



कर्मचारी राज्य बीमा निगम  
(श्रम एवं रोजगार मंत्रालय, भारत सरकार)  
EMPLOYEES' STATE INSURANCE CORPORATION  
(Ministry of Labour & Employment, Govt. of India)



मुख्यालय  
Headquarters  
पंचदीप भवन सी०आई०जी रोड, नई दिल्ली-110002  
PANCHDEEP BHAWAN, C.I.G. MARG, NEW DELHI-110 002  
Phone: 011-23604700 Email: dir-gen@esic.nic.in  
Website: www.esic.nic.in / www.esic.in

फाइल सं. I-11012/2/2022-सू.सं.प्रौ (2451)

दिनांक: 27.03.2026

### परिपत्र

**विषय: आईपी आधारित सीसीटीवी निगरानी प्रणाली की खरीद के लिए तकनीकी विशिष्टताओं का मानकीकरण**

अधोहस्ताक्षरी को यह सूचित करने का निदेश हुआ है कि क.रा.बी.निगम के क्षेत्र कार्यालयों के लिए आईपी-आधारित सीसीटीवी निगरानी प्रणाली की स्थापना हेतु तकनीकी विशिष्टताओं के मानकीकरण की जांच की गई है और उचित विचार-विमर्श के बाद संबंधित विशिष्टताओं को अंतिम रूप दे दिया गया है तथा इसके साथ संलग्न है।

2. तदनुसार, सभी क्षेत्र कार्यालयों को यह सलाह दी जाती है कि वे आईपी-आधारित सीसीटीवी निगरानी प्रणालियों की खरीद करते समय उपर्युक्त मानकीकृत तकनीकी विशिष्टताओं का सख्ती से पालन करें।

3. क्षेत्र कार्यालय यह भी सुनिश्चित करेंगे कि सभी संबंधित प्रापण करने में, लागू नियमों, दिशानिर्देशों और निर्धारित प्रक्रियाओं का अनुपालन किया जाए।

यह सक्षम प्राधिकारी के अनुमोदन से जारी किया जाता है।

संलग्न: यथोपरि

भवदीय,

*मोहित*

मोहित कुमार  
उप निदेशक(सू.सं.प्रौ)

सेवा में,

1. सभी आंचलिक बीमा आयुक्त/ सभी आंचलिक चिकित्सा आयुक्त।
2. सभी क्षेत्रीय निदेशक/निदेशक(प्रभारी)/संयुक्त निदेशक(प्रभारी), क्षेत्रीय कार्यालयों/उप क्षेत्रीय कार्यालय।
3. सभी चिकित्सा अधीक्षक, क.रा.बी.निगम चिकित्सा अस्पताल।
4. निदेशालय(चि)दिल्ली/निदेशालय(चि)नोएडा/निदेशक,राष्ट्रीय प्रशिक्षण अकादमी।
5. सभी अधिष्ठाता, क.रा.बी.निगम चिकित्सा महाविद्यालय तथा अस्पताल।
6. वेबसाइट कंटेन्ट मैनेजर को क.रा.बी.निगम की वेबसाइट पर अपलोड हेतु।

## Technical Specifications of the various components for setting up IP based CCTV monitoring system

### Core Router

S/N	Descriptions	Compliance (Yes / No)
1	The Router should be standalone/ modular and 19" rack mountable	
2	The router should have 16 GB or higher Flash-Memory/Storage to support software images for backup purpose, log reports, route table and etc. for smooth functioning of the device.	
3	The Router should have Redundant Power Supply	
	<b>Interfaces</b>	
4	The Router should support minimum 16 x1/10G SFP+ Ports from day 1 with same OEM 4 nos of 10-Gig SFPs & 4 nos of 1G SFP (Copper or Fiber as per solution requirement). The SFP should be from the same OEM.	
	<b>Protocols – IPv4, IPv6, MPLS</b>	
5	The Router should have flexibility to support both Metro-Ethernet and IP/MPLS features.	
6	The Router should support the following: OSPF, IS-IS, BGP, PIM-SM, NGMVPN/Multicast VPN, IGMP, MPLS, L2VPN, EVPN-VXLAN/BGP-EVPN, EVPN with Multi-Homing, L3VPN, Segment Routing, BGP-LS/LU, BGP Flow Specification, VPLS, RSVP, BFD, Link and Node protection, 16 ECMP ways/paths.	
7	IPv4 Routing, IPv6 Routing Border Gateway Protocol, Intermediate System-to-Intermediate System [IS-IS], Open Shortest Path First [OSPF], IGMP, PIM SSM, OSPFv3 for IPv6, PTP Transparent and Primary, IEEE 1588v2 boundary clock	
	<b>Performance</b>	
8	The router should support non-blocking architecture with line-rate forwarding on all ports	
9	The Router should have 512K IPv4 FIB/256K IPv6 FIB, 8K Multicast routes, 128K MAC, 500 MPLS VRF, 5 label stack depth	
	<b>Equipment shall support</b>	
10	MPLS OAM, Ethernet OAM protocols - CFM (IEEE 802.1ag), Link OAM (IEEE 802.3ah), ITU Y.1731	
	<b>QOS Features</b>	
11	Shall support the Traffic Classification using various parameters : IP Precedence, 802.1p, MPLS EXP, DSCP, WRED/LLQ, Priority queuing, Traffic Conditioning: Committed Access Rate/Rate limiting, Q-in-Q, 1K VLANs	
12	Shall support Strict Priority Queuing or Low Latency Queuing to support real time application like Voice and Video with minimum delay and jitter	
13	Should support 8K VoQ or 8K Hardware Queues.	
	<b>Security</b>	

14	Support Access Control List to filter traffic based on Source & Destination IP Subnet, Source & Destination Port, Protocol Type (IP, UDP, TCP, ICMP etc.), Port Range, URPF	
15	The router should support flow-based traffic monitoring (e.g., NetFlow /sFlow/IPFIX or equivalent)	
16	The Router must support multiple multi-level privilege levels for remote access (e.g. console, SSH)	
	<b>Debug, Alarms &amp; Diagnostics</b>	
17	Display of input and output error statistics on all interfaces	
18	Should support PCEP, Secure boot, Zero Touch Provisioning (ZTP), TWAMP and Netconf /RESTConf	
	<b>Management</b>	
19	Shall support latest version of Secure Shell for secure connectivity	
20	Shall support Telemetry / SNMP	
21	Event and system history logging functions shall be available	
22	Operating Temperature 0° to 40° C, Relative Humidity: 10% to 85% non-condensing	

### **Core Switch**

<b>S/N</b>	<b>Descriptions</b>	<b>Compliance (Yes/No)</b>
1	<b>Solution Requirement</b>	
a	The Switch should support non-blocking Layer 2 switching and Layer 3 routing	
b	There switch should not have any single point of failure like power supplies and fans etc. should have 1:1/N+1 inbuilt level of redundancy for Fan and Power Supply.	
2	<b>Hardware and Interface Requirement</b>	
a	The switch should have 48 x 1/10/25G and 8 x 40/100G Uplink Ports	
b	Each Switch should be provided with 10-Gig-LR-10 Nos, 16 Nos of 25-Gig-LR and 4 nos of 100Gig QSFP. All Fiber SFP/SFP28/QSFP's should be of same OEM.	
c	Switch should have 16GB DRAM and 16GB internal Flash/Storage	
d	Switch should support for different logical interface types like VLAN, SVI/RVI, Port Channel, multi chassis port channel/LAG etc.	
e	The switch should support min. 300,000 IPv4 routes and min. 150,000 IPv6 unicast routes entries in the routing table including 96,000 multicast routes	
f	Switch should support minimum 4Tbps of switching capacity	
3	<b>Layer2 Features</b>	
a	Spanning Tree Protocol (IEEE 8201.D, 802.1W, 802.1S)	
b	Switch should support minimum 250,000 no. of MAC addresses	

c	The Switch should Multihoming using ESI-LAG(EVPN) or vPC	
4	<b>Layer3 Features</b>	
a	Switch should support static and dynamic routing like Static, OSPF and BGP	
b	Switch should provide multicast traffic reachable using PIM-SM and SSM	
c	Switch should support MPLS, RSVP TE and LDP	
5	<b>Availability</b>	
a	Switch should provide gateway level of redundancy in IPv4 and IPv6 using VRRP or equivalent	
b	Switch should support for BFD For Fast Failure Detection	
6	<b>Quality of Service</b>	
a	Switch system should support 802.1P classification and marking of packet CoS, DSCP etc.	
b	Switch should support for advanced QoS including congestion management, queuing and scheduling features using WRED and SP Queuing or equivalent	
c	Switch should support Flow control as per IEEE 802.3x	
7	<b>Security</b>	
a	Switch should support control plane i.e. processor and memory Protection from unnecessary or DoS traffic by control plane protection policy	
b	Support broadcast, multicast and unknown unicast storm control	
c	Switch should support for AAA using TACACS+ / Radius	
d	Switch should support for Role Based access control (RBAC)	
8	<b>Manageability</b>	
a	Support standard monitoring features (e.g., SNMP, telemetry, or equivalent)	
b	Switch should provide remote management via secure protocols for administration such as SSHv2, Telnet	
C	Switch should support for management and monitoring status using different type of Industry standard NMS using SNMP V2 and V3	
9	<b>IPv6 features</b>	
a	Switch should support for IPv6 connectivity and routing required for network reachability using different routing protocols such as OSPFv3, BGP+ etc.	
10	<b>Safety and Compliances</b>	
a	Switch / Switch series should be EAL3/NDcPP certified	

**Server Farm Switch**

S/N	Descriptions	<u>Compliance (Yes/No)</u>
1	<b>Solution Requirement</b>	-
a	The Switch should support non-blocking Layer 2 switching and Layer 3 routing	-
b	There switch should not have any single point of failure like power supplies and fans etc. should have 1:1/N+1 inbuilt level of redundancy for Fan and Power Supply.	-
2	<b>Hardware and Interface Requirement</b>	-
a	Switch should have the 24 x 1/10G SFP fiber ports and should have 4 x 10/25G SFP28 ports & 2 x 100 Gig ports	-
b	Each Switch should be provided with min. 10-Gig-LR-12 Nos, 1-Gig-T-8 nos, 4 Nos of 25-Gig-LR and 2 nos of 100Gig QSFP. All Fiber SFP/SFP28/QSFP's should be of same OEM.	-
c	Switch should have min. 4GB DRAM and 16GB internal Flash/Storage	-
d	Switch should support for different logical interface types like VLAN, SVI/RVI, Port Channel, multi chassis port channel/LAG etc.	-
e	The switch should support 80,000 IPv4 routes and 80,000 IPv6 routes entries in the routing table including 32,000 multicast routes	-
f	Switch should support minimum 880Gbps of switching capacity and 600Mpps forwarding	-
g	The switch should support 360Gbps of Stacking/ Virtual Chassis/ vPC	-
3	<b>Layer2 Features</b>	-
a	Spanning Tree Protocol (IEEE 802.1D, 802.1W, 802.1S)	-
b	Switch should support minimum 80,000 no. of MAC addresses	-
4	<b>Layer3 Features</b>	-
a	Switch should support static and dynamic routing like Static, OSPF and BGP	-
b	Switch should provide multicast traffic reachable using PIM-SM and SSM	-
5	<b>Availability</b>	-
a	Switch should provide gateway level of redundancy in IPv4 and IPv6 using HSRP/ VRRP or equivalent	-
b	Switch should support for BFD For Fast Failure Detection	-
6	<b>Quality of Service</b>	-
a	Switch system should support 802.1P classification and marking of packet CoS, DSCP etc.	-
b	Switch should support for advanced QoS including congestion management, queuing and scheduling features using WRED and SP Queuing or equivalent	-
c	Switch should support Flow control as per IEEE 802.3x	-

