4C4P0	0	2107 DS8000	IBM TotalStorage DS8000	50:05:07:63:03:23:13:e6	50:05:07:63:03:ff:d3:e6	Long	BROCADE	SCSI	L0	7.8MB	14.8MB
16	16		Online	VE	2 Gbps	IBM2498_R06_HRO_A		7800	Brocade Switch	10:00:00:05:33:d1:b2:22					L0	30.6MB	46.3MB

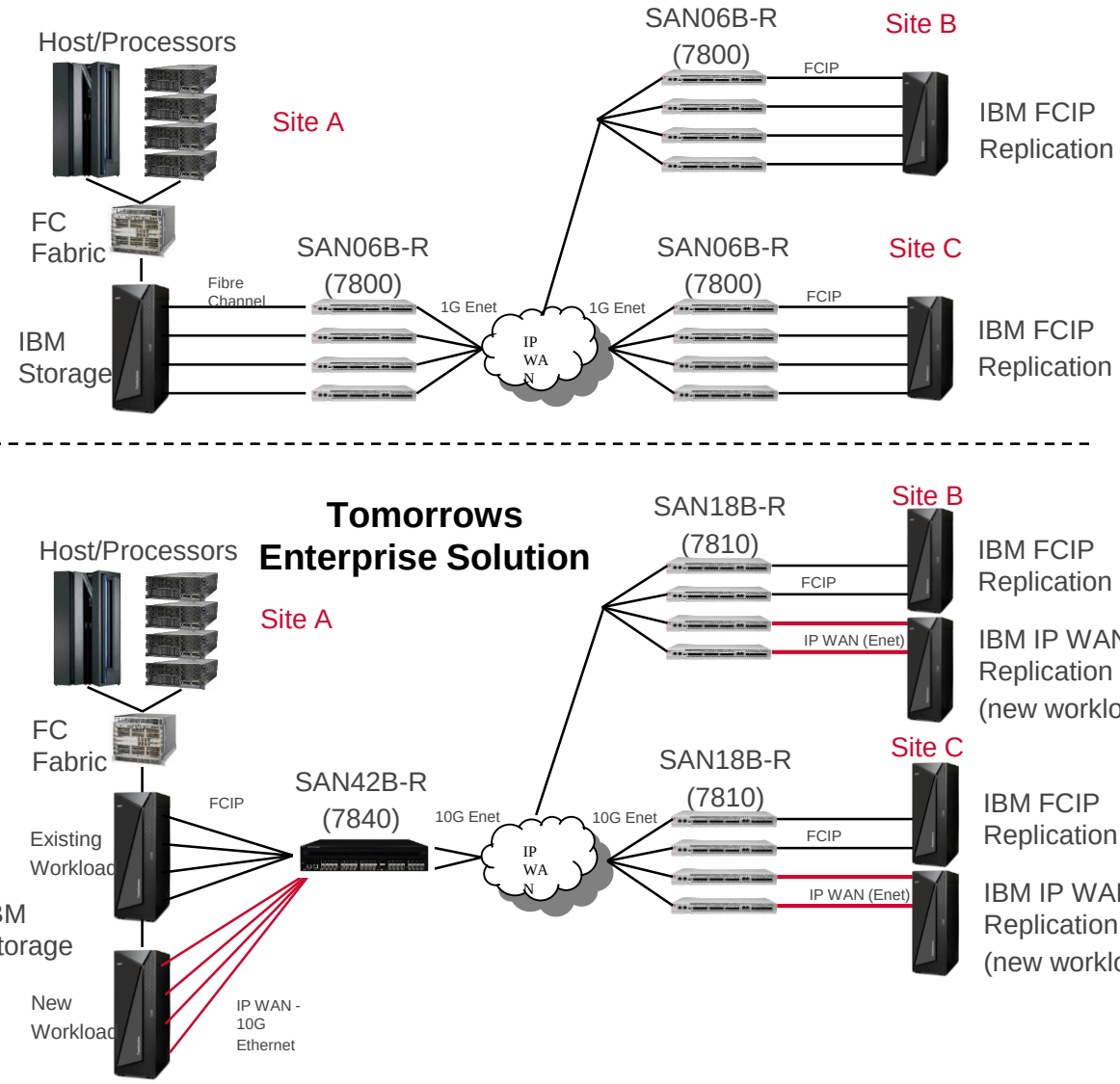
Migrating to the IBM Extension Technologies

Large Deployment

- Market Information
  - 10-15% of SAN06B-R (7800) install base
  - Clients having ***more than 4 units*** per site
    - 85-90% of SAN06B-R (7800) install base
    - Clients having ***4 units or less*** per site

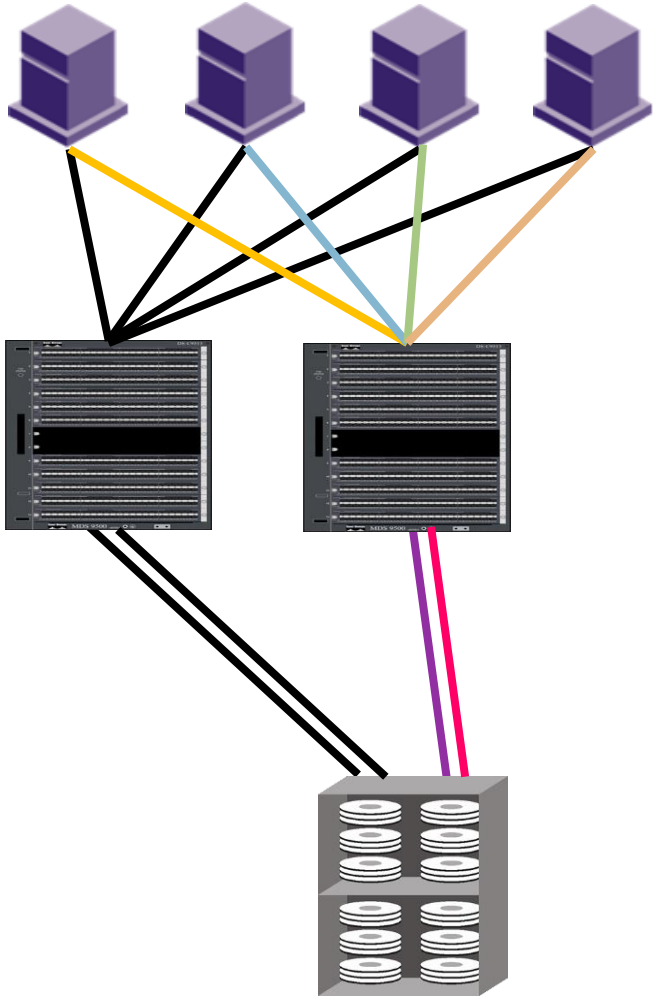
Key Migration Procedure for Refresh:

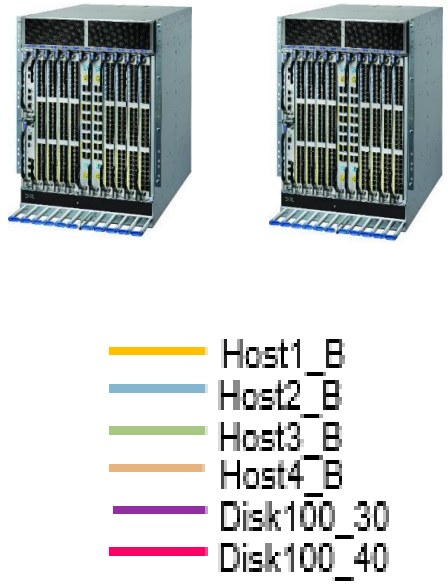
- Rip and Replace Extension Procedures:
  - With this approach simply replace the old switches with new preconfigured switches.(SAN18B-6/SAN42B-R)
- New Workload Deployment – Do more with less
  - Leverage same WAN infrastructure for FCIP and IP based storage replication requirements.
  - Is the SAN18B-6 BW adequate? (2.5Gbps max)?
  - Assuming the same network and IP addresses will be reused…
- The network either needs to be the same subnets & capabilities as when the 7800 (SAN06B-R) was in use.
- You cannot have both the old and new platforms online at the same time when using the same IP addresses, you'll get IP address conflicts on the network. However, you can disable all the ports on the SAN18B-6 and pre-configure the SAN18B-6 with all the ipif, iproute, fciptunnel and fcipcircuit information. Use the existing implementation as the template to configure the SAN18B-6
- Cutover, disable all the ports on the 7800, enable all the ports on the SAN18B-6 such that both boxes are not online at the same time. It is possible to swing the existing cables over to the 7810, or new cabling to the network. If If everything has been configured correctly, the tunnels will come up….



Prepare to Migrate…. Use SAN Health to discover both fabrics

Use the SAN Assessment and zone import tools

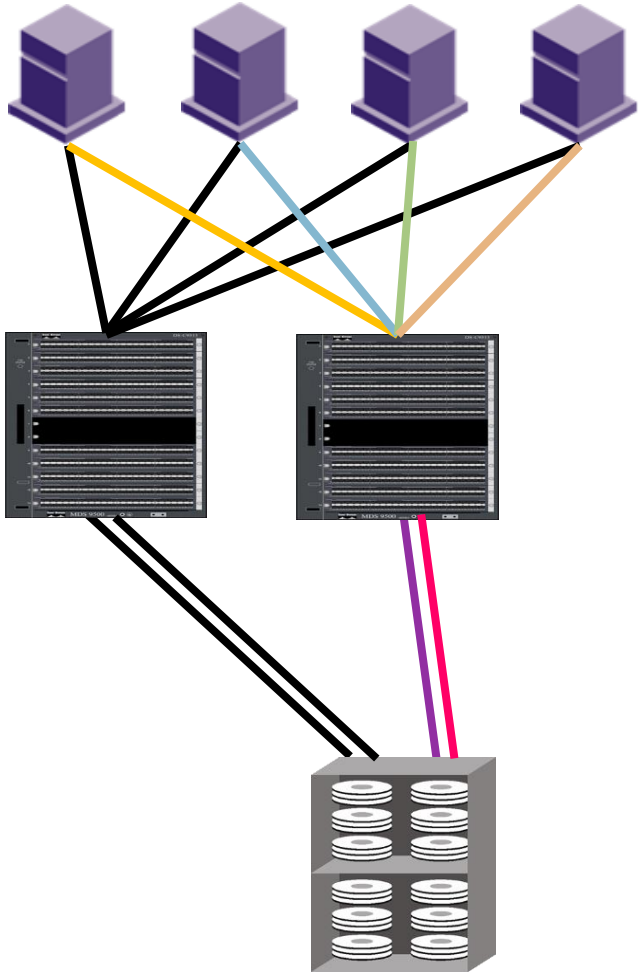


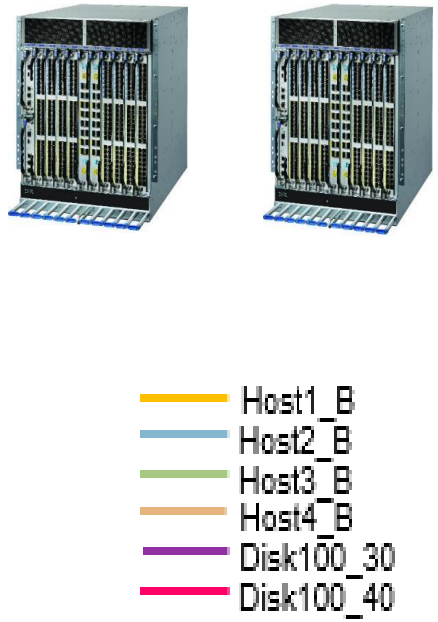


- PROCESS – Recreating the existing zone config from a legacy fabric into a new fabric, which will allow you to move the existing devices and have them properly zoned.
- Prepare to Migrate in advance:
- Build the new SAN infrastructure
- Configure the SAN
- Validate the new SAN
- Run SAN Health

