



## Site Implementation Guide (SIG)

EMC Proven Professional™ Knowledge Sharing 2008

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## Introduction

A Site Implementation Guide (SIG) is one of the most important documents associated with implementation. It guarantees the success of a project, containing all relevant technical information about the current project involving the Solution Architect (SA), Project Manager (PM) and Implementation Specialist (IS).

The SIG is the final documentation delivered to the customer at the end of a project; it includes all corrections executed since the project started. It also logs all project changes and adjustments.

## Objective

The objective of this article is to provide information needed to execute on the project, and to provide the PM with enough technical information to create the plan, tasks and schedules. The PM needs a little technical knowledge to understand the document. It is a powerful tool to create Project Documentation that can be presented to the customer in a Microsoft Project format, for example.

The SA is the main piece of this puzzle. He or she participates in the Pre-Sales and Post-Sales process, where all solution information is validated. During the pre-sales or post-sales time period, he participates in any customer meetings to understand the environment and to determine which EMC solution will best meet the customer needs.

Project activity generates many requests from the customer, including EMCGrabs, outputs from installed switches, answers to questions, Bin File (from Symmetrix® base) or SP Collect (from CLARiiON® base) and more.

The Statement of Work (SOW) from Pre-sales is another important tool that details the scope of the work and the deliverables.

## Observation

1. This process is based on the most common EMC implementation, including basic solutions such as SAN, Storage, Hosts and Local and Remote storage replication.
2. Other solutions can be used in the structural SIG, but the contents will differ in value and type. NAS is an example, where the implementation has different kinds of information.
3. Other solutions such as Invista, RecoverPoint, Replication Manager, Bura, NAS, etc, should be examined and incorporated into the SIG structure. In some cases, we may create other documentation that can be incorporated into the SIG.
4. Each solution has its own methodology. The SA is responsible to adhere to the solutions in the SIG.
5. More details about each screenshot are listed on the Attachment List at the end of this article.
6. Some links in this document are subject to change without notice.

## How does this document flow?

This document details the SIG creation process; in the following phases:

### Phase I – Collecting all required Information

**Input:** We will divide this section by collection categories: Host (EMCGrabs), SAN (Switches Information) and Storage (Bin File / SP Collect / other input). Other information can be added, such as SOW.

**Owner of this task:** SA, TC, IS and Customer

**Output:** All information needed to proceed to the next Phase

### Phase II - Generating the required outputs

**Input:** EMCGrabs, Switch Information, Storage Information and Interview. We will explain how to create the outputs to create the SIG.

**Owner of this task:** SA

**Output:** Heat, HealthCheck, E-Lab, Volumes, Swat, SAN Topology, Zones, Storage Format, SRDF® / MirrorView™ List, EMCGrabs Control

### Phase III – Creating the SIG

**Input:** Host Analysis Environment Tool (Heat), HealthCheck, E-Lab, Volumes, Swat, SAN Topology, Zones, Storage Format, SRDF / MirrorView List, EMCGrabs Control. We will create the SIG with created outputs and information from the customer.

**Owner of this task:** SA

**Output:** SIG Version 00

### Phase IV – Creating the Project Plan

**Input:** SIG Version 00. We will create the Project Plan with tasks, estimated time and resource allocations.

**Owner of this task:** PM

**Output:** Project Plan in Microsoft Project format Version 00

### Phase V – Implementing the Solution

**Input:** SIG Version 00

**Owner of this task:** IS and/or SA

**Output:** Incident Report

# Phase I - Collecting all information needed

We need to collect all of the customer's information before creating a SIG. We will divide this information into three categories:

1. Hosts
2. SAN
3. Storage

Each category has a small introduction that will explain the importance of each document to the SIG creation process.

## 1) Hosts

EMCGrabs are required from the customer and used by the SA to generate documentation such as the Host Environment Analysis Tool (Heat), HealthCheck, E-Lab Interoperability Check and Volumes.

### 1.1) Heat

Heat is a document generated by EMC GS Tools that resumes the EMCGrab information in a simple HTML output (Figure1). Heat provides all relative information about the host environment to guide the SA when creating the HealthCheck.

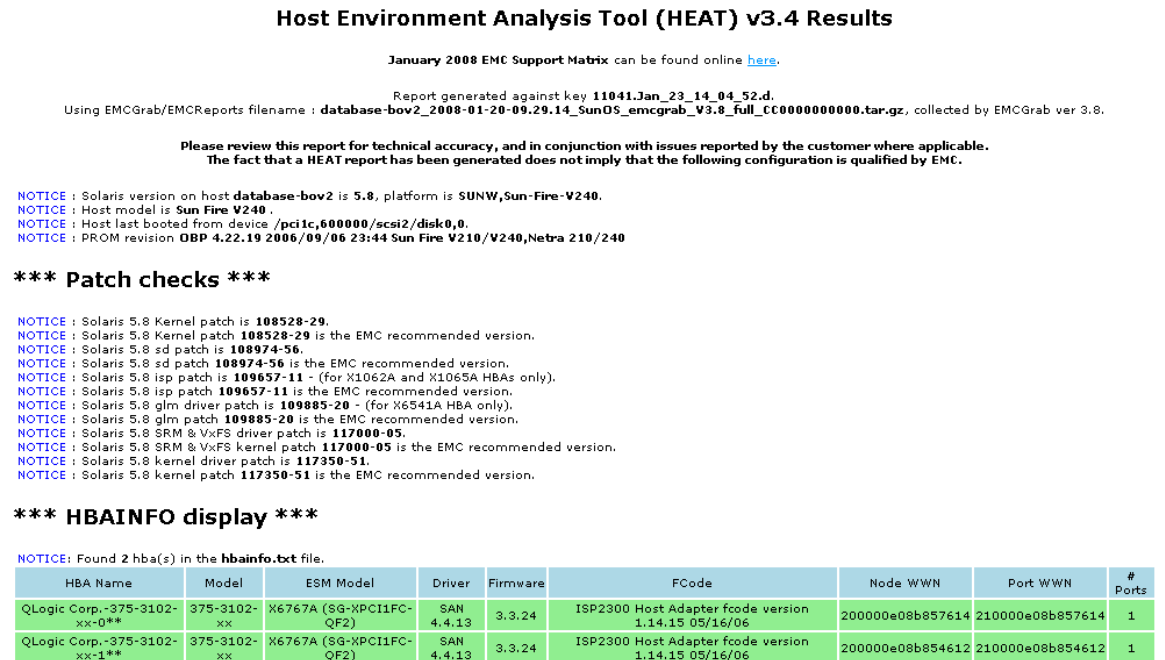


Figure 1 – Heat → generated by EMC GSTools

## 1.2) HealthCheck

The HealthCheck reviews all changes to be executed on the customer's host to bring it up-to-date, ranging from a simple patch of the Operation System to the latest HBA driver and Firmware. It includes both EMC and Non EMC Software checks. We use Heat and EMCGrab files to collect host information.

The HealthCheck is very important. If you have a host or environment that is not supported on our Matrix, we have time to open a Request for Product Qualifier (RPQ). Also, the customer gets a vision of future changes that in his environment, and has time to check this change with other vendors. Figure 2 illustrates a portion of a HealthCheck Excel spreadsheet.

Host			Operation System				EMCGRAB			
Hostname	Manufacture	Model	Patch Kernel	Name	Version	MATRIX?	STORAGE	Sent?	Fixed?	Validate
FSCORP5	HP	DL380 G5	SP2	Windows	2003 EE X86 R2	OK	CX	14/12/2008		
gerback	SUN	Blade 150	108528-29	Solaris	8	OK	DMX	8/11/2008		
hub1sv	HP	ES47	PatchKit 5	Tru64	5.1B	OK	DMX	8/11/2008		
hub2sv	HP	ES47	PatchKit 5	Tru64	5.1B	OK	DMX	8/11/2008		
hub3sv	HP	ES47	PatchKit 5	Tru64	5.1B	OK	DMX	8/11/2008		
hub4sv	HP	ES47	PatchKit 5	Tru64	5.1B	OK	DMX	8/11/2008		
MGTVCORP1	HP	BL460c G1	SP4	Windows	2000 AS X86	OK	DMX	8/11/2008		
MSGSPB1	HP	DL580	SP4	Windows	2000 AS X86	OK	DMX	8/11/2008		
MSGSPB2	HP	DL580	SP4	Windows	2000 AS X86	OK	DMX	8/11/2008		
MSGTE1	HP	DL580	SP4	Windows	2000 AS X86	OK	DMX	8/11/2008		
MSGTE2	HP	DL360 G2	SP4	Windows	2000 AS X86	OK	DMX	8/11/2008		
packv5	HP	ES47	PatchKit 5	Tru64	5.1B	OK	DMX	8/11/2008		
SQLB0V3	HP	RX7840	SP1	Windows	2003 EE IA 64	OK	DMX	8/11/2008		
SQLB0VTE1	HP	RX9620	SP2	Windows	2003 EE IA 64	OK	DMX	8/11/2008		
SQLCORP05	HP	DL380 G5	SP2	Windows	2003 EE X86 R2	OK	CX	8/11/2008		
SQLCORP1	HP	DL385 G1	SP4	Windows	2000 AS X86	OK	DMX	8/11/2008		
SQLCORP2	HP	DL385 G1	SP4	Windows	2000 AS X86	OK	DMX	11/12/2008		
SQLNEGACEITE1	HP	RX9620	SP2	Windows	2003 EE IA 64	OK	CX	8/11/2008		
SQLNEGACORP1	HP	RX9620	SP1	Windows	2003 EE IA 64	OK	DMX	8/11/2008		
SQLSPB5	HP	DL580 G4	SP1	Windows	2003 EE X86	OK	DMX	8/11/2008		
SQLTE3	HP	DL585 G1	SP2	Windows	2003 EE X86	OK	DMX	8/11/2008		
UTILCORP1	HP	DL360	SP4	Windows	2000 AS X86	OK	DMX	8/11/2008		
WEBCORP3	HP	BL460c G1	SP1	Windows	2003 EE X86	OK	CX	8/11/2008		
WEBTE11	HP	BL460c G1	SP2	Windows	2003 EE X86	OK	CX	8/11/2008		
VRTCORP31	HP	BL460c G1	2.4.21-47.0.1.Elvminix	ESX	3.5.0 (64607)	OK	CX	14/12/2008		
vrthomolog7	HP	ML370 G2	2.4.21-47.0.1.Elvminix	ESX	3.5.0 (64607)	NOK	CX	14/12/2008		
wsgeribm	HP	DL580	2.4.9-e25mp	Linux	FH AS 2.96-118.7.2	NOK	DMX	8/11/2008		
BKPCORP3	Dell	PE6580	SP2	Windows	2003 EE X86	OK	STOR NODE	11/12/2008		
BKPCORP5	Dell	PE6580	SP2	Windows	2003 EE X86	OK	STOR NODE	11/12/2008		
COLD-PROD2	IBM	9131-52A	ML06	AIX	5.3.0.0	OK	CX	11/12/2008		
SQLSPB3							??	??		