7	<b>Security</b>	
a	Switch should support control plane i.e. processor and memory Protection from unnecessary or DoS traffic by control plane protection policy	-
b	Support broadcast, multicast and unknown unicast storm control	-
c	Switch should support for AAA using TACACS+ / Radius	-
d	Switch should support for Role Based access control (RBAC)	-
8	<b>Manageability</b>	
a	Support standard monitoring features (e.g., SNMP, telemetry, or equivalent)	-
b	Switch should provide remote login for administration Telnet, SSHv2	-
c	Switch should support for management and monitoring status using different type of Industry standard NMS using SNMP V2 and V3	-
9	<b>IPv6 features</b>	
a	Switch should support for IPv6 connectivity and routing required for network reachability using different routing protocols such as OSPFv3, BGP+ etc.	-
10	<b>Safety and Compliances</b>	
a	Switch / Switch series should be EAL3/NDcPP certified	-

### **Distribution Switch (Managed)**

S/N	Descriptions	Compliance (Yes/No)
<b>1</b>	<b>Solution Requirement</b>	
a	The Switch should support non-blocking Layer 2 switching and Layer 3 routing	
b	There switch should not have any single point of failure like power supplies and fans etc. should have 1:1/N+1 inbuilt level of redundancy for Fan and Power Supply.	
<b>2</b>	<b>Hardware and Interface Requirement</b>	
a	Switch should have the 24 x 1/10G SFP fiber ports and should have 4 x 10/25G SFP28 ports & 100 Gig ports. All SFP should be from OEM.	
b	Each Switch should be provided with 10-Gig-LR-16 Nos, 2 Nos of 25-Gig-LR and 1 no. of 100Gig QSFP. All Fiber SFP/SFP28/QSFP's should be of same OEM.	
c	Switch should have Min. 4GB DRAM and 16GB internal Flash/Storage	
d	Switch should support for different logical interface types like VLAN, SVI/RVI, Port Channel, multi chassis port channel/LAG etc.	
e	The switch should support atleast 80,000 IPv4 routes and 80,000 IPv6 routes entries in the routing table including 32,000 multicast routes	
f	Switch should support minimum 880Gbps of switching capacity and 600Mpps forwarding	
g	The switch should support 360Gbps of Stacking/ Virtual Chassis/ vPC	
<b>3</b>	<b>Layer2 Features</b>	

a	Spanning Tree Protocol (IEEE 8201.D, 802.1W, 802.1S)	
b	Switch should support minimum 80,000 no. of MAC addresses	
<b>4</b>	<b>Layer3 Features</b>	
a	Switch should support static and dynamic routing like Static, OSPF and BGP	
b	Switch should provide multicast traffic reachable using PIM-SM and SSM	
<b>5</b>	<b>Availability</b>	
a	Switch should provide gateway level of redundancy in IPv4 and IPv6 using HSRP/ VRRP	
b	Switch should support for BFD For Fast Failure Detection	
<b>6</b>	<b>Quality of Service</b>	
a	Switch system should support 802.1P classification and marking of packet CoS, DSCP etc.	
b	Switch should support for different type of QoS features using WRED and SP Queuing	
c	Switch should support Flow control as per IEEE 802.3x	
<b>7</b>	<b>Security</b>	
a	Switch should support control plane i.e. processor and memory Protection from unnecessary or DoS traffic by control plane protection policy	
b	Support broadcast, multicast and unknown unicast storm control	
c	Switch should support for AAA using TACACS+ / Radius	
d	Switch should support for Role Based access control (RBAC)	
<b>8</b>	<b>Manageability</b>	
a	Support standard monitoring features (e.g., SNMP, telemetry, or equivalent)	
b	Switch should provide remote login for administration Telnet, SSHv2	
c	Switch should support for management and monitoring status using different type of Industry standard NMS using SNMP V2 and V3	
<b>9</b>	<b>IPv6 features</b>	
a	Switch should support for IPv6 connectivity and routing required for network reachability using different routing protocols such as OSPFv3, BGP+ etc.	
<b>10</b>	<b>Safety and Compliances</b>	
a	Switch / Switch series should be EAL3/NDcPP certified	

### **Access Switch 24 PoE**

<b>S/N</b>	<b>Descriptions</b>	<b>Compliance (Yes/No)</b>
1	Minimum 24 x 10/100/1000 PoE+ and 4 x 10G ports (with required transceiver modules). The PoE budget should be minimum 420W. Each switch should be provided with 2 nos of 10-Gig LR SFP's of same OEM	
2	1 U Rack mountable and should provide stacking of minimum 8 switches with 200Gbps of dedicated stacking/ equivalent bandwidth (All the stacking accessories should be included from day 1).	
3	The Switch should have Min. 4GB DRAM and 8GB internal Flash/ SSD	
4	Min. 128 Gbps or higher switching capacity and minimum 95Mpps of forwarding rate (excluding the stacking bandwidth and forwarding)	

5	Support for at least 1000 VLANs & 60k MAC address	
6	It should support IGMP snooping v1,v2 & v3	
7	It should have static IP routing from Day 1 and should be upgradable to support OSPF, PIM, EVPN-VxLAN and BGP	
8	The switch should support 32k IPv4/ 16K IPv6 and 8k Multicast Routes	
9	Switch should support Min. 8 hardware queues per port	
10	Dynamic Host Configuration Protocol (DHCP) snooping and MLD snooping	
11	Switch should support LLDP capabilities	
12	Should support IP Source Guard, DAI and IPv6 Security feature like IPv6 RA Guard and IPv6 Neighbor Discovery Inspection	
13	Should support Secure Shell (SSH) Protocol and Simple Network Management Protocol Version 3 (SNMPv3).	
14	Switch needs to have console port for administration & management	
15	Management using CLI, GUI using Web interface should be supported	
16	FTP/TFTP for upgrading the operating System	
17	Switch should support IEEE 802.1ae MACsec (AES-256) on uplink ports	
18	Should support Energy Efficient Ethernet	
19	The Switch should support continuous and Fast PoE	
20	IEEE 802.1x support, IEEE 802.1D Spanning-Tree Protocol, IEEE 802.1p class-of-service (CoS), IEEE 802.1Q VLAN, IEEE 802.3u 100BASE-TX, IEEE 802.3af and IEEE 802.3at	
21	Switch should support internal redundant power supply and Hot swappable fans	
22	Switch should be UL-UL60950-1,FCC Part 15, VCCI Class A, EN 55022/550032, EN 55024, EN 300386, CAN/CSA 22.2 No.60950-1, Reduction of Hazardous Substances (ROHS) certified	
23	Switch / Switch series should be EAL3/NDcPP certified	

-

-

### **Access Switch 48 PoE**

<b>S/N</b>	<b>Descriptions</b>	<b>Compliance (Yes/No)</b>
1	Minimum 48 x 10/100/1000 PoE+ and 4 x 10G ports (with required transceiver modules). The PoE budget should be minimum 740W. Each switch should be provided with 2 nos of 10-Gig LR SFP's of same OEM	
2	1 U Rack mountable and should provide stacking of minimum 8 switches with atleast 200Gbps of dedicated stacking/ equivalent bandwidth (All the stacking accessories should be included from day1)	
3	The Switch should have Min. 4GB DRAM and 8GB internal Flash/ SSD	
4	176 Gbps or higher switching capacity and minimum 130Mpps of forwarding rate (excluding the stacking bandwidth and forwarding)	
5	Support for at least 1000 VLANs & 60k MAC address	
6	It should support IGMP snooping v1,v2 & v3	
7	It should have static IP routing from Day 1 and should be upgradable to support OSPF, PIM, EVPN-VxLAN and BGP	



8	The switch should support 32k IPv4/ 16K IPv6 and 8k Multicast Routes	
9	Switch should support min. 8 hardware queues per port	
10	Dynamic Host Configuration Protocol (DHCP) snooping and MLD snooping	
11	Switch should support LLDP capabilities	
12	Should support IP Source Guard, DAI and IPv6 Security feature like IPv6 RA Guard and IPv6 Neighbor Discovery Inspection	
13	Should support Secure Shell (SSH) Protocol and Simple Network Management Protocol Version 3 (SNMPv3).	
14	Switch needs to have console port for administration & management	
15	Management using CLI, GUI using Web interface should be supported	
16	Support secure software upgrade mechanisms (e.g., SCP/SFTP/HTTPS) and legacy methods (FTP/TFTP) if required.	
17	Switch should support IEEE 802.1ae MACsec (AES-256) on uplink ports	
18	Should support Energy Efficient Ethernet	
19	The switch should support continuous PoE during reboot and fast PoE delivery (or equivalent functionality)	
20	IEEE 802.1x support, IEEE 802.1D Spanning-Tree Protocol, IEEE 802.1p class-of-service (CoS), IEEE 802.1Q VLAN, IEEE 802.3u 100BASE-TX, IEEE 802.3af and IEEE 802.3at	
21	Switch should support internal redundant power supply and Hot swappable fans	
22	Switch should be UL-UL60950-1,FCC Part 15, VCCI Class A, EN 55022/550032, EN 55024, EN 300386, CAN/CSA 22.2 No.60950-1, Reduction of Hazardous Substances (ROHS) certified	
23	Switch / Switch series should be EAL3/NDcPP certified	

-

## **12 Port Ethernet Switch**

<b>S. No.</b>	<b>Detailed Technical Specifications</b>	<b>Compliance (Yes/ No)</b>
1	Minimum 12 x 10/100/1000 PoE+ and 2 x 1/10G SPF ports (with required transceiver modules). (The PoE budget should be minimum 180W)	
2	1 U Rack mountable and should support stacking of minimum 4 switches with Min. 20Gbps of dedicated stacking/ equivalent bandwidth	
3	The Switch should have Min. 4GB DRAM and 4GB internal Flash/ SSD	
4	64Gbps or higher Backplane capacity and minimum 42 Mpps of forwarding rate	
5	Support for at least 1000 VLANs & 32k MAC address	
6	It should support IGMP snooping v1,v2 & v3	
7	It should have static IP routing from Day 1 and should be upgradable to support OSPF and PIM	
8	Switch should support 8 hardware queues per port	
9	Dynamic Host Configuration Protocol (DHCP) snooping and MLD snooping	
10	Switch should support LLDP capabilities	
11	Should support IP Source Guard, DAI and IPv6 Security feature like IPv6 RA Guard and IPv6 Neighbour Discovery Inspection	