SAN Health - Migration Assessment

Assessing the existing Fabric Technology

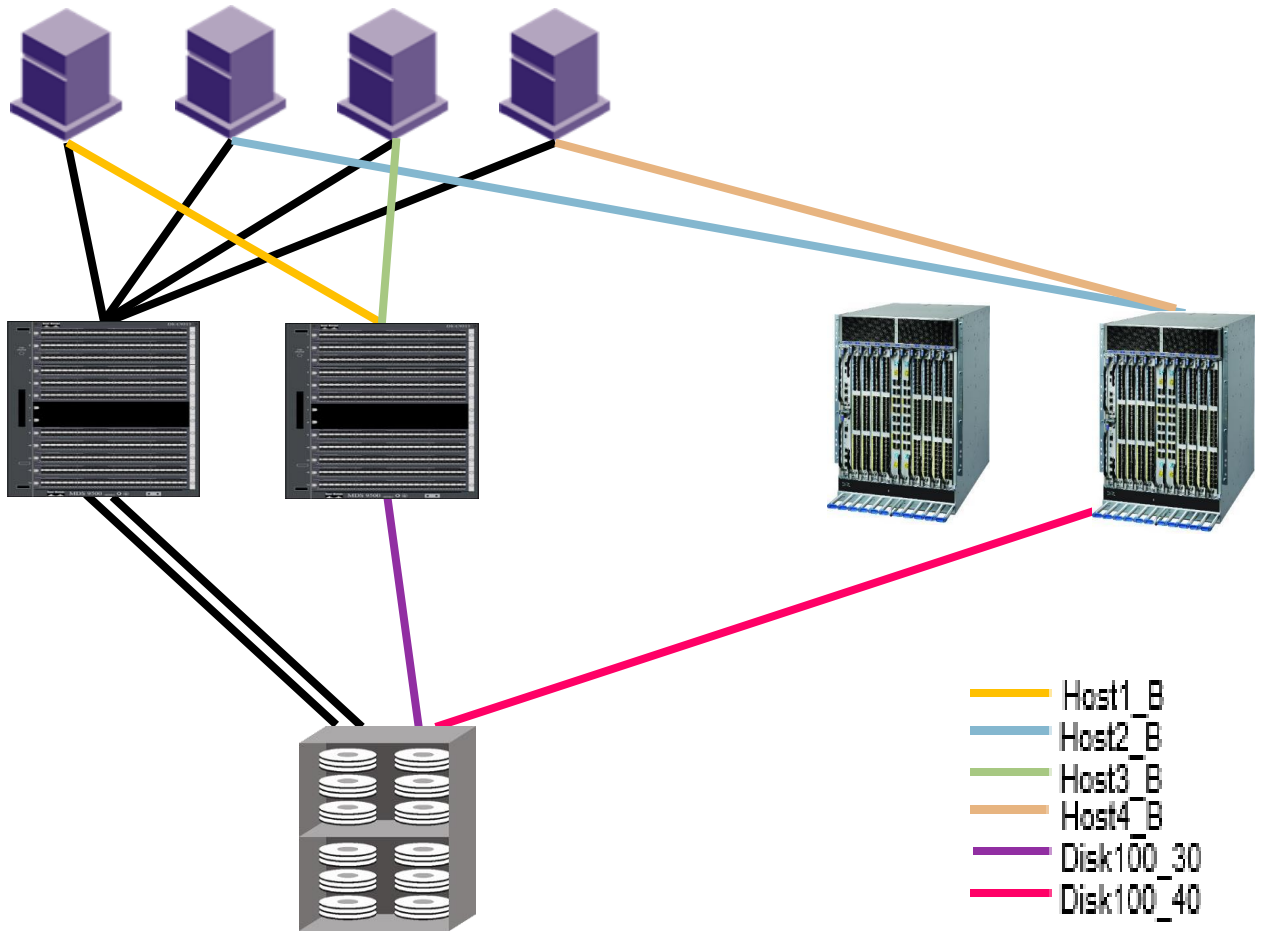




- Application failover considerations
- Storage failover considerations
- Topology change at time of the migration
- Zone configurations export/import stratergy
- Server and storage device placement
- Assessing the new Fabric Technology
  - FOS upgrade requirements
  - Capture Configuration Parms of existing switches
  - Zone Import
  - Trunking considerations
  - Future server & storage expansion
- Preliminary migration planning
- RUN SAN Health

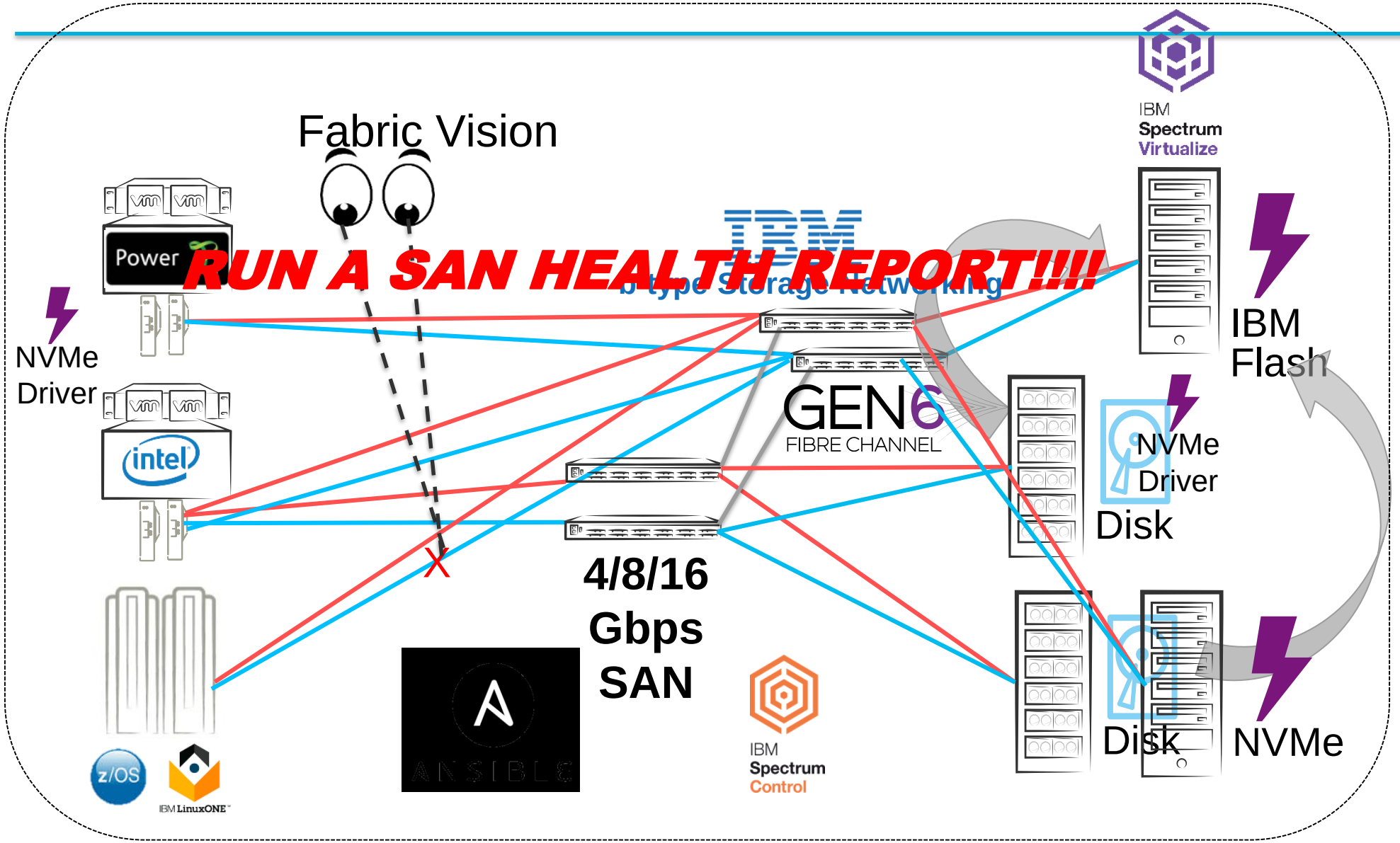
SAN Health - Perform the Migration and Validation

Pre/Post Migration



- Create baseline configs for all switches
- Import/Purge zoning sets
- Create zones for new devices
- Run Broadcom's SAN Health
- Execute the migration
- Validate new SAN Configuration
- Validate application operations
- Backup new SAN Configurations
- Sign off on SAN Migration
- Retire the old SAN Infrastructure

Simple Steps to Modernization



Add New Hardware

Non-disruptive SAN Growth

Virtualize & Migrate Data

Consolidate as needed

Monitor with Fabric Vision

Automate with Your Tool of Choice

Add NVMe/AFA when Ready

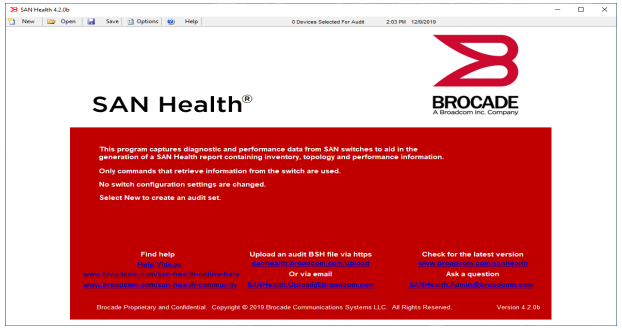
SAN Update

Questions:

Email: SANHealthAdmin@broadcom.com

Downloads and more information: www.broadcom.com/sanhealth
Uploads Upload@Broadcom.com

New Online Help: SAN Health = http://community.broadcom.com/docs/DOC-2662



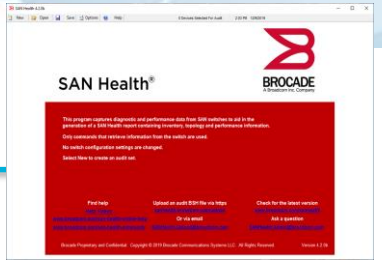
Proven Result

Are you or your customers among the 48,000 users benefitting from this?