Check with the customer, because with R2, there is no SP related on EMC Matrix, just R2, without SP

Figure 2 – HealthCheck → Operational System worksheet

## 1.3) E-Lab Interoperability Check

Based on the host information from HealthCheck, we will create an E-Lab output (Figure3) certifying whether or not the customer's current environment is supported by the EMC Matrix. This information, together with HealthCheck, is used to create an RPQ if necessary.



## Base Connectivity

No.	Host System	Operating System	Host Bus	Host Bus Adapter	Driver	Firmware Revision	Topology	Storage Array	External Boot	BIOS
1	HPQ Proliant BL460c (404664-B21)	Microsoft Windows 2003 [x86] Enterprise Edition SP1	PCI Express	HPQ Emulex LPe1105-HP 4Gb FC HBA for HP c-Class Bladesystem (403621-B21) <sup>1</sup>	1.30a6 <sup>2,3</sup> , 4, 1.30a9 <sup>2</sup> , 4	2.70a5	FC-AL, FC-SW	EMC Symmetrix DMX-4	Y	Multiboot v6.00a2 (3.00a4 BIOS)

1. Minimum Dual Boot v6.00a2 (BIOS 3.00a4) and firmware v2.70a5 are required when connected to the HP 4Gb Virtual Connect FC Module for c-Class Bladesystem (409513-B21).
2. STORPort Miniport Driver
3. Refer to EMC knowledgebase article emc156275 for important information about using the HBAAnyware statistics tab with this driver version.
4. Requires Microsoft STORPort hotfix Q940467. Please see [http://support.microsoft.com/default.aspx?scid=kb;\[LN\];940467](http://support.microsoft.com/default.aspx?scid=kb;[LN];940467). NOTE: Hotfix Q940467 requires a minimum of Service Pack 1 (SP1) to be installed before the hotfix can be installed.  
To obtain this hotfix, fill out the hotfix request form at <https://support.microsoft.com/contactus2/emailcontact.aspx?scid=sw/en;1410&WS=hotfix> and reference knowledgebase article KB940467. Microsoft will email you a link to download the hotfix directly once the form has been processed.

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Figure 3 – E-Lab → *Base Connectivity* is a part the document

### 1.4) Volumes

The volumes spreadsheet provides the SA with a vision of the customer's current capacity planning. We can do future capacity planning using this information, based on EMC Best Practices and customer expectations.

On the same spreadsheet, we have an Actual Capacity (Figure4) that consolidates all volumes assigned to the hosts. We use this information as a guide to configure new arrays.

Hostname	Devices Size Created on Current Storage														TOTAL SIZE (MB)	TOTAL HYPER
	0	1	2	3	4	5	6	7	8	10	13	14	20	23		
0	1,104,000	8,838,720	17,677,440	26,516,160	35,354,880	44,193,600	53,032,320	61,871,040	70,709,760	88,387,200	114,903,360	123,742,080	176,174,400	203,290,560		
010													1			
02SPB102	1	2														
03corp		17														
0404040404		4			1		2		1	1						
05NEGACITE1	2	1		1			1									
06CORP3	1	1														
07TE1	1	1														
08T1										2						
090404		2														
10100_2324	1	10	3		2											
11010CORP1	1			1												
120SPB102	1	3														
130TE102	1	3														
140404					1											
150LB092	2			1							2			6		
160LB07E1	2			3	1			2								
170CORP102	1		1		3	1		1		1						
180NEGACORP1	2	1	1		1			1								
190SPB5	2	6	1	2	2	2		2	1			1				
200TE3						1		2								
210CORP1	1		1							1						
2200100							1									
TOTAL no 1000		51	5	7	10	3	7	4	3	6	2	1	1	6	4,322,134,080	483

If the Storage is a DMX or DMX-3 Family, compare the devices created from Bin File with each accessed host  
If the Storage is a CX Family, compare the devices created from SP Collect with each accessed host

		R1	R2	STD	BCV
XV	General	3,641,252,640	532,134,240	88,387,200	335,871,360
	CX	88,387,200	17,677,440		106,064,640
UEC	TOTAL	866,134,560	3,615,036,480	88,387,200	0
	CX	17,677,440	88,387,200		106,064,640

Figure 4 – Volumes → *Actual Capacity* worksheet

## 2) SAN

The SA is able to design the current SAN's customer draw and the current zone and zoneset active with the switches output. Other relevant information can be extracted from the switch output, such as current firmware version, interoperability and special settings.

### 2.1) Switch Analysis Tool (Swat)

Swat is a document generated by EMC GSTools that resumes the switch output. Today it supports Brocade, Cisco and McData where the outputs are: *supportshow*, *show tech-support detail* and *Data Collection*, respectively. A simple HTML is generated from one of these files. On this Swat, (Figure 5) we have all resumed information on the customer's switch.

#### Switch Analysis Tool (SWAT) v3.0 Results

Please review this report for technical accuracy, and in conjunction with issues reported by the customer where applicable.  
Last updated - December 2007

Report generated against key 16466.Jan\_07\_18\_53\_45.d

#### \*\*\* Cisco Switch Properties \*\*\*

Switch name	SSANIA
Switch S/N	FOX092204QH
Switch mode	DS-C9506
Switch WWN	20:00:00:0d:ec:24:85:80
EDTOV	2000
RATOV	10000
BIOS version	1.1.0
loader version	1.2(2)
Kickstart version	3.1(2) does not match latest version 3.2(1a).
System version	3.1(2) does not match latest version 3.2(1a).
RA Time Out Value	10000 matches recommended value of 10000
ED Time Out Value	2000 matches recommended value of 2000.
Switch has been up	71 days 10 hours 7 minute(s) 21 second(s)

#### \*\*\* Cisco Environmental Checks \*\*\*

NOTICE : Clock A, model DS-C9506-CL, HW 1.0, status is ok/active

NOTICE : Fan Chassis, model DS-6SLOT-FAN, HW 1.1, status is ok

NOTICE : Fan PS-1, model --, HW --, status is ok

NOTICE : Fan PS-2, model --, HW --, status is ok

Figure 5 – Swat → generated by EMC GSTools

## 2.1) Zones

With the switch output, it is possible to check if all created zones (Figure 6) align with EMC best practices, check if there are any mistakes or errors on zones, and map the storage Fan-in/Fan-out.

