Request for Proposal (RFP) for Selection of Implementation Agency for Implementation, Operations and Maintenance of State NOC

Vol 2 of 2

Enquiry No. : OCAC-NEGP-INFRA-0010-2018-19009 Dated 08.03.2019

Revised RFP, after incorporating the responses to Pre-Bid Queries, issued on 02.04.2019

ODISHA COMPUTER APPLICATION CENTRE (OCAC)

OCAC Building, Plot No. – N-1/7-D, Acharya Vihar Square, RRL PO, Bhubaneswar-13, Odisha Tel: 0674-2567064/2567280, FAX- 0674-2567842

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1 Abbreviations

Abbreviations	Expanded
AMC	Annual Maintenance Contract
BMS	Building Management System
EMD	Earnest Money Deposit
GoI	Government of India
GR	Goods Receipt
INR	Indian Rupee
IT	Information Technology
MoU	Memorandum of Understanding
OCAC	Odisha Computer Application Centre
OEM	Original Equipment Manufacturer
OPTCL	Odisha Power Transmission Corporation Limited
PBG	Performance Bank Guarantee
PIA	Project Implementation Agency
PMU	Project Management Unit
PoA	Power of Attorney
RFP	Request for Proposal
UPS	Uninterrupted Power Supply
NIA	NOC Implementation Agency
SNOC	State Network Operation Centre

2 Proposed Technical Solution

2.1 Architecture

The bidder should follow the below architecture for State NOC set up and with the envisaged requirements highlighted with IT and Non-IT system. The architecture depicts the broad minimum requirements of SNOC. Selected bidder will Supply, install, integrate and Commission the new NOC and integrate with BharatNet Network seamlessly.

The new infra setup on the top floor will use the NMS, OSS, BSS and BMS components comprises of the CCTV surveillance, Access control, Fire detection and Suppression control, Integration with DG, UPS and the other standalone devices, VESDA, Water leak detection, Rodent repellent etc. It is required to integrate all the NMS, OSS, BSS and BMS systems in the NOC.

The detailed technical requirements of IT and Non IT infrastructure, interfaces with other systems/stakeholders and data exchange requirements are covered in the subsequent sections.

2.2 Technical Requirements

2.2.1 Brief description

As a part of this project, NIA would be required to undertake the following Infrastructural establishment at OCAC. The requirements classification are as below -

1) Procurement and deployment of IT and Non IT devices
2) Installation and commissioning of the IT and Non IT Infrastructure including Civil works as per requirement of the site.

3 Proposed Physical Layout

Illustrative Layout for the State NOC is given as below. Detail Layout will be choosen from best solution provided by the bidders and freezed during Implementation period. The bidder will make a survey of the site before bid submission and the actual civil layout submitted by the bidder will be finalized in discussions with all the stakeholders.

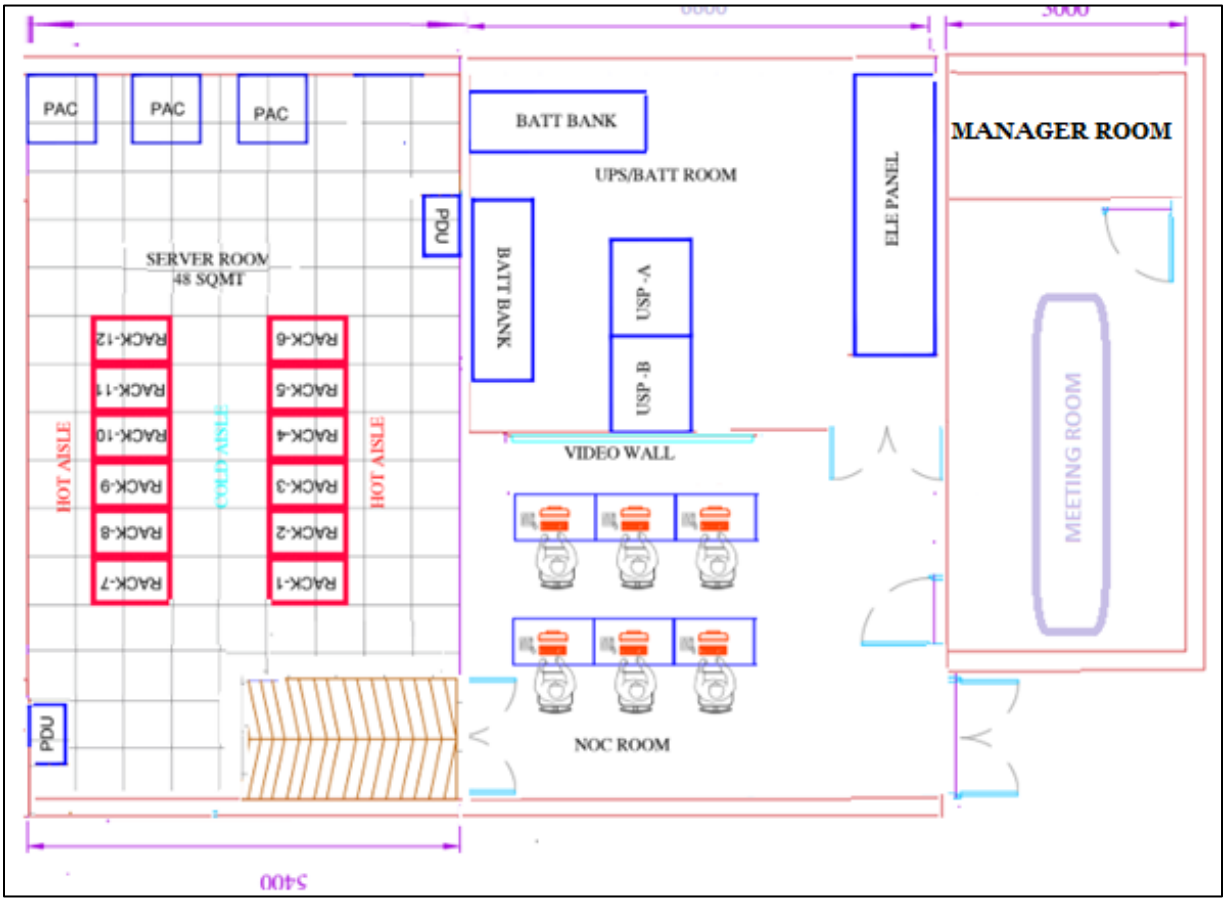

Figure 1 Illustrative Layout

4 Proposed Network Layout

A new network infrastructure is proposed with 2 no's of routers which will be connecting to the next generation firewall with the capability of intrusion prevention, anti-malware, Web and content filtering, core firewall features etc. Entire network will be segmented in several Zones. DMZ servers will be connected from the DC aggregation switch using dedicated DMZ switch. There will be separate zones for Applications, Databases and other management servers where no internet connectivity will be provided and authenticating users via single-sign-on solution such as Active Directory/LDAP etc. Access to this MZ zones to will be controlled by firewalls.

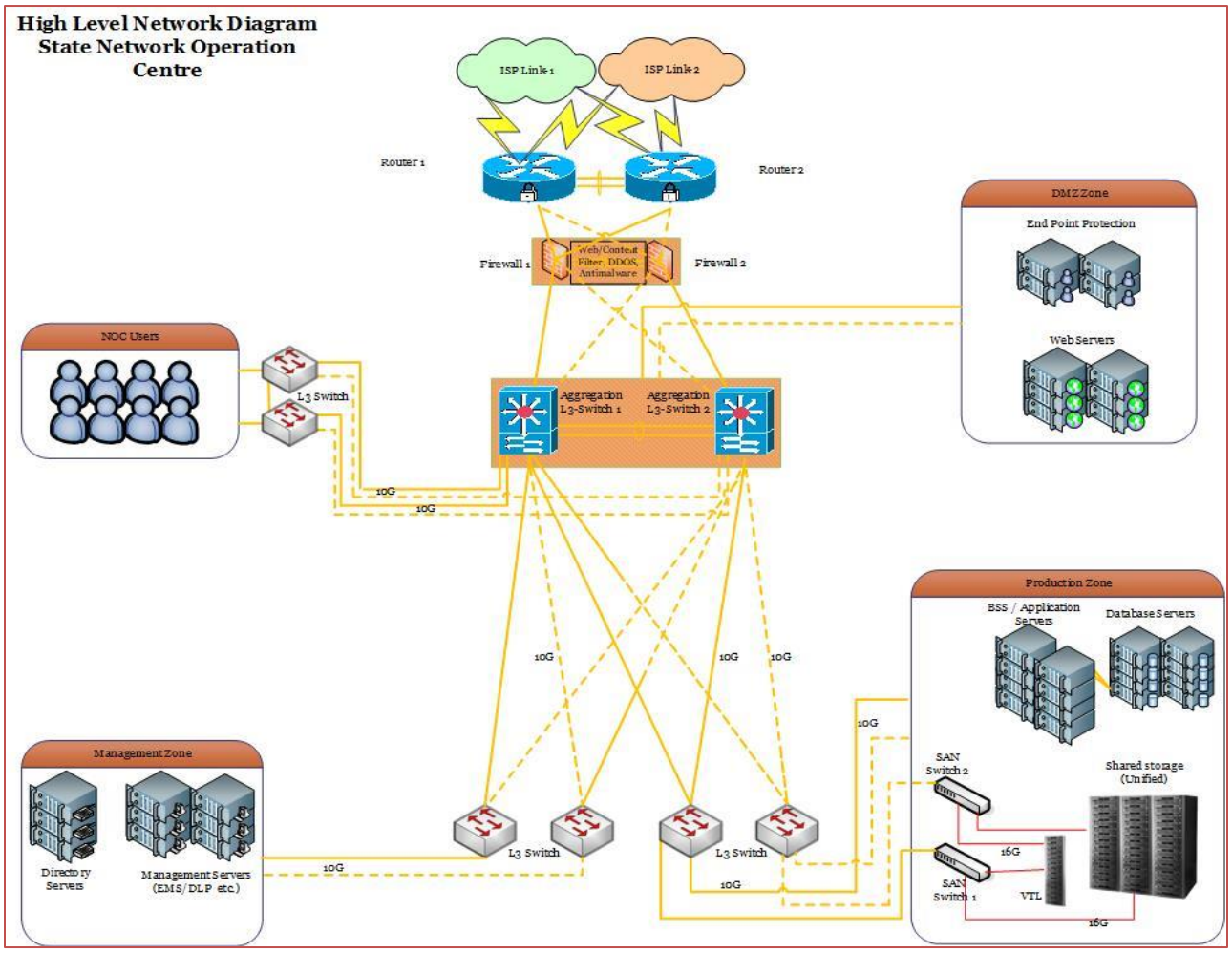

Figure 2 Illustrative Network Layout

5 State NOC - Illustrative Electrical Block Diagram

There should be two Power Panels with Auto interlocking capacity for identifying only one active power source to the LT panel. There are two LT panel with DG Sync panel so that automatic start of DG's takes place in case of Power failure. Although since there will be two raw power sources, DG's will only be utilized only in the case if there is power failure from both the power sources.

The Critical load of the UPS will provide power to the IT equipment's (Computing environment) and the ECM Fans of the Precision AC's to maintain the temperature for few minutes even during non-availability of power at the PAC's. The Non Critical load will be for Non Computing environment like lights, Comfort Air conditioning, reception area and others.

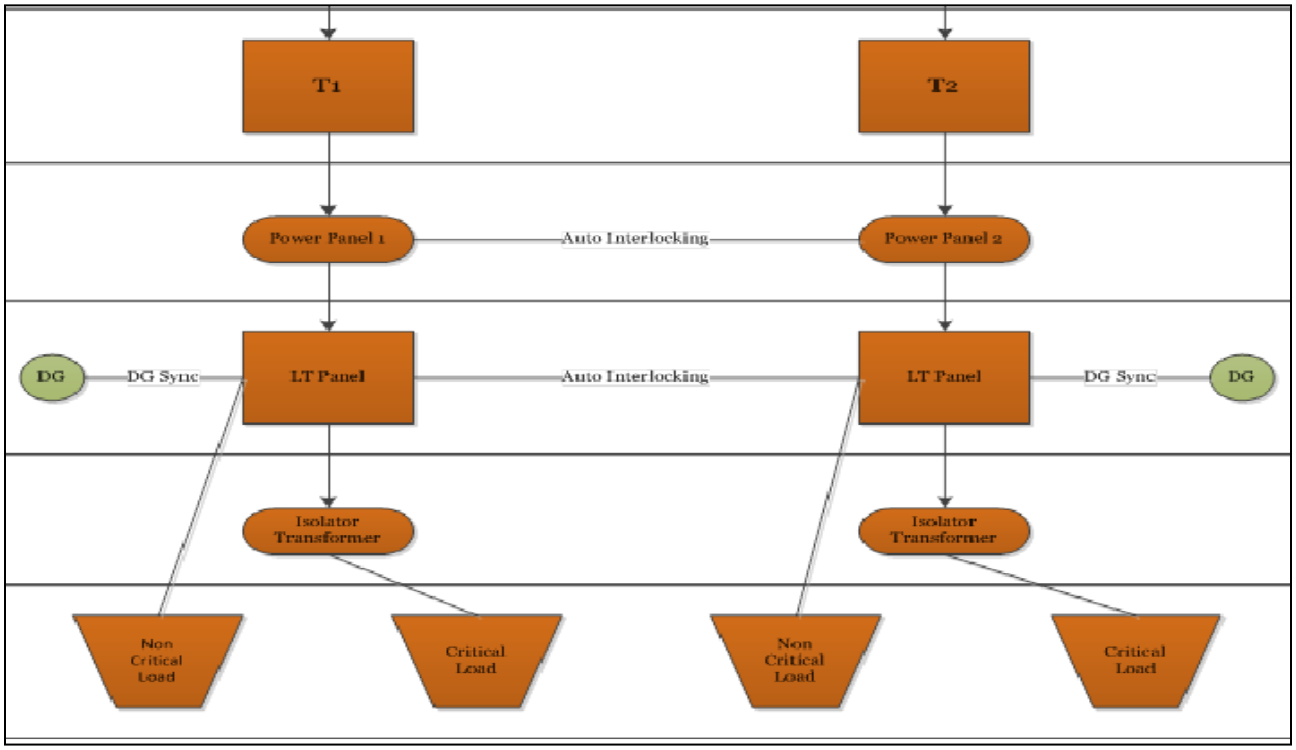

Figure 3 Illustrative Electric Block Diagram

Other design consideration for the electrical environment is as follows:

- Oil filled distribution transformer to be used in redundant set up, each unit to be independently capable to delivering 100% electrical load of the facility
- High efficiency diesel generator shall be deployed with its fuel efficiency certified by the Pollution Control Board. The diesel generator to work as per the load conditions synchronized through the sync panel and number of diesel generators will be decided as per the availability requirements of the facility and corresponding facility requirements.
- High efficiency modular UPS to be deployed as per load requirements with flexibility for expansion. The modular UPS to have inbuilt redundancy
- Battery banks (Lithium Ion) for the UPS to be selected for high efficiency operation and long service life
- Electrical panels to have redundant path ensuring 100% backup to avoid emergency breakdown

- There should be proper time windows for preventive and routine periodic maintenance. Panels to be fitted with proper Surge Protecting Devices (SPD), Automatic Power Factor Correction (AFPC) component
- Duct for power cables/bus to be rated for high current capacity with cables having PVC insulated copper conductor of low loss
- Human movement sensing electrical lighting sensor should be deployed for all the low personnel movement areas.

6 Bill of Material& Compliance

Following includes the minimum Bill of Material for the State NOC. The specifications of the components listed below are provided in the later sections of the RFP. The bidder shall provide the quotation for unit prices for the following components in the commercial bid. However, for overall commercial evaluation, the quantities indicated in the table below shall be considered. At the time actual implementation, based on the requirements, the number of equipment may be increased / decreased by the OCAC. It is the responsibility of Bidder to provide the recommendations to the IA as to how many equipment would be required to be implemented in the DC as per the IA's assessment at the time of implementation of the DC.