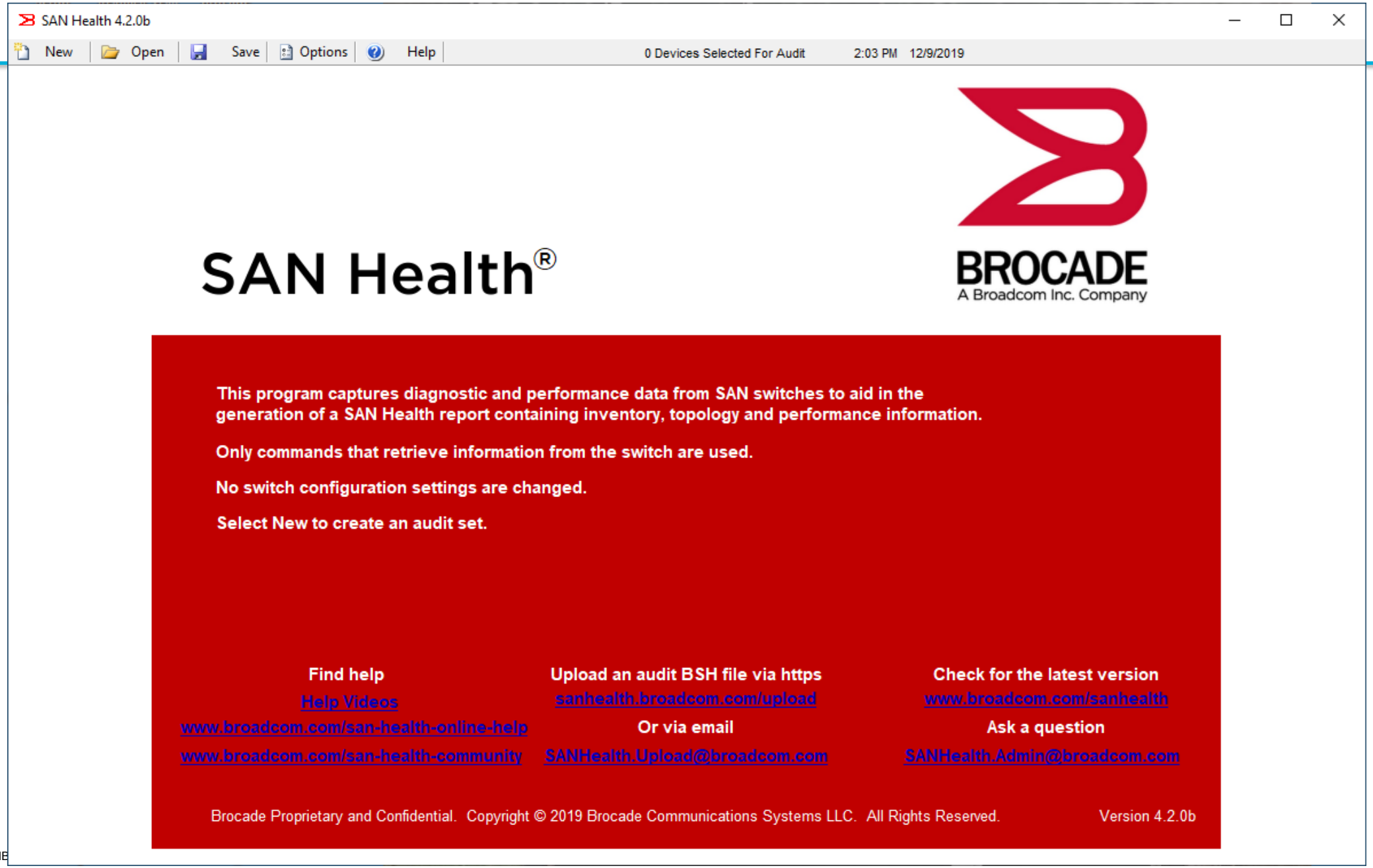
1,800+ reports encompassing 3 million+ switch ports are generated every week!

