Brocade SAN Health Instructions

Modernize the SAN Infrastructure

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Incentive $$ Program for SAN Health

Partner Actions:

1. Review the .ppt for an overview of SAN Health tool, instructions for downloading from Broadcom site, instructions creating a SAN Health report, video instructions and use case examples.
2. We recommend working with a local Brocade field rep to form strategies to collect the customer data, review the data and develop plan to propose new servers, storage or SAN products.
3. Contact Raul Lanza - Brocade at raul.lanza@broadcom.com 970-481-0285 for additional information or help identifying Brocade field resources
4. Send completed SAN Health reports to Brocade-TechData.pdl@broadcom.com to be eligible for the $200 incentive.
5. Make sure you have “registered” to the Brocade site prior to completing the SAN Health report
   - Register at: https://www.surveymonkey.com/r/IBMBundle

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SAN Health for IBM Partners

Introduce SAN Health in all PWR 9, Storage and SAN customer engagements.

- New and competitive accounts
- Identify Customer issues that they may not even know that they have
- Develop plans to refresh hardware solutions

1. Partners will gain insight to all devices attached to the SAN. That will provide critical information to right size solutions for proposals.
2. After running the report, reach out to the local Brocade rep to review the report. They can help identify refresh opportunities and assist with presenting results to the customer.
3. Schedule 3 or 6 month re-occurring SAN Health reviews with your customers. Now you have reasons to talk to your customer.

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SAN Health – A free and powerful sales and assessment tool.

SAN Health answers the question – is your SAN ready for Flash, NVMe, z14, Power9?

6 Reasons

to Download

SAN Health

Make your SAN a business enabler

- Avoid application downtime
- Reduce troubleshooting and resolution time
- Improve capacity planning and productivity
- Gain a competitive edge

Quickly identify congestion risks

- Oversubscribed ports
- Zoning issues
- Configuration anomalies
- Unusually high port errors

Easy to run

- **1 minute** to install
- **3 minutes** to audit
- **0 impact** on network performance

Automate it to run in the background during your backup, or at any other scheduled time.

Audit multi-vendor environments

Audit fabrics that include any storage and network vendor hardware—even Cisco devices running SAN-OS 2.0 and above.

Share insights with others

- Easy-to-read overview for new team members
- Professional insight for the CIO
- Greater SAN visibility for the entire storage team

Generate topological reports

- Eliminate whiteboard SAN management
- See down to the device and port level
- Get clear reports in Excel and Visio formats

Start your free SAN Health audit. Download Today

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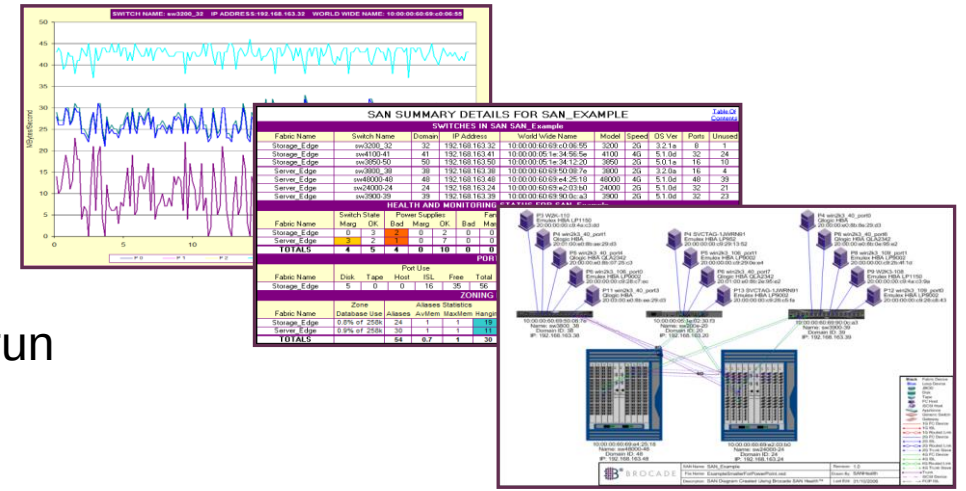
SAN Health is the free tool that lets you see inside your storage environment

SAN Health discovers and provides information about:

- Brocade SAN Switches, as well as, legacy m-type SAN Switches
- Storage Products (EMC, HDS, HPE, IBM, NetApp, etc.)
- Multiple protocols (FCP, FC-NVMe, FICON)
- Cisco MDS SAN Switches
- HBAs (Emulex, QLogic, etc.)



- Takes only minutes to install and run

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Agenda

What is SAN Health?

Let's get started..How does it work?

The report generation process

Getting the most from the report

SAN Storage Refresh Opportunity

Migration Services

Performance Graph Example..SAN Health

What's in a SAN Health Report?

How to Create a SAN Health Report

What is Brocade's SAN Health?

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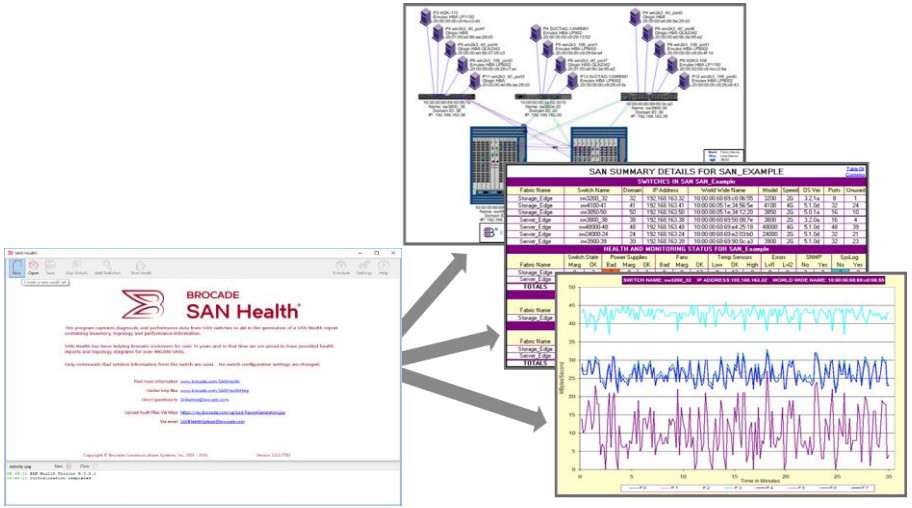
Broadcom's SAN Health

SAN Health is a free utility available from
www.broadcom.com/SANHealth

A no-cost report providing an insightful, accurate view of your SAN environment..

- Inventory of devices, switches, firmware versions, and SAN fabrics
- Captures and graphs performance data
- Enables the comparison of switch configurations and zoning against best practices
- Highlights error conditions, event logs, and error counters
- Provides detailed reports and diagrams
- Refresh Opportunities



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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

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SAN Storage Refresh Opportunity

Migration Services

Performance Graph Example..SAN Health

What's in a SAN Health Report?

How to Create a SAN Health Report

What is Brocade's SAN Health?

October 2017

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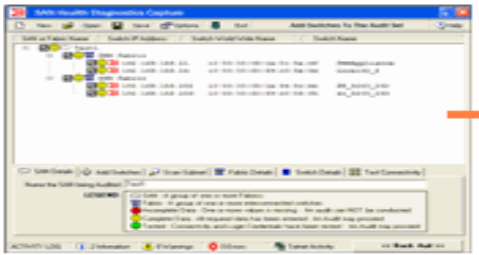
SAN Health Audit Process

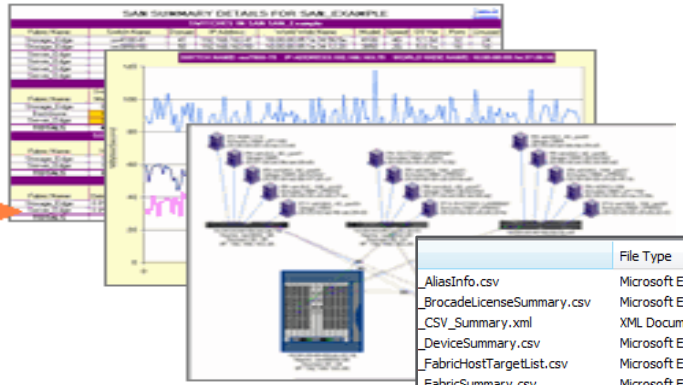
Run the Audit Tool

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 MyBrocade account for retrieval

Broadcom SAN Health Capture

How To Download SAN Health

Link to Broadcom San Health Main Page

- *https://www.broadcom.com/support/fibre-channel-networking/tools/san-health/diagnostics-capture*

Here you will find:

- San Health Overview
- Introduction and basic use videos
- Tips and Tricks document
- FAQ document
- Support Matrix
- Report and Diagram samples
- Link to SAN Health discussion Forum

Step 1

Ensure you have these minimum system requirements:
Intel P4 or AMD Equivalent (AMD K7)
Microsoft Windows XP or higher
512 MB RAM and 20 MB available hard disk space

Step 2

Download SAN Health Diagnostics Capture
This free utility generates diagnostic reports about your SAN environment.
(ZIP, 2.00 MB)

Step 3

Run the file InstallSANHealth.exe. Install on any Windows-based PC that has TCP/IP connectivity to the management port of the switches in your fabrics. Follow the step-by-step instructions to audit your SAN.
This generates an encrypted audit results file (*.BSH) about your SAN environment.

Step 4

Generate your report, by submitting the data file (*.BSH) to the report generation queue via e-mail or https upload.
You will receive a report generation notification e-mail from the Brocade SAN Health Administrator within approximately 1 to 8 hours.

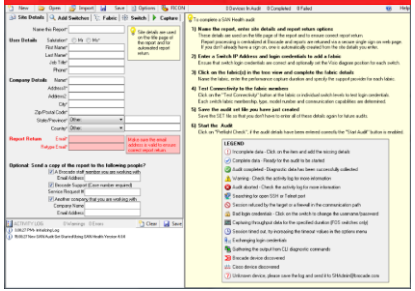
Step 5

Download reports from your secured MyBrocade account. If you do not have a MyBrocade account, SAN Health Diagnostics Capture Utility will automatically register you for access. If you are already a member of this exclusive Brocade Web site, log on to MyBrocade and check your reports

Summary of the SAN Health™ Process

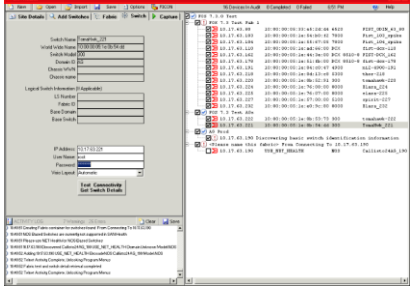
- 4 easy steps… or
- Optionally select report content & fine tune audit options

1.



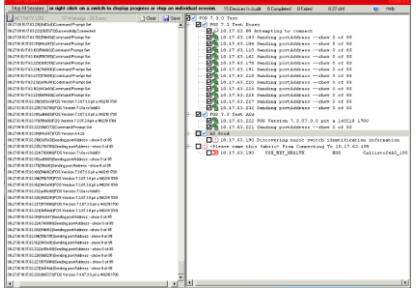
Enter Site Details

2.



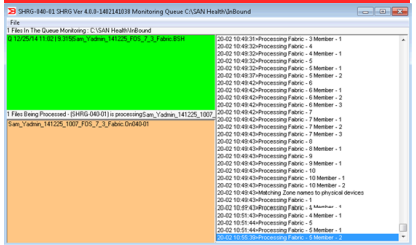
Enter Switch and Fabric Details

3.



Run the Audit

4.



Generate the Report

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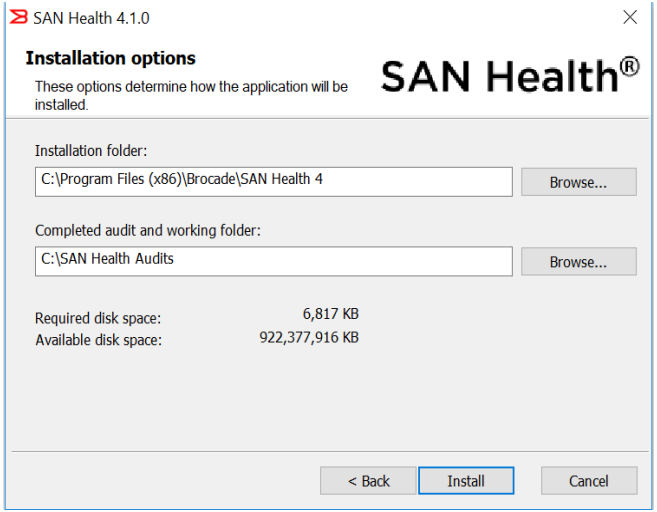
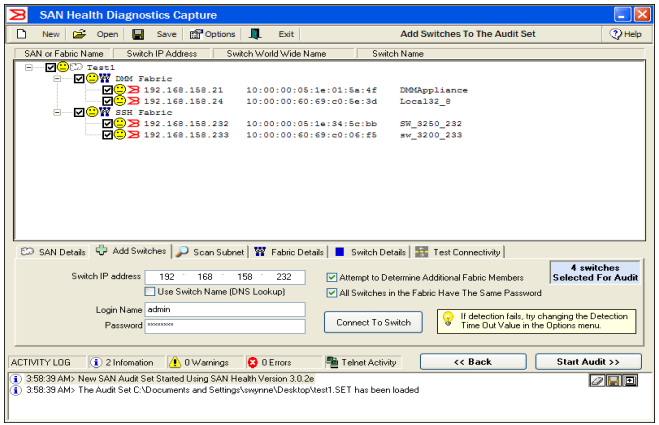
SAN Health Diagnostics Capture

Client-side software

- 1 minute to install and 3 minutes to audit fabrics
- Installs on any Windows workstation with IP connectivity to the switch management IP address
- SAN Health connects via telnet/Secure Shell to the switches and retrieves the output from non-intrusive show and dump commands
- SAN Health can run against a single fabric or multiple fabrics at once
- Switch compatibility matrix is available on http://broadcom.com/sanhealth
- Download Zip File, extract
  Click on “New” to Create a New SAN Audit





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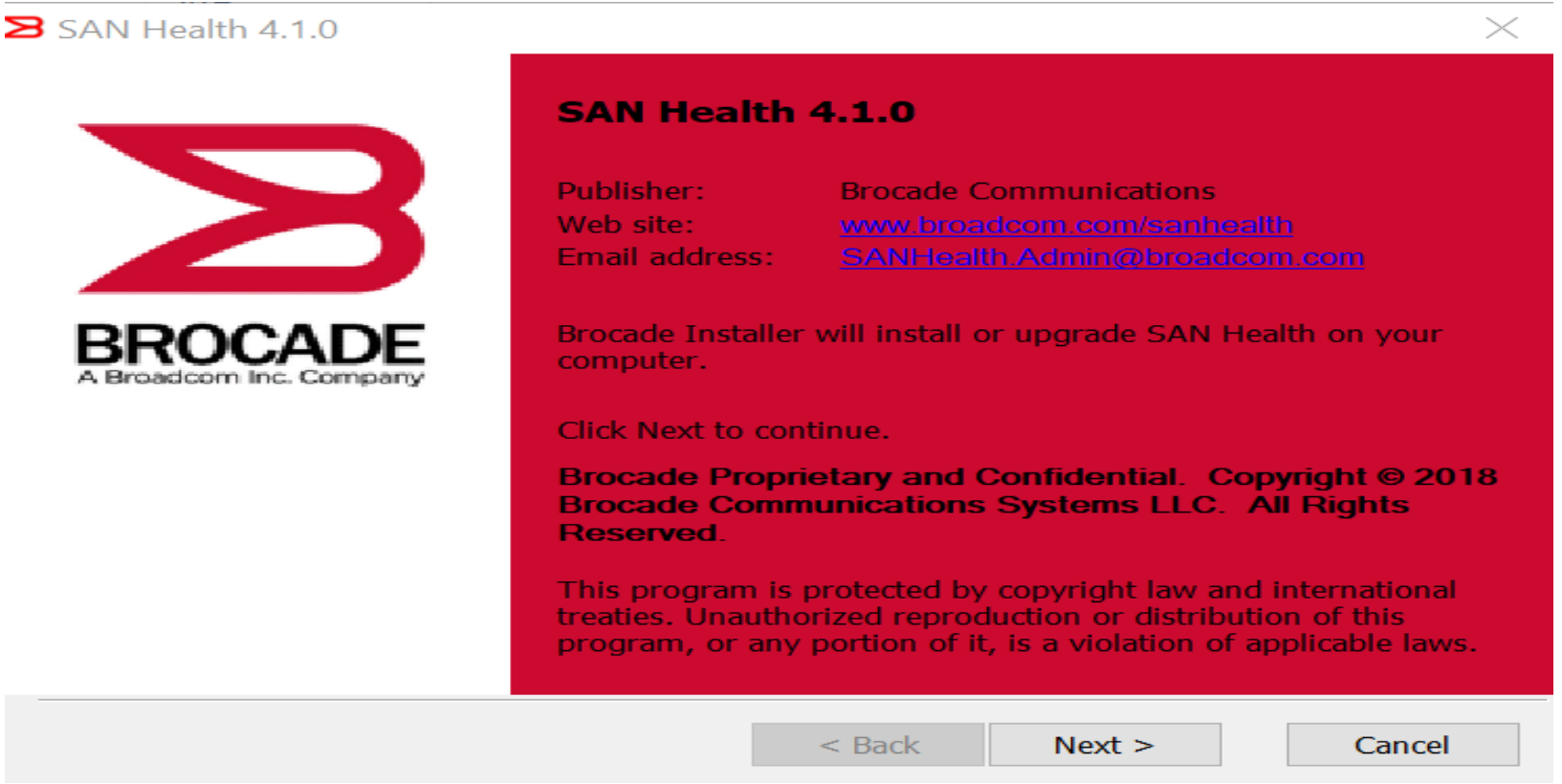
SAN Health Downloaded Successfully InstallSHPackage410.zip