Proposed minimum consolidated Bill of Material for State NOC

#	DC Components	Unit	Qty	Compliance with Reference to the Section of the proposal and Page Number
IT Infrastructure (CA)				
1.	Physical server: x-86 blade/rack servers (minimum 2 processor, 16 core/processor, 2.0 Ghz, Minimum 256 Gb RAM) - for Active Directory, Backup, other management servers - 2 no's - for NMS, OSS - 3 no's	No's	5	
2.	Blade enclosure (if applicable)	No's	As required	
3.	SAN Storage - 15 TB usable and scalable upto 100TB usable	No's	1	
a.	Additional storage disks for scalability	TB	10	
4.	SAN Switch - 24 ports scalable upto 48 ports	No's	2	
5.	Tape Library along with tape cartridges	No's	1	
6.	Backup solution - volume based	TB	15	
7.	Intelligent Racks	No's	6	
8.	Internet routers	No's	2	
9.	Firewall	No's	2	
10.	L3 Aggregation/Spine Switch	No's	2	
11.	L3 Access/Leaf Switch – Type 1	No's	2	
12.	L3 Access/Leaf Switch – Type 2	No's	2	
13.	LAN passive components including Cabling for the entire SNOC Area	Set	1	
14.	Windows Server OS Data Center Edition (Latest version)	No's	1	
15.	Windows Server OS Standard Edition (Latest version)	No's	As required	

#	DC Components	Unit	Qty	Compliance with Reference to the Section of the proposal and Page Number
16.	Linux Enterprise Edition (Latest version)	No's	As required	
17.	Any Other Software for Virtualization	No's	As required	
18.	NMS & OSS	Set	1	
20.	End Point Protection Solution	No's	1	
a.	Licenses for Physical Server (Windows)	No's	As required	
b.	Licenses for Physical Server (Linux)	No's	As required	
c.	Licenses for Virtual Server (Windows)	No's	As required	
d.	Licenses for Virtual Server (Linux)	No's	As required	
21.	Any Other IT components (please specify)	Unit	As required	
Non-IT Components				
22.	Civil & Interior Works (Including Brick work, masonry work, painting, diesel storage tank, Partition, False floor, Raised Floor, False ceiling, Water proofing, etc.	Set	1	
23.	Electrical Cabling (including electrical panel, Earthing, NOC internal electrical wiring, DB, Switchgears, UPS, DG Set, all NOC Areas-for 12 racks, Lighting & fixtures, etc.)	Set	1	
24.	Generator Set (Each 150 KVA)	No's	2	
25.	UPS (modular) for the Server Farm Area for 12 racks and Auxiliary areas; 40 kVA with VRLA battery and minimum 30 Min. backup on full load	No's	2	
26.	Precision Air Conditioning System for the Server Farm Area as per the specifications - 9 TR with N+1 redundancy	No's	2	
27.	Comfort Air Conditioning for the Auxiliary Area as per the specifications- ~ 10 TR	Set	1	
28.	Fire Suppression and Detection System (for all Areas)	Set	1	
29.	VESDA System (for all Areas)	Set	1	
30.	Water Leak Detection System (for all Areas)	Set	1	
31.	Access Control System (for all Areas)	Set	1	
32.	IP CCTV System (for all Areas)	Set	1	
33.	Public Address System (for all Areas)	Set	1	
34.	Fire Proof Enclosure for Media Storage	Set	2	

#	DC Components	Unit	Qty	Compliance with Reference to the Section of the proposal and Page Number
35.	Rodent Repellent System (for all Areas)	Set	1	
36.	Fire extinguisher	Set	1	
37.	Building Management Solution (for the DC Area, as well as for rest of the floor)	Set	1	
38.	Video Wall (3x3) with Controller	Set	1	
39.	Any Other (please specify)		1	

Bidders are required to mention unpriced BoQ for required NMS, OSS solutions including requirement of servers, OS, Database licenses and other licenses for support as applicable.

The BoQ mentioned above is indicative and minimum but if the bidder feels they need more quantity of any items to implement the State NOC, bidder must include that in their BoQ and financial as well.

7 Technical Parameters for the IT components under BOM

7.1 x-86 based Blade / Rack Servers for Active Directory, Backup, End-Point Protection, Management Servers, NMS, OSS etc.

Bidder needs to submit the following compliance sheets for x-86 based Servers:

Make:

Model:

#	Minimum Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
1	Min. 2 numbers x-86 64 bit processor with 16 Core per processor @ 2.0 GHz or above of latest generation				
2	Support for 64 bit Linux/ Windows Operating System with virtualization and clustering				
3	Adequate cache per processor socket				
4	Minimum 256 GB or higher DDR4 RAM @1600 MHz or higher (scalable to 1 TB) with minimum 2 nos. free slots				
5	HDD: SAS hot plug drives - 2 x 600 GB (or higher) for blade server or minimum 3 x 600 GB (or higher) for rack server				
6	The available bandwidth on the server shall be 2x 10 Gbps (minimum) for Ethernet on separate port and 2x16 Gbps (minimum) for FC on separate ports to achieve redundancy. In case of blade, bidder may propose converged solution while meeting the overall bandwidth requirement as asked in the RFP without compromising performance of the proposed system.				
7	As per bidder's solution but it should support multiple RAID levels for rack servers and RAID 0, 1 for blade servers				
8	Server should support virtualization				
9	Dedicated redundant management port/link				
10	Any other specification				

7.2 Blade Enclosure

Bidder needs to submit the following compliance sheets for Blade Enclosure

Make:

Model:

#	Minimum Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
1	Blade chassis shall be maximum 19" Electronic Industries Alliance Standard Width rack mountable and provide appropriate rack mount kit. Blade Server chassis enclosure should be maximum of 12 RU for 16 blades or maximum 6 RU for minimum 8 Blade servers or more.				
2	The power supply modules should be hot pluggable Power supply should be Industry standard. The power subsystem should support all of the following modes of power redundancy (N+1 and N+N) The power subsystem should be support N + N power redundancy for a fully populated chassis				
3	The Blade server chassis should have the capability to provide full redundant cooling for all Blade servers.				
4	The Chassis shall have redundant I/O modules for LAN & SAN Fabrics. Each of the chassis Ethernet Modules (Configured in redundancy) shall have 8 * 10G Ethernet uplink Ports Supporting Ethernet/iSCSI/FCoE. Each of the chassis FC Modules (Configured in redundancy) shall have 8 x 16G FC uplink ports. Bidder may propose alternate solution offering redundant converged I/O modules while meeting the overall uplink bandwidth requirement from blade chassis as asked in the RFP.				
5	Should include support for FC Port Trunking (inbuilt or through external switch)				
6	It should support remote KVM capability from an external keyboard, video monitor and mouse to all blades installed in the chassis through the management controllers. Simultaneous KVM access to a single blade KVM by				

	multiple users but the admin user can take Read Write ownership while the other user is in Read Only mode				
7	Should be able to support the feature of virtual DVD to individual servers from remote systems				
8	Centralized Management should be available to manage all the Blade servers in different chassis from a single console. All the blades in different chassis and rack servers in the server firm zone should be managed from the same console. To achieve that bidder need to factor necessary hardware and software licenses for central manageability.				
10	The SI will prepare the entire design of the SNOC keeping in mind the SNOC compliance requirements and operational requirements. The OEM Validated Design should take into consideration - scalability, modularity, and resiliency aspects of the NOC as well as optimization from space, power and cooling perspective. Respective SI to also ensure that the final deployment is done basis the OEM specified and validated design standards and best practices.				
11	Bidder should submit BOQ of proposed device including the details part numbers and Manufacturer's Warranty part number. Bidder must submit the required performance document and compliance reference document for the proposed device.				
12	Mentioning Manufacturer's warranty part number should be quoted, minimum 3 (Three) years warranty should be provided for this unit from the date of commissioning and after that AMC support should be available for minimum 3 years				
13	Installation, testing and commissioning with necessary accessories				

7.3 SAN Solution

Make:

Model:

#	Minimum Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
SAN Switch – 2 Nos.					
1.	Minimum 24 Active ports should be available, scalable up to 48 Ports. (support for 8/16 Gbps)				
2.	Two nos. of Fibre channel switch should be provided in high availability mode.				
3.	Minimum 15 meter each and accessories for connecting Servers / Devices to SAN with optical mode 4 or higher standard cables.				
4.	Should have capability of ISL trunking of minimum 4 ports.				
5.	Switch should have FC ports for the SAN connectivity.				
6.	All the ports should operate at 16 Gbps and auto-negotiate to 8 Gbps / 4Gbps FC speeds.				
7.	Should have dual Fans and Hot plug power supplies.				
8.	Should have Management Tools for administration and configuration.				
9.	Should support Port security and Port Zoning.				
10.	Should support Secure Shell (SSH) (SSL) and encryptions.				

11.	Should support Fibre Channel trace route and Fibre Channel Ping for ease of troubleshooting and fault isolation				
12.	The switch should be rack mountable.				
13.	Should support features such as Quality of Service (QoS) to help optimize application performance in consolidated, virtual environments.				
14.	Switch shall support diagnostics features such as port mirroring, Syslog, Online system health, Port-level statistics etc.				
18	Any other specification				
SAN – 1 Nos.					
1.	Unified Storage Solution with redundant components inbuilt. The Storage solution should support NAS & SAN & FCOE/iSCSI as an integrated offering with high availability at each level. The architecture should allow modular upgrades of hardware and software for investment protection. The system must support dual-ported 6/12 Gbps FC/SAS Disk Drives (Latest Drive interface) and SATA/NL-SAS Disk Drives (latest Drive interface).				
2.	System to have minimum Two controllers (active-active)				
3.	Cache: 64 GB DRAM total usable protected cache for Disk IO Operations.				

4.	Host interface: Host interface: Minimum 4 FC host ports 8 /16 Gbps or total of 64 Gbps across controllers.				
5.	System should have support for 10GigE IP, iSCSI and/or FCoE as an upgrade in the future.				
6.	Storage Solution to have minimum 4x10 Gbps iSCSI Ports or minimum 4 x10 GigE IP Ports for NAS functionality for High Availability configuration and 4 x 10 Gbps iSCSI ports across controllers for host/network connectivity.				
7.	Drive interface: Minimum 8 drive ports / lanes - Fiber Channel (FC) or Serial Attached SCSI (SAS) standard for FC Arbitrated Loop (FC-AL) or equivalent, minimum 4 Gbps per controller				
8.	Hardware RAID levels Supported: multiple RAID levels (ex: 0,1,5, 6, 10)				
9.	Fans and power supplies: Dual redundant, hot-swappable				
10.	SAN/NAS support: Solution should be compatible of SAN/NAS environment				
11.	Storage subsystem shall support 300 GB or higher 15K RPM FC/SAS drives & 1 TB/2 TB or higher MDL-SAS/NL-SAS/SATA/equivalent 10K drives in the same device array. It should				

	support 400 GB or higher SSD drives				
12.	System should have the capability to designate global hot spares that can be automatically be used to replace a failed drive anywhere in the system. Storage system should be configured with required Global Hot-spares for the different type and no. of disks configured, as per the system architecture best practices.				
13.	All the necessary software to configure and manage the storage space, RAID configuration, logical drives allocation, virtualization, snapshots for configured capacity etc. Offered storage shall support dynamic migration of Volume from one RAID set to another set while keeping the application online				
14.	Redundant power supplies, batteries and cooling fans, data path and storage controller.				
15.	Multi-path & Load balancing software for at-least 50 SAN connected servers shall be provided for current and future use.				
16.	Solution should be configured with CIFS, NFS, iSCSI and FC Protocols. All the licenses should be provided.				

17.	The storage array must have complete cache protection mechanism either by de-staging data to disk/flash or by providing complete cache data protection with battery backup for up-to 72 hours or more.				
18.	The storage shall be supplied with 15 TB (SAS of net usable data capacity after RAID 5/6 for SAS after removing the drives required for (a) Parity/Mirror, (b) Hot spares. The storage is to support SAS, SATA or equivalent (7.2K, 10K, 15K RPM) on the proposed controller. (c) The storage should have minimum 6/12 Gbps FC/SAS Drive interface.)				
19.	The system should scale up to 100TB usable capacity in the same proportion as explained in above point.				
20.	The storage array must have the capability to do array based remote replication using FCIP or IP technology. The storage array should support Synchronous and Asynchronous replication.				
21.	The storage array should support Operating System Platforms &				

	Clustering including: Linux/Windows OS				
22.	Storage should support non-disruptive online firmware upgrade for both Controllers and disk drives.				
23.	The storage array should support hardware based data replication at the array controller level across all models of the offered family.				
24.	The storage should provide automatic rerouting of I/O traffic from the host in case of primary path failure.				
25.	Should provision for LUN masking, fiber zoning and SAN security.				
26.	Should support storage virtualization and online logical volume expansion.				
27.	Proposed array must be supplied with Thin provisioning				
28.	Should support file and block level replication.				
29.	Storage should support inbuilt automated tiering feature. The tiering feature should have flexibility in deployment across the tiers (FC/SAS/SATA). The activation of this feature should not require the reconfiguration of array.				

30.	Should support hot-swappable physical drive raid array expansion with the addition of extra hard disks				
31.	Global Hot Spare Disk should be in addition to the usable capacity mentioned.				
32.	Should be able to support clustered and individual servers at the same time.				
33.	Should be able to take "snapshots" of the stored data. Offered Storage shall have support to make the snapshot and full copy (Clone) on the thin volumes if original volume is created on thick volume or vice-versa.				
34.	Should be configured with "snapshots and clone" for the offered capacity on both SAN and NAS.				
35.	Vendor should also offer storage performance monitoring.				
36.	Should support the functionality of proactive monitoring of Disk drive and Storage system for all possible hard or soft failure.				
37.	Any other Specification				

7.4 Tape Library

Make:

Model:

#	Minimum Specification	Specification Proposed By Bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (If any)
1	Shall be scalable up to 8 x FC LTO drives.				
2	Shall provide native Fiber connectivity to SAN Environment.				
3	Shall have redundant power supply.				
4	Shall be offered with minimum of 40 Cartridge slots scalable up to 280 Slots.				
5	Shall support Barcode reader and shall be provided with required cleaning cartridges.				
6	Shall be rack mountable and shall be offered with mounting kit.				
7	Warranty: 3 years warranty along with 3 years AMC from the date of acceptance				

7.5 Backup Software

#	Minimum Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
Backup Software					
1.	The proposed Backup Solution should be available on various OS platforms such as Windows, Linux and UNIX platforms and be capable of supporting SAN based backup / restore from various platforms including UNIX, Linux, and Windows. It should able to integrate with virtualization software and should able to take back up of virtual servers.				
2.	Proposed backup solution shall have GUI across heterogeneous platform to ensure easy administration.				
3.	The proposed Backup Solution has in-built frequency and calendar based scheduling system and supports Clustering the Backup Server and Media Server on Windows, Linux and UNIX.				
4.	The proposed backup Solution supports the capability to write multiple data streams to a single tape device or multiple tape devices in parallel from multiple clients to leverage the throughput of the Drives using Multiplexing technology. It should support Multiplexing upto 32 streams.				
5.	The proposed backup solution support de-multiplexing of data cartridge to				

	another set of cartridge for selective set of data for faster restores operation to client/servers				
6.	The proposed backup solution should be capable of taking back up of SAN environment as well as LAN based backup. Three location de-duplication technology for application source, backup server, and target device.				
7.	The proposed backup solution shall be offered as per solution for SAN based back up as well as LAN based backup.				
8.	The proposed solution also supports advanced Disk staging. It should support cloud services backup and cloud backup with minimum of 128/256 bit encryption				
9.	The proposed Backup Solution has in-built media management and supports cross platform Device & Media sharing in SAN environment. It provides a centralized scratched pool thus ensuring backups never fail for media				
10.	Backup Software is able to rebuild the Backup Database/Catalog from tapes in the event of catalog loss/corruption.				
11.	Backup clients should be updated automatically using the client push or/ and update feature.				
12.	The proposed Backup Solution should support online backup solution for different type of Databases such as Oracle, MS SQL, Sybase, MYSQL/ PostgreSQL etc. on various OS. A Combination of backup solution is acceptable.				

