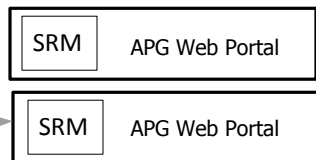


SRM Design for CitiGroup SWDC/GTDC/QRDC

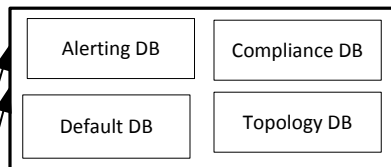


Note: All hosts will have the EMC Watch4Net Health Solution Pack

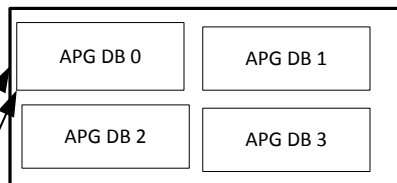
UI Portal Hosts



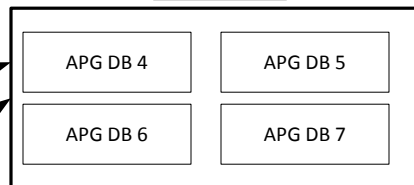
Backend/Primary Database



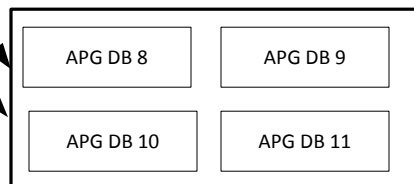
Backend/Secondary Database



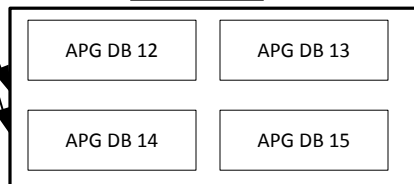
Backend/Scale Out Database1



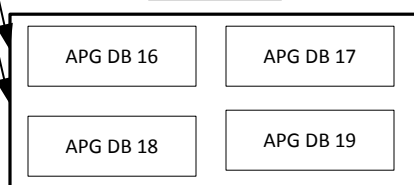
Backend/Scale Out Database2



Backend/Scale Out Database3



Backend/Scale Out Database4

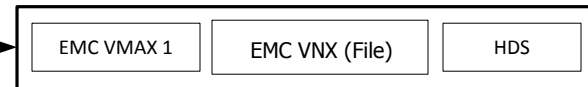


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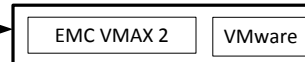
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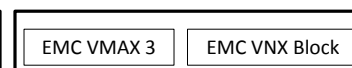
Collector Host #0



