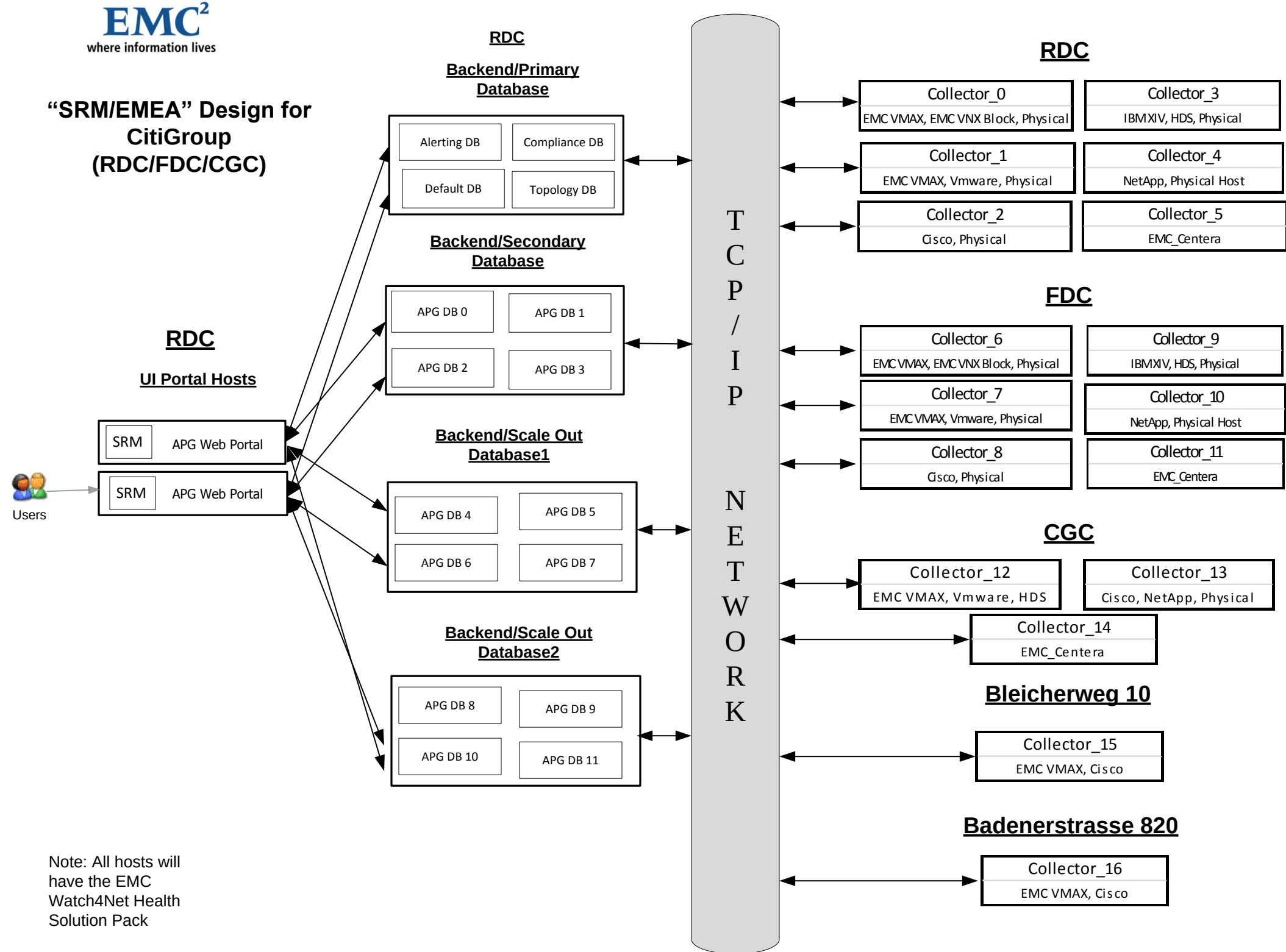


“SRM/EMEA” Design for CitiGroup (RDC/FDC/CGC)



Solution Pack	Count	Total Metrics	Growth Factor	Projection
Cisco MDS/Nexus - # Switches	116	229448	20	275338
Cisco MDS/Nexus - # Ports and Interfaces	20534	1806992	20	2168390
EMC VMAX - # Arrays	21	10626	20	12751
EMC VMAX - # Disks	14250	156750	20	188100
EMC VMAX - # LUNs	205587	4111740	20	4934088
EMC VMAX - # Pools	77	1232	20	1478
EMC VMAX - # Directors	164	14924	20	17909
EMC VNX Block - # Arrays	8	4776	20	5731
EMC VNX Block - # Disks	2700	43200	20	51840
EMC VNX Block - # LUNs	1636	45808	20	54970
EMC VNX Block - # Pools	20	480	20	576
EMC Centera - # Storage Pools	97	485	20	582
EMC Centera - # Nodes	244	976	20	1171
HP EVA - # Disks	4644	27864	20	33437
HP EVA - # LUNs	41255	495060	20	594072
IBM XIV - # Disks	360	720	20	864
NetApp Filer V7 - # Arrays	13	5434	20	6521
NetApp Filer V7 - # Disks	1090	4360	20	5232
NetApp Filer V7 - # Aggregate Pools	34	408	20	490
NetApp Filer V8 - # Arrays	34	15980	20	19176
NetApp Filer V8 - # Disks	144	720	20	864
NetApp Filer V8 - # Aggregate Pools	49	637	20	764
VMware vCenter without Powerpath - # ESX hosts	61	6039	20	7247
VMware vCenter without Powerpath - # Virtual Machines	603	26532	20	31838
Physical Hosts with Powerpath - # Hosts	4949	395920	20	475104
Total Metrics Count		7407111		8888533