SAN Health 4.2 Installation

SAN Health 4.2

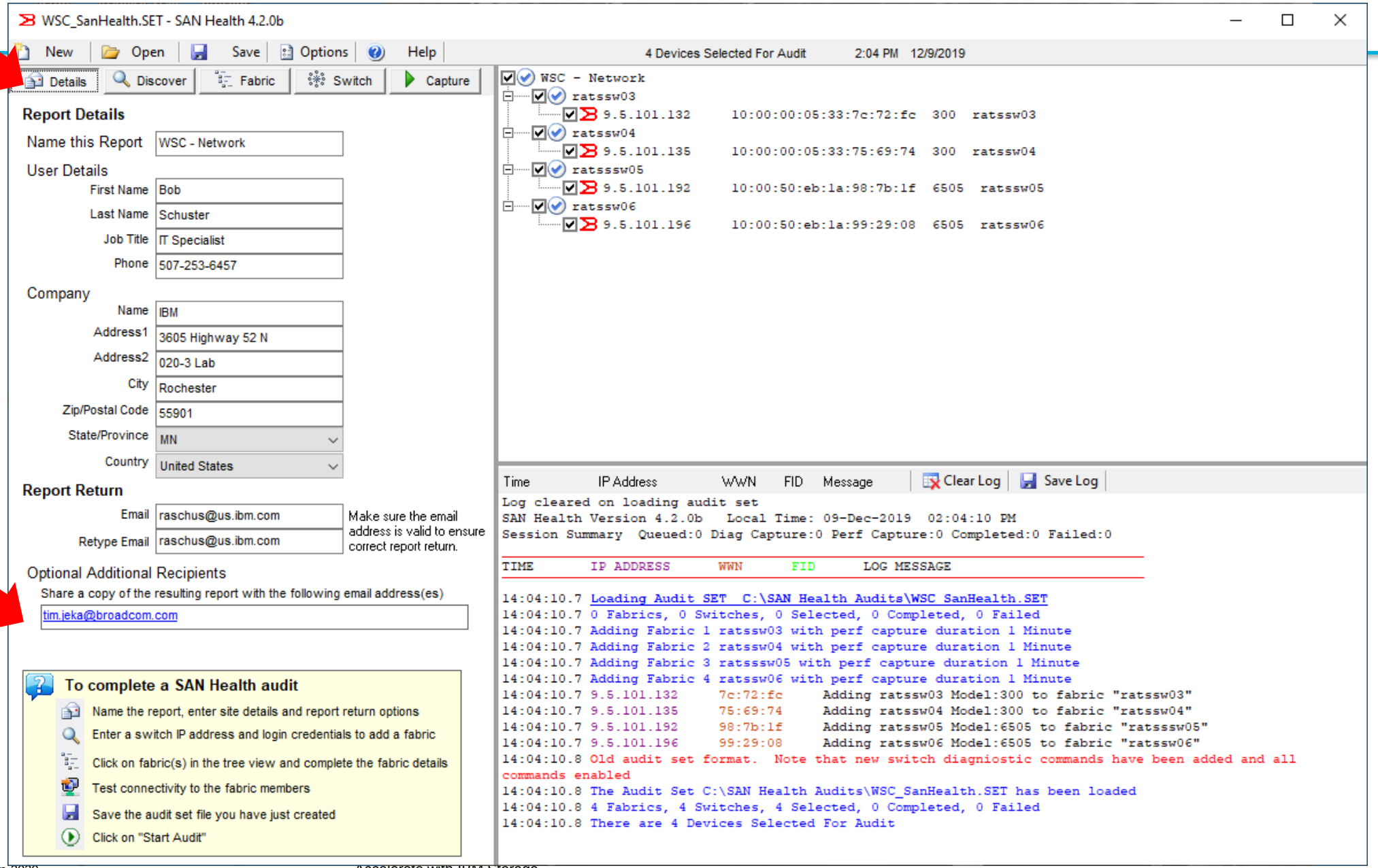


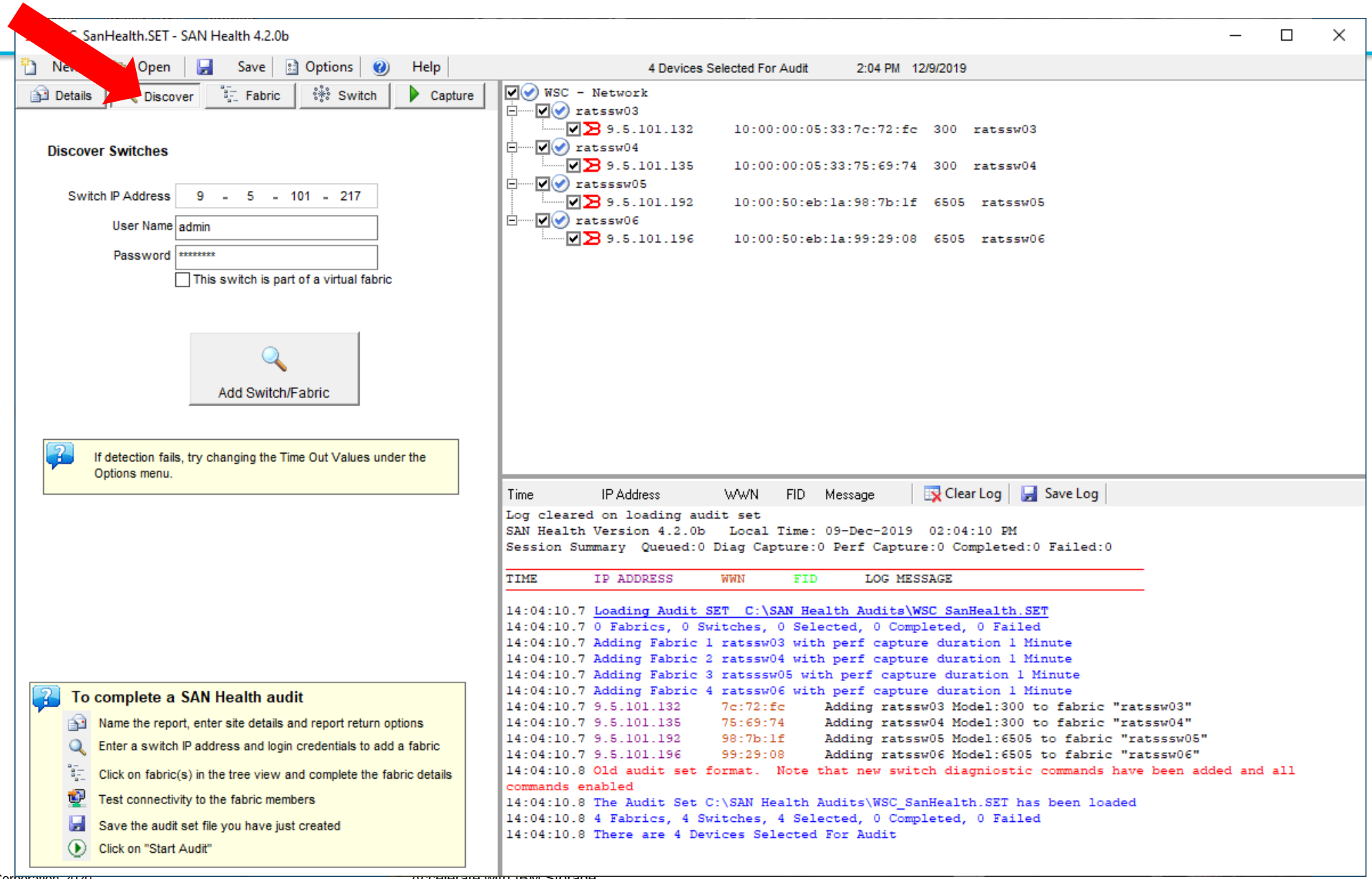
- SAN Health V4.2 is available on the Broadcom Web Site
  - Massive CPU use and associated scalability improvements
  - Resilience to issues / restart of failed responses or move to the next diagnostic without simply faulting that switch session
  - New improved more granular port performance capture
  - Faster data collection, data manipulation with improved watchdog process to handle any error conditions and detect them faster
  - Improvements to Virtual Fabric discovery and logical switch handling
  - Improvements and simplification of the user interface
  - Completes change from Brocade to Broadcom portal/upload/email/etc.
  - Screen resizing and splitter panels setup to handle today's large monitors with high DPI and scaling factors.
  - Updates to underpinning communication stacks (SSH, HTTPS, SSL)
  - End of Life for Brocade FOS 6 and Below
  - End of life for McDATA support

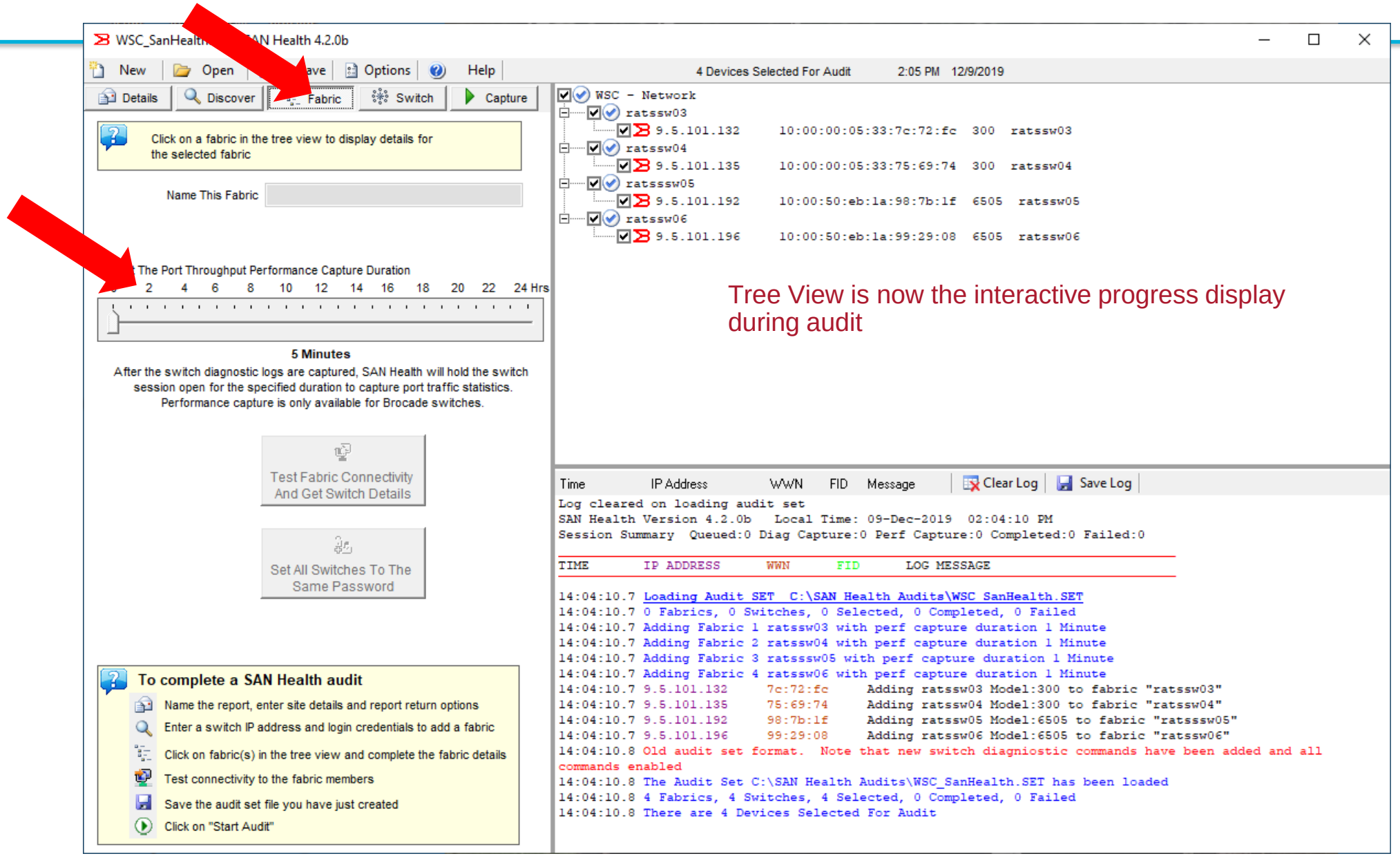


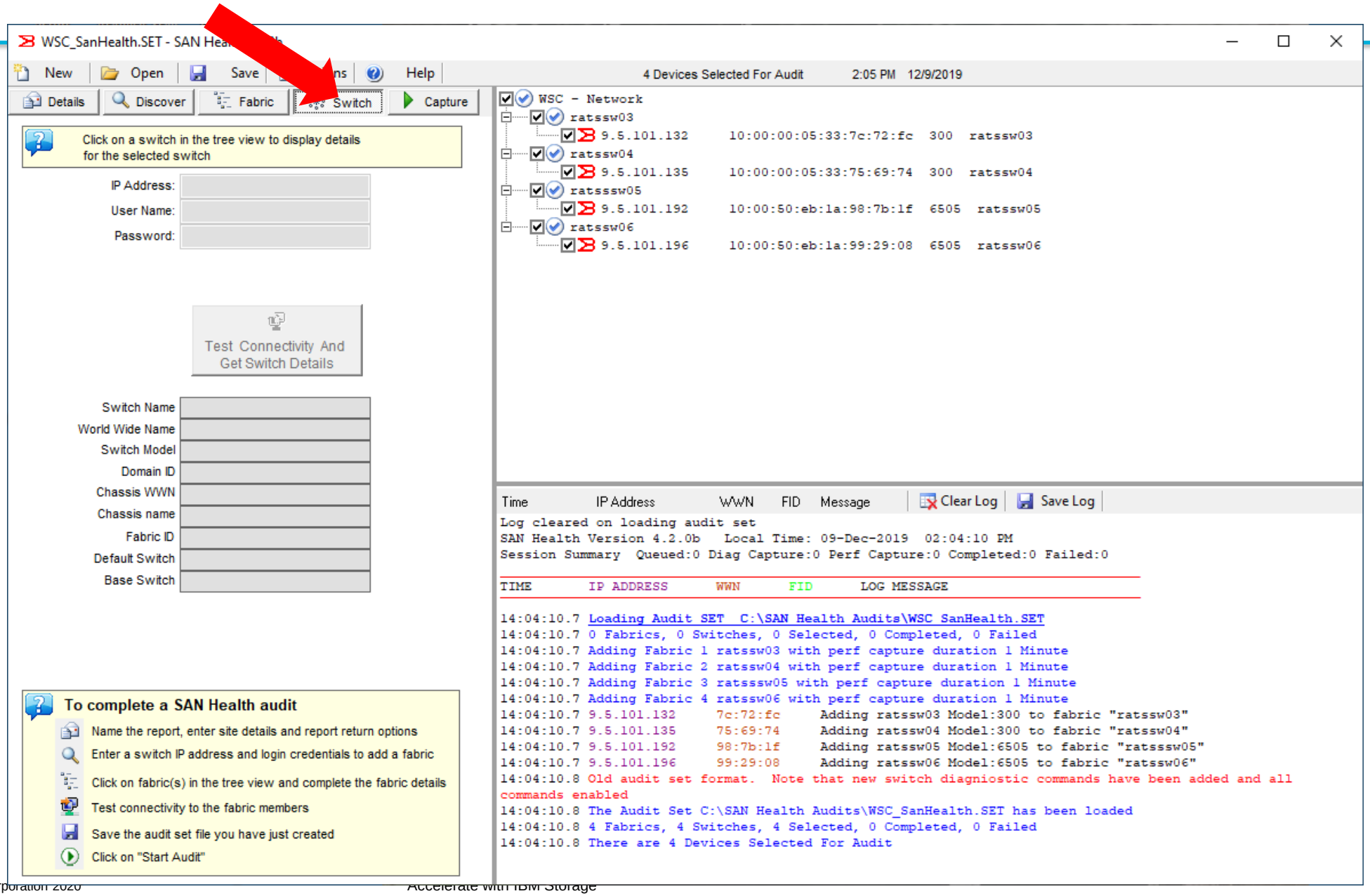
In addition to yourself, you can automatically share the report with:

