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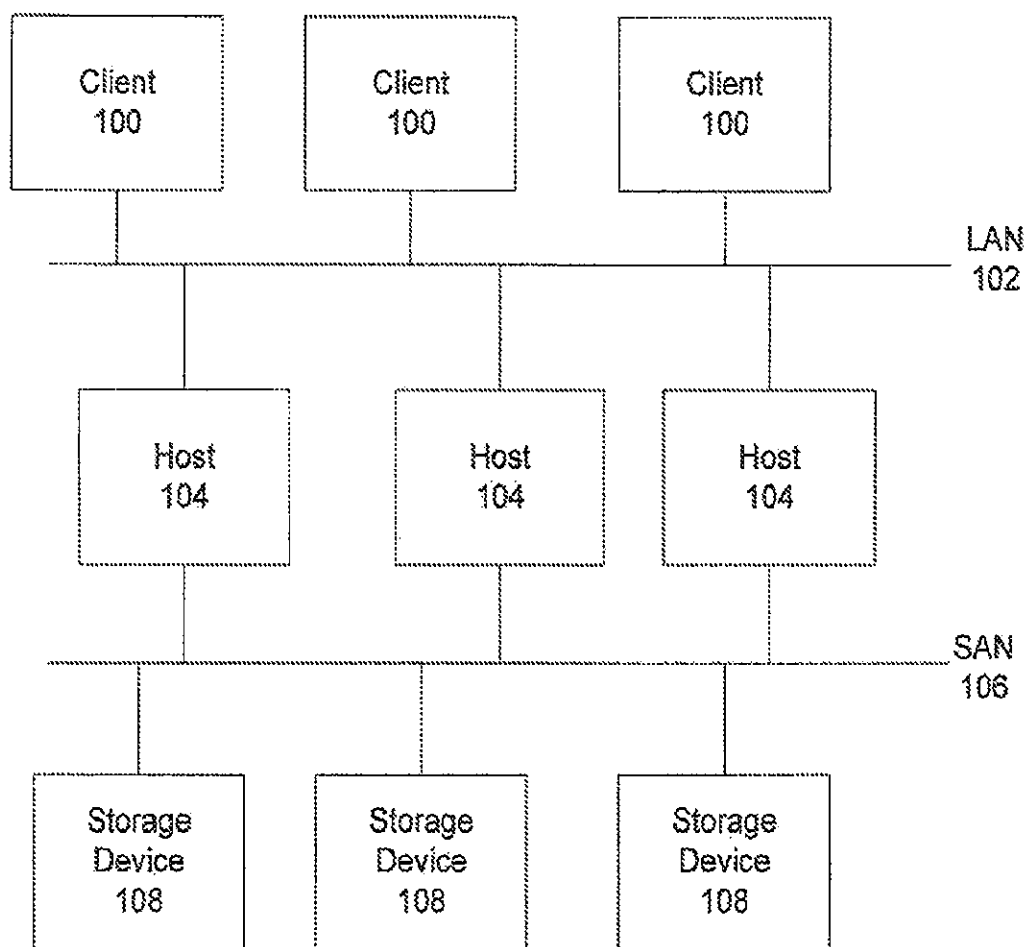


FIG. 1

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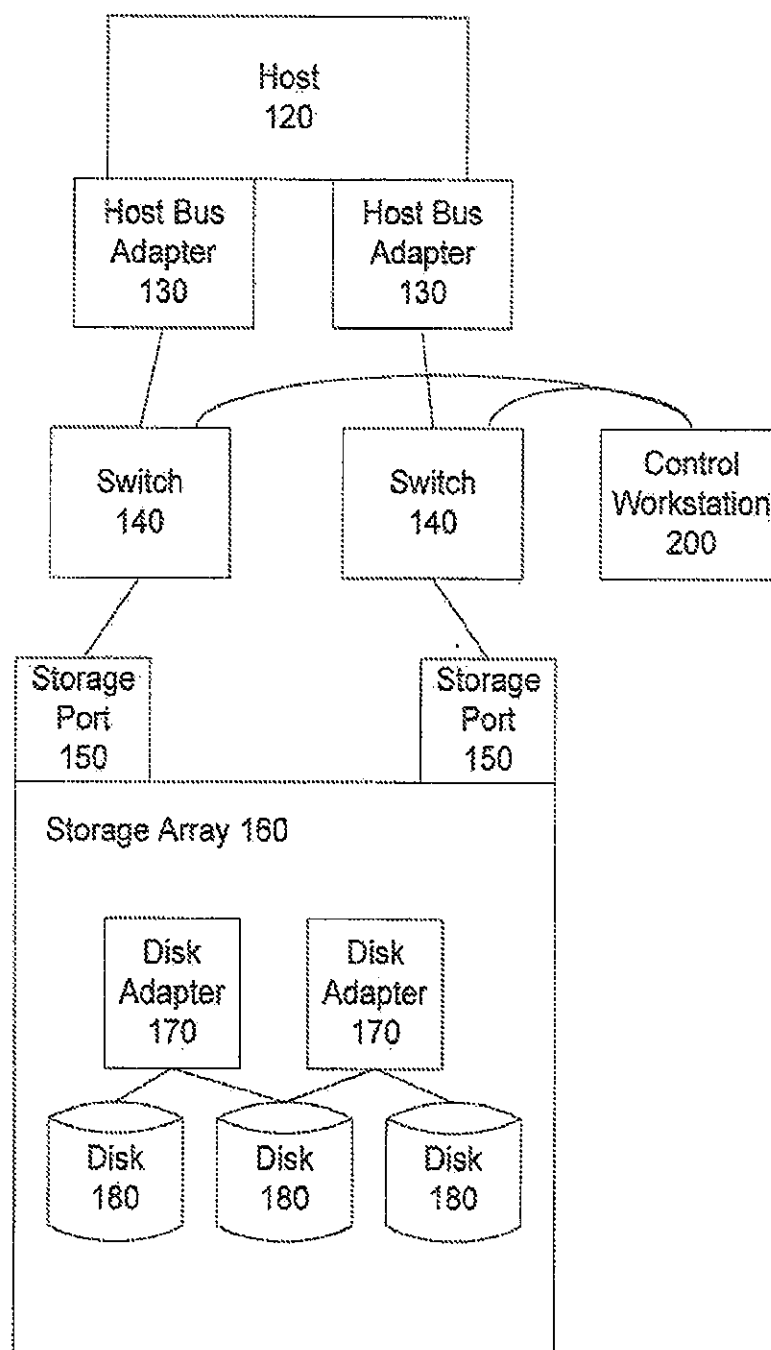