VM Purpose	Number of vCPU	Memory (GB)	OS Disk Space (GB)	Application Disk Space (GB)	Total Disk Space (GB)	Contains	Location	OS
Frontend_1	4 @3.0 GHZ	16	50	70	120	Front End 1	RDC	Linux
Frontend_2	4 @3.0 GHZ	16	50	70	120	Front End 2	RDC	Linux
Primary Backend	4 @3.0 GHZ	24	50	724	774	Compliance, Alerting, Topology, Default DB	RDC	Linux
Secondary Backend	4 @3.0 GHZ	24	50	1,847	1,897	Data Base & Back End: DB0, DB1, DB2, DB3	RDC	Linux
ScaleOut Backend_1	4 @3.0 GHZ	24	50	1,847	1,897	Data Base & Back End Scaleout_1: DB4, DB5, DB6, DB7	RDC	Linux
ScaleOut Backend_2	4 @3.0 GHZ	24	50	1,847	1,897	Data Base & Back End Scaleout_2: DB8, DB9, DB10, DB11	RDC	Linux
Collector_0	4 @2.6 GHZ	24	50	150	200	EMC VMAX1, EMC VMAX2, EMC VNX Block, Physical	RDC	Linux
Collector_1	4 @2.6 GHZ	24	50	150	200	EMC VMAX1, EMC VMAX2, VMware vCenter, Physical	RDC	Linux
Collector_2	4 @2.6 GHZ	16	50	150	200	Cisco, Physical	RDC	Linux
Collector_3	4 @2.6 GHZ	16	50	150	200	IBM XIV, Physical, HDS	RDC	Linux
Collector_4	4 @2.6 GHZ	16	50	150	200	NetApp, Physical	RDC	Linux
Collector_5	2 @2.6 GHZ	8	50	70	120	Centera	RDC	Windows
Collector_6	4 @ 2.6 GHZ	24	50	150	200	EMC VMAX1, EMC VMAX2, EMC VNX Block, Physical	FDC	Linux
Collector_7	4 @ 2.6 GHZ	24	50	150	200	EMC VMAX1, EMC VMAX2, VMware vCenter, Physical	FDC	Linux
Collector_8	4 @ 2.6 GHZ	16	50	150	200	Cisco, Physical	FDC	Linux
Collector_9	4 @ 2.6 GHZ	16	50	150	200	IBM XIV, Physical, HDS	FDC	Linux
Collector_10	2 @ 2.6 GHZ	8	50	150	200	NetApp, Physical	FDC	Linux
Collector_11	2 @ 2.6 GHZ	8	50	70	120	Centera	FDC	Windows
Collector_12	4 @2.6 GHZ	16	50	150	200	EMC VMAX, VMware, HDS	CGC	Linux
Collector_13	4 @2.6 GHZ	16	50	150	200	NetApp, Cisco, Physical *	CGC	Linux
Collector_14	2 @ 2.6 GHZ	8	50	70	120	Centera *	CGC	Windows
Collector_15	4 @2.6 GHZ	16	50	150	200	EMC VMAX, Cisco	Bleig10	Linux
Collector_16	4 @2.6 GHZ	16	50	150	200	EMC VMAX, Cisco	Baden820	Linux
						* These Collectors can discover objects at satellite locations.		

EMC Storage Prerequisites

EMC VMAX SolutionPack							
Support List:	DMX-3, DMX-4, DMX-4 950, VMAX, VMAX SE series						
Requirements:	Solutions Enabler 7.6.2.8 or higher						
	Unisphere for VMAX 1.6.2 or higher (Unisphere for VMAX must be setup to collect performance data)						
	SMI-S Provider 4.6.2 for LUN Performance Metrics						
	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.						
	In the event that the SYMAPI Server uses a "nethost" file, ensure the collector hostname or IP Address						
	is in it. For example, "vm-2981-564 *"						
	(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:	Flare Code 4.30; 5.31 or higher						
	Used with CLARiiON, VNX1 and VNX2 Models						
	VNXe OE 3.0 (Block and File)						
	Used with second generation VNXe modules as of VNXe3200						
	First generation VNXe models such as VNXe3100, VNXe3150 and VNXe3300 are not supported.						
	DART 5.6 and 6.0; VNX OE for File 7.0 or later						
	Used with Celerra, VNX1 and VNX2 models						
Requirements:	Naviseccli (The version should match the Flare code level.)						
	Performance Statistics need to be enabled on SPA & SPB						
	User Account (service account) with read only privileges (Block & File Accounts)						
Info Needed:	Array Serial Numbers, IP Addresses SPA, SPB, Control Station(s), Credentials						
EMC Centera SolutionPack							
Support List:							
Requirements:	Collector must be installed on Windows 2008, 2008R2						
	Centera 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						
EMC XtremIO SolutionPack							
Support List:	XtremIO 2.4 and later						
Info Needed:	Unique friendly name for XIO array						
	Management IP Address or hostname						
	Username (Read-only account) and Password						

