Request for Proposal
for
Selection of Agency for Operation & Maintenance of Gujarat State-Wide Area Network (GSWAN) on behalf of Department of Science & Technology, Government of Gujarat

Volume-II
(Scope of Work and SLAs)

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Abbreviations

1. **GoG**: Government of Gujarat
2. **DST**: Department of Science & Technology
3. **GIL**: Gujarat Informatics Limited
4. **GSWAN**: Gujarat State Wide Area Network
5. **GSDC:** Gujarat State Data Centre
6. **GSCAN**: Gujarat Sachivalaya Campus Area Network
7. **OEM:** Original Equipment Manufacturer
8. **O&M:** Operations & Maintenance
9. **EMS:** Enterprise Management Suite
10. **NMS:** Network Monitoring System
11. **EMD:** Earnest Money Deposit
12. **PBG:** Performance Bank Guarantee
13. **SLA:** Service Level Agreement
14. **FAT:** Final Acceptance Test
15. **TPA:** Third Party Agency
16. **SoW:** Scope of Work
17. **IPS:** Intrusion Prevention System
18. **IMS:** Integrated Infrastructure Management System
19. **CCTV:** Closed Circuit Tele Vision
20. **MP:** Monthly Payment
21. **TENDERER**: GIL/ DIT/ Government of Gujarat

Section I: Introduction

1.1. Gujarat State Wide Area Network (GSWAN)

Government of Gujarat implemented the Gujarat State Wide Area Network (GSWAN 1.0) in the year 2001-02 and it has been upgraded time to time. The current GSWAN 2.0 has been upgraded in Year 2016-17. The end-to-end IP based network has been designed for the service convergence (Voice, Video and Data) on the same backbone. The key objectives were:

- To modernize the intra-governmental communication setup
- To improve administrative effectiveness and efficiency
- To facilitate improvements in the Quality of Public services

1.1.1. GSWAN Overview

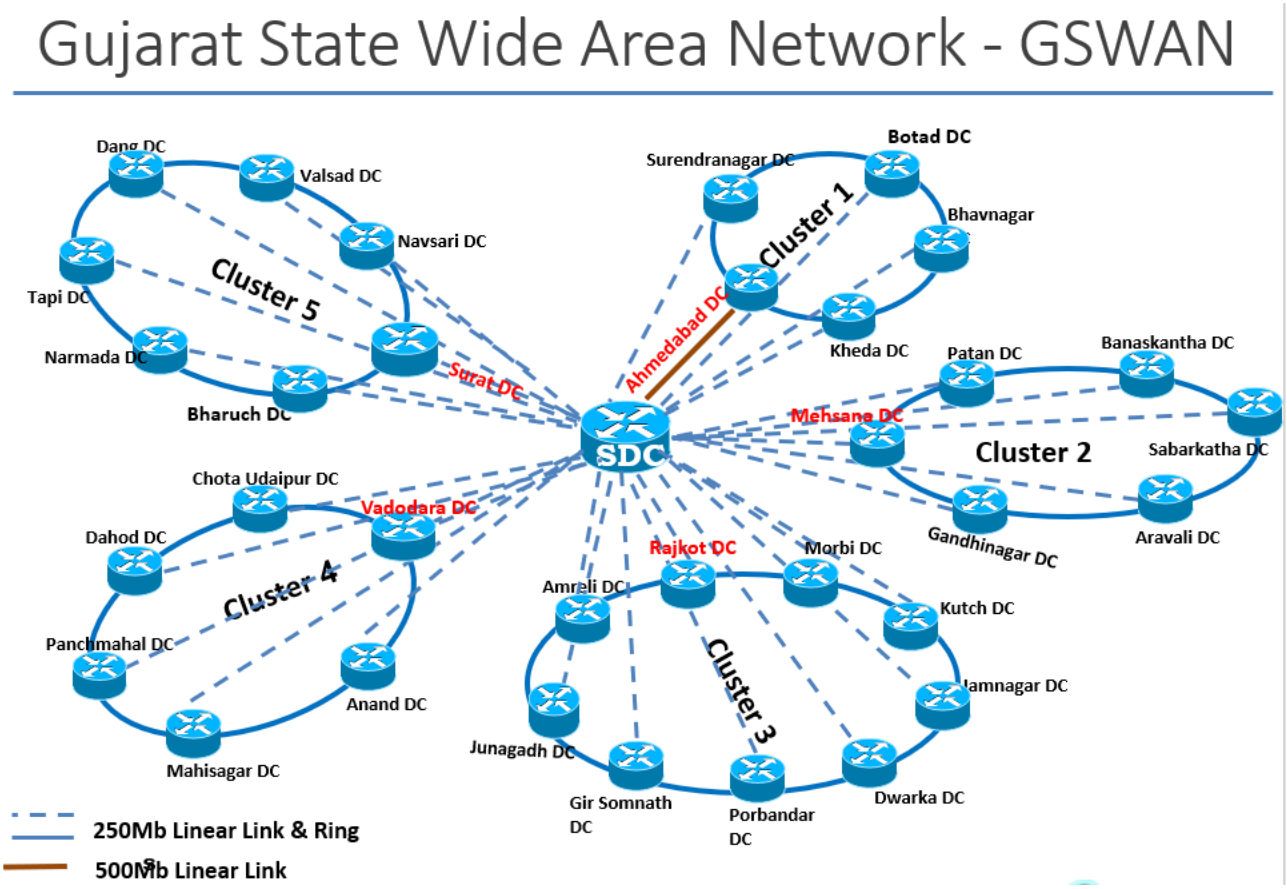
- GSWAN is one of the largest IP based Multi Service IT infrastructure connecting all Districts and Talukas to State capital Gandhinagar.
- The end-to-end IP based network was designed for catering G2G Data and Video services on the same backbone.
- More than 6000 Horizontal Office locations of Government and semi-government offices are connected with GSWAN.
- All District Centers (DC) are connected to State Capital (SC) through 1 Gbps/500 Mbps/250 Mbps Leased Circuits aggregating at the State Data Centre (SDC).
- All Taluka Centers (TC) are connected to respective DC through 100 Mbps/200 Mbps Leased Circuits.
- All DCs are interconnected through BSNL Leased Circuits for redundancy.
- ALL TCs are interconnected through BSNL Leased line circuit for redundancy.
- GSWAN at present has a user base of over 70,000.
- Core Internet Bandwidth of 30 Gbps through National Knowledge Network (NKN), 2 Gbps through BSNL redundant Internet Service Providers and BGP implemented between these 2 ISPs.
- More than 650+ Websites and Applications accessible to users hosted at State Data Center through GSWAN.
- More than 250 Video Conferencing End Points and 8 Multi Conferencing Units (MCU's) are operational on GSWAN.

1.1.2. Existing GSWAN Network Architecture

- The current GSWAN 2.0 has been implemented on MPLS (Multi-Protocol Label Switching) based network architecture.
- Multiprotocol Label Switching (MPLS) enable GSWAN has been upgraded as next- generation intelligent network that can deliver a wide variety of advanced, value-added services. User departments with differing access links can be aggregated on an MPLS edge without changing their current environments, as MPLS is independent of access technologies.
- Integration of MPLS application components, including Layer 3 Network, Layer 2 Network, Traffic Engineering, Quality of Service (QoS) and IPv6 will enable creation of a highly efficient, scalable,

and secure GSWAN that will guarantee Service Level Uptime and Availability.

- The current architecture is shown as under:



- The history of GSWAN leased line Bandwidth up-gradation is as under :

Sr. No.	GSWAN 1.0	GSWAN 2.0
1	**34 Mbps**(SHQ to DHQ)	**1 Gbps /500 Mbps /250 Mbps**(SHQ to DHQ)
2	**10 Mbps**(DHQ to BHQ)	**200 / 100 Mbps**(DHQ to BHQ)
3	**34 Mbps**(DHQ to DHQ)	**500 / 250 Mbps**(DHQ to DHQ)

First tier	Secretariat Centre Center (SC)	• Secretariat Center (SC) at state capital, Gandhinagar, from where the highest office of Government functions in the state. • Various departments and hundreds of subordinate offices located at the state capital are connected to SC horizontally through SCAN (Secretariat Campus Area Network) including State Datacenter • SCAN has about 9000 Ethernet extensions at Gandhinagar and all these are interconnected with GSWAN at SDC level for information exchange. • 33 GSWAN Hotline phone connections have been provided to various offices at Secretariat for direct voice communication to any GSWAN node in the state (at District or Taluka level).
Second Tier	**District Centres (DC)**	• Second Tier constitutes District Centers (DCs) located at district collector's office and multiple district level other offices connected with DC horizontally. • All 33 DCs are connected on 1 Gbps/500 Mbps/250 Mbps leased lines with SC. • Gandhinagar DC is a part of SCAN infrastructure. • GoG evaluated several options to achieve cost effective, flexible and scalable connectivity for all horizontal offices and used Cat- 5 or above, OFC, JFC, wireless VSAT on case to case basis.
Third Tier	**Taluka centres (TC)**	• Third Tier constitutes Taluka Centers (TCs), located at Taluka Mamlatdar office and Taluka Development Office. • At TCs provision are kept for connecting Taluka level other offices horizontally. • All Talukas are connected to DC with 200Mbps/100 Mbps Leased Lines from BSNL. • In each of the stations, there is a state-of-the-art Router, which terminates the Leased Line. These routers route IP packets intelligently throughout the network, and provide the Quality of Service (or QoS) features to enable convergence of voice, video and data on to a single network infrastructure.
Forth Tier	**Gram Panchayat (GP)**	• Over and above, forth tier is under process to provide intranet and internet to GP leveraging GFGNL connectivity. • Further it is also plan to provide horizontal connectivity from GP to various village level government offices like primary School, PHC, Forest, Police , Anganwadi, etc.

1.1.3. GSWAN Wi-Fi

Government of Gujarat has implemented GSWAN Wi-Fi infrastructure to provide wi-fi connectivity to various Government offices in Gandhinagar and selected locations at the District and Taluka in the State.

1.1.4 GSWAN SCAN

Using latest and state-of-the art technology, the Government of Gujarat (GoG) has established Gujarat Sachivalaya Campus Area Network (GSCAN) to improve the administrative efficiency in the Sachivalaya Campus and other main offices campus in Gandhinagar. The GSCAN has been implemented as the backbone network for data, video and voice communications throughout the New Sachivalaya, SS-1, SS-2, Old Sachivalaya, various RU (Remote Unit) locations, other main office Campus locations for the Government operations in Gandhinagar. GSCAN has modernized the communication set up for Intra-Government and Government-Citizen services. GSCAN has a suitable topology, uses state-of-art technologies and has flexibility to expand/upgrade to cover all parts of the Sachivalaya. All Government communication and IT infrastructure would be linked to GSCAN.

Current GSCAN has been implemented to provide Data / Voice / Video services to various designated offices at Sachivalaya and other locations in Gandhinagar. The key applications envisaged on the network are Internet, Video Conferencing, Voice and Data Communication and Intranet Operation.

1.2. Gujarat State Data Centre (GSDC)

Government of Gujarat has set up Gujarat State Data Center (GSDC) in Gandhinagar, the State capital. GSDC includes 2600 sq.ft of server & storage area, 600 sq.ft of connectivity zone and 1300 sq.ft of control room & utility area. GSDC has been connected to all the Government offices through GSWAN infrastructure and is operationalized since 2008.

1.2.1. GSDC Overview:

Connectivity Zone (Network Room): 600 Sq. ft	• Firewall • Intrusion Prevention System • DMZ (Demilitarized zones) • Link Load Balancer for multiple ISP's link, SLB, WAF etc. • Routers and Layer 2/3 switches for network
Network Operation Center (NOC) Area: 2500 Sq. ft	• 24x7 Monitoring and Management facility for GSDC and GSWAN • Operations and Management Team seating arrangement for approx. 50+ personnel

Section II: Scope of Work

GSWAN is the core network of the state of Gujarat through which voice, data & video related applications are being used by all government departments & its field offices in a big way. Also, during the last decade, dependency on network connectivity & its availability has become so high due to deployment of various government intranet applications as well as citizen centric applications. It is envisaged that selected agency shall not merely focus on carrying out O&M of network to achieve the uptime as per SLA but also to progressively improve the satisfaction of network users by achieving reduction of complaints, by improving processes and implementation. Agency is expected to improve the reduction of network downtime due to fibre cut, power outage, RF radio related issues & other issues by close co-ordination with all stakeholders like connectivity service providers, various other implementing agencies, GSWAN users at district, taluka & other government offices, power utility agencies, Road & Buildings dept. offices, etc. Selected agency is expected to arrange monthly meetings such as war room discussions with all important stakeholders for improving upon the close co-ordination & issue resolution thereby improving efficiency & efficacy of the overall network. With an objective to improve user satisfaction & reduce number of complaints / call, over and above the routine O&M scope of the network, various measures are introduced in this RFP like -user education & awareness for availing and better utilization of GSWAN services & to log complaints; Incentives for improvisation of services as well as skills up-gradation & training of deployed manpower.

The scope of work under this RFP is Operations, Management & Maintenance Component: O&M of IT and Non-IT Infrastructure under GSWAN.

2.1. Key Action points for IT & Non-IT Infrastructure in GSWAN

2.1.1 The currently GSWAN has been implemented on ring architecture with three rings connecting Secretariat Centre (SC) to all DCs and 05 Clusters (Ahmedabad, Vadodara, Surat, Rajkot, and Mahesana) with 250+250 Mbps bandwidth, District Centre (DC) to District Centre (DC) ring (33 Districts) with 1 Gbps/500 Mbps/250 Mpbs bandwidth and Taluka Centre (TC) to Taluka Centre (TC) ring with 100/200 Mbps bandwidth and s 576+ PoPs on 20/50/100 Mbps bandwidth.

2.1.2 At this stage, there is no upgradation required at Districts and Taluka locations under GSWAN network. However, Bidder at its discretion, may upgrade or replace the equipment/system/device (without any extra cost to GoG) with equivalent or better capabilities if any require to deliver the required services as defined in this RFP. In such replacement or upgradation, Bidder is responsible for following :

a) The bidder shall install, configure, integrate and commission all such systems.

b) The bidder shall depute adequate skilled resources to ensure that such implementation and commissioning activities are carried out on schedule.

c) The bidder shall submit a detailed test plan and test cases for each solution, that will be used to carry out the UAT (user acceptance test) and FAT (final acceptance test)

d) **Migration Plan: -** The bidder will have to ensure successful migration wherever applicable without disturbing the existing services running on GSWAN, GSDC, GSCAN and GoG Wi-Fi. The bidder will have to suggest the migration plan for the same and will have to obtain an approval from GoG, before implementation.

e) As part of the project completion documentation, the bidder shall submit the documentation, which should at least contain

- As-implemented configurations
- As-implemented architecture and topology diagrams
- Standard operating procedures for administration of the installed devices.

2.1.3 The bidder is required to carry out following tasks**:**

a) Currently there are about 70,000+ users on GSWAN. This number is expected to increase to 1.5L in future course as GSWAN is being expanded rapidly.

b) GoG has implemented a centralized WLAN Controller (CISCO 8500 Series) at SDC, Wi-Fi has been provided to selected offices and key users on GSWAN under this project. The bidder is required to maintain end to end Wireless solutions during entire contract period. For this, Bidder will maintain, manage & provide comprehensive AMC support for existing implemented solutions or if require, bidder may replace the same with equivalent/ better capabilities inclusive of facilities mentioned at (b). The Bidder will be responsible for complete O&M and CAMC support of the same. GSWAN user ID and Password will be used to provide authentication to users over Wi-Fi.

c) Also, there are spare Access points available with GoG as listed in various Annexures attached in this RFP. Bidder is responsible to install & commission of the spare APs in line with requirement of GoG at selected locations in the state without any extra cost to GoG.

d) The bidder is required to provide User education trainings & awareness campaigns for the users of GSWAN.

2.2. Operations and Maintenance (O&M) of GSWAN

2.2.1 The Successful bidder shall be responsible for the overall management of the IT and Non-IT Infrastructure and enabling infrastructure maintenance services / facility management services at all GSWAN locations for ensuring adherence of SLAs. Bidder shall integrate with the EMS/NMS tool () at the State Data Centre that monitors / manages the entire, infrastructure and network related components. EMS/NMS would be provided by Tenderer. Bidder needs to ensure all the GSWAN related IT & NON-IT Components are monitored through this tool. The EMS/NMS would be procured through another bid from GSDC operator with below mentioned functionalities,

GSWAN operator to configure this functionalities. Bidder shall provide the Operations and Maintenance Services for a period of 5 years following the award of the contract/as per terms & condition defined in this RFP. The bidder shall be responsible for following:

a) The Successful bidder shall be responsible for operating and maintaining the entire network for connectivity between Secretariat Centre (SC), District Centre (DC) and offices connected with DC horizontally (approx. 70 to 100+ offices per DC) and Taluka Centre (TC) and office connected with TC horizontally (approx. 20 to 30 offices per TC). The successful bidder is responsible for operating and maintaining entire GSWAN network which includes but not limited to, State centre, all 33 DCs and 258 TCs, dignitaries residences, all MS Buildings and PoPs and Horizontal offices, as well as all future expansion of DC, TC and horizontal connectivity provided/to be provided by Tenderer.

b) It is under process to provide GSWAN connectivity to GP leveraging GFGNL connectivity. Further it is also plan to provide horizontal connectivity from GP to various village level government offices like primary School, PHC, Forest, Police, Anganwadi, etc. Successful bidder is responsible for providing required support if any issue reported with respect to GSWAN connectivity at said offices/locations.

c) For better Network availability, preventive maintenance activity is required to be carried out at least once in a quarter for all IT and Non-IT infrastructure which includes, but not limited to configuration backup and software up gradation/updation, dust cleaning, cable tagging etc.

d) Successful Bidder is required to submit preventive maintenance schedule of all equipment to Tenderer. After performing preventive maintenance activities, bidder is required to submit the report of the same. All such activities should be done preferably in non-working hours.

e) As part of the Operations and Maintenance services, the bidder shall provide support for the software, hardware, and other infrastructure provided/covered as part of this RFP. Bidder shall also provide 5 years comprehensive AMC as per the annexure. The bidder shall also provide services comprising of but not limiting to the following:

(i) Operations and maintenance services for existing and new IT and Non- IT Infrastructure supplied or commissioned by the bidder (if any as a part of O&M solution) at the GSDC and SC, DC, TC and other PoP locations in GSWAN for five years during the contract period.