13.	The Proposed backup solution shall provide granularity of single file restore.				
14.	The Proposed backup solution shall be designed in such a fashion so that every client/server in a SAN can share the robotic tape library.				
15.	Backup Solution shall be able to copy data across firewall.				
16.	Backup solution should also provide report writer that allows designing of report templates which can be used to generate meaningful reports in CSV / HTML / XML / Text format / PDF.				
17.	Backup software shall also support Shared Portal Server and shall have integration with Data Protection Manager or equivalent on open source Backup Software must provide Web based dashboard, telemetry and scheduler option.				
18.	Any other				

7.6 Racks 42U

Make:

Model:

#	Minimum Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
1.	19" 42U racks shall be used in the NOC with dimension of minimum 750mm X 1075mm. All the racks should be mounted on the floor with castor wheels with brakes (set of 4 per rack)				
2.	Floor Standing Server Rack - 42U with Heavy Duty Extruded Frame for rigidity. Top cover with FHU provision. Top & Bottom cover with cable entry gland plates. Heavy Duty Top and Bottom frame of MS. Two pairs of 19" mounting angles with 'U' marking. Depth support channels - 3 pairs. with an overall weight carrying Capacity of 1000Kgs.				
3.	The racks should conform to EIA-310 Standard for Cabinets, Racks, Panels and Associated Equipment and accommodate industry				

#	Minimum Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	standard 19" rack mount equipment.				
4.	Front and Back doors should be perforated with at-least 63% or higher perforations.				
5.	All racks should be OEM racks with Adjustable mounting depth, Multi-operator component compatibility, Numbered U positions, Powder coat paint finish and Protective grounding provisions.				
6.	All racks should have mounting hardware 2 Packs, Blanking Panel.				
7.	Keyboard Tray with BB Slides (Rotary Type) (1 no. per Rack)				
8.	Stationery Shelf 627mm Network (2 sets per Rack)				
9.	All racks must be lockable on all sides with unique key for each rack				
Server Racks should have the following things in addition to the above mentioned hardware:					
10.	Racks should have Rear Cable Management				

#	Minimum Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	channels, Roof and base cable access				
11.	Wire managers - Two vertical and four horizontal				
12.	Power distribution Unit - Vertically Mounted, 32AMPs with minimum 22 Power Outputs. (16 Power outs of IEC C13 Sockets & 6 Power outs of IEC C19 Sockets), Electronically controlled circuits for Surge & Spike protection, LED readout for the total current being drawn from the channel, 32AMPS MCB, 3KVA isolated input to Ground & Output to Ground (1 No per Rack). Bidder to consider adequate number of sockets as per the actual requirements with minimum 20% spare.				
13.	2 sets of power outputs from 2 different sources				
14.	Door - The Racks must have steel (solid/grill/mesh) front/rear doors and side panels.				

#	Minimum Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	Racks should NOT have glass door/panels				
15.	Both the front and rear doors should be designed with quick release hinges allowing for quick and easy detachment without the use of tools.				
16.	Fan trays - Fan 90CFM 230V AC, 4" dia (4 Nos. per Rack)				
17.	Fan Housing Unit 4 Fan Position (Top Mounted) (1 no. per Rack) - Monitored - Thermostat based - The Fans should switch on based on the Temperature within the rack. The temperature setting should be factory settable. This unit should also include - humidity & temperature sensor				
18.	Depth 1075 mm				
19.	Metal extruded profile				
20.	Side panel Detachable side panels (set of 2 per Rack)				
21.	Width 19” equipment mounting, extra width is				

#	Minimum Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	recommended for managing voluminous cables				
22.	Any Other				

7.7 iPDU for Racks

#	Specifications	Complied (Yes/No)
1	Supply, Installation, Testing and Commissioning of 2 Intelligent Rack PDUs in each Rack of 32A, 1Ph for Medium Density Racks and 32A, 3Ph for high density Racks	
2	Single Phase Rack PDU should be with input cable length of minimum 2.5 meters IEC 309 32 A P+N+E connector to connect from floor mount PDU power extension cable. Three Phase Rack PDU should be with input cable length of minimum 1.5 meters IEC 309 32 A 3P+N+E connector to connect from floor mount PDU power extension cable.	
3	PDU should have IEC C13 X 16 & IEC C19 X 8 outlets that support the IT devices allocated in the Rack	
4	Acceptable input voltage: 220–240 VAC; Maximum input current (phase): 32 A VDE; Overload protection (internal): Two (2) 16 A, 1-pole hydraulic-magnetic circuit breakers. PDU should provide real-time remote monitoring (Volts, Amps, total Power- kilowatt and Total Energy- kWh) of connected loads. User-defined alarms warning system. Locally it should be able to display the Volt, Amps and Power on the LCD display affixed on the Power strip itself.	

7.8 Firewalls

The OEM needs to be in the leader's quadrant of Gartner for last year

Make:

Model:

S. No.	Specification	Compliance (Yes/No)	Remarks/Deviation
1	FCC Class A, CE Class A, VCCI Class A, CB		
2	Modular or Fixed		
3	Should be separated from the Data Plane		
4	Minimum storage - minimum 100GB usable space		
5	Dual Power with AC Option.		
6	Minimum 4 x 10G SFP+ Interfaces populated on day 1. Scalable upto 6 x 10G SFP+ interfaces		
7	Minimum 4 x 10/100/1000 copper Interfaces		
8	Dedicated HA ports in addition to requested data ports		
9	Minimum NG Firewall application throughput (combination of Firewall, IPS, Application Control/check.) (measured with traffic mix) – 10 Gbps. The bidder shall submit the performance test report or publicly accessible datasheet		
10	Minimum NG Threat prevention throughput in (by enabling and measured with IPS, Anti- Virus / Anti-Spyware/Anti-Bot / Zero-Day Protection and all other security threat prevention feature and traffic mix) – 5 GBPS. The bidder shall submit the performance test report or publicly accessible datasheet confirming performance		
11	Minimum IPsec VPN throughput – 2 Gbps		
12	Minimum tunnels (SSL, IPSec, and IKE with XAUTH) – 10000. Minimum no. of 100 VPN licenses should be available from day 1		

13	Minimum concurrent sessions - 10,00,000		
14	New sessions per second – 1,00,000		
15	Should support Active/Active, Active/Passive		
16	The proposed firewall shall support application control and threat inspection support in:		
	- Tap Mode		
	- Transparent mode (IPS Mode)		
	- Layer 2		
	- Layer 3		
	- Should be able operate mix of multiple modes		
17	The proposed firewall shall support network traffic classification, which identifies applications across all ports irrespective of port/protocol/evasive tactic.		
18	The proposed firewall shall be able to handle (alert, block or allow) unknown/unidentified applications like unknown UDP & TCP		
20	The proposed firewall shall be able to implement Zones, IP address, Port numbers, User id, Application id and threat protection profile under the same firewall rule or under different set of polices		
21	The proposed firewall shall delineate different parts of the application such as allowing application chat but blocking its file-transfer capability inside the chat application.		
23	Intrusion prevention signatures should be built based on the vulnerability itself, A single signature should stop multiple exploit attempts on a known system or application vulnerability.		

24	Should block known network and application-layer vulnerability exploits		
25	The proposed firewall shall perform content based signature matching beyond the traditional hash base signatures		
26	The proposed firewall shall have on box Anti-Virus/Malware, Anti Spyware signatures and should have minimum signatures update window of every one hour		
27	All the protection signatures should be created by vendor base on their threat intelligence		
28	Should perform stream-based Anti-Virus inspection and not store-and-forward traffic inspection to keep the maximum firewall performance or should perform Anti Persistent Threat based inspection		
29	Should be able to perform Anti-virus/APT scans for SMB traffic		
30	Should support DNS sink holing for malicious DNS request from inside hosts to outside bad domains and should be able to integrate and query third party external threat intelligence data bases to block or sinkhole bad IP address, Domain and URLs		
31	Should be able to call 3rd party or its own threat intelligence data on malicious IPs, URLs and Domains to the same firewall policy to block those malicious attributes and list should get updated dynamically with latest data		
32	Vendor should automatically push dynamic block list with latest threat intelligence data base on malicious IPs, URLs and Domains to the firewall policy as an additional protection service		
33	This should be a cloud base unknown malware analysis service with guaranteed protection signature delivery time not more than 15 minutes		

34	Advance unknown malware analysis engine should be capable of machine learning with static analysis and dynamic analysis engine with custom-built virtual hypervisor analysis environment		
35	Advance unknown malware analysis engine with real hardware, detecting VM-aware malware to detect and protect from virtual sandbox evading advance unknown malware		
36	Cloud base unknown malware analysis service should be certified with relevant Data privacy compliance certification for customer data privacy protection which is uploaded to unknown threat emulation and analysis		
37	Cloud base unknown malware analysis service should be able to perform dynamic threat analysis on such as EXEs, DLLs, ZIP files, PDF documents, Office Documents, Java®, Mobile Apps, Adobe Flash applets, Web pages that include high-risk embedded content like JavaScript, Adobe Flash files		
38	The proposed next generation security platform should be able to detect and prevent zero day threats		
39	The solution must follow multi-faceted prevention strategy that combines proactive protection that reduces threats before they reach users		
40	Same Hardware platform should be scalable to provide URL filtering and web protection and should maintain same performance/throughputs mention in primary scope		
41	The proposed firewall shall have the database located locally on the device or in the attached management server / appliance		
42	The proposed firewall shall support custom URL-categorization		

43	The proposed firewall shall support customizable block pages		
44	The proposed firewall shall support block and continue (i.e. allowing a user to access a web-site which potentially violates policy by presenting them a block page with a warning with a continue option allowing them to proceed for a certain time)		
45	The proposed firewall shall support logs populated with end user activity reports for site monitoring (locally or via separate management solution)		
46	The proposed solution shall support Drive-by-download control		
47	The proposed firewall shall support URL Filtering policies by AD user, group, machines and IP address/range		
48	Should support full-path categorization of URLs only to block re categories the malicious malware path not the full domain or website		
49	Should support zero-day malicious web site or URL blocking update less than 15 minutes for URL DB update for zero-day malware command and control, spyware and phishing websites access protection		
50	Should support URL or URL category base protection for user cooperate credential submission protection from phishing attack with malicious URL path		
52	The proposed firewall shall be able to identify, decrypt and evaluate SSL traffic in an inbound connection		
53	The proposed firewall shall be able to identify, decrypt and evaluate SSH Tunnel traffic in an inbound and outbound connections		

54	The NGFW shall support the ability to have a SSL inspection policy differentiate between personal SSL connections i.e. banking, shopping, health and non-personal traffic		
55	SSL decryption must be supported on any port used for SSL i.e. SSL decryption must be supported on non-standard SSL port as well		
56	The proposed firewall must be able to operate in routing/NAT mode		
57	The proposed firewall must be able to support Network Address Translation (NAT)		
58	The proposed firewall must be able to support Port Address Translation (PAT)		
59	The proposed firewall shall support Dual Stack IPv4 / IPv6 (NAT64, NAT66/NPTv6)		
60	Should support Dynamic IP reservation, tunable dynamic IP and port oversubscription		
61	L2, L3, Tap and Transparent mode		
62	Should support on firewall policy with User and Applications		
63	Should support SSL decryption on IPv6		
65	The proposed firewall must support the following routing protocols:		
	- Static		
	- RIP v2		
	- OSPFv2/v3 with graceful restart		
	- BGP v4 with graceful restart		
66	Should support Policy-based forwarding		

67	Should support PIM-SM, PIM-SSM, IGMP v1, v2, and v3		
68	Should support the following authentication protocols:		
	- LDAP		
	- Radius		
	- Token-based solutions (i.e. Secure-ID)		
	- Kerberos		
69	The proposed firewall's SSL VPN shall support the following authentication protocols		
	- LDAP		
	- Radius		
	- Token-based solutions (i.e. Secure-ID)		
	- Kerberos		
	- Any combination of the above		
70	The proposed solution should have on device or separate appliance/software based centralized management solution		
71	Should have separate real time logging base on all Traffic, Threats, User IDs, URL filtering, Data filtering, Content filtering, unknown malware analysis, Authentication, Tunneled Traffic and correlated log view base on other logging activities		
72	Should support the report generation on a manual or schedule (Daily, Weekly, Monthly, etc.) basis		
73	Should allow the report to be exported into other format such as PDF, HTML, CSV, XML etc.		
74	Should have built in report templates base on Applications, Users, Threats, Traffic and URLs		

75	Should be able to create report base on SaaS application usage		
76	Should be able to create reports base user activity		
77	Should be able to create custom report base on custom query base any logging attributes		
78	There shall be separate management server for logging, reporting, management etc. in case on-device logging, reporting, management etc. not available.		
79	The device or management server shall be able to keep logs for minimum 1 year.		
80	During any query for report generation, the performance of the computing resources (HDD utilization, CPU utilization, Memory utilization etc.) of the management server should not reach beyond 70%. In such case, the SI will be responsible to upgrade the management server without any additional cost.		
81	Original Manufacturer Authorization Certificate for product plan of 7 years down the line to be submitted along with the bid. The OEM should provide warranty/AMC and support for at least 6 years from the date of installation, commissioning & acceptance.		

7.9 Internet Router

OEM of the proposed solution should be in Magic Quadrant of Gartner's latest report.

#	Minimum Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
Hardware Architecture					
1.	Rack mountable				
2.	Should support IPv4,IPv6, MPLS etc. from Day 1				
3.	Fixed/Modular Chassis				
4.	Router should have a multicore architecture and the throughput should be minimum 10 Gbps with 5 Gbps of IPsec performance				
5.	Redundant power supply as required				
Interface / Slots					
6.	Minimum 4 X 100/1000 base TX Ethernet interfaces populated (scalable upto 6 X 100/1000 base TX Ethernet interfaces). The Router should support minimum 4 no's of SFP+ modules				
7.	Should support minimum 1service/interface slots				
8.	Console port - 1 number				
Security					
9.	OS with support for advanced security features				

10.	Should support GRE and IP Sec, 3DES, AES VPN for configuration of VPN tunnels				
11.	Support for IPSEC Site-to-Site and Remote Access VPNs. Should provide hardware assisted IPSec, 3DES encryption.				
12.	NAT, PAT				
13.	Access control – Multilevel				
14.	Support ACL's to provide supervision and control.				
15.	Multiple Privilege Levels for managing & monitoring				
16.	Support for Remote Authentication User Service				
17.	Support for Standard Access Lists to provide supervision and control.				
18.	Controlled SNMP Access using ACL on router to ensure SNMP access only to identified NMS/EMS/OSS				
19.	PPP, CHAP support.				
20.	DoS prevention through TCP Intercept, ACL Filtering				
Routing Protocols					
21.	Static Routes, OSPFv2 and v3.				
22.	BGP, IPv6 ICMP, IPv6 QOS, IPv6 Multicast				
23.	Route redistribution				
Protocols					

24.	Load Balancing Protocol				
25.	IPv4, IPv6				
26.	MPLS L2 & L3				
27.	VRRP or equivalent				
28.	Shall support IPv6 features: DHCPv6 Client & Server, IPv6 QoS, IPv6 Multicast support, Multicast VPN				
29.	MPLS Features: MPLS VPN, MPLS mVPN (Multicast VPN), DiffServ Tunnel Modes, MPLS TE, DiffServ- Aware TE				
Congestion					
30.	Weighted Random Early Detection, Random Early Detection				
31.	Weighted Fair Queuing/Class based queuing				
32.	Priority Queuing				
IP Multicasting					
33.	IGMP v1, v2, v3, PIM-SM, PIM-DM or MOSPF				
Management					
34.	Accessibility using Telnet, SSH, Console access.				
35.	Software upgrades using FTP, TFTP, etc.				
36.	SNMP Support for v1, v2 , v3				
Debug & Diagnostics					

37.	Display of input and output error status on all interfaces				
38.	Display of Dynamic ARP table				
39.	Display of physical layer line status signals like DCD, DSR, DTR, RTS, CTS on all interfaces				
40.	Should have support for SLA monitoring or equivalent for metrics like delay, latency, jitter, packet loss				
41.	Trace-route, Ping, extended PING				

7.10 Layer 3 Aggregation Switch

OEM of the proposed solution should be in Magic Quadrant of Gartner's latest report.