FIG. 2

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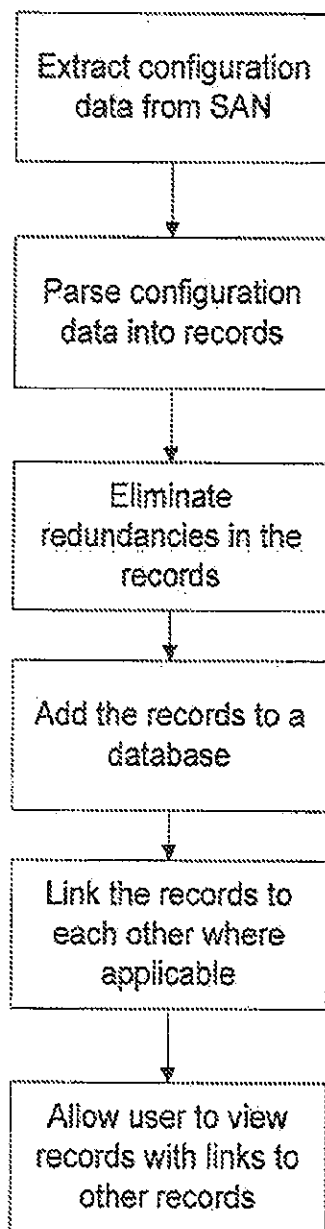


FIG. 3

FIG. 5

SAN Views		Performance		Projects		Maintenance		Reclamation		Migration	
Host Summary View [Host]											
Host	Array	WNN	Part	# of LUNs	Allocated (MB)	Switch	Slot	Port	Active Zone		
XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	580	2	5	XXXXXXXXXX	3	5	Y		
XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	980	2	6	XXXXXXXXXX	4	9	Y		
Zone Name Details [01/04/07 1:47 PM]											
Zone Name	Fabric	Zone Member	Switch	Slot	Port	Active Zone					
XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	3	5	Y					
XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	4	9	Y					
Possible Related Zones: [01/04/07 1:47 PM]											
Zone Name	Fabric	Zone Member	Switch	Slot	Port	Active Zone					
XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	3	5	Y					
XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	4	9	Y					
Asset Information XXXXXXXX: [01/04/07 1:47 PM]											
Business Unit	Category	Contact Group	Applications Name	Primary Contact	Asset P/L						
XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX						
XXXXXXXXXX	Development	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX						
XXXXXXXXXX	Production	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX						
XXXXXXXXXX	Production	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX						
XXXXXXXXXX	Lab/Test	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX						
XXXXXXXXXX	Production	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX						
Configuration XXXXXXXX: [01/04/07 1:47 PM]											
Team	OS	OS Version	System Type	Build							
XXXXXX	SanOS	3.8	San File 489	p8							
Configuration Packages XXXXXXXX: [01/04/07 1:47 PM]											
EMC Package	VMS	XXXXXXXXXX	XXXXXXXXXX	DB Package							
XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX							
Configuration HBA Information XXXXXXXX: [01/04/07 1:47 PM]											
HBA Package	Type	Speed	Signature								
XXXXXXXXXX	Fibre	1 Gbit/sec	390A7 (02390A7)								

Host Summary View (Drill Down): Host, Array WNN, San Port, # of LUNs, Allocated Storage (Drill Down), switch (w. color code to indicate status), slot/port

Zone name details: zone name, fabric, zone member, switch, slot/port, active zone
Possible Related Zones: Show all possibly related zones to host

Asset Information: Business Line (Drill Down), Category, Contact Group, Application Name, Primary Contact, App P/L

Host Configuration: Installed packages, and SAN component date with color coded compliance indicator based off of Configuration Matrix (Maintenance Module)