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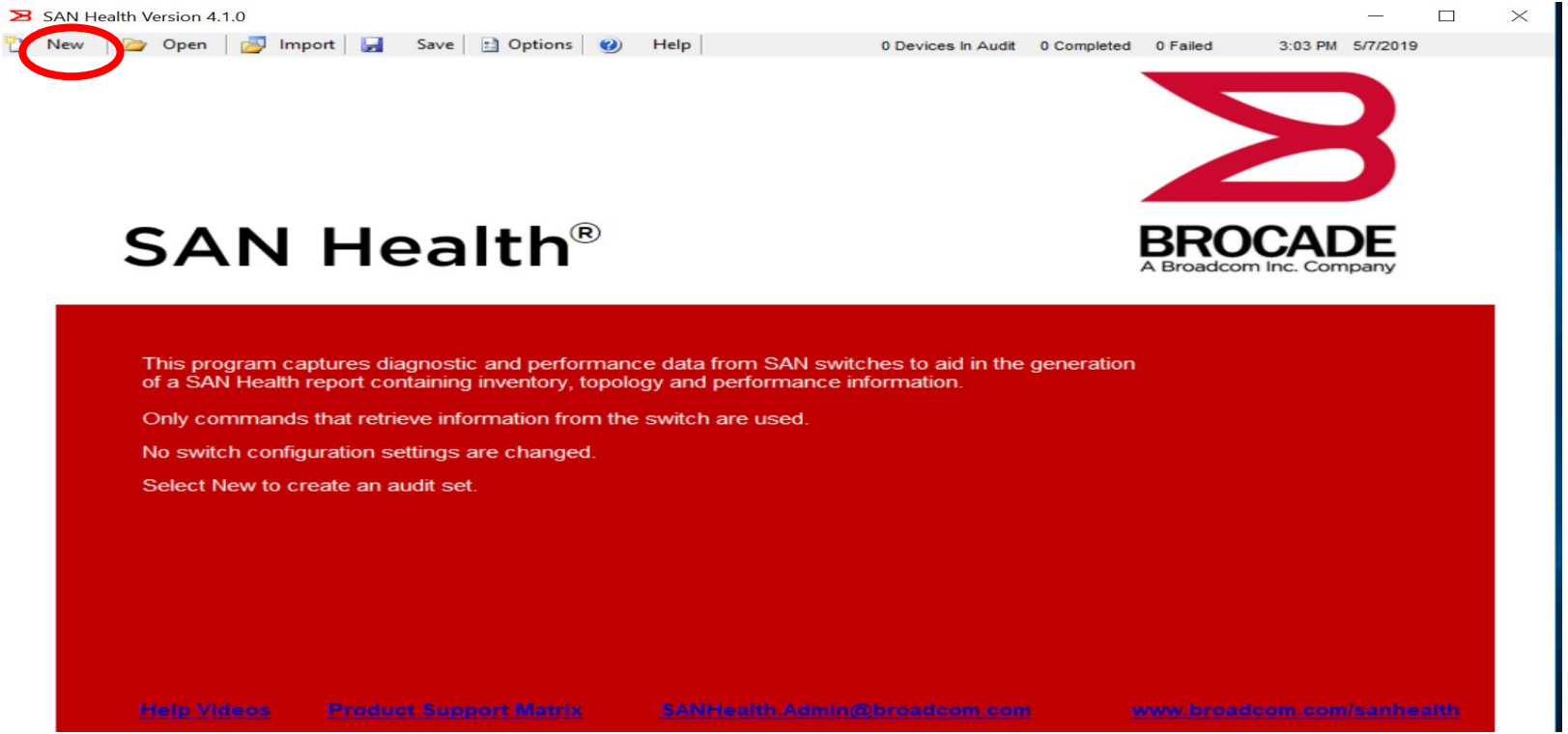
Launch SAN Health



Click “New” button to start

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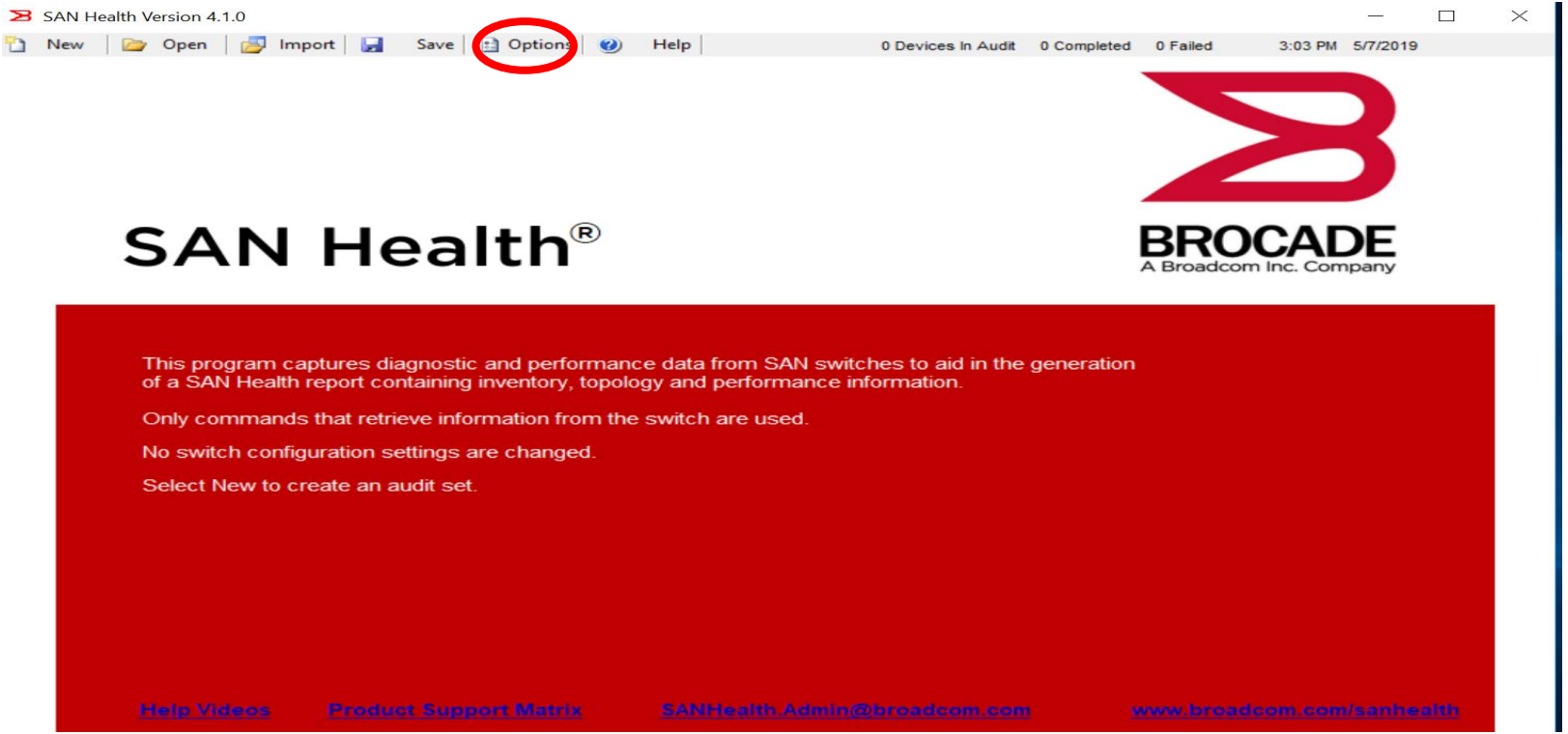
Select Option Button to change defaults



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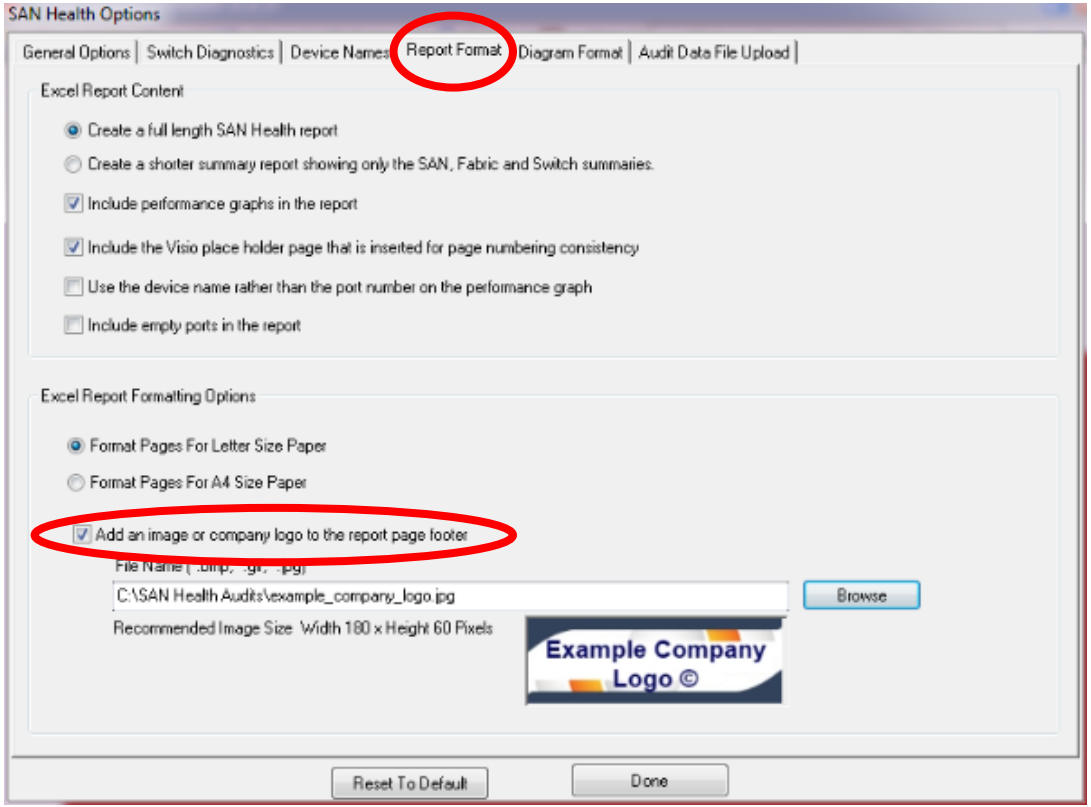
Options ...Report Format



Use this tab to select the content and format of the Excel report that will be provided when the SAN Health audit is processed.

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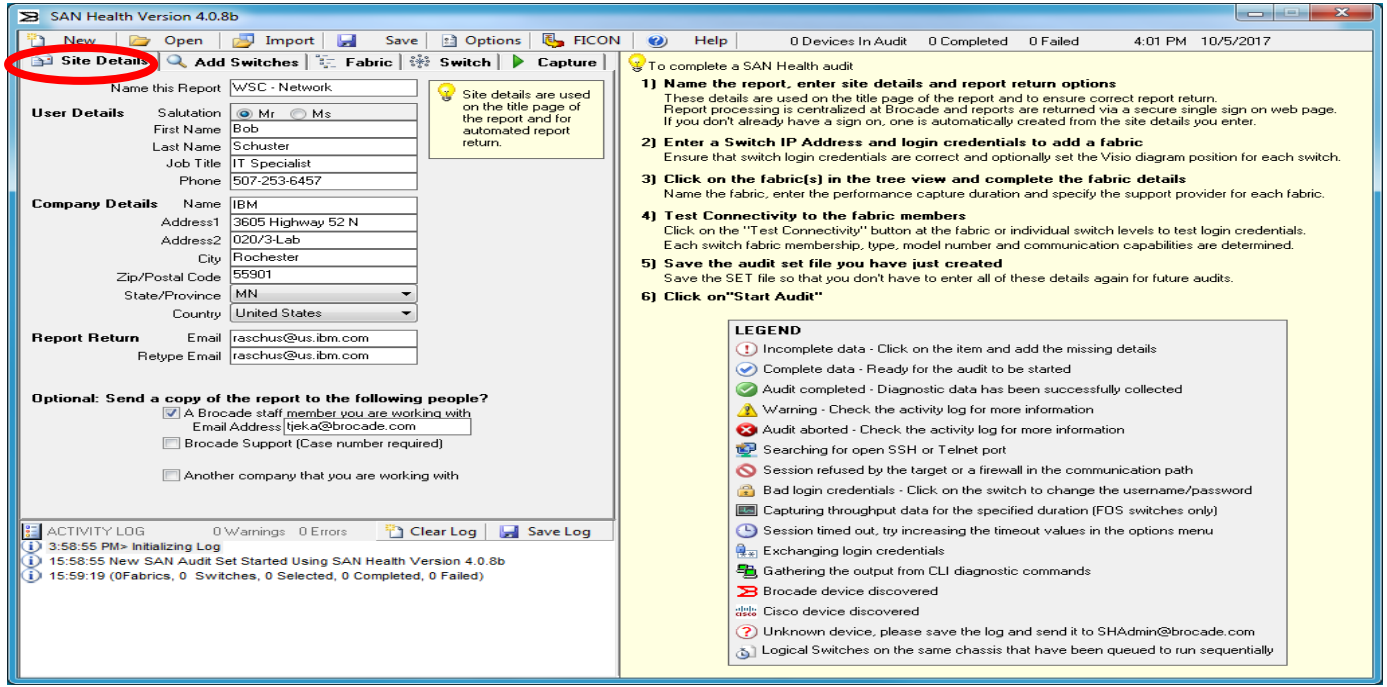
1. Enter Report Name and User Details



New Interactive Tree View… On Screen Icons

Enter your credentials, enter report return details email addresses
Click “Add Switches” to continue.

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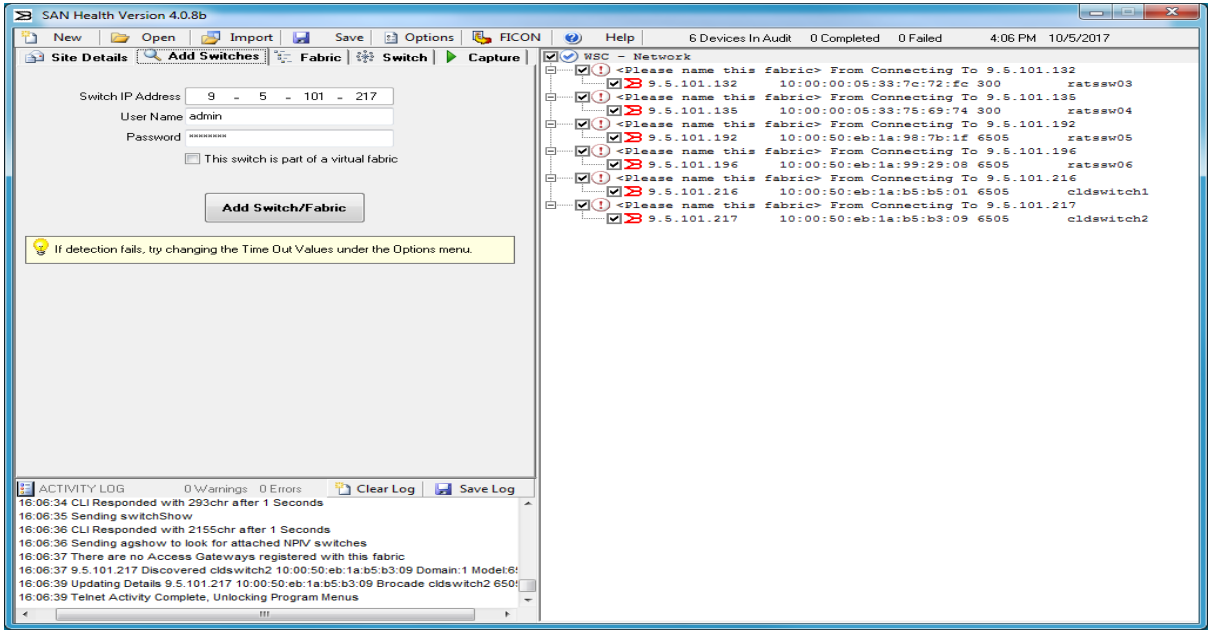
2. Enter Switch and Fabric Details (cont.) – Fabric Tab



SAN Tree View

Activity Log

Discover Switches

- **Switch IP Address**
- **User Name**
- **Password**

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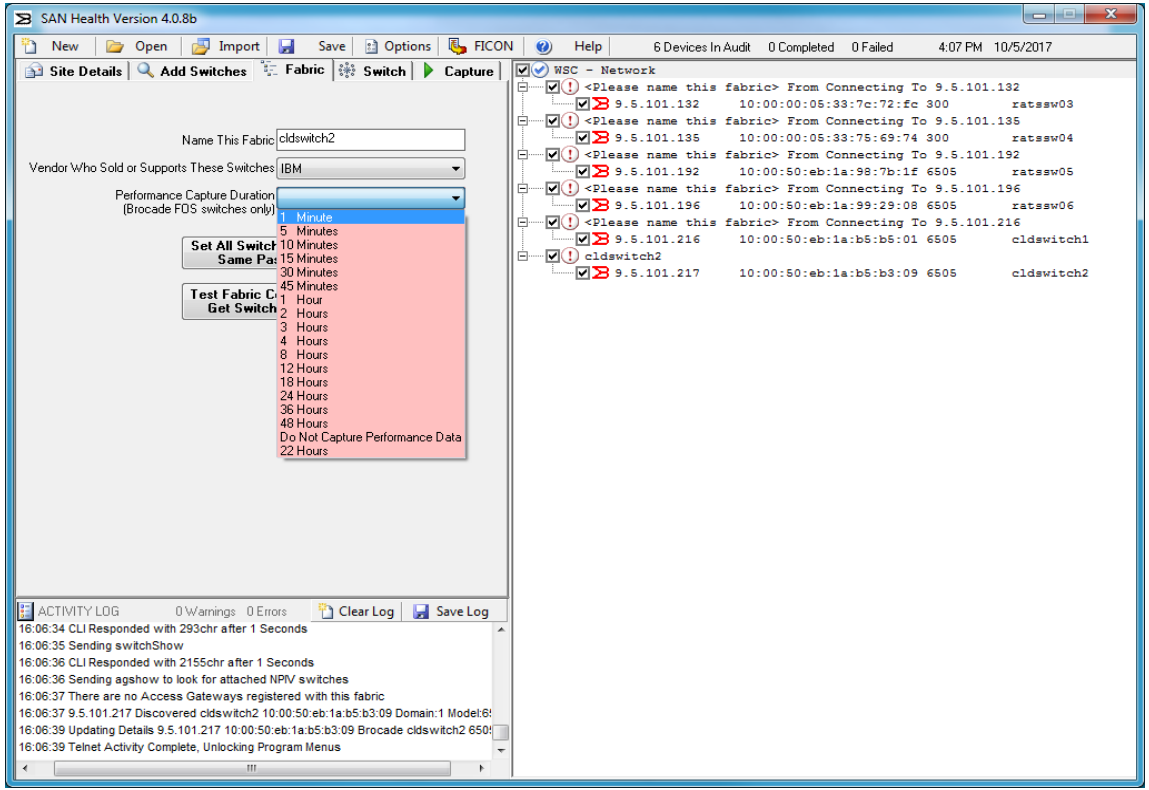
Enter Name of Fabric, Performance Duration – Fabric Tab

Set all switches to the same Password and test connectivity



SAN Tree View

Activity Log

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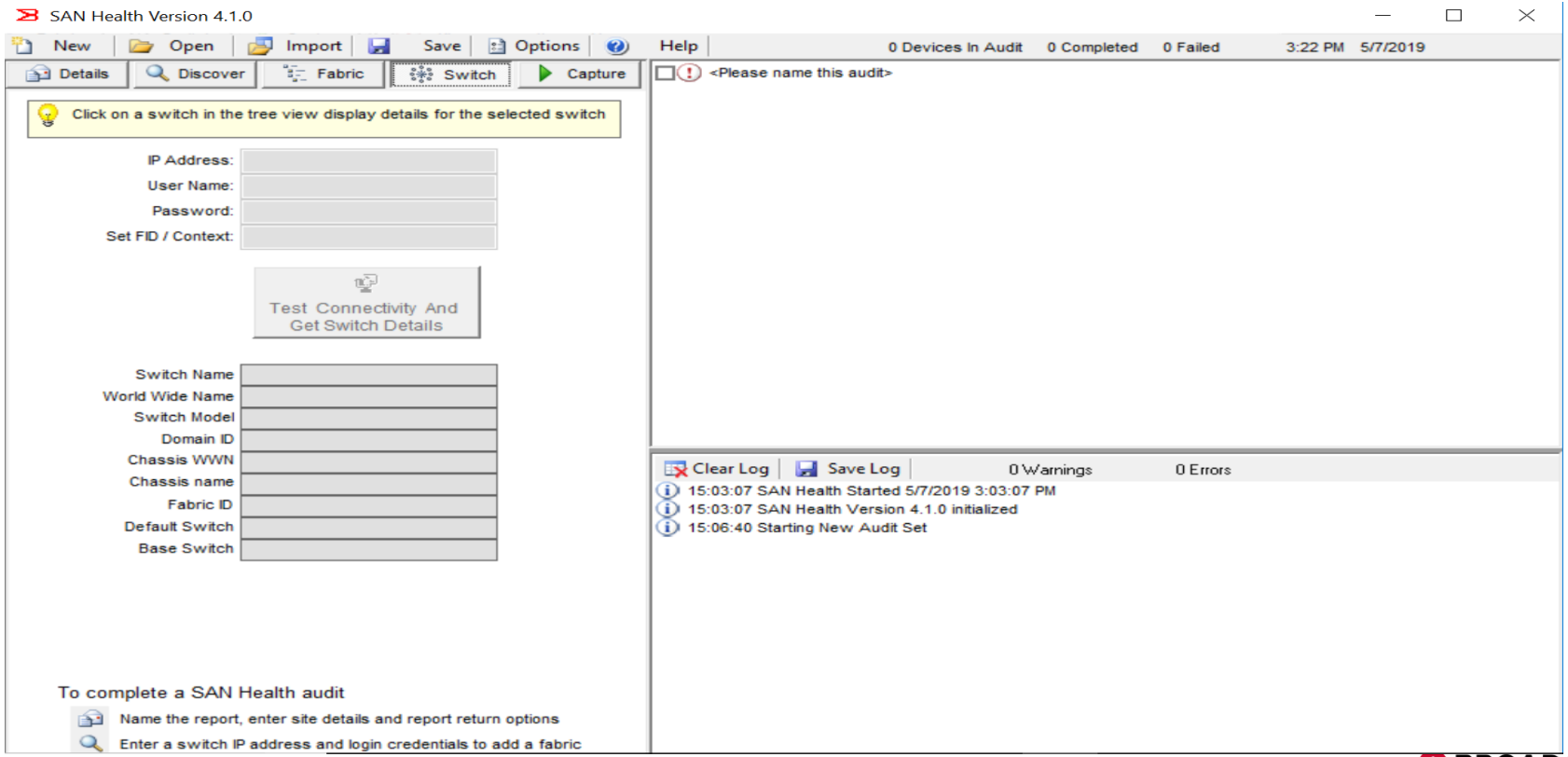
Switch Tab, Click on a switch in the tree view... Display Details.....