(ii) Support for the end users at each of the SC, DC and TC locations including deployment of required competent person at respective locations as defined in this RFP for the entire period of the contract.

(iii) Other IT infrastructure related support services for five years from signing of the contract/as per terms & condition defined in this RFP.

(iv) The services shall be rendered onsite from the designated premises. To provide the support at the locations where the infrastructure will be rolled out, bidder is expected to provide experienced and skilled personnel at each location.

(v) Bidder is responsible to provide all required Hardware/software like Desktop/laptop, Hardware tools, OS, other software etc. to his resources (which are deployed under this project) to perform all the duties/works as a part of the deliverables under this RFP.

f) Warranty Support: As part of the O&M solution, if bidder has upgraded/replaced the equipment /devices/solutions at GSWAN /GSDC, Bidder is responsible to supply, install & commissioning of the said new equipment including 05 years warranty services from FAT/acceptance of the equipment/solution. The bidder shall provide following Warranty services for all new equipments to be supplied under this RFP:

(i) Bidder shall provide a comprehensive warranty and on-site free service warranty for 5 years from the date of FAT for all equipments.

(ii) Bidder shall obtain the 5 year product warranty and 5 year onsite free service warranty from OEM on all licensed software, computer hardware, peripherals, networking equipment and other equipment for providing warranty support.

(iii) Bidder shall provide the comprehensive manufacturer's warranty and support in respect of proper design, quality and workmanship of all hardware, equipment, accessories etc. covered by the RFP. Bidder must warrant all hardware, equipment, accessories, spare parts, software etc. procured and implemented as per this RFP against any manufacturing defects during the warranty period.

(iv) Bidder shall provide the performance warranty in respect of performance of the installed hardware and software to meet the performance requirements and service levels in the RFP.

(v) Bidder is responsible for sizing and procuring the necessary hardware and software licenses as per the performance requirements provided in the RFP. During the warranty period bidder shall replace or augment or procure higher-level new

equipment or additional licenses at no additional cost in case the procured hardware or software is not adequate to meet the service levels.

(vi) Mean Time between Failures (MTBF): If during contract period, any equipment has a hardware failure on four or more occasions in a period of less than three months, it shall be replaced by equivalent or higher-level new equipment by the bidder at no cost. For any delay in making available the replacement and repaired equipments for inspection, delivery of equipments or for commissioning of the systems or for acceptance tests / checks on per site basis, TENDERER reserves the right to charge a penalty.

(vii) During the warranty period bidder shall maintain the systems and repair / replace at the installed site, at no charge, all defective components that are brought to the bidders notice.

(viii) The bidder shall as far as possible repair/ replace the equipment at site.

(ix) In case any hard disk drive of any server, SAN, or client machine is replaced during warranty / AMC the unserviceable HDD will be property of TENDERER and will not be returned to bidder.

(x) Warranty should not become void, if TENDERER buys, any other supplemental hardware from a third party and installs it within these machines under intimation to the bidder. However, the warranty will not apply to such supplemental hardware items installed.

(xi) The bidder shall carry out Preventive Maintenance (PM) at SDC, SCAN locations, SC, DC and TC locations, including cleaning of interior and exterior, of all hardware and testing for virus, if any, and should maintain proper records at each site for such PM. Failure to carry out such PM will be a breach of warranty and the warranty period will be extended by the period of delay in PM.

(xii) Bidder shall monitor warranties to check adherence to preventive and repair maintenance terms and conditions.

(xiii) Bidder shall ensure that the warranty complies with the agreed Technical Standards, Security Requirements, Operating Procedures, and Recovery Procedures.

(xiv) Bidder shall have to stock and provide adequate onsite and offsite spare parts and spare component to ensure that the uptime commitment as per SLA is met.

(xv) Any component that is reported to be down on a given date should be either fully repaired or replaced by temporary substitute (of equivalent configuration) within the

time frame indicated in the Service Level Agreement (SLA).

(xvi) Bidder shall develop and maintain an inventory database to include the registered hardware warranties.

g) Bidder shall also be responsible for the comprehensive AMC of existing IT & non IT Infrastructure (AS-IS condition). Details of the existing hardware which are required to be covered under CAMC by the selected bidder through this RFP are attached as Annexure "A", Annexure "B", Annexure "C", Annexure "D" and Annexure "E", Annexure "F" , Annexure "G", Annexure "H", Annexure "I" ,. Currently some of the hardware is under AMC cover, however bidder will be required to provide CAMC post expiry of existing AMC cover.

h) Bidder has to take CAMC for IT & Non-IT equipment as mentioned in the annexures. It has been clearly mentioned in the annexures against each and every items for which the bidder has to take CAMC. Comprehensive AMC (CAMC) / Warranty support shall not essentially be back to back from respective OEMs of the equipment. However, bidder is required to provide the maintenance services for maintaining the uptime & SLAs.

i) For the IT & Non-IT equipment which are not covered under CAMC as specifications mentioned in the Annexures and if that equipment gets damaged then bidder shall repair such equipment & make it functional for maintaining uptime & SLAs. If the equipment is not repairable, then bidder may suggest replacement of such equipment with new equipment of equivalent or better specifications by submitting proposal in writing. After due technical & commercial scrutiny of the proposal by tenderer / TPA or any of its designated agency, tenderer may either purchase such equipment from selected O&M agency or from open market.

j) For any IT & non IT devices which are currently out of support or their CAMC had already been expired, Bidder is required to take all such IT & Non IT devices (AS-IS condition) into their CAMC support for entire contract period without any extra cost to GoG. Bidder, at his discretion, may replace or upgrade such devices with equivalent/better capabilities, in case of any challenges to get CAMC support.

k) There are various spare equipment/device available with GoG as listed in various Annexures attached in this RFP. Bidder is responsible to install, commissioning the said spare Equipment/devices in line with requirement of GoG at selected location in the state without any extra cost to GoG. This also includes all other costs like but not limited to, Transportation, labour charges if any, lodging charges for technical team/resources etc.

l) There are various equipment /devices which are not in use. The list of such

devices/equipment but not limited to, is attached at Annexure J. Bidder is required to coordinate with Tenderer/other appointed agency by Tenderer for necessary disposal of said equipment/device in line with instruction received from Tenderer.

m) During the contract period, TENDERER may discontinue the O&M and CAMC services for any equipment/device based on their usability for the Project. For such cases,

- 1% of the total purchase cost (Without Tax) of such equipment/device will be deducted from applicable yearly O&M Amount & proportionate Monthly payment.
- 4% of the total purchase cost (without tax) of such equipment/device will be deducted from applicable yearly CAMC amount & proportionate Monthly payment.

This will be applicable from the next month after the notice issued by DST/GoG for such discontinuation of the any equipment/service.

n) "At 33 DC locations, Biometric Access control system (including all accessories like biometric Finger scan card reader, Controller, Smart card reader, Access control software, Smart cards etc.) have been installed for Access Control Management. Please refer attached Annexures-8 (Biometric Access Control System) for more details. Bidder is required to provide O&M support (end to end support) for the said Access Control Systems & it's all accessories including, but not limited to, maintenance of Access cards,) if any required during contract period etc.

2.3. Network operations, Services and maintenance

2.3.1 The services as per the scope of the contract shall include maintaining the network equipment; ensuring running of the services (Data, Voice, and Video) with availability in line with the SLA and Round-the-clock Network monitoring. This shall include:

(a) Equipment Configuration Management
(b) Upgrading IOS/Firmware
(c) Maintaining access control list
(d) Regular review of Network
(e) Regular reports as required by Tenderer and authorized agency from SC, DC & TC
(f) Monitor GSWAN Network at SC, DC, TC & Cluster Level
(g) Regular reports as required by Tenderer & authorized agency from SC, DC, TC & Cluster Level
(h) Auto backup configuration of Router and Switches for SC, DC, & TC
(i) Regular SLA Violation reports for Network vendors

(j) Upgrading Patches on all equipment's including, network & Security Devices and hardening of network & security devices.

(k) The Successful bidder is required to maintain uptime of the network between SC, DC, TC and other PoPs to meet the SLA .In case the network uptime is not maintained due to non-availability of link/Bandwidth by Service provider, bidder is required to produce documentary proof (Service Desk Complaints/Incidents or Vendor assigned Tickets) in terms of certificate of downtime of network link/b/w from the service providers. In case bidder fails to provide such documentary proof the same shall be treated as non-performance of SLA and would be liable for penalty.

(l) The Successful bidder shall keep the details of all the Assets and document any changes in the assets including up-gradation and/or replacement of assets. The asset inventory for the entire network architecture shall always be up to date and shall be submitted to Tenderer on monthly basis.

(m) Successful bidder should keep & maintain stock of atleast 5% spares for items under CAMC to ensure adherence of SLAs and continuity of O&M operations. The spares should be of equivalent or better specifications. The spares shall be kept preferably at major cities at bidder's facilities & bidder shall submit stock & replenishment report on Monthly basis. Tenderer may conduct a random check of the stock of spares available at any point of time during contract period.

(n) Successful bidder will have to do operational liasoning with stake holders (link providers, state government, local bodies, third party agencies / consultants appointed/identified by GoG) to keep the link up & running.

(o) Successful bidder should deploy adequate resources at SC, DC & TC to provide operation, maintenance and support services. Scope of services at SC, DC & TC would include following:

(i) Fault detection in equipment's at SC, DC, TC, other PoPs, Horizontal Offices

(ii) Analysis and follow-up in case of network connectivity issues and vendor managed services (Leased lines, RF and LAN) till the level of field offices

(iii) Coordinating with LAN cabling vendor for repairs in the LAN network

(iv) Carry out feasibility survey for new connectivity

(v) Network Configuration of user device and connecting it to GSWAN network

(vi) Coordinating with Central Help Desk to resolve the trouble tickets to meet the SLAs

(vii) Carrying out the FAT and certifying the work completion carried out by sub-vendors

(viii) Bidder would be responsible for providing network connectivity at every computer as per SLA, bidder will not be responsible for providing application/ Desktop support.

(p) **Comprehensive Annual Maintenance Contract of out of warranty network equipment at SC, DC, TC and other PoPs:** Successful bidder shall enter into comprehensive AMC contract for out of warranty equipment/ hardware at GSDC, SC, DC, TC & other PoPs. List of existing devices, for which currently AMC is either not available or will expire during the Contract period of this bid, is placed at as Annexure "A", Annexure "B", Annexure "C", Annexure "D" and Annexure "E", Annexure "F", Annexure "G", Annexure "H", Annexure "I", for CAMC, bidder will have to provide AMC for these items till the end of this contract.

(q) In case TENDERER decides to migrate the network to IPv6, the successful bidder shall prepare the migration plan and execute the same within 6 months. Failing to the same will attract the penalty of Rs. 1000 per week.

(r) Successful bidder is responsible to facilitate services for video conferencing to end-user offices located at SC, DC or TC or any other office across the State. Presently VC equipments are installed at all District Collectors Offices, all Taluka Mamlatdar offices and at Sachivalaya Campus. For such events, O&M team shall test the setup and report after the completion of events. All expenses or costs to be incurred like but not limited to, Transportation, lodging etc. for managing and coordinating these events are to be borne by Bidder. Nonperformance under this clause will result into penalty.

(s) TENDERER is providing GSWAN Connectivity for web casting services to various remote places across the State for events of Dignitaries through last mile connectivity provided by ISP/Wireless Vendor. Successful bidder is responsible for managing and coordinating these events. All expenses or costs to be occurred like but not limited to, Transportation, lodging etc. for managing and coordinating these events are to be borne by Bidder. Successful bidder is required to keep requisite skilled resources having background of Web Casting and Video Conferencing. Non-performance under this clause will result into penalty.

(t) Successful bidder will help and co-ordinate with TENDERER for paying electricity bills of SC, DC, TC and other PoPs on behalf of TENDERER and actual amount of electricity bills will be reimbursed by TENDERER along with the Monthly O&M Payment.

(u) Bidder has to provide UPS & Battery Health Reports in every month after completing proactive maintenance every month. Bidder will have to replace batteries at the end of 2^{nd} and 4^{th} year of the contract period during 9^{th} and 17^{th} quarter.

(v) TENDERER has set-up control room at State Centre at Gandhinagar and District Centers

at District Collector offices across the State. Successful bidder has to ensure the following for smooth running and operation of the systems at SC, DC, TC & other PoPs, as prescribed.

(i) Cooling requirement of the operational equipment at DC control room need to be maintained. For this purpose Bidder shall use existing automatic cut-off device to switch between the Two ACs installed. Bidder shall monitor the environment variables of the control room through the Infrastructure Management System (IMS) to ensure uninterrupted operations at all DCs.

(ii) Proper electrification along with proper earthing and anti-static flooring, structured cabling for proper management of cables need to be maintained at SC, DC, TC & other PoPs. Bidder has to ensure proper earthing at any point of time during O&M Operations. Proper earthing of Neutral to Earth Voltage less than 1.5 Volts has to be maintained and tested on monthly basis.

(iii) Cabling with proper tagging as per cabling standards with network diagrams need to be maintained at SC, DC, TC & other PoPs.

(iv) Bidder shall use Building Management System (BMS), to monitor various features like, but not limited to, fire detection, extinguisher and water leakage detection and prevention and ensure Cleanliness, hygiene and safety at SC,DC, TC & other PoPs.

(v) Bidder shall use Access Control System installed at SC, DC locations and maintain record of access, man and material movement for the SC & DC control room.

(w) Successful bidder shall be responsible for providing technical feasibility report along with Cable route diagram, LAN sitting arrangement and diagram, digging permission status in case of JFC/OFC connectivity and permission status for mast installation in case of wireless connectivity for expansion and laying of new horizontal link/PoPs and effort estimation and cost-estimation for the same to the TENDERER. This work has to be performed within the prescribed time-limit of 7 working days. Bidder has to follow Change Management documentation, while submitting new location report, along with capacity Report for new location. Non adherence to time-limit will result into penalty.

(x) Successful bidder shall be responsible for carrying out Survey of the work carried out for expansion and laying of new horizontal link/PoPs by all sub-vendors for the said work.

2.4 Network Planning, Optimization and Expansion Services

2.4.1 Core Network

(a) The network should have the capability and facility for Seamless integration with GoI initiatives like NII 2.0, BharatNet.

(b) Network must support next generation architecture to support future application like IP based Surveillance, Voice, Video, Wi-Fi etc.

(c) All the proposed routing devices should support key IP MPLS feature and protocol for enablement of same as and when required.

(d) Network will be connected in Ring architecture and devices must support the redundancy protocol for better convergence.

(e) The Ring Based architecture must be deployed to meet the following:

(i) Redundancy of nodes and Links

(ii) Less prone to failures

(iii) Better Link utilization

(iv) Traffic should not Hog core bandwidth for any to any communication

(v) Easy Insertion of new Node. No configuration change at Core

(f) Core network must support Node and Link protection feature for faster and reliable network convergence.

(g) MPLS Traffic Engineering feature must be deployed at TC and DC Routers.

(h) MPLS Traffic Engineering should be used to Provide the following:

(i) Bandwidth guarantee for critical real-time applications in the control plane.

(ii) Optimized utilization of redundant links between DC and the core.

(iii) Handling of unanticipated load in the network.

(iv) Uneven utilization of links.

(i) TC and DC Network must support resource reservation protocol (RSVP) based dedicated path for Critical Application.

(j) Network Convergence methods like MPLS Fast Reroute (FRR-Link and Node) and Bidirectional failure detection needs to be deployed to achieve faster convergence.

(k) TC and DC Routers should support IPv4 Fast Reroute to reduce the routing transition time to less than 50 milliseconds during a link failure.

(l) SC and DC Routers should support BGP fast convergence feature for IP and MPLS-VPN to improve BGP convergence after network failure. This convergence should be applicable to both core and edge failures and can be used in both IP and MPLS networks. The BGP fast convergence feature for IP and MPLS-VPN feature must create and store a backup/alternate path in the

routing information base (RIB), and forwarding information base (FIB) so that when a failure is detected, the backup/alternate path can immediately take over, thus enabling fast failover.

(m) The network will be running OSPF as an IGP protocol and features like Route Summarization should be supported to reduce the number of routes in neighboring routers.

(n) Router must be configured for Multi Area IGP topology as per network requirement.