12	Should support Secure Shell (SSH) Protocol and Simple Network Management Protocol Version 3 (SNMPv3).	
13	Switch needs to have console port for administration & management	
14	Management using CLI, GUI using Web interface should be supported	
15	IEEE 802.1x support, IEEE 802.1D Spanning-Tree Protocol, IEEE 802.1p class-of-service (CoS) prioritization, IEEE 802.1Q VLAN, IEEE802.3af, IEEE 802.3at	
16	The Switch should support Fast and Perpetual PoE	
17	Switch should be UL-UL60950-1, FCC Part 15, VCCI Class A, EN 55022/550032, EN 55024, EN 300386, CAN/CSA 22.2 No.60950-1, Reduction of Hazardous Substances (ROHS) certified	

**NGFW-Next Generation Firewall**

<b>S/N</b>	<b>NGFW Specifications</b>	<b>Compliance (Yes/No)</b>
1	Next Generation Enterprise Firewall	
2	The product should be TEC MTCTE Certified or equivalent	
3	The offered firewall must be a single appliance and not a cluster and should be provided with redundant Fans and power supplies	
4	Firewall appliance must have at least 10 virtual firewall/domains/instances (active from day-1) with each virtual firewall/domains/instances having a separate administrative control OR equivalent, Security zones and VLAN. Associated Licenses, Software and Hardware towards Virtual domains / Virtual Firewalls/ Virtual instances shall be provided from day 1	
5	The proposed firewall must have min 8 physical cores with x86 processor	
6	The following features must be available in each virtual firewall domain/instant context environment: Firewall, IPSEC and SSL VPN, IPS, Web and Application Control, Anti-Malware, Traffic Shaping & policy based routing, DDOS, User and Group management, Logging and Reporting.	
7	The NGFW should have 900 GB solid-state drives for System storage	
8	Min 8 x 1 Gig Copper interfaces from day one	
9	Minimum 6*1G SFP and Minimum 6x 1/10Gig SFP/SFP+ ports fully populated with SR transceivers from day 1. SFP must be from the same OEM	
10	Dedicated 1 x HA ports with active optical cable of minimum 5 meter length in addition to requested data ports, Console , Management and USB Port	
11	A Minimum Application control throughput – minimum 70 Gbps considering Application-Identification/AVC/Application control and Logging enabled. The bidder shall submit the performance test report reference from public documents or from Global Product Engineering department / Global Testing Department/ Global POC	

	team of OEM certifying the mentioned performance and signed by person with PoA.	
12	Minimum NG Threat prevention throughput by enabling and measured with Application-ID/AVC, IPS, Malware protection with logging enabled- minimum 25 Gbps. The bidder shall submit the performance test report reference from public documents or from Global Product Engineering department / Global Testing Department/ Global POC team of OEM certifying the mentioned performance and signed by person with PoA.	
13	IPsec VPN throughput with logging enabled- minimum 40 Gbps and NGFW Throughput of 30 Gbps	
14	New Layer 4 sessions per second -Min. 700,000 or New Layer 7 sessions per second – Min 300,000	
15	Concurrent Layer 4 sessions - Min 12 Million or Concurrent Layer 7 sessions - Min 7 million	
16	Active/Active and Active/Passive and should support session state synchronization among firewalls in a high availability cluster	
17	The proposed system shall be able to operate on either Transparent (bridge) mode or NAT/Route mode. Both modes can also be available concurrently using Virtual Contexts.	
18	The proposed firewall shall have native network traffic classification which identifies applications across all ports irrespective of port/protocol/evasive tactics.	
19	The proposed firewall shall be able to handle (Monitor, block or allow) unknown/unidentified applications like unknown UDP & TCP	
20	The proposed firewall should have the ability to create custom application signatures and categories directly on firewall without the need of any third-party tool or technical support. Also the device should have capability to provide detailed information about dependent applications to securely enable an application	
21	The NGFW must have GUI based packet capture utility within its management	

	console with capability of creating packet capture filters for IPv4 and IPv6 traffic and ability to define the packet	
22	Firewall policy must facilitate IP, Network, Port, Protocol, User, Application and Zone. And must facilitate to apply features like IPS, Web & application Content filtering, Anti-Malware, IPS, DDOS prevention, Traffic Shaping (define - guaranteed, burstable/maximum bandwidth, set different level of priority) on any firewall policy for a specific time/Date/Period. Firewall policy must also have an option of configuring exceptions to any specific features.	
23	The firewall must support creation of policy based on wildcard addresses to match multiple objects for ease of deployment	
24	The proposed firewall shall delineate different parts of the application such as allowing Facebook chat but blocking its file-transfer capability inside the chat application base on the content.	
25	The proposed firewall shall be able to protect the user from the malicious content upload or download by any application. Example Blocking a malicious file download via a chat or file sharing application.	
26	The firewall must have the ability to manage firewall policy even if management server is unavailable	
27	Must support various form of user Authentication methods simultaneously, like: Local Database, LDAP server, RADIUS server, TACACS+ server and PKI methods (PKI authentication with PCKS#7, PCKS # 10 standards).	
28	The firewall must have the capability to create DOS prevention policy to prevent against DOS attacks on per zone basis (outbound to inbound, inbound to inbound and inbound to outbound) and ability to create and define DOS policy based on attacks like UDP Flood, ICMP Flood, SYN Flood(Random Early Drop and SYN cookie), IP Address Sweeps, IP Address Spoofs, port scan, Ping of Death, Teardrop attacks, unknown protocol protection etc	
29	Should have protocol decoder-based analysis which can state fully decodes the	

	protocol and then intelligently applies signatures to detect network and application exploits	
30	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.	
31	Should block known network and application-layer vulnerability exploits	
32	The proposed firewall shall perform content based signature matching beyond the traditional hash base signatures	
33	The proposed firewall shall have on box Anti-Virus/Malware, Anti Spyware signatures and should have minimum signatures update window of every one hour	
34	All the protection signatures should be created by vendor base on their threat intelligence and should not use any 3rd party IPS or AV engines.	
35	Should be able to perform Anti-malware scans for HTTP, SMTP, IMAP, POP3, and FTP traffic.	
36	Should have 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	
37	The device should support zero day prevention using Static and dynamic analysis of suspicious files results in sub-second malware detection and verdicts. If the file is clean, the NGFW will release the file to the user. Otherwise, the file will be blocked and quarantined for further action.	
38	The device should have protection for min 15000 IPS signatures excluding custom signatures	
39	Should have. threat prevention capabilities to easily import IPS signatures from the most common definition languages Snort and Suricata	
40	The solution must have data loss prevention by defining the categories of sensitive information that is required to	

	TIITER.	
41	Should be able to call 3rd party 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	
42	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	
43	The NGFW should have native protection against credential theft attacks(without the need of endpoint agents) with ability to prevent the theft and abuse of stolen credentials and the following :	
44	Automatically identify and block phishing Sites using advanced threat prevention techniques.	
45	Prevent users from submitting credentials to phishing sites	
46	Prevent the use of stolen credential	
47	There should be provision to enable the APT solution if required in Future with following features.	
48	The device should support zero day prevention using Static and dynamic analysis of suspicious files results in sub-second malware detection and verdicts. If the file is clean, the NGFW will release the file to the user. Otherwise, the file will be blocked and quarantined for further action.	
49	Cloud base unknown malware analysis service should be certified with SOC2, where required	
50	The solution must be able to leverages a combination of antivirus, advanced threat filtering, static and dynamic analysis, deep neural networks, AI/ML to deliver real-time verdicts without compromising productivity or security.	
51	Should protect against phishing and JavaScript	
52	The proposed firewall shall 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).	

53	NGFW should support policy creation around end user attempts to access the defined URL	
54	NGFW should have a vast categorisation database where websites are classified based on site content, features, and safety in more than 70 categories	
55	Should detect and prevent malicious DNS request from inside hosts to outside bad domains, sinkhole the DNS request and should be able to integrate and query third party external threat intelligence databases to block or sinkhole bad IP address, Domain and URLs.	
56	Solution should support database maintenance containing a list of known botnet command and control (C&C) addresses which should be updated dynamically	
57	It should support all protocols being used by Internet at least Telnet, FTP, SMTP, HTTP, HTTPS, LDAP, DNS, ICMP, DHCP, SNMP etc	
58	All internet-based applications should be supported for filtering like Telnet, FTP, SMTP, http, DNS, ICMP, DHCP, ARP, SNMP, MS-Exchange etc	
59	The proposed solution should be able to Detect and Prevent command, Control IP, URL & DNS	
60	The solution should support integration and correlation to provide effective prevention against	
61	Must support DNS client and NTP client. Firewall should also have capability to be configured as DNS server for the LAN/segments/zones.	
62	The device should have Hardware based DDoS Host Protection, which can mitigate DDoS attacks directed towards the appliance over the Hardware, without any impact to the CPU.	
63	The proposed product or product family or operating system should be FIPS 140-2 or higher certified. Bidder need to submit public website link or documentary proof along with the technical bid.	
64	The proposed product or product family or operating system should be EAL 4 or higher or NDPP certified. Bidder need to	



	submit public website link or documentary proof along with the technical bid.	
65	The solution should have File Filter capabilities to block certain files, specifically the password-protected files from being uploaded/downloaded.	
66	The proposed firewall should have SSL decryption in Hardware and shall be able to identify, decrypt and evaluate SSL traffic in an outbound connection (forward-proxy)	
67	The proposed firewall shall be able to identify, decrypt and evaluate SSL traffic in an inbound connection	
68	Should support TLS v1.3 decryption in all modes (SSL Forward Proxy, SSL Inbound Inspection etc.)	
69	The solution should have 15 Gbps or more of SSL Inspection/ Decryption TLS throughput.	
70	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	
71	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	
72	The proposed firewall must be able to operate in routing/NAT mode	
73	The proposed firewall must be able to support Network Address Translation (NAT)	
74	The proposed firewall must be able to support Port Address Translation (PAT)	
75	The proposed firewall shall support Dual Stack IPv4 / IPv6 (NAT64, NPTv6)	
76	Should support on firewall policy with User and Applications	
77	Should support SSL decryption on IPv6	
78	Should support SLAAC Stateless Address Auto configuration	
79	Should be IPv6 Logo or USGv6 certified	
80	The proposed firewall must support the following routing protocols:	
81	- Static	