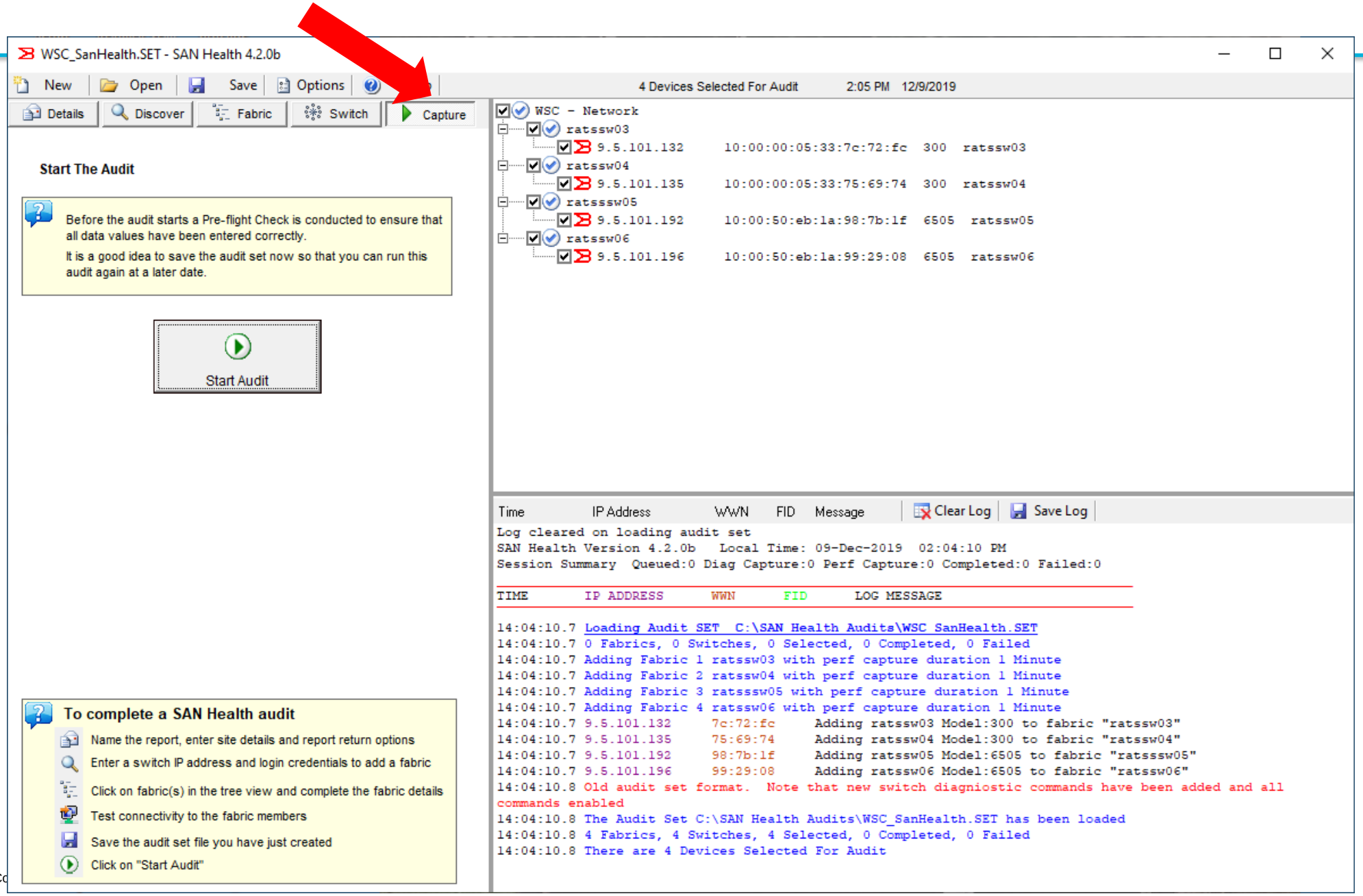
- A Broadcom SE
- Broadcom Tech Support
- Any other individual