#	Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
1	Fixed / Modular Chassis with Distributed Architecture from day-1 with High back plane speed of 1 Tbps or more				
2	19'' rack mountable				
3	Active switching bandwidth should be minimum 1 Tbps with supported modules.				
4	The forwarding rate should be 892 Mpps.				
7	Min 24 x 10 Gig SFP+ Fiber ports populated on day 1 with fiber modules (12 no's of SR and 12 nos. of LR), scalable upto 48 x 10 Gig SFP+ ports, support upto minimum 4 x 40 Gig QSFP+ ports				
9	Wire speed performance on each offered interfaces.				
10	The solution should provide IPV4 and IPV6 compliant without any performance degradation.				
13	The solution should support 40 Gig or higher interfaces.				
	Should have redundancy at various levels:				
15	Should have redundant Power Supply, preferably single power supply or N+1 should be sufficient to provide fully loaded chassis				
	Layer 2 Features for Solution:				
16	Layer 2 switch ports and VLAN trunks				
17	IEEE 802.1Q VLAN encapsulation				
18	Support for at least 4000 VLANs.				
19	802.1s				

#	Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
20	802.1w				
21	Port trunking capability.				
22	Port mirroring capability				
23	Support for 64,000 or more MAC addresses				
24	The core must support MAC learning disable				
25	The core musts support static MAC address assignment for interface.				
26	The core must support per vlan MAC learning limit & must support MAC address filtering.				
27	The core must support Jumbo frames of at least 9192 bytes				
	Layer 3 features:				
28	VRRP or equivalent				
29	Static IP routing				
30	IP routing protocols				
31	Open Shortest Path First				
32	Routing Information Protocol				
33	Should support DHCP				
	Standards:				
34	Ethernet : IEEE 802.3, 10BASE-T				
35	Fast Ethernet : IEEE 802.3u, 100BASE-TX				
36	Gigabit Ethernet: IEEE 802.3z, 802.3ab				
37	IEEE 802.1D Spanning-Tree Protocol				
38	IEEE 802.1w rapid reconfiguration of spanning tree				
39	IEEE 802.1s multiple VLAN instances of spanning tree				
40	IEEE 802.1p class-of-service (CoS) prioritization				
41	IEEE 802.1Q VLAN encapsulation				
42	IEEE 802.3ad				
43	IEEE 802.1x user authentication				

#	Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
44	1000 BASE-X (small form-factor pluggable)				
45	1000 BASE-X (GBIC / SFP) (Support for SX,LX)				
	High Availability:				
46	Shall support Redundant Power supply				
47	Shall support On-line insertion and removal for cards, Power Supply and Fan tray.				
48	Shall support storage requirements of multiple images and configurations.				
49	System should support NSSU/ISSU or equivalent.				
	Must support Layer 2 QoS:				
50	The core must support egress shaping - per queue, per port				
51	The core must support 6 hardware unicast queues per port per line card.				
52	The core must support IEEE 802.1p remarking.				
53	The core must support IEEE 802.1p, DSCP trust (ingress).				
54	The core must support the following classification criteria:				
A	- Interface				
B	- MAC address				
C	- Ether type				
D	- IEEE 802.1p				
E	- VLAN				
	Security Features:				
55	Must support the following Access Control Lists (ACLs):				
56	- Port-based ACL (PACL) – Ingress and Egress				
57	- VLAN-based ACL (VACL) – Ingress and				

#	Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	Egress				
58	- Router-based ACL (RACL) – Ingress and Egress				
59	The core must support min of 1,200 ACL entries in hardware.				
60	The core must support the ability to add/remove/change/insert ACL entries				
62	Shall have support for CLI, Telnet and SNMPv1,2,v3				
63	Shall support SSH				
64	Should support multiple levels of administration roles to manage and monitor the device.				
65	Should support Network Time Protocol.				
66	Should be able to send and receive Syslog and SNMP traps from devices.				
	Additional				
67	Any other				

7.11 Layer 3 Access/Leaf Switch – Type 1 (24 port)

OEM of the proposed solution should be in Magic Quadrant of Gartner's latest report.

#	Minimum Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	Hardware Specification				
1.	The switch should have minimum 24 x 10/100/1000 Base-T Ports and 2 x 10 Gig ports with suitable transceivers populated as per proposed design requirement.				
2.	Should have redundant power supply from day 1				
3.	Should have fan for proper cooling.				
4.	At least 84 Gbps switching fabric.				
5.	Forwarding rate – At least 60 Mpps.				
6.	MAC Address support : 16000				
	Layer-2 Features				
7.	IEEE 802.1Q VLAN encapsulation. At least 1000 VLANs should be supported. Support for 4000 VLAN IDs.				
8.	Spanning-tree Enhancements for fast convergence				
9.	IEEE 802.1d, 802.1s, 802.1w, 802.3ad,				

10.	Spanning-tree root guard feature to prevent other edge switches becoming the root bridge.				
11.	IGMPv3. IGMP filtering.				
12.	Link Aggregation Protocol (LACP)				
13.	Per-port broadcast, multicast, and storm control to prevent faulty end stations from degrading overall systems performance.				
14.	Local Proxy Address Resolution Protocol (ARP) to work in conjunction with Private VLAN Edge to minimize broadcasts and maximize available bandwidth.				
15.	Multicast VLAN registration (MVR)/GVRP/GARP/IGMP Snooping to continuously send multicast streams in a multicast VLAN while isolating the streams from subscriber VLANs for bandwidth and security reasons.				
	Network security features				
16.	IEEE 802.1x to allow dynamic, port-based security, providing user authentication.				
17.	Port-based ACLs for Layer 2 interfaces to allow application				

	of security policies on individual switch ports.				
18.	SSHv2 and SNMPv3 to provide network security by encrypting administrator traffic during Telnet and SNMP sessions.				
19.	Bidirectional data support on the Mirrored port.				
20.	RADIUS authentication to enable centralized control of the switch and restrict unauthorized users from altering the configuration.				
21.	MAC address notification to allow administrators to be notified of users added to or removed from the network.				
22.	DHCP snooping to allow administrators to ensure consistent mapping of IP to MAC addresses. This can be used to prevent attacks that attempt to poison the DHCP binding database, and to rate-limit the amount of DHCP traffic that enters a switch port.				
23.	Port security to secure the access to an access or trunk port based on MAC address.				
24.	Multilevel security on console access to prevent unauthorized users from altering the switch configuration using local				

	database or through an external AAA Server.				
	Quality of Service (QoS) & Multicast				
25.	Standard 802.1p CoS and DSCP				
26.	Minimum eight egress queues per port				
27.	Strict priority queuing mechanisms				
28.	There should not be any performance penalty for highly granular QoS functions.				
29.	Rate limiting should be provided based on source and destination IP address, source and destination MAC address, Layer 4 TCP and UDP information, or any combination of these fields, using QoS ACLs, class maps, and policy maps.				
30.	Shaped Round Robin (SRR) scheduling and Weighted Tail Drop (WTD) or equivalent congestion avoidance.				
	IPv4 & IPv6 Unicast Routes				
31.	Static, OSPF routed access, OSPFv3 and PBR from day 1				
32.	PIM sparse mode (PIM-SM)/ PIM dense mode (PIM-DM)/ PIM sparse-dense mode and				

	Source Specific Multicast (SSM)				
33.	Support for Multicast Groups				
	Management				
34.	Superior manageability Features				
35.	Command Line Interface (CLI) support for configuration & troubleshooting purposes.				
36.	For enhanced traffic management, monitoring, and analysis, upto four RMON groups (history, statistics, alarms, and events) must be supported.				
37.	Domain Name System (DNS) support to provide IP address resolution with user-defined device names.				
38.	FTP/ Trivial File Transfer Protocol (TFTP) to reduce the cost of administering software upgrades by downloading from a centralized location.				
39.	Network Timing Protocol (NTP) based on RFC 1305 to provide an accurate and consistent timestamp to all intranet switches.				
40.	SNMP v1, v2c, and v3 and Telnet interface support				

	delivers comprehensive in-band management, and a CLI-based management console provides detailed out-of-band management.				
41.	RMON I/ RMON II standards				

7.12 Layer 3 Access/Leaf Switch - Type – 2 (24 port)

OEM of the proposed solution should be in Magic Quadrant of Gartner's latest report.

#	Minimum Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	Hardware Specification				
1.	The switch should have minimum 24 x 10/100/1000 Base-T Ports and 2 x 10 Gig ports with suitable transceivers populated as per proposed design requirement. Scalable upto minimum 44 x 10/100/1000 Base-T Ports and 4 x 10 Gig ports				
2.	Should have redundant power supply from day 1				
3.	Should have fan for proper cooling.				
4.	At least 168 Gbps switching fabric.				
5.	Forwarding rate – At least 120 Mpps.				
	Layer-2 Features				
6.	IEEE 802.1Q VLAN encapsulation. At least 256 VLANs should be supported. Support for 4000 VLAN IDs.				
7.	Support for Automatic Negotiation of Trunking				

	Protocol, to help minimize the configuration & errors.				
8.	Spanning-tree Enhancements for fast convergence				
9.	IEEE 802.1d, 802.1s, 802.1w, 802.3ad,				
10.	Spanning-tree root guard feature to prevent other edge switches becoming the root bridge.				
11.	IGMPv3. IGMP filtering.				
12.	Link Aggregation Protocol (LACP)				
13.	Per-port broadcast, multicast, and storm control to prevent faulty end stations from degrading overall systems performance.				
14.	Local Proxy Address Resolution Protocol (ARP) to work in conjunction with Private VLAN Edge to minimize broadcasts and maximize available bandwidth.				
15.	Multicast VLAN registration (MVR)/GVRP/GARP/IGMP Snooping to continuously send multicast streams in a multicast VLAN while isolating the streams from subscriber VLANs for bandwidth and security reasons.				

	Network security features				
16.	IEEE 802.1x to allow dynamic, port-based security, providing user authentication.				
17.	Port-based ACLs for Layer 2 interfaces to allow application of security policies on individual switch ports.				
18.	SSHv2 and SNMPv3 to provide network security by encrypting administrator traffic during Telnet and SNMP sessions.				
19.	Bidirectional data support on the Mirrored port.				
20.	RADIUS authentication to enable centralized control of the switch and restrict unauthorized users from altering the configuration.				
21.	MAC address notification to allow administrators to be notified of users added to or removed from the network.				
22.	DHCP snooping to allow administrators to ensure consistent mapping of IP to MAC addresses. This can be used to prevent attacks that attempt to poison the DHCP binding database, and to rate-limit the amount of DHCP traffic, that enters a switch port.				

23.	Port security to secure the access to an access or trunk port based on MAC address.				
24.	Multilevel security on console access to prevent unauthorized users from altering the switch configuration using local database or through an external AAA Server.				
	Quality of Service (QoS) & Multicast				
25.	Standard 802.1p CoS and DSCP				
26.	Minimum eight egress queues per port				
27.	Strict priority queuing mechanisms				
28.	There should not be any performance penalty for highly granular QoS functions.				
29.	Rate limiting should be provided based on source and destination IP address, source and destination MAC address, Layer 4 TCP and UDP information, or any combination of these fields, using QoS ACLs, class maps, and policy maps.				
30.	Shaped Round Robin (SRR) scheduling and Weighted Tail Drop (WTD) or equivalent congestion avoidance.				

	IPv4 & IPv6 Unicast Routes				
31.	Static, OSPF routed access, OSPFv3and PBR from day 1				
32.	PIM sparse mode (PIM-SM)/ PIM dense mode (PIM-DM)/ PIM sparse-dense mode and Source Specific Multicast (SSM)				
33.	Support for Multicast Groups				
	Management				
34.	Superior manageability Features				
35.	Command Line Interface (CLI) support for configuration & troubleshooting purposes.				
36.	For enhanced traffic management, monitoring, and analysis, upto four RMON groups (history, statistics, alarms, and events) must be supported.				
37.	Domain Name System (DNS) support to provide IP address resolution with user-defined device names.				
38.	FTP/ Trivial File Transfer Protocol (TFTP) to reduce the cost of administering software upgrades by downloading from a centralized location.				

39.	Network Timing Protocol (NTP) based on RFC 1305 to provide an accurate and consistent timestamp to all intranet switches.				
40.	SNMP v1, v2c, and v3 and Telnet interface support delivers comprehensive in-band management, and a CLI-based management console provides detailed out-of-band management.				
41.	RMON I/ RMON II standards				

7.13 NMS & OSS

#	Minimum Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
1	"NMS and OSS OEM/s shall be in the 'Gartner's magic quadrant as per the latest report' or the NMS, OSS solution should have been 'successfully implemented* in any Telecom or BharatNet project in last 5 years in India or abroad'. *Successful implementation of NMS, OSS shall be validated by 'a project completion certificate' or 'Final acceptance certificate or report signed off by the client and shall be operational after FAT'."				
2	Following OSS products to be considered. a. Service Assurance: Fault Management, Performance Management, Trouble Ticketing, Consolidated Reporting & Dash Boarding b. Service Fulfilment: Inventory & Discovery, Provisioning & Activation.				
3	Solution should be inclusive with hardware, OS, patches, database and any other licenses for their monitoring etc.				
4	The solution should be scalable to meet the requirement for the entire project period. In addition, the cost for scalability for the period of the project should be inclusive.				
5	The Network Fault Management system shall provide comprehensive fault Management functions for the NOC. The system should be able to monitor the system alarms from the network elements deployed in BharatNet project by the PIA. Engineers /				

	Helpdesk agents should be notified when fault conditions occur. Threshold crossing should be monitored and alarm should be generated. The Network Fault Management functions shall provide- a. Comprehensive monitoring of resources to detect problem areas. b. Effective procedures for maintenance intervention. c. Efficient facilities for data retrieval and Network fault analysis. d. Customized dash board illustrating the status of NE's/EMS/NMS and Nodes in the form of graphical topology and alarms browsers etc.				
6	The Network Fault Management System should have proven capability to manage and monitor following network technologies. 1: GPON 2: IP-MPLS 3: DWDM 4: FTTx				
7	The proposed solution should be capable of analyzing SNMP and non-SNMP data covering range of service provider technology domains. It should display them in a unified user interface optimized for very high scale visualization, correlation and root cause analysis.				
8	The proposed solution must provide a portal that aggregates the overall performance information all the management domains. The portal must be according to the modern web standards and support delivering rich content and flexible UI.				

9	The proposed solution must be capable of manage multi-vendor, multi-technology, multi-standard and geographically scattered network elements and resources effectively and efficiently from a single logical viewpoint.				
10	The NMS solution should support Open API for easy integration with other element managers. The system should have a strong event correlation engine.				
11	Alarm correlation will generally be interested only in equipment alarms (as opposed to traffic alarms) and will be used for three primary purposes:- To determine the root-cause underlying sets of alarms and report the root-cause as a single alarm and able to drill down to underpinning alarms. To assist in reducing the number of alarms seen by engineers to the minimum necessary to effectively manages the NOC. The NOC shall provide a comprehensive alarm correlation facility. The bidder shall describe in their responses the alarm correlation facilities available in their system, and comment on their suitability for programming in the future				
12	The solution must allow administrators to create own custom metrics and certify new devices for monitoring. It should also allow configuration of the device properties via an API.				
13	The system shall have indicators to show whether the displayed alarm is a correlated alarm or vice versa.				