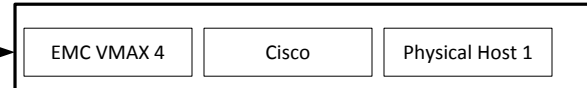
Collector Host #1



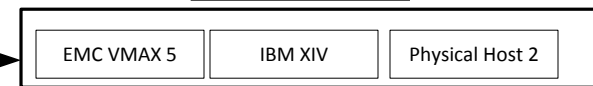
Collector Host #2



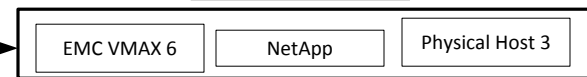
Collector Host #3



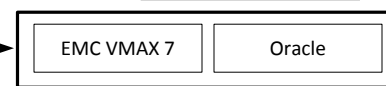
Collector Host #4



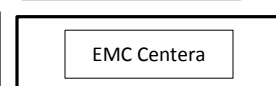
Collector Host #5



Collector Host #6



Collector Host #7

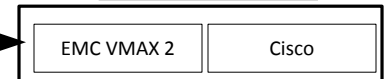


GTDC

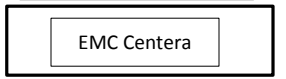
Collector Host #8



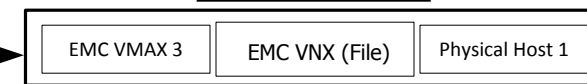
Collector Host #9



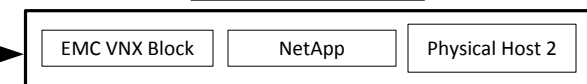
Collector Host #12



Collector Host #10

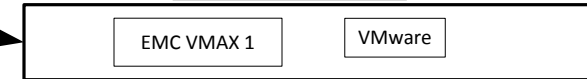


Collector Host #11

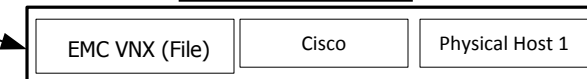


QRDC

Collector Host #13



Collector Host #14



Solution Pack	Count	Total Metrics	Growth Factor	Projection
Cisco MDS/Nexus - # Switches	92	181976	20	218371
Cisco MDS/Nexus - # Ports and Interfaces	21416	1884608	20	2261530
EMC VMAX - # Arrays	82	41492	20	49790
EMC VMAX - # Disks	46882	515702	20	618842
EMC VMAX - # LUNs	487660	9753200	20	11703840
EMC VMAX - # Pools	201	3216	20	3859
EMC VMAX - # Directors	638	58058	20	69670
EMC VNX Block - # Arrays	10	5970	20	7164
EMC VNX Block - # Disks	3315	53040	20	63648
EMC VNX Block - # LUNs	2463	68964	20	82757
EMC VNX Block - # Pools	24	576	20	691
EMC VNX File - # VNX File	75	102075	20	122490
EMC VNX File - # DataMovers	32	3744	20	4493
EMC Centera - # Storage Pools	34	170	20	204
EMC Centera - # Nodes	64	256	20	307
IBM XIV - # Disks	405	810	20	972
NetApp Filer V7 - # Arrays	190	79420	20	95304
VMware vCenter with Powerpath - # ESX hosts	164	23616	20	28339
Physical Hosts with Powerpath - # Hosts	5257	420560	20	504672
Physical Hosts with Powerpath - # CPUs	115750	1041750	20	1250100
Hitachi Device Manager - # Disks	9061	27183	20	32620
Hitachi Device Manager - # LUNs	52355	523550	20	628260
Oracle Database - # Database instances	8	2000	20	2400
Total Metrics Count		14791936		17750323

VM Purpose	Number of vCPU	Memory (GB)	Disk Space (GB)	Contains	Location	OS
Frontend_1	4 @3.0 GHZ	16	120	Front End 1	SWDC	Linux
Frontend_2	4 @3.0 GHZ	16	120	Front End 2	SWDC	Linux
Primary Backend	4 @3.0 GHZ	24	774	Compliance, Alerting, Topology, Default DB	SWDC	Linux
Secondary Backend	4 @3.0 GHZ	24	1,897	Data Base & Back End: DB1, DB2, DB3, DB4	SWDC	Linux
ScaleOut Backend_1	4 @3.0 GHZ	24	1,897	Data Base & Back End Scaleout_1: DB5, DB6, DB7, DB8	SWDC	Linux
ScaleOut Backend_2	4 @3.0 GHZ	24	1,897	Data Base & Back End Scaleout_2: DB9, DB10, DB11, DB12	SWDC	Linux
ScaleOut Backend_3	4 @3.0 GHZ	24	1,897	Data Base & Back End Scaleout_3: DB13, DB14, DB15, DB16	SWDC	Linux
ScaleOut Backend_4	4 @3.0 GHZ	24	1,897	Data Base & Back End Scaleout_4: DB17, DB18, DB19, DB20	SWDC	Linux
Collector_0	4 @2.6 GHZ	16	200	EMC VMAX_1, EMC VNX File, HDS	SWDC	Linux
Collector_1	4 @2.6 GHZ	16	200	EMC VMAX_2, VMware vCenter	SWDC	Linux
Collector_2	4 @2.6 GHZ	16	200	EMC VMAX_3, EMC VNX Block	SWDC	Linux
Collector_3	4 @2.6 GHZ	16	200	EMC VMAX_4, Cisco, Physical_1	SWDC	Linux
Collector_4	4 @2.6 GHZ	16	200	EMC VMAX_5, IBM XIV, Physical_2	SWDC	Linux
Collector_5	4 @2.6 GHZ	16	200	EMC VMAX_6, NetApp, Physical_3	SWDC	Linux
Collector_6	4 @2.6 GHZ	16	200	EMC VMAX_7, Oracle	SWDC	Linux
Collector_7	2 @2.6 GHZ	8	120	Centera	SWDC	Windows
Collector_8	4 @ 2.6 GHZ	16	200	EMC VMAX_8, IBM XIV, HDS, Vmware	GTDC	Linux
Collector_9	4 @ 2.6 GHZ	16	200	EMC VMAX_9, Cisco	GTDC	Linux
Collector_10	4 @ 2.6 GHZ	16	200	EMC VMAX_10, EMC VNX File, Physical_1	GTDC	Linux
Collector_11	4 @ 2.6 GHZ	16	200	EMC VNX Block, NetApp, Physical_2	GTDC	Linux
Collector_12	2 @ 2.6 GHZ	8	120	Centera	GTDC	Windows
Collector_13	4 @2.6 GHZ	16	200	EMC VMAX_11, Vmware	QRDC	Linux
Collector_14	4 @2.6 GHZ	16	200	EMC VNX File, Cisco, Physical_1	QRDC	Linux
	0	400	13,339			

