MORMUGAO PORT TRUST
ENGINEERING MECHANICAL DEPARTMENT

E-TENDER FOR "SUPPLY, INSTALLATION, TESTING & COMMISSIONING OF NETWORK SWITCHES AT DATA CENTER AND OTHER PORT AREAS".
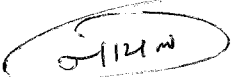
e-TENDER NO: e-TENDER No. CME/EDP/4/2017/2

ADDENDUM

CORRECTIONS / ADDITIONS / DELETIONS

Revised Technical Specifications (SECTION-II) and BOQ (SECTION-V) are attached herewith.

[Total Number of Pages: 18]

NOTE:

1.   This "Addendum" should be read in conjunction with Tender Document reference no. CME/EDP/4/2017/2.

2.   Consequential changes, arising out of this Addendum, will be deemed to have been effected, even if the same were not incorporated specifically in the Tender Document.

3.   The date for submission of the Tender and Opening of Cover – I is on 03.11.2017 **(submission at 1100hrs, opening at 1130 hrs).**

4.   All other terms and conditions of the Tender Document will remain unchanged.

5.   One set of this "Addendum", along with one set of Tender Document, shall be uploaded along with the Techno-Commercial Offer (in Cover-I), with each page of it, duly signed and sealed, as token of acceptance.

AxEN (EDP)

SECTION – II

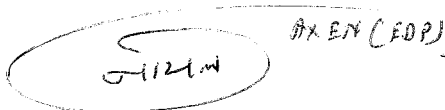# TECHNICAL SPECIFICATION

2.0   General:

Mormugao Port Trust Proposed to replace the existing network switches at Data Centre and other Port area. Accordingly, Tenders are invited from the OEM or Authorized Dealers for Network Switches, in two bids system (Part-I techno-commercial bid & Part - II - price bid).

The atmosphere in the above premises is tropical, highly saline and laden with moisture and dust particles. The ambient temperature may go up to as high as 38ºC. Average annual rainfall is 2500 cms.

2.1   SCOPE OF WORK

The scope of work includes supply, installation, testing and commissioning of network switches at Data Centre and other Port areas.

1)   Existing central Core switch at Data Center has to be replaced with 2 nos. new 32 port "Layer 3" switch with 10G/1G OFC uplink.

2)   Redundancy has to be configured between the two central core switches.

3)   All the racks should have uplink from both the switches and work simultaneously; if one switch fails another switch should take over without any manual intervention.

4)   V-LAN has to be configured in the central core switch as well as in the access switches (for RFID, Department-wise, CCTV, telephone exchange)

5)   Wireless access points have to be installed and centralised management, policies and maintenance has to be configured.

6)   In the operational areas OFC network has to be redesigned using existing OFC back bone and dependency on intermittent switches along the existing network path should be reduced as much as possible.

7)   New OFC cable from core switches to network racks in AO building has to be laid for giving uplink for connectivity and splicing of OFC to be carried out wherever required.

8)   Unshielded Twisted Pair Cat 6 cable has to be laid through casing-capping where network points are not working or new additional network points required. The IO boxes, faceplate and keystones shall be provided by Port.

9)   All the network switches shall be supplied with IPV6 compliance.

10) All the existing and new network points have to be tested and tagged with proper marking.

11) The Contractor has to supply, install and integrate a <u>Network Management System</u> (NMS) with Port's network system.

12) After completion of the execution, Vendor has to prepare the documentation (layout, termination etc.) and train the MPT staff for the maintenance. Also, one year support should be provided at MPT site.