82	- RIP v2	
83	- OSPFv2/v3 with graceful restart	
84	- BGP v4 with graceful restart	
85	The device should support load balancing of traffic on multiple WAN links	
86	The proposed solution must support Policy Based forwarding / SDWAN Rule based on:	
87	- Zone	
88	- Source or Destination Address	
89	- Source or destination port	
90	- Application (not port based)	
91	- AD/LDAP user or User Group	
92	- Services or ports	
93	The proposed solution should support the ability to create QoS policy on a per rule basis- by source address, by destination address, by application (such as Skype, Bittorrent, YouTube, azureus, webex), by static or dynamic application groups (such as Instant Messaging or P2P groups), by port and services.	
94	Solution should support the following authentication protocols:	
95	- LDAP	
96	- Radius (vendor specific attributes)	
97	- Token-based solutions (i.e. Secure-ID)	
98	- Kerberos	
99	The proposed firewall's SSL VPN / IPSEC shall support the following authentication protocols	
100	- LDAP	
101	- Radius	
102	- Token-based solutions (i.e. Secure-ID)	
103	- Kerberos	
104	- SAML	
105	- Any combination of the above	
106	Should provide on device as well as dedicated centralized management and reporting solution with complete feature parity on firewall administration. The	

	Central Management and Reporting Solution should be a dedicated OEM appliance with the required software licenses bundled from day 1 or in case of software based management and logging solution required server and storage to be factored along.	
107	To help prevent tampering, the Appliance should have Trusted Platform Module (TPM) chip soldered on the motherboard to reduce the risk of data transaction interceptions from attackers. This is used to protect the passwords and private keys against malicious software and phishing attacks. The dedicated module helps in generating, storing, and authenticating cryptographic keys	
108	The management solution must support the native capability to optimize the security rule base and offer steps to create application based rules	
109	Should have separate real time logging base on all Traffic, Threats, URL filtering, Data filtering, Content filtering, unknown malware analysis, Authentication, Tunneled Traffic and correlated log view base on other logging activities	
110	Should support the report generation on a manual or schedule (Daily, Weekly, Monthly, etc.) basis	
111	Should allow the report to be exported into other formats such as PDF, HTML, CSV/XML etc.	
112	Should have built in report templates base on Applications, Users, Threats, Traffic and URLs	
113	Should be able to create report base on application usage	
114	Must provide the real time health status of NGFW on dashboard and CLI together for CPU memory utilization, state table, total No. of concurrent connections and the connections/second counter, real time data transfer/bandwidth utilization of individual IP/Application/protocol/port/Interface/Zone	
115	Should be able to create custom report base on custom query base any logging attributes	

-

**CAT6-A Cable**

(Cable to be provided in boxes with cable length of 305m each)

S/N	Parameters	Descriptions	Compliance (Yes/No)
1		CAT6A U/UTP LSZH Cable	
2	Type	8 X 23 AWG solid bare copper Electrolytic Grade Copper Conductors Twisted as 4 Pairs; The twisted pairs are insulated with polyethylene or polyolefin material and LSZH Outer Jacket, Category 6A, confirming to ANSI-TIA 568-C.2 for Category 6A & ISO/IEC 11801 for ISO/IEC 11801FOR CLASS E	
3	Support	Supports 10/100/1000Base-T, 155Mbps ATM, IEEE 802.3an (10GBase-T) Standard requirement for Applications such as High-Speed Data, Voice & Video Signals over LANs, Server Farms and Other Bandwidth Sensitive Indoor Applications.	
4	Conductors	Solid bare copper 23 AWG	
5	Pair Separator	+ Shape Spline	
6	Packing	Box of 305 meters	
7	Cable Outer Diameter	7.0mm ± 0.05mm	
8	Insulation Material	Foam Polyolefin	
9	Insulation Diameter	As per OEM , Pl. specify. :	
10	Pairing	2 insulated conductors twisted together	
11	Max. Delay Skew	45 ns	
12	Max. Conductor Resistance	93.8 Ω /km (@ 20°C)	
13	Nom. Mutual Capacitance	≤ 5.6 nF/100 m @ 1KHz	
14	Max. Conductor Resistance Unbalance	≤ 5% (@ 20°C)	
15	Max. Capacitance Unbalance	≤ 330 pF/100 m	
16	Min. Bend Radius (Install)	4X cable overall diameter	
17	Nom. Velocity of Propagation	69%	
18	Temperature Range Operation	-20 °C to +70 °C	
19	Temperature Range Installation	0 °C to +50 °C	

20	Performance characteristics @ 500 MHz	Max. Attenuation: 45.3 dB/100m	
		Min. NEXT: dB 26.1dB	
		Min. PS NEXT: Db 23.2dB	
		Min. Return Loss: dB 6dB	
		Min. ACR-F: 9.3db	
		Min. PSACRF: 6.3dB	
21	Regulatory Compliances ROHS Compliant	OEM offered must be in India / SAARC for at least 5 years or more.	
		All passive products from single OEM & should be manufactured as per latest TIA/EIA or ISO/IEC standard and have 25 years of channel performance and 5 Years component warranty. OEM should be member of Telecommunications Industry Association (TIA)	

-

#### **24 PORT, 1U Straight Patch Panel, Unloaded**

S/N	Parameters	Descriptions	Compliance (Yes/No)
1	Make & Model	To be Specified by the bidder.	
2	Type	24 Port, 1U Straight Patch Panel, Unloaded - 1U	
3	Features	1U high universal modular 19" panel for mounting UTP keystone jacks.	
		Possibility of mounting up to 24 RJ45 unshielded keystone jacks	
4	Availability	Patch Panel should be available with 24 Ports in 1U & 48 Ports in 2U	
5	Cable management	Straight Patch Panel with integrated rear cable manager	
6	Compatibility	Patch Panel should be able to accept Cat6A, Cat6 and Cat5e information outlets for backward and forward compatibility	
7	Height	1U (1.75")	
8	Color and Material	Metal SPCC, Black, plastic inserts, Double layer - 1.5mm, provided with mini cable ties, cage nuts & rare cable management.	

-

-

S/N	Parameters	Descriptions	Compliance (Yes/No)
	Make & Model	To be specified by the bidder.	
1	Type	Category 6A Unshielded Keystone Outlet	
2	Type	Modular Jacks shall meet and exceed channel specification of ANSI/TIA 568-C.2, IEC/ISO 11801 & IEC 60603-7-41 when used as a component in a properly installed within a channel.	
		Unshielded	
3	Contact Material	Phosphor Bronze, nickel plated	
4	Plastic Housing	ABS Grade Polycarbonate Material	
5	Plastic Parts type	High impact flame retardant plastic	
6	Termination Interface	Plug Insertion Life (RJ45 Contacts) $\geq$ 750 Cycles	
		Durability (IDC Life) 200 termination cycles	
7	Jack wire material and thickness	50 micro- inche gold plated on plug contact area	
8	IDC Conductor	0.5mm Phosphor bronze, Tin plating PC,UL94V2	
9	Contact Compatibility	Accommodates 23 to 26 AWG solid	
10	Termination Pattern	TIA / EIA 568 A/B	
11	Operating Temperature	-10° to +60°C	
12	Regulatory Compliances	OEM offered must be in India / SAARC for at-least 5 years or more.	
		All passive products from single OEM & should be manufactured as per latest TIA/EIA or ISO/ IEC standard and have 25 years of channel performance and 5 Years component warranty. OEM should be member of Telecommunications Industry Association (TIA)	

### **Face Plate, UK Style, Square with Shutters**

S/N	Parameters	Descriptions	Compliance (Yes/No)
1	Make & Model	To be Specified by the Bidder	
2	Type	UK Style with Built-in Anti-Dust Shutters	
3	Material	, ABS Grade Polycarbonate Material, White color, UK Style.	
4	Acceptability	Should be able to accept Cat6A, Cat6 and Cat5e information outlets, Modules, Keystones and Adaptors to suit all installation requirements	

5	Compliance	ANSI/TIA 568-C.2,	
6	Mounting screws	Include mounting screws and Label Holders with Plastic covers	
7	Available	Single/Dual/Quad network faceplate	
8	Dimensions	(H x W x D) 86 x 86 x 14.42 mm	

**Back Box for Face Plate, UK Style**

S/N	Parameters	Descriptions	Compliance (Yes/No)
1	Make	To be Specified by the Bidder	
2	Type	Back Box for UK Style Faceplate	
3	Material	White High impact plastics.	
4	Dimensions	(85.2*85.2*36.7MM)LXBXH	
5	Compatible	Back box allows for mounting a various port of Faceplates	

**CAT6A Unshielded LSZH Patch Cords**

S/N	Parameters	Descriptions	Compliance (Yes/No)
	Make & Model	To be Specified by the Bidder	
1	Type	CAT6A Unshielded LSZH Patch Cord Cable	
2	Type	Modular Cord shall meet and exceed channel specification of ANSI/TIA 568-C.2, ISO/IEC 11801 Standard.	
3	Conductor	Flexible Stranded Bare Copper, 24 AWG,	
4	Insulation	Foam Skin PE (0.96 ± 0.05 mm)	
5	Feature	Improved Strain Relief boot with Soft latch-cover design for easy depression	
		Backward compatible for easy integration with any network component that uses a RJ45 connection	
6	Length	1 / 2 / 3 / 5 Meter Customized length depends on MoQ	
7	Connectors	High Grade 50 μ gold plated RJ45 Connectors	
8	Conductor Material	Stranded Bare Copper	
9	Operating Temperature Range	-20 °C to +60°C	
10	Storage Temperature	-20 °C to +70°C	

	Range:		
11	Installation Temperature:	0 °C to +50°C	
12	Sheath Material	LSZH	
13	Performance	Patch Cords which will give guaranteed higher bandwidth will be preferred.	
14	Regulatory Compliances	OEM offered must be in India / SAARC for at-least 5 years or more.	
		All passive products from single OEM & should be manufactured as per latest TIA/EIA or ISO/ IEC standard and have 25 years of channel performance and 5 Years component warranty. OEM should be member of Telecommunications Industry Association (TIA)	

### **Six/Twelve Core Multimode (50/125MM) OM4 Fiber Optic Cable**

S/N	Parameters	Descriptions	Compliance (Yes/No)
1	Make & Model	To be Specified by the Bidder	
2	Type	6/12 Core Multimode (50/125µm) OM4 Fiber optic tight buffer Indoor Cable	
3	Cable	6/12 Core Multimode Indoor fiber optic cables are tight buffered with colored fiber cores. Fiber cable is perfectly suited for both gigabit Ethernet and 10 gigabit Ethernet campus and backbone applications	
5	Outer Sheath	LSZH Jacket / Black or Aqua	
6	Fiber Count	6/12	
7	Strength Member	Aramid Yarns	
8	Cable Specifications	Fiber Color : Blue, Orange, Green, Brown, Grey, White b Cable diameter : 6.0 ± 0.5 mm	
9	Optical Properties	Core Non-circularity : ≤ 5 %	
		Cladding Diameter : 125.0 ± 1 µm	
		Attenuation Co-efficient	
		850 Wavelength (nm) : ≤ 2.7Db/km	
		1300 Wavelength (nm) : ≤ 0.8Db/km	
		Chromatic Dispersion :	
		850 Wavelength (nm) : ≥ 3500 Mhz.km	
1300 Wavelength (nm) : ≥ 4700 MHZ.KM			
		Storage Temperature Range: -20°C to +70°C	
10	Temperature Range	Installation Temperature Range: -20°C to +60°C	
		Operating Temperature Range: -20°C to +70 °C	
		Complies to ANSI/TIA-568.3-D, Telcordia GR-20, IEC 60794-2, ISO/IEC 11801	
11	Physical Properties	Cable Bend Radius : 20 x Cable Diam.	
		Cable Kink Radius : 10 x Cable Diam.	