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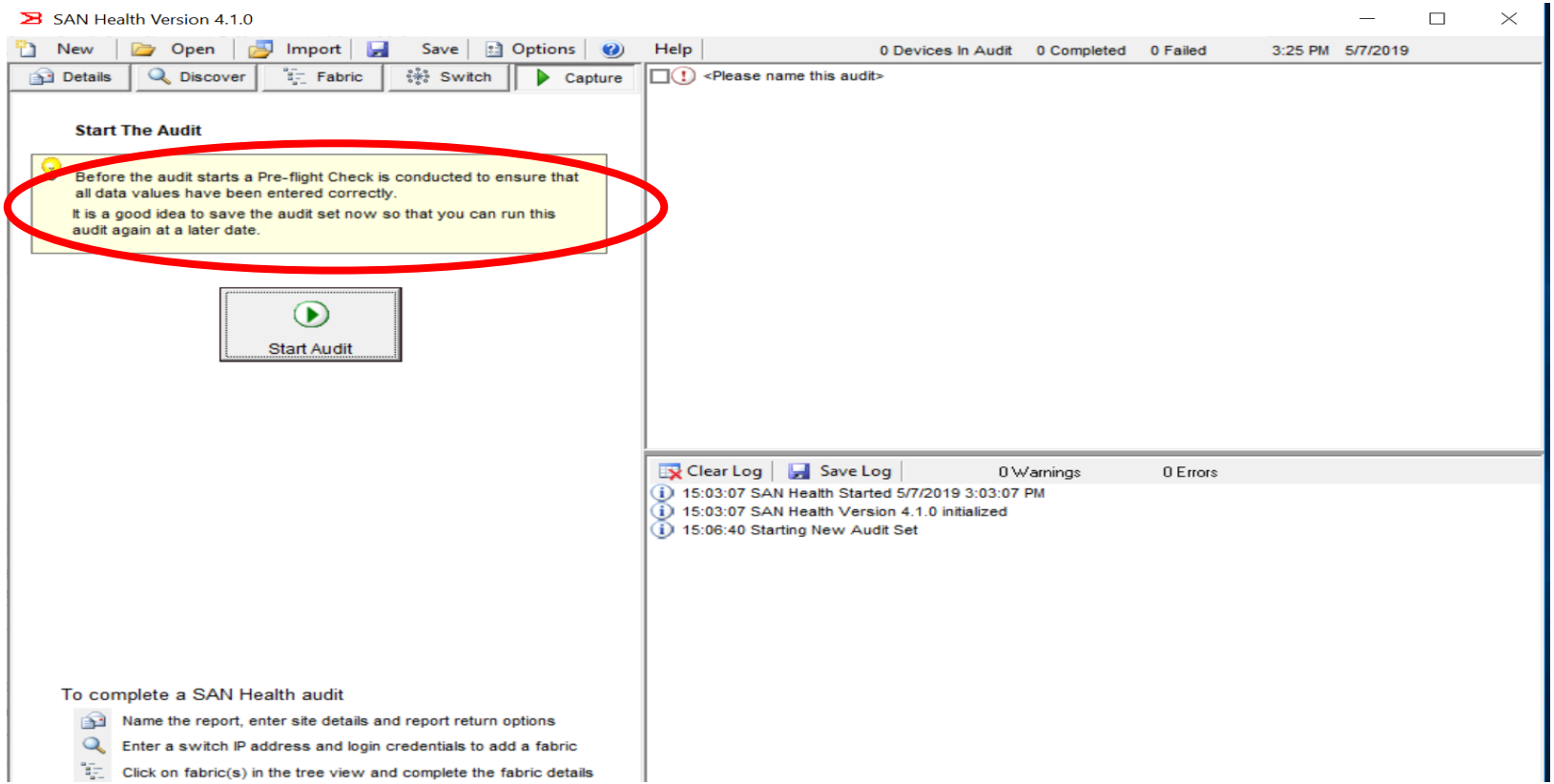
Start the Audit...Before the audit starts a Pre-flight Check is conducuted....



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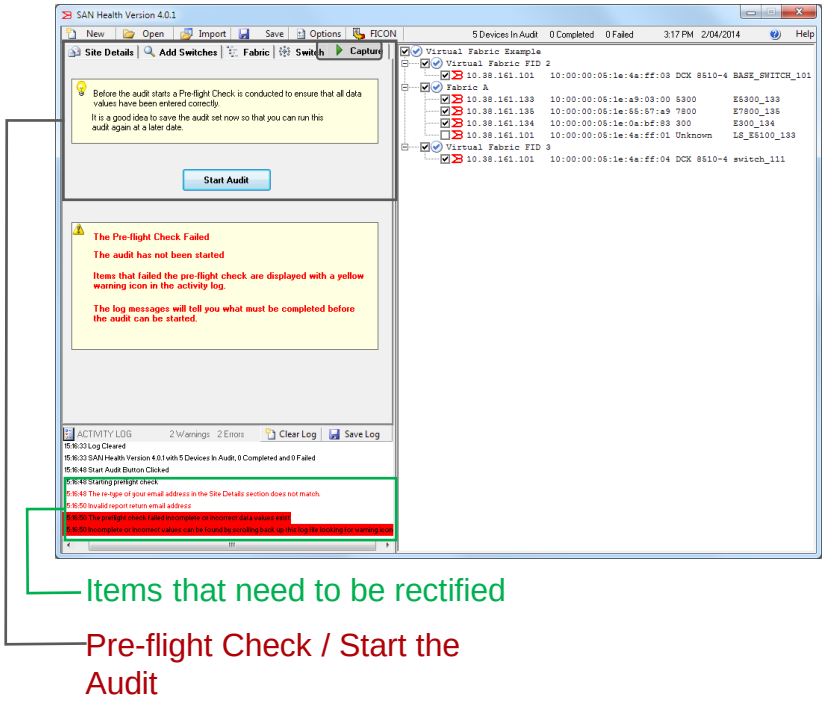
Running SAN Health™

- 3. Running the Audit – Starting the Audit

- A pre-flight check is conducted before an audit can be started
  - If anything is incomplete or incorrectly formatted, an error will display in the activity log and the audit will not start
- Clicking on “Start Audit” launches an individual telnet or SSH session to each switch and the output from diagnostic CLI commands is captured



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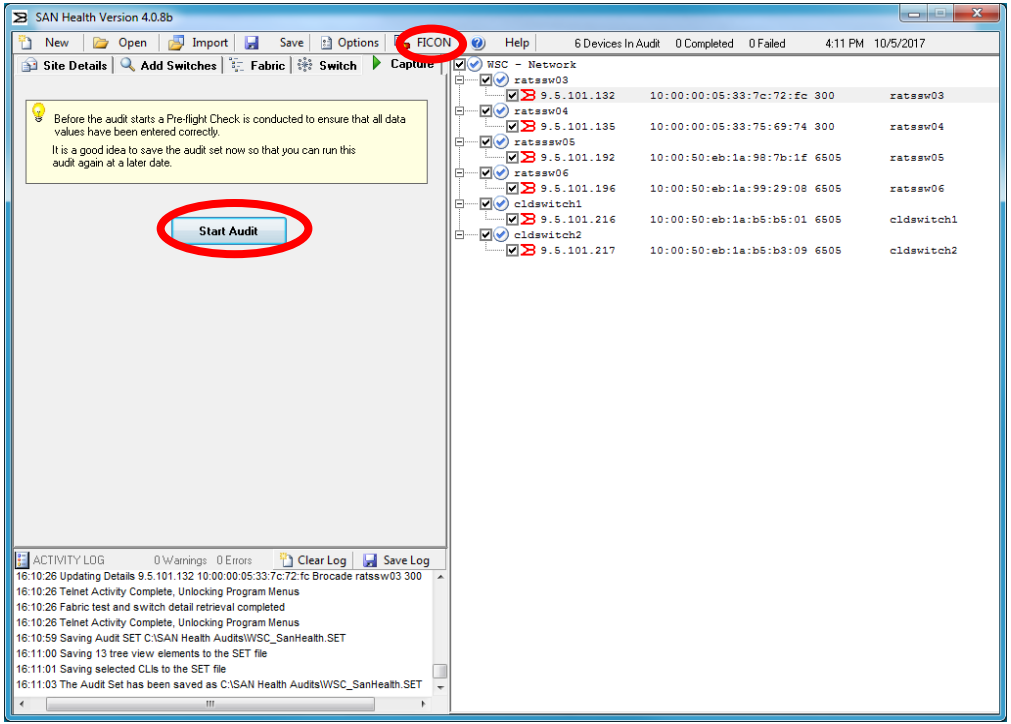
Running the Audit



Ensure all switches are accessible. Click on “Capture” tab, then click “Start Audit” button.

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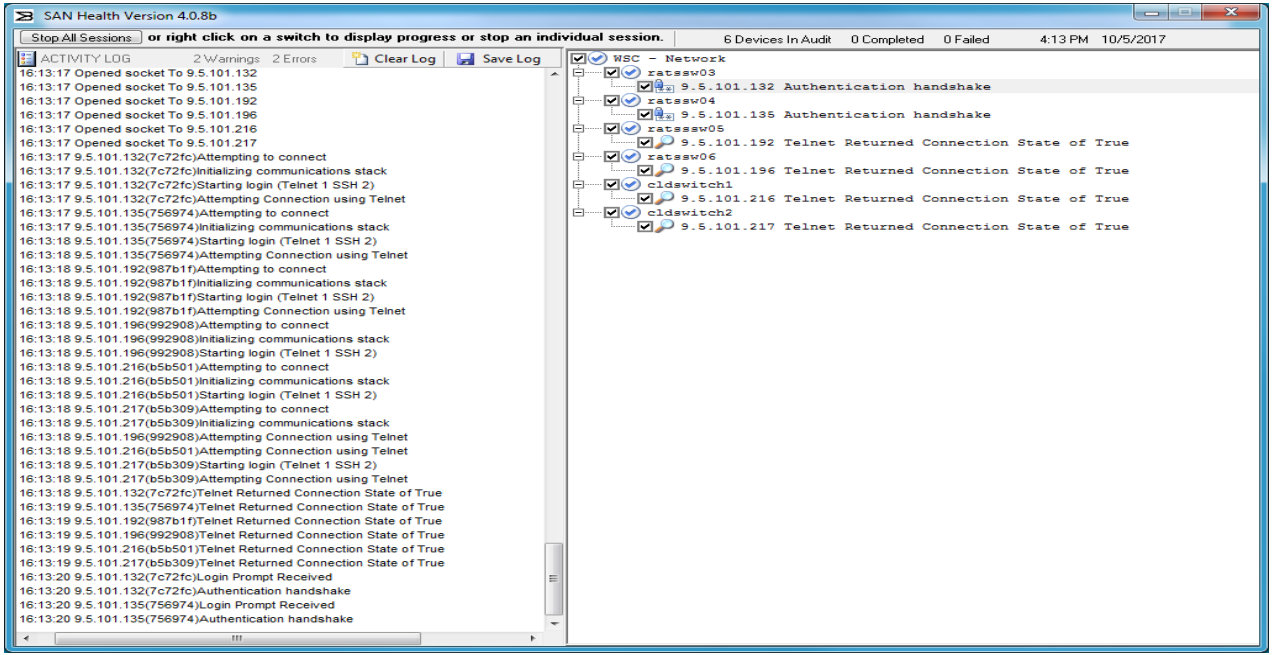
San Health runs the audit, issue the diagnostic commands, and displays the progress of each session!



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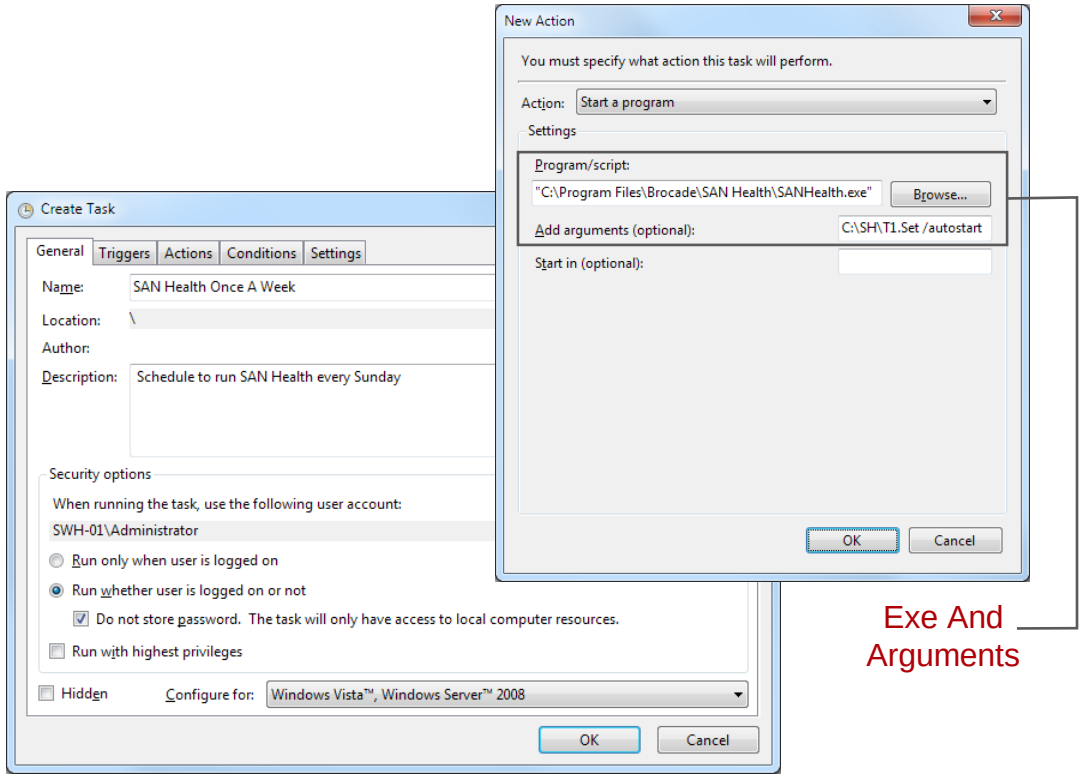
Running SAN Health™

- Scheduling Audits

- Windows Scheduler can run audits on a set schedule
  - Run SANHealth.exe as the program
  - Use the .SET file as one argument
  - Add /autostart as a second argument
  - Password does not need to be stored
  - User does not need to be logged in for SAN Health to run

New for 4.0!



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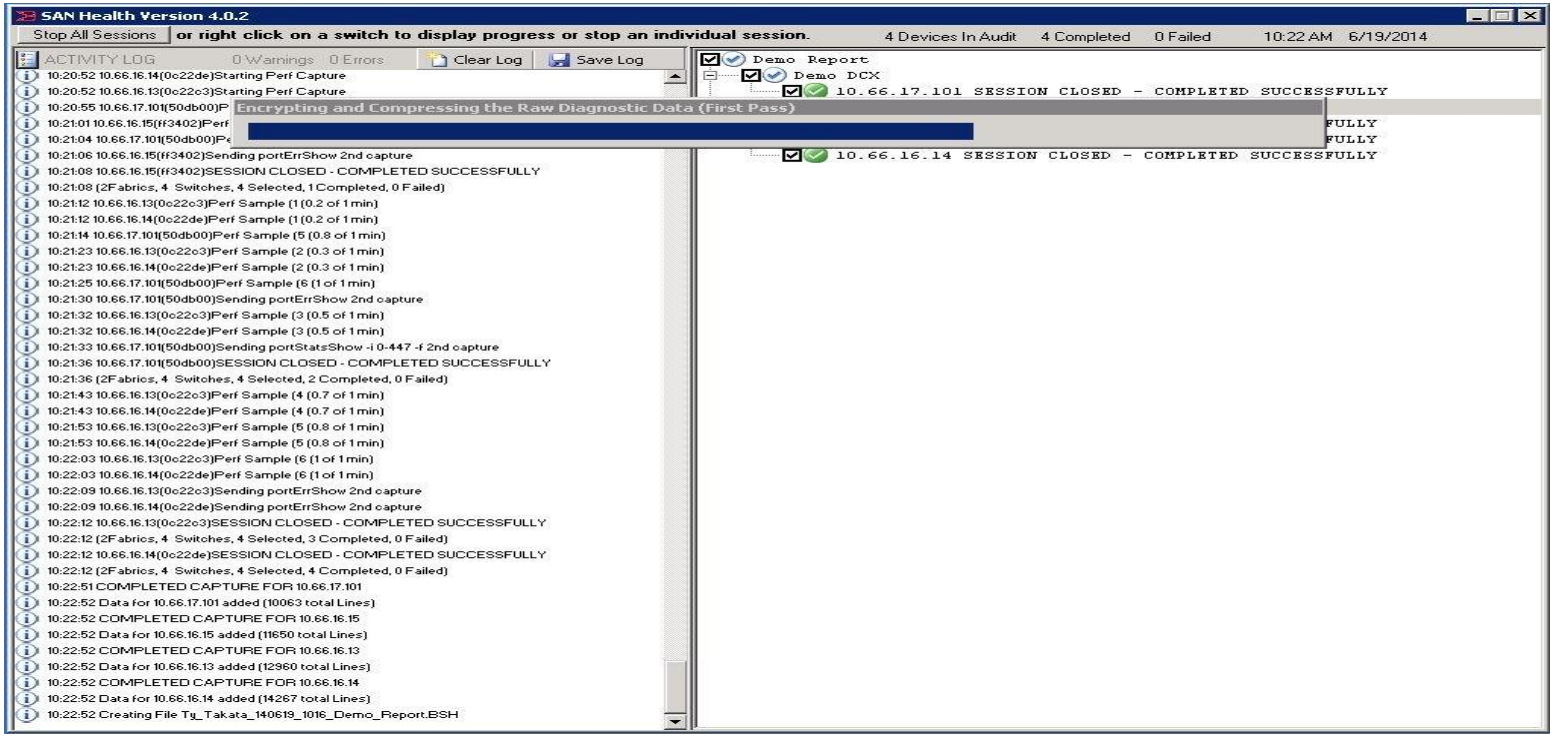
San Health will encrypt all the data immediately



San Health will encrypt all the data immediately.