(o) IGP should be only used for carrying management routes and user routes should be shared using Broader gateway protocol (BGP)

(p) Routers must support segregation of departmental traffic using Virtual Routing and Forwarding (VRF).

(q) Routers must support Hub and Spoke, MESH and Extranet VPN as per requirement of network.

(r) Network must support BGP for IPv4, IPv6 and VPNv4.

(s) All Internet exit will be from SDC.

(t)Proposed solution must consider NAT to facilitate IPv4 NAT, IPv6 to IPv4 NAT VRF Aware NAT to meet end user requirement.

(u) Route Reflector based BGP Solution should be designed keeping scalability in consideration.

(v) Route Reflector must be scalable and devices proposed as Route Reflector must support high routing scale in a small form factor.

(w) Network must have two Route Reflectors for redundancy however bidders are free to quote more.

(x) QoS enables a network to provide improved service to selected network traffic. The network must support the following MPLS QoS features:

  (i) MPLS Experimental Field

  (ii) Classification

  (iii) Policing and Marking

  (iv) Preserving IP ToS

(y) At least 4 Class of diff-serve based Service Model should be deployed.

(z) Standard methods such as ACL, IPP, DSCP & MPLS EXP should be used for

classifying the traffic.

(aa) Congestion avoidance methodology such as WRED should be deployed in conjunction with QOS to meet optimal performance in network.

(bb) All devices in network should support Hierarchical Quality of Service for Ingress and Egress.

(cc) All devices should support priority queuing for assigning more priority to Voice and Video traffic over non critical data traffic.

(dd) The network should support Multiprotocol BGP based methodology to carry IPv6 with in a MPLS VPN over an IPv4 MPLS network to ensure no additional overhead is put on Routers.

(ee) The proposed design should not require any change in SC and DC Router configuration for IPV6 transport and should run only IPv4 protocols.

(ff) The Taluka and POP Router shall support adaptive routing for path selection using link performance criteria like Response time, packet loss, delay, jitter and traffic load of Wan links for intelligently controlling the traffic and to maximize the quality of the user experience

(gg) The Taluka and Pop router should also facilitate application based performance monitoring and automated routing control of traffic in case SLA is breached.

(hh) All the devices in network must support DHCP relay functionalities.

(ii) Switching devices must provide security for ipv6 network/links similar way that of ipv4 network.

(jj) IP (Public IP belongs to Department of Science & Technology) Log related information to be stores for at least 2 year so that it can be provided to cyber cell department under rules, require software, storage, etc. to be arranged by bidders.

2.4.2 The successful bidder will provide on-going support to GSWAN for specific network planning and optimization services such as configuration support required for addition of new sites and locations to the network, VLAN creations, and voice/data/video/services, upgrading to IPv6 from existing IPv4, improving network availability and performance and capacity planning services. This may include following specific activities:

(a) Provide inputs for network expansion including effort estimation and cost-estimation.

(b) Up gradation of SC, DC, TC & PoP network from IPv4 to IPv6 using latest technology

(Dual Stacking, Bridging, Encrypted Tunnel preparation etc.)

(c) Update technical design documents on quarterly basis.

(d) Configuration of network hardware and software and planning for implementation.

(e) Create a checklist of activities to be performed for technical network operations

(f) Successful bidder will ensure IP network is monitored for performance and utilization of the network resources, including monitoring of the IP network and equipment for it's over or under utilization, and provides capacity reports to optimize and commission the B/W or equipment accordingly.

(g) Evaluate the utilization of all the IP network and check for the adequate bandwidth provisioning.

2.5 Network Management Processes

The Gujarat State Wide Area Network (GSWAN), should be managed in accordance with various standards e.g. ISO Network Management Model (ISO20000: latest version), ITIL, Disaster Recovery Model, OEM Certifications for AMC & Services for GSWAN etc. For this purpose, processes may be defined under following functional areas that would govern the GSWAN Network Management:

(a) Configuration management
(b) Performance management
(c) Fault management
(d) Backup management
(e) Network Security Management
(f) Network Redundancy Management
(g) Change Management

2.6 EMS/NMS for SLA and Performance Reporting

2.6.1 The Successful bidder shall operate and maintain an Enterprise Management Suite (EMS)/Network Management System (NMS) and SLA and Performance Monitoring System for GSWAN backbone at Network Operation Centre (NOC) and GSDC network components centrally at SC. Currently, GSWAN is monitored through CA-NMS tool The successful bidder is required to maintain and configure the tools provided by GSDC Operator with below mentioned functionalities. The EMS/NMS shall be used for regular monitoring of the network. Successful bidder shall configure/ provision the systems to be used by GoG for audits and also help in monitoring the service level parameters on an ongoing basis as defined in Service level agreements. The TENDERER or its designated agency shall have access to all generated reports for service levels audits and monitoring. Successful bidder shall deploy adequate access policy and security policy on the systems in consultation with TENDERER for ensuring authenticity and integrity of the reports. The system shall essentially have 3 components, Network and Data Centre Management component, Helpdesk & SLA Management component. The TENDERER or its designated agency should be able to view the SLA

Management component. The Successful bidder shall be responsible for creating network monitoring environment through the following:

a. The EMS/NMS system shall be configured to automatically discover all manageable elements of the GSWAN and GSDC.
b. All network components shall be configured to alert the centralized EMS/NMS server in case of any events, so as to reflect real status of all network components and links across GSWAN and GSDC.
c. The NMS should also poll all network devices and other IT and Non-IT components in GSWAN & GSDC at regular intervals in order to determine their status and working.

2.6.2 The functional requirements of the EMS/NMS system are as follows: (EMS/ NMS with following features will be provided by the tenderer. GSWAN O&M is required to configure all the elements / network devices on EMS / NMS with provided functionalities. The features are listed below.

a) **Alarm Correlation & Root Cause Analysis Capabilities**

(i) Solution should be configured with alarm correlation and facilitate reduction of total number of alarms displayed by means of intelligent alarm correlation, suppression and root cause analysis techniques built in to the system. The system must ensure reduction in MTTR by means of advanced event correlation, filtering and root cause analysis.

(ii) It should be configured to perform cross domain correlation with alarm correlation from Network Monitoring tool, Systems monitoring tool and other domain monitoring tools.

(iii) Alarm Filtering should allow flexible filtering rules for NOC staff to filter the alarms by category, severity, elements, duration, by user, by views, by geography or by department.

(iv) Bidder shall apply severity to alarms according to predefined rules.

(v) Bidder is required to add description to the alarms.

(vi) The solution should be configured with out of the box root cause analysis with multiple root cause algorithms inbuilt for root cause analysis.

(vii) The system should be configured to clearly identify configuration changes as root cause of network problems

(viii) Alarms should be mapped to the live topology views and real time updates to topology based on alarm occurrences.

(ix) Historical Reporting of alarms must be configured and system should be able to store large volumes of alarm data for historical reporting purpose

(x) Bidder should convert Critical Alarms into Incidents for auto ticket generation into proposed Helpdesk tool.

(xi) Should trigger automated actions based on incoming events / traps. These actions can be automated scripts/batch files.

(xii) Bidder should configure NMS to send e-mail or Mobile –SMS to pre-defined users for pre-defined faults. The SMS Gateway would be provided by Tenderer.

(xiii) Consolidated network view embedded with digital maps should be configured.

b) Network Fault and Performance Management

(i) The Network Management function must monitor performance across heterogeneous networks from one end of the enterprise to the other.

(ii) The Network Management function should be configured with graphical topological display of all discovered network devices in real time.

(iii) The proposed Network Fault Management solution must be configured to provide network asset inventory reports

(iv) The proposed Network Fault Management solution must be configured to support extensive discovery mechanisms and must easily discover new devices using mechanisms such as SNMP Trap based discovery. It must also allow for inclusion and exclusion list of IP address or devices from such discovery mechanisms.

(v) The discovery must also be configured to support device redundancy discovery in case of virtual IP addresses using vendor specific protocols such as VRRP and HSRP.

(vi) The NMS must be configured to provide a detailed asset report, organized by vendor name, device type, listing all ports for all devices. When a report is run the administrator must have an option of specifying the number of consecutive days the port must be “unused” in order for it to be considered “available”.

(vii) The solution must be configure to provide sufficient reports that identify unused ports in the managed network infrastructure that can be reclaimed and reallocated. The proposed management system must also intelligently determine which ports are operationally dormant. This will help in analyzing capacity needs of the Network ports and better network

capacity planning across the GSWAN network.

(viii) It should be configured with integrated Fault, Performance, and Configuration Management features from a single solution.

(ix) It should show live interface connections between discovered network devices and must be able to do mapping of LAN and WAN connectivity with granular visibility up to individual port levels

(x) It should proactively analyze problems to improve network performance.

(xi) The Network Management function should have extensive reporting facility, providing the ability to format and present data in a graphical and tabular display.

(xii) The Network Management function should poll or collect and analyze the large volumes of fault and performance data. Once collected, it should automatically store data gathered in a database. This enterprise-wide data should be easily accessed from a central location and used to help with capacity planning, reporting and performance analysis.

(xiii) The Network Management function should have a feature of discriminated polling of devices.

(xiv) The Network Management function should be able to monitor device performance in near real time

(xv) It should be able to automatically generate a notification in the event of a link failure to ensure proper handling of link related issues.

(xvi) Solution should be configured to provision for suppression of maintenance alarms during the maintenance period.

(xvii) The proposed performance management system shall be configured to provide network, server and database performance information, alarms and also reporting interface(s) for components. The current performance state of the entire network & system infrastructure shall be visible in a console.

(xviii) The solution must be configured to scale to large networks while supporting a single web interface for access to reports. The system must support multiple locations and a distributed deployment for collection and monitoring. Primary instrumentation should exist at the Central Site.

(xix) The solution must be configured to support out of the box trend reports on group of metrics or group of devices in a single report. This will help

understand the performance of multiple devices against a KPI (Key Performance Indicator)

(xx) The solution must be configured to support out of the box capacity planning reports that assist in the analysis of capacity needs based on projected load.

c) Network Performance Reporting

(i) Solution should be configured to collect Key performance measurements and statistics (CPU, Memory, availability, reachability, package loss, latency etc.) from all network domains and store it. This data is to be used for evaluation of performance of the end to end network infrastructure/ services.

(ii) Solution should be configured for KPI calculation on the raw metrics collected.

(iii) Solution should be configured to do Trend analysis from the performance data.

(iv) Should be configured to generate web-based reports both near real time and historical data for the network.

(v) It should be possible to view live report.

(vi) Solution should be configured to support historical storage of aggregated data for one year and data backup.

(vii) Solution should be configured to also provide a threshold and profile capability on the KPIs monitored on the network in order to understand the impact of failures and degradations which eventually results in downtime/network unavailability.

(viii) The system shall be configured to support separate warning and violation threshold levels, so that in the event of gradual service quality deterioration, warnings shall be generated before critical level thresholds are breached.

(ix) Out of the box fault and performance reports

(x) Customizable Reporting should be configured without the need for additional reporting engine.

(xi) It should be configured with automatic base lining on historical data, and thresholds that can be adjusted as required, based on data collected.

(xii) It should be configured with secured interface with role based access and privileges.

(xiii) Availability of drill-down reports.

(xiv) Solution should be configured to offer off-the-shelf Reports for KPIs such as Availability, Uptime, and Resource Utilization.

(xv) Solution should be configured to facilitate reports summarized by time – Hour, Day, Week, Month, Quarter, Year and by Property- service, location, department etc.

(xvi) Highly Flexible Group based Reporting: It shall be configured to use a KPI at different network element levels (individual Network Device, Interface, Group of Network Devices, Links, etc.) and time dimensions out of the box modifying the KPI definition.

(xvii) It should be configured to generate SLA Reports on Availability & Performance.

(xviii) Should have capability to exclude the planned-downtimes or downtime outside SLA.

d) Centralized ITIL Aligned IT Service Desk:

(i) The Service Desk is one of the most essential components of Network Operations Center. It is the central mechanism for NOC staff to track and respond to requests and problems logged by end users and also work upon other NOC functions such as Change Management, Knowledge Management, Release Management, etc. Thus, it is expected that the proposed Service Desk is well aligned to maximum number of ITIL processes such as:

a. Incident Management
b. Request Fulfillment
c. Problem Management
d. Change Management
e. Release & Deployment Management
f. Knowledge Management
g. Service Asset & Configuration Management
h. Service Catalog Management
i. Service Level Management
j. Service Portfolio Management

k. Availability Management

l. Capacity Management

m. Event Management

n. IT Service Continuity Management

(ii) **General Requirements of Service Desk**

a. Native integration of processes i.e. Incident Management with Change Management and vice-versa

b. Native integration of processes with Knowledge base i.e. automatically creation of knowledge base post closure of tickets

c. Bidder to create and modify forms as per Tenderer requirement

d. Bidder should define different SLAs for different services / domains

e. Solution should be configured to support multi-tenancy with complete data isolation as well as with ability for analysts based on access rights to view data for one, two or more organizational units

f. Bidder to define different workflows for different processes

g. Bidder to send automatic escalation mails as defined in workflow

h. Should integrate CMDB from different federated data sources and build a single CMDB

i. Should be configured for email based interactions allowing ticket creation, update and approval of request.

j. Bidder to integrate with Active Directory and populate user information automatically

k. The support person can interact with the end users through chat in built and add those chat transcripts in the ticket.

l. The system should be configured with graphical interface to define, visualize and update ITIL processes

(iii) **Service Catalogue Functionality**

a. Should be configured to support single service catalogue for end users to submit and track service request, spanning ALL IT services

b. Should be configured to provide for Service Requests Workflows and Fulfilment definitions for commonly used IT services

c. Various types of Customer profiles should be configure to support such as, for ex: Profile-1: CMO, Profile-2: IAS Cadre, Profile-3: Grade 2 Officers and so on.

(iv) **Service / Help Desk (Incident and Problem Management)**

a. Service Desk solution should allow detailed multiple levels/tiers of categorization on the type of incident being logged for IT services that shall span across multiple domains like GSWAN, GSDC etc.

b. Service Desk solution should provide classification to differentiate the criticality of the security incident via the priority levels, severity levels and impact levels.

c. The solution should provide embedded and actionable best practices workflows i.e., best-practices process & views based upon implementations

d. It should allow SLA to be associated with a ticket based on priority, severity, incident type, requestor, asset, location or group individually as well as collectively

e. It should have the ability to search multiple built-in knowledge bases like the incident, problem, and known-error database simultaneously without requiring the agent to search each knowledge base individually.

f. It should have an updateable knowledge base for technical analysis and further help end-users to search solutions for previously solved issues.

g. Should support full text search capabilities

h. Should centralize all known error and problem workarounds into a single, searchable knowledge base

i. The incident Management solution should be completely integrated to the CMDB to ensure that CIs can be associated with the ticket to provide better visibility

j. The incident management solution should have the ability to initiate the change request on a button click

k. The solution should have the ability to associate an incident with an existing change request, a problem or known error for tracking purposes

l. It should allow the CI to be associated with tickets.

(v) **Change & Release Management**

a. The solution should be able to track a request for change through the different stages of lifecycle of a change request

b. The tool should facilitate the identification of the change type and associated workflow For example: standard, normal, and emergency

c. The tool should facilitate the differentiation of normal Changes For example: Category - Minor or Small, Category - Significant or Medium, Category – Major or Large

d. The tool should facilitate the ability to create simple to complex request workflows through sequential and parallel tasking

e. The tool should notify all the users about the scheduled changes/outage and sent a reminder to responsible contacts for implementation of change.

f. Change management should have fields to record impact analysis and, back-out plans, within the change record

g. It should have the capability to automatically and continually perform impact analysis, risk assessment, and change collision dates detection (for same CI's) on all change requests. The solution should provide complete view of planned changes with services & their components.

h. The tool should facilitate the scheduling of post implementation reviews for implemented changes after defined time interval

i. The application should have the ability to assign change advisory board (CAB) responsibilities to change management roles

j. The tool should facilitate ability of authorized roles to reject changes For example, status of reject, ability to record reason for rejects notification

k. The change approval engine should be configurable such that approvals can happen if either one of the individuals approves a change, or a majority approve the change, or certain people in the committee approve the change etc. It should also incorporate multi-staged approvals like MD-GIL, JS-IT, Sec-IT etc.

l. Change management should be capable of integrating with CMDB to facilitate access to CI attributes and relationships to enable change assessment and authorization

m. Solution should provide a consolidated view of the tasks that the release management team must perform to drive the completion of the change requests and activities required to close the release.

n. Solution should provide Change and Release Calendar views for the current schedule of releases, change requests, and business events for any potential conflicts.

o. The solution should have the ability to prompt change planners with suitable time slots for conducting a change depending upon the changes that have been scheduled/in progress, risk associated with it and the priority of the change.

p. The solution should have the ability to identifying and flagging changes that are being done by various team to prevent change collisions.