	Cable Max. Tensile Strength (Short Term) : 2000 N	
	Cable Max. Crush Resistance (Short Term) : 3000 N	

**1U Rack Mount Fiber Enclosure (LIU) including Pigtaills, Splice Trays and Adapter Strips**

S/N	Parameters	Descriptions	Compliance (Yes/No)
1	Make	To be Specified by the Bidder	
2	Type	1U Rack Mount Fiber Enclosure (LIU) including Splice Trays and Adapter Strips	
3	Fiber Interface Unit	Fiber Patch Panel Typically used in Server rooms, Network rooms, Data Centers and Small offices Can be mounted directly on any 19" rack or cabinet. It should be able to accommodate a variety of Fiber connectors and terminated to fiber cables using Splicing or other methods.	
4	Type	Fiber LIU should be 1U (1.75"), 19 Inch Rack Mount.	
		12/24/48 Port should be available in 1U Rack Mount LIU respectively.	
		LC Type Connectors will be required.	
5	Features & Compatibility	Each 1U LIU should be able to accommodate max 48 fibers in LC type connectors.	
		12/24 Fiber Splice trays should be included with LIU.	
		Each 1U panel should take either two or four adapter plates for flexible and customized patch panel design.	
		Adapter Strips should be preloaded with adapters/couplers Duplex and the pigtaills	
		Couplers in adapter strip should be Blue Colored	
		Adapter strips should be available for both Single-mode and Multimode.	
		Adapter strips should be available in LC/SC types.	
6	Material	Panel should be available in SPCC (Cold rolled steel sheet) and Aluminum Material	
7	Dimensions	410 X 310 X 42 mm(dxwxh)	
8	Pigtaills Type	Multi-mode OM4	

9	Insertion Loss	MM: $\leq 0.3\text{dB}$	
10	Return Loss	MM: $\geq 28\text{dB}$ (PC)	
11	Ferrule Material	Zirconia Ceramic	
12	Operating Temperature	$-40\text{ }^{\circ}\text{C}$ to $+ 70\text{ }^{\circ}\text{C}$	

**Fiber Patch Cords, LC-LC Duplex, Multi Mode OM4**

S/N	Parameters	Descriptions	Compliance (Yes/No)
1	Make	To be Specified by the Bidder	
2	Features	LC-LC OM4 LSZH Patch cord	
		Meets all TIA/EIA-568-D.3 Standard	
		Constructed from high performance OM4 50/125 $\mu\text{m}$ multi mode cable	
		Small diameter, light weight, easy to connect and support large capacity data transmission.	
		100 % factory tested for insertion loss	
3	Fiber Count	2	
4	Tight Buffer Fiber OD	$0.9 \pm 0.05\text{ mm}$	
5	Operating Temperature	$-40\text{c}$ $+700\text{ c}$	
6	Optical Specification		
7	Fiber Mode	MM, OM4	
8	Insertion Loss	typical : $<0.2\text{Db}$ , max $0.3\text{dB}$	
9	Durability	$< 0.2\text{Db}$ 200 times mating cycle	
10	Length	3, 15, 25 and 40 Mtrs.	

**Bullet Camera**

S/N	Parameters	Descriptions	Compliance (Yes /No)
1	Image Sensor	Min. 5 MP Bullet camera 1/2.8" Progressive Scan, CMOS Sensor or Better	
2	Supported resolutions	2592 X 1944, 2592 X 1520, 2048 X 1536, 1920 X 1080, 720p, D1, 2CIF, CIF, VGA	
3	Video Compression	H.265 HEVC, H.264, MJPEG, Smart Codec	
4	Video Standard	PAL/NTSC	
5	Bitrate	128Kbps-8Mbps or Better	
6	FPS	Main Stream: Max@25fps; Second Stream: Max@20fps; Third Stream: Max@20fps	

7	Unicasting/ Multicasting	Supported	
8	Shutter speed	Auto/Manual, 1/100000s ~ 1/3s	
9	Minimum Illumination	Color: 0.005 Lux @F1.6 B/W: 0Lux (IR on)	
10	Signal to Noise Ratio (SNR)	50dB or better	
11	Lens focal length	2.7 ~ 13.5 mm, (F 1.4 ~ F 3.6), Motorized Focus and Zoom Lens	
12	Built In IR irradiance upto	50mtrs or Better , Smart IR, Day and Night mode switching based on IR sensor or schedule.	
13	Day/Night Camera Switching	Should Support with Auto ICR	
14	Network Failure recording	In case of Network failure, the Camera shall start recording on NAS or SD Card, which can be retrieved back when the network connectivity restores ( ANR)	
15	Edge Storage	Min 256 GB Onboard storage or better; SD card/micro SD card Encryption	
16	Network Connectivity	10Base-T/100BaseTX Ethernet (RJ-45), Dual Status LED on RJ45 connector	
17	Supported Network Protocols	Pv4, IPv6, TCP/IP, HTTP, HTTPS, RTSP/RTP/RTCP, IGMP/Multicast, SMTP, SNMP, DHCP, NTP, DNS, DDNS, CoS, QoS, 802.1X, UPnP, mDNS(Bonjour), UDP, ICMP, ARP, TLS, SFTP	
18	Image Stabilization	Stable imge with Digital noise reduction	
19	Security	Firmware encrypted / Signed, User account and password protection, IP Filter, Digest authentication, Device Certificate, TLS 1.2 / 1.3, Stream encryption, AES128/256, SSH/Telnet closed, Secure boot, Prevent brute-force attack, Audit User Access/System/Event log management	
20	HTTPs Streaming	Should Support	
21	I/O	Audio: Support Line in/out, Built-in Mic supporting G.711, H.726, AAC; Alarm Support	
22	Network Authentication	802.1x Network authentication	
	Video Content	Motion Detection, Scene Change, Tamper Detection, Object classification: Human, vehicle, Intrusion, Line Crossing Detection, Unattended Object Detection, Missing Object Detection, Audio Detection	

			Compliance
23	Analytics (VCA)	Crossing Detection, Unattended Object Detection,	
24	Back light Compensation (BLC)	Should Support	
25	Wide Dynamic Range	Support 120dB True WDR or better	
26	Image Enhancement	Saturation, Contrast, Sharpness, Brightness, Auto Exposure, Gamma , White balance, Intelligent Defog	
27	Noise Reduction	2 DNR, 3 DNR	
28	Surge Protection	Surge Protection	
29	Power	POE (802.3af/at), 12 V 2A or Better	
30	Operating Temperature	~30°C- +60°C or better	
31	Operating Humidity	95% or less	
32	Ingress Protection	IP67 Document Should be attached	
33	Impact protection	Support appropriate impact protection (e.g., IK rating) based on deployment requirements.	
34	MAC Address	The Mac Address of the Camera shall be registered in the name of the OEM	
35	ONVIF Compliance	ONVIF Supported ONVIF: Profile S, G/ T/ M	
36	Regulatory Approvals/ Certifications To be attach	BIS-ER/STQC	
37	IP camera & Recorder	Should be same Make	
38	Condensation Compensation	Supported	
39	Reset	Hardware Reset: Secure with Reset button within Housing. Reset provision outside housing shall not be acceptable Software Reset of cameras with ability to retain UN/PW/Network IP/Cameras Zoom	
40	Streaming	Camera should have quad streaming.	
41	Body Type	The camera should have metal body/ a rugged enclosure suitable for indoor/outdoor deployment	

S/N	Parameters	Descriptions	(Yes /No)
1	Image Sensor	5 MP Dome camera 1/2.8" Progressive Scan, CMOS Sensor or Better	
2	Supported resolutions	2592 X 1944,2592 X 1520,2048 X 1536, 1920 X 1080,720p,D1,2CIF,CIF,VGA	
3	Video Compression	H.264, H.265 HEVC, MJPEG or Higher	
4	Video Standard	PAL/NTSC	
5	Number of Streaming support	Main Stream: 5MP and lower resolutions; Second Stream: 5MP and lower resolutions; Third Stream: 1080p and lower resolutions; Fourth Stream: optional	
6	Bitrate	128Kbps-8Mbps or Better	
7	FPS	Main Stream: Max@25fps; Second Stream: Max@20fps; Third Stream: Max@20fp	
8	Unicasting/ Multicasting	Supported	
9	Shutter speed	1/3s-1/100000s or Better	
10	Minimum Illumination	Color: 0.005 Lux @F1.6 B/W: 0Lux (IR on)	
11	Signal to Noise Ratio (SNR)	50dB or better	
12	Lens focal length	2.7 ~ 13.5 mm, (F 1.4 ~ F 3.6), Motorized Focus and Zoom Lens	
13	Built In IR irradiance upto	40mtrs or Better , Smart IR	
14	Day/Night Camera Switching	Should Support with Auto ICR	
15	Network Failure recording	In case of Network failure, the Camera shall start recording on NAS or SD Card, which can be retrieved back when the network connectivity restores ( ANR)	
16	Edge Storage	<b>Min 256 GB Onboard storage or better; SD card/micro SD card Encryption</b>	
17	Network Connectivity	10Base-T/100BaseTX Ethernet (RJ-45); Dual Status LED on RJ45 connector	
18	Supported Network Protocols	IPv4, IPv6, TCP/IP, HTTP, HTTPS, RTSP/RTP/RTCP, IGMP/Multicast, SMTP, SNMP, DHCP, NTP, DNS, DDNS, CoS, QoS, 802.1X, UPnP, mDNS(Bonjour), UDP, ICMP, ARP, TLS, SFTP	
19	Image Stabilization	Stable image with Digital no ice reduction	