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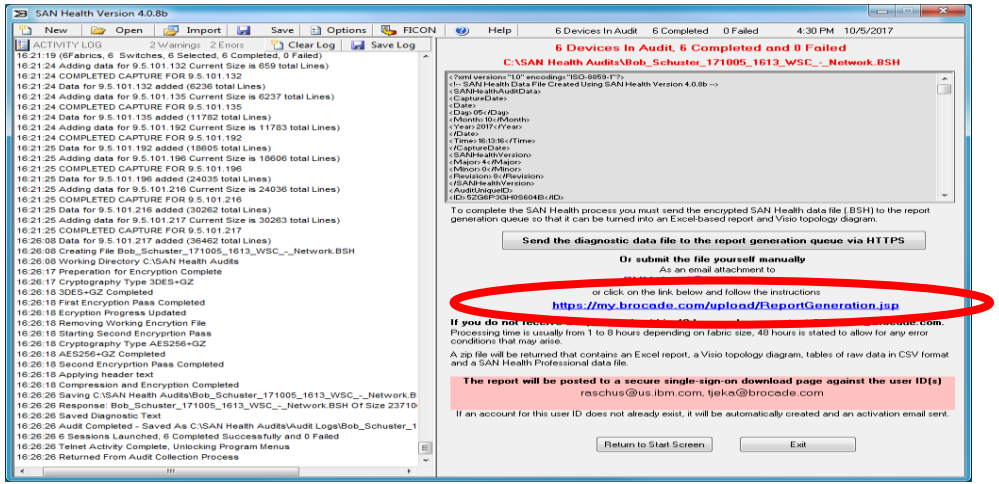
Once encryption is finished, click on “Send the diagnostic data file to the report generation queue via HTTPS” button.



SAN Health audit files get sent to shupload@brocade.com or uploaded at https://my.brocade.com/upload/ReportGeneration.jsp

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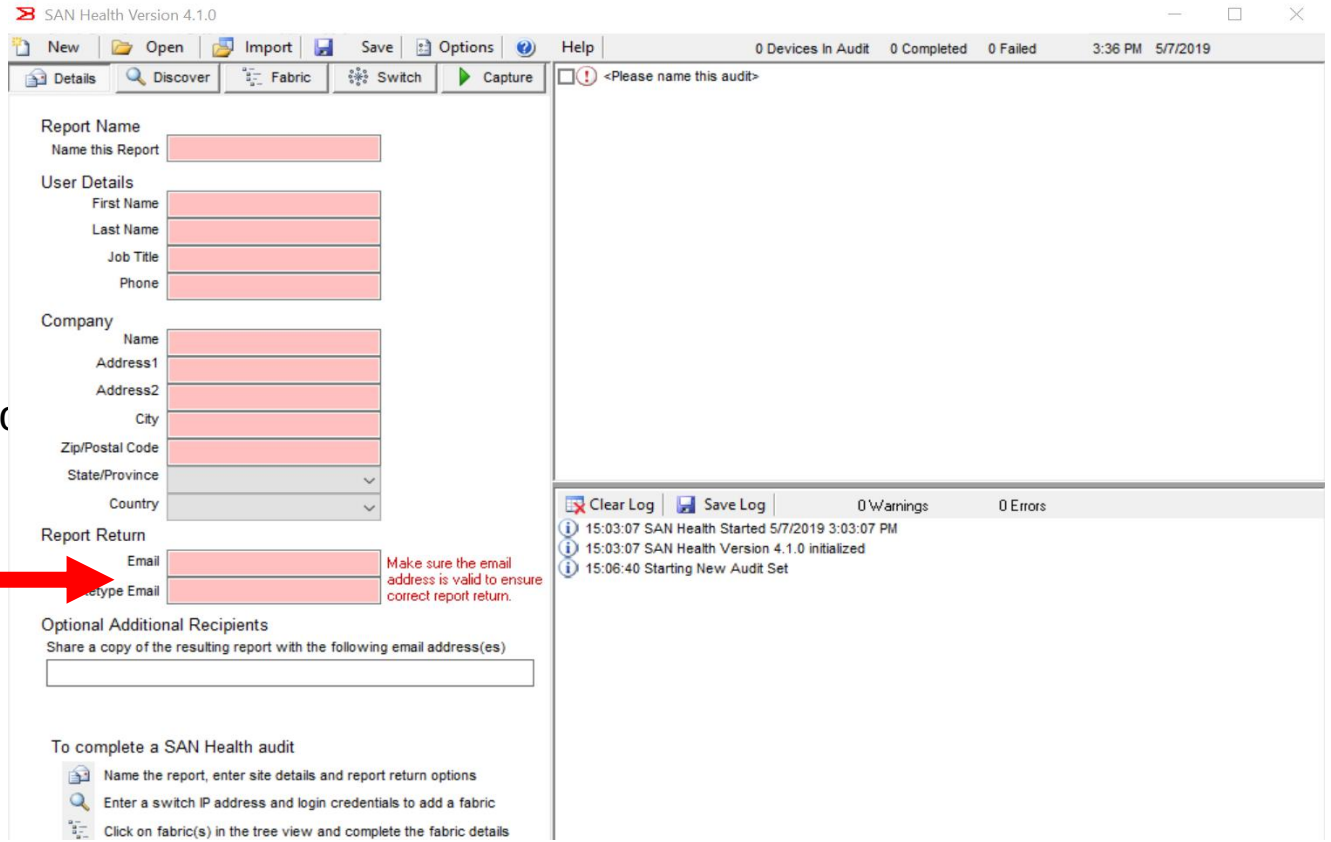
Report Return

- In addition to yourself, you can automatically share the report with:
  - A Broadcom SE
  - Broadcom Tech Suppo
  - Any other individual



Report Generation

- The report generators analyze the raw diagnostic data and generate a detailed SAN Health report and topology diagram
- Automated, secure, backend report generation process
- 1 to 8 hours to process (48 hours for faulted files)
- The report is stored in your MyBrocade account for retrieval
- You are notified when the report is available for download
- Shared recipients will automatically receive copies of the report
- Reports are keep for 30 days and then are automatically deleted
- Audit files can be re-submitted if the report needs to be re-generated

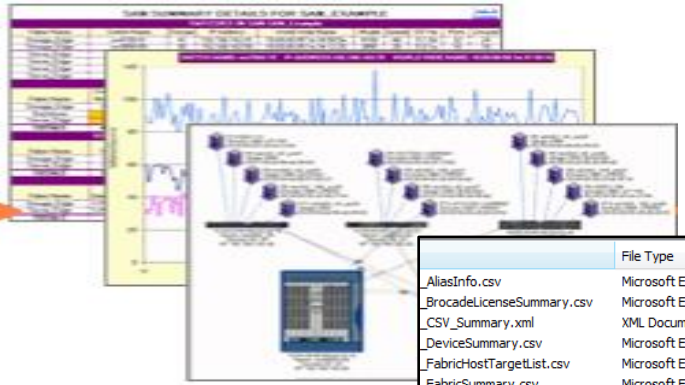
SAN Health Audit Process

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
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_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 MyBrocade account for retrieval

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Report Retrieval

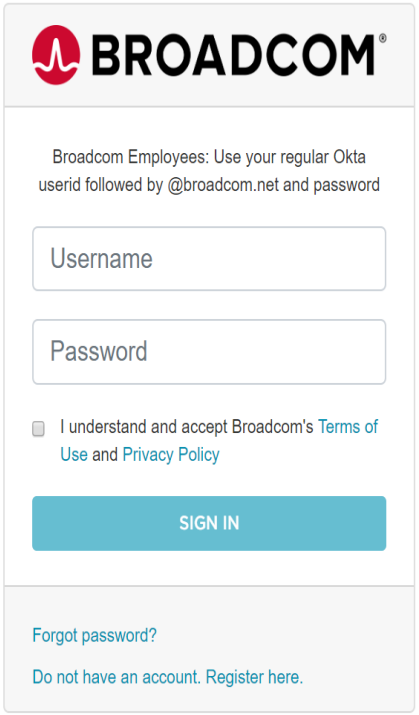
- Select the desired report to download

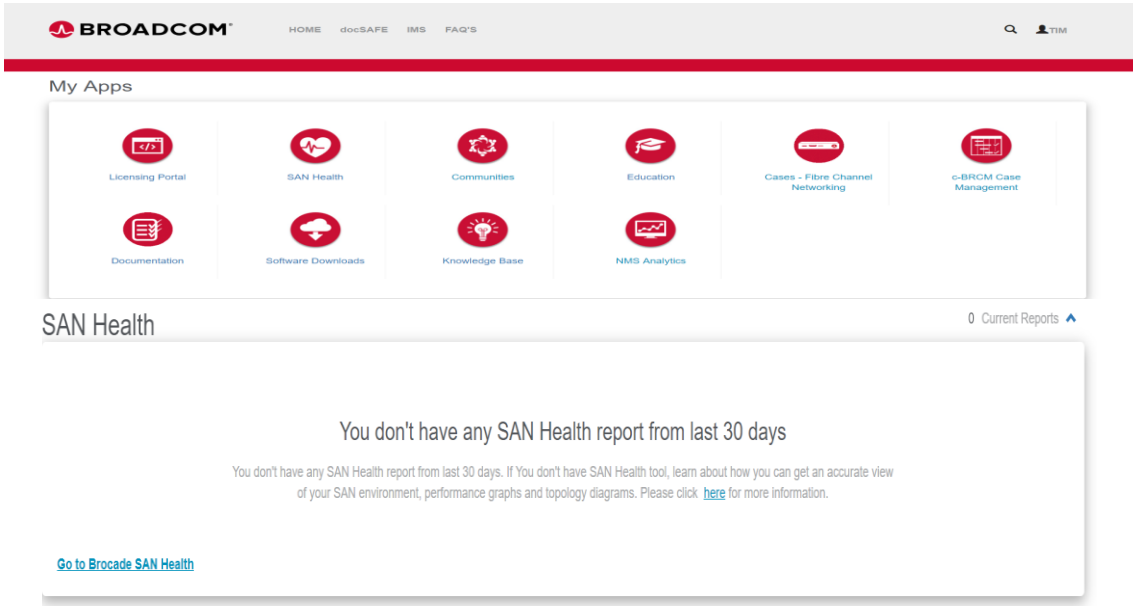
When we send report ready notifications, the direct link we send users is https://portal.broadcom.com/group/support/san-health

However the main portal page is here - which in my opinion is where the mybroadcom stuff should land people.... https://portal.broadcom.com/group/support/home

What you see under it (the apps) is dependent on your profile.

If a user has run SAN Health, they will see SAN Health in the list, clicking on it takes you to the url above.





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

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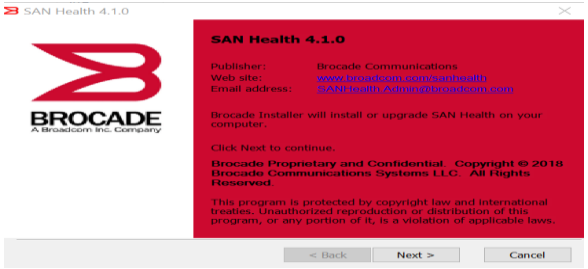
SAN Update



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!

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SAN Storage Refresh Oppotunity

Migration Services

Performance Graph Example..SAN Health

What's in a SAN Health Report?

How to Create a SAN Health Report

What is Brocade's SAN Health?

October 2017

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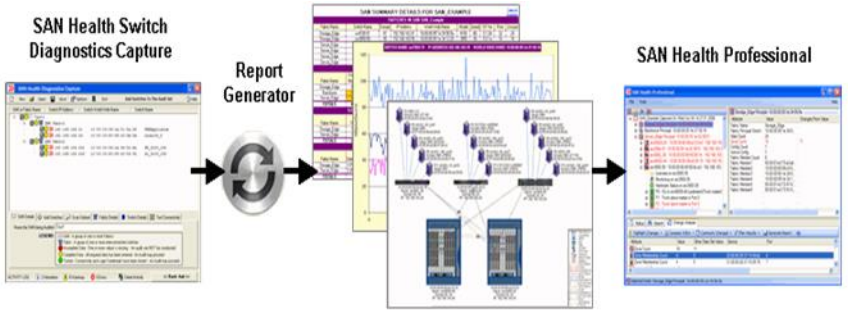
Brocade's SAN Health
The Deliverable...



Launch the Tools

Lets See what's inside….

Your SAN Health report is comprised of three files:

A Microsoft Visio topology diagram (.VSD)

A spreadsheet in Microsoft Excel format (.XLS)

A .SHData file for use in SAN Health Professional.

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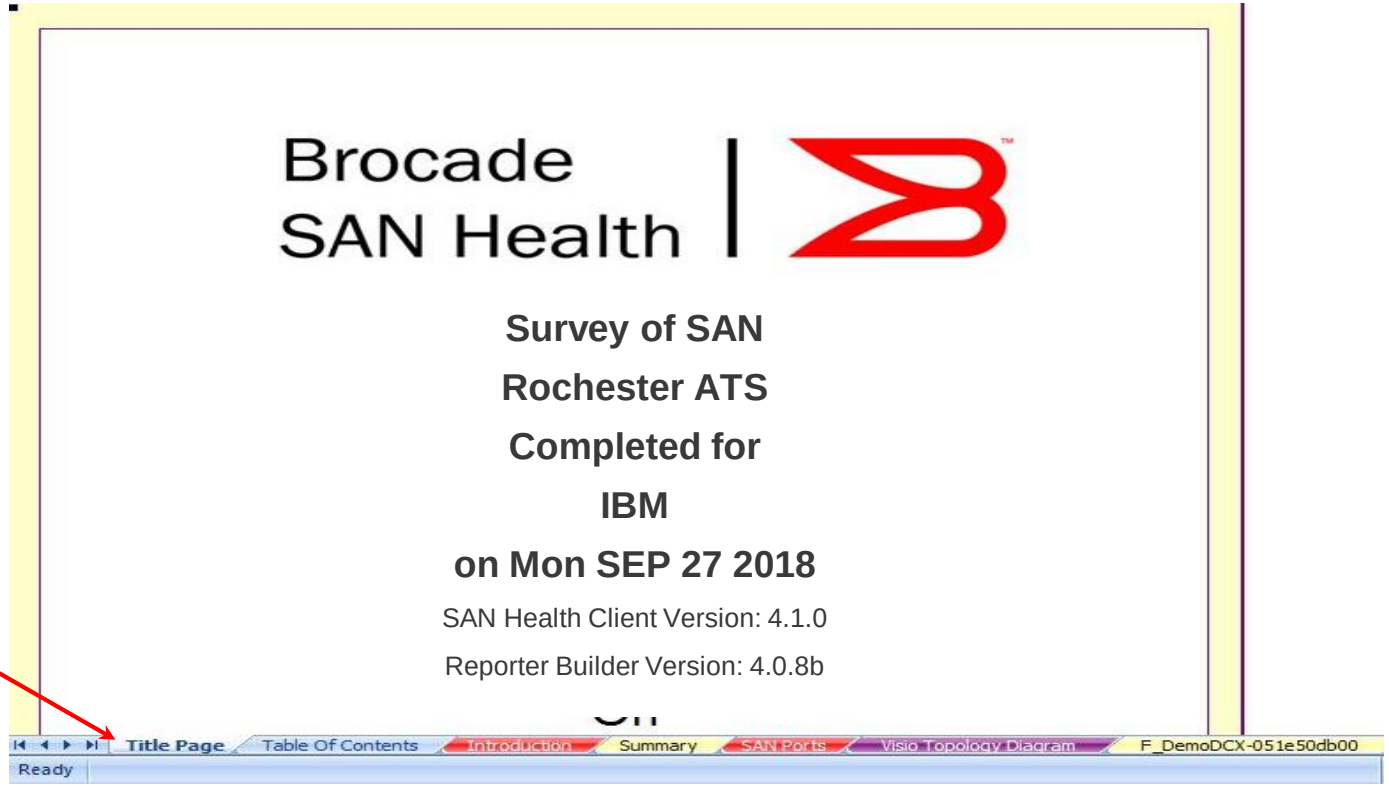
Excel Report is Categorized by Tabs

Select “End of Maintenance” tab Or Alert



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SAN Health Report Generation

Installation Package Builder… now a Requested item!

http://tinyurl.com/HealthInstalls

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

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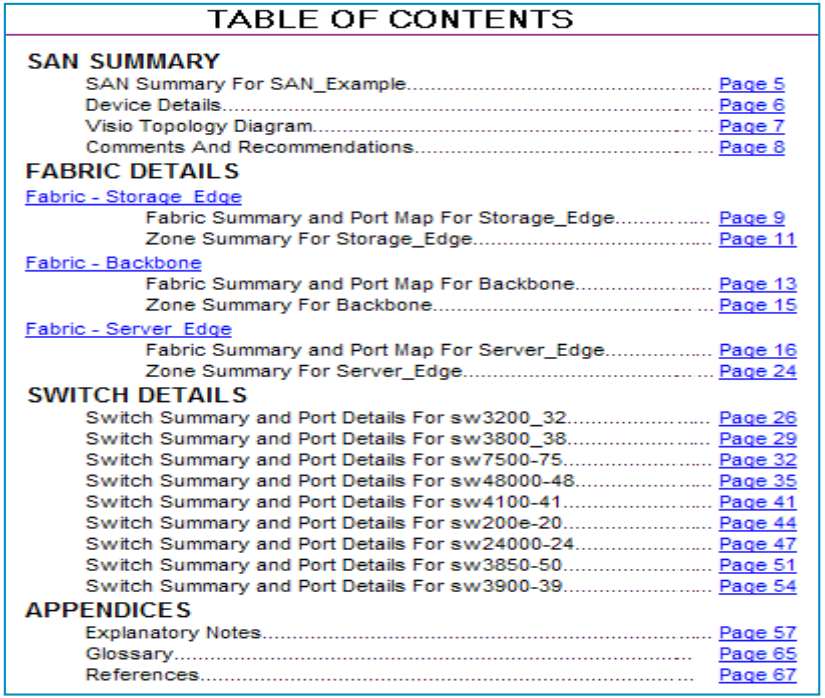
Exploring Your Reports

Well organized detailed information



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You will receive a report containing:

- A multi-tabbed Microsoft Excel based reports structured in a hyperlinked drill down hierarchy of SAN to Fabric to Switch to Port
- A Microsoft Visio diagram of the SAN(s)
- A zipped set of the captured data

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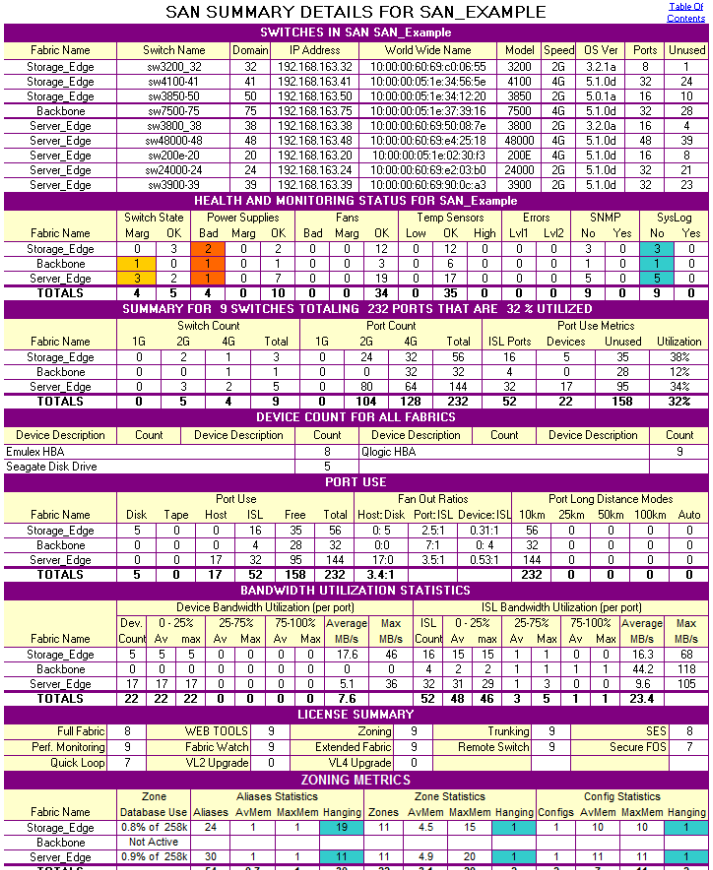
The SAN Summary is your starting point



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

New Interactive Tree View… On Screen Icons

LEGEND


Incomplete data - Click on the item and add the missing details


Complete data - Ready for the audit to be started


Audit completed - Diagnostic data has been successfully collected


Warning - Check the activity log for more information


Audit aborted - Check the activity log for more information


Searching for open SSH or Telnet port


Session refused by the target or a firewall in the communication path


Bad login credentials - Click on the switch to change the username/password


Capturing throughput data for the specified duration (FOS switches only)


Session timed out, try increasing the timeout values in the options menu


Exchanging login credentials


Gathering the output from CLI diagnostic commands


Brocade device discovered


Cisco device discovered


Unknown device, please save the log and send it to SHAdmin@brocade.com

Explanatory Notes Appendix

Review the Explanatory Notes appendix for additional detail and items of interest

1.1.2 Health and Monitoring Status Table

HEALTH AND MONITORING STATUS FOR EXAMPLE SAN 1

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
ETS-Fabric-A	0	5	0	0	10	0	0	20	0	15	0	0	3	5	0	0	5
ETS-Fabric-B	0	1	1	0	1	0	0	6	0	5	0	0	0	1	0	1	0
TOTALS	**0**	**6**	**1**	**0**	**11**	**0**	**0**	**26**	**0**	**20**	**0**	**0**	**3**	**6**	**0**	**1**	**0**

This table provides information about the overall health of each fabric. Each row provides information about one fabric, except the last row which provides an overall total for all fabrics.