Zone Name	Zone Member 1	Switc	Poi	VSA	Device	Zone Member 2	Switc	Poi	VSA	Device
ALGO_HBA0_DMX1223_FA4CA	21:00:00:e0:8b:1f:38:b4	SSAN1	fc1113	100	ALGO	50:06:04:84:48:93:d9:c3	SSAN1	fc1113	100	DMX1223_FA4CA
ALGO_UEC_HBA0_DMX1231_FA13BB	21:00:00:e0:8b:1f:0d:b4	SSAN2	fc373	100	ALGO-UEC	50:06:04:84:48:93:db:fc	SSAN2	fc471	100	DMX1231_FA13BB
BIZSPB1_HBA0_DMX1223_FA4BB	10:00:00:00:c9:24:3c:6a	SSAN1	fc279	100	BIZSPB1	50:06:04:84:48:93:d9:f3	SSAN1	fc271	100	DMX1223_FA4BB
BIZSPB2_HBA0_DMX1223_FA13BB	10:00:00:00:c9:24:3d:54	SSAN1	fc125	100	BIZSPB2	50:06:04:84:48:93:d9:fc	SSAN1	fc270	100	DMX1223_FA13BB
BIZSPB3_HBA0_DMX1231_FA4BB	10:00:00:00:c9:28:1b:f6	SSAN2	fc272	100	BIZSPB3	50:06:04:84:48:93:db:f3	SSAN2	fc271	100	DMX1231_FA4BB
BIZTE3_HBA0_CX3-40F_UEC_SPA2	21:00:00:e0:8b:19:36:c3	SSAN2	fc2725	100	BIZTE3	50:06:01:62:30:22:d3:c4	SSAN2	fc2724	100	CX3-40F_UEC_SPA2
BIZTE3_HBA0_CX3-40F_UEC_SPB3	21:00:00:e0:8b:19:36:c3	SSAN2	fc2725	100	BIZTE3	50:06:01:62:30:22:d3:c4	SSAN2	fc4712	100	CX3-40F_UEC_SPB3
BKPCORPL_HBA0_DMX1223_FA4AA	10:00:00:00:c9:50:4b:1e	SSAN1	fc121	100	BKPCORP1	50:06:04:84:48:93:d9:c3	SSAN1	fc171	100	DMX1223_FA4AA
BKPCORPL_HBA1_DMX1223_FA13BB	10:00:00:00:c9:50:4b:1f	SSAN1	fc2725	100	BKPCORP1	50:06:04:84:48:93:d9:fc	SSAN1	fc2730	100	DMX1223_FA13BB
BKPCORPL_HBA2_CDL310_P1	10:00:00:00:c9:50:45:3d	SSAN1	fc476	200	BKPCORP1	21:01:00:0d:77:26:d9:03	SSAN1	fc479	200	CDL310_P1
BKPCORPL_HBA2_SL500_CTRL_ROBOTIC	10:00:00:00:c9:50:45:3d	SSAN1	fc476	200	BKPCORP1	50:01:04:f0:00:8e:ca:94	SSAN5	fc179	200	SL500_CTRL_ROBOTIC
BKPCORPL_HBA2_SL500_LTO3_DRV1	10:00:00:00:c9:50:45:3d	SSAN1	fc476	200	BKPCORP1	50:01:04:f0:00:8e:ca:9e	SSAN5	fc177	200	SL500_LTO3_DRV1
BKPCORPL_HBA3_CDL310_P1	10:00:00:00:c9:50:45:3e	SSAN1	fc372	200	BKPCORP1	21:01:00:0d:77:26:d9:03	SSAN1	fc479	200	CDL310_P1
BKPCORPL_HBA3_CDL310_P11	10:00:00:00:c9:50:45:3e	SSAN1	fc372	200	BKPCORP1	21:03:00:0d:77:64:dd:c7	SSAN1	fc378	200	CDL310_P11
BKPCORPL_HBA3_CDL310_P4	10:00:00:00:c9:50:45:3e	SSAN1	fc372	200	BKPCORP1	21:00:00:0d:77:06:df:04	SSAN5	fc122	200	CDL310_P4
BKPCORPL_HBA3_L700_CTRL_ROBOTIC	10:00:00:00:c9:50:45:3e	SSAN1	fc372	200	BKPCORP1	50:01:04:f0:00:60:11:b3	SSAN6	fc177	200	L700_CTRL_ROBOTIC
BKPCORPL_HBA3_L700_LTO3_DRV01	10:00:00:00:c9:50:45:3e	SSAN1	fc372	200	BKPCORP1	50:01:04:f0:00:60:11:b3	SSAN6	fc178	200	L700_LTO3_DRV01
BKPCORPL_HBA3_L700_LTO3_DRV02	10:00:00:00:c9:50:45:3e	SSAN1	fc372	200	BKPCORP1	50:01:04:f0:00:60:11:b7	SSAN6	fc179	200	L700_LTO3_DRV02
BKPCORPL_HBA3_L700_LTO3_DRV03	10:00:00:00:c9:50:45:3e	SSAN1	fc372	200	BKPCORP1	50:01:04:f0:00:60:11:b4	SSAN6	fc170	200	L700_LTO3_DRV03
BKPCORPL_HBA3_SL500_LTO3_DRV2	10:00:00:00:c9:50:45:3e	SSAN1	fc372	200	BKPCORP1	50:01:04:f0:00:8e:ca:a1	SSAN5	fc178	200	SL500_LTO3_DRV2
BKPCORPL_HBA4_CDL310_P3	10:00:00:00:c9:50:4b:d7	SSAN1	fc472	200	BKPCORP1	21:03:00:0d:77:66:d9:03	SSAN1	fc471	200	CDL310_P3
BKPCORPL_HBA4_L700_LTO3_DRV04	10:00:00:00:c9:50:4b:d7	SSAN1	fc472	200	BKPCORP1	50:01:04:f0:00:60:11:b1	SSAN6	fc179	200	L700_LTO3_DRV04
BKPCORPL_HBA4_L700_LTO3_DRV05	10:00:00:00:c9:50:4b:d7	SSAN1	fc472	200	BKPCORP1	50:01:04:f0:00:60:11:ae	SSAN6	fc120	200	L700_LTO3_DRV05
BKPCORPL_HBA4_L700_LTO3_DRV06	10:00:00:00:c9:50:4b:d7	SSAN1	fc472	200	BKPCORP1	50:01:04:f0:00:60:11:ab	SSAN6	fc121	200	L700_LTO3_DRV06
BKPCORPL_HBA4_L700_LTO3_DRV07	10:00:00:00:c9:50:4b:d7	SSAN1	fc472	200	BKPCORP1	50:01:04:f0:00:60:11:a8	SSAN6	fc122	200	L700_LTO3_DRV07
BKPCORPL_HBA5_CDL310_P7	10:00:00:00:c9:50:4b:d6	SSAN1	fc376	200	BKPCORP1	21:03:00:0d:77:66:df:04	SSAN1	fc371	200	CDL310_P7
BKPCORP2_HBA0_DMX1231_FA13AA	10:00:00:00:c9:50:48:3a	SSAN2	fc1718	100	BKPCORP2	50:06:04:84:48:93:db:cc	SSAN2	fc371	100	DMX1231_FA13AA
BKPCORP2_HBA1_DMX1231_FA4AB	10:00:00:00:c9:50:4c:ba	SSAN2	fc2712	100	BKPCORP2	50:06:04:84:48:93:db:c3	SSAN2	fc279	100	DMX1231_FA4AB
BKPCORP2_HBA3_DMX1231_FA13AA	10:00:00:00:c9:50:48:3b	SSAN2	fc2718	100	BKPCORP2	50:06:04:84:48:93:db:cc	SSAN2	fc371	100	DMX1231_FA13AA
BKPCORP2_HBA3_L40_DRV0_DRV1	10:00:00:00:c9:39:36:6a	SSAN6	fc175	200	BKPCORP2	21:00:00:00:02:23:62:e1	SSAN6	fc177	200	L40_DRV0_DRV1
BKPCORP3_HBA0_CDL310_P4	21:00:00:e0:8b:9e:87:04	SSAN5	fc1113	200	BKPCORP3	10:00:00:0d:77:06:df:04	SSAN5	fc122	200	CDL310_P4
BKPCORP3_HBA1_L700_LTO3_DRV01	21:01:00:e0:8b:be:87:04	SSAN1	fc374	200	BKPCORP3	50:01:04:f0:00:60:11:b3	SSAN6	fc178	200	L700_LTO3_DRV01
BKPCORP3_HBA1_L700_LTO3_DRV02	21:01:00:e0:8b:be:87:04	SSAN1	fc374	200	BKPCORP3	50:01:04:f0:00:60:11:b7	SSAN6	fc179	200	L700_LTO3_DRV02
BKPCORP3_HBA2_SL500_LTO3_DRV1	21:00:00:1b:32:1e:af:80	SSAN5	fc171	200	BKPCORP3	50:01:04:f0:00:8e:ca:9e	SSAN5	fc177	200	SL500_LTO3_DRV1
BKPCORP3_HBA2_SL500_LTO3_DRV2	21:00:00:1b:32:1e:af:80	SSAN5	fc171	200	BKPCORP3	50:01:04:f0:00:8e:ca:a1	SSAN5	fc178	200	SL500_LTO3_DRV2
BKPCORP3_HBA3_L700_LTO3_DRV03	21:01:00:1b:32:3e:af:80	SSAN1	fc475	200	BKPCORP3	50:01:04:f0:00:60:11:b4	SSAN6	fc170	200	L700_LTO3_DRV03

Figure 6 – Zone Spreadsheet → Created from switch output

You can get a snapshot of the customer configuration using the zone spreadsheet. This is useful to check if there are any mistakes or problems with a host connection. When we have #N/A information, it means that the WWN from the host has a zone created, but the HBA is not logged on to the Switch. Based on this information, we can check with the customer if the zone is incorrect, powered down, or if there is an HBA problem.

The other perspective of the current FAN-IN/FAN-OUT is a draft, shown in Figure 7.

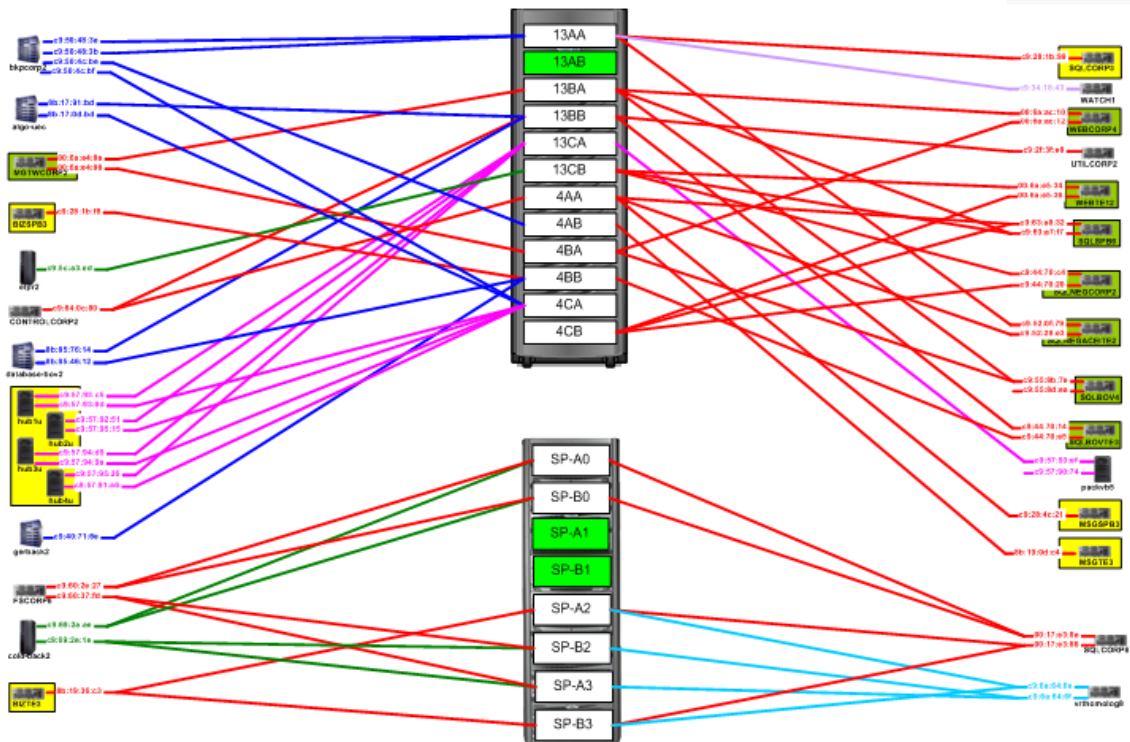


Figure 7 – Zone Draft Visio → Current Zone

The final documentation from this step provides the customer with an illustration of the future environment, applying corrections and best practices.

## 2.2) Topology

After the draft of the Actual Topology (Figure 8), the SA can design a new one or correct the current. This generates a port list from each switch to calculate the future changes.

(Illustration on following page)

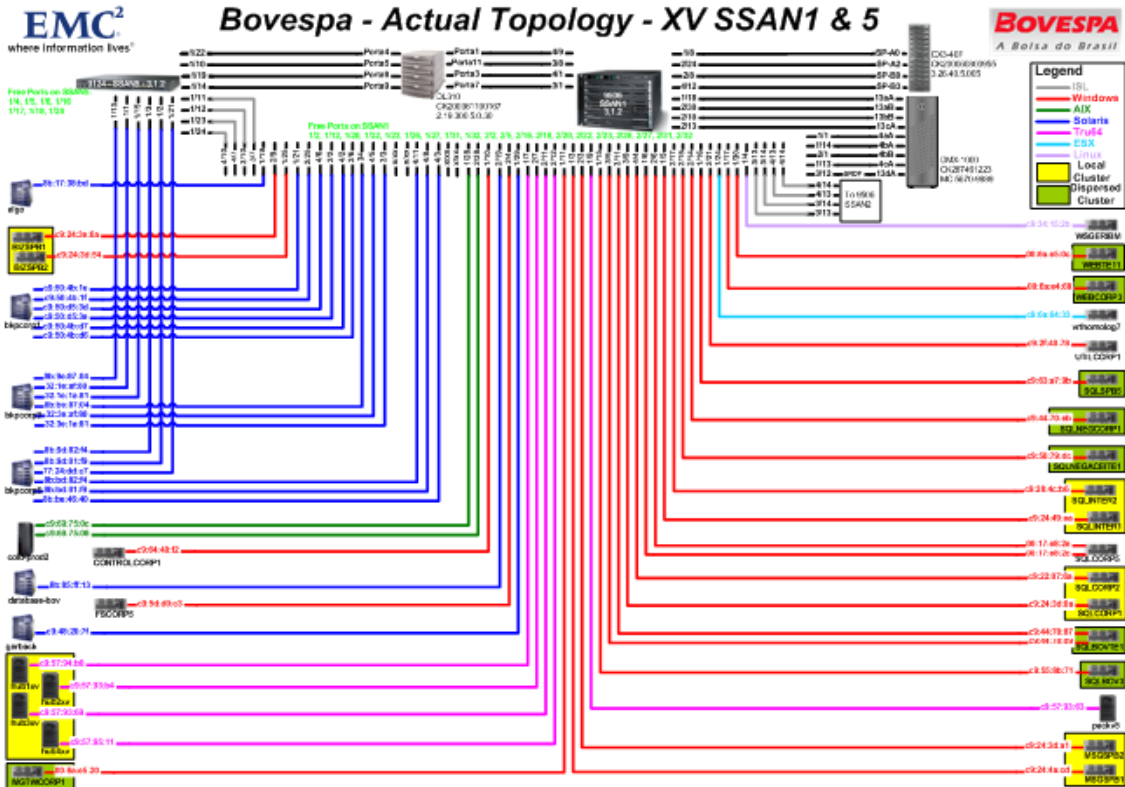


Figure 8 – Topology Draft Visio → Actual Topology

The Future Topology (Figure 9) results from analyses and study powered by the SA, based on availability, performance, FAN-IN/FAN-OUT and EMC Best Practices.