14	The solution shall provide an event filtering and correlation function. The bidder shall state the available functionalities and mechanism in detail.				
15	The solution shall have the ability to provide advanced correlation capabilities which correlate events across multiple domains of a heterogeneous network infrastructure including (GPON, DWDM and IP MPLS)				
16	The system shall be capable of determining the root cause of a network problem given a set of associated alarms. Determination of root cause shall be dynamic in relation to the arrival of new alarm data. In addition, the system shall be able to determine multiple root cause problems at any time.				
17	The supplier shall state whether their stream correlation solution is capable of detecting specific/unordered sequences of alarm events (with or without a fixed time limit or rolling time window) and carrying out specified actions.				
18	Solution should offer inbuilt/ packaged correlation scenarios in order to start realizing the benefits from the beginning. Scenarios/ use cases for following technology domains have to be packaged along with the solution				
19	The NMS shall be a bundled solution includes fault, event & log analytics				
21	The system shall correlate the duplicated events and filter the same. Events that survive the filter shall only be raised as an Alarm.				
22	The system shall be capable of doing cross-domain alarm correlation between				

	Transmission Network Alarms and IP/MPLS Network Alarms.				
23	The system shall be able to do a root cause analysis based on cross-domain correlation for a network resource outage and service outage				
24	The system should support maps grouped by network topology, geographic locations of the equipment's and user group/departments. These should help in understanding physical Network, virtual Network services and the relationships between them				
25	The system should be able to provide topology view for physical as well as virtualized devices				
26	Network topology module shall integrate tightly & seamlessly with NMS & EMS to provide topology-based event correlation and root-cause analysis (RCA) to help network operator's work more efficiently by focusing time and attention on root cause events				
27	All OSS applications such as Fault Management, Trouble Ticketing, SLA Management, Performance Management, Order Management, Inventory Management, Reporting and Dashboards should be available in single window, single URL and single user authentication				
28	Unified console should support single window for Alarm Management, Root Cause analysis, Service Impact analysis, Auto and Manual Ticket creation, Ticket update, ticket resolution, SLA calculation and escalation, Inventory view and update, Order Management, Performance Reports, report				

	creation and execution, dashboard creation, update and automatic refreshing				
29	The OSS console UI should be built on latest technology that is HTML5 and CSS				
30	The UI should be rich in graphics and flexible for quick aesthetic changes				
31	Access of different OSS applications has to be governed by user privileges in console and user shall only be able to access the applications he is authorized to access, along with defined role in the application				
32	Administrator should be able to create, delete and modify users and their privileges				
33	Console should have built in plug-ins for quick and easy integration with 3rd party databases, applications, dashboards (View import)				
34	It is required that centralized OSS console should be fully compatible with different types of mobile/handheld/tablet devices offering functionalities of Dashboard, Reports, Tickets, Alarms				
35	The bidder need to supply NMS/OSS and the GUI interface of the same system should be available through web interface or mobile application for mobile users with Android, iOS platform				
36	The users interface for mobile devices has to be pre designed with proven deployment references in the similar environment				
37	Sufficient control over user / device specific access (like MAC /IP range based access etc.) of console on mobile application				
38	The bidder need to supply NMS/OSS and the GUI interface of the same system should be				

	available through web interface or mobile application for mobile users.				
39	Single view access on mobile device for all Fault, SLA and performance dashboards for targeted audience				
40	Ability to create, modify, drilldown and refresh dashboards from mobile view				
41	Dashboards shall automatically update at least once every 5 minutes and customizable as per needs				
42	Dashboards should drill down to specific network and service component				
43	Allows modifying and creating new views in a few clicks with the View Designer				
44	System should allow new views and modifications to be done in minutes using a visual editor and make changes available dynamically across the production environment				
45	Report should show real time inventory and bandwidth utilization reports (Vendor wise, Node wise, Section wise, Customer wise, Ring wise, Region wise, Technology wise and for complete network)				
46	Network MTTR/Fault Reports should show - Yearly, Quarterly, Monthly, Weekly, Daily(Vendor wise, Node wise, Section wise, Customer wise, Ring wise, Region wise, Technology wise and for complete network).				
47	The reports should show - MTTR violation Reports, SLA Reports in Yearly, Quarterly, Monthly, Weekly, Daily view, Customer & link/circuit wise SLA Violation Report in Yearly, Quarterly, Monthly, Weekly, and Daily, Customer & link/circuit wise				

	Performance Reports, Percentage, Chart and Graph Options for all Reports,				
48	System should be capable of Management Information System (MIS) Reports on Capacity Utilization, Service Quality etc.				
49	Customer specific reports shall be accessible to the particular customer via internet				
50	A single login shall be provided to external monitoring agencies to monitor the customer wise utilization reports for their links				
51	The contractor shall be responsible to ensure adequate security of these extensions (as mentioned above) through internet				
52	The reports should be extractable in CSV, Excel & PDF form				
53	Proposed solution should have tight integration with non-SNMP devices data collector solution. Performance management solution should represent collected data (Data from non-SNMP devices or obtain data from the Element Management System (EMS)) through its own dashboard				
54	Tool shall act as a Unified source of information for all performance related queries by the users. It shall support comprehensive set of performance reports for Multi-vendor equipment on one single platform				
55	The system shall support network level SLA monitoring and correlate the measurements on customer services				
56	The system shall be capable to collect, monitor & generate reports for performance parameters of various protocols and status for IP/MPLS backbone links. System should				

	generate alert if the performance degrades from a predefined (configurable) limit				
57	The system shall be capable to collect, monitor & generate reports for WAN link availability, latency, jitter & utilization factors				
58	The Service Catalog system should reduce overall design and delivery time and cost which can assist in launching new services quickly				
59	Proposed Service Catalog system should enable more products/services rollout to increase revenue				
60	Proposed Service Catalog system should add flexibility with centralized product and technical definitions thereby simplifying overall OSS architecture				
61	Proposed Service Catalog system should significantly reduce hardcoded workflows/business logics in service orchestration and provisioning				
62	Proposed Service Catalog system should manage the service decomposition and delivery rules				
63	Proposed Service Catalog system should offer re-usable delivery and technical items which can be used by more than one commercial sellable product/services				
64	Proposed Service Catalog system should come pre-integrated with Order Management				
65	Proposed Service Catalog system should be scalable and supports Active-Active High availability model				
66	Proposed Service Catalog system should support on premise and private cloud installations				

67	Proposed Service Catalog system should store the deliverable technical details of products in a central place – not separately in each sales system / channel				
68	Proposed Service Catalog system should implement the industry standards of modelling services				
69	Proposed Service Catalog system should contain a hierarchical model of Products, Services and Resources				
70	The Provisioning and Activation system of the solution should control and automate network and service activations towards any underlying network and service platforms				
71	Proposed Service & Resource Inventory system should maintain accurate information on infrastructure, services and subscribers				
72	All system functions must be available through the browser interface. No additional client applications must be required.				
73	The system must integrate with one or more external security systems (e.g. LDAP, Active Directory) for user authentication.				
74	The system security model must be easily configured to support secure access to third party organizations including end customers				
75	Solution must have Service Management Process Model in built based on ITIL v3 best practices				
77	Solution offered should have modules for managing key ITIL functions and processes including and not limited to: Incident, Knowledge, Release, Problem, Change, Service Level & Asset Management functions				
78	The Solution displays the complete ITIL process flow for Incident, problem, Change				

	and release, Asset and Service level Management. Proposed service desk tool should provide an easy drag-and-drop visual workflow designer and configuration tooling, where no programming/ coding is required to define the process management workflows.				
79	The solution should leverage a single application instance across ITIL processes, including unique data and workflows segregated by business unit, cost center, and user role				
80	The tool should integrate with a directory system to enable recording and accessing user records of information				
81	The solution should provide the functionality of executing searches to the entire database				
82	The solution should have the ability to operate all functionality available in the incident, problem, change, assets etc. via a mobile device like iPhone & Android phone with native app or should be accessible via mobile devices with mobile screen adaptation along with pending ticket notification to mobile users				
83	The solution should have a persona based approach for IT staff so that user see his relevant UI based his role, for example change manager should see change functionalities only				
84	The system should have graphical interface to define, visualize and update ITIL processes				
85	The solution should have the ability to develop highly customized workflows and easy user interface				

86	The Solution should be able to create processes across multiple vendors (suppliers) and defined their SLA's and escalation matrix				
87	The solution should be open and interoperable and has rich integration capabilities that support interfaces from web services or any other interfacing protocol required to integrate with third party OSS systems				
88	The solution should provide a centralized dashboard that picks up relevant business metrics from the monitoring and service management solution				
89	These dashboards need to be dynamic that allows user to drag and drop these metrics and create custom dashboards without any coding				
90	Service Desk solution should allow detailed multiple levels/tiers of categorization on the type of incident being logged for IT/Non IT services				
91	Service Desk solution should provide classification to differentiate the criticality of the security incident via the priority levels, severity levels and impact levels				
92	It should allow SLA to be associated with a ticket based on priority, severity, incident type, requestor, asset, location or group individually				
93	It should have the ability to search multiple built-in knowledge bases like the incident, problem, and known-error database simultaneously without requiring the agent to search each knowledge base individually				
94	The tool should have the ability to notify and functionally escalate (assign) a ticket to an				

	individual or support group based on pre-defined parameters, thresholds or manual override conditions				
95	The solution should have the ability to associate an incident with an existing change request, a problem or an known error for tracking purposes				
96	In case of failure of primary, the HA instance of the overall solution should come up with full functionality and configuration in less than 30 minutes				
97	The system should support custom / user defined searching criteria for searching ticket objects				
98	The drop-down menus in the ticketing system should be formatted, scrollable and auto-arranged in case of large list of data shown in the menu				
99	Proposed helpdesk system should be ITILv3 certified for all key ITIL process (incident, problem, change) and a valid certificate has to be submitted at the time of bid submission				
100	The service desk tool should have capability of auto-escalation of the tickets bound to SLA				

7.14 Enterprise Endpoint Protection

Name:

Version:

#	Minimum Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
1.	Should restrict e-mail bound Virus attacks in real time without compromising performance of the system				
2.	Should be capable of providing multiple layers of defense				
3.	Should be capable of installation on both the gateway as well as mailing servers. Inbound and outbound monitoring on all data transfer mechanisms and all e-mail systems				
4.	Should be capable of detecting and cleaning virus infected attachments as well				
5.	Should support scanning for ZIP, RAR compressed files, and TAR archive files				
6.	Should support online upgrade, where by most product upgrades and patches can be performed without bringing messaging server off-line.				
7.	Should use multiple scan engines during the scanning process				
8.	Should support in-memory scanning so as to minimize Disk IO.				
9.	Should support Multi-threaded scanning				
10.	Should support scanning of a single mailbox or a one off scan. Should protect email server and intercept malware before it reaches user inboxes. Detect, clean, and block malware from Email servers. Secure mobile devices, data, and networks. Simplify provisioning and de-provisioning. Prevent loss of sensitive data by restricting use of removable media. Manage policies, compliance, and				

#	Minimum Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	reporting from a single, centralized console. Instantly see and take action to adjust security health of endpoints. Pinpoint which critical assets are vulnerable to which threats. Get instant, actionable data correlation on emerging threats to quickly identify whether proper protection is in place. Reduce time spent patching and diagnosing issues.				
11.	Should support scanning by file type for attachments				
12.	Should support scanning of nested compressed files				
13.	Should be capable of specifying the logic with which scan engines are applied; such as the most recently updated scan engine should scan all emails etc.				
14.	Should support heuristic scanning to allow rule-based detection of unknown viruses.				
15.	Updates to the scan engines should be automated and should not require manual intervention.				
16.	All binaries from the vendor that are downloaded and distributed must be signed and the signature verified during runtime for enhanced security.				
17.	Updates should not cause queuing or rejection of email				
18.	Updates should be capable of being rolled back in case required				
19.	Should support content filtering based on sender or domain filtering. Should provide enterprise-class anti-malware, APT and botnet protection with integrated day-zero threat protection.				
20.	Stop rootkits and stealthy attacks with protection below the OS. Prevent unwanted applications and malware from installing and executing with minimal impact on system				

#	Minimum Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	performance, users, and administrators.				
21.	Host Intrusion Prevention and Endpoint Firewall. Guard against unknown, zero-day threats and new vulnerabilities.				
22.	Reduce patch urgency. Defend against new and emerging threats across all vectors with real-time intelligence gathered by millions of sensors worldwide.				
23.	Should provide content filtering for message body and subject line, blocking messages that contain keywords for inappropriate content				
24.	File filtering should be supported by the proposed solution; file filtering should be based on true file type.				
25.	Common solution for anti-spyware and anti-virus infections; and anti-virus and anti-spyware solution should have a common web based management console.				
26.	Should support various types of reporting formats such as CSV, HTML and text files				
27.	Should provide support for Windows and Linux				
28.	Should support Data Leak Prevention or equivalent				
29.	Should support Virtual Machines				
30.	Any Other				
HIPS functionality					
1.	HIPS should perform rootkit detection, time-based alerting and active response. It should help to detect attacks, software misuse, policy violations and other forms of inappropriate activities.				
2.	HIPS should be able to monitor multiple systems, with one system being the HIPS server and the others the HIPS agents that report back to the server.				

#	Minimum Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
3.	Must have "Zero-day" protection against DoS / DDoS and worm attacks based on traffic behavior. Also it should mitigate Zero day http floods and brute force attack & vulnerability scanning attempts based on traffic behavior analysis				
4.	Time to Time Signature updates				
5.	Monitoring and prevention from Intrusion attack				
6.	Verifies success or failure of an Server				
7.	Monitors specific system				
8.	Detects attacks that network-based systems miss				
9.	Well-suited for encrypted and switched environments				
10.	Near-real-time detection and response				
11.	The offered product series must have achieved EAL (Evaluation Assurance Level) Certification of EAL3 or higher in the Common Criteria for Information Technology Security Evaluation (ISO/IEC 15408) for computer security certification				
12.	Any Other				

8 Technical Specification Compliance details – Non IT Components

8.1 Civil and Architectural Work

Note: *Construction designs along with detailed BOQ of civil work of the facility shall be submitted by the bidder separately*

#	Product Names/Items	Description of requirements	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
1	Civil & Interior works for SNOC Approx. 1500 sq. ft. floor space area	Work listed below is requires to be considered (Quantity shall be as per actual site measurement)				
i	Dismantling Works	Dismantling of existing items				
ii	Brick Works	125/250 mm brick work with 1st class bricks in cement mortar (1:4), all complete as per direction. (Approx.)				
iii	Plaster Works	1" plaster to wall (1:6) inner surface of the building, finishing the corner and edges in/c removing the existing damp plaster (if necessary). All complete as per direction. (Approx.)				
iv	Normal Paint	Plastic emulsion paint of approved color of reputed brand to wall/column of inside wall of the Branch of two coats over a coat of brand specified primer / scalar collapsing specified time for drying/recoating including cleaning, drying, making free from dirt grease, wax, removing all chalked and scald materials like fungus, mending grid				

		for the surface defects, sand papering the surface and necessary scaffolding by roller/ spray etc. and printing with two coats of synthetic enamel paint approved color over a coat of priming etc. all complete as per direction (Approx.)				
	Brand	Berger or other globally reputed brand				
	Country of Origin	To be mentioned by the bidder				
v	Epoxy Paint	Epoxy Industrial Paint for protect thermal proof and wall damp proof				
	Brand	Berger or other reputed brand				
	Country of Origin	To be mentioned by bidder				
vi.	Tiles Work	Floor Tiles Work				
	Brand	To be mentioned by the bidder				
	Country of Origin	To be mentioned by the bidder				
vii	Description of the Floor Tiles Work	Supply, fitting and fixing of mirror polish Wall Tiles size 600 x600mm placing over existing floor with required cement mortar (proportion 1:3 and average thickness 3/4"), racking out the joint & filling with same color pudding including cutting and leveling of the wall etc. all complete as per direction of the purchaser				
viii	Dry Wall Partition	Gypsum Partition for drop ceiling with necessary structure				
		Gypsum board partition for outside wall with necessary structure and inside glass wool				
	Brand	Reputed brand				

	Country of Origin	To be mentioned by the bidder				
ix	Tempered Glass Partition	Supplying, fitting and fixing of Protector Bit Glass Partition work made with anodized 'Silver' color Aluminum Protector Bit section, silicon gum & 10mm Tempered glass included edge polish, original bronze anodized star geed matching, screw, etc. Complete in all respect as per design, drawing and direction. (10 mm , consider the glass as 8 feet height) Approx. (Glass partition will be double for outside due to thermal protection)				
	Brand	Nasir/Euro or other reputed brand				
	Country of Origin	To be mentioned by the bidder				
x	Tempered Glass Door	Supply and installation of 10mm thick tempered glass swing door in/cl fitted with concealed best quality door closer, key locks, handle etc. all complete as per direction.				
		a) Tempered glass door (size: 3'-6"X 7'-0")				
		b) Sliding Door				
xi	Metal Door	Fire Rated Metal Door, Size: 3'-6"X8'-0"				
	Brand	To be mentioned by the bidder, must be a reputed brand				
	Country of Origin	To be mentioned by the bidder				
		NFPA 251 Standard				

		Test standard: Fire Door must be tested according to Bangladesh or international standard				
		Shutter materials: Steel				
		Two hours fire resistivity				
		Jamb:2 vertical Fire Resisting jamb and 1 Fire Resisting horizontal jamb				
		Door shutter sheet thickness: At least 3mm				
		Vision panel: Fire Rated glass vision panel				
		Hinge, bolt and screw :Fire rated				
		Internal Insulation: Honeycomb core insulation				
		Lock: Built in mortise lock				
		Auto Door Closer :Default				
xii	Security film	Supplying & pasting of best quality Security film paper after cleaning the glass properly as per approved design				
xiii	Louver	Aluminum louver				
xiv	Ducting	Duct making and fitting by 22 SWG MS Sheet with PU Insulation as per the purchaser's direction in the mouth of Precision Air-Conditioner Water sealing of existing ducts inside NOC				
xv	Ramp	Metal frame ramp as per design				
xvii	Logo	Supply, fitting & fixing of standard signage made by PVC sticker at Inside & Entry, as per direction of the purchaser				

xviii	Stair	2 step Movable metal Stair by MS checker plate				
xix	Miscellaneous Works	Supplying Fitting & fixing at site other Miscellaneous Work such as Frosted paper vertical blinds PVC floor mat, signage, Façade decoration etc. all complete as per approved design, drawing and direction				
b	Perforated Panel					
	Brand	To be mentioned By Bidder				
	Country of Origin	To be mentioned By Bidder				
	Panel Type:	To be mentioned By Bidder				
		Flammability: A1				
		Panel size: 600 x 600 mm				
		Perforated steel panels designed for static load shall be interchangeable with standard field panels and capable of supporting concentrated loads with at least the load carrying capacity as the standard panels. Panels shall have 45% or higher free air flow. Optionally the perforated panels should be equipped with a damper or air flow control.				
		The panel must be conductive powder coated				
		Double suction panel lifter				
c	Air Grommet	Air grommet Dust proof panel with double brush. Color black. Divided section. Overlapping Brushes with double layer facilities. Latch removable brush section.				