Items to Watch For

The *Switch State* is determined by the Switch Status Policy settings. If you believe that your switch is incorrectly displayed as Marginal of Faulty, review the corresponding Switch Status Policy thresholds in the Switch Details section of this report.

The *Temperature Sensors* are located inside the switch. In some switch models, high temperature readings may be normal. When high readings are noted in SAN Health, it is important to check that the ambient air temperature at the airflow intake for the switch does not exceed 40 Degrees Celsius. If that is the case, and all fans are working, then the temperature sensor reading is not a problem.

The *Error Levels* "PANIC" and "CRITICAL" are added to the Level 1 error count. The Error Level "ERROR" is added to the Level 2 count. Level 1 errors are rare and should always be investigated immediately. Level 2 errors should be investigated, but are not always indicative of a real problem. First check the error date on the Switch Details page.

On some switch models up to over two thousand error messages may be stored, so a significant number of historical messages may remain in memory, which means that many error messages may be left over conditions that occurred long ago, e.g. when the switches were originally installed or when a major change was made to the fabric. If the error message is recent and/or repeating, or looks serious, you should contact your support provider.

It is common for the *Syslog* alert to be highlighted in blue. This means that the switch is not configured to send alert messages to a syslog server. Configuring a syslog server is always recommended. In extreme error conditions, the log inside the switch may becomes full, causing important error messages to "scroll" out of memory. Using an external syslog server ensures that all error messages are saved.

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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

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Storage_Edge

Dom	Port	Speed	Description	Name / Alias	Model	Firmware	Driver	Port World Wide Name	Additional Information
32	3	2 G	Seagate Disk Drive	jbod_32_port3_1	ST336605	Unknown	Unknown	22:00:00:20:37:e6:02:1b	36G
32	4	2 G	Seagate Disk Drive	jbod_32_port4_1	ST336605	Unknown	Unknown	22:00:00:20:37:42:3e:df	36G
41	4	2 G	Seagate Disk Drive	jbod_41_port4_2	ST336605	Unknown	Unknown	22:00:00:20:37:15:06:bb	36G
41	5	2 G	Seagate Disk Drive	jbod_41_port5_3	ST336605	Unknown	Unknown	21:00:00:20:37:15:17:05	36G
41	7	2 G	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	2 G	Qlogic HBA	win2k3_40_port2	Unknown	4.00.23	9.1.2.19	21:02:00:e0:8b:ce:29:d3	(w 32)
38	1	2 G	Qlogic HBA	win2k3_40_port5	QLA2342	3.03.19	9.1.2.19	21:01:00:e0:8b:27:25:c3	(w 32) 133MHz PCI-X Dual Port
38	2	2 G	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	2 G	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	2 G	Qlogic HBA	win2k3_40_port1	Unknown	4.00.23	9.1.2.19	21:01:00:e0:8b:ae:29:d3	(w 32)
38	5	2 G	Qlogic HBA	win2k3_40_port4	QLA2342	3.03.19	9.1.2.19	21:00:00:e0:8b:07:25:c3	(w 32) 133MHz PCI-X Dual Port
38	6	2 G	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	2 G	Qlogic HBA	win2k3_40_port3	Unknown	4.00.23	9.1.2.19	21:03:00:e0:8b:ee:29:d3	(w 32)
20	4	2 G	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	2 G	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	2 G	Qlogic HBA	win2k3_40_port7	QLA2342	3.03.19	9.1.2.19	21:01:00:e0:8b:2e:95:e2	(w 32) 133MHz PCI-X Dual Port
20	13	2 G	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	2 G	Qlogic HBA	win2k3_40_port0	Unknown	4.00.23	9.1.2.19	21:00:00:e0:8b:8e:29:d3	(w 32)
39	6	2 G	Qlogic HBA	win2k3_40_port6	QLA2342	3.03.19	9.1.2.19	21:00:00:e0:8b:0e:95:e2	(w 32) 133MHz PCI-X Dual Port
39	8	2 G	Emulex HBA	win2k3_109_port1	LP9002	3.82A1	5-5.10A10	10:00:00:00:c9:2b:4f:1d	Win 2000/3 x86 SCSIport Minipor
39	9	2 G	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	2 G	Emulex HBA	win2k3_109_port0	LP9002	3.81A3	5-5.10A10	10:00:00:00:c9:28:c8:43	Win 2000/3 x86 SCSIport Minipor

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
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**

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:f[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	AplInc (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	5.1[illegible]:1	0	8	34	30	0	0	0	96	0	0	0	0	0
RDCDIRB41	240	76	0	51	0	107	0	1	[illegible]	3	1	2.06:1	15.9:1	2	29	122	87	0	0	0	[illegible]0	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

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Report Use Example:

Suspicious Port Errors…. Color coded after thresholds are exceeded!

PORT DETAILS FOR CORE39 IN FABRIC ETS-Fabric-B

Port 0	Unused Port																														
Port 1	Unused Port																														
Port 2	Unused Port																														
Port 3	Unused Port																														
Port 4	**euro_1_9bwwn Seagate JBOD 13 public SEAGATE ST336605FC 0002**																														
Av Perf	7MB/s	Port WWN	22:00:00:04:cf:20:5a:f2			Speed	2 Gbps		Port ID	9c04cd		Media	ShortWave		SFP Type	IBM														
Peak Perf	21 MB/s	NodeWWN	20:00:00:04:cf:20:5a:f2			Type	L-Port		Status	Online		LD level	L0		Bound	SCSCI														
Tx	536m	Rx	4.2g	Ecln	319m	crc	291m	Shrt	0	Lng	0	EOF	0	Eout	6	Sync	0	Link	0	C3D	918	Lsig	0	Rjct	0	Bsy	0				
Port 5	**euro_1_10bwwn Seagate JBOD 8 public SEAGATE ST373307FC 0006**																														
Av Perf	10.2 MB/s	Port WWN	21:00:00:04:cf:d5:35:7a			Speed	2 Gbps		Port ID	9c05cd		Media	ShortWave		SFP Type	IBM														
Peak Perf	33 MB/s	NodeWWN	20:00:00:04:cf:d5:35:7a			Type	L-Port		Status	Online		LD level	L0		Bound	SCSCI														
Tx	72m	Rx	96m	Ecln	0	crc	0	Shrt	0	Lng	0	EOF	0	Eout	21	Sync	0	Link	0	C3D	0	Lsig	0	Rjct	0	Bsy	0				
Port 6	Unused Port																														

- Port errors are a normal part of a healthy SAN. However, if any of the following counters: crc, too short, too long, enc_in and bad eof are greater than 5% of the TX and RX count then the port should be investigated.
- Frame errors are an indicator for a marginal component (GBIC/SFP, cable) in the path.

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Zoning and Performance Tabs Provide Additional Insight

ZONING DETAILS FOR STORAGE_EDGE

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CONFIG "Storage_Edge" IS ACTIVE

Zone Database Use	Aliases Statistics: Aliases	AvMem	MaxMem	Hanging	Zone Statistics: Zones	AvMem	MaxMem	Hanging	Config Statistics: Configs	Av Num	Max Num	Hanging	Zones in Active Config
0.8% of 258k	24	1	1	19	11	4.5	15	10	1	10	10	1	10

24 ALIASES

Alias Name	Alias Member(s)
jbod_32_port3_1	22:00:00:20:37:e6:02:1b
jbod_32_port3_2	22:00:00:20:37:15:1f:e5
jbod_32_port3_3	22:00:00:20:37:15:0e:ea
jbod_32_port4_1	22:00:00:20:37:42:3e:df
jbod_32_port4_2	22:00:00:20:37:15:00:80
jbod_32_port4_3	22:00:00:20:37:42:42:a1
jbod_41_port4_1	22:00:00:20:37:15:08:1c
jbod_41_port4_2	22:00:00:20:37:15:08:bb
jbod_41_port4_3	22:00:00:20:37:15:09:1c
jbod_41_port5_1	21:00:00:20:37:15:17:6c
jbod_41_port5_2	21:00:00:20:37:15:1a:2c
jbod_41_port5_3	21:00:00:20:37:15:17:05
jbod_41_port7_1	21:00:00:20:37:15:09:b8
jbod_41_port7_2	21:00:00:20:37:15:09:76
jbod_41_port7_3	21:00:00:20:37:15:08:ad
win2k3_106_port1	10:00:00:00:c9:29:0e:e4
win2k3_109_port0	10:00:00:00:c9:28:c8:43
win2k3_109_port1	10:00:00:00:c9:2b:4f:1d
win2k3_40_port0	21:00:00:e0:8b:8e:29:d3
win2k3_40_port1	21:01:00:e0:8b:ae:29:d3
win2k3_40_port2	21:02:00:e0:8b:ce:29:d3
win2k3_40_port3	21:03:00:e0:8b:ee:29:d3
win2k3_40_port4	21:00:00:e0:8b:07:25:c3
win2k3_kaivon_0	10:00:00:00:c9:28:c5:fa

11 ZONES

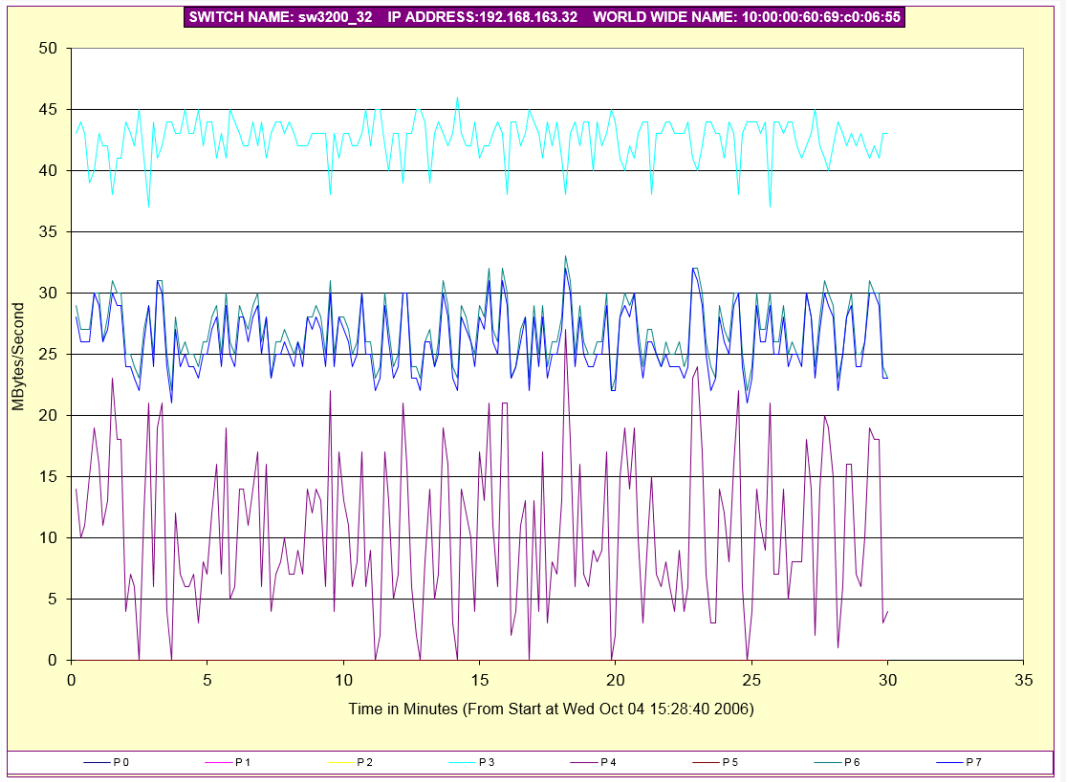
Zone Name	Zone Member(s)				
LSAN_win_pathA	win2k3_40_port0	jbod_41_port4_1			
LSAN_win_pathB	win2k3_40_port1	jbod_41_port5_1			
LSAN_win_pathC	win2k3_40_port2	jbod_41_port7_1			
LSAN_win_pathD	win2k3_40_port3	jbod_32_port3_1			
LSAN_win_pathE	win2k3_40_port4	jbod_32_port4_1			
LSAN_win_pathF	win2k3_106_port1	jbod_41_port4_2	jbod_41_port5_2	jbod_41_port7_2	
	jbod_32_port3_2	jbod_32_port4_2			
LSAN_win_pathG	win2k3_kaivon_0	jbod_41_port4_2	jbod_41_port5_2	jbod_41_port7_2	
	jbod_32_port3_2	jbod_32_port4_2			
LSAN_win_pathH	win2k3_109_port0	jbod_41_port4_2	jbod_41_port5_2	jbod_32_port4_2	
LSAN_win_pathI	win2k3_109_port1	jbod_41_port7_2	jbod_32_port3_2		
LSAN_win_pathJ	win2k3_106_port0	jbod_41_port4_2	jbod_32_port4_2	jbod_41_port7_2	
	jbod_32_port3_2				
Storage_Fabric	jbod_41_port4_1	jbod_41_port4_2	jbod_41_port4_3	jbod_41_port5_1	
	jbod_41_port5_2	jbod_41_port5_3	jbod_41_port7_1	jbod_41_port7_2	
	jbod_41_port7_3	jbod_32_port3_1	jbod_32_port3_2	jbod_32_port3_3	
	jbod_32_port4_1	jbod_32_port4_2	jbod_32_port4_3		

1 CONFIG

Config Name	Config Member(s)		
Storage_Edge	LSAN_win_pathA	LSAN_win_pathB	LSAN_win_pathC
	LSAN_win_pathD	LSAN_win_pathE	LSAN_win_pathI
	LSAN_win_pathF	LSAN_win_pathG	LSAN_win_pathH
	Storage_Fabric		

RUNNING CONFIG "Storage_Edge" WITH 10 ACTIVE ZONES

Active Zones	Active Zone Member(s)			
LSAN_win_pathA	21:00:00:e0:8b:8e:29:d3	22:00:00:20:37:15:08:1c		
LSAN_win_pathB	21:01:00:e0:8b:ae:29:d3	22:00:00:20:37:15:17:6c		
LSAN_win_pathC	21:02:00:e0:8b:ce:29:d3	21:00:00:20:37:15:09:b8		
LSAN_win_pathD	21:03:00:e0:8b:ee:29:d3	22:00:00:20:37:e6:02:1b		
LSAN_win_pathE	21:00:00:e0:8b:07:25:c3	22:00:00:20:37:42:3e:df		
LSAN_win_pathF	10:00:00:00:c9:29:0e:e4	22:00:00:20:37:15:08:bb	21:00:00:20:37:15:1a:2c	21:00:00:20:37:15:09:76
	22:00:00:20:37:15:1f:e5	22:00:00:20:37:15:00:80		
LSAN_win_pathG	10:00:00:00:c9:28:c5:fa	22:00:00:20:37:15:08:bb	21:00:00:20:37:15:1a:2c	21:00:00:20:37:15:09:76
	22:00:00:20:37:15:1f:e5	22:00:00:20:37:15:00:80		
LSAN_win_pathH	10:00:00:00:c9:28:c8:43	22:00:00:20:37:15:08:bb	21:00:00:20:37:15:1a:2c	22:00:00:20:37:15:00:80
LSAN_win_pathI	10:00:00:00:c9:2b:4f:1d	21:00:00:20:37:15:09:76	22:00:00:20:37:15:1f:e5	
Storage_Fabric	22:00:00:20:37:15:08:1c	22:00:00:20:37:15:08:bb	22:00:00:20:37:15:09:1c	21:00:00:20:37:15:17:6c
	21:00:00:20:37:15:1a:2c	21:00:00:20:37:15:17:05	21:00:00:20:37:15:09:b8	21:00:00:20:37:15:09:76
	21:00:00:20:37:15:08:ad	22:00:00:20:37:e6:02:1b	22:00:00:20:37:15:1f:e5	22:00:00:20:37:15:0e:ea
	22:00:00:20:37:42:3e:df	22:00:00:20:37:15:00:80	22:00:00:20:37:42:42:a1	



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Report Use Examples

- Zone and Configuration Checking

15 ALIASES

Alias Name	Alias Member(s)
dell_4_3bwwn	10:00:00:00:c9:29:04:77
dell_4_4bwwn	10:00:00:00:c9:29:04:32
demotestalias	156,5
hitachi_00	50:00:60:e8:02:ee:78:00
dmx800_16c1	50:06:04:8a:cc:c8:8c:6f
dmx800_16d1	50:06:04:8a:cc:c8:8c:7f

ZONING METRICS

Fabric Name	Zone Database Use	Aliases Statistics				Zone Statistics				Config Statistics			
		Aliases	AvMem	MaxMem	Hanging	Zones	AvMem	MaxMem	Hanging	Configs	AvMem	MaxMem	Hanging
Prod-1	6.1% of 127k	72	1.8	2	7	62	2.9	6	7	1	62	62	1
Prod-2	6.1% of 127k	84	1.1	2	3	64	3.8	8	5	1	64	64	1
DR-1	6.6% of 127k	128	1.3	2	17	28	4.8	13	9	1	28	28	1
DR-2	9.5% of 127k	182	1	2	27	41	6.2	14	20	2	40.5	41	2
TOTALS		**466**	**1.3**	**2**	**54**	**195**	**4.4**	**14**	**41**	**5**	**48.6**	**64**	**5**

  - Hanging zones are identified, these are most likely historical zones where the device has moved or has been decommissioned
  - Alerts are provided for zones with too many members and these should also be examined