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FIG. 6

Provision	SAN Views	Performance	Projects	Maintenance	Reclamation	Migration
Storage Utilization xxxxxxxx: [01/04/07 1:56 PM]						
FA DMK: 18772	Shared Host					Select
	Device	LUN (hex)	LUN (Dec)	File System (LVol)	Free Filesystem (GB)	Type
3A1	71A	0F8	248		0	3 2-way Mir
7A0	71B	0F9	249		0	3 2-way Mir
7A0	A51	001	1		0	8632 R0F2+Mir
7A0	A52	002	2		0	8632 R0F2+Mir
7A0	A53	003	3		0	8632 R0F2+Mir
7A0	A54	004	4		0	8632 R0F2+Mir
7A0	A55	005	5		0	8632 R0F2+Mir
7A0	A56	006	6		0	8632 R0F2+Mir
7A0	A57	007	7		0	8632 R0F2+Mir
7A0	A58	008	8		0	8632 R0F2+Mir
7A0	A59	009	9		0	8632 R0F2+Mir
7A0	A5A	00A	10		0	8632 R0F2+Mir
7A0	A5B	00B	11		0	8632 R0F2+Mir
7A0	A5C	00C	12		0	8632 R0F2+Mir
7A0	A5D	00D	13		0	8632 R0F2+Mir
7A0	A5E	00E	14		0	8632 R0F2+Mir
7A0	A5F	00F	15		0	8632 R0F2+Mir
7A0	A60	010	16		0	8632 R0F2+Mir
7A0	A61	011	17		0	8632 R0F2+Mir
7A0	A62	012	18		0	8632 R0F2+Mir
7A0	A63	013	19		0	8632 R0F2+Mir

Storage Utilization by Host (Allocated Drill Down): Per Array and WWN... Switch, slot/port, shared host (other hosts hat are sharing the device along with the FA?port that hose sees the storage from), device id, LUN (Hex), LUN (Dec), File system (LVol), Free Filesystem (GB), Device size, and Device type

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Filter
8
6
E

SAN Views Module>SAN View: SAN Zone

Provision		SAN Views		Performance		Projects																																																													
Fabric Select a SAN Fabric to view: 6 [All Fabrics] [Search] [Clear] Breakdown by Fabric: [-1] <table border="1"> <thead> <tr> <th>Defined Members</th> <th>Active Members</th> <th>Inactive Members</th> </tr> </thead> <tbody> <tr><td>383</td><td>381</td><td>2</td></tr> <tr><td>400</td><td>391</td><td>9</td></tr> <tr><td>502</td><td>535</td><td>47</td></tr> <tr><td>549</td><td>511</td><td>38</td></tr> <tr><td>302</td><td>288</td><td>14</td></tr> <tr><td>278</td><td>254</td><td>20</td></tr> <tr><td>Total Zones</td><td>2404</td><td>130</td></tr> </tbody> </table> << Previous Rows 1-30 of 2454 [1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,...] Next >> <table border="1"> <thead> <tr> <th>Zone Name</th> <th>Fabric</th> <th>Switch</th> </tr> </thead> <tbody> <tr><td>XXXXXXXXXX</td><td>XXXXXXXXXXXXX</td><td>XXXXXXXXXXXXX</td></tr> <tr><td>XXXXXXXXXX</td><td>XXXXXXXXXXXXX</td><td>XXXXXXXXXXXXX</td></tr> <tr><td>XXXXXXXXXX</td><td>XXXXXXXXXXXXX</td><td>XXXXXXXXXXXXX</td></tr> <tr><td>XXXXXXXXXX</td><td>XXXXXXXXXXXXX</td><td>XXXXXXXXXXXXX</td></tr> <tr><td>XXXXXXXXXX</td><td>XXXXXXXXXXXXX</td><td>XXXXXXXXXXXXX</td></tr> <tr><td>XXXXXXXXXX</td><td>XXXXXXXXXXXXX</td><td>XXXXXXXXXXXXX</td></tr> </tbody> </table>								Defined Members	Active Members	Inactive Members	383	381	2	400	391	9	502	535	47	549	511	38	302	288	14	278	254	20	Total Zones	2404	130	Zone Name	Fabric	Switch	XXXXXXXXXX	XXXXXXXXXXXXX	XXXXXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXXXXX	XXXXXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXXXXX	XXXXXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXXXXX	XXXXXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXXXXX	XXXXXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXXXXX	XXXXXXXXXXXXX															
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Zone Name Details eqdbprod9_dmx0822_fat14d_6bs0: [01/30/06 5:37PM] <table border="1"> <thead> <tr> <th>Zone Name</th> <th>Fabric</th> <th>Zone Member</th> <th>Slot</th> <th>Port</th> <th>Active Zone</th> </tr> </thead> <tbody> <tr><td>XXXXXXXXXX</td><td>XXXXXXXXXXXXX</td><td>3005004B</td><td>1</td><td>4</td><td>N</td></tr> <tr><td>XXXXXXXXXX</td><td>XXXXXXXXXXXXX</td><td>1000000</td><td>2</td><td>14</td><td>N</td></tr> </tbody> </table> Possible Related Zones to eqdbprod9_dmx0822_fat14d_6bs0: [01/30/06 5:37PM] <table border="1"> <thead> <tr> <th>Zone Names</th> <th>Fabric</th> <th>Zone Member</th> <th>Slot</th> <th>Port</th> <th>Active Zone</th> </tr> </thead> <tbody> <tr><td>XXXXXXXXXX</td><td>XXXXXXXXXXXXX</td><td>5005004</td><td>1</td><td>4</td><td>N</td></tr> <tr><td>XXXXXXXXXX</td><td>XXXXXXXXXXXXX</td><td>1000000</td><td>2</td><td>14</td><td>N</td></tr> <tr><td>XXXXXXXXXX</td><td>XXXXXXXXXXXXX</td><td>1000000</td><td>2</td><td>14</td><td>Y</td></tr> <tr><td>XXXXXXXXXX</td><td>XXXXXXXXXXXXX</td><td>5005004</td><td></td><td></td><td>Y</td></tr> <tr><td>XXXXXXXXXX</td><td>XXXXXXXXXXXXX</td><td>5005004</td><td>1</td><td>4</td><td>N</td></tr> <tr><td>XXXXXXXXXX</td><td>XXXXXXXXXXXXX</td><td>1000000</td><td>2</td><td>14</td><td>N</td></tr> </tbody> </table>								Zone Name	Fabric	Zone Member	Slot	Port	Active Zone	XXXXXXXXXX	XXXXXXXXXXXXX	3005004B	1	4	N	XXXXXXXXXX	XXXXXXXXXXXXX	1000000	2	14	N	Zone Names	Fabric	Zone Member	Slot	Port	Active Zone	XXXXXXXXXX	XXXXXXXXXXXXX	5005004	1	4	N	XXXXXXXXXX	XXXXXXXXXXXXX	1000000	2	14	N	XXXXXXXXXX	XXXXXXXXXXXXX	1000000	2	14	Y	XXXXXXXXXX	XXXXXXXXXXXXX	5005004			Y	XXXXXXXXXX	XXXXXXXXXXXXX	5005004	1	4	N	XXXXXXXXXX	XXXXXXXXXXXXX	1000000	2	14	N
Zone Name	Fabric	Zone Member	Slot	Port	Active Zone																																																														
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XXXXXXXXXX	XXXXXXXXXXXXX	5005004	1	4	N																																																														
XXXXXXXXXX	XXXXXXXXXXXXX	1000000	2	14	N																																																														