(Illustration follows on next page)

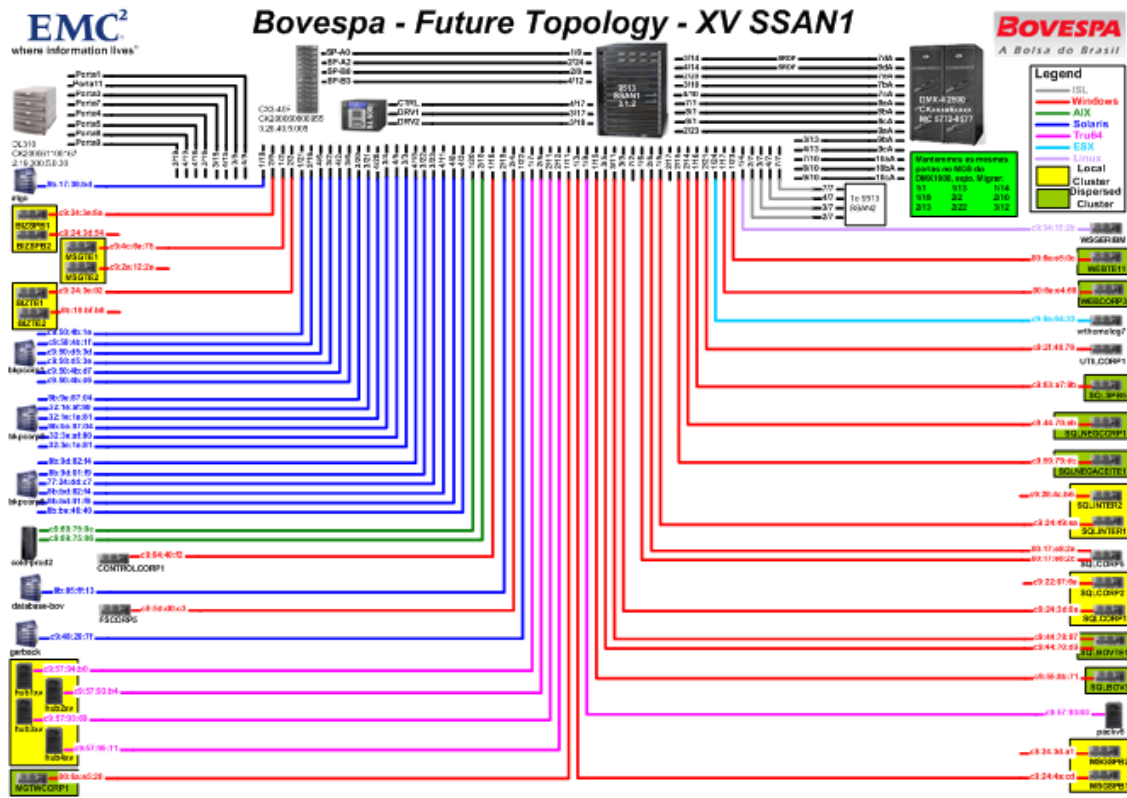


Figure 9 –Topology Draft Visio → Future Capacity

### 3) Storage

Storage information gives us the direction we will use to migrate, correct or check the current situation at the customer site. Other references from storage, such as performance, are very important before designing the new storage architecture.

The SA can use the Volumes spreadsheet to define the future Symmetrix Bin File and/or define the future CLARiON format, and suggest the migration strategy to the customer.

#### 3.1) Symmetrix Family

The Volumes spreadsheet has another important worksheet that includes a simple Symmetrix Format (Figure 10) that defines the amount of disks, protection, cylinders size, etc.



DMX-3 - #682				DMX1000 - #1776					
HOSTNAME FROM	TYPE	SYMVOL	FA	TYPE	SYMVOL	HOSTNAME TO	FA	APPLICATION	
LACBRA001CA0011/CB0011	R1	0093	7dB/9aB/9cB/10cB	R2	0093	LACBRA940AS0040	4dA/13dA	OLTP	
LACBRA001CA0011/CB0011	R1	0094	7dB/9aB/9cB/10cB	R2	0094	LACBRA940AS0040	4dA/13dA	OLTP	
LACBRA001CA0012/CB0012	R1	0095	7cb/7dB/8bB/10cB	R2	0095	LACBRA940DB0012	4aA/13aA	OLTP	
LACBRA800CA0001/CB0001	R1	0096	7aB/7dB/7cB/8bB	R2	0096	LACBRA940DB0001	4cA/13cA	OLTP	
LACBRA800CA0008/CB0008	R1	0098	7aB/7dB/7cB/8bB	R2	0098	LACBRA940DB0008	13dA	OLTP	
NÃO MONTA	R2	0099		R1	0099	LACBRA940CA0200/CB0200	4cA/4bA/13cA/13bA	OLTP	
NÃO MONTA	R2	009A		R1	009A	LACBRA940CA0200/CB0200	4cA/4bA/13cA/13bA	OLTP	
LACBRA001CA0011/CB0011	R1	00A7 (M2)	7dB/9aB/9cB/10cB	R2	00A7 (M2)	LACBRA940AS0040	4dA/13dA	OLTP	
LACBRA001CA0011/CB0011	R1	00A9 (M6)	7dB/9aB/9cB/10cB	R2	00A9 (M6)	LACBRA940AS0040	4dA/13dA	OLTP	
LACBRA001CA0011/CB0011	R1	00AF (M6)	7dB/9aB/9cB/10cB	R2	00AF (M6)	LACBRA940AS0040	4dA/13dA	OLTP	
LACBRA001CA0011/CB0011	R1	00B5 (M6)	7dB/9aB/9cB/10cB	R2	00B5 (M6)	LACBRA940AS0040	4dA/13dA	OLTP	
LACBRA001CA0011/CB0011	R1	00BB (M6)	7dB/9aB/9cB/10cB	R2	00BB (M6)	LACBRA940AS0040	4dA/13dA	OLTP	
LACBRA001CA0011/CB0011	R1	00C1 (M16)	7dB/9aB/9cB/10cB	R2	00C1 (M16)	LACBRA940AS0040	4dA/13dA	OLTP	
LACBRA001CA0011/CB0011	R1	00D1 (M5)	7dB/9aB/9cB/10cB	R2	00D1 (M5)	LACBRA940AS0040	4dA/13dA	OLTP	
LACBRA001CA0012/CB0012	R1	00D6 (M7)	7cb/7dB/8bB/10cB	R2	00D6 (M7)	LACBRA940DB0012	4aA/13aA	OLTP	
LACBRA001CA0012/CB0012	R1	00DD (M7)	7cb/7dB/8bB/10cB	R2	00DD (M7)	LACBRA940DB0012	4aA/13aA	OLTP	
LACBRA001CA0012/CB0012	R1	00E4 (M7)	7cb/7dB/8bB/10cB	R2	00E4 (M7)	LACBRA940DB0012	4aA/13aA	OLTP	
LACBRA001CA0012/CB0012	R1	00EB (M7)	7cb/7dB/8bB/10cB	R2	00EB (M7)	LACBRA940DB0012	4aA/13aA	OLTP	
LACBRA001CA0012/CB0012	R1	00F2 (M7)	7cb/7dB/8bB/10cB	R2	00F2 (M7)	LACBRA940DB0012	4aA/13aA	OLTP	
LACBRA800AS0006	R1	00F9 (M15)	9db/10aB	R2	00F9 (M15)	LACBRA940AS0006	4dA/4cA	OLTP	
LACBRA800AS0006	R1	0108 (M25)	9db/10aB	R2	0108 (M25)	LACBRA940AS0006	4dA/4cA	OLTP	
LACBRA800AS0038	R1	0121 (M6)	9db/10aB	R2	0121 (M6)	LACBRA940DB0012	4aA/13aA	OLTP	
LACBRA800AS0038	R1	0127 (M6)	9db/10aB	R2	0127 (M6)	LACBRA940DB0012	4aA/13aA	OLTP	
LACBRA800AS0038	R1	012D (M6)	9db/10aB	R2	012D (M6)	LACBRA940DB0012	4aA/13aA	OLTP	
LACBRA800CA0001/CB0001	R1	0195 (M8)	7aB/7dB/7cB/8bB	R2	0195 (M8)	LACBRA940DB0001	4cA/13cA	OLTP	
LACBRA800CA0001/CB0001	R1	019D (M8)	7aB/7dB/7cB/8bB	R2	019D (M8)	LACBRA940DB0001	4cA/13cA	OLTP	
LACBRA800CA0001/CB0001	R1	01A5 (M8)	7aB/7dB/7cB/8bB	R2	01A5 (M8)	LACBRA940DB0001	4cA/13cA	OLTP	
LACBRA800CA0001/CB0001	R1	01AD (M8)	7aB/7dB/7cB/8bB	R2	01AD (M8)	LACBRA940DB0001	4cA/13cA	OLTP	
LACBRA800CA0001/CB0001	R1	01B5 (M8)	7aB/7dB/7cB/8bB	R2	01B5 (M8)	LACBRA940DB0001	4cA/13cA	OLTP	
LACBRA800CA0001/CB0001	R1	01BD (M8)	7aB/7dB/7cB/8bB	R2	01BD (M8)	LACBRA940DB0001	4cA/13cA	OLTP	
LACBRA800CA0001/CB0001	R1	01C5 (M8)	7aB/7dB/7cB/8bB	R2	01C5 (M8)	LACBRA940DB0001	4cA/13cA	OLTP	
LACBRA800CA0001/CB0001	R1	01CD (M8)	7aB/7dB/7cB/8bB	R2	01CD (M8)	LACBRA940DB0001	4cA/13cA	OLTP	

Figure 12 – SRDF → With Symm from (R1) with Symm to (R2)

### 3.2) CLARiiON Family

We use the CLARiiON Designer (Figure 13) to create a CLARiiON Configuration Planning Form (CCPF).