(vi) **Knowledge Management**

a. The tool should have the knowledge management OOB - knowledge databases to support investigations, diagnoses, root cause analysis techniques, and creating / updating workarounds, temporary fixes and resolutions.

b. The tool should allow the creation of different access levels (i.e. Read only, write, create, delete) to knowledge management system

c. The tool should allow creation and enforced use of data input rules for creating knowledge records For example: mandatory fields for content and information; QA and change approval to move from draft to production

d. The tool should allow for the entry of free-form text, images,

attachments, etc.

e. The tool should automate the population of knowledge records with author and owner data, creation date, as well as any other attributes required by organization

f. The tool should facilitate the identification of redundant or duplicate information, whether in single record or multiple records

g. The tool should allow automating notification to interested parties on submission new knowledge/solutions applicable to them

h. The tool should have a powerful search engine to sort, retrieve and search using advanced search options, search content in multiple format, and also search within knowledge records

i. The tool should allow displaying FAQs and highlight the newly added knowledge content

j. The module should allow integration with all other modules of service management to enable knowledge records to be quickly created from records with associated links.

k. The solution should have the ability to prompt users with interactive set of questions and answers that will eventually guide the users to the relevant solution.

l. The module will facilitate opening of a problem record directly from a menu for pro-active tracking of problem activity as well as from an incident record for reactive tracking of problem activity.

(vii) **Configuration Management database (CMDB)**

a. The Configuration Management Database should support multiple datasets with federation and reconciliation facilities so as to get data from various discovery tools and also through manual import process

b. Reconciliation of data should be possible with multiple data providers based on common attributes and ability to define precedence rules on attributes

c. Federation of external data sources should be possible with ability to store common attributes inside CMDB and getting other attributes from external data sources in real time

d. The proposed helpdesk solution must allow the IT team to see the CI relationships in pictorial format, with a specified number of relationships on single window.

e. The CMDB should have built-in drift management capabilities to capture and report on infrastructure drift based on infrastructure attributes like RAM, memory, etc.

f. Should provide Attribute-level normalization and reconciliation to leverage existing data from external sources and realize the goal of having one dependable source of configuration data.

(viii) **Service level Management**

a. Solution should support comprehensive SLA management platform

b. Manage service levels for delivery and support of business services

c. Must allow creating and applying various operational level parameters to Incidents, Requests, Changes, and Release management modules.

d. Real-time visualization of service level targets, penalties.

e. The module should link available support hours to service levels when calculating deadlines as well as suspend SLA calculation for certain criteria – ex. 'pending information from customer'

f. The SLM module should integrate with incident and problem management to automate escalation, and notification activities based on response and resolution targets

g. It should also integrate with change management to provide access to service level agreement details, implementation windows, change blackout periods, and availability requirements

h. The application should have a predefined/customizable field to indicate & track the progress/status of the lifecycle of ticket(s). It should contain predefined status codes and allow defining new status codes

i. The tool should provide an audit trail, tracking & monitoring for record information and updates from opening through fulfilment to closure For example: IDs of individuals or groups opening, updating & closing records; dates / times of status & activities updates, etc.

(ix) **Dashboard Reporting**

a. The Solution should provide a centralized Dashboard that picks up relevant business metrics from the service management solution giving at-a-glance visibility to key operational initiatives.

b. Tenderer assigned staff members should be able to graphically view the health of their business services and its related ticket KPI's pertaining to different categories and departments configured in Service management tool.

c. These dashboards need to be dynamic that allows user to drag and drop these metrics and create custom dashboards without any coding.

d. The Dashboards should support rich formatting capabilities to represent the data in different chart formats.

e) **Business Services Dashboard**

(i) Proposed Business Services Dashboard should provide flexible, role- based dashboards (for IT executives and service owners of Tenderer) and

operational consoles (for operations managers in NOC and technical staff) for a common understanding of service status, risks and quality problems.

(ii) The proposed Business Services Dashboard Solution must enable intelligent service modeling by importing IT components (like network devices, server resources, applications, transactions etc.) from the management tools that directly manage infrastructure and applications:

(iii) The Service Dashboard should display business service status in real- time. From the dashboard, operators should be able to launch technical operations console for service visualization, impact analysis, alert details and automated actions for remediation.

(iv) It should be possible to determine impact of network faults and performance degradation on customer services. .

(v) Solution should perform cross domain correlation between network alarms and degraded performance data received from multiple domains.

(vi) Solution should show the real time status of real time status of service problems for all the underline impacted services.

(vii) The Business Process Views should have capability to provide business oriented views of the IT infrastructure management. For example, it should have capability to create views of the resources catering to GoG Departments who consume various IT Services of Tenderer.

f) **Service Level Management**

Service Level Management will be one of the crucial functions of Network Operations Center. SI's must propose a full fledge Service Level Management System that helps define, document, monitor, measure, report, and review the level of IT Services.

(i) SI's must propose a full-fledged Service Level Management Solution that allows for tracking of various service level performances of IT Infrastructure and vendor performance.

(ii) The product should be able to measure, collect, and import performance and SLA data from a wide range of sources, including performance Management modules

(iii) The SLM System should help to compute the automated weighted average score of the SLA metrics and arrive at the monthly/quarterly/half-yearly/yearly service penalties as per the contract/SLA with different agencies

(iv) The solution should support SLA violations alerts during the tracking period.

(v) The solution should support the creation of different contracts which are currently underpinning with vendors.

(vi) The solution should support managing and maintaining a full history of an SLA.

(vii) Solution should support SLA violations in context of effective “impact” such as operational impact, financial impact and contractual impact.

(viii) The solution must provide a flexible framework for collecting and managing service level templates including Service Definition, Service Level Metrics, Penalties and other performance indicators measured across infrastructure and vendors

(ix) The solution must have a unified repository to capture and manage all service level templates.

(x) The solution must provide detailed control/methodology of the metrics that are being collected

(xi) The solution must contain out-of-the-box content for best practices frameworks such as ITIL.

(xii) The solution must support the concept of service templates, Service templates grouping and metric groupings.

(xiii) The solution must follow governance, compliance and content validations to improve standardization of service level contracts

(xiv) The solution must allow for grouping and composition of Services

(xv) The solution must have a pre-configured catalog of reusable Service Level Calculations and Aggregation methods.

(xvi) The solution provide document repository capabilities for supplemental documents associated with SLAs, SLA Management & Reporting process

(xvii) The solution must support management of service level agreement in a central repository.

(xviii) Creating of new service level agreements must be easy to be used by business and non-technical users.

(xix) The creation of SLA must be done via a Wizard driven interface

(xx) The solution must allow for customization of the service level agreement.

(xxi) The solution must have the ability to define and calculate key performance indicators (KPIs) from an End to End Business Service delivery perspective.

(xxii) The solution must support dependencies between business and technical metrics.

(xxiii) The solution must support dependencies between supplier's contracts and internal or external contracts.

(xxiv) The solution must support weighting of Service Level Indicators

(xxv) The solution must have the ability to manage multiple SLAs for the same contract party

(xxvi) Manage scheduled and un-scheduled maintenance windows

(xxvii) The solution must support SLA approval/validation workflow

(xxviii) The solution support role base access to service level agreements

(xxix) Links to external or internal sources can be created from within service level agreements.

(xxx) Tight integration of SLA Creation & Reporting/Monitoring modules

(xxxi) The solution must support aggregation and correlation of performance data relatively to contractual agreements.

(xxxii) The solution should be an integrated with Business dashboard

(xxxiii) View of Contract Parties & current SLA delivery levels

(xxxiv) View of Services & current SLA performance

(xxxv) The solution must support standard and user configurable aggregation

(xxxvi) The solution supports SLA Alerts escalation and approval process.

(xxxvii) The solution must make it possible to find the underlying events that cause the service level contract to fail.

(xxxviii) The solution must provide annotation capabilities that must appear in reports generated against the service level.

(xxxix) Provide pre-configured connectors and adapters

(xl) Timing for collection of data is configurable

(xli) Ability to define Adapters to data source in a visual manner without coding.

(xlii) Design, customize, & Generate reports easily & based on User Roles

(xliii) The system must include the ability to generate customer SLA document from SLA information entered in the solution

(xliv) The solution must allow for reporting across customers, Type of Customer, Business unit, Service, Product any configured area of measurement.

(xlv) Reports should be created in a friendly manner using visual tools and wizards without any code or database query configuration.

(xlvi) Report module and SLA Management module must be integrated to provide ease-of reports configuration and execution.

(xlvii) The solution must support data integrity in reports correlation and present the end users indication regarding reports which includes data manipulations, corrections and exceptions,

(xlviii) The solution must allow the distribution of reports to appropriate roles/ people, through Web-based interface/ Web Portal, or via email.

(xlix) The solution must support single sign-on as well as integrate LDAP for user login and authentication.

g) **IT Asset Management**

SI must propose an IT Asset Inventory Management Solution that shall enable centralized and automated management of IT assets governed from Central Site.

(i) Solution must be able to discovery IT Assets for Inventory Management Purposes

(ii) The discovered IT Assets must be maintained in a single IT Asset Repository database for better and single pane of glass visibility for all IT Assets

(iii) The discovery should have feature of scheduling the discovery at specific periods

(iv) The discovery solution or IT Asset Management solution should also support IT Asset inventory import from other data sources such as excel inventory, monitoring tools like Network Monitoring tool for a holistic IT Asset Inventory collection.

(v) IT Asset Management solution must be able to integrate with proposed monitoring solutions to perform auto discover into Asset Management database.

(vi) Solution must be able to track Warranty / AMC of all IT Assets

h) **Network Configuration Automation**

(i) The Network Monitoring Solution must also have Configuration Automation feature for the monitored devices.

(ii) The system should be able to clearly identify configuration changes as root cause of network problems.

(iii) The system should support secure device configuration capture and upload and thereby detect inconsistent “running” and “startup” configurations and alert the administrators.

(iv) The proposed system should be able to administer configuration changes to network elements by providing toolkits to automate the following administrative tasks of effecting configuration changes to network elements:

a) Capture running configuration
b) Capture startup configuration
c) Upload configuration
d) Write startup configuration
e) Upload firmware

(v) The proposed fault management solution must able to perform "load & merge" configuration changes to multiple network devices

(vi) The proposed fault management solution must able to perform real-time or scheduled capture of device configurations

(vii) The proposed fault management solution must able to store historical device configurations captured in the database and thereby enable comparison of current device configuration against a previously captured configuration as well as compare the current configuration against any user-defined standard baseline configuration policy.

2.6.3 Successful bidder shall provide the following:

(a) NMS reports including Bandwidth utilization report & Link up-time report & network equipment health check report on a monthly basis.
(b) Change management carried out by Helpdesk operation.
(c) Network Device Performance Report for SC-DC-TC and other priority offices, Weekly Monthly.
(d) Change management report – Monthly
(e) New Location Connectivity –Weekly, Monthly
(f) Asset Report Location wise – Monthly
(g) Help Desk Report – Daily, Weekly , Monthly
(h) NetQOS Report about utilization of Network protocol and GOG applications.
(i) Vendor SLA Violation Report – Weekly , Monthly
(j) Audit Report – Monthly
(k) Network Utilization Report – Monthly
(l) Network performance after Integration (with other network) Reports – every 6 months.
(m) VC & other Web Event completion report –Monthly
(n) Preventive Maintenance Report – Quarterly
(o) Spares Stock & replenishment report - Monthly

2.6.4 Successful bidder shall have to consult TENDERER for finalizing the report formats and frequency formulating a Communication Plan prior to the start of services. Successful bidder shall also enable the GoG designated Officer to be able to view any (up-to-date/ historical) reports related to GSWAN and GSDC at any point of time via a Web-based

interface to the NMS.

2.6.5 Bidder should also provide on-line Dashboard where, Tenderer can get summary view of GSWAN and GSDC Connectivity and Health Status.

2.6.6 Successful bidder would generate and provide Reports as stated below periodically. Bidder shall also be under obligation to provide any other reports as asked by Tenderer.

2.6.7 General Reporting Features:

(a) Shall be able to present the reports through web, and also generate "PDF" version reports of the same.

(b) Should provide user flexibility to create customized reports according to the user privilege level.

(c) Should provide information regarding capacity utilization and error statistics for physical and logical WAN links

(d) Should create reports on trend analysis and capacity planning from historical data and also by considering Mean Time Between Failure (MTBF) of equipment.

(e) Should be capable to send the reports through e-mail to predefined user at pre-defined interval.

(f) Should have capability to exclude the planned downtimes from SLA.

(g) Should be able to generate web based reports both in near real time and historical data for supported devices.

2.6.8 Availability Reports

(a) Overall Network Availability and Uptime Report on Daily, Weekly, Monthly, Yearly basis through GUI.

(b) Uptime & Availability Report for Vendor/Service provider; MPLS network, Leased Lines, LAN, Server on Daily, Weekly, Monthly, Yearly basis.

(c) Uptime & Availability Report on Network Devices: Router, Switch, Security Appliance on Daily, Weekly, Monthly, Yearly basis.

(d) Uptime & Availability Report of UPS at State, District & Taluka level on Daily, Weekly, Monthly, Yearly basis.

(e) Mean Time To Acknowledge (MTTA) and Mean Time To Repair (MTTR) Reports.

2.6.9 Performance Reports

(a) Overall Network Device Performance (Router, Switch, Security Appliance) – CPU and Memory Utilized at State, District & Taluka level.

(b) Every Link Input/output Utilization (percentage, bps, kbps, mbps, octets/sec) on Leased Line, Wireless, Trunks between Switches, Link errors (Leased Lines, ISDN, Trunks, etc).

(c) Should be able to indicate the Network Latency, Flapping Links, Changed Link Metrics, Prefix List and New Prefixes on each leased links at State, District

& Taluka level.

(d) Trend report based on Historical Information.

2.6.10 SLA Based Report:

(a) Should be able to do computation of SLA for entire GSDC network components and GSWAN network and Individual links

(b) Should be able to generate automated Daily, Weekly, Monthly, Quarterly and Yearly SLA reports

(c) Should be able to present "At-a-Glance" report comprising critical SLA parameters

(d) Should provide component level report.

2.6.11 Inventory Status Report:

(a) Equipment Inventory report –device name, device part number & serial number, device model number deployed at SC, DC & TC level.

(b) Change Management report - Change management scorecards, change audit reports, changes by user and change detail reports provide immediate visibility into whether or not the defined CCM process is working and being followed.

2.6.12 Event & Fault Management Report

(a) Should provide details about the number of complaints received due to failure of network devices and Voice devices.

(b) Should provide the exact time and date when the complaints was resolved on daily, monthly and yearly basis. This should include the time taken to resolve the complaint and the reason due to which fault had occurred.

2.7 Quality of Service (QoS)

2.7.1 Successful bidder shall configure quality of service (QoS) parameters on network switching and routing devices for end-to-end QoS for voice, video and other critical traffic over the network. Successful bidder shall configure network management policies for managing all the network and security devices using network management systems. Bidder will also be responsible for generating NETQOS reports from NMS tool and adhering to such policies that are issued from time to time by GoG.

2.8 Helpdesk / Contact Centre

2.8.1 For servicing the GSWAN users, currently following Helpdesk/Contact centre has been installed at Gandhinagar for providing Helpdesk services to GSWAN and GSDC users.

(Contact centre solution: Cisco BE7H-M4-K9 with all required Hardware, Software, cables, tools, accessories etc. for contract centre solution)

Successful bidder is required to maintain the existing centralized Helpdesk System with IVR (Intelligent Voice Recognition), E-mail, SMS and Call-tracking mechanism. The Helpdesk would be operated by a Third Party vendor appointed by TENDERER. The

Bidder is required to provide following support under Helpdesk service.

- The Helpdesk should allow GSWAN and GSDC users to log queries / complaints on a centralized phone number, which should be resolved as per the Service Level requirements.
- The helpdesk queries / complaints related to connectivity, security, configuration or any other issues which relate to the usage of GSWAN and GSDC should be handled by the Helpdesk. Daily report of calls logged and resolved should be generated and submitted to GoG.
- GoG has implemented the Helpdesk Centre from NOC. Bidder is responsible to maintain the required hardware, Helpdesk Software and licenses to setup this Helpdesk during entire contract period.
- The Helpdesk software should be able to take care of classification, automatic escalation, management, status tracking and reporting of incidents as expected by the service level requirements.
- Status tracking should be available to GSWAN and GSDC users through the centralized Help Desk number as well as online through software. Helpdesk software should also give a report on status of calls and violation of SLAs during disposal of such calls. Bidder shall be responsible to provide training to the Call Centre Agents to use the Helpdesk Software. Bidder shall deploy one resource to coordinate with the Helpdesk team to assign priorities to tickets generated.
- Bidder is required to configure additional UMI for chat boat facility on Whatsapp (on registered mobile) procured through separate bid as well as on GSWAN web page, FAQ and Navigation to register complaints in Helpdesk tool with possible answers for the same. It is required to be prepared in consulting with TENDERER. To implement this chat boat facility required compute power and storage can be used of GSDC. To implement this solution in premises of SDC, if any additional Operating System(OS), Data Base (DB) id required, bidder has to account the same in future own .

2.8.2 **Problem Resolution and Sign-Off**

GSWAN and GSDC users would report any network related problem through online Helpdesk interface or by calling the Centralized Helpdesk number. The severity of the call will be automatically decided according to the Helpdesk Severity Matrix detailed in the SLA section. The Bidder will keep track of Helpdesk performance. This online report would contain:

(a) Trouble Ticket Number as generated in the Online System
(b) Time at which the problem was logged
(c) Problem Description
(d) Customer Details – Contact and Location
(e) Helpdesk Engineer
(f) Problem Resolution Time
(g) Cause of problem

2.8.3 At the end of each problem resolution performed by the Helpdesk or GSWAN Engineer at respective location, the GSWAN engineer would provide a confirmation by sending a ping to a designated IP form the end user desktop/laptop. The receipt of ping from the end user IP would automatically indicate closure of call.