2.2. Technical Specification

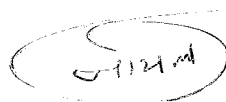### 2.2.1.- MAIN DISTRIBUTION SWITCH - 32 Port

a) Switch Architecture

- 32Nos 1/10G SFP+ ports.
- Support stacking using dedicated stacking ports separate from uplink ports with minimum stack bandwidth of 460 Gbps with support for 4 switches or more in a single stack.
- Multicore CPU Architecture. Preferablequadcore
- 3GB of flash for storing OS and other logs and 4GB of DRAM.
- Redundant field replaceable fans and incase of failure of any one of those the other fans should automatically speed up.
- Power savings mechanism wherein it should reduce the power consumption on ports not being used.
- Capable of terminating wireless control plane from locally connected AP's.
- Based on a Modular OS Architecture capable of hosting applications.
- Internal redundant hot swappable power supply and power stacking should support from day one

b) Switch performance

- Atleast 620 Gbps switching bandwidth
- Atleast 400 Mpps of forwarding rate
- Support atleast 32000 MAC Addresses
- Support atleast 22000 IPv4 routes
- Support full flexible netflow v9/ Jflow/ Sflow which provides ability to characterize traffic and identify its source, traffic destination, timing and application information which is critical for network availability, performance and troubleshooting. The switch should support atleast 5000 flows per switch
- Atleast 240Gbps Unidirectional or 480Gbps Spatial Reuse Stack Bandwidth.
- Up to 20Gbps throughput for Wireless Control Plane.
- Switch support Jumbo Frames size of 9198 bytes

c) Layer 3 features

- Support static IP routing and RIPv1, RIPv2, RIPng from day 1
- Support multicast features like IP Multicast and PIM, PIM Sparse Mode, PIM Dense Mode, PIM Sparse-dense Mode & Source-Specific Multicast with license upgrade
- Support Advanced IP unicast routing protocols (Open Shortest Path First [OSPF] for IPV4 & IPV6, EIGRP, Border Gateway Protocol Version 4 [BGPv4], and Intermediate System-to-Intermediate System Version 4 [IS-ISv4]) with license upgrade.
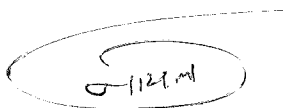
d) Layer 2 features

- Able to discover (on both IPv4 & IPv6 Network) the adjacent device giving the details about the platform, IP Address, Link connected through etc, thus helping in troubleshooting connectivity problems
- Support Detection of Unidirectional Links
- Support IEEE 802.1d, 802.1s, 802.1w Spanning-Tree & its Enhancement for fast convergence.
- Support 802.1q VLAN encapsulation
- Support centralized VLAN Management, VLANs created on the core switch should be propagated automatically
- Support 802.3ad (LACP)
- Support layer2 traceroute and NTP
- Support MAC based V LAN.

e) Network Security Features

- IEEE 802.1x, DHCP snooping, IP Source Guard, control plane protection, storm control, Dynamic ARP inspection, uRPF, BPDU Guard and Spanning-tree Source guard.
- Support flexible & multiple authentication mechanism, including 802.1X, MAC authentication bypass, MAC Address notification, IGMP Filtering, VACL, Dynamic VLAN.
- Support Private VLANs or equivalent to restrict traffic between hosts in a common segment by segregating traffic at Layer 2
- Support Multidomain authentication to allow an IP phone and a PC to authenticate on the same switch port while placing them on appropriate voice and data VLAN.
- Support Port based ACL, VLAN ACLs and IPv6 ACLs that can be applied to filter IPv6 traffic.
- Support TACACS+ and RADIUS authentication to facilitate centralized control of the switch and restricts unauthorized users from altering the configuration.
- Support IPv6 RA Guard, DHCPv6 guard, IPv6 Snooping to prevent any Man-in-middle attack.

f) Quality of Service and Control

- Capable of Queuing, Policing, Shaping and marking Traffic based on Class of Service (CoS) or DSCP.
- Support 802.1p CoS and DSCP Field classification using marking and reclassification on a per-packet basis by source and destination IP address, MAC address, or Layer 4 Transmission Control Protocol/User Datagram Protocol (TCP/UDP) port number.