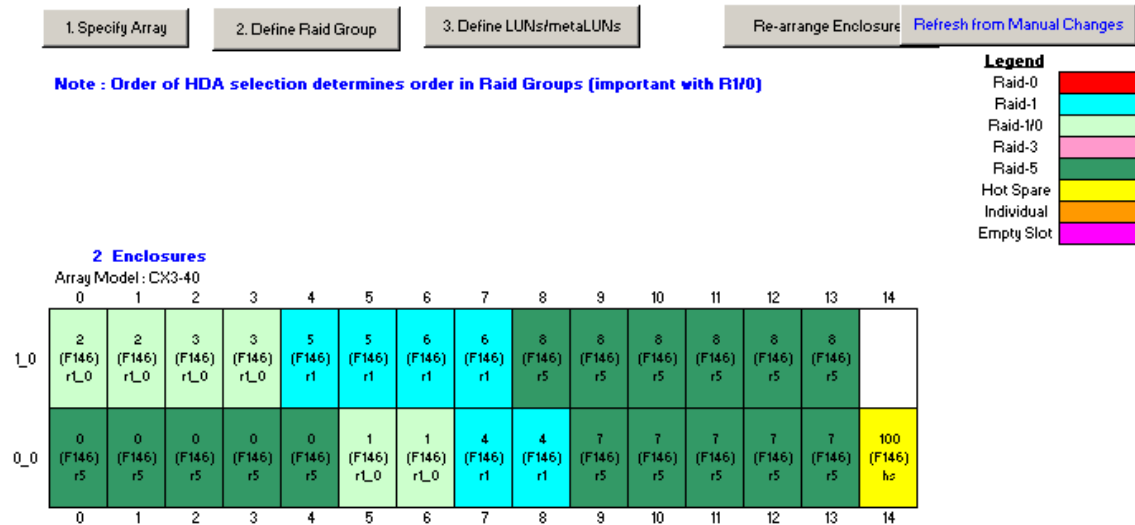


Figure 13 – CLARiiON Designer → Worksheet Array Layout worksheet



It is important to discover the use of technologies implemented at the customer's storage. If the customer has changed the platform, for example, if the customer has a Symmetrix and they are going to CLARiiON, it is important to clarify some basic concepts and functionality differences associated with each storage system.

The draft of the solution is the other relevant phase of the project, where the SA should know what the customer application does to determine the best solution. Some whitepapers can be a great help, and must be used with the customer to determine the definitive layout.

The SA creates a document that will be helpful to the IS who implements the solution, based on format, front-end distribution, host masking, etc.

Any other relevant information from the customer can help us to create the SIG, including EMC ControlCenter<sup>®</sup> implementation. An interview with the customer helped us to discover the hardware specifications where ControlCenter will be installed, and on which Operating System we have to install the contracted agents. This information was used to fill the qualifier process.

The same operation can be used to request information about Replication Manager software, where this information will be used to fill the qualifier process, also.

## Phase II - Generating all output needed

In this phase, we will create the documentation used to create the SIG. These documents are based on outputs received from the customer. The creation process uses:

- Heat
- HealthCheck
- E-Lab Interoperability
- Volumes
- Swat
- Zones
- SAN Topology
- Storage Format
- SRDF / MirrorView List
- EMCGrabs Control

Microsoft Excel, Microsoft PowerPoint, Microsoft Visio, Microsoft Project and EMC web sites are the necessary tools to create these documents.

### **1) Heat**

Generating Heat from the *Host Environment Analysis Tool* at

<http://toolbox.isus.emc.com/heat-upload2> is the first thing to do after receiving

EMCGrabs from the customer. After you save the file, you will use Heat in the next steps.

### **2) HealthCheck**

We will start to fill the fields from the HealthCheck template. The *Resume* worksheet (Figure 14) has an introduction to the spreadsheet and instructions about how to fill the fields.








## Welcome to EMC HealthCheck

The propose of this document is to show all current customer environment and the supported environment.  
The follow steps are:

- 1) Collect all EMCGrabs from the customer's hosts;
- 2) Create a Heat of then;
- 3) Fill each field with information from Heat or EMCGrabs;
- 4) After that, pick-up all information and put on E-Lab, getting the pdf of each host;

This process guarantee that the current environment is or not supported by EMC.

Present all necessary corrections on this document, and, also, put some additional information on Alerts;

Legend:	
	Local Cluster
	Information got from Heat or EMCGrab
	Information got from E-Lab
	SRDF/CE
	Remote Cluster without SRDF/CE

[Operational System](#)

When you will fill up the sheet, some this one will be Protect, to avoid any mistake. On this case, the Cell that you need to input the data is marked with gray light for the first sheet and gray dark for the other one.

[PowerPath License](#)

[Patches](#)

When you identify that a host is a part of cluster, the Cells must be fill up with Yellow or Orange color.

[HBA DRV FW](#)

After the customer had applied all corrections, it needs to send a new EMCGrab again, to check if all corrections were correctly applied.

[HBA SAN](#)

This information is on each sheet, ath the column EMCGrabs, where the Sent? Means that the customer sent us the EMCGrab, the Validate? means that EMC checked the EMCGrab and validate the corrections. On this cell, put the date of your check.

[3rd Software](#)

[EMC Software](#)

[Alerts](#)

Figure 14 – HealthCheck → Resume worksheet

The MATRIX field should be empty until the HealthCheck and E-Lab have been completed. When the E-Lab is done, each worksheet will be filled with OK or NOK (Figure 15) in this field, indicating if it has a problem and what type of problem it is.

Create an RPQ if you find any discrepancy in a current customer environment that is not supported by the EMC Matrix. After analyzing the RPQ, complete the MATRIX column with the approved RPQ number (green) or the disapproved RPQ number (red).

After you present this spreadsheet or the guide to the customer, and it will correct the environment, send a new EMCGrab to the SA to check if the corrections were applied correctly to comply with the EMC Matrix. Then, update the spreadsheet and create a new version. The EMCGRAB field is used for this control.

Here is a structure of information needed (to be obtained from Heat and EMCGrab files) to fill each worksheet:

Operational System

- Hostname
- Manufacturer
- Model
- Patch Kernel
- Name
- Version

PowerPath® License

License

Serial

Patches

Minimum Recommended Patches

HBA DRV FW (Driver and Firmware)

Quantity

Model

Driver

BIOS

Firmware

The same information above in case of the HBA is not certified by EMC

Switch

Model

Firmware

HBA

3<sup>rd</sup> Software

Product

Actual Version

Mandatory Version

EMC Software

Product

Actual Version

Mandatory Version

Alerts

Depending if Heat is displaying. This worksheet is used to advise the customer about any irregular settings in the environment

Host			Operation System				Mandatory				
Hostname	Manufacture	Model	Patch Kernel	Name	Version	HBA	Driver	BIOS	FirmWare	MATRIX	Sent?
hub2w	HP	E547	PatchKit 5	Tru64	5.1E	OK	OK	-	OK	OK	8/1/2008
hub3w	HP	E547	PatchKit 5	Tru64	5.1E	OK	OK	-	OK	OK	8/1/2008
hub4w	HP	E547	PatchKit 5	Tru64	5.1E	OK	OK	-	OK	OK	8/1/2008
MGTVCORP1	HP	BL460c G1	SP4	Windows	2000 AS X86	OK	OK	-	-	OK	8/1/2008
MSGSPB1	HP	DL580	SP4	Windows	2000 AS X86	OK	2.42a0	-	OK	RPQ3455410	8/1/2008
MSGSPB2	HP	DL580	SP4	Windows	2000 AS X86	OK	2.42a0	-	OK	RPQ3455410	8/1/2008
MSGTE1	HP	DL580	SP4	Windows	2000 AS X86	OK	2.42a0	-	1.92a1	NOK	8/1/2008
MSGTE2	HP	DL360 G2	SP4	Windows	2000 AS X86	OK	2.42a0	-	OK	RPQ3455447	8/1/2008
paokv5	HP	E547	PatchKit 5	Tru64	5.1E	OK	OK	-	OK	OK	8/1/2008
SQLBOV3	HP	RX7640	SP1	Windows	2003 EE IA 64	OK	1.30a9	-	1.92a1	RPQ3455453	8/1/2008
SQLBOVTE1	HP	RX8620	SP2	Windows	2003 EE IA 64	OK	1.30a9	-	1.92a1	NOK	8/1/2008
SQLCORP05	HP	DL380 G5	SP2	Windows	2003 EE X86 R2	OK	OK	-	-	OK	8/1/2008
SQLCORP1	HP	DL385 G1	SP4	Windows	2000 AS X86	OK	2.42a0	-	OK	RPQ3455457	8/1/2008
SQLCORP2	HP	DL385 G1	SP4	Windows	2000 AS X86	OK	2.42a0	-	OK	RPQ3455457	11/1/2008
SQLNEGACITE1	HP	RX8620	SP2	Windows	2003 EE IA 64	OK	1.30a9	-	1.92a1	NOK	8/1/2008
SQLNEGACORP1	HP	RX8620	SP1	Windows	2003 EE IA 64	OK	1.30a9	-	1.92a1	NOK	8/1/2008
SQLSPB5	HP	DL580 G4	SP1	Windows	2003 EE X86	OK	2.40a3	-	2.72a2	NOK	8/1/2008
SQLTE3	HP	DL585 G1	SP2	Windows	2003 EE X86	OK	1.30a9	-	3.92a2	RPQ3455482	8/1/2008
UTILCORP1	HP	DL360	SP4	Windows	2000 AS X86	OK	2.42a0	-	OK	RPQ3455481	8/1/2008
VEBCORP3	HP	BL460c G1	SP1	Windows	2003 EE X86	OK	9.14.15	1.26	-	NOK	8/1/2008
VEBTE11	HP	BL460c G1	SP2	Windows	2003 EE X86	OK	9.14.15	1.26	-	NOK	8/1/2008
VRTCORP31	HP	BL460c G1	2.4.21-47.0.1.Elvminix	ESX	3.5.0 (64607)	OK	7.09-vm32	-	-	NOK	8/1/2008
vrthomolog7	HP	ML370 G2	2.4.21-47.0.1.Elvminix	ESX	3.5.0 (64607)					NOK	8/1/2008
wsgeribm	HP	DL580	2.4.9-e.25mp	Linux	RH AS 2.96-118.7.2	OK	OK	-	OK	RPQ3455736	8/1/2008
BKPCORP3	Dell	PE6590	SP2	Windows	2003 EE X86	OK	OK	-	-	OK	11/1/2008
BKPCORP5	Dell	PE6590	SP2	Windows	2003 EE X86	OK	OK	-	-	OK	11/1/2008
COLD-PROD2	IBM	9131-52A	ML06	AIX	5.3.0.0	OK	-	-	OK	OK	11/1/2008
SQLSPB3	0	0	0	0	0						

Figure 15 – HealthCheck → HBA DRV FW (Driver and Firmware)

### 3) E-Lab

The next step is to certify if the customer environment is aligned to the EMC Support Matrix. This is done at *EMC E-Lab Interoperability Navigator*, at <https://elabnavigator.emc.com/do/navigator.jsp>. Add each item compiled from HealthCheck to the *Search Cart* (Figure 16). At the final selection, generate a PDF file from your query using the **Get Results** button.