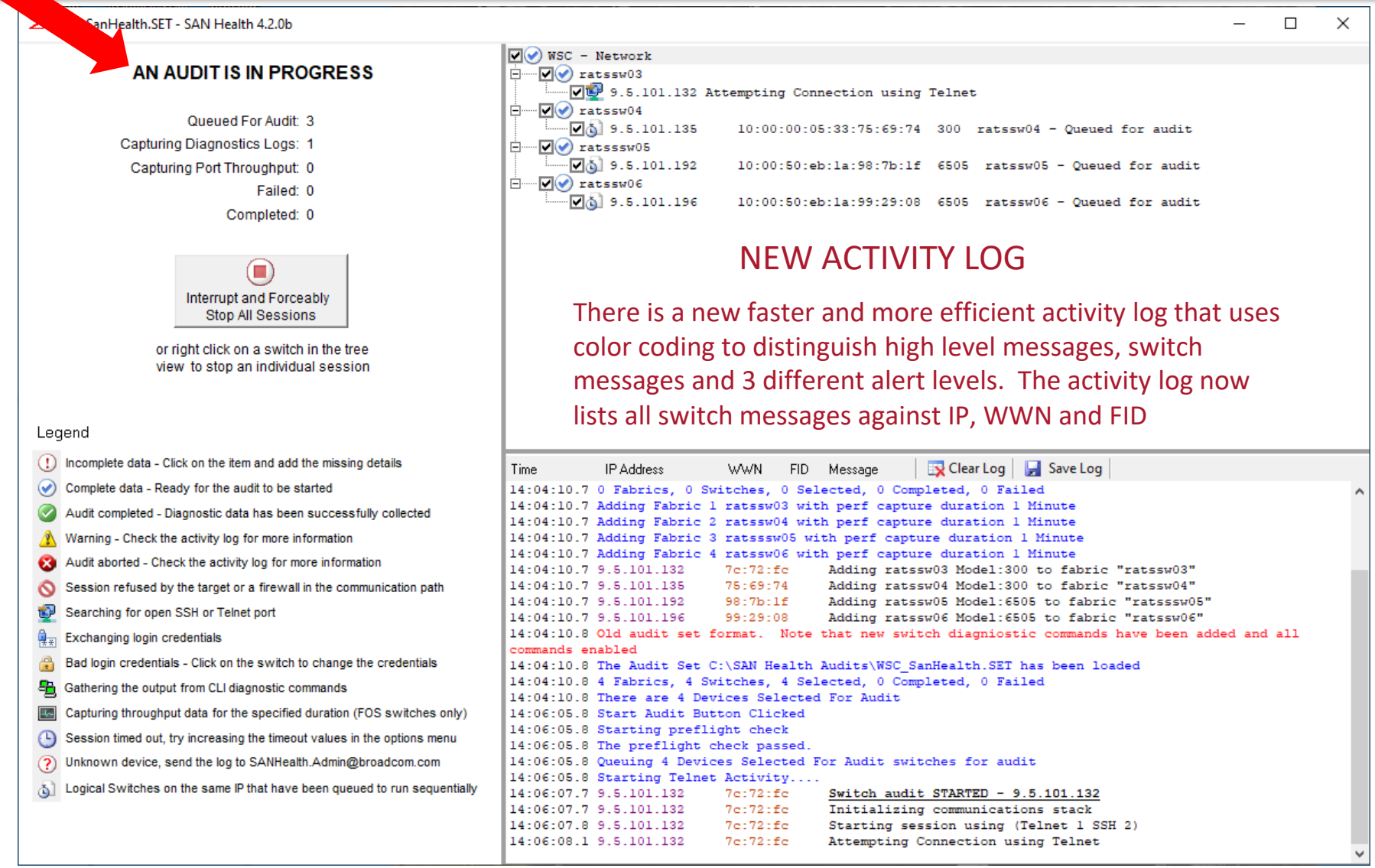


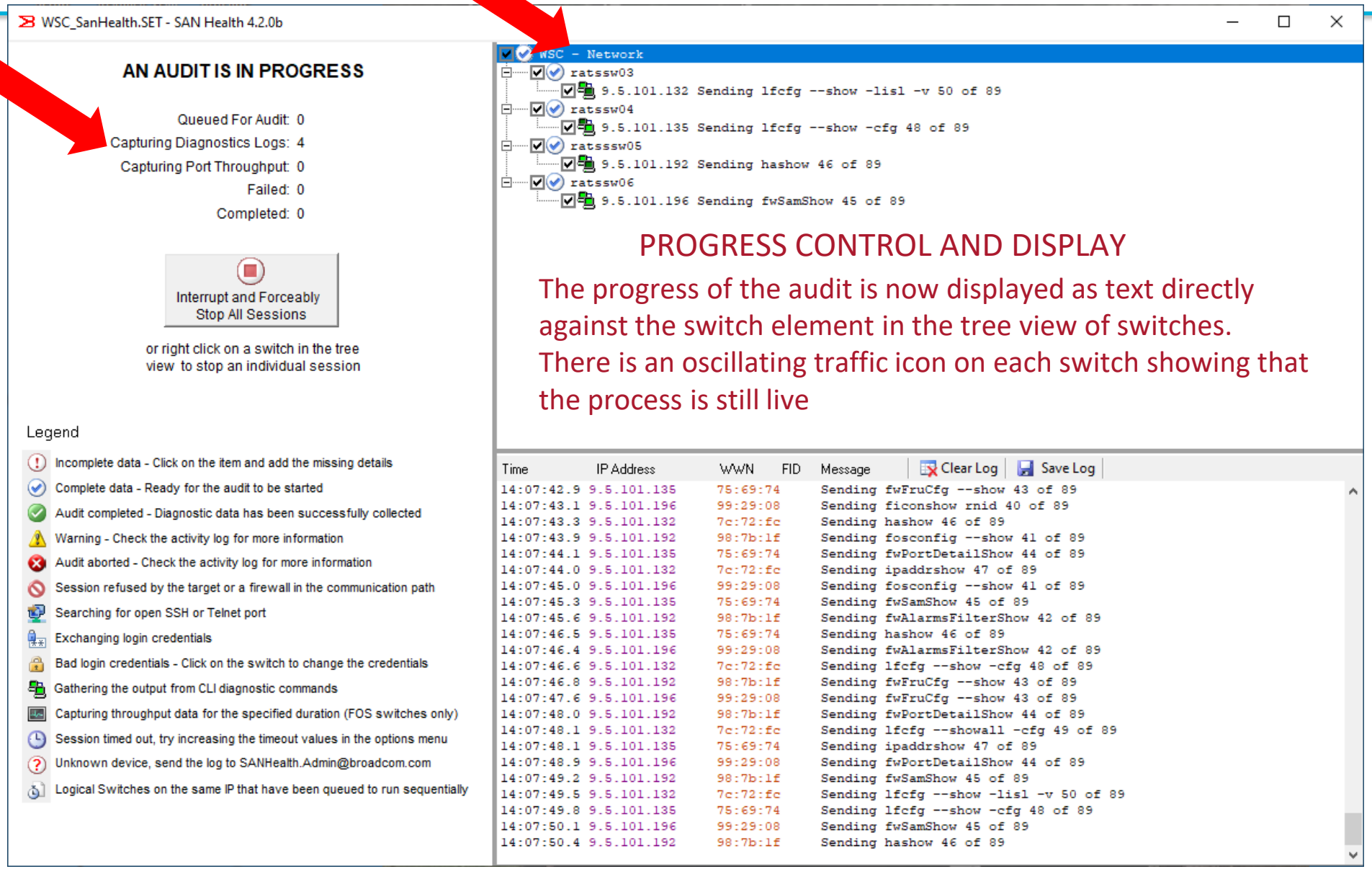






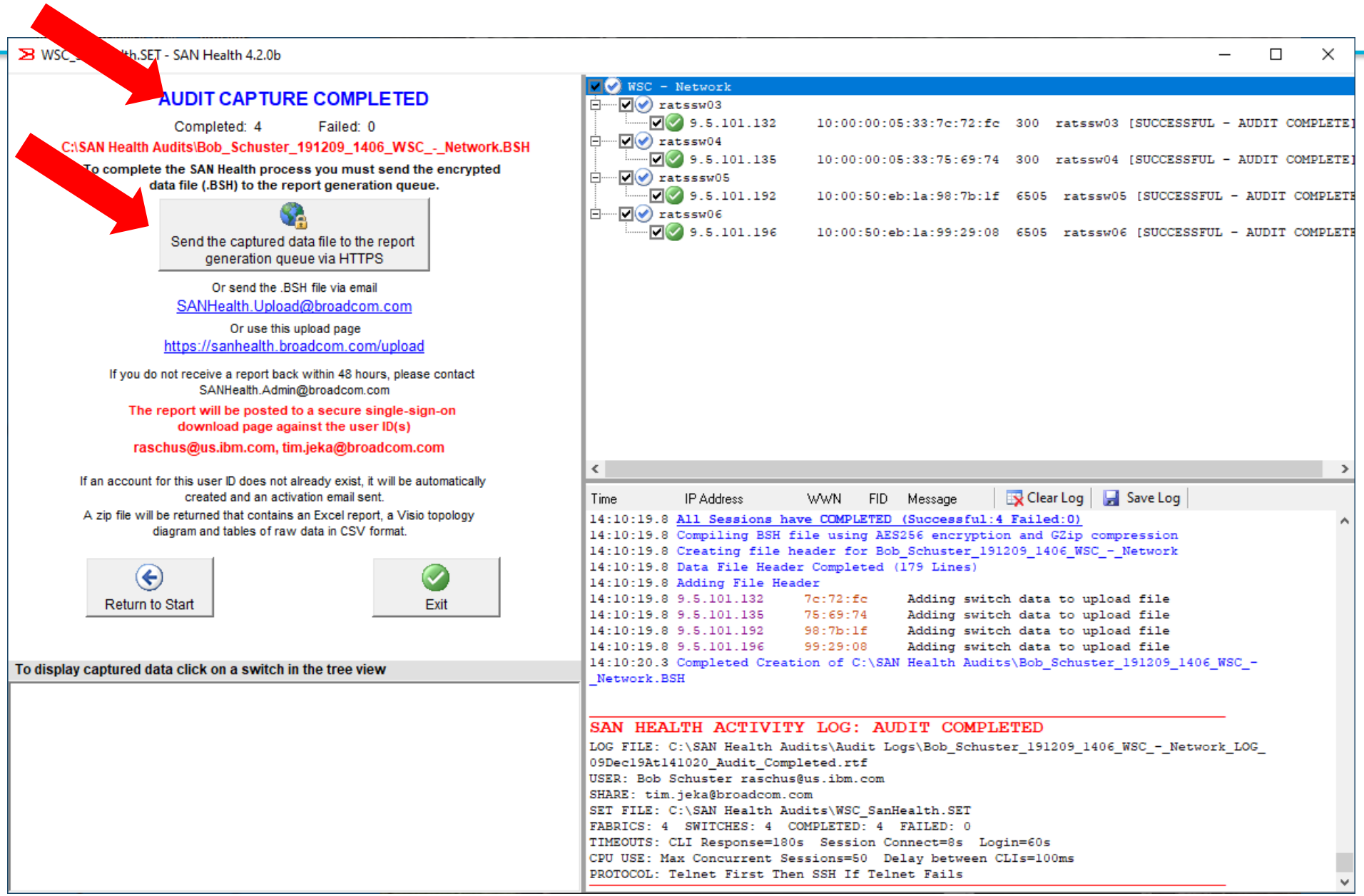


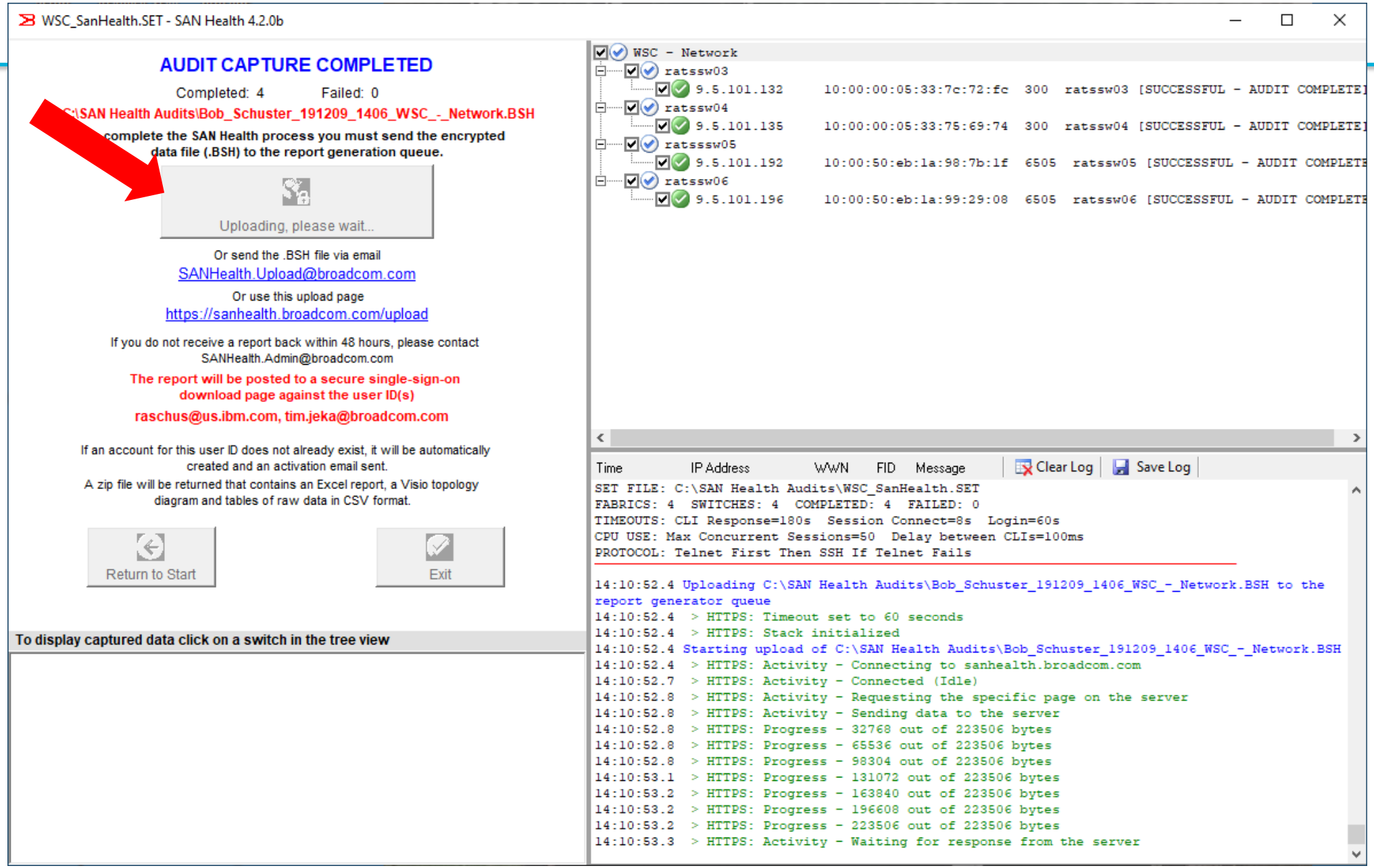


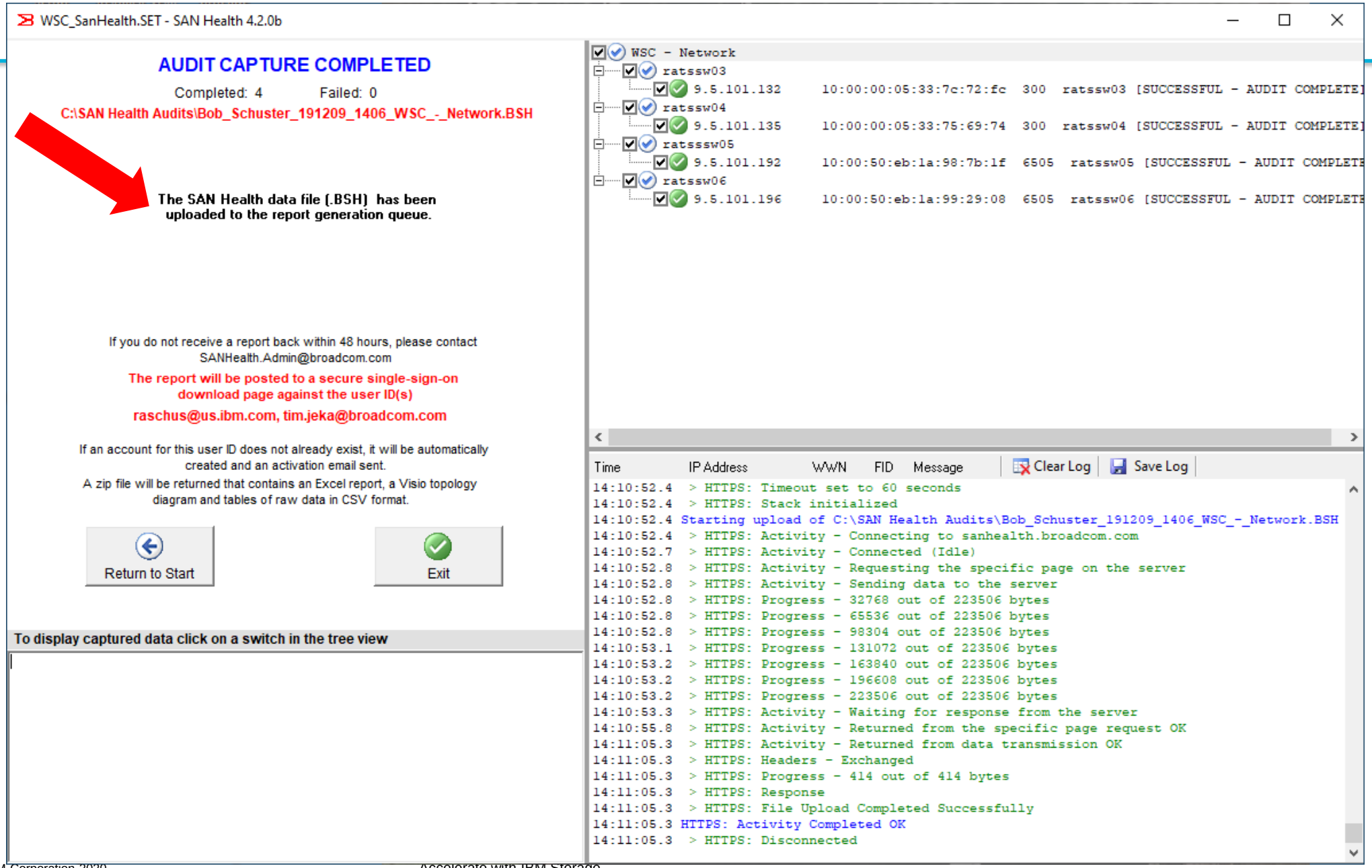


PROGRESS CONTROL AND DISPLAY

The progress of the audit is now displayed as text directly against the switch element in the tree view of switches. There is an oscillating traffic icon on each switch showing that the process is still live







SAN Health

Follow these steps to access your SAN Health Report

Step 1: Go directly to the SAN Health Download Reports page at : https://portal.broadcom.com/group/support/san-health

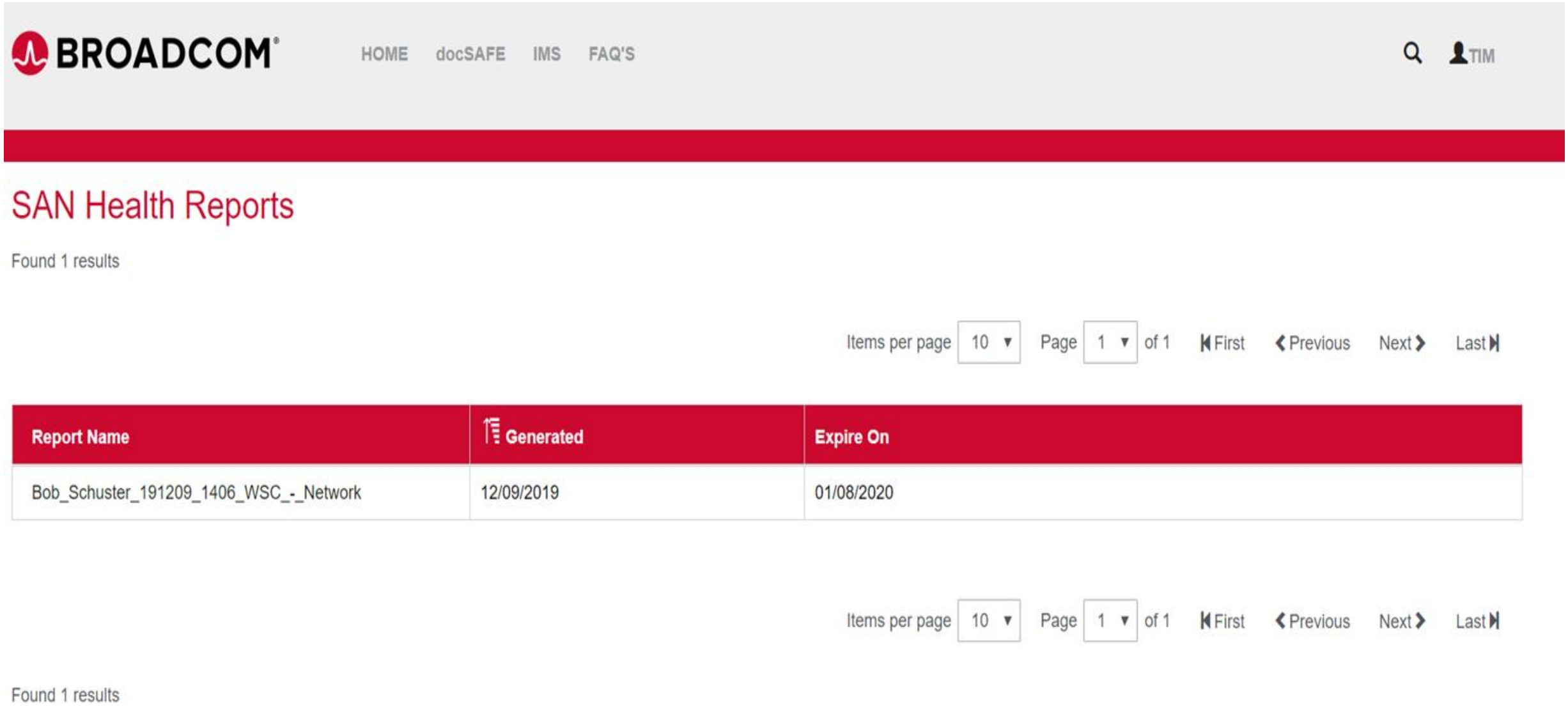
Step 2: Log in using your existing Broadcom User ID and password. Your User ID is : raschus@us.ibm.com

Note: If you forgot your password, simply click on the "Need help signing in?" link on the login page to reset it.

If you have trouble downloading your reports or logging in to Broadcom Support Portal, please contact csp_help@broadcom.com

If you have any SAN Health related questions, please visit https://www.broadcom.com/san-health-online-help

SAN Health Report Access



SAN Health 4.2 Changes