- Support Rate limiting based on source and destination IP address, source and destination MAC address, Layer 4 TCP/UDP information, or any combination of these fields, using QoS ACLs (IP ACLs or MAC ACLs), class maps, and policy maps
- Support Eight egress queues per port

g) Standards and compliance (switch should support all the mentioned standards)

- IEEE 802.1x, IEEE 802.11, IEEE 802.1x-Rev, IEEE 802.3ad, IEEE 802.3af, IEEE 802.3at, IEEE 802.3x full duplex on 10BASE-T, 100BASE-TX, and 1000BASE-T ports, IEEE 802.3 10BASE-T specification, IEEE 802.3u 100BASE-TX specification, IEEE 802.3ab 1000BASE-T specification, IEEE 802.3z 1000BASE-X specification

h) Management

- support RMON I and II standards, Secure Shell (SSH) Protocol, Kerberos, and Simple Network Management Protocol Version 3 (SNMPv3).The Switch should have RJ45 & Mini USB Console Ports for Management

i) Certification

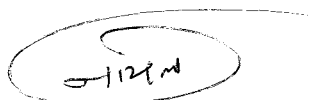- Switch should be EAL3 or NDPP certified from day one

2.2.2 - ACCESS LAYER SWITCH WITH 10G SFP+ PORT - 24 Port

a) Switch Architecture and Performance

- 24 Nos. 10/100/1000Base-TX auto-sensing with: 2xSFP+ ports to accommodate 1/10G Ports for uplink purpose

b) Layer 2 features

- IEEE 802.1Q VLAN tagging
- 802. 1Q VLAN on all ports with support for minimum 1020 active VLANs and 4k VLAN ids
- Support for minimum 16000 MAC addresses
- Spanning Tree Protocol as per IEEE 802.1d
- Multiple Spanning-Tree Protocol as per IEEE 802.1s
- Rapid Spanning-Tree Protocol as per IEEE 802.1w
- Self learning of unicast & multicast MAC addresses and associated VLANs
- Support centralized VLAN Management, VLANs created on the core switch should be propagated automatically
- Link Aggregation Control Protocol (LACP) as per IEEE 802.3ad
- Support full IGMP v1/v2/v3 as well as IGMP v1/v2/v3 snooping from day 1

c) Quality of service (Qos) features

- Support classification and scheduling as per IEEE 802.1P on all ports.
- Support 8 queues per port.
- Support QoS configuration on per switch port basis.
- Support classification and marking based on IP Type of Service (TOS) and DSCP.
- Provide traffic shaping and rate limiting features (for egress as well as ingress traffic) for specified Host, network, Applications etc.
- Strict priority queuing guarantees that the highest-priority packets are serviced ahead of all other traffic.
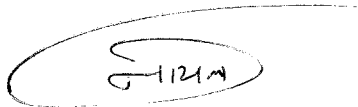
d) Security features

- IP Route Filtering, ARP spoofing, DHCP snooping etc.
- Support a mechanism to prevent edge devices not in the network administrator's control from becoming Spanning Tree Protocol root nodes
- Support static ARP, Proxy ARP, UDP forwarding and IP sourceguard.
- Support following functions: IPv6 snooping,neighbour discovery (ND) Inspection, IPv6 DHCP guard, IPv6 router advertisement (RA) guard.

e) Management

- Should be SNMP manageable with support for SNMP Version 1, 2 and 3.
- Support RMON I and II standards, Secure Shell (SSH) Protocol, Kerberos, and Simple Network Management Protocol Version 3 (SNMPv3).The Switch should have RJ45 & Mini USB Console Ports for Management
- Support TELNET and SSH Version-2 for Command Line Management
- Comprehensive debugging features required for software & hardware fault diagnosis.
- Support Layer 2 trace route or equivalent for the easy troubleshooting by identifying the physical path that a packet takes from source to destination.
- Support a mechanism to detect connectivity issues with both fibre and copper cabling.
- Support FTP/ TFTP

f) Certification

- Switch should be EAL3 or NDPP certified from day one

2.2.3 - <u>ACCESS LAYER SWITCH WITH 1G SFP PORT - 24 Port</u>
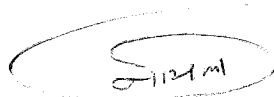
a) **Switch Architecture and Performance**
 - 24 Nos. 10/100/1000Base-TX auto-sensing with: 4 x SFP ports to accommodate 1 G Ports for uplink purpose
 - Support stacking using dedicated stacking ports/stacking module separate from uplink ports with minimum stack bandwidth of 80 Gbps
 - Support link aggregation across multiple switches in a stack and support atleast 8 switches in a stack
 - Have non-blocking wire-speed architecture.
 - Support IPv4 and IPv6 from day One
 - Support external/internal redundant power supply
 - Forwarding rate of minimum 71 Mpps and switching bandwidth of 200 Gbps