20	Security	Firmware encrypted / Signed, User account and password protection, IP Filter, Digest authentication, Device Certificate, TLS 1.2 / 1.3, Stream encryption, AES128/256, SSH/Telnet closed, Secure boot, Prevent brute-force attack, Audit User Access/System/Event log management	
21	HTTPs Streaming	Should Support	
22	I/O	Audio: Support Line in/out, Built-in Mic supporting G.711, H.726, AAC; Alarm Support	
23	Network Authentication	802.1x Network authentication	
24	Video Content Analytics (VCA)	Motion Detection, Scene Change, Tamper Detection, Object classification: Human, vehicle, Intrusion, Line Crossing Detection, Unattended Object Detection, Missing Object Detection, Audio Detection	
25	Back light Compensation (BLC)	Should Support	
26	Wide Dynamic Range	120 dB or Better	
27	Image Enhancement	Saturation, Contrast, Sharpness, Brightness/ Auto Exposure,/Gamma/ White balance/Intelligent Defog	
28	Noise Reduction	2 DNR, 3 DNR	
29	Surge Protection	Surge Protection	
30	Power	POE (802.3af/at), 12 V 2A or Better	
31	Operating Temperature	~30°C- +60°C or better	
32	Operating Humidity	95% or less	
33	Ingress Protection	IP67 Document Should be attached	
34	Impact protection	IK10 Document Should be attached	
35	MAC Address	The Mac Address of the Camera shall be registered in the name of the OEM	
36	ONVIF Compliance	S,G,/ T,/ M.Onvif Supported	
	Regulatory Approvals/	BIS-ER/STQC	

37	Certifications To be attach		
38	IP camera & Recorder	Should be same Make	
39	Condensation Compensation	Supported	
40	Reset	Hardware Reset: Secure with Reset button within Housing or Software reset retaining UN/PW/Network IP/Camera Zoom	
41	Streaming	Camera should have 3 streaming or better	
42	Body Type	The camera should have a metal body/ rugged enclosure suitable for indoor/outdoor deployment	

### **PTZ Camera**

S/N	Parameters	Descriptions	Compliance (Yes/No)
1	Resolution	Min. 4 MP (2592 x 1520)	
2	Sensor Type and Size	1/1.8" CMOS 4MP Progressive Scan	
3	Minimum Illumination	Color: 0.005 Lux, B/W: 0Lux (IR ON)	
4	Focal Length	5-200mm (+/-10% each side) (30x or better) Autofocus MFZ lens	
5	Iris	P-Iris/Auto Iris	
6	Field of View (FOV)	H: 60.7° ~ 2.33° V: 36.8° ~ 1.38	
7	Focus	Motorized Varifocal	
8	Aperture	F 1.6 - F4.7	
9	IR Details	IR Range: Up to 150m or better IR LED Wavelength: 850nm IR Switching: Auto/Manual	
10	Pan	Pan Range: 360°, Pan Speed:1°/s to 300°/sec	
11	Tilt Range	Tilt Range: -10° to 90° (auto-flip), Tilt Speed: 1°/s to 300°/s	
12	Presets	300	
13	Patrol	4 patrols	
14	Pattern	4 pattern scans	
15	Power Off Memory	Yes	
16	Audio IN & OUT	1-1	
17	Audio and Codec	Audio Streaming: Two way Audio Audio Compression : G.726, G.711 a-law/u-law	

18	Alarm In & Out	5-2	
19	SD Card	256gb or better	
20	No. of Stream Profiles	3	
21	Stream Profiles	Primary: 2592 x 1520/1920 x 1080/1280 x 720 Secondary: 1920 x 1080/704 x 576/640 x 480/352 x 288 Tertiary: 640 x 480/352 x 288/320 x 240 Four streams support	
22	Available Resolutions	2592 x 1520, 1920x1080, 720p, D1, VGA, 2CIF, CIF	
23	Max Resolution	2592 x 1520	
24	Bitrate	128kbps - 16Mbps	
25	Bitrate Type	CBR, VBR	
26	Video Compression	H.265 HEVC, H.264, MJPEG, Smart Codec	
27	Frame Rate	1-25fps	
28	Shutter Speed	1/15s - 1/30000s	
29	Optical Zoom	30x or better	
30	Digital Zoom	16x	
31	Image Stabilization	Required	
32	ONVIF Profiles	S, G, T/ M	
33	Edge Recording	Yes	
34	Motion Recording	Yes	
35	Event Type	Analytics alarm, Security alarm, Disk alarm, Recording alarm	
36	Defog	Required	
37	Privacy Masks	4	
38	WDR	True WDR (140dB)	
39	SNR	50dB or Better	
40	Image Enhancement	Saturation, Contrast, Sharpness, Brightness, Auto Exposure, Smart IR	
41	DNR	3D	
42	Video Analytics	Smart motion, Scene Change, Intrusion, Face detection, Line crossing detection, Unattended object detection, Missing object detection, Audio detection	
43	Alert	IP Conflict Alert, Network Disconnect Alert, Storage Full Alert	
44	Region of Interest	4, Programmable	



45	Supported Protocols	IPv4, IPv6, TCP/IP, HTTP, HTTPS, UPnP, RTSP/RTP/RTCP, IGMP/Multicas, SMTP, DHCP, NTP, DNS, DDNS, QoS, SNMP, 802.1X, UDP, ICMP, ARP, TLS	
46	Secure Boot	Yes	
47	Firmware	Signed / Encrypted	
48	Data Encryption	AES256	
49	IP Filtering	Yes	
50	HTTPs Streaming	TLS 1.2	
51	SD Card Data Encryption	Yes	
52	Network Authentication	802.1x	
53	Security	User account and password protection, Digest authentication, Stream encryption, SSH/Telnet closed, Secure authentication chipset built-in	
54	Web Login Protection	Yes	
55	Auto Tracking	Supported	
56	Power Supply	AC24V	
57	POE++ Support	IEEE 802.3 bt (Class 6)	
58	Power Consumption	Max 45W	
59	Operating Humidity	<90%	
60	Operating Temperature	Operating : -40°C to 70°C	
61	Communication Interface	1x Ethernet RJ-45	
62	Protection	IP67, IK10	
63	Regulatory Approvals/ Certifications To be attach	ER_BIS/STQC	
64	Body Type	The camera should have metal body/ a rugged enclosure suitable for indoor/outdoor deployment.	

-

**VMS****VMS Software**

S. No	Specifications	Compliances (Y/N)
1	The system should be easy to install, learn, operate and manage the VMS must have rich user interface that provides one click access, drag drop, menu, customizable GUI etc. to enhance operational efficiently in daily tasks and maintain the VMS shall have ability to respond fast & shall be applicable to all processes, functions, features, and screens of a video management system	
2	Scalability: The proposed video management system shall be able to support any no. of CCTV Cameras so as to accommodate any future expansion system shall support viewing of video from multiple locations and by multiple users the VMS shall support more than 500 or More cameras. The VMS shall have ability to receive and support recordings based on inputs or alarms, Event management. Support for Standard protocols: The VMS shall have ability to maintain independence from any one vendor & shall support open standard protocol i.e. ONVIF Profile S	
3	On screen help and instructions: the system should provide help and assistance through help guide on same station	
4	User management with user roles & privileges right to view, update shall be available	
5	Centrally controlled user management - Users, roles, rules, and privileges should be stored on the central VMS server allowing any authorized user to log into any workstation	
6	Recording server	
7	The system shall not restrict the number of recording camera	
8	Shall support dual streaming	
9	Shall allow each camera to be viewed independently by client viewer	
10	Shall support multiple storage form	
11	Shall support recording in all resolution at desired FPS	
12	Shall support video cum audio recording	
13	The VMS shall have ability to configure access privileges and other parameters for all users	
14	Support for event based or schedule based recordings to optimize bandwidth and storage	
15	customizable recording retention period for specific camera	
16	Remote users should support at least 10 remote users via network/web browser/client software	
17	wizard driven installation of software updates for VMS server and client machines	
18	Copy or clone option to install new device based on already configured device	
19	The VMS shall have ability to easily install, configure, modify, search and remove surveillance devices with automatic discovery of IP devices using external tool or in built options	
20	The VMS shall have ability to logically group device based on installation location & device type	
21	The VMS shall have ability to search and view devices based on standard criteria like camera ID/Name, Location, Group, etc.	
22	The VMS shall have ability to enforce access privileges (view /add /edit/ Remove) to device (s).	
23	provision for independent storage settings for individual camera feeds	
24	The VMS shall have ability to configure multiple streams with different quality parameters e.g. codec (H.264, JPEG), Resolution, frame & bit rate etc.	
25	The VMS Shall have ability to create and assign pre-configured views/layouts for monitoring including features like	

26	The VMS shall support Sequencing in Views, whereby the pre-sets of PTZ cameras as well as fixed cameras are cycled on a timed basis, within a single view or within the view port of a multiple camera view.	
27	The VMS shall support sequence views. A sequence view consists of a single camera view, which can be cycled on a time basis. Pan-tilt-zoom cameras, which support pre-set positions, can have these pre-sets cycled on a time basis. In this way an operator can view a variety of pre-sets on a series of PTZ cameras. Fixed cameras can also be included in the Sequence and cycled accordingly,	
28	Special views for wide screen monitors,	
29	Granting or revoking permission to use the view etc.	
30	Setup Virtual matrix on operator workstation monitor	
31	Basic recording options [Full, Scheduled recoding, Motion detection recording, external/internal hardware or software events / trigger-based recording]	
32	Advanced recordings options [Video only, Video plus Audio, Retention rules, Archive/back-up rules, and storage limits report set.]	
33	PTZ configuration including pre-sets, patterns, patrolling, masking, priority and permissions should be possible from camera web page	
34	Multiple monitor support: The system should allow connecting minimum 2 or more as per proposed Solution multiple monitors on single client workstation (loaded with suitable graphics card) and display different contents on each of the connected monitor.	
35	All panes / tiles should indicate mode (live or recoded), source (camera name/location) and date/time and applied quality information (FPS, CODEC). A matrix view should support minimum 2x2, 3x3, 4x4 on small monitors and 9x9 formats on video wall and any number of multiple screen divisions.	
36	PTZ controls: When PTZ is deployed and enabled, system should offer a separate Control panel for PTZ operations. The control panel should include list of pre-sets, patterns, tours, eight directional & home positions and zoom-in & zoom-out buttons.	
37	System should allow creating a still image from live or recorded feed and storing it into a workstation.	
38	Replay facility with timeline control to display and play back recorded video for one or more cameras. Playback shall be possible on 1 or more cameras simultaneously for all cameras currently displayed in the Video Workspace.	
39	The VMS shall have ability to bookmark / add-to-favourites in both live and playback modes. Bookmarks shall be created, search, removed by the owner.	
40	Digital zoom to enlarge portion of an image to provide superior zooming capability.	
41	The VMS shall have ability to Start/Stop Recording on demand (manually).	
42	Option to view surrounding cameras: The system should enable operators to configure camera feed and based on group/subgroup details.	
43	Evidence export feature: The system should allow users to export audio/video evidence in open format for internal investigation or to share authentic proof to public authorities and outside agencies.	
44	The VMS shall provide an advanced search of recorded video. The search shall be based on recording time, camera and recording details. Wildcards shall be accepted for the Point ID, description, area, priority.	
45	The system should offer following playback controls Play/Pause	