Domain	Port	Speed	Status	Type	World Wide Name	Alias Name	Desctiption	Avg Perf	Max Perf	Port ID
4	0	2 Gbps	Online	F-Port	10:00:00:00:c9:2b:50:a5	ETS_FILE01_2	EMULEX	37.6 MB/s	69 MB/s	040000
4	1	2 Gbps	Online	F-Port	10:00:00:00:c9:2d:03:71	NOT ZONED	EMULEX	0 MB/s	0 MB/s	040100
4	2	2 Gbps	Online	F-Port	10:00:00:00:c9:2b:9d:ac	ETS_BOOTP01	EMULEX	22.6 MB/s	65 MB/s	040200
4	3	2 Gbps	Online	F-Port	10:00:00:e0:02:02:88:24	IT_TAPE	CROSSROADS	25.4 MB/s	68 MB/s	040300
4	4	2 Gbps	Online	E-Port	10:00:00:60:69:51:73:1b	To CORE15	ISL	14.9 MB/s	44 MB/s	
4	5	2 Gbps	Online	E-Port	Trunk Slave		ISL	14.8 MB/s	44 MB/s	

  - Devices that you forget to zone will not be able to communicate

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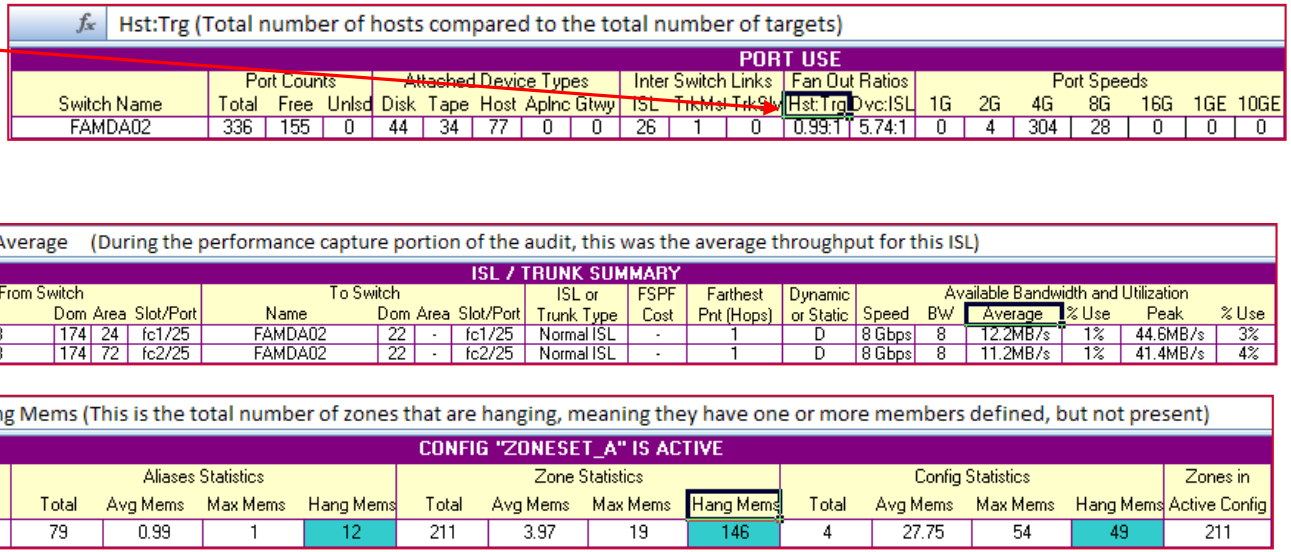
Report Content

- In-Report Explanations
  - Many cells in the report can be selected to see more info in the formula bar
  - Learn more about report content such as zone membership, hanging zones, etc

Select the cell you would like Information on

Look in the formula bar for explanatory details



fx Hst:Trg (Total number of hosts compared to the total number of targets)

PORT USE

Switch Name	Port Counts			Attached Device Types					Inter Switch Links			Fan Out Ratios		Port Speeds						
	Total	Free	Unlsd	Disk	Tape	Host	Aplnc	Gtwy	ISL	TrkMsl	TrkSlv	Hst:Trg	Dvc:ISL	1G	2G	4G	8G	16G	1GE	10GE
FAMDA02	336	155	0	44	34	77	0	0	26	1	0	0.99:1	5.74:1	0	4	304	28	0	0	0

fx Average (During the performance capture portion of the audit, this was the average throughput for this ISL)

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	% Use	Peak	% Use
FAMDA03	174	24	fc1/25	FAMDA02	22	-	fc1/25	Normal ISL	-	1	D	8 Gbps	8	12.2MB/s	1%	44.6MB/s	3%
FAMDA03	174	72	fc2/25	FAMDA02	22	-	fc2/25	Normal ISL	-	1	D	8 Gbps	8	11.2MB/s	1%	41.4MB/s	4%

fx Hang Mems (This is the total number of zones that are hanging, meaning they have one or more members defined, but not present)

CONFIG "ZONESET_A" IS ACTIVE

Zone	Aliases Statistics				Zone Statistics				Config Statistics				Zones in
Database Use	Total	Avg Mems	Max Mems	Hang Mems	Total	Avg Mems	Max Mems	Hang Mems	Total	Avg Mems	Max Mems	Hang Mems	Active Config
1.2%	79	0.99	1	12	211	3.97	19	146	4	27.75	54	49	211

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Real 7840 Line errors…..Congestion ISL Slow Drained Device

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 (
LINMF7840-2	2	34	34	CARMF7840-2 FID128	22	34	34	FCIP ISL	500	1	D	16 Gbps	4.950	163.3 MB/s	-	1100 MB/s	-

IMPORTANT ALERTS AND WARNINGS (Including Historic Alerts, Please Check Date & Time Stamp)

Date Stamp	Error Level	Process	Description
Sat Nov 24 15:23:13 2018	ERROR	MS-1009	LINMF7840-2 RLIR event. Slot/Port 0/4 (0x020400). Device Port Tag is 0x0612. Loss of Signal or Synchronization.
Sat Nov 24 15:23:43 2018	ERROR	MS-1009	LINMF7840-2 RLIR event. Slot/Port 0/4 (0x020400). Device Port Tag is 0x0613. Loss of Signal or Synchronization.

FRAME ERROR COUNTS | **PERF CAPTURE**

Port	Slot/Port	Name / Alias / Zone	Port World Wide Name	Transmit (fr	Receive (fra	Enc In (e	CRC (cr	Short (tc	Long (t	EndFrame (	Enc Out (e	Class3D (di	Link Fail (lir	losSync (lo	losSig (lo	Reject (fri	Busy (fl	Avg Perf (Du	Peak Perf (Du
0	0	port0	50:05:07:63:07:0b:92:ba	2.5g	4.2g	0	0	0	0	0	0	1.3k	0	1	5	0	0	37.3 MB	371.7 MB
1	1	port1	50:05:07:63:07:3c:12:ba	1.7g	1.0g	0	0	0	0	0	0	0	0	5	0	0	0	37.5 MB	339 MB
4	4	port4	50:05:07:63:07:31:d2:ba	2.5g	3.7g	0	0	0	0	0	0	774	0	4	5	0	0	38 MB	379.6 MB
5	5	port5	50:05:07:63:07:31:52:ba	1.7g	967.7m	0	0	0	0	0	0	0	0	3	0	0	0	37.3 MB	376.6 MB
34	34	CARMF7840-2	10:00:88:94:71:22:23:0a	3.6g	942.1m	0	0	0	0	0	0	0	0	0	0	0	0	163.3 MB	1100 MB

SAN Health Detects 7840 Error MS-1009

MS-1009

ERROR

Probable Cause

Indicates a registered link incident record (RLIR) has been generated for one of the actions indicated by the *message* value. •

Unrecognized link incident

Recommended

Action

Persistent RLIR incidents are likely the result of SAN hardware problems such as bad cables or small form-factor pluggable (SFP) transceivers. If the message persists, replace hardware.

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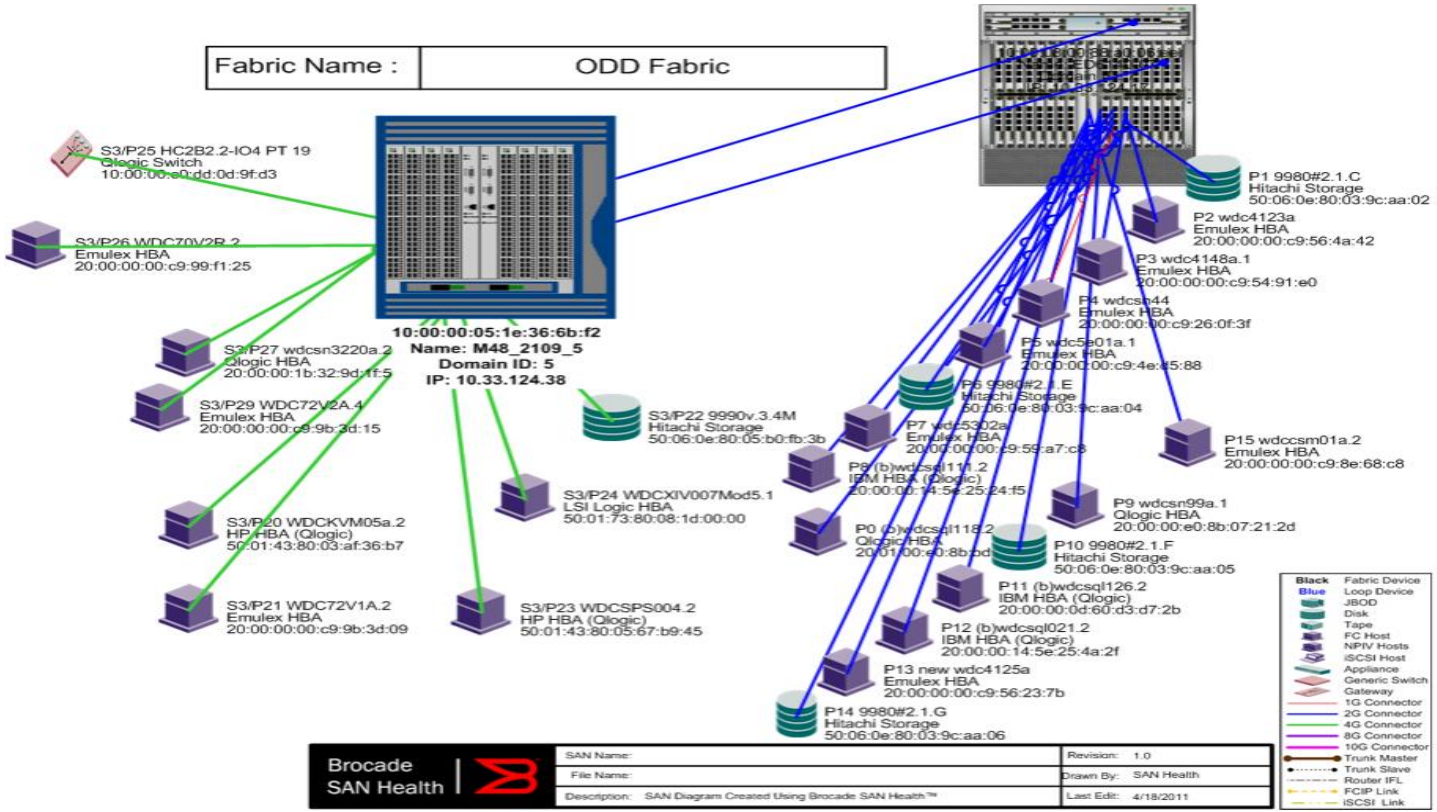
Installed Configuration/Topology

Visio Diagram SAN Fabric



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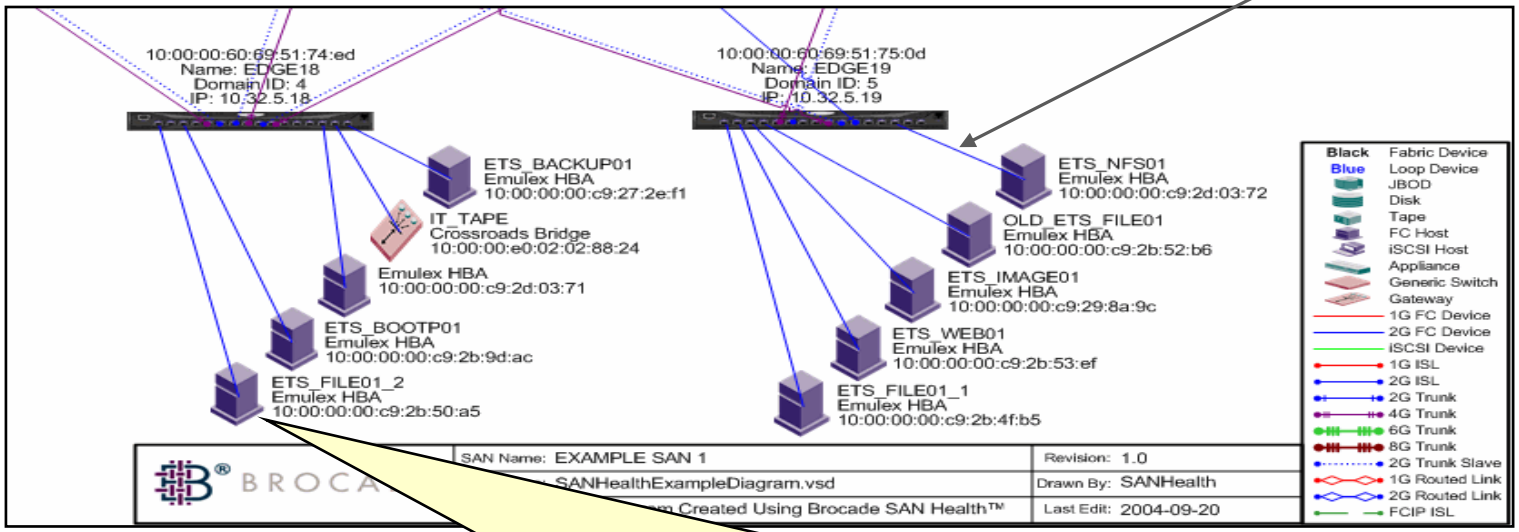
SAN Health Report Sample

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

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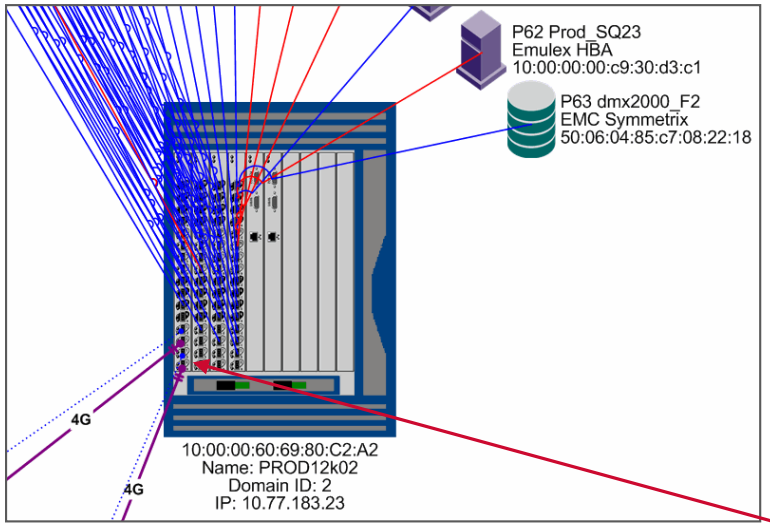
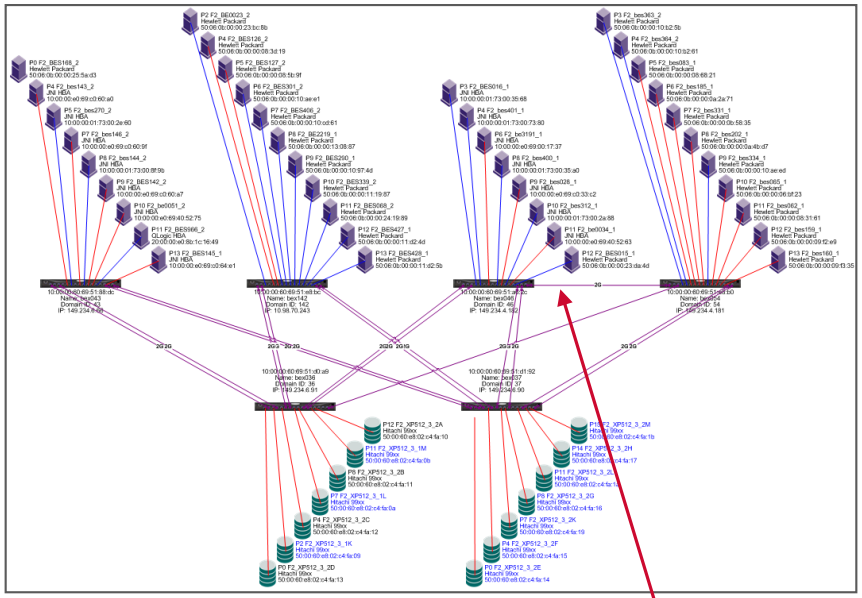
Diagram Use Examples…. ISL Placement

- Physical Configuration Review
- Problems are sometimes only obvious when you look at a diagram





Poorly configured ISL placement may be easier to see on a diagram

Multiple ISLs going to a single blade may not be by-design

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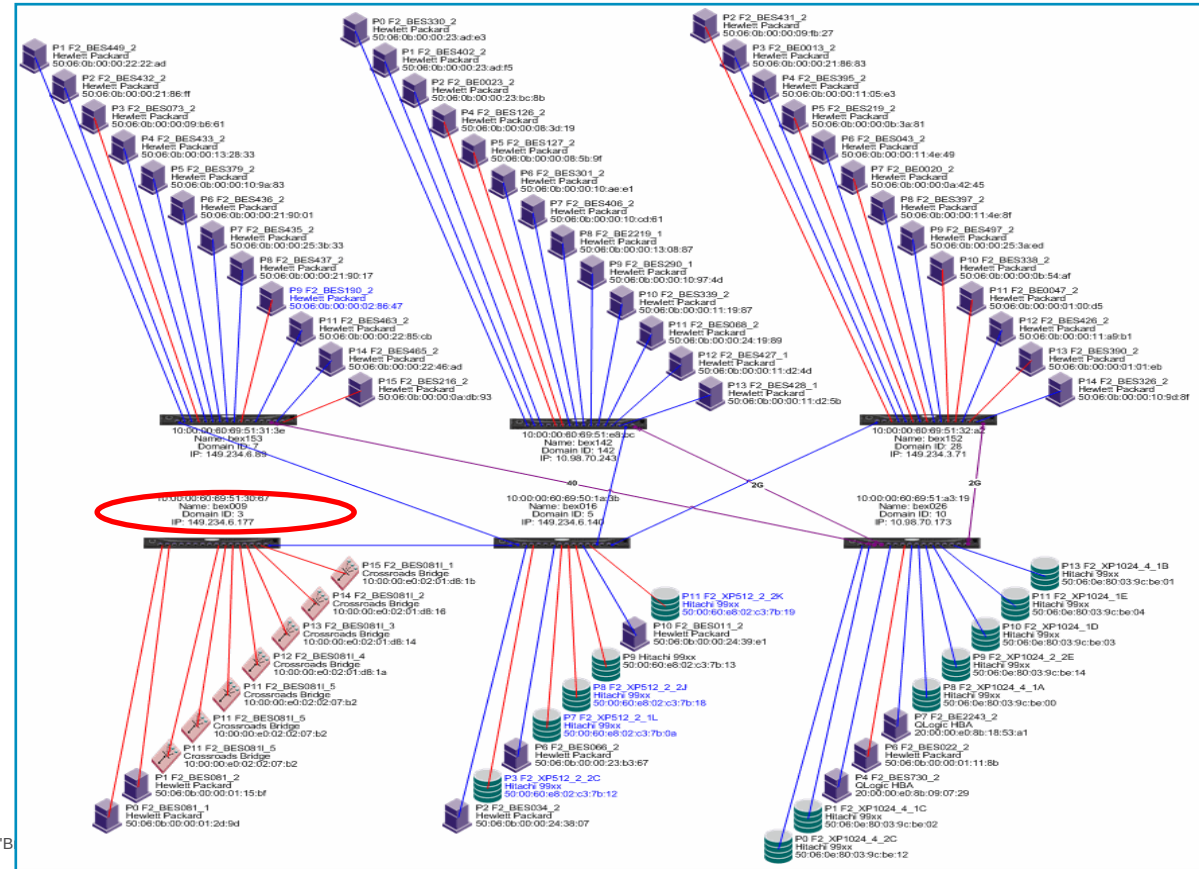
Diagram Use Example:

Specific Application Traffic Problems

- Display the traffic statistics on the diagram or view the ISL and device custom properties.
  - Backup window traffic
  - Replication traffic
  - Database traffic



SAN Storage Refresh Opportunity

Migration Services

Performance Graph Example.. SAN Health

Actual SAN Health Examples

What's in a SAN Health Report?