2.9 Operation & services of horizontal links from all PoPs or otherwise.

2.9.1 Successful Bidder would be responsible for uptime as mentioned in SLA for defined district level and taluka level PoPs/Horizontal offices. The Bidder would be responsible for operation and services of horizontal links. This includes fault detection, analysis and escalation to respective agencies and TENDERER within 4 hours of down-link reported in NMS tool or otherwise or on helpdesk and follow-up with respective agencies to close the complaint. Successful Bidder would be responsible for uptime as mentioned in the SLA for these existing approx. 6000+ horizontal links at horizontal offices at SC, DC & TC as well as for new horizontal links which may be established during contract period. Successful bidder would be 1st level SPOC for any fault in GSWAN connectivity at SC, DC, TC including PoP locations and HO locations. Successful bidder would go for physical visit to the offices for first level analysis of any issue(s) reported via NMS/ Helpdesk tool/by email/ any other mode of communications. Successful bidder shall responsible for carry out necessary trouble shooting to resolve the issues. If any 3rd party issue (not in Bidder's scope), Successful bidder is required to escalate the issue with respective agency and coordinate with them until the issue(s) get resolved.

2.10 Implementation, operations and services & maintenance of New PoPs

2.10.1 In case Tenderer desires to set up the new DC and TC control room or other Main DC PoPs, TENDERER may do their own arrangements for creating Control room including IT and Non IT devices, passive works, physical infrastructure etc. After implementation of the said Control rooms/PoPs, Operation, Services and maintenance of new Control room/ PoPs will be provided by selected bidder. For this O&M services, 1% of the total cost (exclusive of applicable taxes)of setting up of new Control room, per annum would be applicable for additional payment as a part of O&M and SLA of 99.74% uptime and other applicable SLAs if any as defined by Tenderer will be enforced on additional equipment /devices /hardware /software etc.

At any time during the contract period, Tenderer may ask successful bidder to provide their end to end support to create the new PoPs as per the requirement. Bidder has to support to set up this new PoPs in consultation with Tenderer /designated agency by Tenderer. For any new PoPs set up/implementation, all equipments (including Routers/switches/UPS/ and required accessories/consumables (I/O/ UTP cable, PVC Pipe, & necessary electrification including switch and plug) would be procured/ supplied by Tenderer. Link commissioning/Termination and Bandwidth provisioning would be the responsibility of Tenderer.

2.10.2 Bidder is responsible for implementation of the Control room/PoP. Implementation activity would mainly constitute:

a) Configuration of Network equipment i.e. Routers, Switch/Modem/Hub
b) Liaison with service providers,
c) Co-ordinate with NOC State Centre team connectivity related issue of the bidder for checking
d) Discovery of New POP Location in Centralized NMS Tool
e) Update of Asset Register after implementation of new POP

2.10.3 It is the responsibility of the successful bidder to maintain the networking infrastructure at the existing/newly created PoPs and control rooms. All the networking equipment shall be kept in good working condition and shall be repaired or replaced. In case of any equipment which is under Warranty the Bidder would be required to liaise with respective Vendor to ensure that all equipments are repaired/ replaced.

2.10.4 All the electrical equipment and accessories including lighting equipment, backup power sources, plugs, wires etc. shall be maintained and if required replaced by the successful bidder at its own cost. The successful bidder shall deploy the prescribed resources as given in the proposed technical solution in the technical bid of RFP for ensuring desired uptime of all GSWAN PoPs and other IT infrastructure. At various PoPs, the bidder shall provide maintenance and support services.

2.10.5 The Successful bidder shall also maintain an up-to-date inventory of all GSWAN supported equipment and spares and make the same available for review and inspections every Quarter by TENDERER.

2.11 IT Infrastructure Security Administration

2.11.1 The activities to be carried out under security administration shall include, but not limited to the following:

(a) Addressing the ongoing needs of Security Management including, Monitoring and Management of various devices / tools such as Firewall, , Intrusion Prevention System, Content Filtering and URL Blocking, Virus Protection, Load Balancer, , DMZs, VLANs, and vulnerability protection through implementation of proper patches and rules as per best practices.

(b) Carrying out periodic Vulnerability Analysis and Penetration Testing (VAPT) to ensure that GSWAN systems and network are safe and secure. This activity has to be performed at least once in quarter and on need basis as per GOG instructions.

(c) Maintaining an updated knowledge base of all the published security vulnerabilities and virus threats for related software and microcode etc.

(d) Ensuring that patches/workarounds for identified vulnerabilities are patched/ blocked immediately.

(e) Respond to security breaches or other security incidents and ensure that workaround / patches are made available for the same.

(f) Provide a well-designed access management system, security of physical and digital IT assets, data and network security, backup and recovery etc.

(g) Maintenance and management of IT security devices, including, but not limited for maintaining firewall services to restrict network protocols and traffic, detecting intrusions or unauthorized access to networks, systems, services, applications or data, protecting email gateways, firewalls, servers, from viruses.

(h) Ensuring that the IT security policy is maintained and updates to the same are made regularly as per ISO 27001:2013, ISO 20000:2018 guidelines.

(i) Access Control Management
    (i) Audit Trail and Log Analysis
    (ii) Establishing and monitoring access control

(j) Firewall policy management which will include the Configuration & Patch Management Intrusion Detection System Management: This arrangement shall include Incident Handling and recovery. The Incident Handling Procedure (IHP) has to be followed as per the guidelines drawn by the DST, GoG. This would also include virus and spam control, policy configuration & management. The audit logs shall be maintained by the Bidder for review. The bidder would also establish counter measures that are needed for the perceived risks. The bidder shall establish the counter measures to mitigate the risk.

(k) The successful bidder would be responsible to ensure that any Vulnerability or security advisory, as notify by CERT-IN, NCIIPC, NIC-CERT, OEM and any other agency should be fixed/complied as per the SLA. The successful bidder (O&M operator) would keep track of such notification and intimate concern authority at GSDC and TENDERER immediately

2.12 Vendor Management Services

2.12.1 The activities shall include, but not limited to the following:

(a) O&M agency shall coordinate and follow-up with all the relevant vendors of the State User Department to ensure that the user problems and issues are resolved in accordance with the SLAs agreed upon with them by updating the Tenderer as and when deviation in the SLA is reported.

(b) O&M agency shall also ensure that unresolved issues are escalated to respective user departments / Tenderer in accordance with the escalation matrix.

(c) O&M agency shall also coordinate with Chief Information Officers (CIOs) / Officers designated by the User Departments t o ensure that the network related issues are resolved in accordance with User Departments. O&M agency shall maintain a track of SLA performance for such vendors.

(d) O&M agency shall maintain database of the CIOs / designated officers and various vendors with details like contact person, telephone nos., escalation matrix, response time and resolution time commitments etc.

(e) O&M agency shall draw a consolidated monthly SLA performance report as

defined by the Tenderer / Departments across vendors for consideration of the user departments. (Monthly)

2.13 License Management

2.13.1 The activities shall include, but not limited to the following:

(a) All the licenses should be in the name of Government of Gujarat.

(b) O&M agency shall keep the record of all the licenses and track usage.

(c) The O&M agency shall avoid the unauthorized usage of Licensed Software. In the event of any claim asserted by Third Party of Infringement of Copyright, Patent or Trademark arising from the use of IT components or software, the O&M agency shall be entirely responsible to extinguish such a claim. If the O&M agency fails to comply and the Tenderer is required to pay the compensation to the Third Party resulting from such infringement, the O&M agency shall be responsible for the compensation including all expenses, court costs and lawyer fees.

2.14 Email/Messaging Services:

2.14.1 Currently MS Exchange 2016 is being used for an e-mail service. The activities shall include, but not limited to the following:

(a) End-to-end management of messaging systems

(b) Purging and compaction of mail boxes at regular intervals for optimum utilization of resources as per the policies.

2.15 Backup and Restore Services

2.15.1 The activities shall include, but not limited to the following:

(a) Backup of Configuration of network devices including Routers & Layer- 3 Switches as per stipulated policies at the SDC. For devices out of GSDC the backup should be taken on Quaterly basis and archived in DVD and placed with Tenderer.

(b) Real-time monitoring, log maintenance and reporting of backup status on a regular basis. Prompt problem resolution in case of failures in the backup processes.

(c) Media management including, but not limited to, tagging, cross-referencing, storing, logging, testing, and vaulting in fire proof cabinets.

(d) Drill activity for the backup and restore to be done by the O&M agency. The O&M agency would be responsible to take the back up in concurrence with the GIL / GoG in accordance with the defined back up policy.

(e) O&M agency should be responsible for successful DC-DR Configuration in coordination with GSDC O&M Operator.

2.16 MIS Reports (For GSWAN)

2.16.1 O&M agency shall submit the reports on a regular basis in a mutually decided format. The following is only an indicative list of MIS reports that may be submitted to the TENDERER:

(a) Daily reports

(i) Summary of issues / complaints logged at the Help Desk

(ii) Summary of resolved, unresolved and escalated issues / complaints

(iii) Summary of resolved, unresolved and escalated issues / complaints to vendors.
(iv) Log of backup and restoration undertaken.
(v) Security Incidents
(vi) Component wise Report (Server, Network, Security devices, Backup, , etc.)

(b) Weekly Reports
(i) Issues/Complaints Analysis report for virus calls, call trend, call history, etc.
(ii) Summary of systems rebooted.
(iii) Summary of issues / complaints logged with the OEMs.
(iv) Security Incidents
(v) Inventory of spare parts in the GSWAN.
(vi) Summary of changes undertaken in the Data Centre including major changes like configuration changes, patch upgrades, etc. and minor changes like log truncation, , user creation, user password reset, etc.

(c) Monthly reports
(i) Component wise IT infrastructure availability and resource utilization
(ii) Consolidated SLA / (non)-conformance report.
(iii) Summary of component wise DC / TC network equipment uptime.
(iv) Summary of changes in the DC / TC network equipments.
(v) Security Incidents

(d) Quarterly reports
(i) Log of preventive / scheduled maintenance undertaken
(ii) Log of break-fix maintenance undertaken.

(e) Half-yearly Reports
(i) IT infrastructure Upgrade / Obsolescence Report
(ii) Risk Assessment, Risk Management and Risk treatment Report

(f) Incident Reporting
(i) Detection of security vulnerability with the available solutions/workarounds for fixing.
(ii) DoS attacks, Hacker attacks, Virus attacks, unauthorized access, security threats, etc. – with root cause analysis and plan to fix the problems.

(g) MIS for reporting Attendance
(i) O&M agency has to report attendance on monthly basis.

2.17 ISO 27001 ISMS Standards for GSDC Network Components.

2.17.1 O&M agency is responsible for maintaining the overall Information Security posture for network components at GSDC. The O&M agency would be responsible for establishing, operating, monitoring, reviewing, maintaining and continuously improving the Information Security Management System (ISMS) for network components at GSDC.

2.17.2 The regular revision/review/change of Policy, process & procedure documents as and when required is the responsibility of the O&M Agency.

2.17.3 O&M agency has to take consent of Tenderer in case of any changes required in policy manual or documentation.

2.17.4 O&M Agency has to carry out Risk Analysis to identify and assess potential risks that could affect continuity of businesses at GSWAN. O&M Agency will also be responsible to recommend and implement adequate measures such as Risk Treatment to counter/ mitigate, the risks identified.

2.17.5 O&M Agency will responsible for preparing and carry out testing and execution of Business Continuity Plan and Disaster Recovery Plan

2.18 ISO 20000 ITIL (Information Technology Infrastructure Library) Standard for GSWAN

2.18.1 ISO/IEC 20000 adoption in Gujarat SDC infrastructure helps in ascertaining that the Services delivered to the Tenderer / User Departments by the O&M agency are:

(a) As per the agreed Service levels
(b) Professionally managed with domain expertise
(c) Project Risks are well understood and managed

2.18.2 O&M agency shall be responsible to follow ISO/IEC 20000 standard which shall promote the adoption of an integrated process approach to effectively deliver managed services to meet the SDC, Tenderer and User Departments.

2.18.3 **Methodologies for ITSM/ITIL standard:** applicable methodology shall be adopted to implement ISO 20000 standard to establish the objectives and processes necessary to deliver results in accordance with Tenderer requirements as well as the SDC policies and to implement the processes accordingly. O&M agency shall monitor and measure processes and services against policies objectives and requirements and report the results and take actions on the differences and continually improve process performance.

2.18.4 Alignment of information technology services and strategy.

2.18.5 To create a formal framework for current service improvement projects.

2.18.6 To create stable framework for both resource training and service management automation.

2.19 Change Management

2.19.1 The activities shall include the following, but not limited to the following:

(a) Tracking the changes in hard / soft configurations, changes to applications, changes to policies, applying of upgrades / updates / patches, etc.
(b) Plan for changes to be made - draw up a task list, decide on responsibilities, coordinate with all the affected parties, establish and maintain communication between parties to identify and mitigate risks, manage the schedule, execute the change, ensure and manage the port change tests and documentation.
(c) Any changes (as and when required) at the architecture or configuration level for GSDC related network components is part of the O&M activity and it should be carried out by the O&M Agency.

2.20 O&M of Physical Infrastructure

2.20.1 All the devices installed as part of the physical infrastructure should be remotely monitored and managed on a 24x7x365 basis. The physical infrastructure

management and maintenance services shall include, but not limited to the following:

(a) Management of Physical Access to the premises as per the policies set by the Department of Science and Technology.

(b) Material inward/ outward control as per policies set by the Department of Science and Technology.

(c) Monitoring and managing safety and surveillance equipment like CCTV, Access Control, Fire detection and Suppression etc.

(d) Issuing access control as per approval from the Department of Science and Technology.

(e) Reporting incidents to the Department of Science and Technology.

(f) Co-ordinate with respective trusted personnel and communicate with authorized maintenance personnel for various utilities at the as required.

(g) Vendor Co-ordination for various physical Infrastructure components

(h) Component that is reported to be down on a given date should be either fully repaired or replaced by temporary substitute (of equivalent or higher configuration) within the time frame indicated in the Service Level Agreement (SLA). In case the selected bidder fails to meet the above standards of maintenance, there will be a penalty as specified in the SLA.

(i) The selected bidder shall also maintain records of all maintenance of the system and shall maintain a logbook on-site that may be inspected by TENDERER or authorized authority.

(j) CCTV footage installed at DC is to be kept to meet legal, regulatory, ISO Policies compliance requirements and would be stored in GSDC SAN/NAS during the contract period in coordination with O&M operator of GSDC. The record retention period shall be as per policies of TENDERER.

(k) Ensure availability of the physical Infrastructure including Power, include of DG, UPS, Cooling, CCTV, Access Control, Intelligent Racks, Fire detection and suppression systems, Rodent Repellent systems, Water leak Detection Systems and other components included as part of physical Infrastructure related services in GSWAN & Mini Data Centres (MDCs).

(l) O&M AGENCY will have to submit monthly & quarterly MIS reports of each components as per the SLA

(m) O&M AGENCY should log SR/Incidents calls in service desk related to each component.

(n) Proactive and reactive maintenance, repair or replacement of defective components (IT and Non-IT/ Hardware and Software) related to Physical Infrastructure systems and sub-systems.

(o) The Bidder shall maintain documentation for installation, testing, commissioning of any system/sub-systems that is installed or upgraded.

(p) Acceptance test shall be carried out for any system that is installed and/or upgraded.

(q) Bidder shall record all the incidents/issues related to physical infrastructure services, security, systems and Sub-systems in the Helpdesk.

(r) The bidder shall carry out periodic Risk assessment of the Physical Infrastructure as per Policy/Guidelines specified by Tenderer and provide a Risk Assessment report including recommendations.

(s) The bidder shall provide training to resources deployed at periodically.

(t)The bidder shall carry out current state assessment on an annual basis to determine the state of all the components installed and maintained, on completion the bidder shall submit a recommendation/up gradation report.

(u) Full compliance to all the policies, procedures, processes, guidelines, Government- Acts, Rules & Regulations, etc. The bidder shall provide full compliance/adherence of all activities performed by them, to the aforementioned statutes, without any additional cost to TENDERER.

2.20.2 Monitoring of Current CCTV System with IP base Cameras with high resolution and night vision cameras Transformer, Circuit Breaker, Electricity and DG Set Maintenance & Management at Mini Data Centres (MDCs):

i. The O&M agency shall be responsible for Operations, Management and Comprehensive Annual Maintenance of Transformer, Circuit Breaker, HT/LT Power Cables, Electricity and Diesel Management for the entire project period. The O&M agency shall ensure that diesel shall be there in the DG sets at its full capacity in case of power failure. O&M agency has to maintain register for monitoring and reimbursing the diesel consumption for the DG set.

ii. Procedure for monitoring and reimbursing the Diesel consumption for the DG set:

(a) There will be a register maintained and kept with the O&M agency showing the following columns:

Sr. No	Date	Current Reading	Fuel Available	Date of filling	Qty. Filled	Total fuel available	Signature of Tenderer	Signature of O&M agency
1								
2								

(b) Reimbursement of diesel cost will be done on Monthly basis along with Monthly Payment.

(c) TENDERER shall verify the diesel consumption from the log book maintained and MIS generated.

(d) The O&M agency will submit the bill (original bills of petrol/diesel pump) for every purchase along with their invoice for reimbursement.

(e) Payment will be processed by TENDERER based upon verification of bill with the register entry on Monthly basis.