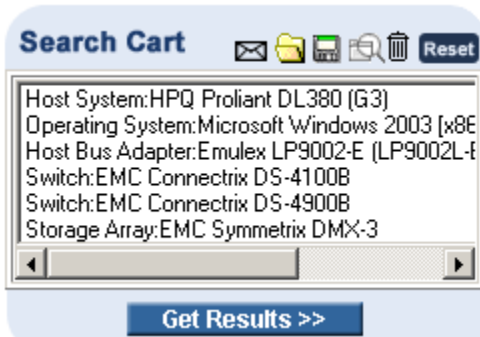


Figure 16 – E-Lab Interoperability Navigator → Search Cart

This PDF file is your certification that the environment is, or is not, supported by EMC. It will be used to complete some fields on the HealthCheck spreadsheet. At this point, the SA has to analyze the customer's host environment and certify if there are any discrepancies. If an RPQ is needed, the SA must complete it. All information is provided by the E-Lab and HealthCheck documents.

#### 4) Volumes

We will start to fill the fields from the unused or template Volumes. The *Resume* worksheet (Figure 17) has an introduction that describes how to fill the fields.

This is the version 03, updated on Sep 28th by Zancope



### Welcome to EMC Volumes

The propose of this document is to show all volumes accessed by the host, resume the actual format of the frame and give a overview of the new frame's format, where:

- 1) Collect all EMCGrabs from the customer's hosts;
- 2) Change the name of each sheet with the hostname;
- 3) Fill each sheet with volume information from Heat or EMCGrabs;
- 4) With all volumes defined and filled up, create a summary on Actual Capacity sheet;
- 5) After format defined, you can filled up the Future Capacity sheet;

With this information, you can have notion of the actual capacity planning from each host and from the frame. Based on this information, you can define the future format of new customer's frame, showed at Format sheet;

[Format Resume](#)

[Format](#)

[Actual Capacity](#)

[Future Capacity](#)

Legend:	
	Data Input (Marked the options on the Cell)
	There is no information displayed
	Pay Attention

Figure 17 – Volumes → *Resume* worksheet

The *Format Resume* worksheet (Figure 18) explains the configuration from each Symmetrix Family to help the SA decide which format is best applied to the Symmetrix.



### Format Resume

[DMX-3](#)

[Format](#)

[DMX](#)

When you configure DMX-3 Family, consider the following usable cylinders:

- Disk of 73GB ---> 74612 Usable Cyl
- Disk of 146GB --> 149228 Usable Cyl
- Disk of 300GB --> 304934 Usable Cyl
- Disk of 500GB --> 508225 Usable Cyl

When you configure DMX-3 Family, consider the following slots pairs:

Front-End Pairs:	Back-End Pairs
- 7 with 10	- 1 with 16
- 8 with 9	- 2 with 15
- 4 with 13	- 5 with 12
- 3 with 14	- 6 with 11

When you configure DMX-3 Family, consider the following Minimal and Max Configuration and Max Disks per Configuration:

- Model 1500:



- + 1 DA Pair -> 1 Storage bay (Min Conf) -> MAX 120 Disks
- + 1 DA Pair -> 2 Storage bay (Max Conf) -> MAX 240 Disks



- Model 2500 :



- + 2 DA Pair -> 1 Storage bay (Min Conf) -> MAX 192 Disks
- + 2 DA Pair -> 4 Storage bay (Max Conf) -> MAX 960 Disks



- Model 3500:



- + 3 DA Pair -> 2 Storage bay (Min Conf) -> MAX 360 Disks
- + 3 DA Pair -> 8 Storage bay (Max Conf) -> MAX 1440 Disks



Figure 18 – Volumes → *Format Resume* worksheet

The *Format* worksheet (Figure 10) helps the SA to configure the Symmetrix by checking its model and series. The SA completes the yellow fields to get the final format, size and amount of hyper.

Insert information about the host volume access, such as hostname, WWN from HBAs, device name of these devices, serial number from the source frame, Symmetrix volume number, quantity of hyper, type of volume, which FA is the host is accessing the volumes and the volume size (host point of view) from each host worksheet (Figure 19). Some of this information is obtained from Heat and EMCGrab files. If there will be a target frame used by SRDF migration, complete the rest of worksheet.

Host				Symmetrix FROM DMX-1000					Symmetrix TO DMX-4						
Hostname	WWN	Dev Name	S/N	SymVol	Hyper	Type	FA	Size	S/M	SymVol	Hyper	Dev Type	FA	Size	Clone Vol
BIZSPB1	10.00.00.00:c9:24:3e:6a	u:\PHYSICALDRIVE3	23 00H2		1	RDF1-R5	4bB	8,838,720						0	No Clone
BIZSPB2	10.00.00.00:c9:24:3d:54	u:\PHYSICALDRIVE4	23 00H3		1	RDF1-R5	14bB	8,838,720						0	No Clone
								0						0	
								0						0	
								0						0	
								0						0	
								0						0	
								0						0	
								0						0	
								0						0	
								0						0	
								0						0	
								0						0	
								0						0	
								0						0	
								0						0	

Figure 19 – Volumes → Host worksheet

After each host worksheet is completed correctly, you can view the summary on the *Actual Capacity* worksheet (Figure 20). This summarized view is an effective way to check the customer's current situation and will be very helpful when deciding future capacity planning and frame format.

Hostname	Enter the Current Storage Series: DMX Enter the Model 1000										Device Type						HYPER		
	0	1	2	3	4	5	6	7	8	10	11	12	13	14	20	23	TOTAL	TOTAL	
bin	1,104,000	8,838,720	17,677,440	26,516,160	35,354,880	44,193,600	53,032,320	61,871,040	70,709,760	88,387,200	114,303,360	123,142,080	176,174,400	203,290,560			176,174,400	24	
BIZSPB1b2	1	2											1				17,677,440	2	
bizcorp		17															176,258,240	11	
datacorp		4			1	1				2	1	1					339,271,360	16	
SOLNEGACITE1	2	1		1				1									60,367,200	10	
WEBCORP3	1	1															8,838,720	1	
WEBTE11	1	1															8,838,720	1	
zsp1											2						176,174,400	10	
zspback		2															17,677,440	2	
zspflow_2,3,4	1	10	3		2												270,128,000	14	
NGHTWCORP1	1			1													26,516,160	3	
NEGSPB1b2	1	3															26,516,160	3	
NEGSTE1b2	1	3															26,516,160	3	
zspdb					1												26,516,160	3	
SOLB010	2	1			1							2			5		1,044,204,000	53	
SOLB01E1	2			3		1		2									247,440,000	13	
SOLCORP1b2	1	1	1		3		1			1							265,161,600	14	
SOLNEGOCORP1	2	1		1			1										26,516,160	10	
SOLSPB5	2	5		1	2	2			2	1			1				339,271,360	17	
SOLTE3								1	2					1			176,174,400	10	
UTILCORP1	1		1								1						26,516,160	10	
zspzlib							1										26,516,160	3	
<b>TOTAL no</b>	<b>1000</b>		<b>51</b>	<b>5</b>	<b>7</b>	<b>10</b>		<b>3</b>	<b>7</b>	<b>4</b>		<b>3</b>	<b>6</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>6</b>	<b>4,322,134,080</b>	<b>483</b>

If the Storage is a DMX or DMX-3 Family, compare the devices created from Bin Files with each accessed host  
 If the Storage is a CX Family, compare the devices created from SP Collect with each accessed host

The host goes to DMX-4	XV		<b>R1</b>	<b>R2</b>	<b>STD</b>	<b>BCV</b>	
The host goes to CX		Genl	3,641,552,640	592,194,240	88,387,200	335,871,360	4,658,005,440
		CX	88,387,200	17,677,440			106,064,640
	UEC		<b>R1</b>	<b>R2</b>	<b>STD</b>	<b>BCV</b>	
		TOTAL	866,194,560	3,615,036,480	88,387,200	0	4,569,618,240
		CX	17,677,440	88,387,200			106,064,640

Figure 20 – Volumes → Actual Capacity worksheet

## 5) Swat

Swat is one of the steps to check the current configuration of the switch (summarized mode). It is available at EMC GSTools, at <http://toolbox.isus.emc.com/swat-upload.php>. The Swat process follows the same procedure as Heat, except that it asks to check which vendor you are using.

Some important information can be obtained from the summarized report, such as switch model, IP configuration, current firmware version, etc. Other information can be found on the specific switch output command, where it will use the zone and port information to create a zone spreadsheet.

## 6) Zones

The zone spreadsheet summarizes all zones created on the switch, based on outputs from specific commands, depending on switch model. The spreadsheet uses the VLOOKUP feature that allows you to separate worksheets in 2: Actual Zone and port (Figure 21).



34	BKPCORP3_HBA1_L700_LTO3_DRY02	21:01:00:e0:8b:be:87:04
35	BKPCORP3_HBA2_SL500_LTO3_DRY1	21:00:00:1b:32:1e:af:80
36	BKPCORP3_HBA2_SL500_LTO3_DRY2	21:00:00:1b:32:1e:af:80
37	BKPCORP3_HBA3_L700_LTO3_DRY03	21:01:00:1b:32:3e:af:80

Figure 21 – Zone → *Actual* and *port* Worksheet

The *port* worksheet is the main part of the spreadsheet that contains all the information about WWN logged on the current port of switch, and on which switch this WWN is logged. The other part is zone information, where we can discover the member from each zone. All of this information is obtained from specific switch output.

This information must be separated in three columns: WWN, Switch Name and Port Number. After the SA finds it on the switch output, he pastes it on the worksheet, as bellow (Figure 22):



50:06:04:84:48:93:d9:c3	SSAN1	fc1/1	100
10:00:00:00:c9:24:4a:cd	SSAN1	fc1/3	100
10:00:00:00:c9:34:15:2b	SSAN1	fc1/4	100
10:00:00:00:c9:24:49:ea	SSAN1	fc1/5	100
50:01:10:a0:00:17:e8:2c	SSAN1	fc1/6	100
10:00:00:00:c9:57:94:b0	SSAN1	fc1/7	100
50:06:01:60:30:22:88:1e	SSAN1	fc1/8	100
10:00:00:00:c9:57:93:63	SSAN1	fc1/9	100
10:00:00:00:c9:64:40:f2	SSAN1	fc1/10	100
50:06:0b:00:00:6a:e5:20	SSAN1	fc1/11	100
50:06:04:8c:48:93:d9:c3	SSAN1	fc1/13	100
50:06:04:84:48:93:d9:d3	SSAN1	fc1/14	100
10:00:00:00:c9:55:8b:71	SSAN1	fc1/15	100
10:00:00:00:c9:63:a7:9b	SSAN1	fc1/16	100
50:06:0b:00:00:6a:e4:68	SSAN1	fc1/17	100
50:06:04:84:48:93:d9:cc	SSAN1	fc1/18	100
21:00:00:e0:8b:17:38:bd	SSAN1	fc1/19	100
10:00:00:00:c9:50:4b:1e	SSAN1	fc1/21	100
10:00:00:00:c9:6a:64:33	SSAN1	fc1/24	100
10:00:00:00:c9:24:3d:54	SSAN1	fc1/25	100
10:00:00:00:c9:69:75:0c	SSAN1	fc1/28	100
10:00:00:00:c9:48:20:7f	SSAN1	fc1/29	100
50:06:0b:00:00:6a:e5:0c	SSAN1	fc1/30	100
50:06:04:84:48:93:d9:f3	SSAN1	fc2/1	100
10:00:00:00:c9:24:3d:a1	SSAN1	fc2/3	100

Figure 22 – Zone → Port worksheet

After all the information is pasted on this worksheet, the SA needs to make the relationship of this information on the *Actual Zone* worksheet, using the VLOOKUP to discover where the specific WWN member from a zone and switch is logged. Figure 23 shows an example of a zone name with its members.