b) **Layer 2 features**
 - IEEE 802.1Q VLAN tagging.
 - 802. 1Q VLAN on all ports with support for minimum 1020 active VLANs and 4k VLAN ids
 - Support for minimum 16000 MAC addresses
 - Spanning Tree Protocol as per IEEE 802.1d
 - Multiple Spanning-Tree Protocol as per IEEE 802.1s
 - Rapid Spanning-Tree Protocol as per IEEE 802.1w
 - Self learning of unicast & multicast MAC addresses and associated VLANs
 - Support centralized VLAN Management, VLANs created on the core switch should be propagated automatically.
 - Link Aggregation Control Protocol (LACP) as per IEEE 802.3ad.
 - Support full IGMP v1/v2/v3 as well as IGMP v1/v2/v3 snooping from day 1

c) **Quality of service (Qos) features**
 - Support classification and scheduling as per IEEE 802.1P on all ports
 - Support 8 queues per port.
 - Support QoS configuration on per switch port basis
 - Support classification and marking based on IP Type of Service (TOS) and DSCP.
 - Provide traffic shaping and rate limiting features (for egress as well as ingress traffic) for specified Host, network, Applications etc.
 - Strict priority queuing guarantees that the highest-priority packets are serviced ahead of all other traffic.

d) Security features

- IP Route Filtering, ARP spoofing, DHCP snooping etc
- Support a mechanism to prevent edge devices not in the network administrator's control from becoming Spanning Tree Protocol root nodes.
- Support static ARP, Proxy ARP, UDP forwarding and IP sourceguard.
- Support following functions: IPv6 snooping, , neighbor discovery (ND) Inspection, IPv6 DHCP guard, IPv6 router advertisement (RA) guard

e) Management

- SNMP manageable with support for SNMP Version 1, 2 and 3.
- Support RMON I and II standards, Secure Shell (SSH) Protocol, Kerberos, and Simple Network Management Protocol Version 3 (SNMPv3).The Switch should have RJ45 & Mini USB Console Ports for Management.
- Support TELNET and SSH Version-2 for Command Line Management
- Comprehensive debugging features required for software & hardware fault diagnosis.
- Support Layer 2 trace route or equivalent for the easy troubleshooting by identifying the physical path that a packet takes from source to destination.
- Support a mechanism to detect connectivity issues with both fiber and copper cabling.
- Support FTP/ TFTP

f) Certification

- Switch should be EAL3 or NDPP certified from day one.

2.2.4 - <u>ACCESS LAYER SWITCH WITH 1G SFP PORT.</u>

a) Switch Architecture and Performance

- 8 Nos. 10/100/1000Base-TX auto-sensing with: 2x SFP ports to accommodate 1 G Ports for uplink purpose.
- Have non-blocking wire-speed architecture.
- Support IPv4 and IPv6 ready from day One
- Have Forwarding rate of minimum 14 Mpps and switching bandwidth of 20 Gbps

b) Layer 2 features

- IEEE 802.1Q VLAN tagging.
- 802.1Q VLAN on all ports with support for min. 64 active VLANs and 4k VLAN ids
- Support for minimum 8k MAC addresses
- Spanning Tree Protocol as per IEEE 802.1d

- Multiple Spanning-Tree Protocol as per IEEE 802.1s
- Rapid Spanning-Tree Protocol as per IEEE 802.1w
- Self learning of unicast & multicast MAC addresses and associated VLANs
- Support centralized VLAN Management, VLANs created on the core switch should be propagated automatically
- Link Aggregation Control Protocol (LACP) as per IEEE 802.3ad
- Support full IGMP v1/v2/v3 as well as IGMP v1/v2/v3 snooping from day 1