SAN Health Features that are End Of Life

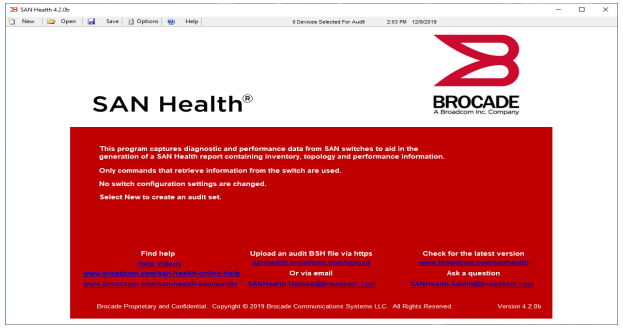
SUPPORT FOR McDATA SWITCHES .....

FICON IOCP LOAD USING THE USER INTERFACE .....

SAN HEALTH PROFESSIONAL .....

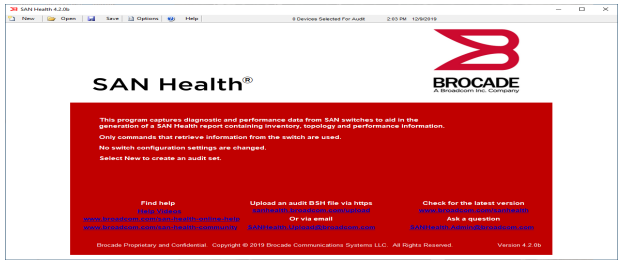
PARTNER PACKAGE BUILDER.....

SAN Health 4.2 Support for McData Switches



McDATA or Brocade M Series switches are no longer supported. If a user still has McDATA switches they will need to use SAN Health 4.1. However, we plan to also remove report generation capability against McDATA at the end of 2019. Post 2019 there will be no support for McDATA switches even if an old version of SAN Health is used.

SAN Health 4.2 FICON IOCP LOAD using the User interface



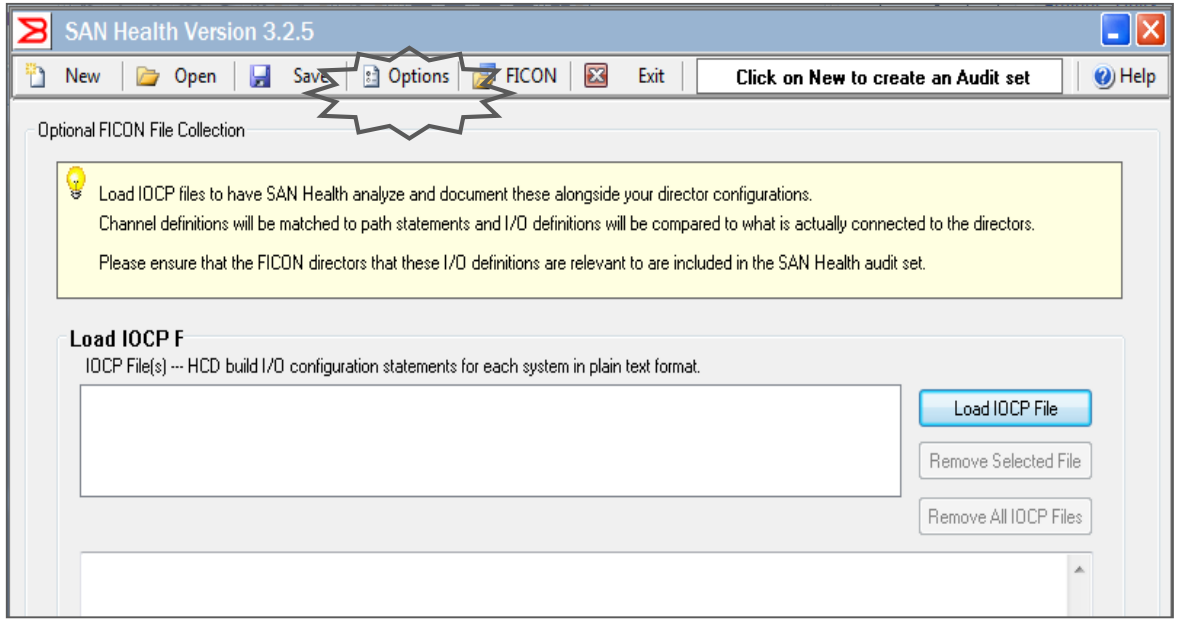
When included in the audit file, FICON IOCP files are analyzed and matched to the SAN Health data. This is a low volume uptake item and as such selecting IOCP files to be added to the upload file has been removed from the user interface. If users still wish to upload IOCP files along with their SAN Health audits, they can include them by editing the SET file and adding text similar to this example showing the addition of 2 ICOP files.