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FIG. 9
SAN Audit Module: Summary and Details

Audit Types [Type: No Object Selected]		Select on Audit		array - DMX - no alias		Swap Object Details		Search		Clear																																																					
Audit Summary: [Type: Array (01/04/07 12:51 PM)] <table border="1"> <tr> <td>Array</td> <td>No Logins</td> <td>State LUNS Entries</td> <td>Storage Reclaims in GB (LUNS)</td> <td>No Alias</td> </tr> <tr> <td>DMX</td> <td>1001</td> <td>2138</td> <td>26267 (1245)</td> <td>138</td> </tr> <tr> <td>Clarion</td> <td>170</td> <td>N/A</td> <td>19001 (319)</td> <td>0</td> </tr> <tr> <td>EVA</td> <td>N/A</td> <td>N/A</td> <td>1945 (30)</td> <td>0</td> </tr> </table>												Array	No Logins	State LUNS Entries	Storage Reclaims in GB (LUNS)	No Alias	DMX	1001	2138	26267 (1245)	138	Clarion	170	N/A	19001 (319)	0	EVA	N/A	N/A	1945 (30)	0																																
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Clarion	170	N/A	19001 (319)	0																																																											
EVA	N/A	N/A	1945 (30)	0																																																											
Audit Summary: [Type: Host (01/04/07 12:51 PM)] <table border="1"> <tr> <td>Array</td> <td>Single Path Count</td> <td>LUN Count Mismatch</td> </tr> <tr> <td>Clarion</td> <td>3</td> <td>0</td> </tr> <tr> <td>EVA</td> <td>1</td> <td>0</td> </tr> <tr> <td>DMX</td> <td>105</td> <td>58</td> </tr> </table>												Array	Single Path Count	LUN Count Mismatch	Clarion	3	0	EVA	1	0	DMX	105	58																																								
Array	Single Path Count	LUN Count Mismatch																																																													
Clarion	3	0																																																													
EVA	1	0																																																													
DMX	105	58																																																													
Audit Summary: [Type: Replication (01/04/07 12:51 PM)] <table border="1"> <tr> <td>Application Model</td> <td>Not Sync</td> <td>In Progress</td> <td>Invalid Tracks</td> <td>Remote Invalid Tracks</td> <td>DR Group Mismatch</td> </tr> <tr> <td>DMX</td> <td>2346</td> <td>71</td> <td>799710</td> <td>53611563</td> <td>3408</td> </tr> </table>												Application Model	Not Sync	In Progress	Invalid Tracks	Remote Invalid Tracks	DR Group Mismatch	DMX	2346	71	799710	53611563	3408																																								
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DMX	2346	71	799710	53611563	3408																																																										
Audit Summary: [Type: Switch (01/04/07 12:51 PM)] <table border="1"> <tr> <td>Model</td> <td>Zoned HBA Not Logging onto Fabric</td> <td>Logged in HBA not in Zone</td> <td>Inactive Zones</td> <td>Zone Cleanup (Based on no array Login)</td> </tr> <tr> <td>Brocade</td> <td>478</td> <td>447</td> <td>130</td> <td>253</td> </tr> </table>												Model	Zoned HBA Not Logging onto Fabric	Logged in HBA not in Zone	Inactive Zones	Zone Cleanup (Based on no array Login)	Brocade	478	447	130	253																																										
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Brocade	478	447	130	253																																																											
Audit Summary: [Element: DMX redclaim] <table border="1"> <tr> <th>Array</th> <th># of Volumes</th> <th>Capacity (GB)</th> <th>Last Updated</th> </tr> <tr> <td>XXXXXXXX</td> <td>105</td> <td>1700248</td> <td>2006-07-11 00:00:00</td> </tr> <tr> <td>XXXXXXXX</td> <td>185</td> <td>2753516</td> <td>2006-07-11 00:00:00</td> </tr> <tr> <td>XXXXXXXX</td> <td>45</td> <td>2270038</td> <td>2006-07-11 00:00:00</td> </tr> <tr> <td>XXXXXXXX</td> <td>103</td> <td>1700449</td> <td>2006-07-11 00:00:00</td> </tr> <tr> <td>XXXXXXXX</td> <td>116</td> <td>2157824</td> <td>2006-07-11 00:00:00</td> </tr> <tr> <td>XXXXXXXX</td> <td>65</td> <td>2370838</td> <td>2006-07-11 00:00:00</td> </tr> <tr> <td>XXXXXXXX</td> <td>308</td> <td>2831276</td> <td>2006-07-11 00:00:00</td> </tr> <tr> <td>XXXXXXXX</td> <td>45</td> <td>198782</td> <td>2006-07-11 00:00:00</td> </tr> <tr> <td>XXXXXXXX</td> <td>59</td> <td>182635</td> <td>2006-07-11 00:00:00</td> </tr> <tr> <td>XXXXXXXX</td> <td>34</td> <td>293486</td> <td>2006-07-11 00:00:00</td> </tr> <tr> <td>XXXXXXXX</td> <td>37</td> <td>319384</td> <td>2006-07-11 00:00:00</td> </tr> <tr> <td>XXXXXXXX</td> <td>144</td> <td>1213068</td> <td>2006-07-11 00:00:00</td> </tr> </table>												Array	# of Volumes	Capacity (GB)	Last Updated	XXXXXXXX	105	1700248	2006-07-11 00:00:00	XXXXXXXX	185	2753516	2006-07-11 00:00:00	XXXXXXXX	45	2270038	2006-07-11 00:00:00	XXXXXXXX	103	1700449	2006-07-11 00:00:00	XXXXXXXX	116	2157824	2006-07-11 00:00:00	XXXXXXXX	65	2370838	2006-07-11 00:00:00	XXXXXXXX	308	2831276	2006-07-11 00:00:00	XXXXXXXX	45	198782	2006-07-11 00:00:00	XXXXXXXX	59	182635	2006-07-11 00:00:00	XXXXXXXX	34	293486	2006-07-11 00:00:00	XXXXXXXX	37	319384	2006-07-11 00:00:00	XXXXXXXX	144	1213068	2006-07-11 00:00:00
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XXXXXXXX	144	1213068	2006-07-11 00:00:00																																																												