c) Quality of service (QoS) features

- Support classification and scheduling as per IEEE 802.1P on all ports
- Support 4 queues per port
- Support QoS configuration on per switch port basis
- Support classification and marking based on IP Type of Service (TOS) and DSCP.
- Provide traffic shaping and rate limiting features (for egress as well as ingress traffic) for specified Host, network, Applications etc.
- Strict priority queuing guarantees that the highest-priority packets are serviced ahead of all other traffic

d) Management

- SNMP manageable with support for SNMP Version 1, 2 and 3.
- Support RMON I and II standards, Secure Shell (SSH) Protocol, Kerberos, and Simple Network Management Protocol Version 3 (SNMPv3).The Switch should have RJ45 & Mini USB Console Ports for Management.
- Support TELNET and SSH Version-2 for Command Line Management.
- Have comprehensive debugging features required for software & hardware fault diagnosis.
- Support Layer 2 trace route or equivalent for the easy troubleshooting by identifying the physical path that a packet takes from source to destination
- Support a mechanism to detect connectivity issues with both fiber and copper cabling.
- Support FTP/ TFTP

e) Safety and Compliance
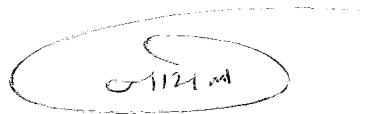
- RoHS, UL, 60950-1, EN55024.

2.2.5 - Indoor Access Point.

- Access Points proposed must include radios for 2.4 GHz and 5 GHz with 802.11ac Wave 2.
- Mounting kit should be standard from OEM directly.
- High-speed spectrum intelligence across 20-, 40-, and 80-MHz-wide channels to combat performance problems due to wireless interference
- Access point should have Rj45 console port
- Have atleast 3 dBi Antenna gain on 2.4 Ghz and 5 dBi on 5Ghz
- Support 3x3 multiple-input multiple-output (MIMO) with two spatial streams
- Support minimum of 1 Gbps on 802.11ac.
- Support minimum of 22dbm of transmit power on 2.4 Ghz& 23dbm on 5GHz Radio.
- Support beam forming technology to improve downlink performance to mobile devices and increase battery life.
- Flexible deployment, should be allowed to be deployed with or without controller.
- Support AP enforced load-balance between 2.4Ghz and 5Ghz band.
- Maximal ratio combining
- Have -100 dB or better Receiver Sensitivity.
- Do the spectrum scanning for WiFi and non-WiFi interference at all 20Mhz ,40Mhz and 80Mhz channels
- Must be plenum-rated (UL2043)
- Support Power over Ethernet, local power(DC Power), and power injectors
- WMM, UL/IEC/EN 60950-1
- Cyclic Shift Diversity
- 1Gb DRAM and 256MB Flash

2.2.6 - OFC Modules

- Module should be from the same OEM.
- Module should be Enterprise Class and not commercial grade

2.2.7 The specifications and locations of network switches to be provided are listed below.

Sr. No.	Material	Location	Qty
1	32 Port 10G Fiber Switch IP base	Data Centre	2
2	24 Port 100/1000Mbps manageable switch with 2 nos. 10G uplink	Data Centre	2
		FA Dept.	2
		CE Dept.	2
		CME Dept.	2
		GAD	2
		Chairman Office	1
		Gate No. 9	1
		MPT Hospital	1
		CDC	1
		CISF	1
		DC Dept.	1`
		Support Inventory	1
4	24 Port gigEthernet, 4 x 1G SFP, LAN Base	Data Centre	6
		FA Dept.	2
		CE Dept.	2
		CME Dept.	3
		PMS Division	1
		MPT Hospital	1
		GCB bldg near Gate no.9	1
		T1 Shed – Berth No. 10	1
		Civil Maint. HL	1
		Cruise Berth, Harbour	1
		Support Inventory	1
5	8 port gigE, 2 x 1G SFP, LAN Base	Signal Station	1
		Electrical Maint. HL	1
		MPT Guest House	1
		Gate No. 1	1
		Gate No. 2	1
		Civil Maint. HL	1
		MM Office, Baina	1
		Baina Work Shop	1
		Substation-'A' (33KV)	1
		Weigh Bridge	1
6	Wave2 indoor access point 3x3:2 SS	Guest House	1
		Chairman's bungalow	1
		Chairman's Office	1
		Dy. Chairman Office	1
		CME Office	1
		FA Office	1
		CE Office	1
		Secretary Office	1
		TM Office	1
		DC Office	1

2.2.8.**OFC cable :**

- 12C, single mode and armoured of D-Link / Amp make.