EMC Storage Prerequisites

EMC VMAX SolutionPack								
Support List: DMX, VMAX, VMAX10K, VMAX 20K, VMAX40K								
Requirements: Solutions Enabler 7.6.1.0 or higher								
Unisphere for VMAX 1.6.0.1 or higher (Unisphere for VMAX must be setup to collect perf data)								
Symmetrix communications occur via GateKeepers. The two options available are outlined below) (Remote Mode - Option 1) - Assign 2 additional gatekeepers to existing SYMAPI server.								
SRM will utilize the existing SYMAPI Server to communicate with the Symmetrix Devices via SYMCLI. No additional software will need to be installed on the SYMAPI server.								
(Local Mode - Option 2) - Assign 2 additional gatekeepers to existing SYMAPI server.								
Install the VMAX Collector on the SYMAPI server. A unique server can also be used if desired.								
If using ACL's - SRM will run the SYMCLI commands under a user called "apg".								
The "apg" user requires permissions to access the storapid daemon in the daemon_users file.								
Info Needed: Array Serial Number, IP Address for Unisphere for VMAX Server, Unisphere Credentials, SYMCLI Credentials if using ACL's								
EMC VNX SolutionPack								
Support List: VNX - OE 7.0 or later								
VNX Gateways VG2 & VG8 - OE 7.0 or later								
CLARiiON CX4 - FLARE R30, R31, R32								
Celerra NX4, NS-120, NS-480 and NS-960 - DART 5.6 and 6.0								
Requirements: Navisecli								
Performance Statistics need to be enabled on SPA & SPB								
User Account (service account) with admin privileges (Block & File Accounts)								
Info Needed: Array Serial Numbers, IP Addresses (PA, SPB, Control Station(s), Credentials								
EMC Centera SolutionPack								
Support List:								
Requirements: Collector must be installed on Windows (W2K8R2 or later)								
Centera CLI 4.2 or 4.3 must be installed on collector server								
User Account (Service Account) with monitor role privileges								
Info Needed: Hostname or IP Address of Management Node, Credentials								