Dropdown filters Filter by Keywords (HBA, SID, Hostname...) Summary Drill Down of details

Details by clicking on links

Audit Objects:

- Array
- Host
- Replication
- Switch

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FIG. 10

SAN Audit Module: Summary and Details

Provision	SAN Views	Performance	Projects	Maintenance	Reclamation	Migration
Audit Types [Type: No Object Selected]						
Select an Audit Object:						
array - DMX - reclaim						
Select Audit Object						
array - Clarion - no_aliases						
array - Clarion - no_login						
array - Clarion - reclaim						
DMX						
array - Clarion - state_jun						
Clarion						
array - DMX - no_aliases						
array - DMX - no_login						
array - DMX - reclaim						
array - DMX - state_jun						
Audit Summary:						
array - EVA - no_aliases						
array - EVA - no_login						
array - EVA - reclaim						
Clarion						
array - EVA - state_jun						
DMX						
array - Clarion - host_mismatch						
array - Clarion - single_path						
array - DMX - lun_mismatch						
array - DMX - single_path						
Audit Summary:						
array - EVA - lun_mismatch						
Application Mode						
array - EVA - single - path						
DMX						
array - EVA - single - path						
Reclamation - DMX - group_mismatch						
Type - Switch (01/04/07 12:51 PM)						
Audit Summary:						
Model Zoned HBA Not Logging onto Fabric						
Broadcast 428						
Audit Summary:						
Array Device FA LUN Capacity Array Array Last Updated Comments						
XXXXXXXXXX 65 075 8632 2007-01-04 2006-07-11 00:00:00 [01/04/07 1:29 PM SANpulse Admin]						
XXXXXXXXXX 67 074 8632 2007-01-04 2006-07-11 00:00:00 [01/04/07 1:29 PM SANpulse Admin]						
XXXXXXXXXX 68 075 8632 2007-01-04 2006-07-11 00:00:00 [01/04/07 1:29 PM SANpulse Admin]						
XXXXXXXXXX 65 076 8632 2007-01-04 2006-07-11 00:00:00 [01/04/07 1:29 PM SANpulse Admin]						
XXXXXXXXXX 67 077 8632 2007-01-04 2006-07-11 00:00:00 [01/04/07 1:29 PM SANpulse Admin]						
XXXXXXXXXX 68 078 8632 2007-01-04 2006-07-11 00:00:00 [01/04/07 1:29 PM SANpulse Admin]						
Audit Summary:						
Array Device FA LUN Capacity Array Array Last Updated Comments						
XXXXXXXXXX 65 075 8632 2007-01-04 2006-07-11 00:00:00 [01/04/07 1:29 PM SANpulse Admin]						
XXXXXXXXXX 67 074 8632 2007-01-04 2006-07-11 00:00:00 [01/04/07 1:29 PM SANpulse Admin]						
XXXXXXXXXX 68 075 8632 2007-01-04 2006-07-11 00:00:00 [01/04/07 1:29 PM SANpulse Admin]						
XXXXXXXXXX 65 076 8632 2007-01-04 2006-07-11 00:00:00 [01/04/07 1:29 PM SANpulse Admin]						
XXXXXXXXXX 67 077 8632 2007-01-04 2006-07-11 00:00:00 [01/04/07 1:29 PM SANpulse Admin]						
XXXXXXXXXX 68 078 8632 2007-01-04 2006-07-11 00:00:00 [01/04/07 1:29 PM SANpulse Admin]						

When using the filter to select elements, the screen can call comments and acknowledge the element