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:	AMS200, AMS2100, USP and USP-V, HUS and VSP						
Requirements:	Hitachi Command Suite 7.4.1 or higher (Full license; core license is not adequate.)						
	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:	Cisco MDS (9xxx)					
	Cisco ONS (1520x)					
	Cisco Nexus (5548, 1000V)					
Requirements:	Supported MIBS:					
	CISCO-FLASH-MIB					
	CISCO-NS-MIB					
	CISCO-DM-MIB					
	CISCO-ENTITY-SENSOR-MIB					
	ENTITY-MIB					
	CISCO-FC-FE-MIB					
	IF-MIB					
	CISCO-ENTITY-FRU-CONTROL-MIB					
	CISCO-VSAN-MIB					
	CISCO-ZS-MIB					
	CISCO-SYSTEM-EXT-MIB					
	SNMPv2-MIB					
	CISCO-FCS-MIB					
	CISCO-FEATURE-CONTROL-MIB					
	SNMP must be enabled/configured. SRM Supports v1 ,v2C and v3 (SHA auth & AES128 privacy only)					

Host Prerequisites

VMware vCenter SolutionPack						
Support List:	VMware vCenter Server 4.1 or higher					
	Vmware ESX 4.1, 5.0, 5.1					
Requirements:	vCenter User Account - Read Only Account with Browse Datastore and all Storage View privileges					
	If PowerPath / VE is running and metrics are desired, PP /VE 5.8 or later is required					
Info Needed:	vCenter Hostname or IP Address, Credentials					
EMC Physical Hosts						
Support List:	HPUX 11iv1 11.11, HPUX11iv2 11.23, HPUXiv3 11.31					
	IBM AIX 5.1, 5.2, 5.3, 6.1, 7.1					
	Linux RHEL AS/ES 4.x, 5.x, 6.x					
	Linux SUSE es9, ES9.3, ES10, ES11					
	Solaris 9, 10, 11, SVM, VxVM, zfs					
	Microsoft Windows 2003, 2003 R2 SP2, 2003 SP2					
	Microsoft Windows 2008 Core, 2008 SP1, 2008 SP2, 2008 R2					
	Microsoft Windows 2012					
	Standard, Enterprise and Datacenter editions					
Requirements:	Host Prerequisites: (PowerPath is only needed if PowerPath metrics are desired)					
	HPUX - PowerPath 5.2, INQ 7.6.1 or higher, perl interpreter 5.6.1 or higher					
	IBM AIX - PowerPath 5.7b194, INQ 7.6.1 or higher, perl interpreter 5.6.1 or higher					
	RHEL & SUSE Linux - PowerPath 5.7, INQ 7.6.1.0 or higher, perl interpreter 5.6.1 or higher					
	Solaris - PowerPath 5.5 P02 HF02, INQ 7.6.1.0 or higher, perl interpreter 5.6.1 or higher					
	Windows - PowerPath 5.7, Powershell 2.0, INQ 7.6.1.0 (Optional)					
	Linux / Unix host connections will utilize SSH. A user account with sudo access is required					
	Sudo user needs root privileges to run the following commands: inq, powermt, sar, mpstat, vgdisplay					
	vxdisk (Solaris)					
	dmidecode, vgs, lvdisplay (Linux)					
	Windows hosts connections will utilize WinRM & PowerShell. PowerShell 2.0 or higher is required					
	WinRM Execution Policy should be set to unrestricted :set-executionpolicy unrestricted					
Info Needed:	HostName or IP Address, OS Version, Credentials					

Application Prerequisites

Oracle Database SolutionPack								
Support List:	Oracle 10&up							
Requirements:	Oracle Config Type (Simple, RAC)							
	The appropriate JDBC driver (based on the Oracle version to be discovered) jar file needs to be installed.							
	Hostname or IP address of Database Server and the Database Service Name							
	Oracle database user credentials are required. Either an administrator equivalent system account or a dedicated system account.							
	SP requires the Oracle JDBC driver matching your Oracle DB version available on the APG collector							
Info Needed:	Oracle Config Type, Hostname or IP Address of DB Server, DB Service Name, Credentials							

SRM 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
IBM XIV Collector	TCP	5988/5989	<--Bi-Directional -->	IBM CIM Agent Host	IBM CIM