How to Create a SAN Health Report

What is Brocade's SAN Health?

October 2017

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Identify technology upgrade opportunities

Large Account – Multiple Data Center Engagement

- Leverage SAN Health Reports to determine current:
  - Topology
  - Switch type and count
  - Port Utilization
- Drill down in the reports to uncover areas needing mitigation, such as:
  - Deprecated device attachment speeds
  - Loop devices
  - Deviation from customer standards

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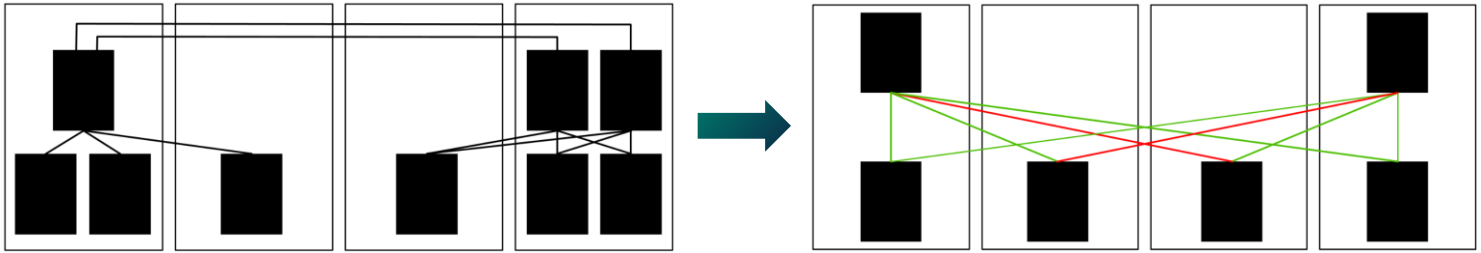
How We Approached the Technology Upgrade

Determined the customer's goals and limitations

- Maximum lifecycle. Technology refresh from DCX's to Gen6.
- Reduction in footprint: switch count and unused port count.
- Incorporate the replacement of twelve existing storage arrays with two new high-density, all-flash arrays. Be ready for NVMe over FC.
- Optimize the configuration for any-to-any connectivity.



- Insert newly proposed server and Arrays to the SAN Health Report.

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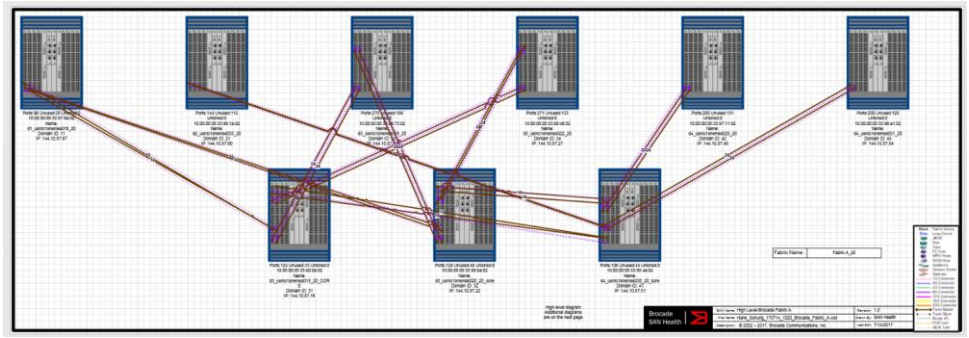
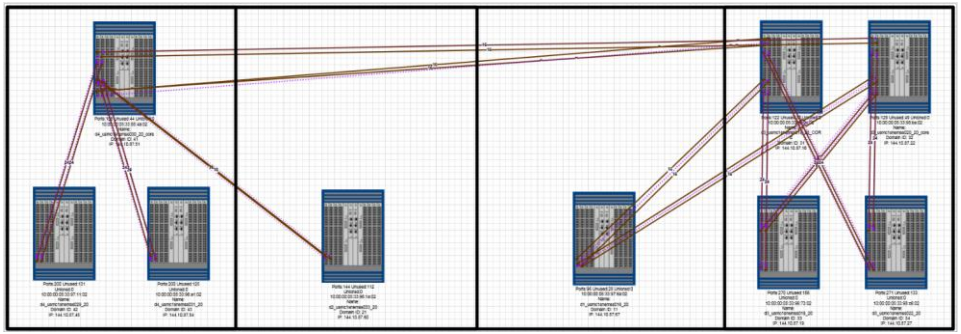
How We Approached the Technology Upgrade

Determine the current topology

- Started with the high-level SAN Health Visio diagram.



- Then rearranged the switches as needed



How We Approached the Technology Upgrade

Checked the SH SAN Summary Tab to ensure all switches were audited

Fabric Name	Dom	Model	Spd	OSVer	Status	DaysUp	Pwr(W)	Ports (Total	Unusd	UnLicnd
Fabric A_20	11	DCX	8G	7.4.1d	Healthy	34	1568	96 (96)	28	0
Fabric A_20	21	DCX	8G	7.4.1d	Healthy	34	1313	144 (144)	112	0
Fabric A_20	31	DCX	8G	7.4.1d	Healthy	34	1335	122 (122)	33	0
Fabric A_20	32	DCX	8G	7.4.1d	Healthy	34	1335	129 (129)	49	0
Fabric A_20	33	DCX	8G	7.4.1d	Healthy	34	1441	270 (270)	156	0
Fabric A_20	34	DCX	8G	7.4.1d	Healthy	34	1441	271 (271)	133	0
Fabric A_20	41	DCX	8G	7.4.1d	Healthy	34	1335	106 (106)	44	0
Fabric A_20	42	DCX	8G	7.4.1d	Healthy	33	1313	200 (200)	131	0
Fabric A_20	43	DCX	8G	7.4.1d	Healthy	33	1313	200 (200)	125	0

How We Approached the Technology Upgrade

Used the Fabric Summary to obtain the per-switch device counts for Disk, Tape, Host, Gateways and ISLs

Switch Name	Port Counts			Attached Device Types					Inter Switch Links		
	Total	Unusd	Unlcd	Disk	Tape	Host	Aplnc	Gtwy	ISL	TrkMst	TrkSlv
[redacted]	96	28	0	0	3	93	0	10	8	4	4
[redacted]	144	112	0	0	0	32	0	3	4	2	2
[redacted]	122	33	0	69	0	0	0	0	20	8	12
[redacted]	129	49	0	60	0	0	0	0	20	8	12
[redacted]	270	156	0	0	0	112	0	18	12	4	8
[redacted]	271	133	0	0	3	145	0	25	12	4	8
[redacted]	106	44	0	38	0	0	0	0	24	10	14
[redacted]	200	131	0	0	8	55	0	0	6	2	4
[redacted]	200	125	0	0	0	85	0	27	6	2	4
TOTALS	**1538**	**811**	**0**	**167**	**14**	**522**	**0**	**83**	**112**	**44**	**68**

How We Approached the Technology Upgrade

Created an OEM- tab to show the proposed equipment

	DC1 Edge	DC2 Edge	DC3 Core	DC3 Edge	DC4 Core	DC4 Edge
Min # of FC blades	3	1	2	6	2	4
# of unused ports	27	11	15	16	34	35
% of unused ports	19%	23%	16%	6%	35%	18%
Rec # of FC blades	4	2	2	7	2	4
# of unused ports	75	59	15	64	34	35
% of unused ports	39%	61%	16%	19%	35%	18%

	Fabric A						Fabric B						A/B
	DC1 Edge	DC2 Edge	DC3 Core	DC3 Edge	DC4 Core	DC4 Edge	DC1 Edge	DC2 Edge	DC3 Core	DC3 Edge	DC4 Core	DC4 Edge	Totals
Brocade Gen6 X6-8 Director	1			1		1	1			1		1	6
Brocade Gen6 X6-4 Director		1	1		1			1	1		1		6
Rack-mount Rail Kit	1	1	1	1	1	1	1	1	1	1	1	1	12
Non-Port Side Intake Blowers	3	2	2	3	2	3	3	2	2	3	2	3	30
Non-Port Side Intake Power Supplies	4	2	2	4	2	4	4	2	2	4	2	4	36
US Power Cords	4	2	2	4	2	4	4	2	2	4	2	4	36
Enterprise Software Bundle	1	1	1	1	1	1	1	1	1	1	1	1	12
FC32-48 Port Blade	4	2	2	7	2	4	4	2	2	7	2	4	42
16 Gbps LWL SFPs (for inter-DC ISLs)	16	8	22	16	28	10	16	8	22	16	28	10	200
16 Gbps SWL SFPs (for intra-DC ISLs)			16	16	10	10			16	16	10	10	104
16 Gbps SWL SFPs (for devices)	176	88	58	304	58	172	176	88	58	304	58	172	1712
Brocade Network Advisor	1												

How We Approached the Technology Upgrade

Worked with OEMs to generate quotes for our customer

- Customer Selects OEM.
- We worked with the OEMs to generate and double-check their quotes for adherence to the BOMs.
- Customer awarded the order to OEM.
- This ended up being a $2.1M+ opportunity for Brocade/IBM

Wait we have more! Add to Consultative Value

XXX Co.– Summary

- San Health data from 7 location (5-US, 1- France, 1-Australia) March 23, 2017
- Overall, there are no major concerns
- FOS firmware in March was v7.3.1a which should be upgraded to v7.4.1d
- Reviewed Slot and Port availability
- Almost all connections to this 8Gb SAN are at 8Gb
- There are only ten 4Gb ports and two 2Gb ports – very good!
- No errors of consequence – several units lost partial power one day plus two SFP error messages and a CP warning
- 8Gb directors have entered the End-of-Life program
  - The End-of-Sale date was 9/15/2014
  - The End-of-Support date is 11/15/2019
- ISLs between DID 1 and DID 108 are not trunked and should be investigated

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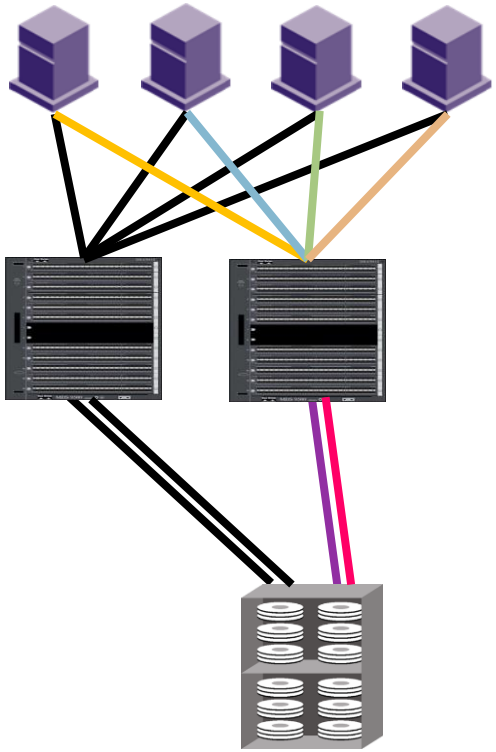
Migrating from OEM or Older Directors to Brocade Directors

Pre-Migration



Host1_B
Host2_B
Host3_B
Host4_B
Disk100_30
Disk100_40

- Create the zones for the target Brocade SAN for those devices being migrated
- The SAN Health Tool provides the capability to identify the VSANs used in each Cisco MDS chassis, the number of ports in each VSAN and the specific physical ports assigned to each VSAN
- The Excel-based SH report is used to check inventory and assist with plan and scoping components.
- The Visio diagram provides a graphical representation of the SAN.

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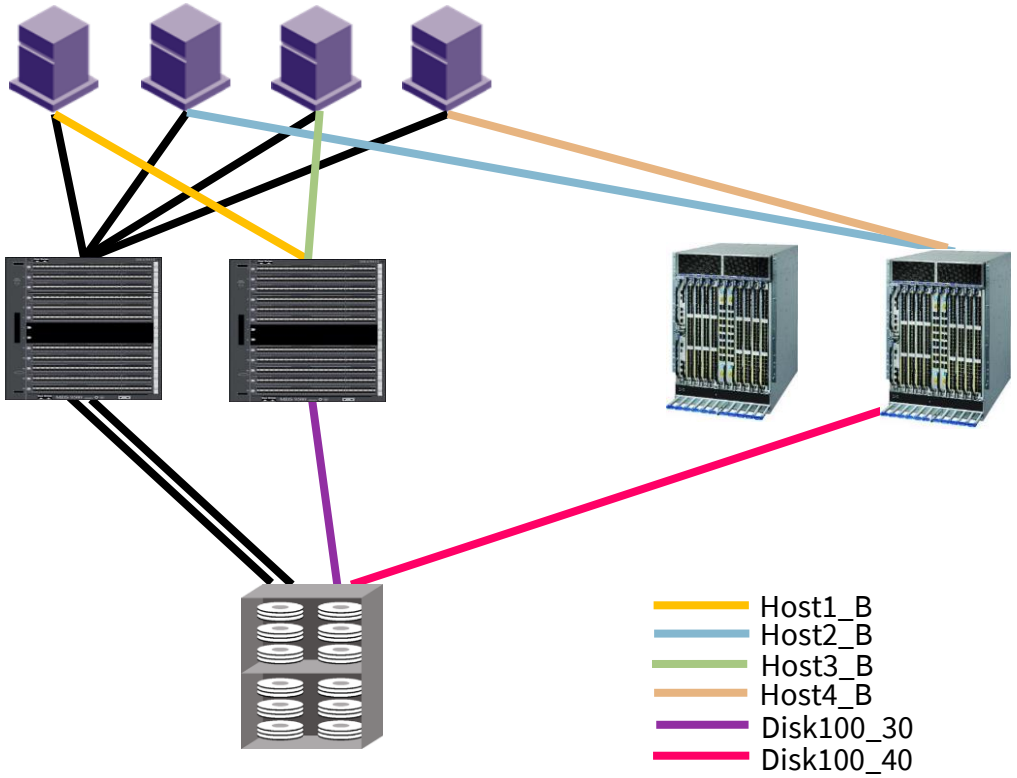
Migrating from OEM or Older Directors to Brocade Directors

Post Migration



- Capture zoning information from the Cisco MDS SAN
- Edit zoning statements to eliminate VSAN information if it exists
- Create the zones for the target Brocade SAN for those devices being migrated
- Implement the zones in to the target Brocade SAN fabric
- Execute the migration

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SAN Storage Refresh Opportunity

Migration Services

Performance Graph Example.. SAN Health

Actual SAN Health Examples

What's in a SAN Health Report?

How to Create a SAN Health Report

What is Brocade's SAN Health?

October 2017

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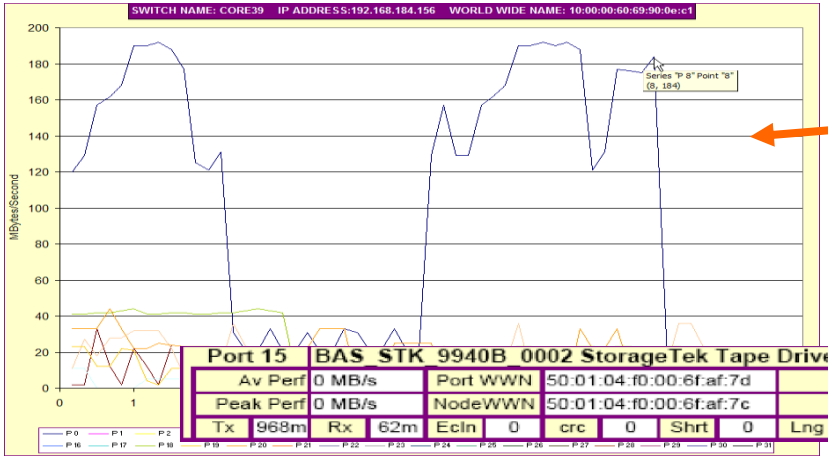
Report Use Example
High levels of Traffic and Unusual Spikes

Plan for Flash and NVMe solutions



Mouse over the data to display the port number

Identify the device from the port details page

Port 15	BAS_STK_9940B_0002 StorageTek Tape Drive 9940B STK T9940B 1.36																							
Av Perf	0 MB/s	Port WWN	50:01:04:f0:00:6f:af:7d	Speed	2 Gbps	Port ID	090f01	Media	-	SFP Type	-													
Peak Perf	0 MB/s	NodeWWN	50:01:04:f0:00:6f:af:7c	Type	L-Port	Status	Online	LD level	L0	Bound	SCSI													
Tx	968m	Rx	62m	EcIn	0	crc	0	Shrt	0	Lng	0	EOF	0	Eout	356	Sync	0	Link	0	C3D	1	Lsig	0	Rjct	0	Bsy	0

Use the Port Map to identify the traffic partner devices

PORT MAP FOR ALL SWITCHES IN FABRIC ETS-FABRIC-B

Domain	Port	Speed	Status	Type	World Wide Name	Alias Name	Desctiption	Avg Perf	Max Perf	
156	0	2 Gbps	No_Light							
156	1	2 Gbps	No_Light							
156	2	2 Gbps	No_Light							
156	3	2 Gbps	No_Light							
156	4	1 Gbps	Online	F-Port	21:00:00:d0:b2:00:42:40	9940B_0003	9940B	18.2 MB/s	36 MB/s	
156	5	2 Gbps	Online	L-Port	21:00:00:04:cf:d5:35:7a	demotestalias	SEAGATE	10.2 MB/s	33 MB/s	9c05cd
156	6	2 Gbps	In_Sync							
156	7	2 Gbps	Online	L-Port	21:00:00:20:37:d9:78:37	NOT ZONED	SEAGATE	0 MB/s	0 MB/s	9c07cd
156	8	2 Gbps	Online	F-Port	50:06:04:8a:cc:c8:8c:60	9840C_0004	9840C	96.8 MB/s	192 MB/s	9c0800
156	9	2 Gbps	Online	L-Port	21:00:00:20:37:c8:7d:e6	euro_1_10bwwn	SEAGATE	12.4 MB/s	23 MB/s	9c09d6

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SAN Health Report Sample
Performance Metrics and Graphs... 32GB SAN Sale