		Installation facilities at the panel edge or within the panel. High Strength Flame Retardant ABS Shape: round or rectangle				
	Installation	Installation should be done in accordance with TIA -942 Standard				
xxi	Floor insulation					
	Brand	To be mentioned by the Bidder/Must be a globally reputed brand				
	Country of Origin	To be mentioned by the Bidder				
	Manufacturing Country	To be mentioned by the Bidder				
		Supplier should supply and install 19 mm thick closed cell elastomeric nitrile rubber, class “O” type on Floor and top of that supply and install Aluminum foil Tap/sheet contained high tempered Self-adhesive to cover SNOC floor area by solution gum and necessary silicone gel to prevent floor slab sweating from its bottom.				
	Installation	Installation should be done in accordance with TIA -942 Standard				
xxiii	Aisle Containment (Cold and Hot)	Openable and auto closing double door for entering Cold Aisle (Containment area) using the acrylic sheets with 4 mm thickness. Aluminium Frame with black anodized. Provisioning for PAC Sensors, Fire Detectors and Nozzles to be done as per respective vendor’s advice.				
	Brand	To be mentioned by the Bidder/Must be a globally reputed brand				

	Country of Origin	To be mentioned by the Bidder				
	Manufacturing Country	To be mentioned by the Bidder				
	Installation	Installation should be done in accordance with TIA -942 Standard				
Note: All above mentioned components will be installed by the bidder as applicable. Bidder are requested to visit the site before they propose their solution and estimate the amount of work. The unit rates of each elements must be mentioned separately and the payment will be made on actual basis.						

8.2 Electrical Panels including cabling

#	Product Names/Items	Description of requirements	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	Guideline	Electrical panels (including cabling) - 2 set including Main LT Panel - 2 set Utility Panel - UPS input/output panel - PAC Panels - All panels should be Complete Dual Redundant - Details of Electrical work and specification as mentioned as below • AMF,DG Synch Panel • ATS wall mounted type with enclosure • Intelligent PDU,Isolation transformer, • Software to monitor each out put on real time, • recording basis, to be integrated with BMS Through SNMP Card • Wall mounted Distribution boards • Perforated 450x30x2mm cable tray with support, corner and laying inside false floor • Perforated 300x30x2mm cable tray with support, corner and laying inside false floor • S S Basket type tray overhead 300 mm width • Operable closed tray overhead for fiber • Protection over BBT for rain and weather outside rooms				

		• Cabling Electrical room to the NOC server farm area • Cabling installation to follow TIA942 standards				
	Brand	To be mentioned by the bidder				
	Model	To be mentioned by the bidder				
	Country of origin	To be mentioned by the bidder				
	Manufacturing Country	To be mentioned by the bidder				
	Installation & Commissioning	Installation, testing and commissioning with necessary accessories				
	Warranty	Six years full warranty (onsite covering everything with parts and services) period including all maintenance and support for the system from the date of commissioning and acceptance. This warranty coverage document shall include 24 x 7 supports and maintenance services from Principal shall be submitted to the customer.				

8.3 Earthing Pits, Earthing Grids, Earth Cabling

#	Product Names/Items	Description of requirements	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	Guideline	Earthing Pits, Earthing Grids, Earth Cabling. - Body Earth for DG - Neutral Earth for DG - Earth for UPS Neutral - Body Earth for UPS - Earth for TX and Substation - Earth for Grid - Earth for Electrical Panel - Earth for lightening arrestor Earth Electrodes and Earth Strips GI Earthing using 600mm x600mmx 6mm GI Sheet , earth pit up to 3meter deep ,19 mm dia class B GI pipe perforated for watering complete as per IS spec. with salt, charcoal, brick masonry chamber 450x450mm, with cast iron frame and heavy duty cover and inspection point for Routine earth resistance measurement . Plate Earth Electrode with using 19 mm dia B Class GI pipe and copper plate of size 600 x 600 x 3 mm thick with cast iron frame and heavy duty cover. Supply and installation of maintenance free earth pits, Tripod type earthing with 4bags of earth gel & related accessories. • 25 x 3 mm GI strip for body earthing of panels run on Cable Trays/Walls/Ceiling/Floor.				

		• 50 x 6 mm GI. Strip in PVC Sleeve. • 25 x 3 mm Copper strip in PVC Sleeve. • 25 x 6 mm Copper strip in PVC Sleeve. • 25 x 6 mm Copper strip. • 50 x 6 mm Copper strip in PVC Sleeve. • 150 x 6 mm Copper Flat with PVC Sleeve for Earthing terminals • Consolidated earth terminal box • Earthing links • FRP insulators, suitable for 433V, with necessary fasteners to support earth strips.				
	Brand	To be mentioned by the bidder				
	Model	To be mentioned by the bidder				
	Country of origin	To be mentioned by the bidder				
	Manufacturing Country	To be mentioned by the bidder				
	Installation & Commissioning	Installation, testing and commissioning with necessary accessories				
	Warranty	Six years full warranty (onsite covering everything with parts and services) period including all maintenance and support for the system from the date of commissioning and acceptance. This warranty coverage document shall include 24 x 7 supports and maintenance services from Principal shall be submitted to the customer				

8.4 Diesel Generator

#	Product Names/Items	Description of requirements	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
1	**General**	Supply, Installation of three phase auto start generator with auto transfer switch - 2 no's 150 KVA, 400/230 V, 3-phase, 50 Hz. prime rated DG Set - including Auto Mains Failure(AMF) Panel - Sync panel -Manual transfer switch for AMF (for Backup) - Fuel tank level Min/max and parameters monitoring thru BMS Compatible control Panel - air/water cooled, floor mounted, indoor type - Engine, Alternator, Digital Control Panel for 3x 150KVA automatic start Diesel Generator 1c 300 mm2 NYY Cable 1c 300 mm2 BYA ECC green				
2	**Installation & Commissioning**	Installation, testing and commissioning with necessary accessories				
3	**Warranty**	6 years full warranty (onsite covering everything with parts and services) period including all maintenance and support for the system from the date of commissioning and acceptance. This warranty coverage document				

		shall include 24 x 7 supports and maintenance services from Principal shall be submitted to the customer.				

8.5 **Uninterrupted Power Supply (UPS) with Battery for the Server Farm area**

#	Product Names/Items	Description of requirements	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	Guideline	Supply, installation, testing & commission of 40 KVA 400ACV, 3-phase, 50Hz. UPS for server farm (Integrated with Single Mode operation), 30 Minutes battery backup power with output power factor (PF) 0.9 at full (100 %) load. • UPS System 40 KVA, , 3 Phase, 415 V, • Parallel kit to add 4 or more UPS • Paralleling kit to have common Output • Empty Panel/Blank Plate(To be used to cover blanked Power module • Battery Circuit Breaker (BCB) • SIC/SNMP Card for BMS Integration • Modbus Card **VRLA based battery with 30 Min backup on full load. The bidder should consider replacement of batteries during the contract period.**				
	Brand	To be mentioned by the bidder				
	Model	To be mentioned by the bidder				
	Country of origin	To be mentioned by the bidder				

	Manufacturing Country	To be mentioned by the bidder				
	Relevant Directives and reference standards	The product shall have the CE marking for compliance with the following European directives: • Low Voltage Directive 2006/95/EC • EMC Directive 2004/108/EC The Manufacturer's shall demonstrate conformity with the UPS harmonized standards and directives EN 62040-1-2 (Safety) and EN 62040-2 (EMC).				

8.6 Precision Air Conditioner

#	Product Names/Items	Description of requirements	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	Precision Air-Conditioner	Direct Expansion (DX) Precision Air- Conditioner				
	Quality Certifications	ISO Certification, CE Certifications to fulfill the requirements of the harmonized EC Directives and EC Safety Standards (i.e., Showing EC machinery directive, EC directive for low voltage, EC EMC directive, EC pressure equipment directive, etc.)				
	Brand	To be mentioned by the bidder				
	Country of Origin	To be mentioned by the bidder				
	Country of Manufacture	To be mentioned by the bidder				
	Model	To be mentioned by the bidder				
	Design Parameter:					
	Air flow rate	Minimum 9000 CFM				
	Refrigerant	R410A or R-407C				
	Air Inlet Temperature to the PAC unit	24 deg C				
	Air Inlet Relative Humidity	50%				
	Electric supply	3 phase, 50Hz				
	Required fan static pressure	Minimum 20 Pa or higher				
	Ambient Temperature	40 deg C				

	Unit Configuration Type	Down flow up Smart Aisle				
	Cooling Capacity (Gross)	Minimum capacity 9 TR				
	Sensible cooling Capacity (Gross)	Minimum 9 TR				
	Sensible Heat Ratio	1				
	Type of Compressor	Variable (20%-100%) Compressor				
	No of Outdoor Unit	As required				
	Humidifier	Required				
	Electric Heater	Required				
	Heat Rejection Capacity of each Outdoor Unit	As per specification				
	CABINET	The cabinet is manufactured from galvanized steel sheet, externally painted with Black 7021 color epoxy-polyester powder paint and assembled using stainless steel screws and high tensile rivets. The front and rear panels are double-skinned, with 10mm Class 'O' (A1 EU) fireproof insulation sandwiched between the skins to reduce noise emission and heat loss. The side panels are removable and insulated with 10mm Class 'O' (A1 EU) fireproof insulation with aluminum foil to form a complete double-skinned cabinet. The front access panel(s) are hinged and secured by means of a lever catch				

	COOLING CIRCUITS	Double refrigeration circuit, incorporating high efficiency, fully hermetic variable scroll compressor with crankcase heater with outlet service valve, safety valve, filter drier, moisture indicating sight glass, liquid line solenoid valve and an externally equalized thermostatic expansion valve. Compressor should be equipped with pre-set high and low pressure switches for protection against high condensing and low evaporating temperatures. The low pressure switch features an automatic reset whilst to avoid compressor cycling at high discharge pressures, the high pressure switch is equipped with a manual reset. The inclined evaporator coil is manufactured from copper tubes and aluminum fins, with a stainless steel condensate drain pan. The large face area/low velocity coil allows precise control of temperature and humidity during cooling and dehumidification, and is designed to optimize fluid velocity and minimize pressure drop. The moisture indicating sight glass, liquid line solenoid valve and thermostatic expansion valve for the circuit should be mounted in a service compartment, isolated from				

		the air stream, to allow checking and adjustment while the unit is in operation				
	FAN SECTION	The unit should be fitted with two direct-driven, highly efficient, single inlets, backward curved, centrifugal 'plug' type fan with aluminum nozzle and impeller. The fan motor is three-phase, 4-pole, IP54, with internal thermal protection. The fan motor is Electronically Commutated, IP54, with internal protections, continuous speed regulation via controller signal. Fan impeller should be statically and dynamically balanced and equipped with self-lubricating bearings.				
	ELECTRICAL PANEL	The electrical panel, located at the front of the unit in a compartment isolated from the airflow, contains the iMCCB's, contactors, transformers, controller PCB, overload relays etc. Each high voltage system component is provided with an iMCCB over-current protective device. All high voltage components are touch protected by means of a plastic cover. Electrical power supply is 400V (±10%)/3Ph/50Hz +N +E and are fitted with a mains isolator, mechanically interlocked with the electrical panel cover.				

	ELECTRIC HEATING	The heating resistors are of a rigid design for extended operational life and are normally utilized to maintain room dry-bulb conditions during a system call for dehumidification. The low Watt-density, electrically enclosed elements are made of finned aluminum, reducing sheath temperatures and eliminating ionization. Heating control is of the ON-OFF type. The heaters are phase balanced and are provided with a manual reset safety thermostat to disable them in the event of a high temperature. The heating system also incorporates Miniature Circuit Breaker which protects the heater from short circuits, should the harness be damaged accidentally.				
	HUMIDIFIER	The unit is fitted with a humidifier suitable for use with water of varying degrees of hardness, treated or de-mineralized water is also applicable. The humidifier is complete with a water inlet valve, water outlet valve and a maximum water level sensor. Steam from the tray/cylinder is mixed with the discharge air from the evaporating coil by means of a copper steam distributor. Humidification control may be of the proportional or of the on-off type, according to the requirements				

		of the installation: on/off is set as standard.				
	MICROPROCESSOR CONTROLLER	The Control System is microprocessor based, 32 bit RISC. It can be programmed to control the function of every device within the unit via I/O. An external on/off switch is fitted, incorporating a 3-colour LED, indicating the unit status – 'Power on' (Orange), 'Stand-by' (Flashing green), 'Unit on' (Green) or 'Warning/Alarm activated' (Red) The controller allows setting and monitoring of the following room parameters via a 3 button keypad: • Air Temperature • Temperature set-point • Temperature band • Humidity • Humidity set-point • Humidity band The parameters are indicated using symbols and text on a back-lit, 3 digit Liquid Crystal Display. The control provides with the following functions: unit-to-unit Ethernet connection to operate with multiple units, run/stand-by rotation, automatic changeover and parameter sharing functions, external communications through BMS or other monitoring solution,				

		sequential auto restart timer, with adjustable time delays to be applied to unit restart after a power loss. The following warnings / alarms should be included: • High & low temperature • High & low relative humidity • Humidifier failure • Fan failure • Compressor Low & high Pressure trip • Electrical heater high temperature (When applicable) • Sensor failure • Controller errors Terminals are provided for remote start/stop control plus Volt-free 'Common Alarm' and 'Unit Run' indication.				
	AIR FILTRATION	The filter cells should be made of pleated synthetic fiber in a Steel frame and are designed to minimize the air pressure drop while maintaining maximum filter efficiency. They are easily accessed /replaced by opening the front panel. The rated efficiency should be F5, in compliance with EN 779 standards				
	Safety Protections	The unit shall also incorporate the following protections: •Single phasing preventers. •Reverse phasing •Phase misbalancing •Phase failure • Overload tripping (MCB) of all				

		components • High pressure trip- Manual reset for each compressor • Low pressure trip- Manual reset for each compressor.				
	Remote Communication	Each of the unit should be fitted with SNMP card for remote monitoring. Additionally it should be capable to connect dry contact output signal in case of any alarm generation.				
	Heat Removal System	The outdoor unit shall comprise of high capacity Condenser fan with variable speed motor and high size coil designed for 40 deg C ambient temperature.				
	Installation & Commissioning	Installation, testing and commissioning with necessary accessories				
	Warranty	6 Years comprehensive warranty (onsite covering everything with parts and services) period including all maintenance and support for the system from the date of commissioning and acceptance. This warranty coverage document shall include 24 x 7 supports and maintenance services from Principal shall submit to customer.				