	Forward playback Reverse playback Frame forward frame rewind	
46	Evidence Printing: Option to create and print a small surveillance open that includes image(s) and comments about recorded incident from command control system.	
47	The system should enable users to view different graphics to preconfigured displays.	
48	The system/camera should offer options to set Brightness, Contrast, Sharpness etc.	
49	The facility should be there to extract & save the video footages / images on CD, DVD, USB, External Storage etc.	
50	A) The system shall offer the ability to create and edit layouts without changing the current layout.	
	B) The layouts shall be able to be saved, backed up and restored.	
	C) Loading layouts: Load selected layout from the saved layouts. Default Layout: Should automatically get launched when the controller boots up.	
	D) Delete Layout: There shall be provision to delete the existing layout from the list.	
	E) Launching Sources: Facility to display the input source/s on the video wall.	
	F) Displaying all available sources: Adds all input sources on the video wall in a sequence.	
	G) Custom Grids: User can define custom grids for easy drag & drop of sources anywhere on the wall.	
51	H) Drag and Drop Sources: Drag and drop sources on user defined grid for easy alignment of sources.	
	Device Import: Should facilitate importing device configuration data from Excel (.xlsx) or CSV (.csv) files, processing each record individually with validation and error handling.	
52	Auto-Switching Camera Display: The system should enable automated cycling of camera feeds for efficient monitoring, both in single-screen and multi-screen environments.	
	<b>Modes:</b> 1) Single-Screen Carousel Mode: Automatically cycles through cameras from a selected group on a single screen, displaying each feed for a configurable duration. 2) Multi-Screen Group Rotation: Distributes cameras from a group across multiple available screens and rotates entire groups at specified time intervals. 3) Multi-Screen View Rotation: Automatically switches between saved views at set intervals.	

**VMS Server**

Details	Specification	Compliance	Deviation
Processor	Intel Xeon 6325 P 3.5 GHz 4 core, & 4 logical processor/ AMD or equivalent		
RAM	Min. 128 GB memory DDR5 or above		
OS Hard Drive	Dual (RAID1) 480GB SSDs		
Operating System	Microsoft latest Windows® Server 64-bit (2022 and above)		
Video Adaptor	Display Adapter with Video resolution 1024x768 pixels or higher ; 32-bit color or higher		
Optical Drive	DVD+/-RW (Optional)		
Networking	min 2x1GbE LAN ports		
Power	Hot Swap Redundant power supply		
Chassis	1U, including rack mounting kit		
Human Interface	102-key keyboard and a mouse pointing device		
Warranty (Year)	Minimum 01 years or as per OEM standard which ever is higher		

**Recording Server**

Details	Specification	Compliance	Deviation
Processor	Intel Xeon Silver 6325 / AMD EPYC 7302 or equivalent		
RAM	Min. 256 GB DDR5 or above		
OS Hard Drive	2 * 1 TB SSD HDD; Protected by RAID 1		
Operating System	Windows Server 2025 or higher Microsoft SQL Server 2025 or higher		
Video Adaptor	Standard Video Adaptor		
Video Output	VGA * 2 nos		
Maximum bandwidth	Total (Input +Output) 1500 Mbps		
Networking	4x1GbE LAN ports		
USB Ports	Min. 3 nos		
Audio Ports	Line In, Line Out, Mic In		
Accessories	Keyboard, Mouse		
Video Storage Drive	Video rated or Enterprise drives		
	Internal SSD drives supporting Up to 12 bays, 24TB or higher each.  <ul style="list-style-type: none"> <li>• 24x7 for a period of 90 days in full HD at</li> </ul>		

Storage	25fps with RAID 5 <ul style="list-style-type: none"> <li>The Contractor must submit the storage calculation. Simultaneous play back and recording at full duplex operation.</li> </ul>		
RAID Controller	Supported RAID levels 0, 1, 5, 6, 10; Hot Spare support		
Power Supply	1+ 1, Hot Plug, Redundant Power Supply		
Chassis with locking bezel	2U, including rack mounting kit		
Hardware Cybersecurity	TPM 2.0		
Regulatory	CE/EN, FCC, RoHS		
Warranty (Year)	Minimum 01 years or as per OEM standard whichever is higher		

-

-

### **VMS Client Workstation**

-

S/N	Parameters	Descriptions	Compliance (Yes/No)
1	CPU	14 <sup>th</sup> Gen Intel core i7-14000K /AMD Ryzen 9 7900X processor or higher	
2	Memory	Min. 64 GB DDR5 or higher	
3	Hard Disk	Total 1 TB SSD	
4	Video card	16GB Nvidia Ge Force RTX series or AMD Radeon RX 7800 XT (16GB) or better Dual port Graphics card with HDMI/Digital compatibility	
5	Display	24" LED	
6	Mouse and Keyboard	Wireless mouse and keyboard, Mouse pad with wrist support	
7	Network adapter (NIC)	Two (02) number of GE Ports ( 10/100/1000 Mbps)	
8	Wireless	Minimum 1 Gbps Wi-Fi Wireless Network Adapter for Desktop PC with 2.4GHz/5GHz High Gain Dual Band 5dBi Antenna Wi-Fi with Bluetooth connectivity of 4.0 or better, supports latest Windows OS version provided	
9	Sound card	In-Built	
10	DVD writer	DVD RW/ Blu-Ray combo internal/external	
11	Ports	2 nos. USB 3.0 at front panel and 02 nos. USB 3.0 at rear side, Ethernet LAN, 02 nos. HDMI	
12	Operating System	Latest Windows OS	

-

### **55 Inch Display**

S/N	Parameters	Descriptions	Compliance (Yes/No)
1	Screen Size (Inches)	55 inch	
2	Audio Power (minimum)	20 W	
3	Maximum Resolution (Pixels) supported	4K Ultra HD (UHD): 3840x2160	
4	Salient Feature	Inbuilt Speakers, Wall Mount bracket	
5	Standby Mode	0.3W	
6	Power Supply (Voltage, Hz)	100V ~ 240V, 50/60 Hz	
7	Input port	HDMI (3) USB (2) RS232 In Lan IN (1)	
8	Output Port	Audio Output	
9	Refresh Rate	60Hz	

-

## BOQ/ BOM - Bill of Material

S/N	Active Component	UOM	Qty
1	Core Router with 16 1/10 Gig Ports	Nos	
2	Layer 3 24 Port SFP+ Distribution switch and 25/40-Gig with RPS & Accessories	Nos	
3	24 Port POE + switch 10/100/1000 Mbps with SFP/SFP28 & Accessories	Nos	
4	48 Port POE + switch 10/100/1000 Mbps with SFP/SFP28 & Accessories	Nos	
5	12 Port POE + switch 10/100/1000 Mbps with SFP/SFP28 & Accessories	Nos	
5	Next Generation Firewall with Reporting & Management Hardware	Nos	
6	VMS System - Intelligent Image Processing with AI Based Triggers	Nos	
7	Servers including Storage Server		
8	30KVA 3-PH UPS	Nos	
9	5 Years OEM Support/Warranty Cost	Nos	
10	Resident Engineer - working minimum 40 hours/ week for 5 Years	Nos	

-

-

S/N	Passive Component	UOM	Qty
1	Cat-6A U/UTP Copper Cable	Mtr	
2	Cat-6A 24Port Unloaded Patch Panel	Nos	
3	Cat-6A Information outlet for Rack side	Nos	
4	Cat-6A Information outlet for field side	Nos	

5	Cat-6A Singlex face plate with Backbox	Nos	
6	Cat-6A Duplex face plat with Backbox	Nos	
7	Cat-6A Patch Cord 2 Meter	Nos	
8	06 Core Fiber cable OM4 MM	Mtr	
9	12 Core LIU with loaded all accessorises	Nos	
10	24 Core LIU with loaded all accessorises	Nos	
11	LC LC Fiber Patch cord type 3mtr	Nos	
12	Cable Manager	Nos	
13	25MM PVC conduit	Mtr	
14	100MM GI Raceway	Mtr	
15	200MM GI Raceway	Mtr	
16	300MM GI Raceway	Mtr	
<b>B</b>	<b>Rack Component</b>		
1	Supply of 12U Rack 600x600 MM	Nos	
2	Supply of 15U Rack 600x600 MM	Nos	
3	Supply of 18U Rack 600x600 MM	Nos	
4	Supply of 42U Rack 1000x1000 MM	Nos	

<b>S/N</b>	<b>Passive Services Boq</b>	<b>UOM</b>	<b>Qty</b>
1	Laying of Cat-6A Cable in raceway	Mtr	
2	Ferrulling & Continuty Testing of Cat-6A	Nos.	
3	Termination of UTP Cable Cat-6A I/OS	Nos.	
4	Installation of Jack panel 24 port Cat 6A	Nos.	
5	Installation of Cable Manager	Nos.	
6	Installation of Singlex Face plate	Nos.	
7	Installation of Duplex Face plate	Nos.	
8	Labeling of UTP Cat6A Patch cord	Nos.	
9	Testing of UTP Cat-6A Lan point	Nos.	
10	Laying of Fiber cable	Mtr	
11	Installation of LIU Including labelling	Nos.	
12	Fusion Splicing with Faruling Taging	Nos.	
13	Testing of fiber Pigtailes	Nos.	
14	Patching of Fiber patch cord and labelling	Nos.	
15	Installation of Network Rack 12U	Nos	
16	Installation of Network Rack 15U	Nos	
17	Installation of Network Rack 18U	Nos	
18	Installation of Network Rack 42U	Nos	
19	Rack Dressing of 12U Rack	Nos	
20	Rack Dressing of 15U Rack	Nos	
21	Rack Dressing of 18U Rack	Nos	
22	Rack Dressing of 42U Rack	Nos	
23	Laying of PVC/PPE (per meter)	Mtr	
24	Installation of Raceway	Mtr	
25	Installation of Switch Rauter Active	L/S	
28	Project management & Documentation	L/S	
<b>S/N</b>	<b>CCTV Component</b>	<b>UOM</b>	<b>Qty</b>
1	Dome Camera 5MP	Nos	
2	5MP Bullet Camera	Nos	



3	5MP PTZ Camera	Nos	
4	Video Management System		
5	Enterprise VMS: 500 Camera Annual Upgradation Licence		
6	55" Display	Nos	
8	Hard Disk - 16 TB	Nos	
9	Workstation with display	Nos	