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Provision	SAN Views	Performance	Projects	Maintenance	Reclamation	Migration
Tier Management						
Tier Description						
SRDF DMX Storage, mirrored				Tier	Vendor	Model
DMX Storage, mirrored				1	EMC	DMX
Replicated DMX Storage, RAID-5				1	EMC	DMX
DMX, RAID 5				1	EMC	DMX
DMX				1	EMC	DMX
Solid				1	EMC	DMX
Replicated DMX Storage (Remote), RAID 5				1	EMC	DMX
EMC Clontion RAID				2	EMC	Clontion
HP EVA, RAID 5				2	HP	EMA SDD
EVA FAIA RAID 5				3	HP	EMA SDD
NETApp Clontion, RAID 3				4	NetApp	F95D
EMC Centera				5	EMC	Centera
DMX BCV, Unprotected				BCV	EMC	DMX
						BCV
						5

Tier Manager: Graphical User Interface (GUI) that allows one to define various types of storage tier and cost according to a service catalog or financial numbers. This is used mainly by the chargeback report or management financial reports

Provision	SAN Views	Performance	Projects	Maintenance	Resignation	Migration
Tier Management [edit: DMX BCV, Unprotected]						
Tier Description			DMX BCV, Unprotected			
Tier description						
Tiering Level			BCV			
The tier level describing about the tier.						
Vendor			EMC			
Enter the vendor name.						
Model Type			DMX			
Enter the model from vendor.						
Protection			BCV			
Enter the protection level as produced from device output (i.e. RDF+Mir).						
Cost per GB (\$)			5			
Enter the cost per GB in dollars.						

Tier Manager: EDIT Clicking on the Tier Description in the Tier Management screen allows the user to edit and update the entry to reflect the latest changes. The ADD screen is also the same GUI.

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FIG. 12

Provision	SAN Views	Performance	Projects	Maintenance	Restoration	Migration																																																																																	
Host Details (Host: No Host Selected) Select a Host to XXXXXXXXXXXX Search Host nfs Search Clear																																																																																							
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Chargeback Views: Based in user data input into the Tier Manager. Has the ability to detect possible incorrect naming. When detected, offers the user the option to delete entries or cleanup by generating the necessary workfiles or a command generation for the user.

The report enables organizations to attribute cost to business units and applications based in type of storage allocated and quantity.

The customizable report handles clusters thatshare devices to avoid duplicate charges.

Option to handle cost center splits via Cost Center Split GUI (when provided the appropriate source)

FIG. 13

Provision	SAN Views	Performance	Projects	Maintenance	Reclamation	Migration
Allocation Split: [new]						
Split 1	Application				Application P/L	
					Infrastructure	
					Infrastructure	
					Infrastructure	
					Infrastructure	
					Infrastructure	
					Infrastructure	

This GUI allows the operator to distribute costs or weight costs to different cost centers or by application

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FIG. 14

Provision		SAN Views		Performance		Projects		Maintenance		Redemation		Migration	
Storage and Zoning Rename for xxxxxxxx: [01/04/07 3:44 PM]													
Current Name		Array		xxxxxxx		Enter Correct Hostname		Correction		Enter Change Reason		[01/04/07 3:44 PM] SANpulse Admin	
Zoning Data for xxxxxxxx: [01/04/07 3:44 PM]													
Host	WWN	Zone Name	Switch	Slot/Port	Rename	Delete							
xxxxxxx	10000000xxxxxx	xxxxxxxxxxxxxxxxxxxxxx		/	☒	☐							
xxxxxxx	10000000xxxxxx	xxxxxxxxxxxxxxxxxxxxxx		/	☒	☐							
xxxxxxx	10000000xxxxxx	xxxxxxxxxxxxxxxxxxxxxx		/	☒	☐							
xxxxxxx	10000000xxxxxx	xxxxxxxxxxxxxxxxxxxxxx		/	☒	☐							
xxxxxxx	10000000xxxxxx	xxxxxxxxxxxxxxxxxxxxxx	xxxxxxx	3/10	☒	☐							
xxxxxxx	10000000xxxxxx	xxxxxxxxxxxxxxxxxxxxxx	xxxxxxx	3/10	☒	☐							
xxxxxxx	10000000xxxxxx	xxxxxxxxxxxxxxxxxxxxxx	xxxxxxx	3/10	☒	☐							
xxxxxxx	10000000xxxxxx	xxxxxxxxxxxxxxxxxxxxxx	xxxxxxx	3/10	☒	☐							
Array Data for xxxxxxxx													
Host	Array ID	FA	WWN	# of LUNS	Login	Rename	Delete						
xxxxxxx	xxxxxx	4B1	10000000xxxxxx	37		☒	☐						
xxxxxxx	xxxxxx	13B1	10000000xxxxxx	37		☒	☐						
xxxxxxx	xxxxxx	13A0	10000000xxxxxx	61		☒	☐						
xxxxxxx	xxxxxx	4A0	10000000xxxxxx	61		☒	☐						
xxxxxxx	xxxxxx	13A0	10000000xxxxxx	22		☒	☐						
xxxxxxx	xxxxxx	4A0	10000000xxxxxx	22		☒	☐						

The chargeback report can aid in resolving discrepancies between billing, finance, and storage records. A SAN operator can correct naming syntaxes when notified by clicking the hostname in the "DNS Name" column from the chargeback report.