Text to add to the SET file:

```
IOCPFilesLoaded=2
IOCPFile1=C:\SAN Health Audits\IOCPfilename1.txt
IOCPFile2=C:\SAN Health Audits\IOCPfilename2.txt
```

SAN Health Diagnostics Capture

- Optional FICON Data
  - SAN Health is compatible with FICON switches
  - IOCP file contains the path configuration statements for a given Mainframe system
  - SAN Health will match these path statements and match them up to the physical switch ports found in the SAN Health audit



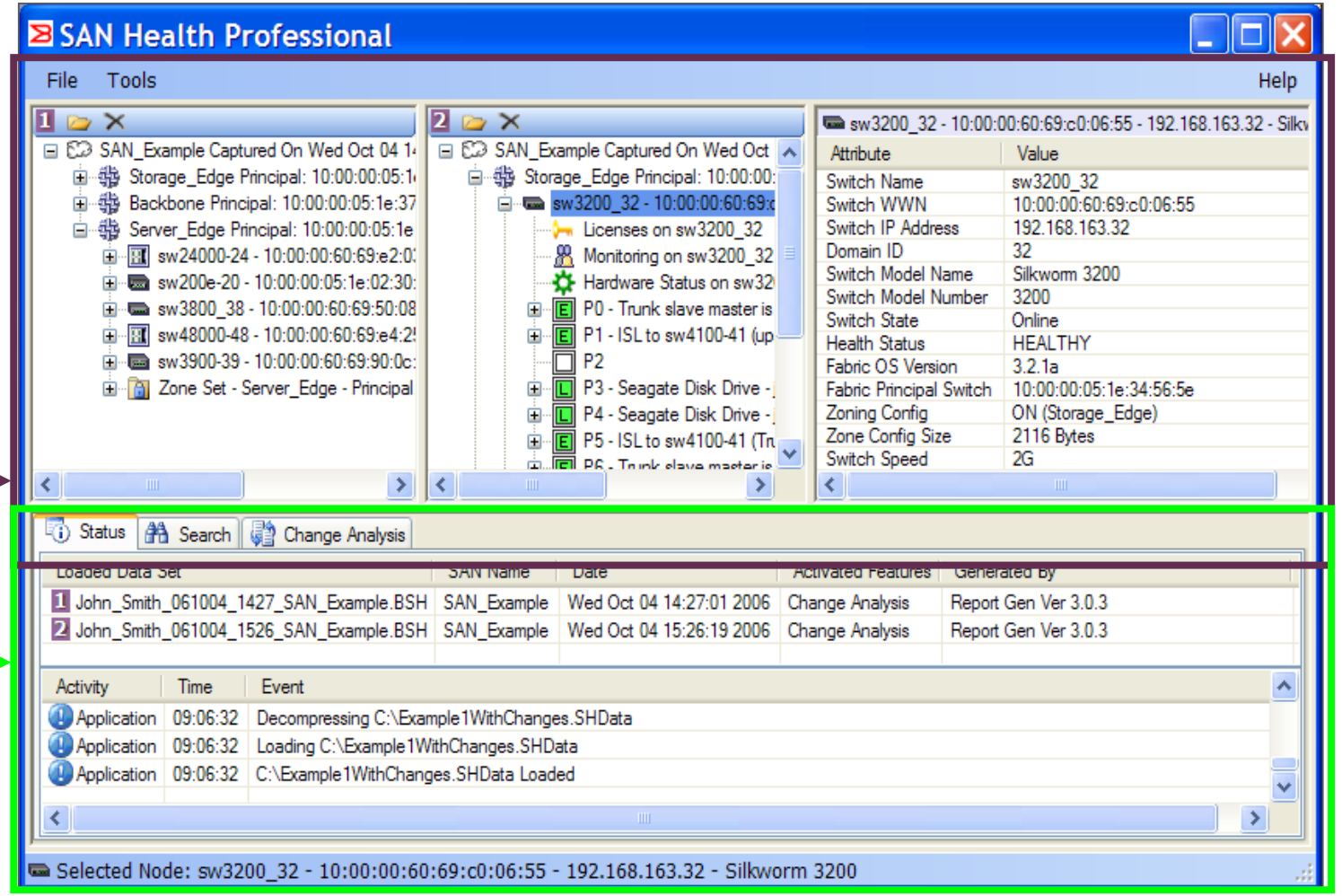
SAN Health 4.2 SAN Health Professional

- SAN Health professional is now end of life. Please use the CSV files that are returned alongside your SAN Health report instead.

- Brocade SAN Health Professional provides an easy-to-understand framework for analyzing SAN components and configuration data captured by the SAN Health Diagnostics Capture utility. It provides a straightforward, easy-to-navigate user interface for auditing SAN Health data captures - making it a valuable tool for SAN inventory tracking and change management activities. You can import up to two SAN Health captures to SAN Health Professional for immediate, detailed analysis about any SAN component.

SAN Health Professional

- SAN health Professional is a GUI wrap around for your report data.
- Allows functionality beyond the capabilities of Excel and Visio



Data Viewing Area

Data Manipulation Area

SAN Health 4.2 Partner Package Builder

- SAN Health package builder inserted a logo, company name and email address into the normal SAN Health installation pack. This allowed partners to co-brand SAN Health. This was causing too many anti-virus platforms to flag it as a potential virus as were noticing the change in the original install pack due to the insertion of the additional content. Due to this we are no longer able to support the package builder and it is now end of life.

SAN Health Report Generation

Installation Package Builder… now a Requested item!

Create a custom installation package of SAN Health that is pre-populated with your details and company logo.

- Package Builder Install SAN Health Builder Package….
- ZIP InstallSHPackage407c.zip
- Pre-populate SAN Health with your:
  - ✓ Company Name
  - ✓ Email Address
  - ✓ Company Logo
- Reports will be returned with your logo on the page footer and in the Visio diagram

Resources

Get the Basics Here….

Introduction to Brocade SAN Health

Brocade, a Broadcom Limited Company • 3.7K views • 2 years ago

This 3 minute video explains what the **SAN Health** application is and provides examples of report content and topology diagrams. In

https://youtu.be/ZVmjd19iAsI

Get the Basics Here….

How to run a Brocade SAN Health Audit

Brocade, a Broadcom Limited Company • 5.9K views • 2 years ago

This 5 minute video walks you through running a **SAN Health** Audit with Brocade. From installing the application all the way through

https://youtu.be/Gf8g4tok_lQ

Understanding the Options Menu in Brocade SAN Health

Brocade, a Broadcom Limited Company • 2.2K views • 2 years ago

This quick video looks at the available options and configuration settings in **SAN Health**. Some of the options control the way **SAN**

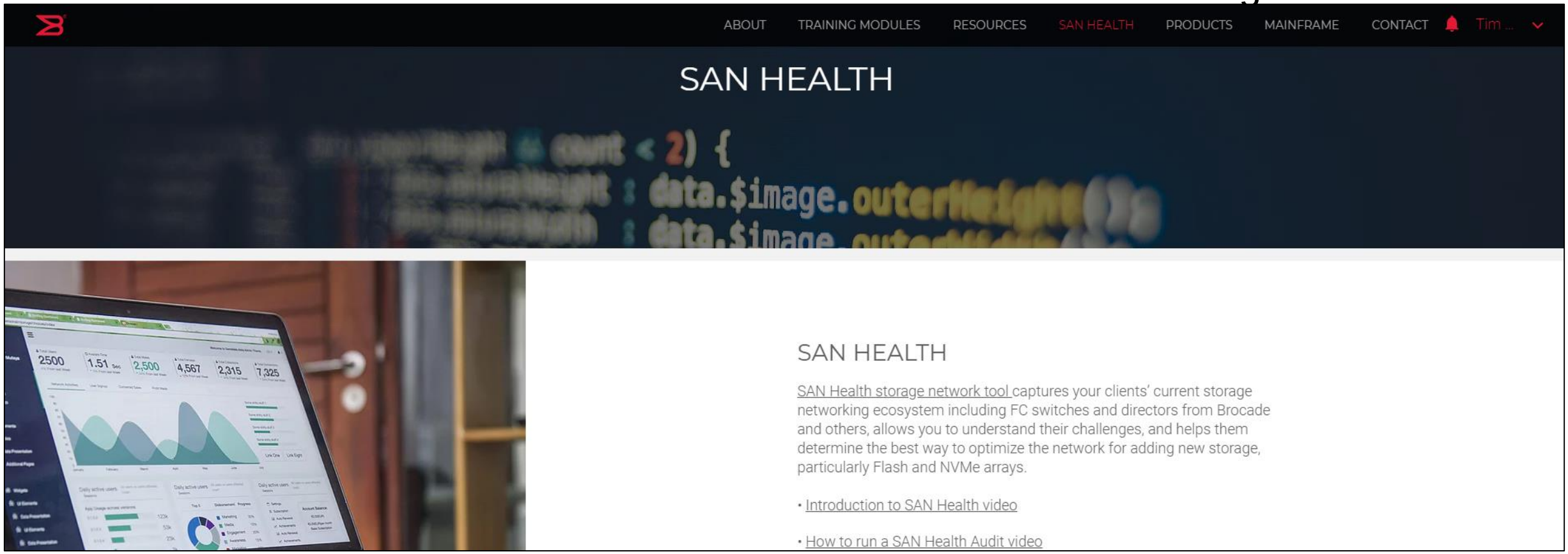
https://youtu.be/lnNa-GuUgRI

Brocade SAN Resource Center for IBM b-type Storage Networks

www.brocade-ibm-san.com

Brocade SAN Resource Center for IBM b-type Storage Networks

- Access to **SAN Health** network assessment tool and the training to use SAN



Questions?