8.7 Comfort AC

#	Product Names/Items	Description of requirements	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	Guideline	The bidder shall supply the comfort AC for all auxiliary areas. Capacity of AC should be as per room size. For maximum 125 sq.ft. area there should be minimum 1 TR CAC. For NOC, Electrical room, Meeting room; the CAC should be redundant				
	Brand	To be mentioned by the bidder				
	Model	To be mentioned by the bidder				
	Country of origin	To be mentioned by the bidder				
	Manufacturing Country	To be mentioned by the bidder				
	Installation & Commissioning	Installation, testing and commissioning with necessary accessories				
	Warranty	6 years full warranty (onsite covering everything with parts and services) period including all maintenance and support for the system from the date of commissioning and acceptance. This warranty coverage document shall include 24 x 7 supports and maintenance services from Principal shall be submitted to the customer				

8.8 Fire Detection and Suppression System

#	Product Names/Items	Description of requirements	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	Guideline	Fire Detection and Suppression Fire Detection- Suppression system. (Sapphire/ Novec-1230) for DC Area and Portable ABC Type, Foam Soda for rest of the area • Heat and Smoke Detector • Integration through Cables • Fire Detection display panel • Integration with PAC and BMS System • Suppression through NOVEC-1230 • SITC of 2 loop panel with LCD display, power supply and battery backup. • The fire alarm system shall be integrated with the access control system to deactivate all door locks in case of emergency. • Instructions/signal from panel should also shut down the PACs in case of fire. • The fire alarm system should also be integrated with the BMS through SNMP CARD to get all the alerts and alarm on the BMS • With adequate loop capacity capable to handle the following detectors and devices.				

		• SITC of Analogue Addressable Photoelectric type Smoke Detector with Detector base Server Farm Area • SITC of Analogue Addressable Photoelectric type Smoke Detector with Detector base ground floor/ Utility area • SITC of Intelligent Analogue Addressable type Laser Detector with 0.03% per feet obscuration., UL Listed, NFPA 318 compliant • SITC of Addressable Break Glass type Manual Call Point • SITC of Addressable Monitor Modules • SITC of Addressable Control Modules • SITC of 100 DB Sounder • SITC of 2C x 1.5 mm2 of FRLS shielded Armored Cable				
	Brand	To be mentioned by the bidder				
	Model	To be mentioned by the bidder				
	Country of origin	To be mentioned by the bidder				
	Manufacturing Country	To be mentioned by the bidder				
	Warranty	Six years full warranty (onsite covering everything with parts and services) period including all maintenance and support for the system from the date of commissioning and acceptance. This warranty coverage document shall include 24 x 7 supports and maintenance				

		services from Principal shall be submitted to the customer				

8.9 **Very Early Smoke Detection Apparatus (VESDA)**

#	Product Names/Items	Description of requirements	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	Guideline	S.I.T.C Single Inlet HSSD Aspiration Unit working on Laser Based Detection Technology, Pre-Alarm, Alarm, Fire and Fault relays and Power Supply Unit. (two redundant sets having separate zones)				
		S.I.T.C of Capillary Tube with accessories.				
		S.I.T.C of Sampling Point for Capillary, tube end, etc.				
		PVC Conduit FR 20/20mm dia				
		SITC of 2x1.5sq.mm sc Armored Cable				
		• Should be able to detect the moisture below the raised floor. • It should provide immediate warning after detecting the moisture and water. • The Required system should be able to monitor and detect at least in 20 (pcs) X 5(Floor) different locations below the raised floor. • Monitors each zone independently. • Provides subsequent alarming, no matter how many zones go into ALARM or FAULT. • Identifies location, time & date of all ALARM and FAULT conditions.				

		• Alarming should be provided at-least via two or more of the below state method
		  o Audible
		  o Visual
		• In-band and out-of-band methods indicating in the software console and/or in the Building management system.
		• Modbus/BACNET/SNMP interface
		• Monitoring software should be provided with the system.
		To provide the solution if any other component has to add it should be included and the price should be provided				

	Brand	To be mentioned by the bidder				
	Model	To be mentioned by the bidder				
	Country of origin	To be mentioned by the bidder				
	Manufacturing Country	To be mentioned by the bidder				
	Installation & Commissioning	Installation, testing and commissioning with necessary accessories				
	Warranty	Six years full warranty (onsite covering everything with parts and services) period including all maintenance and support for the system from the date of commissioning and acceptance. This warranty coverage document shall include 24 x 7 supports and maintenance services from Principal shall be submitted to the customer				

8.10 Water Leak Detection system

#	Specifications	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
1	Supply, Installation, Testing & Commission of Water Leak Detection System.				
2	Water Leak detection panel				
3	Water Leak detection module				
4	Water leak detection cable sensor (30 Mtrs) including end connectors, mounting accessories.				
5	Electronic Hooter				
6	Supply and laying of 3 core 4 sqmm FRLS armoured cable complete with tags, ferruling …etc.				
7	WLD Interface card to be monitored through Modbus, backnet or SNMP				

8.11 Access Control System

#	Specifications	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
1	The Access Control System shall be deployed with the objective of allowing entry and exit to and from the premises to authorized personnel only. The system deployed shall be based on proximity as well as biometric technology for the critical areas and Proximity technology for non-critical areas.				
2	An access control system consisting of a central PC, intelligent controllers, proximity readers, power supplies, proximity cards and all associated accessories is required to make a fully operational on line access control system.				
3	Access control shall be provided for doors. These doors shall be provided with electric locks, and shall operate on fail-safe principle. The lock shall remain unlocked in the event of a fire alarm or in the event of a power failure.				
4	The fire alarm supplier shall make potential free contacts available for releasing the locks in a fire condition especially for staircase and main doors.				
5	Entry to the restricted area shall be by showing a proximity card near the reader and exit shall be using a push button installed in the secure area. The system shall monitor the status of the doors through magnetic reed contacts.				
6	Controlled Entries to defined access points				
7	Controlled exits from defined access points				
8	Controlled entries and exits for visitors				
9	Configurable system for user defined access policy for each access point				
10	Record, report and archive each and every activity (permission granted and / or rejected) for each access point.				
11	User defined reporting and log formats				
12	Fail safe operation in case of no-power condition and abnormal condition such as fire, theft, intrusion, loss of access control, etc.				

13	Day, Date, Time and duration based access rights should be user configurable for each access point and for each user.				
14	One user can have different policy / access rights for different access points.				
15	Should be able to check the reports, logs, define access policies/configuration.				
16	Access controller 2 door tcp/IP based capable of handling entry and exit of doors with Built in power supply unit and with all accessories. UL listed				
17	PROXIMITY Card Reader with 2" - 4 " read range fastened with security screws.				
18	Electro Magnetic Lock with magnetic contact.				
19	Exit Push Button				
20	Emergency Release Switch				
21	Smart card - Blank Face				
22	Access Management Client Software UL listed.				
23	Panic bar for emergency exit. (If applicable)				
24	Supply and laying of 2/4 core 1.5/1 sq. mm-shielded FRLS armored cable complete with tags, ferruling.				
25	Supply and laying of 6 core 1 sq. mm-shielded FRLS armored cable complete with tags, ferruling.				

8.12 Biometric Door Access System

#	Specifications	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
1	Optical Fingerprint scanner with 500 dpi resolution				
2	Registration Time <1 Sec , 1:1 Match < 1 sec, 1:N match <1 sec for 1000 templates				
3	Equal Error Rate < 0.1%				
4	User Database capacity of 30,000				
5	Transaction storage capacity of last 60,000 events				
6	Capacity to store 1900 fingerprint templates expandable up to 9000				
7	Built in most accurate RTC (Real Time Clock) with Lithium cell backup				
8	Built in Card reader for different authentication modes like only Finger , only Card, Card + Finger				
9	Card reader options – HID iClass, Mifare				
10	RJ45 High speed Ethernet connectivity				
11	Interface for exit reader				
12	Interface for door lock, exit switch & door sensor				
13	Support of template on card mode with contactless smart card				
14	Support of command cards for easy user management				
15	Multicolor LED indication for successful match				
16	Programmable Buzzer & LED control from controller				
17	Sleek plastic molded enclosure				
18	Operating voltage 12VDC				

8.13 IP CCTV System

#	Specifications	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
1	The Critical area of the NOC along with the Non Critical area needs to be under constant video surveillance. The primary objective of implementing a CCTV system is to ensure effective surveillance of the area and also create a record for post event analysis. Monitoring cameras should be installed in proper areas to cover all the critical areas of the SNOC. The scope of work involves supply, installation, commissioning, testing and maintenance of the Closed Circuit Television system for SNOC.				
2	The CCTV system shall provide an on-line display of video images on monitor. The entire setup shall be monitored from the control room on 24/7 basis. Cameras with suitable lenses shall be used to view all the critical areas of the NOC, Reception and Corridor.				
3	The CCTV system shall be based on the use of fixed dome cameras and integrated pan/tilt/zoom cameras that can be controlled from control room location.				
4	The CCTV System shall be a combination of colour fixed and PTZ designed for continuous duty. The system and each of its devices shall be designed to meet the site ambient temperature and the site environmental conditions and shall operate satisfactorily under the specified permitted voltage and frequency variation band of the power supply source system.				
5	All outdoor cameras shall be IP 66 rated.				
6	A set of fixed dome cameras and integrated pan / tilt / zoom, (PTZ) cameras with remote control operation of focus and zoom.				
7	A professional housing with internal and external cooling fans to protect both the camera and lens from the rigors of all environments and at the same time it should be designed and built for ease of installation and maintenance.				
8	A complete CCTV control facility that performs all the functions with provision to increase the total number of inputs for each monitor site.				

9	CCTV Cabinets as required complete with all cable termination facilities, cable distribution system for video and power system along with any additional video amplifiers and other video equipment as may be required.				
10	End point amplifiers as may be required to achieve satisfactory system operation.				
11	Test equipment covering all tools, tackles and testing equipment / kits as required for preventive and first line maintenance including test monitors, camera adjustment and testing facilities.				
12	Complete range of accessories as required.				
13	All necessary relay boxes connectors, extension cables and adapter boxes as required at each of the ends of the CCTV System as required.				
14	All systems and components shall have been thoroughly tested and proven in actual use.				
15	All systems and components shall be provided with a one-day turnaround repair express and 24-hour parts replacement. The manufacturer on warranty and non-warranty items shall guarantee the repair and parts expresses.				
16	Specifications included in this section are indicative and considered as a minimum; component and software that shall be acquired at the time of implementing the project shall be the latest versions available in the market.				
17	The system also should provide clear & accurate indication of an intruder or abnormal movement within and around the Facility.				
18	The system shall provide visual images from the cameras located throughout the facility. The cameras located shall be fed into the Digital Video Server (DVS) located in the security room.				
19	The Digital Video Server shall consist of 16 channels Digital Multiplexer with built-in recording system into Hard Disk.				
20	The Main Security Control Room, which shall house the Monitors and the Digital Video Management Server.				
21	The CCTV should be equipped with Digital recording facility for later scrutiny, with at least 90 days of recording facility.				
22	The cameras will be of 1/3" format CCD pickup device for fixed lens camera and ¼ " format for PTZ cameras . The cameras are being				

	used for special observation purposes and are being located both indoor and outdoor & mounted on specially designed suitable mounting arrangement for operation under all severe environmental conditions to which these will be subjected especially the outdoor locations.				
23	The cameras being used at these locations shall have the following basic minimum requirements: The cameras shall be fixed dome camera and integrated Pan/Tilt/Zoom camera type that can be controlled from its monitor position, such that the cameras can be panned, tilted, zoomed and focused on to any part or entire area which they have been located to bring under observation from keyboard location.				
24	The cameras shall be complete with the latest state of the art optical systems, filters, light sensitive pickup systems suitable for capturing images with very low light levels, and necessary interlaced scanners, encoders, decoders, associated amplifiers, synchronization facilities and any interfacing adapters as required, with all systems of that type suitable for a compact, durable, distortion free and clear image processing type camera.				
25	Cameras should have Light sensitivity of 0.008 Lux (Color) and 0.001 Lux (Monochrome) as a standard. The outdoor PTZ cameras shall be day/night camera with a minimum of 23 X optical zoom and 12 X digital zoom.				
26	The Outdoor PTZ camera shall have a minimum of 80 X wide dynamic range, to withstand complex light variations in the environment.				
27	The preset accuracy for the camera shall be +/- 0.1degree maximum				
28	The Outdoor PTZ camera shall have a preset speed of 360 deg /sec Pan and 200 deg /sec tilt.				
29	The camera shall resume after alarm to the previously programmed state of alarm after alarm acknowledgement.				
30	The outdoor PTZ camera shall have auto flip feature, whereby which the dome shall rotate at 180 deg at the bottom of the tilt travel.				
31	The cameras shall have automatic level control complete with auto iris, and gain control of the amplifier and shall be complete with spot filter as required.				

32	The cameras shall have automatic shutter or 100% closing iris to prevent burning-in of image pickup device when the camera is not in use, both the shutter and iris shall fully close upon failure of power supply in order to prevent damage.				
33	The cameras shall have standby circuitry for when the camera is not selected on any of the monitors. The beam current of the camera pickup device shall be switched off automatically.				
34	The cameras shall have automatic circuitry which relates the black level in the signal to the darkest spot of the picture (black level control), limits the video signal in case of scene high-lights in order to prevent overloading of the monitor (White limiter), and prevents the automatic sensitivity control from reacting to strong highlights (Peak white eliminator).				
35	The cameras shall have the features that shall prevent the occurrence of internal condensation or condensation on the window, necessary heaters/thermostats shall be provided as required.				
36	The cameras shall be equipped with Pan & Tilt heads to allow for rotation over a minimum 360 degrees.				
37	The cameras shall be provided with a local power distribution junction box, with local isolation switches and fuses to isolate each of the power circuits of the camera related to main camera power, and other circuits related to Pan & Tilt head, cooling fan, blower etc.				
38	The camera housing shall have a rain/sun shield and a weather protection feature with a minimum IP protection of IP66 for outdoor mounted cameras. For indoor cameras, the protection class shall be IP45.				
39	The aperture ratio (f-number) of the lenses shall be selected such that, a good picture is obtained at night.				
40	Power supply units, as required for the cameras, shall be provided.				
41	The camera and its supporting structures presence least obstruction of view and least obstruction for satisfactory movement and operation of the camera due to remote and local controls.				
42	The cameras shall not be mounted on vibrating structures, where this is not possible than special structures or other facilities/measures for reducing vibrations shall be provided.				

43	All the camera movements along with Pan and Tilt, and associated forces on structures are taken in to account during the design and installation of the cameras.				
44	The installation presence the least risk of accidental damage.				
45	The equipment and its components are accessible for maintenance.				
46	The vibration of any object shall be less than that specified for the camera.				
47	The monitor shall be suitable for use as desktop units.				
48	The monitors shall be high-resolution video monitors. The monitor shall have a bandwidth of at least 10 MHz (-3dB) and a horizontal resolution in the center of the picture minimum 420 lines in the case of colour monitor.				
49	The monitors shall have the facilities to loop the video signal through the other monitor.				
50	Each monitor shall have local control knobs and remote control equipment and panel for monitor controls associated with power on/off switch standby on/off switch and for adjustment brightness, contrast, horizontal hold, vertical hold etc.				
51	Monitor shall be suitable for use as desktop units or can be rack mounted with suitable racks as appropriate.				
52	The video signal shall be transmitted using co-axial cable and control of all zoom lens and Pan-Tilt functions through twisted pair interconnected between receiver and DVR.				
53	Video link				
54	Remote control of cameras in terms of its control of pan tilts zooms & focus.				
55	Power supply cables.				
56	The cable shall be shielded or provided with facilities to avoid interference between signals.				
57	The transmission losses shall be minimized and where required for satisfactory operation correction amplifiers are cable equalizes shall be provided in the monitors on the CCTV cabinets.				

58	CCTV cabinets shall be provided near set of monitors. The cable from the cameras shall be terminated in this cabinet from where these signals are distributed to the monitors.				
59	All necessary video amplifiers, interfaces etc. that forms the part of the CCTV system shall be installed in the cabinet.				
60	The Dome camera unit shall be 1/3" CCD Color Dome camera and shall provide a minimum of 540 TV lines resolution. It shall have built-in 3 -9mm varifocal lens. The camera shall operate on minimum lux level not more than 0.15 lux .The complete unit shall be housed in an integrated dome and base unit, both preferably made from injection molded plastic. It shall be possible to adjust the camera head inside the dome in both the planes so that it can be wall or ceiling mounted. The camera shall operate on 24 V AC or 12 volts D.C.				
61	The digital recorder shall comply or exceed the following design and performance specifications:				
62	The DVR Digital video recorder shall have 400 images/sec viewing speed as well as 40 images / sec recording speed				
63	The recorder shall have a minimum of 16 video inputs. It shall also have looping inputs for all 16 inputs				
64	The recorder shall run on Windows NT.				
65	The recorder shall provide PAL , the following recording resolutions shall be possible 320 x 288 / 640 x 288 / 640 x 576 / 352 x 288 / 704 x 288 / 704 x 576				
66	The DVR shall have 4 high speed USB ports				
67	The DVR shall be in a position to display 16 video images simultaneously on the DVR or the remote client from Multiple DVRS on the LAN.				
68	The recorder shall support instant playback and shall have programmable favorite channel selection.				
69	The recorder shall allow a minimum of 6 X digital zoom on playback				
70	The recorder shall support simultaneous playback and record full duplex operation.				