1	Zone Name	Zone Member 1	Switch	Port	Device	Zone Member 2	Switch	Port	Device
2	LACBRA940AIX020_hba0_DMx776_FA4AB	10:00:00:c9:5e:a4:66	CNSP-C	7	LACBRA940AIX020	50:06:04:84:48:94:64:23	CNSP-C	16	DMX1000-1776-4aB
3	LACBRA940AIX015_hba0_DMx776_FA4AB	10:00:00:c9:5e:a6:51	CNSP-C	6	LACBRA940AIX015	50:06:04:84:48:94:64:23	CNSP-C	16	DMX1000-1776-4aB
4	LACBRA940AIX016_hba0_DMx776_FA4AB	10:00:00:c9:5e:6e:3c	CNSP-C	30	LACBRA940AIX016	50:06:04:84:48:94:64:23	CNSP-C	16	DMX1000-1776-4aB
5	LACBRA940AIX023_hba0_DMx776_FA4AB	10:00:00:c9:5e:3e:56	CNSP-C	15	LACBRA940AIX023	50:06:04:84:48:94:64:23	CNSP-C	16	DMX1000-1776-4aB

C2	=VLOOKUP(\$B2,port!\$A:\$B,2,FALSE)	D2	=VLOOKUP(\$B2,port!\$A:\$C,3,FALSE)
----	-------------------------------------	----	-------------------------------------

Figure 23 – Zone → Actual Zone

This example illustrates the use of VSLOOKUP. In this case, the C2 cell has the formula to reference data in cell B2. The formula checks the data stored on the *port* worksheet, indicating to which switch the manually input WWN on B2 is physically connected. The same occurs at cell D2, looking for which port the WWN is attached.

Remembering that the fields: Zone Name, Zone Member 1, Device, Zone Member 2 and Device should be entered manually, separate the member from a zone inside an activated zone set.

## **7) SAN Topology**

Once the SA creates the Zones spreadsheet, he can create the actual customer Topology (Figure 8) that has information about each component, where it is connected, and to which port. This process varies from SA to SA, but the tool should be the same: Microsoft Visio and the draw must have all connections from a host, storage or tape library to a switch port.

The draft of the current zone (Figure 7) is another document that must be created. It is another visualization of FAN-IN/FAN-OUT and zone information.

A future topology is created (Figure 9) after the FAN-IN/FAN-OUT study, based on the new or migration switch and/or new or migration storage. This illustrates what was and what will be the customer environment.

## **8) Storage Format – Symmetrix**

All collected information is forwarded to the Customer Engineer (CE) to create a new Bin File. There are two ways to forward this information:

1. Forward the format and hyper size to create a new Bin File, including creation of Vault Volumes, SFS, Gate Keeper, VCMDB, etc. All other volumes such as Meta Volume and their assignments are made later, with software, using the Symmetrix Command Line Interface (SYMCLI) over the Configuration Manager. In this case, the IS can create the metas and assign them to respective FAs based on the *Volumes* spreadsheet created by the SA. After that, the IS masks these volumes to a specific host.
2. The other option includes CE discovery about which Micro Code will be loaded at the Symmetrix. Pick up a copy and install it on your machine. Then, simulate creation of Vault Volumes, SFS, Gate Keepes, VCMDB, etc. The SA must know a little about the Symmwin tool. Then, go into Volume Map and export it to Excel (text format). With Excel, create the Metas and assign them to FAs.

It is uncommon, but at times the CE participates in pre-site meetings and becomes responsible to create the Bin File and leave it with the SA to do a final check before applying it to the storage.

After the CE has created the Bin File, he sends the current Bin File to the SA, and the Volume Map worksheet (Figure 11) is created. This worksheet is used to create Meta Volumes and assign each volume to FA. This information helps the IS to create a simple script to create Metas and assign them to FA. It uses the SYMCLI Configuration Manager from a unique host connected to Storage and an assigned Gate Keeper.

### **9) Storage Format – CLARiiON**

All collected information is forwarded to the CE using the CCPF document. With CCP, the CE can install and configure the CLARiiON. The CCPF has important information about Raid Group formatting, hosts that will be connected, switches to be connected, LUN and Storage Groups that need to be created.

The CLARiiON Procedure Generator is the other important document. This is completed by the CE and contains information about field installation.

### **10) SRDF / MirrorView List**

This is a simple list of source devices that will be mirrored to the target devices. If both storages are new installations, this creation process will be more difficult because there is no definition running yet. If the customer has production storage and is replicating it to the secondary, or this feature is used for migration, the process should be completed quickly.

The SA must take the current configuration, mask source array, and create a relationship of these devices with the target array. In some cases, the SA leaves this documentation with a CE to create a Bin File. In other cases, the IS is responsible to do that when we have MirrorView and SRDF with dynamic configuration.

The source devices can be taken over Volumes spreadsheet, masking of the storage, or, in extreme case, inquiry from host to host. Although SRDF is created on the Bile File, if the link and/or devices are set to dynamic, the IS can do the relationship of source and target and start the replication over SYMCLI.

### **11) EMCGrab Control**

This document is used to help the SA and PM verify if the customer is sending the requested EMCGrabs, based on new changes executed by the customer himself or changes requested by EMC, to keep the host compliant with the EMC Matrix.

## Phase III – Creating the SIG

The SIG was developed to compile all information created by the SA. This information is used by the PM to create a project plan and to implement the solution.

The SIG is structured in:

- Version Control
- Topologies: Actual, Future and SRDF/MirrorView
- HealthCheck
- Hosts – Total
- Hosts – Actual and Future Masking
- Hosts – Actual and Future Capacity Planning
- TimeFinder / Snapview
- SAN – Switches
- SAN – Actual and Future Zone
- SAN – Actual and Future Ports
- Storage – Description, Format and Fiber Ports
- EMC ControlCenter – Configuration and Agents
- Macro Plan and/or Points of Attention

### **1) Version Control**

Display all SA document versions, based on changes in the customer environment, analyses checks and new documentation. It is useful to follow the evolution of the SIG and the documentation.

For example, if the customer has made mandatory changes on HealthCheck, a new HealthCheck will be generated, so a new version of the SIG should be created, too.

### **2) Topologies: Actual, Future and SRDF/MirrorView**

The SA drew the SAN Topologies using Microsoft Visio. On this part of the SIG, the SA just pastes the drawing in the respective field. Remember that the SA needs switch outputs to create a SAN map and, after that, a draw.

Look that at the footer page; it has a small text box sized 5,73 x 8,17 – 0,83 x 1,27 that means the size and position of the picture. To access it, just right click over the picture and select the *Format Objects* (Figure 24), click on size tab and put the values (height and width), listed on the picture. The other option is to deselect is the *Lock aspect ratio*.

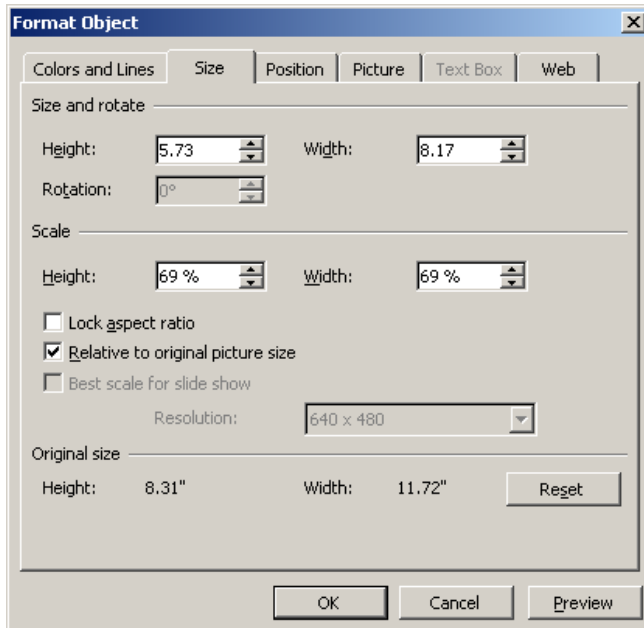


Figure 24 – SIG → Standard picture size and position

Horizontal or Vertical are the other standard values (Figure 25) accessed over the *Position* tab. All of these values create a standard value of the picture.

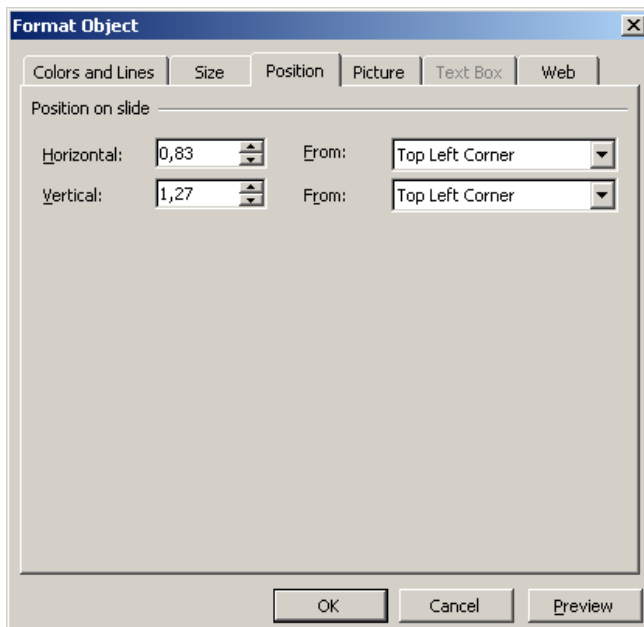


Figure 25 – SIG → Standard Horizontal and Vertical size

### **3) HealthCheck**

Show all information consolidated at the HealthCheck phase. All HealthCheck information is summarized on the SIG for presentation to the customer. If any changes occur on HealthCheck, the SIG should be changed, too.

The SIG has a space to document any issue found during the HealthCheck process. This is very important because the customer has a formal description of some relevant information of their environment that can be fixed.

### **4) Hosts - Total**

Summarize the number of hosts in the current customer environment, divided by Operating System. This information is helpful to certify how many hosts are in the environment. This helps to plan the FAN-IN/FAN-OUT distribution and how many SAN ports will be used.