2.21 Preventive Maintenance Services

2.21.1 Check, Repair/Replace any loose contacts in the cables/connectors & connections on a regular basis.

2.21.2 Conduct preventive maintenance every three months or as directed by the TENDERER (including inspection, testing, satisfactory execution of diagnostics and necessary

repairing of the equipment).

2.21.3 Cleaning and removal of dust, dirt etc. from the interior and exterior of the equipment on a daily basis.

2.21.4 Preventive Maintenance Activities of components as per their manufactures' recommendation/advice.

2.21.5 The operator will keep a web-based monitoring format and schedule of preventive maintenance services and shall provide reports to the Tenderer as and when asked.

2.21.6 The Preventive Maintenance shall be carried out in Non-Prime Hours only under prior intimation and approval from TENDERER.

2.22 Corrective Maintenance Services

2.22.1 Warranty and maintenance/troubleshooting of hardware problem of all supplied IT & Non-IT Infrastructure including network (active/passive) equipment, Security, etc. and support infrastructure equipment UPS, AC, DG Set etc. and rectification of the same.

2.22.2 Troubleshooting of problems arising in the network and resolving the same.

2.22.3 Documentation of problems, isolation, cause and rectification procedures for building knowledge base for the known problems.

2.23 Asset Management Services

2.23.1 The O&M agency shall be required to create database of all the equipments/software procured/Installed under Project. The details of all assets like hardware, software, peripherals, manuals, media and other related peripherals, etc., shall be maintained by recording information like make, model, configuration details, serial numbers, licensing agreements, warranty, place of installation etc.

2.23.2 Record installation and removal of any equipment under the project and inform TENDERER even if it is temporary.

2.23.3 Create Software details with information such as Licenses, cost, Version Numbers, validity, support if any and Registration Details.

2.23.4 Perform software license management, notify TENDERER on licensing contract renewal and assist them in getting the license renewed.

2.23.5 Asset Management services of physical and IT infrastructure under the project must conform to ITIL framework.

2.24 Configuration/Reconfiguration Management Services

2.24.1 The successful bidder shall maintain complete configuration including reconfiguration (in & soft form in safe environment) for all equipment and handover the same to the TENDERER at the time of completion of project or as and when asked by the TENDERER.

2.24.2 The O&M agency shall define and adhere to the change management procedures and also ensure that no unauthorized changes are carried out. Any changes shall be incorporated with prior approval of the TENDERER.

2.24.3 The O&M agency shall do proper version management of these configurations as they are bound to change from time to time.

2.24.4 These configurations shall not be accessible in general and must be kept confidential.

2.25 Resource Requirement for Operation, Services and Maintenance

2.25.1 The minimum requirement of manpower resources, their qualification and responsibility of each resource is given below. However, for the resources who are working with existing O&M agency will be given priority over minimum qualification criteria defined in this RFP. This is minimum indicative list of resources and based on actual requirements, the bidder may deploy any number of resources to meet the SLA. TENDERER shall not pay any cost for additional resources required to operate, maintain, monitor & manage the GSWAN as per the SLA. In case support staff is not available or is on leave, the bidder is required to provide the alternative personnel with same or higher technical capabilities of the non-available personnel.

Sr. No.	Designation	Gen.	Min. Qualification, Relevant Experience & Certifications	Penalty per day per resource (Rs.)
1	Technical Manager (GSWAN)	01	+ MBA/PGDBM/PGDM + 10 Years relevant experience in IT/ITeS (minimum 6 years' experience for managing WAN) + PMP/ PRINCE2 Certified	5000
2	Helpdesk Manager	01	B.E./B.Tech/MCA with 3 years of relevant experience or diploma with 5 Years relevant experience	3000
	Total - SC	**2**		
3	Network Engineer (SCAN)	12	B.E./B.Tech/MCA with 3yrs of relevant exp.	2000
4	Network Engineer (DC)	33	B.E./B.Tech/MCA with 3yrs of relevant exp.	2000
5	Network Engineer (TC)	258	B.E./B.Tech/MCA with 2yrs of relevant exp. or Diploma with 3years of relevant of exp.	1000
6	VC	06	B.E./B.Tech/MCA with 3yrs of relevant exp or diploma with 5 Years relevant experience., Cluster wise one	2000
	Total - SWAN	**311**		

S. No.	Description	Roles & Responsibilities
1	Technical Manager (SWAN)	• Responsible for Network Planning, Designing & Optimization. • Responsible for network availability from Data Centre till last mile user node • Liaison with various stakeholders / agencies & GoG Departments for GSWAN related issues etc. • Responsible for Network services across client departments and citizens of the State as per the agreed Service Levels.
2	Network Administrator	• Responsible for network uptime, performance and other related services. • Network monitoring and proactive network uptime maintenance. • Network management (routing), Router Configuration and Troubleshooting, upgradation, Link Performance Management of L3 and L2 Switch at Data Center and GSWAN Network on day to day basis. • Support administration, Change Management, Liaison with Bandwidth

		Provider officials and external vendors, bandwidth and facility management
3	Helpdesk Manager	• Logging of support calls, escalation of calls, recording of configuration items and service calls monitor and control the Service levels and underlying service quality Creating MIS reports for management purpose Managing and Supporting the Helpdesk System (tool) for day- to-day operations. • Required to do recommended modifications, additions, deletions in tool. Managing and operating Helpdesk tool issues as a Tool Specialist.
4	Video Conferencing Engineers	• Managing Video Conferencing events and equipments. • Vendor co-ordination and setting up of Video Conferencing sessions as per need and requirement.
5	Network Engineers (SCAN)	• Installation, troubleshooting, commissioning of network equipment for Sachivalaya Campus and horizontal offices in Gandhinagar. • Maintenance, Monitor and Support for network availability at the users end points in sachivalaya campus. • Installation, configuration and maintenance of wireless network in Sachivalaya Campus. • Regular update of software patches for network equipment, anti-virus etc.
6	Network Engineers (DC)	• Installation, Troubleshooting, commissioning of network equipment in District Control Room and horizontal offices at District level. • Maintenance, Monitor & Support for network equipment of POP. • Installation, configuration and maintenance of wireless network at District level. • Regular update of software patches for network equipment, antivirus etc. • Monitoring bandwidth utilization for the POP • Generating report and submit it to Project Manager (GSWAN). • Carry out and coordinate feasibility surveys for new connectivity in the district • Coordinate for VC events in DC Office and webcasting events in district
7	Network Engineers (TC)	• Installation, Troubleshooting, commissioning of network equipment in Taluka Centre and at horizontal offices at Taluka level. • Maintenance, Monitor & Support for network equipment of POP. • Installation, configuration and maintenance of wireless network at Taluka level. • Regular update of software patches for network equipment, antivirus etc. • Monitoring bandwidth utilization for the POP • Generating report and submit it to Project Manager (GSWAN). • Carry out feasibility surveys for new connectivity in the Taluka • Coordinate for VC events in Mamlatdar office and webcasting events in Taluka

Note: It is clarified that the responsibilities and numbers mentioned against the position type are only indicative, it is the responsibility of bidder to provide requisite resources of right competency and experience to completely discharge functional requirements of Operations & management, Error reporting, SLA compliance, support (installation of applications, software, networking devices, OS, Storage, Backup) and the cost of such manpower should be part of the bid being quoted by the bidder. As required by the tenderer, O&M agency shall shift the manpower deployed across DCs/TCs depending

upon requirement & the number of complaints.

2.25.2 The manpower deployed by the bidder for carrying out and providing services shall necessarily be Core resources except the following:

(a) Network Engineers (DC & TC)

(b) Video Conferencing Engineers

2.25.3 The bidder may outsource the deployment of personnel listed above to its existing partner engaged in the networking business at the time of bidding. The complete set of manpower resources proposed by the Bidder shall be on-site manpower only and strictly dedicated for this contract. Noncompliance of such deployment would result into imposition of penalty / termination of the contract as per the terms and conditions of RFP.

2.25.4 The manpower deployed by the bidder shall report to the respective nodal officers nominated by TENDERER.

2.25.5 During the contract period, based on the requirement of tenderer, the bidder shall deploy additional Network engineers at DC / TC level at following rates:

- Rs. 40000 plus applicable GST per month per Network Engineer at DC
- Rs. 25000 plus applicable GST per month per Network Engineer at TC

The bidder shall deploy such additional resource within one month of receipt of order from the tenderer.

2.25.6 The Bidder has to provide supporting IT and Communication Infrastructure to such manpower, during entire contract period without any extra cost to the TENDERER. Workspace shall be made available to the bidder by the concerned offices. Bidder has to ensure that the Support personnel deputed during all stages of the project shall carry an Identity Card duly authenticated by the TENDERER.

2.26 Scope of work under GSWAN Wi-Fi

- Government of Gujarat has implemented GSWAN Wi-Fi infrastructure to provide wi-fi connectivity to various Government offices in Gandhinagar and selected locations at the District and Taluka in the State.
- Following are brief scope of work for O&M for WiFi services under this project :
  - The entire scope of the work depends on the technical skill and experience in management of the same level or kind of infrastructure.
  - It is mandatory for Bidder to deploy qualified professional to O&M of the existing Wi-Fi network and future Wi-Fi connectivity to be provided under GSWAN.
  - The Bidder will have to carry out reinstallation of any of the equipment 'Free of Cost, if required.
  - The Bidder need to manage & maintain various records related to the services extended to the Government.
  - The Bidder needs to maintain the required security of the network as per the DoT/GoG Security guidelines.
  - The Bidder is responsible to maintain documentation on the progress of other work and will have to update the same on regular basis. Vendor will have to submit the MIS reports regularly, as per the guideline issued by Tenderer/TPA.

- In case of failure of any system or equipment, the Bidder needs to replace or repair the faulty part/component/device to restore the services at the earliest. The cost of the repairing or replacement of faulty Cable/component/device has to be entirely born by the Bidder.
- All expenses related to cable/component/device, including hiring of specialized technical expertise, in case required, has to be borne by the
- Bidder shall submit details of various reports generated by NMS like link availability, downtime, usage, fault & rectification, BER etc. which are required for AP(s) monitoring.
- Wi-Fi network access should be available throughout the campus inside the buildings as well as in Lobbies, Corridor locations to all the staff at the identified locations on well-defined access policy.
- The System should support seamless roaming within the campus for users with mobile devices such as smart phones and tablets.
- Bidder has to ensure for configuration of WiFi infrastructure to support the user devices with 2.4 GHz as well as 5 GHz frequency band at the same time.
- Bidder has to manage the Wi-Fi network from a central location i.e. State Data Centre, though the wireless management system.
- Bidder is responsible to configure and deploy access points (APs) remotely through a Wireless controller.
- System should support multiple VLANs to support users with different privileges.
- Bidder shall require to keep updated the network diagram all the time including detailed technical documentation and detailed Project Plan for all the locations mentioned and to submit it at periodic time or as requested by Tenderer during contract period.

- Following security parameters to be taken care by Bidder :
  - The successful bidder has to configure/manage the system on Rule based Access Rights.
  - Data communication between devices should take place in encrypted form to ensure end-to-end security of user information/ data along with implementation of Wireless Security Standards such as WPA and WPA2.
  - A Secure Guest Portal would be configured for Guest User Access if reqd.
  - Bidder is responsible to manage the existing Wireless Intrusion Prevention System (WIPS) to prevent Intrusion into the wireless network.
  - **The Bidder has to ensure compliance with all Regulatory and Legal guidelines issued by Department of Telecommunications from time to time. At no point GoG or its agencies would be responsible for any non-compliance arising from non-adherence on the side of the successful bidder.**
  - The bidder shall carry out survey of the campus to ascertain number of Access Points and their positioning to ensure maximum coverage as desired and excellent signal strength.
- The Bidder shall arrange for the Technical manpower for the entire contract period to

look after the day to day management of services related to Wi-Fi facility management. These services would include:

(i) Providing connectivity to user devices as per Wi-Fi access policy,

(ii) Satisfactorily handling all the issues related to connectivity, performance and security.

- Structured cabling for connecting all the APs will be in scope of the bidder. This would include installation of APs at designated places, laying of LAN and power cables through PVC conduits, connecting the APs to nearest Access switch of SCAN network. All core centralized equipment would be centrally placed at SDC. Bidder has to undertake necessary LAN and power cable connectivity to ensure system operations during the entire contract period. GoG will provide necessary support from GSWAN and SDC teams for the same.
- All active and passive components required for maintaining and management of Access Points and Core infrastructure including converters, injectors, poles, frames, mounts, other accessories, etc. would be in scope of the bidder.
- The successful bidder will be responsible for installations, configurations and enabling services at new locations as decided by GoG.
- The bidder will provide all the documentations including operating and service manuals, diagrams and test reports of the deployed Wi-Fi system at periodic time (Monthly) or as requested by Tenderer.
- The bidder will have to arrange for all the testing equipment & tools required for installation, testing and maintenance etc. at his own cost.
- The successful Bidder will be responsible for User Creation for Guest, Privilege Assignment, and Online Support for the entire project.
- The successful bidder will be responsible for smooth operations of the entire system in respect to new User configurations and connectivity, User Management, Troubleshooting, User education through documentation and Training material in Hard and Soft forms.
- The Bidder would be solely responsible for smooth on boarding of new users such as Guests, Day to day management of the entire system, Life cycle management of temporary troubleshooting, fault users, identifications, configuration and re-configuration, etc.

2.27 Scope of work under GSWAN SCAN

Using latest and state-of-the art technology, the Government of Gujarat (GoG) has established Gujarat Sachivalaya Campus Area Network (GSCAN) to improve the administrative efficiency in the Sachivalaya Campus and other main offices campus in Gandhinagar. The GSCAN has been implemented as the backbone network for data, video and voice communications throughout the New Sachivalaya, SS-1, SS-2, Old Sachivalaya, various RU (Remote Unit) locations, other main office Campus locations for the Government operations in Gandhinagar. GSCAN has modernized the communication set up for Intra-Government and Government-Citizen services. GSCAN has a suitable topology, uses state-of-art technologies and has flexibility to expand/upgrade to cover all parts of the Sachivalaya. All Government

communication and IT infrastructure would be linked to GSCAN.

Current GSCAN has been implemented to provide Data / Voice / Video services to various designated offices at Sachivalaya and other locations in Gandhinagar. The key applications envisaged on the network are Internet, Video Conferencing, Voice and Data Communication and Intranet Operation.

Scope of work

- The Successful bidder shall be responsible for operating and maintaining the entire SCAN network for connectivity in Secretariat Centre (SCAN) and other office connected in SCAN. Please refer annexures for the infrastructure coved under SCAN.
- For better Network availability, preventive maintenance activity is required to be carried out at least once in a quarter which includes configuration backup and software up gradation/updation.
- Successful Bidder is required to submit preventive maintenance schedule of all equipment to Tenderer. After performing preventive maintenance activities, bidder is required to submit the report of the same. All such activities should be done preferably in non-working hours.
- As part of the Operations and Maintenance services, the bidder shall provide support for the software, hardware, and other infrastructure installed in SCAN. Bidder shall also provide 5 years comprehensive AMC for all the equipment covered under SCAN.
- Support for the end users at each of the SCAN and Other Offices locations connected under SCAN network.
- The services shall be rendered onsite from the designated premises. To provide the support at the locations, bidder is expected to provide experienced and skilled personnel at each location.
- Against non-performance and delays in O&M support to end users, necessary penalty will be levied as defined at Penalty clause under GSWAN Section.

2.28 User education, training & awareness

The selected O&M agency through its deployed manpower shall conduct user awareness & educational campaign sensitize the users of GSWAN by the way of creating videos/pamphlets/training sessions for below mentioned indicative list of subjects:

- Do's & Don'ts for appropriate usage of Internet connectivity & password management within GSWAN network
- Grievance redressal mechanism
- Procedure for availing new connectivity
- Process for arranging Video Conferencing
- Any other subject as suggested by GIL/DST

The content for education, training & awareness programmes shall be verified and approved by Third Party Auditor (TPA) or any other agency designated by tenderer. The awareness drive should be conducted on regular interval i.e. quarterly basis and O&M operator should be able to demonstrate the performance improvement based on the awareness drive carried out at End User level. The bidder shall submit the report on the

training & awareness activities undertaken at DC & TC level.

2.29 Supply, Install and commissioning of last mile equipments on turnkey basis for offices of Government of Gujarat.

2.29.1 Introduction:

Department of Science and Technology is nodal agency of Government of Gujarat for implementation of LAN/WAN/SICN network throughout the state. As of now Government of Gujarat has already connected more than ~5k offices through its own network i.e. Gujarat Sachivalaya Campus Area Network (GSCAN-Sachivalaya LAN) and Gujarat State Wide Area Network (GSWAN-Spread across the state).

GSCAN and GSWAN: Is the core backbone of state-wide IT infrastructure. It currently serves the state government departments/board/corporations to fulfill their need of connectivity (Both Internet and Intranet) across the state. Over the years of experience GSCAN and GSWAN has proved to be a reliable state-wide carrier for data, voice and internet access for the different departments spread across varied geographical boundaries across the state of Gujarat. GSWAN connects all 33 Districts, 258 Talukas ultimately interconnecting last mile offices for secure digital communication. GSCAN and GSWAN rides on various modes of connectivity like owned OFC, Leased OFC from ISP, Wireless links connecting to nearest PoPs. Recently, Tenderer had completed 3rd phase of upgradation of GSWAN and increases minimum bandwidth at each PoP to 20mbps from 2mbps focusing more on creating fibre backbone and more and more no of PoPs to serve the last mile.