71	The recorder shall have the feature of an internal hardware watchdog. The recorder shall have an internal hard disc capacity of min 500 GB				
72	The DVR shall be of the same make as that of the cameras to ensure 100% system compatibility. All the components in the DVR including hard disc etc. shall be provided for the manufactures factory not locally assembled DVRS shall be provided. 100 % finished goods shall be supplied from the manufacturer				
73	The DVR shall have each channel individually programmable.				
74	Remote workstation shall be in a position to administer / view live images / search and view playback images				
75	The recorder shall have 16 hard-wired alarm inputs, which shall be capable of configuring globally as normally open or normally closed. Each of these inputs shall be assigned to any or all of the cameras to trigger recording at custom record rates. Up to 5 seconds of pre-alarm shall also be available on each camera.				
76	The recorder shall provide 24 dry contact outputs, each of which shall be associated with any or all of the camera inputs and/or alarm inputs.				
77	The recorder shall provide an extremely flexible scheduling on a week-by-week basis. Each 24-hour period shall be divided into 15-minute blocks enabling different configurations of recording triggers to be available during each 15-minute period.				
78	The recorder shall provide onscreen controls for operation of PTZ cameras. All fully functional cameras shall be controlled via a PC comport which shall use an additional converter to communicate via RS485/422				
79	The recorder shall provide an Ethernet port as standard. If required in addition free client software shall supplied which enables remote control and connectivity via TCP/IP. The DVR shall support Gigabit port 10/100/1000 base T				
80	The recorder shall be tested to comply with UL regulations/certifications.				
81	The recorder shall provide a screen resolution of 1280 x1024 (XVGA output)				

82	The recorder shall have a built in watchdog that will automatically restart after a power failure and begins to record as per its configured settings.				
83	The recorder shall provide the ability to manually 'back up' recorded data to hard disk or DVD / RAID while the unit continues to record.				
84	The recorder shall be programmed using a keyboard and mouse via on screen menus.				
85	The recording of the recorders are watermarked and encrypted requiring backup software to open and view them. In addition, images backed up in bitmap or JPEG format can be verified for authenticity				
86	The recorder shall be suitable for mounting on a standard 19" rack.				
87	There shall be a network management Digital Video Recorder (DVR) if more than DVR is required to allow viewing of cameras from multiple DVR's in any combination.				
88	The DVR shall support pre-alarm and post alarm recording.				
89	The DVR shall support CIF / 2CIF and 4 CIF resolutions while recording.				

8.14 Public Address System

#	Product Names/Items	Description of requirements	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	Guideline	- Making public announcement from the BMS /NOC room - Clear and crisp announcement should reach to the entire Facility area. - Microphones should be provided to make announcements /respond to announcement from the designated location within the Facility. - To play light music if required.				
		A complete PA System integrated inside an elegant plastic/PVC frame. The system will have built-in 120 Watts amplifier, Provision for adequate speakers for entire DC area, MP3 / CD (Audio) playback cum recording facility and wireless microphone receiver. Fitted with an adjustable lamp and a gooseneck wired microphone, it should have a complete integrated solution for the sound system. Integrated with fire alarm system.				
		Input supply 230 V AC				
		Recess /wall mounted speakers 4 ohm 25 W				
		Audio cables single pair shielded and armored				
	Brand	To be mentioned by the bidder				
	Model	To be mentioned by the bidder				
	Country of origin	To be mentioned by the bidder				

	Manufacturing Country	To be mentioned by the bidder				
	Installation & Commissioning	Installation, testing and commissioning with necessary accessories				
	Warranty	Six years full warranty (onsite covering everything with parts and services) period including all maintenance and support for the system from the date of commissioning and acceptance. This warranty coverage document shall include 24 x 7 supports and maintenance services from Principal shall be submitted to the customer.				

8.15 Fire Proof Enclosure for Media Storage

#	Product Names/Items	Description of requirements	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	Fire Data Safe					
	Guideline					
	Brand	To be mentioned by the bidder				
	Model	To be mentioned by the bidder				
	Country of origin	To be mentioned by the bidder				
	Manufacturing Country	To be mentioned by the bidder				
	Specification	Rated to protect vital business records and computer media, Fire and Impact Rated Media Safes built to exceed the stringent UL label requirements for the following tests: A one-hour test for fire resistance in external temperatures exceeding 1700°F. A 30-foot drop impact-resistance test in addition to a 1550°F fire resistance test. A 2000°F explosion hazard resistance test.				
		High Security Key Lock, Burglary Rated.				
		Water Resistant.				
	Installation & Commissioning	Installation, testing and commissioning with necessary accessories				

8.16 Rodent Repellent System (for all areas)

#	Product Names/Items	Description of requirements	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	Guideline	The entry of Rodents and other unwanted pests shall be controlled using non-chemical, non-toxic devices. Ultrasonic pest repellents shall be provided in the false flooring and ceiling to repel the pests without killing them. However periodic pest control using Chemical spray can be done once in 3 months as a contingency measure to effectively fight the pest menace. Road Repellent System should comprises of : Main Console Transducers MODBUS/BACNET /SNMP Interface for monitoring Wire Bundles (From each Satellite to Console) FPVC Conduits 20mm Stand Brackets.				
	Brand	To be mentioned by the bidder				
	Model	To be mentioned by the bidder				
	Country of origin	To be mentioned by the bidder				
	Manufacturing Country	To be mentioned by the bidder				
	Installation & Commissioning	Installation, testing and commissioning with necessary accessories				

	Warranty	Six years full guarantee (onsite covering everything with parts and services) period including all maintenance and support for the system from the date of commissioning and acceptance. This warranty coverage document shall include 24 x 7 supports and maintenance services from Principal shall be submitted to the customer				

8.17 Intelligent Building Management Solution

#	Product Names/Items	Description of requirements	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
	Guideline	Agency shall design & provide a full Building automation system on the basis of truly distributed intelligence and shall comprise of the following general functional sub systems. - Air Conditioning Management & Control - Precision AC Units - Temperature monitoring and controls at all specified positions/locations - Energy Management - LT Panel Energy Monitoring - UPS Monitoring - Safety & Security Systems Integration - Fire Alarm System Integration - VESDA (Very Early Smoke Detection Alarm) System Integration - Access Control & Surveillance System Integration - Gas System Integration - Integration • DG Set on MODBUS Protocol with RS 485 Communication Port • Energy Meter on MODBUS Protocol with RS 485 Communication Port				

		Intelligent BMS system & connectivity for monitoring & control equipment with SMS / Mail Alerts provisioning on set limit violation. Minimum two set of temperature, humidity and vibration sensors should be considered in all critical areas such as server farm, telco room , UPS area etc.				
		Specifications as follow				
		BMS Workstation, i5, 1 TB HDD, 2.4 GHZ Processor, 4GB RAM, 52X CD ROM drive, 17" colour monitor, keyboard, Mouse, 2 serial, 1 parallel port & Windows NT operating system- Server				
		Integrator for Precision AC Units on MODBUS RTU protocol				
		Integration for UPS on MODBUS RTU protocol (8 UPS)				
		Integration for Electrical switchgears (Electrical panels) on MODBUS RTU protocol				
		Integrator for Energy Meter Units on MODBUS RTU protocol				
		Integrator for DG set on MODBUS RTU protocol				
		Integrated Intelligent building management server software having capacity to accommodate approx. 800 points (hard & software), 24 readers and more with graphics user interface comprising of the following modules.				

		Building Management Seamless integrating all utilities				
		Intelligent Access Control system Seamless integrating				
		Fire alarm system Integration Software and Integration				
		Third party- ,Access control ,WLD, Rodent repellent, UPS, Load manager/Energy meter, Precision AC, DG set, integration on Modbus TCP/IP/ RS485 RTU, BACnet TCP/IP License.				
		DDC (Direct Digital controller)				
		DC Controller with I/O module etc., The controllers shall be 32 bit microprocessor based standalone and net workable type with real time clock and historical database of min 3600 events, with port for Portable Operator Terminal & peer to Peer communication. The selection of DDC controller shall be as per I / O summary.				
		Networkable DDC Controller				
		Inside Temperature + RH sensors				
		Low/high level switch for DG tank and U/g Tank integration				
	Model	To be mentioned by the bidder				
	Country of origin	To be mentioned by the bidder				
	Manufacturing Country	To be mentioned by the bidder				

	Installation & Commissioning	Installation, testing and commissioning with necessary accessories				
	Warranty	Six years full warranty (onsite covering everything with parts and services) period including all maintenance and support for the system from the date of commissioning and acceptance. This warranty coverage document shall include 24 x 7 supports and maintenance services from Principal shall be submitted to the customer				

8.18 Video Wall Specifications

#	Item Description with Detailed Specification		Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
1	Monitor Type	LED/DLP Cubes with Laser light				
2	Panel Technology	IPS /DLP				
3	Screen Size	46" (diagonal)or Higher				
4	Aspect Ratio	(16:9)				
5	Native Resolution	1,920 x 1,080 (Full HD)				
6	Brightness	450 nit or higher for LED or 2000 Lumens or higher for DLP				
7	Contrast Ratio	1,200 : 1 or more				
8	Dynamic CR	400,000 : 1 or higher				
9	Viewing Angle (H x V)	178 x 178 degree				
10	Response Time	Up to 12ms (GTG σ)				
12	**Inputs**					
13	Digital	Digital - HDMI(1), DVI-D(1) or DP (1)				
14	Analog	Analog - RGB(1), Component (RGB Shared), AV [for LED]				
15	Audio	Shall support external Audio inputs				
16	External Control	Via IP				
17	USB	1 or more				
18	**Outputs**					
19	Digital	DVI-D(1) or Display Port (1)				

20	Analog	RGB(1) for LED				
21	Audio	External Speaker				
22	External Control	Should support external control				
23	Bezel to Bezel Gap	4.9 mm or less				

8.19 Modular Architecture based Video Wall Controller for 3*3 Video Wall

#	Item Technical Specifications	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
1	It should be Modular architecture based and should Supports 4 or Higher Input Slots and 4 or higher Output Slots to accommodate up to 4 or Higher Input Boards & 4 or Higher Output Boards				
2	Supports up to 16 or higher Digital Input sources (Either DVI / VGA / HDMI or Combination of DVI & HDMI)				
3	Supports up to 16 or higher Digital Outputs e.g. Displays (Either DVI or HDMI or Combination of DVI & HDMI)				
4	Seamless Switch feature provides continuous video streams, real-time switching and stable signal transmission				
5	It should be able to implement FPGA matrix system architecture to easily switch between multiple sources and multiple displays				
6	Looping less Videowall. No Loop In Loop Out is Allowed				
7	It should have a provision to put a Redundant Power Supply				
8	Built-in EDID wizard – provides an easy way to customized EDID settings				
9	Control & Configuration through Ethernet, RS232 & front panel buttons				
10	It should be Hot Swappable i.e cards can be removed and inserted without shutting down the system				
11	Equipped with front paneled LCD for operation display				
12	supports TMDS high data transfer rate at 1080p / 1920 x 1200 @ 60Hz				
13	Superior video quality – HDTV resolution of 480p, 720p, 1080i, and 1080p (1920 x 1080), VGA, SVGA, SXGA, UXGA and WUXGA (1920 x 1200)				
14	It should have a built in Scalar so that it can scale the input resolution of the displays upto 1080p and WUXGA in case any inferior display input is detected.				

15	Every Input & Output Board has Analog balanced/unbalanced stereo audio inputs/outputs for separate audio routing				
16	It should support Bezel Adjustment Setting & Consumer Electronic Control				
17	Videowall profile creation depending upon the number of displays connected. Profile Scheduling, Digital Signage Profile, Videowall Profile.				
18	GUI Features: Customize Profile, Scheduling, Scaling resolution, EDID Wizard & Bezel Adjustment Setting.				
19	Fan Speed Should be 45 CFM or more				

Note: Bidders are free to propose their solution meeting basic requirements specified in the RFP. They are free to provide LED or DLP based video walls as well.

8.20 LED Monitor

#	Description	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data Sheet	Value Add (if any)
1.	H-Scanning Frequency 30 ~ 81kHZ				
2.	Maximum Pixel Frequency 148.5MHz				
3.	V-Scanning Frequency 48 ~ 75HZ				
4.	Panel Diagonal Size minimum 42"				
5.	Resolution 1920x1080 (16:9)				
6.	Pixel Pitch(mm) 0.53025(H) x 0.53025(V)				
7.	Active Display Area 1018.08 mm (H) X 572.67 mm (V)				
8.	Brightness 1500 cd/m2				
9.	Contrast Ratio 10000:1				
10.	Viewing Angle(Horizontal/Vertical) 178/178				
11.	Response Time (G-to-G) 8ms				
12.	Display Color 8 bit - 16.7M				
13.	Contrast Ratio 4,000:1				
14.	Connectivity Input –RGB D-SUB, DVI-D				
15.	Video-USB, HDMI, CVBS, Component(by D-SUB)				
16.	Audio-RCA(L/R) , Stereo mini Jack				
17.	Output-RGB ,DVI-D(Loop-out)				
18.	Audio- Stereo MINI Jack				

8.21 Passive Cabling

S. No	Min Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data sheet	Value Add (if any)
1	Cabling between the network rack and server racks shall be done using OM4 MPO trunk cables to support 10G/25G/40G.				
2	Backbone links between Network access/leaf switch to Network Core/Spine switches shall be support 40G/100G.				
3	CAT6A Copper cabling to be considered for management services upto each rack.				
4	Fiber and copper cabling shall be provisioned over redundant paths on an end-to-end design basis.				
5	The cable pathway design must consider the cable fill ratio, separation and bend limits as per TIA 569-C, ISO/IEC 14763-2:2012 and BICSI TDMM 13 design guidelines				
6	Dedicated copper trays and enclosed fiber pathway system to be considered for respective cable routing for the entire Data center.				

8.22 Fiber & Copper Cabling Solution

Make:
Model:

S. No	Min Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data sheet	Value Add (if any)
1	Fiber and copper cabling as per TIA guidelines. Passive OEM offered must be in India for more than 10 years.				
2	Cabling design shall meet TIA 942 recommendations for Tier III DC design.				
3	OEM shall have ISO 9001 & 14001 certified manufacturing units in India.				
4	OEM shall have global presence with membership in TIA or ISO committee.				
5	OEM shall have RCDD certified manpower in India for design support and validation.				
6	All components for fiber, copper cabling including fiber pathway systems and copper wire buskets must be from single OEM.				
7	All cabling used in the DC must be LSZH IEC 60332-3 compliant.				

8.23 Fiber MPO Cassette, OM4

Make:
Model:

S. No	Min Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data sheet	Value Add (if any)
1	24F MPO-LC OM4 cassette with 2 MPO trunks at rear.				
2	Cassettes shall have internally collapsible translucent shutters, compatible with VFL.				
3	Cassettes shall have wiring pattern to enable use of same cassette on either end of link, for easy management and scalability.				
3	UL 1863 listed.				
4	MPO cassettes must have low loss. Max IL < 0.35dB.				

8.24 Fiber Panel

Make:
Model:

S. No	Min Specification	Specification proposed by bidder	Compliance (Y/N)	Page Reference in Data sheet	Value Add (if any)
1	Fiber enclosure shall be 19"-1U/2U with sliding drawer feature along with front patch cord trough and transparent label window				
2	High density fiber panels shall be used in the network racks which support upto 144 duplex LC ports in 2U.				
3	Fiber panel shall have front sliding design for easy access during MAC's				
4	Fiber panel shall have rear and side entry ports for cables, supported by sealing glands.				
5	Shall have a powder coated metal premium finish				
6	Shall have adequate depth, min 500mm, to support fiber cable storage.				

Note: the bidder as applicable will install all above-mentioned components. Bidder are requested to visit the site before they propose their solution and estimate the amount of work. The unit rates of each elements must be mentioned separately and if more quantity will be ordered by the PIA at later stage, the payment will be made on actual basis. The specification mentioned for components are minimum, bidders are free to provide any item/s meeting the minimum requirements.

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