Third Party Storage Prerequisites

IBM XIV SolutionPack										
Support List:	IBM XIV									
Requirements:	The XIV CIM Agent must be available (In v10.1.0 and higher, it is preinstalled & enabled on the admin module)									
	User Account (Service Account).									
Info Needed:	(3) Management IP Addresses, Credentials									
Hitachi SolutionPack										
Support List:	Hitachi Command Suite 7 and higher, AMS200, AMS2100, USP-V, HDS9970V									
Requirements:	HiCommand Device manager 7.3 or higher									
	CIM/WBEM features must be enabled in Hitachi Device Manager									
	User Account with admin privileges on the Hitachi Device Manager system									
Info Needed:	Array name or IP Address for the Hitachi Device Manager, Credentials									
NetApp Filer SolutionPack										
Support List:	NetApp Filer 7-Mode on Ontap v7 or higher									
	NetApp Filer Cluster-Mode on Ontap v8 or higher									
	Note: The cluster management IP must be provided during C-Mode Filer discovery									
Requirements:	SRM utilizes NetApp CLI via SSH to communicate to NetApp arrays. SSH v2 must be enabled									
	SSH connection to the NetApp devices with the following role : login-ssh, cli-stats*, cli-snap*, cli-aggr*									
	cli-vol*, cli-disk*, cli-environment, cli-nfs*, cli-cifs*, cli-df, cli-sysconfig, cli-ifconfig, cli-version									
	C-Mode requires admin privilege for user to run commands of type 'run -node *' and 'statistics samples delete W4N*'									
	A full list of the CLI Commands can be provided as needed for proper user account access creation									
	Polling must be done to the real NetApp Filer (not a vFiler)									
Info Needed:	NetApp filer Mode, Hostname, IP Address, Credentials									

Cisco FC Switch Prerequisites

Cisco MDS/Nexus Switch SolutionPack						
Support List:	MDS - MDS 9148, DS-C9124, DS-C9506, DS-C9509, DS-C9513, ONS 15201, ONS 15202, DS-X9216					
	Nexus - Nexus 5548, Nexus 1000V					
Requirements:	SNMP must be enabled/configured. SRM Supports v1 ,v2C and v3 (SHA auth & AES128 privacy only)					

Host and Application Prerequisites

[illegible]

Firewall Ports

Source	Protocol	Ports	Direction	Target	Notes
*	TCP	58080	<--Bi-Directional -->	UI Portal Host	App access via Web
UI Portal Host	TCP	389	<--Bi-Directional -->	LDAP Host	LDAP Authentication
All Collector Hosts	TCP	2020	Out -->	Backend 1-Primary Database Host	Load Balancer
All Collector Hosts	TCP	2001	<--Bi-Directional -->	Both Backend-Database Hosts	Control Interface
All Collector Hosts	TCP	2010	Out -->	Backend 1-Primary Database Host	Alerting
VNX Collector Hosts	TCP/UDP	2040	Out -->	Backend 1-Primary Database Host	VNX Alert Consolidation
All Collector Hosts	TCP	48443	<--Bi-Directional -->	Backend 1-Primary Database Host	TMS Service
All Collector Hosts	TCP	52001	<-- In	UI Portal Host, Both Backend-Database Hosts	Event Processing
All Collector Hosts	TCP	52004	Out -->	Backend 1-Primary Database Host	Event Processing
Generic RSC Collector	TCP	5985/5986	<--Bi-Directional -->	Windows Host to be discovered	WS-MAN
Generic RSC Collector	TCP	22	<--Bi-Directional -->	UNIX Host to be discovered	ssh
Vmware Collector	TCP	443	<--Bi-Directional -->	vCenter Host to be discovered	https
Cisco Collector	UDP	161	<--Bi-Directional -->	Cisco switches to be discovered	SNMP
VNX File Collector	TCP	80/443	<--Bi-Directional -->	VNX Control Stations	http/https
VNX Block Collector	TCP	22	<--Bi-Directional -->	VNX SPA/SPB	ssh
VMAX Collector	TCP	2707	<--Bi-Directional -->	Remote SYMAPI Servers	Remote SYMAPI Calls
Centera Collector	TCP	3218/3682/7069/8069	<--Bi-Directional -->	Centera Nodes	SDK/Centera API Calls
NetApp Collector	TCP	22	<--Bi-Directional -->	NetApp Node	ssh
HDS Collector	TCP	5988/5989	<--Bi-Directional -->	HDS Array Host	SMI-S
HDS Collector	TCP	1099/51099/2000/2001/51100	<--Bi-Directional -->	HDS Array Host	Text Collector