2.2.9. The Network Management System

It shall be configured for 200 devices and shall have the following features:

- Support multi brand equipment's from the day one to monitor, configure and to generate the reports
- Multi-user system and based on Graphical User Interface
- Able to diagnose its own faults by running diagnostic software
- Provide the complete view of the network elements and theinterconnecting links.
- Provide Health Monitoring reports of the network with settable periodicity -@24 Hrs, 1 week, 1 month.
- Provide the graphical layout of the network element with modules drawn usingdifferent colours to indicate their status
- Have a messaging system which will generate andsend alert via email or SMS to the designated personnel depending upon the location ofNE, on generation of alarms.
- Possible to produce pre-defined reports
- Support all SNMP enabled device configuration, monitoring and reporting from central console from day one.
- Licensing should be Device based. 200 device license from day 1 and upgradable up to 500

NMS features either by itself or through Plug-in application
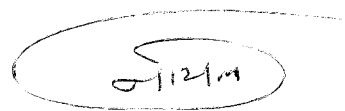
- Network mapping and discovery software using Layer 2/ Layer 3 protocols for devices
- Bandwidth Utilization and Network Performance Visualization for devices and should be configurable

a) **Discovery Features:-**

- Support for SNMP v1-3, IPv4/IPv6 address range, SNMP Smartscan, hosts file
- Scheduled discovery scans
- Web-based discovery

b) **Mapping Features:-**

- Automated map creation
- Customizable topology maps
- Display of Device dependencies
- Multi-level topology views

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c) **Monitoring Features:-**

- SNMP v1-3, SSH and WMI support
- Real-time monitoring
- MIB Walker, MIB Explorer and MIB Manager
- WMI application monitoring
- Wireless Infrastructure Monitoring, Popup and audio-visual Alerting and Reporting
- Custom monitoring with Jscript or VBScript
- Threshold monitoring (Performance, Passive and Flow)
- Blackout period to suspend specific actions during the scheduled period of time

d) **Management Console, Alerts Notification and ReportingFeatures:-**

- Web and Windows based management console
- Alert centre for centralized alerts/notification'sescalation management.
- Support Web Alarm and should support & SMS & Email Notification so thatit can be augmented in future
- Configurable Alert with Popup and audio-visual mode and Notification escalation policies
- Mobile Interface with one-click log-in
- Configurable role-based management
- Dashboard manager
- Real-time split second and historical graphs
- Scheduling of recurring reports
- Report export to: email, Excel®, and PDF formats
- Pre-defined and customizable reports
- Configurable alert thresholds
- Support of wild card search for device configuration, inventory or other device specific information

e) **Visual Mapping features:-**

- Should be able to automatically generate integrated network topology maps showing both Layer 3 addressing and Layer 2 connectivity.

f) **Inventory and Configuration features:-**

- Agentless scans for inventory control
- Collect and store comprehensive hardware inventory and configuration information for all networking devices

g) **Single point Console features for:-**

- Managing network discovery, creation and administration of maps, to access detailed device inventory and configuration information.

h) **User Defined Device Categories**

- Provide the users to have the ability to define, edit, add or delete device categories from auto discovered connected devices

i) **Layer 2 Trace**

- Support both LAN or WAN connectivity
- Display in-bound and out-bound interfaces for each network device in thepath
- Provide Layer 2 trace feature to help network managers to rapidly pinpoint physical layer connectivity issues from the console.

j) **IP/Mac Finder features:-**

- Provide IP/Mac finder tool to locate an IP or Mac address on a network from console.