There are three types of Cabling done in the entire network of GoG:-

- The Campus Backbone is the cabling system that provides data and/or telecommunication services between buildings. It connects two or more Buildings and will almost always be in the form of fiber optic cabling.
- The Building Backbone is the cabling system that provides telecommunication services between floors or areas within a building. It connects the Building to the Floors and will usually consist of both fiber optic and copper links.
- The horizontal cabling is the cabling system that provides telecommunication services from the Floor to the Nodes. It will almost always be in the form of copper cabling but occasionally fiber optic may be required.

SICN Project

Sachivalaya Integrated Communication Network (SICN) is a TDM based Private Telephone Exchange (PABX) network owned by Government of Gujarat for their Voice Communication needs implemented in the 2000. This network is spread in capital of Gujarat Gandhinagar connecting almost all the Govt. Offices, Boards & Corporations Offices.

- The core of this network is Lucent make DEFINITY G3r EPABX with the capacity of 9500+ lines and 650 trunks working on E1 R2 MFC and ISDN-PRI (at present total 23 PRI trunks are in use), expandable up to 25000 lines. Through OFC this EPABX

is connected to 11 remote units (1 Core Exchange and 10 Remote Units interconnected through OFC).

- As a backbone around 100 Kms. Of Optical Fiber has been laid and 150 Kms. Of JFC has been laid with Structured cabling for Voice & Data nodes. There are 9500+ Voice Nodes on TDM based voice only Analog and Digital extensions.
- **Network Architecture:** This Network is equipped with the DEFINITY Enterprise Communications Server (ECS), which organizes and routes voice transmissions. It can connect to private and public telephone networks, Ethernet LANs, ATM networks, and the Internet. This network has the following components.
    1. Processor Port Network
    2. Remote Units.
    3. OFC and UTP Backbone
    4. Main distribution frame (MDF) and intermediate distribution frame (IDF)
    5. Patch Panels
    6. Endpoint (Analog or Digital)
- OFC has been laid as the back bone for data networking. These OFCs are Single-mode fiber (SMF) and Multi-mode fiber (MMF) both.
- Remote Units (RU) are used when the system grows beyond the capacity of a single port network or must serve geographically dispersed offices. (RUs) provide additional ports as needed.
- Subscriber lines are coming from RUs and these lines are connected at MDF & IDF and then carried by JFC cable to the distribution panel. From Distribution Panel / Patch Panel through CAT-5/6 Cable (UTP Cabling)/2 Pair it goes to the end subscriber.

The rates discovered by this RFP for horizontal connectivity component as mentioned in Annexure – FIN –C1, will be valid initially for a period of 2 (Two) year from the date of award. i.e. issuance of LOI/WO. Bidder is allowed 5% rise each year after completion of two years. Bidder has to make Back to Back agreement with respective OEMs for the same. As this is an RFP of Rate Contract empaneling agency(s) for the duration of two years, Tenderer does not guarantee order of any assured quantity at the time of issuance of work order or signing the contract agreement. The Quantities mentioned are for evaluation purpose. Placing of order will be as per actual requirement during tenure of contract.

This is an EPC/turnkey kind of procurement wherein successful empaneled agency(s) will be responsible for end-to-end LAN/WAN/OFC/JFC cabling work including various activities such as carrying out LAN/WAN/SICN, OFC/JFC related work for both the categories i.e. new connection/ link or repairing of existing links of GSCAN/GSWAN/SICN etc. Broad scope of the work includes undertaking various activities like supplies of various materials, installation, testing, commissioning and O&M during the warranty period.

2.29.2 OFC CABLING WORKS

As mentioned above bidder will be responsible for end-to-end with material Cabling work

including all like cable, passive items, I/O box, patch cord, Labour work, warranty and maintenance services as per the industry best practices and complying to the RFP requirement throughout the state to provide SCAN/ GSWAN connectivity at various GoG offices using OFC / CAT-6A cable. Bidder will be responsible to undertake and complete the works within the defined time frame related to supply, installation, testing and commissioning of services as indicated in the bid anywhere across the Gujarat state.

Coaxial or Optical Fibre Cable quoted/supplied/installed by the Bidder as per the scope of work of this RFP must be manufactured/made in India only. The works are to be completed on turnkey basis and the supplied equipments are required to be maintained for Three years from the date of FAT. The Bidder shall be responsible for implementation of the work as defined. Bidder is required to carry out following tasks but not limited to:

1) **Supply, Installation, testing and commissioning of the LAN/WAN/OFC work**: The Bidder is required to carry out cabling work as per the requirements of Tenderer. Bidder will have to carry the user details such as User name, IP address and Network Layout in respective file / respective offices for installation and commissioning of equipments. Bidder is required to send a mail to gswansupport@gujarat.gov.in and other email addresses as specified by Tenderer, from respective user account for the confirmation of Data.
2) **Turnkey Project Basis**:- The Bidder shall act as single Bidder to organize and manage the entire project – including design, supply, installation and commissioning of all required hardware, software, networking, accessory items and local wiring for Electrical power supply etc. at locations proposed by Tenderer. The Bidder shall be in a position to test, demonstrate and certify the basic requirements in accordance with the contract.
3) **Technical arrangements:** The Bidder shall provide details of site and infrastructure requirements in a layout plan after making a site survey.
4) **Earthing Arrangement:** The Bidder shall provide wiring and pit specifications, Earth resistance etc. The Bidder shall arrange to construct separate earth-pits as required.
5) **Warranty Support:** The works are to be completed on turnkey basis and the supplied equipments are required to be covered under warranty period of 5 years from the date of FAT. The Bidder shall be responsible for implementation of the work as defined. New item supllied during the contract period should be with 5 years warranty support. The successful bidder has to provide Comprehensive onsite warranty for all equipments as mentioned in RFP.
6) All goods or materials shall be supplied strictly in accordance with the specifications, Drawings, datasheets, other attachments and conditions stated in the RFP/ Agreement / SLA. All materials supplied by the Bidder shall be guaranteed to be of the best quality of their respective kinds and shall be free from faulty design, workmanship and materials.
7) **Certification:** The Bidder shall test and certify the availability and reliability of the link and give the connectivity matrix between various locations and get it certified by Tenderer.
8) **Documents:** The Bidder shall provide 1 set of documents and manuals (hard copy, soft copy with each item of the unit supplied). Bidder will have to submit the

Escalation matrix with details of responsible person names, E-mail's and mobile numbers in order to solve any technical and non-technical problems throughout the life cycle of the project and warranty period.

9) **Reporting:** Detailed report is required to be submitted for the work under progress and for functional performance of the connectivity, throughput. The same have to be certified by GIL/DST or its representative agency. Bidder shall submit the installation plan for each location to GIL/DST or its representative agency, who in turn shall approve the plan before execution. Bidder will have to fill up an installation and commissioning report and get it duly signed by concern officer with their seal and remarks if any.
10) Tenderer reserves the right to redefine the requirement of services within the scope of items specified in the bid as required from time to time.
11) The Under Ground (U/G) Cables are to be buried at depth such that the top of the cable is One meter (1000 mm) below the normal ground level. The items of work involved in U/G Cable laying are as under: -
    A. Excavations of trench up to a depth such that the top of the cable is 1 meter below the normal ground level according to the construction specifications.
    B. Laying and pulling of cables in trenches through pipes/ ducts.
    C. Placing of Half round RCC Pipes / Stones slabs /Precast RCC Slabs /Layer of Bricks as per specifications.
    D. OFC LIU should be 24 pair (Fully Loaded) by default for all sort of OFC cabling work
    E. Route indicators (Metallic) for OFC cable are to be placed for every 100 mtrs.
    F. Joint indicators for OFC cable are to be placed for every OFC joint.
    G. Digging and burying of OFC cable 1Km. Length and the OFC cables are to be laid in buried HDPE pipes. Diameter of the HDPE pipe should be 25mm of Std. Make with ISI mark.
    H. Back filling in compacting of the excavated trenches according to the construction's specifications and removal of excess earth from the site.
    I. Construction of pillar foundations erection, painting and sign writing of pillars.
    J. Erection, termination, painting and sign writing of DPs
    K. Termination of Cables in MDF and Pillars.
    L. Jointing and End-to-End testing of Cables– Correspondence and Electrical tests. Supply, fixing, painting and sign writing of root and joint indicators.
    M. Documentation: Submission of detailed diagram/drawing of work carried out.
    N. Modernized Method of cable laying should be incorporated, where, minimum damage to the infrastructure is required i.e. cable laying machine is used for such purposes.
    O. Bidder is required to maintain work log and activity sheets on a software which facilitates reporting of their performance through SLA monitoring, the access to these reports to be made available to Tenderer/its designated agency.
    P. Bidder is required to submit the underground cable diagram with longitude and latitude from start point to end point including each turning point with cable length. (In form of hardcopy as well as soft copy in CD)
    Q. Bidder must comply and confirm the above-mentioned points in their proposals

2.29.3 LAN/WAN/Structured Cabling Works

All work shall conform to the Building Code, and all local codes and ordinances as applicable. Any exceptions to the above must have written authorization from Tenderer. As mentioned above entire work has to be completed in turnkey/EPC manner. Further, below mentioned are the minimum tasks which Bidder will have to carry out during the work:

(a) To carry out the feasibility study for the deployment of required LAN.

(b) Bidder shall act as single Bidder to organize and manage the entire project including design, supply, installation and commissioning. The Bidder shall be in a position to test, demonstrate and certify the LAN connectivity in accordance with the contract.

(c) The Bidder shall carry out site survey and prepare tentative BoM for the work to be carried out at that particular site. This BoM will have to be submitted to Tenderer for approval along with a layout diagram indicating the location of equipment to be installed.

(d) The Bidder will be responsible to undertake and complete the works related to supply installation and commissioning services across the Gujarat state.

(e) In case of repairing or upgradation of existing links bidder will be responsible for removal of existing old/faulty cables or material without any additional cost to the purchaser.

(f) The Bidder shall be using 4" GI Pipe as standard while installation of cabling work.

(g) The Bidder shall be responsible to share the status report of existing infrastructure (i.e. Cable, network equipments, patch cord, OFC etc.), during resolving complaints.

(h) The Bidder shall provide one copy of the Network Diagram, warranty documents, manuals and FAT/UAT reports etc. to concern local GOG/GSWAN authorities and another copy to Tenderer for further process of completion of orders.

(i) The Bidder will be responsible to provide the services at all the locations at the agreed price. Bidder is required to Supply and Install LAN components and commission LAN as per the requirements. The structured cabling works are to be completed on turnkey basis including installation of all required casing, conduits, flexi pipes, I/O boxes, Face Plates, removal of existing Lan infra if any, etc. To ensure quality of work done, no cable should be left bare or visibly exposed and the supplied equipments are required to be maintained for Three years from the date of FAT.

(j) The Bidder shall be responsible for implementation of the work as defined. Delivered Solution must be tested and commissioned as per defined procedures before handing over the project to Tenderer. Any hardware equipments or software's required for those testing and commissioning procedures is the sole and full responsibilities of the bidder.

(k) All goods or materials shall be supplied strictly in accordance with the specifications, drawings, datasheets, other attachments and conditions stated in the RFP/Agreement/ SLA. All materials supplied by the Bidder shall be guaranteed

to be of the best quality of their respective kinds and shall be free from faulty design, workmanship and materials.

(l) The Bidder shall provide details of site and infrastructure requirements (Power, earthing etc.) in a layout plan after making a site survey.

(m) Detailed report is required to be submitted for the work under progress and for functional performance of LAN, the connectivity, throughput. The same have to be certified by Tenderer/ PROJECT COORDINATOR. Bidder shall submit the installation plan for each location to PROJECT COORDINATOR, who in turn shall approve the plan before execution. Bidder will have to fill up an installation and commissioning report and get the same duly signed by concern officer with their seal and remarks if any.

(n) On acceptance of work, a work completion report must be prepared by the bidder and signed by both parties i.e. TENDERER or its designated agency and bidder. During the warranty period, for each visit whether periodical or on call, whether preventive or corrective maintenance, the bidder contact person must inform to resident GSWAN team. A technical/service report of the work carried out must be signed by resident GSWAN engineer and bidder's representative.

(o) The bidder should ensure that while installation or attending the complaints of LAN, day-to-day functioning of official work and existing network setup/connectivity/internet connectivity should not get disrupted.

(p) The bidder will be responsible to undertake and complete the works related to supply installation and commissioning services as indicated in the bid anywhere in state promptly and within the time duration prescribed by Tenderer/user department.

The bidder will be responsible to provide the services at all the site locations which also include Taluka places at the agreed price. Bidder is required to Supply/ Install / Commission Transceivers, OFC components, I/Os and Patch Cords, as per the specifications mentioned in the Bid document. The works are to be completed on turnkey basis and the supplied equipments are required to be maintained for Three years from the date of FAT. The Bidder shall be responsible for implementation of the work as defined.

(q) <u>Standard Cabling Best Practices:</u>

A. For Cabling, the Cable used shall be Standard Branded CAT6A, 100ohm, 4 pair unshielded twisted pair (UTP) For e.g. If 25 nodes are required at a floor with future expansion planning of 20 more nodes, then in such situation minimum hardware is required to be install is one Switch (48 Port) and one Patch panel for floor level distribution.

B. All Floor uplink shall be provided on fiber only and if distance between two-point is less than 90 Mtr. CAT6A cable may be used for Up-link.

C. All node should be connected to switch through I.O. Port and Patch panel only.

D. Cable Tagging shall be at both side and at both end (i.e. node side and rack side and inside and outside of I.O port and Patch panel)

E. Care must be taken to not to stretch or abrade cables during installation, i.e. the pulling tension for cables must not be exceeded.
F. Cables that pass through the infrastructure of the building shall be suitably protected against damage. Through walls and floors this shall involve an appropriate type of sleeve; through any form of metalwork or stiff plastic then a rubber grommet shall be used.
G. To ensure cable management and also strain relief, cables shall be properly dressed using Velcro cable ties. However, cables ties should never be over tightened.
H. On vertical runs, the cables shall be dressed and tied from the bottom up, thus putting minimum strain on the cables.
I. Cables shall not run behind radiators.
J. In order that the system may be easily re-routed, or damaged sections quickly replaced, free access to the cable, where possible, is important
K. Draw cords shall be left in ducting, piping etc. for future use
L. Because of the nature of offices, dust sheets be used at all times.
M. Special care shall be taken to avoid contact with dangerous materials e.g. asbestos
N. Sharp bends in the cable will damage the insulating material thus causing unacceptable losses in the transmission medium. Therefore, the internal radius of every bend in a cable shall be such as not to cause damage to the cable, nor impair the characteristics of the cable.
O. Patch panels shall be installed within the Communications 24 nodes from the top, continuing downwards.
P. Patch panels shall be use of PCB Patch Panels.
Q. The cable shall be clearly labeled at both ends, as outlined in the documentation and/or drawing.
R. High power electrical plant may produce switching transients and radio frequency emissions that may induce interference on the UTP cable. Therefore, in addition to the rules imposed by the IEE Regulations, data cables shall not run parallel to power cables, especially where these cables may carry heavy switching loads. If, however, this is unavoidable it is advisable to keep cables as far as possible. (Like Transformer-100CM, Electric Meter- 100Cm Fluorescent Light-30Cm).
S. Cable shall not be routed over pipes, conduits, other cabling, ceiling tiles, etc., but shall rest directly on the supporting surface so as to minimize the potential for sharp bends, kinks etc. Every cable used shall be supported in such a way that it is not 25 exposed to undue mechanical strain and so there is no appreciable mechanical strain on the terminations.
T. For cables which are not continuously supported, the maximum distance between supports shall not exceed 50cm (horizontal or vertical).
U. All newly installed Device must be capable of supporting CAT6a cabling.
V. Floor Plans, both hard copy and Soft Copy, suitably marked up to show location and I.O. of each and every data point, and detailing any deviation from the original plan.
W. Full Structured Cabling Test Results, via email or compact disc.

2.29.4 JFC Cabling work for Telephony Connections under the SICN Project

Setting-up of new Telephone connections & Shifting of existing Telephone connections:

1) Bidder is end-to-end (including supply, installation, testing, commissioning and O&M) responsible for providing new connection and shifting of existing connections as per the requirement of Tenderer with in the state capital i.e. Gandhinagar. Tenderer will issue a separate order for such requirement as per the rates discovered with this RFP valid for the contract duration.
2) Bidder will be responsible for conducting actual site survey, estimate preparation and submission for approval and issuance of work order by Tenderer. In case of shifting bidder will be responsible for removal of existing facility and re-installation of the same at the newer location including any other components required for successfully completion of the same.
3) Bidder is required to Supply / Install / testing/ Commissioning of SICN project related work (JFC Cabling, Telephone Instrument, RJ11 clamping, I/o box, and other applicable H/w component & accessories) as per the specifications mentioned in the Bid document.
4) **Warranty Support:** The works are to be completed on turnkey basis and the supplied equipments are required to be covered under warranty period of 5 years from the date of FAT. The Bidder shall be responsible for implementation of the work as defined. New item supplied during the contract period should be with 5 years warranty support. The successful bidder has to provide Comprehensive onsite warranty for all equipments as mentioned in RFP.
5) All the work related with JFC cabling for SICN project to server the existing and new user/connections will be in the scope of this RFP.
6) Bidder will be responsible to undertake and complete the works related to supply installation and commissioning of services as indicated in the bid, mentioned above, promptly and within the duration prescribed by Tenderer.
7) GoG does not guarantee order for any fixed quantity at the time of issuing the work order and signing the contract agreement. The rates should be valid for a period of Two years from the date of agreement. Bidder has to make Back to Back agreement with respective OEM for the same. The escalation of the rate during the rate contract is not permitted**.**
8) All goods or materials shall be supplied strictly in accordance with the specifications, Drawings, datasheets, other attachments and conditions stated in the RFP/ Agreement / SLA. All materials supplied by the Bidder shall be guaranteed to be of the best quality of their respective kinds and shall be free from faulty design, workmanship and materials.
9) Certification: The Bidder shall test and certify the availability and reliability of the link and give the connectivity matrix between various locations and get it certified by GoG.
10) **Documents:** The Bidder shall provide 1 set of signed documents and manuals (hard copy/soft copy with each item of the unit supplied.) to Tenderer/TPA.