This GUI presents summery zone and array data to help the user validate the information and changes

All changes (renames or deletes) are tracked

FIG. 16

SAN Block Builder: Main Screen, SAN Block Edit Screen, SAN Block Item Builder Screen

Provision	SAN Views	Performance	Projects	Maintenance	Reclamation	Migration
SAN Block						
Root SAN Block Name						
Administration						
Provision						
SAN Views						
Performance						
Projects						
Maintenance						
Reclamation						
Migration						

SAN Block Builder Main Screen:
 Allows the user to:
 View available root SAN Blocks
 Edit existing SAN Block Structure
 Defete SAN Blocks
 Add newly created SAN Blocks

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FIG. 17

SAN Block [edit: Administration]	
SAN Block	Administration
User Friendly Name for SAN Block	Index
SAN Block Module	23161481e8285e16085fa4e72f1036b2
Enter Root SAN Block Module	top_header
License Key	
Enter license key for SAN Block	
Include Header	
Choose associated Include Header	

SAN Block Items	
SAN Block	SAN Block type
Management (add)	Menu Header
License Manager (add)	Menu Item
Graph Manager (add)	Menu Item
Tree Elements (add)	Menu Item
Load (add)	Menu Item
Host Load (add)	Menu Item
HBA Load (add)	Menu Item
Data Source Load (add)	Menu Item
DS Process (add)	Menu Item
Cluster Build (add)	Menu Item
INQ Load (add)	Menu Item
Priv Mode (add)	Menu Header
SAN Block Builder (add)	Menu Item
SMT Configurations (add)	Menu Header
Settings (add)	Menu Item
Tools (add)	Menu Header
User Manager (add)	Menu Item
Logout User (add)	Menu Item

The SAN Block items section allows the user to customize the structure of the SAN Block as well as add new features and functions to the root SAN Block it is associated with.

Clicking on the SAN Block item allows the user to edit the SAN Block Header or SAN Block Items

Root SAN Block Edit Screen:
Allows the user to edit the root SAN Block name and associated modules and enter the license key for the block to be used.

Clicking on the Add allows the user to add a new feature or function to the SAN Block.

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FIG. 18

Provision	SAN Views	Performance	Projects	Maintenance	Reclamation	Migration
SAN Block Item Builder						
Root SAN Block Choose the Root SAN Block for this item						
SAN Block Item Type Choose what type of SAN Block item this is						
SAN Block Main Title						
SAN Block Item Enter user friendly SAN block item						
SAN Block ID Enter SAN block item ID associated with the root SAN Block Module						
Management SAN Block Item SAN Block Header SAN Block Item License Manager License						

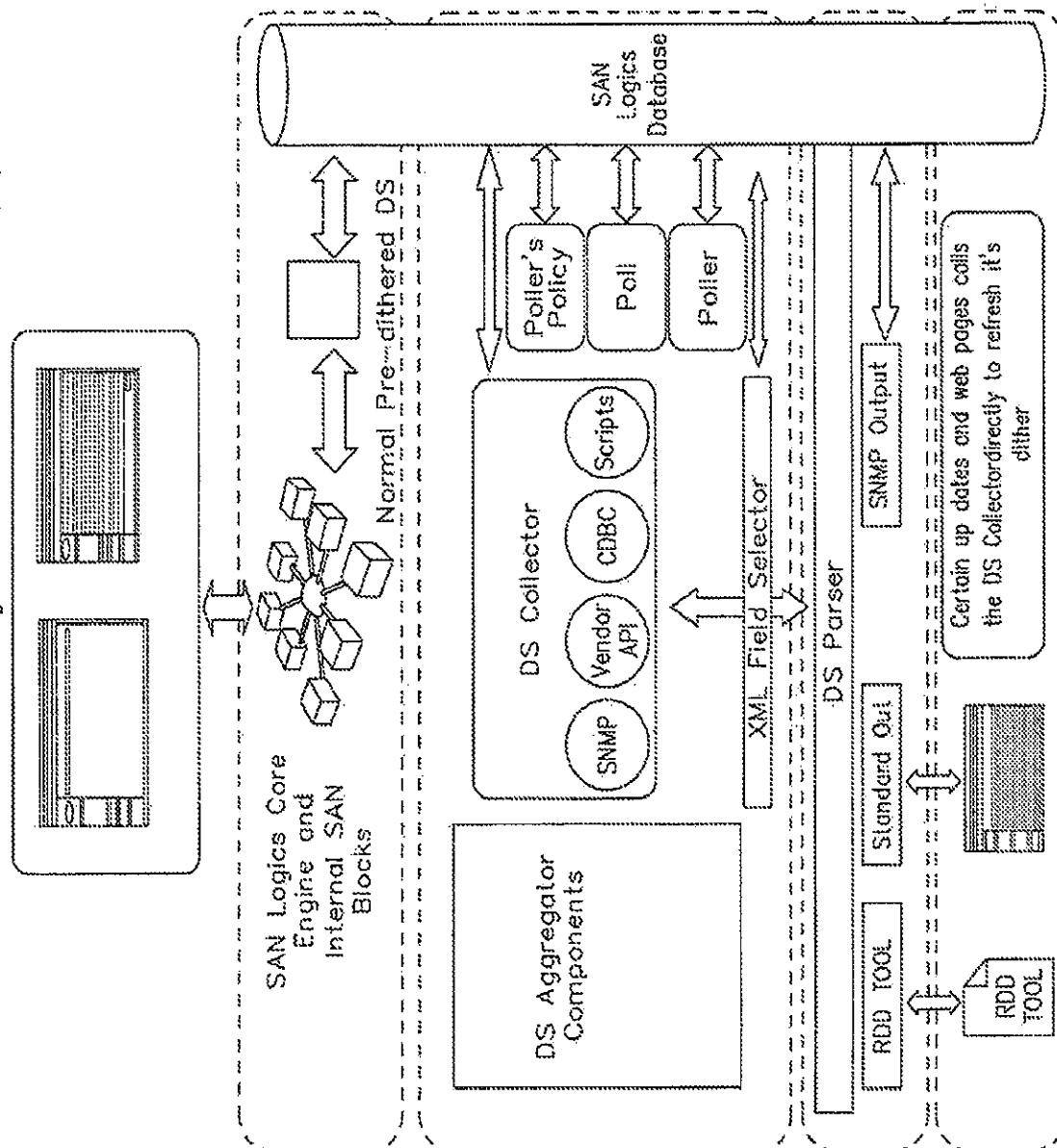
SAN Block Item Builder Screen (same for editing or adding)

Creates the SAN Block Headers or SAN Block Item to be associated with the root SAN Block. This can be based on client or project requirements as well as templates.