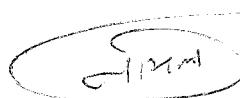k) **Flow Monitoring features (Additional Plug-ins)**

- Support automatic classification of traffic by type and protocol
- Support Identification of traffic flow patterns through the network
- Support Identificationof traffic sources (top talkers) and destinations
- Support Identification of traffic destination by domain, top level domain (TLD),and country
- Support Pinpointing of internal and external traffic sources and destinations
- Display traffic information by bytes, packets or flows

l) **Configured Features - (Additional Plug-ins)**

- Scheduled configuration backup of networking device
- Alert if device configuration has been changed on next scheduled
- Compare device configuration
- Single click for configuration restore
- Configuration Audit trail and reports
- VLAN management
- Provision to run audit template
- Scheduled and bulk task running
- Compliance audit trail
- No separate installation for Plug-ins, should get activated by Serial key
- Must provide easy to use security dashboard

m) **Security**

- Provide the ability to locate and contain rogue access points from the management application
- Support automated alarms enabled responses to mitigate risks.

n) **Guest Wireless**

- Have secured wired and wireless guest access that provision controlled wireless access to customers, vendors, visitors and partners while keeping the network secure
- Have role based access control to provide flexibility to segment the wireless network into one or more virtual domains controlled by single management platform
- Provide an interface for IT help desk personal to create guest credentials

o) **Support Network Based Application Monitoring and Troubleshooting**

- Get comprehensive network based visibility into application performance and end user experience
- Manage multiple modules/appliances providing network analysis functionality and traffic monitoring with application performance intelligence
- Should provide end-to-end performance visibility by proactive network based monitoring of:
  1) Business critical applications
  2) End user experiences
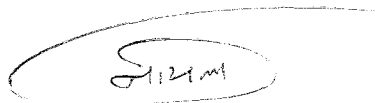
p) **Make: WhatsupGold/ Solarwinds**

2.3. Standards

The design, manufacturing, supply, installation, testing and Commissioning of the variousequipment's and accessories covered in this specification shall comply with relevant IS standards with latest amendments.

2.3. Installation & Commissioning

a) The Contractor shall commence and complete the work as per the scope of work and BOQ and proper care should be taken while carrying out the work.

b) The work should be carried out with utmost safety precaution with minimum possible network disruption. The installation of the various equipment's shall be carried as per relevant IS standards amended upto date.

.c) The work has to be carried out as per the site condition and as directed by the Engineer - in - Charge (EIC).

2.4 Technical Requirements

a) Tenders are invited from the OEM or Authorized Dealers for Network Switches.

b) OEM/Authorized dealer should confirm their technical support for the period of 5 years from the date of supply of material. If, the Work Order shall be issued to authorized dealer then they should confirm the technical support from the OEM for the period of 5 years.

c) The bidder shall supply the material strictly as per Technical Specifications.

d) The bidder is allowed to propose only one OEM for active components. However, supplying multiple optional OEMs will lead to rejection of the bid.

e) Tenderers should be ISO 9001-2015 certified.

f) Switches and Wireless products should be from the same OEM.

g) The proposed solution should integrate and interoperate seamlessly with existing network switches/system.

h) OEM must have a 24x7 technical helpdesk available in India, where customer can directly log a complaint either through phone call or E-mail, for technical support during the 5 year period.

i) OEM should be listed in Leader's Quadrant Gartner's report for Wired and Wireless infrastructure for the years 2014, 2015 & 2016.

j) Site Engineer should be available at site during all working days including Saturdays. However, he should attend to any breakdown on holidays if required.

k) The bidder has to supply the switches and OS/software which is not end of life as on date of supply.

l) If the end of vulnerability/security support is declared within 5 years from date of supply, the bidder/OEM should provide vulnerability/security support by providing required bug fixes/patches.

m) Software upgrades shall be included as a part of warranty.