### **5) Hosts – Actual and Future Masking**

Display the current distribution of volumes from storage to the host. Based on the inquiry command from the host, this information displays the current path distribution to certify if the balancing is working on the physical Host Bus Adapter (HBA). The mask gives the valid path and device driver of the Operation System it is using. To plan a migration, for example, the device path is very important to decide the best method to migrate and rollback.

Future masking is used when the host will be migrated from one storage to another, and you plan the future path distribution where each device will be a map. This provides the IS with a clear vision from where each host should be connected (front-end storage ports) and which device the host should access.

## **6) Hosts – Actual and Future Capacity Planning**

Masking the actual capacity gives us general information, from a management point of view, of the amount of data allocated to the host. This information is valid to plan the format and distribution of future storage. Using this information, the SA can visualize the real storage situation, host by host.

Future capacity is a result of a capacity study based on the customer environment growth plan. The other important information from this analysis will be a resume of volumes that will be created, that will be helpful to create a bin file in a Symmetrix environment.

## **7) TimeFinder / SnapView**

Depending on the technology the customer is using, this section summarizes local replication. The idea is to demonstrate to the customer how their local replicas are distributed and to plan a future strategy for this replication.

It is important, because if the customer is using a determinate feature from storage that is not supported on the future storage, the SA has time to study an alternative to fill the gap and propose any changes. A good example is where the customer has Symmetrix TimeFinder/Mirror and the future storage will be CLARiiON (with ILM), where this functionality does not work equally for Symmetrix.

## **8) SAN - Switches**

We need a simple overview of the current hardware installed on the customer site and a display of information about some essential settings, such as IP Address, Gateway, etc, and a main of that: current firmware version.

With the current firmware version, the SA can check the EMC interoperability matrix to determine the latest firmware to be upgraded on the project implementation time. This is relevant information on the E-Lab navigator to validate the current customer SAN components to the new Firmware switch.



### **9) SAN – Actual and Future Zone**

Display the current zone to present to the customer, showing some error or incorrect configuration that can be fixed during the implementation process. This is very useful to check the current FAN-IN/FAN-OUT distribution where the SA can examine this scenario and has time to study and propose any solution or change.

The results of this study are the Future Zone, where all components align with EMC best practices.

### **10) SAN – Actual and Future Ports**

This information display how SAN ports are distributed by Hosts, Storage, ISL, TLU and other SAN Components. It provides a resumed list of each component that can be used to plan a new SAN.

In some cases, where the customer uses ISL to traffic backup and data information together, this study can be more detailed. It can verify the switch performance to check if there is a bottleneck on the ISL path or ports; the SA can study the best way to fix this issue or recommend an alternative.

### **11) Storage – Description, Format and Fiber ports**

Give a simple and resumed display of the acquired storage by the customer, showing the model, serial number, number of disk, fiber ports and cache. This provides the customer with an idea of the total storage capacity.

The format is another important piece of information, because in most of cases the pre-sales person had spoken with the customer. Else, the SA can drive this direction with customer needs in mind.

Fiber ports are how the customer sees how many paths are available and if the SA can work with this number to draw the future FAN-IN/FAN-OUT and front-end distribution.

## **12) EMC ControlCenter – Configuration and Agents**

This is a very simple draft of the EMC ControlCenter configuration where the customer has an idea of the implementation and which kind of agents will be required to work closely with the EMC ControlCenter server.

The EMC ControlCenter qualifier is a pre-sales responsibility that is not covered here. Just the implementation and agents' layout distribution are relevant at this point.

## **13) Macro Plan and/or Points of Attention**

This is optional information in case the customer needs a macro plan of a complex data migration. This is a simple animated draft of how the data will be migrated.

A Point of Attention is one thing that can be used. It allows the SA to show the customer all important issues that can be fixed immediately, or during project implementation. In some cases, these issues are an emergency fix.

## Phase IV – Creating the Project Plan

The Project Manager creates a project plan after all SIG information is presented to the customer and the customer agrees (Figure 26). Please consider the task, predecessors and resource allocation. Do not attempt to time each task because the time can vary depending on project complexity.

	Task Name	Duration	% Compl	Start	Finish	Pri	Resourc
1	Project Name	58.75 hrs	0%	Mon 6/6/05	Wed 6/15/05		
2	SOW	1.25 hrs	0%	Mon 6/6/05	Mon 6/6/05		
5	KickOff	8 hrs	0%	Mon 6/6/05	Tue 6/7/05		
9	Requesting Customer Information	1 hr	0%	Tue 6/7/05	Tue 6/7/05		
10	EMCGrabs	1 hr	0%	Tue 6/7/05	Tue 6/7/05		
11	Request EMCGrabs to the Customer	1 hr	0%	Tue 6/7/05	Tue 6/7/05	8	EMC/SA
12	Switches Output	0.25 hrs	0%	Tue 6/7/05	Tue 6/7/05		
13	Request the Switch Output	15 mins	0%	Tue 6/7/05	Tue 6/7/05	8	EMC/SA
14	Bin File / SP Collect	0.5 hrs	0%	Tue 6/7/05	Tue 6/7/05		
15	Request the Symmetrix Bin File	15 mins	0%	Tue 6/7/05	Tue 6/7/05	8	EMC/SA
16	Request the Clarion SP Collect	30 mins	0%	Tue 6/7/05	Tue 6/7/05	8	EMC/SA
17	Customer Environment Analyses	5 hrs	0%	Tue 6/7/05	Wed 6/8/05		
18	Receive all customer information Required	30 mins	0%	Tue 6/7/05	Tue 6/7/05	15,13	EMC/SA
19	Generate Heat	2 hrs	0%	Tue 6/7/05	Tue 6/7/05	18	EMC/SA
20	Create HealthCheck Worksheet	2 hrs	0%	Tue 6/7/05	Tue 6/7/05	19	EMC/SA
21	Create RPQ	15 mins	0%	Tue 6/7/05	Tue 6/7/05	20	EMC/TC
22	Create E-Lab Navigator PDF	15 mins	0%	Wed 6/8/05	Wed 6/8/05	21	EMC/SA
23	Create Volumes Information Worksheet	15 mins	0%	Tue 6/7/05	Tue 6/7/05	18	EMC/SA
24	Generate Swat	15 mins	0%	Tue 6/7/05	Tue 6/7/05	18	EMC/SA
25	Draw SAN Topologies	15 mins	0%	Tue 6/7/05	Tue 6/7/05	24	EMC/SA
26	Create SAN Zones Worksheet	15 mins	0%	Tue 6/7/05	Tue 6/7/05	25	EMC/SA
27	Create Storage Format Document	15 mins	0%	Tue 6/7/05	Tue 6/7/05	23	EMC/SA
28	Create SRDF/Mirror/View List	15 mins	0%	Tue 6/7/05	Tue 6/7/05	27	EMC/SA
29	Create EMCGrab Control	15 mins	0%	Tue 6/7/05	Tue 6/7/05	28	EMC/SA
30	Customer Environment Analyses Concluded	0 hrs	0%	Tue 6/7/05	Tue 6/7/05	29	EMC/SA
31	SIG	0 hrs	0%	Tue 6/7/05	Tue 6/7/05		

Figure 26 – Project Plan → Simple example of Project Structure

You can use Work Breakdown Structure - WBS (Figure 27) software to present a macro view to the customer. The most important part of the Project Plan is to present the customer with the structural plan of the project. The PM will fill in other information, based on project requirements. The PM is responsible to track the project plan with the customer and IS. The SA can help the PM to add relevant information on the project plan so that IS can implement successfully.

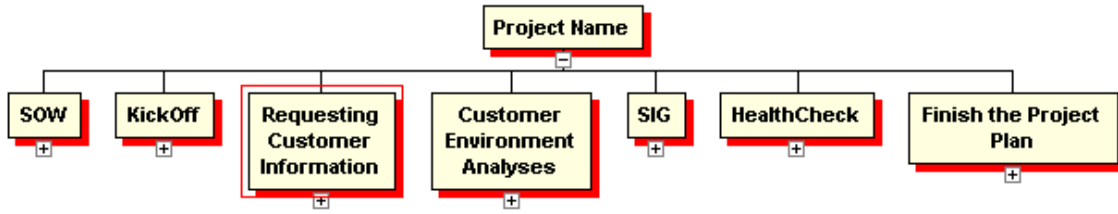


Figure 27 – Project Plan → WBS level 1 example

Remembering that this project plan is malleable, the PM can adjust it as necessary, according to the SIG and SA engagement.

## Phase V – Implementation of the Solution

After the Project Plan is concluded, in accordance with the customer windows and assuming acceptance, the SIG and Project Plan is passed to IS to implement the solution.

The PM tracks each task. If there is any doubt or problem, the SA is available anytime to correct the SIG and help the PM on the Project Plan.

There are some essential EMC tools that can be used; the most important is Change Control Activity – CCA. The IS is responsible for this. He opens and closes all activity necessary at the customer site. The SIG provides all necessary information.

In some cases, the IS needs additional information about the customer environment. In this case, the SA can provide any additional information such as Heat or EMCGrab to attach to the CCA.

## Attachment List

All attachments are examples from Brazil Customers. A zip file contains all templates.

- 1 - \_database-bov\_2008\_Jan\_09\_00\_45\_08-s.html  
Example of a Heat got from EMC GSTools
- 2 - 815937\_Bovespa\_Healthcheck\_XV\_V04\_20080123.xls  
Example of HealthCheck Spreadsheet.
- 3 - HP\_BL460c\_W2003EEX86SP1\_LPe1105HP\_MDS3.1.2\_DMx4.pdf  
Example of a part of hosts from the customer environment.
- 4 - 815937\_Bovespa\_Volumes\_XV\_V04\_20080131.xls  
Example of Volumes Spreadsheet.
- 5 - ssan1-cisco-outfile.2008\_Jan\_08\_06\_30\_01.html  
Example of a Swat got from EMC GSTools
- 6 - 815937\_Bovespa\_Zones\_V01\_20080117.xls  
Example of Zones created on the Switches
- 7 - 815937\_Bovespa\_SAN\_V01\_20080124.jpg (The original Visio is too big!)  
Example of draft from the current and future topology and zones
- 8 - 811631\_Honda\_CLARiiON Designer\_501\_V00.xls  
Example of format of Clariion of the customer
- 9 - 759815\_Citibank\_SRDF\_V01.xls  
Example of SRDF list to help the CE to create Bin File
- 10 - 759815\_Citibank\_EMGrabs\_V02.xls  
Example of EMCGrabs control sent by the customer
- 11 - Template - PAS#\_CUSTOMER\_Plan\_V00.mpp  
Template of Project Plan
- 12 - Template - PAS#\_CUSTOMER\_Plan\_V00.wbs  
- Template of WBS
- 13 - Template - PAS#\_CUSTOMER\_Guide\_V00.ppt  
- Template of SIG. The filled up is too big to attach