Bandwidth Metrics and Alerting

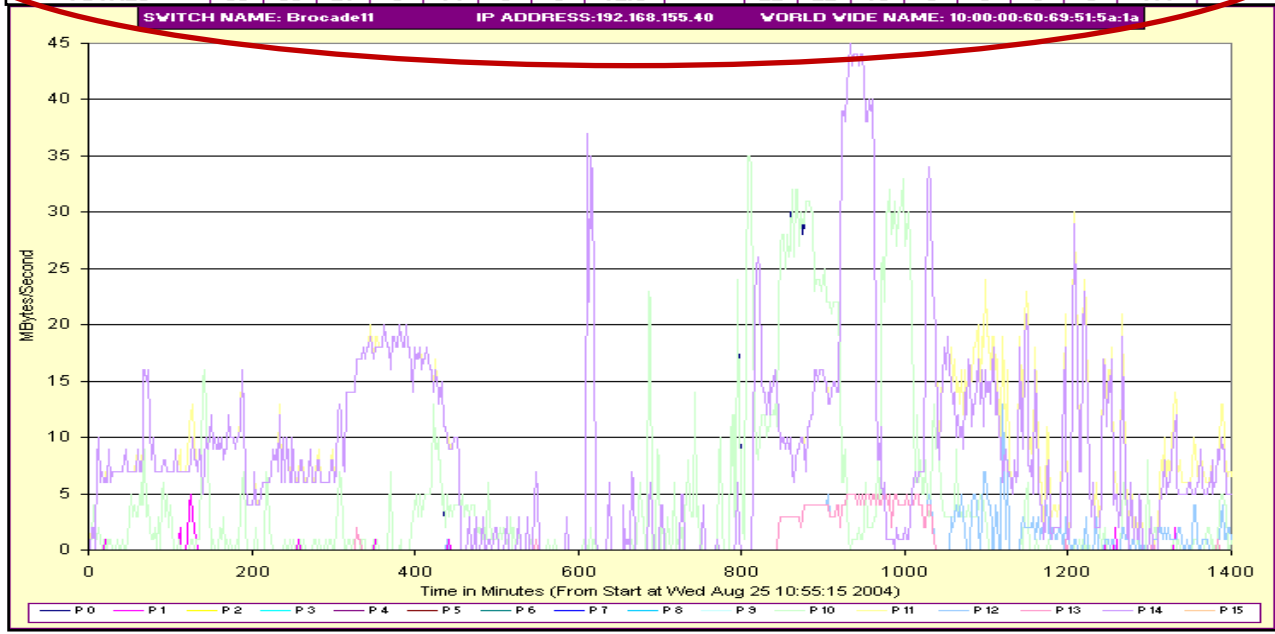
Detailed Performance Graphs

- Maximum duration of 48 hours per audit
- Sample interval is automatically calculated
- One graph per switch

BANDWIDTH UTILIZATION STATISTICS

	Device Bandwidth Utilization (per port)									ISL Bandwidth Utilization (per port)								
Fabric Name	Dev. Count	0 - 25% Av	0 - 25% max	25-75% Av	25-75% Max	75-100% Av	75-100% Max	Average MB/s	Max MB/s	ISL Count	0 - 25% Av	0 - 25% max	25-75% Av	25-75% Max	75-100% Av	75-100% Max	Average MB/s	Max MB/s
ETS-Fabric-A	26	26	13	0	13	0	0	14	69	22	22	16	0	6	0	0	14.7	58
ETS-Fabric-B	9	9	8	0	1	0	0	11.3	44	0	0	0	0	0	0	0	0	0
TOTALS	**35**	**35**	**21**	**0**	**14**	**0**	**0**	**12.6**		**22**	**22**	**16**	**0**	**6**	**0**	**0**	**7.4**	

SWITCH NAME: Brocade11 IP ADDRESS:192.168.155.40 WORLD WIDE NAME: 10:00:00:60:69:51:5a:1a



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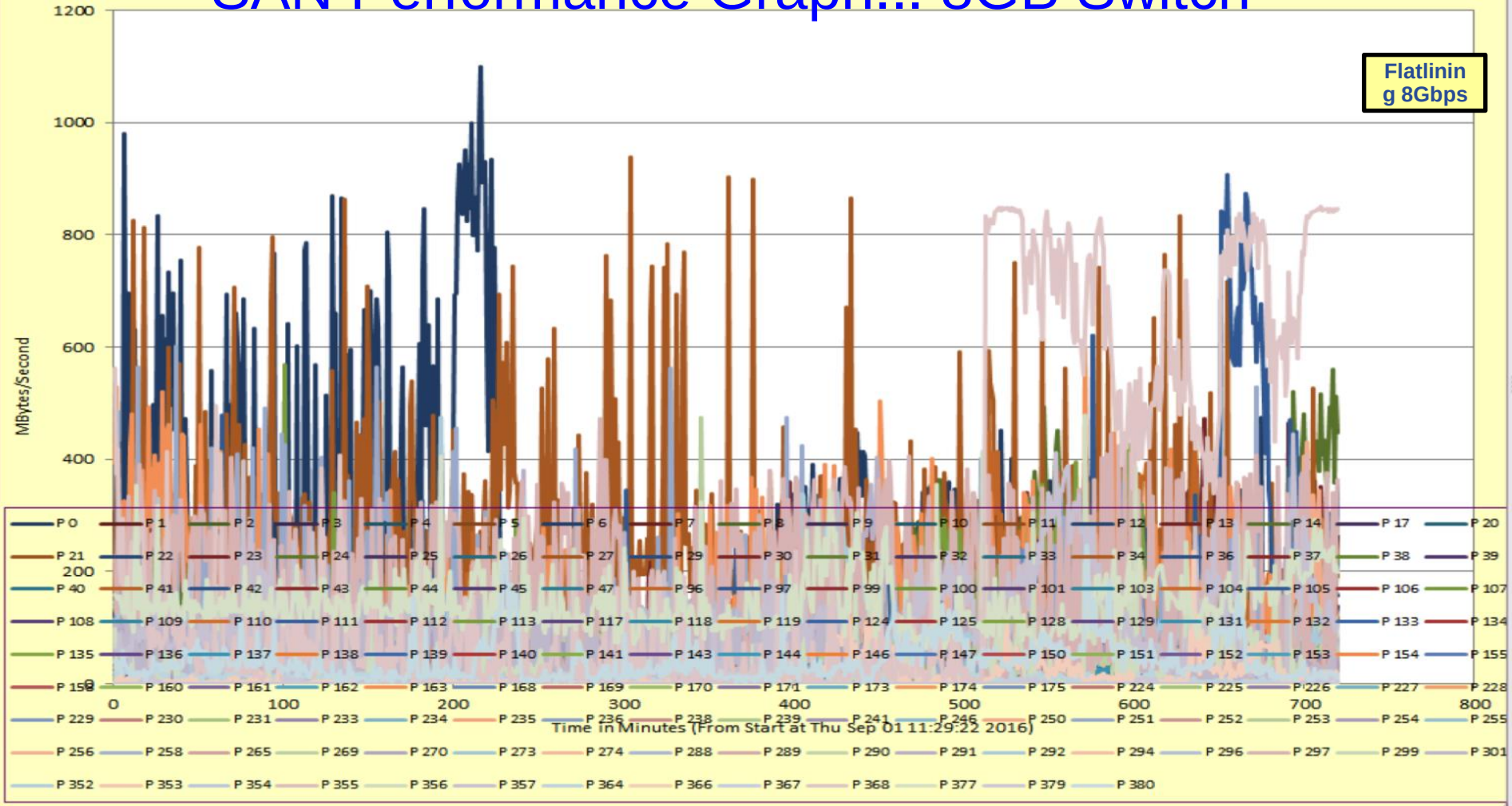
SAN Performance Graph... 8GB Switch



SAN Utilization…finding from SAN Health

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 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

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Recommendations

Installing 32Gbps SAN:

- Gen6 upgrade moves potential bottlenecks out of the switch fabric
- Pushes the max utilization level down well below critical thresholds
- 8Gbps Environments gain immediate benefit due to intrinsic ASIC capabilities
- Positions Account XXX to gain maximum value on for SSD architecture investment
- Native IO/Flow Visibility/Diagnostics with the SAN

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SAN Storage Refresh Opportunity

Migration Services

Performance Graph Example.. SAN Health

What's in a SAN Health Report?

How to Create a SAN Health Report

What is Brocade's SAN Health?

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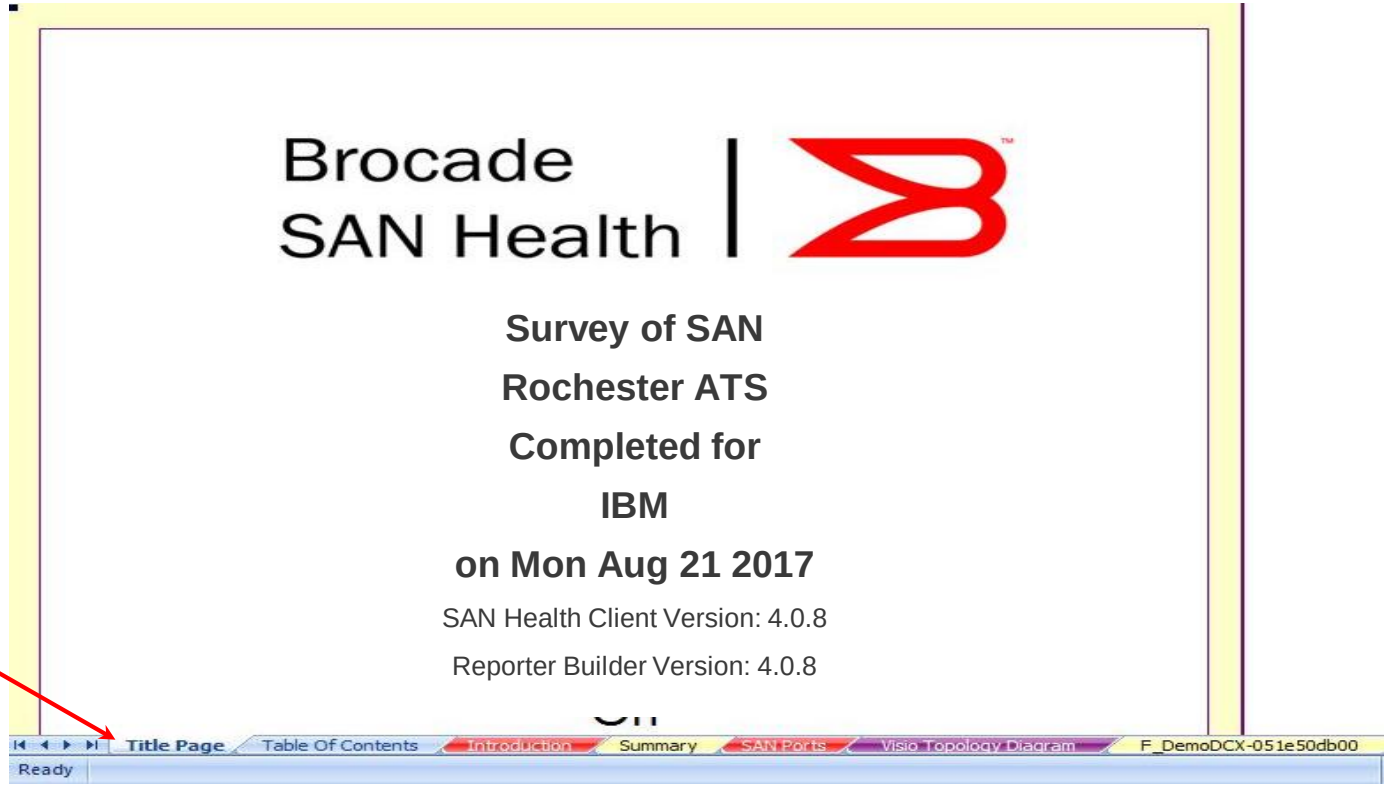
Excel Report is Categorized by Tabs

Select “End of Maintenance” tab Or Alert



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Undesirable Firmware Levels in USE

ALERTS

Table Of Contents

UNDESIRABLE FIRMWARE LEVELS IN USE

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	

End of Service Support additions SAN Health V4.0.8b

Brocade Network Advisor and Fabric Vision

MAINTENANCE SUPPORT ENDING SOON

Recommended Replacement	End of Support Switch	Model	Ports	Unused Ports	IP Address	World Wide Name	Serial Number	Date Support Ends
DCX 8510-4 or DCX 8510-8	CBCDIRE	M6140	140	34	192.168.1.2	10:00:08:00:88:a0:16:26	13A0008	Feb-28-2014
DCX 8510-4 or DCX 8510-8	CBCDIROSA02	M6140	140	33	192.168.1.9	10:00:08:00:88:04:04:6c	13A2843	Feb-28-2014
DCX 8510-4 or DCX 8510-8	RDCDIROSF11	M6140	140	40	192.168.1.54	10:00:08:00:88:04:69:24	13G0193	Feb-28-2014
DCX 8510-4 or DCX 8510-8	CBCDIROSB06	M6140	140	66	192.168.1.13	10:00:08:00:88:04:c5:51	13G1383	Feb-28-2014
DCX 8510-4 or DCX 8510-8	CBCDIROSA06	M6140	140	66	192.168.1.12	10:00:08:00:88:04:d6:c8	131661G	Feb-28-2014
DCX 8510-4 or DCX 8510-8	RDCDIROSA09	M6140	140	74	192.168.1.20	10:00:08:00:88:04:e3:3e	131833G	Feb-28-2014

What is Gen 5 Fibre Channel?

Gen 5 Fibre Channel SAN is the purpose-built, data center-proven network infrastructure for storage - delivering unmatched reliability, simplicity, and performance. Gen 5 Fibre Channel unleashes the full potential of high-density server virtualization, cloud architectures, and next-generation storage.

Try Brocade Network Advisor and Brocade Fabric Vision today

Brocade Network Advisor management software helps proactively manage end-to-end network health, monitor performance, and aids troubleshooting. Administrators can quickly identify network issues with customizable dashboards and drill-down to isolate and fix problems. Network Advisor supports the entire Brocade IP and SAN portfolio, for unified network visibility and control.

Brocade Fabric Vision technology, an extension of Gen 5 Fibre Channel, provides unprecedented insight and visibility across the storage network with powerful built-in monitoring, management, and diagnostic tools that enable organizations to simplify monitoring, increase availability, and dramatically reduce costs.

MAINTENANCE SUPPORT ENDED

End of Support Switch	Model	Ports	Unused Ports	IP Address	World Wide Name	Serial Number	Date Support Ends
ITOC61401	M6140	140	94	172.21.230.7	10:00:08:00:88:04:42:11	IN12041	Feb-28-2014
UTBLi15FCB	4024	24	18	172.21.228.124	10:00:00:05:1e:07:92:85	WH040028858	Aug-1-2014

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Tech Alert End of Support Page… Replacement Solutions

http://www.brocade.com/launch/promo/4gbps-fc-directors-refresh/index.html?intcmp=lp_4gfcdirectors_bn_00012

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 5 Fibre Channel unleashes the full potential of high-density server virtualization, cloud architectures, and next-generation storage. Brocade Fabric Vision technology extends Gen 5 capabilities with diagnostic and management features that greatly simplify SAN deployment, reduce costs, and increase visibility across storage networks.

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End of Service Support additions SAN Health V4.0.8b

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:7	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:a	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:e6:8	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:8	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:99:1	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	10:00:00:05:33:86:25:2	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:e5:97:0	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:d1:75:0	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:0	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:0	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 DIR	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

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SAN Health 4.2

- Currently at Release Candidate, GA end of May 2019
  - 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.
  - Version 4.2 automatically discovers Mutliprotocol Routers and Access Gateways just from connecting from any seed switch in the SAN.
  - End of life for McDATA support

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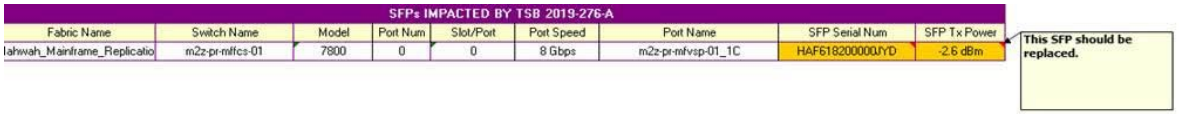
SAN Health – Faulty SFP Alerting

- Detection is based on the SFP model, type, serial number and operating parameters (TSB-2018-274-A and SB 2019-276-A)
- Potentially faulty SFPs are categorised based on the current operational metrics
  - Blue alert = Operating within acceptable ranges, but has potential to fail in the future and should be monitored
  - Orange alert = Potential to fail and is operating outside of acceptable ranges. It should be replaced!
- So that it can't be missed, if faulty SFPs are detected a summary Alert page is added to the start of the SAN Health report along with flags against the detailed content.



SFPs IMPACTED BY TSB 2019-276-A

Fabric Name	Switch Name	Model	Port Num	Slot/Port	Port Speed	Port Name	SFP Serial Num	SFP Tx Power
lahwah_Mainframe_Replicatio	m2z-pr-mfcs-01	7800	0	0	8 Gbps	m2z-pr-mfvsp-01_1C	HAF618200000UYD	-2.6 dBm

This SFP should be replaced.

SFP Serial Num	SFP Tx Power
JAF3165300015RU	-2.5 dBm
JAF317010000DAL	-2.3 dBm
JAF317010000NTC	-2.1 dBm
JAF317010000NT5	-1.3 dBm

This SFP is operating within valid operating conditions with recommendation to monitor into the future.

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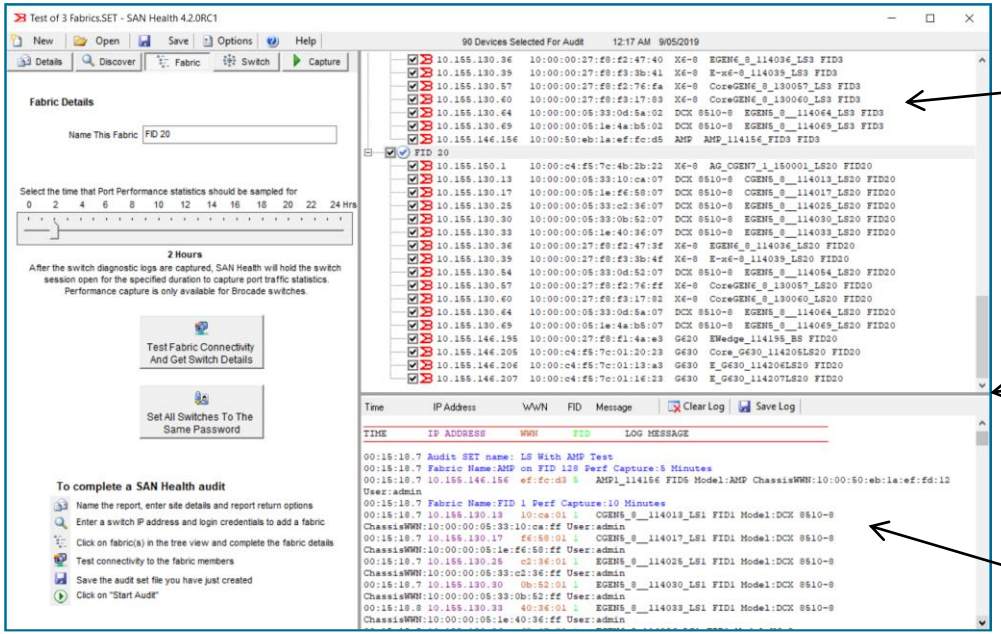
SAN Health 4.2



Tree View is now the interactive progress display during audit

Resizable window with left/right and top/bottom splitters

New multi-colored log with WWN and FID for better Virtual Fabric support

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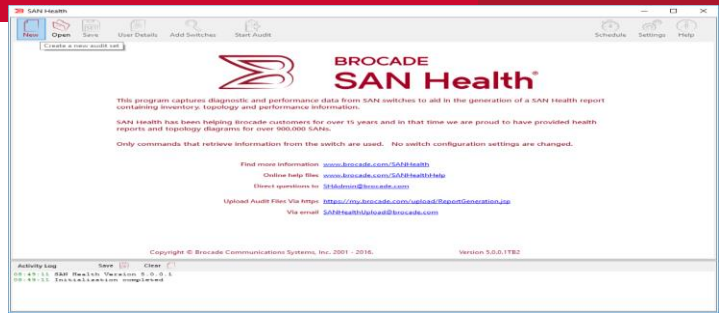
SAN Update



Questions:

Email: SANHealthAdmin@broadcom.com

Downloads and more information: www.broadcom.com/sanhealth
https://www.broadcom.com/support/fibre-channel-networking/tools/san-health/diagnostics-capture

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!

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Questions?

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