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SECTION - V

PRICE SCHEDULE (BILL OF QUANTITIES)
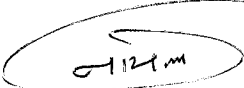
Sr. No.	Description	Unit	Qty.	Rate/Unit (Rs.)		Applicable GST (%)	Amount (Rs.)
				In Fig	In Words		
PART 'A' : SUPPLY & INSTALLATION OF COMPONENTS							
1	**Main Distribution Switch with 10G SFP + Ports**						
1.1	**Supply**						
i.	32 Port 10G Fiber Switch IP baseas per specifications at 2.2.1	No.	2				
ii.	1 Gbps copper moduleas per specifications at 2.2.6	No.	4				
1.2	**Installation of 1.1. above**	LS	1				
2	**Access layer switch with 10G SFP + Port at Server room & Network Rack**						
2.1	**Supply**						
i.	24 Port 100/1000Mbps manageable switch with 2 nos. 10G uplinkas per specifications at 2.2.2	No.	17				
ii.	10G Twinax/DAS Cable (3 mts)	No.	4				
iii	10G SM OFC Moduleas per specifications at 2.2.6	No.	32				
2.2	**Installation of 2.1. above**	LS	1				
3	**Access layer switch with 1G SFP Port**						
3.1	**Supply**						
i.	24 gigE, 4 x 1G SFP, LAN Base as per specifications at 2.2.3	No.	20				
ii.	8 port gigEthernet, 2 x 1G SFP, LAN Baseas per specifications at 2.2.4	No.	10				
iii.	FlexStack Plus Stacking Module	No.	25				
iv.	1Gbps OFC Module as per specifications at 2.2.6	No.	25				
v.	Wave2 indoor access point 3x3:2 SS, 48V,30W as per specifications at 2.2.5	No.	10				
vi.	Power Over Injectorfor above access point devices	No.	10				
3.2	**Installation of 3.1. above**	LS	1				

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4	Passive items							
4.1	**Supply**							
i.	24 Port LIU with pigtail and adapter loaded	No.	2					
ii.	6 Port LIU with pigtail and adapter loaded	No.	9					
iii.	24-Port blank patch panel	No.	7					
iv.	SC-LC OFC Patch cord	No.	25					
4.2	**Installation of 4.1. above**	LS	1					
4.3	UTP CAT6 indoor cable							
a.	**Supply**	Mtr.	4575					
b.	**Installation**	Mtr.	4575					
4.4	1" Casing Capping							
a.	**Supply**	Mtr.	1800					
b.	**Installation**	Mtr.	1800					
4.5	12 C OFC single mode, armoured, Make:D-LINK/ AMP							
a.	**Supply**	Mtr.	1000					
b.	**Installation on wall**	Mtr.	1000					
4.6	1 inch black colour PVC pipe							
a.	**Supply**	Mtr.	1000					
b.	**Installation on wall**	Mtr.	1000					
							PART 'A' TOTAL	

(In Words Rupees

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_____Only)

AXEN (EDP)

Sr. No.	Description	Unit	Qty.	Rate/Unit (Rs.) In Fig	Rate/Unit (Rs.) In Words	Applicable GST (%)	Amount (Rs.)
PART 'B' : OTHER SERVICES (SOFTWARE UPGRADATION & DOCUMENTATION)
1	**Main Distribution Switch with 10G SFP + Ports**						
i.	Advance replacement (NBD) support pack for main distribution switch	No.	2				
2	**Access layer switch with 10G SFP + Port at Server room & Network Rack**						
i.	Advance replacement (NBD) support pack for Access layer switch with 10G SFP+ uplink	No.	17				
3	**Access layer switch with 1G SFP Port**						
i.	Advance replacement (NBD) support pack for Access layer switch with 1 G uplink- 24 port	No.	20				
ii.	Advance replacement (NBD) support pack for Access layer switch with 1 G uplink- 8 port	No.	10				
iii.	Advance replacement (NBD) support pack for Wi-Fi access point	No.	10				
4	**Splicing of OFC Cores**	No.	170				
5	**Punching of network points in IO Box and Patch panel.**	No.	200				
6	**Network Management System for 200 devicesas per specifications at 2.2.9**	LS	1				
7	**Testing, commissioning, documentation of project.**	LS	1				
						PART 'B' TOTAL	
	NET TOTAL = TOTAL OF (PART A) + (PART B)		

(In Words Rupees _____

_____Only)

Note: a) The prices offered should be firm. Applicable GST (%) on the goods / services to be indicated in the BOQ.

b) Evaluation will be done on the basic price i.e. Thetotal b a s i c pricesmentioned in the Price schedule = Part - A + Part – B