S/N	CCTV Component	UOM	Qty
1	<p>Supply, Installation, Testing &amp; Commissioning of 5MP IP MFZ Lens IR Rugged Dome Camera with minimum specifications as: Embedded Quad Core Arm based processor, Sensor Size: 1/2.8" CMOS; Effective Pixels: 2592 x 1944; Lens: 2.7mm~13.5mm Motorized Focus &amp; Zoom lens with Auto ICR (Infrared Cut Filter); Gyro based Electronic Image Stabilization; Min. Illumination: Colour: 0.005 lux &amp; B/W: 0 lux (IR On); Electronic Shutter: 1/3 ~ 1/100,000s; Smart IR with up-to 50m IR distance; Light Compensation: BLC, HLC, WDR 130dB; Advance Video Compression: H.265 HEVC, H.264, MJPEG, Smart Codec; Streams: Four Video Streams configurable at H.265/H.264, with 2 streams simultaneous at 5MP; Frames: Max 50 FPS; Noise Reduction (3DNR); Minimum Edge Intelligence: Motion Detection, Scene Change, Tamper Detection, Object Classification (Human, Vehicle, Animal), Smart Motion, Smart Intrusion, Smart Loitering, Smart Line Crossing Detection, Unattended Object Detection, Missing Object Detection, People Counter, Queuing, Crowd Gathering, Heat Map, Face Detection, Audio Detection, Defog; 5 Privacy Mask and 6 ROI support; Security: Firmware encrypted &amp; Signed, SD card encryption, User account and password protection, HTTPS, IP Filter, Digest authentication, Device Certificate, TLS 1.2 &amp; 1.3, Stream encryption, AES128/256, SSH/Telnet closed, Secure boot, Prevent brute-force attack, Audit User Access/System/Event log management; Local Storage: 2TB Micro SD/SDHC/SDXC card slot; Breathable membrane to minimize condensation; Alarm I/O support: 1 In/1 Out; Two-way Full Duplex Audio Support: Line in/out, Built-in Mic; G.711, G.726, AAC audio compression; Environmental Protection: IP66, IP67, IK10 with Die Cast Aluminum Housing with earthing terminal; Power: DC12V, PoE (IEEE 802.3af); Operating temp range: -30°C to 60° C; Inbuilt 4KV Surge Protector as per EN55035 standard; Relative Humidity: Less than 95%; Certifications: ONVIF Profile S, G, T, M (Listed on ONVIF Website); Safety: UL 62368-1, BIS-IS 13252; Reliability: IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-11, IEC 60068-2-27, IEC 60068-2-64, IEC 60068-2-78; Emission: FCC PART 15, CE (EN 55032), ICES-003; Immunity: CE (EN 50130-4, EN 55035); Environment: RoHS, REACH, WEEE; Cyber Security: BIS ER, STQC, PCI Data Security Standard, Secured by Default &amp; NDAA Sec 889. Complete with Brackets suitable for wall / ceiling mounting as per site conditions. Vendor to consider and quote all necessary additional accessories required to make the system functional.</p> <p>Note - Compliance of the product should be provided on OEM Letter Head</p>	Nos	
	Supply, Installation, Testing & Commissioning of 5MP IP MFZ Lens IR Rugged Bullet Camera with minimum specifications as: Embedded Quad		

2	<p>Core Arm based processor, Sensor Size: 1/2.8" CMOS; Effective Pixels: 2592 x 1944; Lens: 2.7mm~13.5mm Motorized Focus &amp; Zoom lens with Auto ICR (Infrared Cut Filter); Gyro based Electronic Image Stabilization; Min. Illumination: Colour: 0.005 lux &amp; B/W: 0 lux (IR On); Electronic Shutter: 1/3 ~ 1/100,000s; Smart IR with up-to 70m IR distance; Light Compensation: BLC, HLC, WDR 130dB; Advance Video Compression: H.265 HEVC, H.264 , MJPEG, Smart Codec; Streams: Four Video Streams configurable at H.265/H.264, with 2 streams simultaneous at 5MP; Frames: Max 50 FPS; Noise Reduction (3DNR); Minimum Edge Intelligence: Motion Detection, Scene Change, Tamper Detection, Object Classification (Human, Vehicle, Animal), Smart Motion, Smart Intrusion, Smart Loitering, Smart Line Crossing Detection, Unattended Object Detection, Missing Object Detection, People Counter, Queuing, Crowd Gathering, Heat Map, Face Detection, Audio Detection, Defog; 5 Privacy Mask and 6 ROI support; Security: Firmware encrypted &amp; Signed, SD card encryption, User account and password protection, HTTPS, IP Filter, Digest authentication, Device Certificate, TLS 1.2 &amp; 1.3, Stream encryption, AES128/256, SSH/Telnet closed, Secure boot, Prevent brute-force attack, Audit User Access/System/Event log management; Local Storage: 2TB Micro SD/SDHC/SDXC card slot; Breathable membrane to minimize condensation; Alarm I/O support: 1 In/1 Out; Two-way Full Duplex Audio Support: Line in/out, Built-in Mic; G.711, G.726, AAC audio compression; Environmental Protection: IP66, IP67, IK10 with Die Cast Aluminum Housing with earthing terminal; Power: DC12V, PoE (IEEE 802.3af); Operating temp range: -30°C to 60° C; Inbuilt 4KV Surge Protector as per EN55035 standard; Relative Humidity: Less than 95%; Certifications: ONVIF Profile S, G, T, M (Listed on ONVIF Website); Safety: UL 62368-1, BIS-IS 13252; Reliability: IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-11, IEC 60068-2-27, IEC 60068-2-64, IEC 60068-2-78; Emission: FCC PART 15, CE (EN 55032), ICES-003; Immunity: CE (EN 50130-4, EN 55035); Environment: RoHS, REACH, WEEE; Cyber Security: BIS ER, STQC, PCI Data Security Standard, Secured by Default &amp; NDAA Sec 889. Complete with Brackets suitable for wall / ceiling mounting as per site conditions. Vendor to consider and quote all necessary additional accessories required to make the system functional.</p> <p>Note - Compliance of the product should be provided on OEM Letter Head</p>	Nos	
	<p>Supply, Installation, Testing &amp; Commissioning of 4MP TDN IR 40X Network IR PTZ Camera with minimum specifications as: Sensor Size: 1/1.8" CMOS, Progressive Scan; Effective Pixels: 2592 x 1520; Lens: 5mm~200mm (+/- 10% on each side), 40X optical zoom, DC-IRIS lens with Auto ICR (Infrared Cut Filter); Frames: 25 FPS for all resolution, 50 fps @ 1080p; Min. Illumination: 0.005 lux @ Color &amp; 0 lux IR On; Electronic Shutter: 1/30,000 - 1/1; Smart IR with up-to 450m IR distance; Light Compensation: BLC, HLC, WDR 140dB; Advance Video Compression: H.265 HEVC, H.264 , MJPEG, Smart Codec; Streams: Triple Video Streams configurable at different Resolutions and FPS using H.265/H.264; Noise Reduction (3DNR); PTZ: 400 presets, 4 Patrols, 4 Tours and Auto Pan Scan support; Minimum Edge Intelligence: Smart motion, Scene Change, Intrusion, Multi loitering, People counter, Face</p>		

3	<p>detection, Line crossing detection, Unattended object detection, Missing object detection, Audio Detection, Auto-Tracking; Defog and Image Stabilization; 5 Privacy Mask and 5 ROI support; Security: HTTPS, TLS 1.2, Stream encryption, AES-128/256, Secure boot and Secure authentication Hardware Encryption Chipset Built-in; 1TB SD card support with SD card encryption, Signed and Encrypted firmware; Alarm I/O support: 7 In/2 Out; Two-way Audio Support: Line In /Out; Power: AC24V, HPOE, Heater; Environmental Protection: IP67, IK10; Operating temp range : -40°C to 70° C. Certifications: ONVIF Profile S, G, T, M (Listed on ONVIF Website); UL 62368-1, CE (EN 50130-4 &amp; EN 55032), FCC Part 15, RoHS, PCI Data Security Standard, Secured by Default &amp; NDAA Sec 889 compliant. Complete with Brackets suitable for wall / pole mounting as per site conditions. Vendor to consider and quote all necessary additional accessories required to make the system functional.</p> <p>Note - Compliance of the product should be provided on OEM Letter Head with 5 Years Warranty.</p>	Nos	
---	---	-----	--

UPS features	Unit	Desired Specifications	Supplier data
<b>Rectifier features</b>			
Nominal voltage	(Vac)	380 / 400 / 415 three-phase + N	
KVA rating	(V)	30kVA	
Voltage tolerance at 100% load for non-intervention from battery	(Vac)	315 , 465	
Voltage tolerance at 50% load for non-intervention from battery	(Vac)	210 , 465	
Nominal frequency (Hz selectable)	(Hz)	50 / 60Hz	
Frequency tolerance	(Hz)	45 – 65	
Input power factor @ 100% load	-	0.99	
Input current harmonic distortion	(%)	≤3 for linear load	
<b>Battery features</b>			
Standard battery	-	SMF VRLA	
Battery Make	-	Exide/Quanta	
Backup Time	min	60min	
Minimum VAH	VAH	54720VAH	
DC Bus Voltage	(Vdc)	384-480 V	
End cell Voltage	(V)	1.75	
Charging current	(V)	10% Of AH Rating required	
Charging Period/Time	Hrs	8-10Hrs Maximum	
<b>Inverter output features</b>			
Nominal voltage	(Vac)	400 three-phase + N	

Nominal frequency (60 Hz selectable)	(Hz)	50	
Nominal apparent power	(kVA)	30kVA	
Active power	(kW)	30kW	
Output Power Factor	-	Unity	
Static voltage stability with input voltage within the accepted limits and load variation from 0 to 100%	(%)	±1	
Dynamic voltage stability with instantaneous load variation from 0 to 100%	(%)	±3	
Load peak factor without derating	-	3:1	
Output voltage distortion with 100% linear load	(%)	≤ 3	
Output voltage distortion with 100% of non-linear load as specified in IEC/EN 62040-3 standard	(%)	≤ 6	
Output frequency stability with internal oscillator	(%)	0.01	
Overload capability	(%) (%)	Upto 110% for 1 Hour ,125% for 10 Min & 150% for 1 Min	
Short circuit current: $>2.5 I_n$	(s)	<50ms	
<b>Static switch features</b>			
Nominal voltage (380 - 415 selectable)	(Vac)	400	
Voltage range (adjustable)	(Vac)	± 10%	
Nominal frequency (60 Hz selectable)	(Hz)	50	
Frequency range	(%)	47- 53Hz	
Noise level measured @ 1 metre and at 100% of the load according to ISO 3746	(dBA)	≤65dBA	
AC/AC performance under double conversion operation at 100% load	(%)	≥94 (30 KVA)	
AC/AC performance under double conversion operation at 50% load	(%)	≥90 (30 KVA)	
Performance during under ECO mode operation at 100% load	(%)	≥98	
Cabinet protection rating	-	IP 20	
Cabinet colour	-	RAL 7016	