This creates the links between the web frontend and the application backend, allowing the user to access and utilize the new feature and function via the web browser

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FIG. 19



The DS Aggregator (DSA) interacts with the SAN Logics Core Engine as a Web front-end. The DSA is responsible collecting various data sources driven from a Web front-end and internal triggers and policies. The DSA is made up of GUI user interface, Poller, Run Queue (RunQ), DS Parser, XML Mapper, SNMP, rrdtool, DS SAN Block collection modules, refresh policies, and when necessary vender supplied data hooks (API's, CLI's...)

FIG. 20

The DSA user interface allows clients to add, edit, and delete data source information. Data sources types can come from, but not limited to a vendor API, internal scripts CLI programs, SNMP, or ODBC. User input parameters are based on DS types. Below is an example of fields related to data collected by an API to SAN storage arrays. The DS aggregator allows SAN Logics to take a feed from a data source and does not have to be SAN related (business unit information, server inventory data, configuration management database, etc...)

Below is an example of an API data source, CLI data source and how they are integrated.

Cluster Build	Username
INQ Load	Enter the username.
Priv. Mode	Password
SAN Block Builder	Enter the password.
SMT Configurations	Scope (for Clarition Arrays)
Settings	Enter the scope if needed.
Tools	Path or URL
User Manager	Enter the path to data collector.
Logout User	Collector State
XML Mapper	Enable or Disable Collector.
Data Collection	
API Sources	
Script Sources	
CLI Sources	
SNMP	
ODBC	
Template	
Switch	
Done	

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FIG. 21

DS Aggregator: API data source main screen, API data source edit screen, CLI data source main screen, and CLI data source edit screen

Previous	Performance	Projects	Maintenance	Registration	Migration
Data Collector Management					
Collector Name	Vendor	Model	Method	Collector Type	Status
Brocade F64-A NYC	Brocade	Brocade	api	brocade	
EMC UC	EMC	Symmetrix	api	symmetrix	
DMX NYC	EMC	DMX	api	symmetrix	
DMX RUTH	EMC	DMX	api	symmetrix	
DMX SS	EMC	DMX	api	symmetrix	
Previous	Performance	Projects	Maintenance	Registration	Migration
Data Collector Management (edit: DMX NYC)					
Data Collector Description					
Data collection name for this data source					
Collector					
Name of vendor collecting data source					
Vendor					
Name of vendor associated with poller					
Model					
Data interface					
Poller					
Data interface address of data interface					
Data Poll Interval					
Enter the amount of time in seconds for poll interval					
Port					
Enter the specific port used for communication					
Username					
Enter the username					
Password					
Enter the password					
Scope (for Clarifon Array)					
Enter the scope if needed					
Path or URL					
Enter the path to data collector					
Collector State					
Enable or Disable Collector					

DS Aggregator: API Datasource View.
Displays the various API's or server hosting the API's that SAN Logics can currently communicate with to perform queries and gather data (when appropriate client API or software is installed and configured)

API Datasource Edit View (DMX NYC)
User can update and edit current views with the appropriate info so it can be used

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FIG. 22

Provision	SAN Views	Performance	Projects	Datasource	Refreshment	Migration
CU Aggregator Management						
Name	Description					
Test Datasource	Command to show zones in table A					
syndev cd	syndev cd					
Test	Test					
Zone Info	Broads Zone Info					
Test Run 2007-03-01 11:03:05 2007-03-26 21:14:16 2007-03-26 21:04:30 2007-03-21 22:07:53						

DS Aggregator. CU (command line interface) Datasource view. Displays the various individual CU's that SAN Logics can execute. The CU can be ran through a API client it currently communicate with, internal application installed on the server, or native commands.

Provision	SAN Views	Performance	Projects	Datasource	Refreshment	Migration
CU Aggregator Management [edit: syndev]						
CU Description	syndev					
Display the CU's collection name for this data source	syndev cd					
CU's description or comments of CU	syndev -sd <id> test					
CU's command	DMX NYC					
CU's CU's with variables enclosed in \$ >	[V]mp syndev					
CU's description with data collection	☐ No Screen Output ☒ Output to Screen					
CU's CU's for need to add data for cd command	☐ No Screen Output ☒ Output to Screen					
Enter the output path for cd. If none are specified output will be written to temp folder	☐ No Screen Output ☒ Output to Screen					
Output to Screen	☐ No Screen Output ☒ Output to Screen					
Open to output CU to screen	☐ No Screen Output ☒ Output to Screen					

This example shows that individual syndev command gets executed via the "DMX NYC" API datasource. The DS Aggregator parses the item enclosed in "<>" and replaces them with the appropriate data points. Furthermore, rules and policies can be set for page views that refresh "on click" by calling the individual CU and parsing its output in real-time. These pages will only be refreshed on a as needed basis verses constantly polling for the data. SAN Logics builds intelligence into the user reports and views.