11) **Reporting:** Detailed report is required to be submitted for the work under progress and for functional performance of the equipment installed. The same have to be certified by TPA. Bidder shall submit the installation plan for each location to TPA, who in turn shall approve the plan before execution. Bidder will have to fill up an installation and commissioning report and get is duly signed by concern officer with their seal and remarks if any.
12) Below mentioned are the major task to be carried out during link installation; but not limited to:
    i. The Under-Ground Cables are buried to a depth such that the top of the cable is One meter (100 Cms.) below the normal ground level. The items of work involved in U/G Cable laying are as under.
    ii. Excavations of trench up to a depth such that the top of the cable is 1 meter below the normal ground level according to the construction specifications.
        - Laying and pulling of cables in trenches are through pipes/ ducts.
        - Placing of Half round RCC Pipes / Stones slabs /Pre-cast RCC Slabs /Layer of Bricks as per specifications.
        - Back filling in compacting of the excavated trenches according to the construction's specifications and removal of excess earth from the site.
        - Construction of pillar foundations erection, painting and sign writing of pillars.
        - Erection, termination, painting and sign writing of DPs
        - Termination of Cables in MDF & Pillars.
        - Jointing and End-to-End testing of Cables– Correspondence and Electrical tests. Supply, fixing, painting and sign writing of root and joint indicators.
        - Documentation along with GIS based map which includes latitude and longitude for under ground cabling.
        - Modernized Method of cable laying should be incorporated, where, minimum damage to the infrastructure is required i.e. cable laying machine is used for such purposes.
    iii. Bidder is required to maintain work log and activity sheets on a software which facilitates reporting of there performance through SLA monitoring, the access to these reports to be made available to TPA.

2.29.5 <u>SITC of Radio frequency Connectivity in GSWAN.</u>

- The TENDERER is planning to install high speed Radios in GSWAN to connect the remote locations in Point-to-Point configuration. The distance between two locations which is required to be connected in GSWAN will vary from 1km to 30kms. The work is to be completed on a turnkey basis and the RF links are to be maintained for a period of 5years from the date of completion of FAT
- The offered solution should provide Point-to-Point connectivity over wireless Radio.
- The Scope of work under this RFP consists of following task:
- The bidder will be responsible for end-to-end installation, commissioning and maintenance of the RF link up to the termination point on network equipment at the node
- The RF link includes supply and installation of radios at both (base and remote)

location along with all the necessary components like Antennas, Mounting structure (pole/Mast), clamps, cables(active/Passive), lightening arrester, earthing, aviation lamp, etc.

- The distance between the GSWAN node and the remote location may vary from 1km to 30kms.
- The RF links connected in the GSWAN should be able to deliver minimum throughput of 30mbps from day one.
- Proposed wireless solution should conform to applicable WPC regulations for use of license-free spectrums in terms of EIRP. A declaration to this effect must be submitted which must be supplemented by periodic compliance reports during the project period.
- The Radio's should be provided with at least 2(two) Ethernet 10/100 Base-Tx port to provide port level redundancy, for connecting to the network device provided by the Tenderer at the end locations. The port level redundancy means, if there is any fault on the Ethernet port of the radio, the second port can be used to make the link live with minimum configuration level changes only.
- The bidder is to provide the single make and model of the radio to provide the point-to-point connectivity.
- The bidder shall carry out the survey/feasibility study wherever required, to identify and resolve all the RF/data path related issues for the proposed connectivity.
- The bidder will be responsible for site readiness and transportation of material, erection and anchoring of support structure, earthing, lightening arrestor, STP/RF cable, aviation lamp, surge protection and other accessories.
- It will be responsibility of the bidder to arrange and obtain all the necessary permissions at the base and remote location for the required erection of the support structure and installation.
- The bidder will be provided with the required access, power at each location for installation and commissioning of the devices. However, it will be responsibility of the bidder to extend the electrical power at each site as per actual requirement.
- The bidder has to complete the installation of the links within 15 working days from the date work order.
- The bidder is required to maintain the required service levels i.e. uptime of 99.74%, failing which operational penalties will be levied.
- The bidder will have to use the IP schema provided by Tenderer.
- The bidder will be responsible to ensure that the wireless radios should be integrated and discoverable in the existing NMS tool of the TENDERER.
- The bidder shall be bound to the Service Level Agreement under the contract and is supposed to provide the support service during the 5 years of Operation and Maintenance period.
- The bidder shall also be responsible for O&M of the existing RF link deployed across Gujarat.

2.30 Hand-over/take-over existing Operations (Duration 1 Month)

- If, other than the existing agency is awarded the work, the selected agency will be responsible to complete the transfer of Knowledge & Handing/Taking over activity from existing agency within one month of issuance of LOI/WO.
- After successful completion of H/T over process, all supporting documents will be handed over to the Selected Agency.
- During this period, only O&M charges will be paid to Selected Agency on pro-rata basis. SLA or Penalty clause will not be applicable during 1 month of Hand-over/Take-over process. Selected Agency will responsible to provide confirmation about successful Hand-over/Take over operations from existing agency at the end of 1 month period. The selected agency shall depute the required resources as per the requirements of tender document for carrying out the operations activity.
- Successful agency is required to issue Completion certification for completion of this H/T over process. Existing Agency will provide necessary handholding and transition support to new agency.

Section III: Service Level Agreement (SLA)

3.1. Definition

SLA defines the terms of the O&M agency's responsibility in ensuring the performance of the network based on the agreed performance indicators as detailed in the agreement.

3.2. Network uptime

The table below summarizes the performance indicators for the services to be offered by the bidder. The detailed description of the performance indicators, SLA Terms and their definitions are elaborated in the following sections.

S. No.	SLA Parameter	SLA Target
1	Network Availability between SC – DC	>=99.74 %
2	Network Availability between DC – TC , DC- other PoPs , TC- other PoPs	>=99.5%
3	Network Backbone Latency	Less than 50 ms
4	Network Backbone Packet Loss	<=1 %
5	Network Jitter	Less than 30 ms

3.3. Network SLA Terms & Definitions

S.No.	SLA Terms	Description
1	Network Backbone	'Network Backbone' refers to Internet Protocol (IP) based routing infrastructure consisting network of selected GSWAN PoPs identified by the State at which, O&M Agency has installed network devices ("Selected PoPs") for Wide Area Network within the State.
2	Uptime	'Uptime' refers to GSWAN backbone availability across various segments i.e. between State Head Quarters to District Head Quarters and District Head Quarters to Taluka Head Quarters. "%Uptime" means ratio of 'up time' (in minutes) in a month to Total time (in minutes) in the month multiplied by 100.
3	Latency	'Latency' refers to the average time required for round-trip packet transfers between Selected PoPs on the selected portions of the GSWAN Backbone during a calendar month.
4	Packet Loss	'Packet Loss' refers to the average percentage of IP packets transmitted between Selected PoPs during a calendar month that are not successfully delivered.
5	Planned Network Outage	'Planned Network Outage' refers to unavailability of network services due to infrastructure maintenance activities such as configuration changes, up gradation or changes to any supporting infrastructure. Details related to such planned outage shall be approved by the TENDERER or authorized authority and shall be notified to all the concerned stakeholder in advance (at least seven working days before). It is desirable that such outage shall be taken on Sundays or other Government holidays to the extent possible.

6	Unplanned Network Outage	'Unplanned Network Outage' refers to an instance in which no traffic can pass in or out through which users are connected to the GSWAN Backbone

3.4. GSWAN Backbone Latency

The Latency on the GSWAN Backbone shall be maintained at:

Network Segment	Network Latency	Remarks
SC – DC	50 ms	SLA allows a maximum of 50 Milliseconds in the connectivity between the State Head Quarter and to all the District Head Quarters.
DC – TC DC- other PoPs , TC- other PoPs	50 ms	SLA allows a maximum of 50 Milliseconds in the connectivity between the District Head Quarters to all the Taluka Headquarters.

3.5. GSWAN Backbone Packet Loss

The Packet Loss on the GSWAN Backbone shall be maintained typically at less than 1%.

Network Segment	Packet Loss	Remarks
SC - DC, DC-TC DC- other PoPs, TC- other PoPs	<=1%	SLA allows a maximum of 1% of packet loss in the connectivity between the State Head Quarter and to all the District Head Quarters And between the District Head Quarters to all the Taluka Headquarters.

3.6. Denial of Service

3.6.1. Denial of Service (DoS) is the most common form of attack on the Network, which leads to network unavailability for the genuine network users. Successful Bidder shall respond to Denial of Service attacks reported by departments/ GSWAN users or GSWAN maintenance personnel within 15 minutes of intimation to the helpdesk. Denial of Service attack can be defined as sudden burst of network traffic leading to more than 90-95% utilization of the GSWAN bandwidth in any segment or complete network. In such a scenario operator shall perform an analysis of the issue, verify whether the network utilization is due to genuine user requirements or it is a denial of service attack. In case it is identified as DoS attack, operator shall identify the source of Denial of Service attack, and shall disconnect the source or network from GSWAN backbone and resolve the issue to ensure availability and performance of the backbone.

3.6.2. Successful bidder at regular intervals, shall monitor and measure the actual bandwidth allocated by the Bandwidth Provider against the agreed Committed Interface Rate (CIR) and issues identified shall be reported to TENDERER and shall be escalated to the Bandwidth Service provider for resolution.

3.7. Network Operations Management

3.7.1. Successful bidder is required to establish Contact Center (Helpdesk) at the State level with an appropriate Helpdesk tool. Helpdesk shall act as a SPOC (Single Point of Contact) for all the Network & Security related issues reported by the government departments or any other related stakeholders of the GSWAN. Each issue need to be recorded in the Helpdesk tool as a Service Request (with allocation of service request number) and the resolution timelines for such Service Requests shall be monitored by the State.

Sr. No.	Severity	Initial Response Time	Issue Resolution Time
1	Level 1	15 mins	1 hr
2	Level 2	30 mins	2 hrs
3	Level 3	60 mins	8 hrs
4	Level 4	240 mins	24 hrs

*Working hours for sr. no 3 & 4 (from 9:30 AM to 6:30 PM)

* 24x7 support for Sr. no. 1 & 2.

3.7.2. Severity Level Definition

Level 1	The network outage, security or performance related issues impacting the network availability/performance and leading to unavailability of the services in State Head Quarter.
Level 2	The network outage, security or performance related issues impacting the network availability/performance and leading to unavailability of the services in one or more Districts. Also, any network outage, security or performance related issues impacting the network availability/performance and leading to unavailability of the services to one or more users at SS-1, SS-2, Other Secretary offices, SCAN campus, Minister's bungalows and other cases as decided by TENDERER/TPA.
Level 3	The network outage, security or performance related issues impacting the network availability/performance and leading to unavailability of the services to one or more departments in DC/Sub division/ Taluka.
Level 4	The network outage, security or performance related issues impacting the network availability/performance and leading to unavailability of the services to one or more Horizontal links and any GSWAN related service issue reported by group of users or individual user.

3.8 Time Lines for execution of work

Successful bidder has to complete the Installation/ Commissioning/ Acceptance of the ordered work within the time period (s) specified in the below table. However, in case of any delay solely on the part of successful bidder Tenderer reserve the right to levy the appropriate penalties as per the below table:

3.8.1 Time Lines for execution of LAN/OFC Cabling work (GSWAN)

S/n	Work type	Time Limit for Execution	Penalty for Delay	Maximum Penalty
1	**New Connection**: Upto 10 locations/Cities 10 to 20 locations/Cities More than 20 locations/cities	30 days 45 days 60 days	5% of order value of delayed/pending work per week or part thereof Note: For calculation of penalty order value of delayed/ pending locations will be considered.	25%
	Days means working days			
2	**Repair and Maintenance**			
2.1	Involving Under Ground Cable	4 Days	Rs. 5000/- for every 4 Days	Rs. 25000/-
2.2	Involving LAN Cabling in Building	3 Days	Rs. 1000/- for every 3 Days	Rs. 5000/-
2.3	Involving Fault with electronic devices	2 Days	Rs. 1000/- for every 2 Days	Rs. 3000/-
2.4	Involving fault with connector/ patch cord/ RJ 45 port/ Termination boxes/ DP Electricity fault, Non-electronic device fault)	2 Days	Rs. 500/- for every 2 Days	Rs. 1000/-

Days means working days

3.8.2 Time Lines for execution of telephone cabling works (SICN)

S/N	Type of User or Work	Time Limit for Site Survey	Penalty for delay in site survey	Time Limit for Execution	Penalty for Delay in Execution	Maximum Penalty
A) Time Limit for New Telephone Connection/Shifiting of work						
1	Priority-1 Users	6 Hrs	1000/- per day beyond defined time limit	1 Day	Rs.5000/- per day beyond defined time limit	10% of the work order value
2	Priority-2 Users	1 Day		2 Day		
3	Priority-3 All other Users	2 Day		4 Day		
4	For bulk works/Digging works (entire building/users more than 25 nodes),	7 Days		15 Days		
B) Time limit for Repair & Mainenance:						
1	Involving Under Ground Cabling work	2 Days	1000/- per day beyond defined	4 Days	Rs.5000/- for every 4 Days	Rs.25,000/-
2	Involving internal SICN	2 Days		3 Days	Rs.1000/-	Rs. 5,000/-

	related cabling in Building		time limit		for every 3 Days	
3	Involving Fault with electronic/ Telephonic devices	1 Days		2 Days	Rs.1000/- for every 2 Days	Rs.3,000/-
4	Involving fault with connector/patch cord/RJ 11 port/Termination boxes/DP Electricity fault, Non- Electronic device fault.	1 Days		2 Days	Rs.500/- for every 2 Days	Rs. 1,000/-

Days means working days

User Categories:

- Priority-1: A User in the CMO, CS office, CM Residence, Raj Bhavan, O/o Speaker of GLA and his residence, SEOC, All Minister office and Residence, Office and Residence of Leader of Opposition, Parliamentary secretary, Phones of Gujarat Legislative Assembly during Assembly session and Other dignitaries as specified by Tenderer from time to time.
- Priority-2: Head of the department, board, corporations and other dignitaries as specified by Tenderer from time to time.
- Priority-3: All other users

Note:

- Material supplied, installed and commission as per this rate contract should be covered under the **warranty for a period of 5 years from the date of FAT.**
- In case of any fault arised during the warranty period (as mentioned above), as per the specification of the RFP the successful bidder is requires to install the replacement of faulty material at free of cost.
- **In case of Non-Compliance of RFP Specification:**
  - Any time during the warranty period it is found that the materials supplied/Installed/commissioned are not as per the specification of the RFP/work order Tenderer reserves the right to ask the successful bidder to replace all such material at free of cost.
  - Successful bidder requires to attend and rectify the non-compliance within seven (7) days of receipt of such notice/information from the Tenderer. If, successful bidder fails to attend and rectify the same, then successful bidder shall reimburse DST/GIL all costs and expenses incurred for such defect rectification.

3.8.3 Time Lines for execution of RF Connectivity work (GSWAN)

- The Tenderer will provide centralized helpdesk for assistance or registration of user complaints through various mediums like Call/SMS/Email of ticket generation system. Bidder is responsible for coordination with the Helpdesk operator for early resolution of the complaints/request booked at the centralized helpdesk provided by the TENDERER.

- On ticket generation at the centralized helpdesk, the calls pertaining to the RF connectivity, created under this RFP, will be allotted to the bidder for further resolutions of the complaints.
- After rectifying the compliant, bidder is required to update the resolution/call-closure on the centralized helpdesk.
- The bidder will also be responsible for replacement of faulty equipment's at sites even in case of same due to power surge issues at the sites, without any additional cost to the tenderer
- The Tenderer or its designated agency will monitor the performance of links during the operations period. The Tenderer or its designated agency will be responsible for verification, validation of all works/services under the terms & conditions of the agreement.

Operations and Maintenance of RF Devices

- The Successful Bidder shall be responsible for day to day operations and maintenance for a period of 5-years from the date of commissioning of the project.
- It shall be the responsibility of the Successful Bidder to ensure that all software/firmware etc. should be updated for patches/release etc. periodically.
- Reactive Maintenance: the bidder needs to ensure all the fault tickets logged in the helpdesk tool of the Tenderer are addressed and resolved in timely manner as per the SLA's defined
- Preventive Maintenance: The bidder should perform the preventive maintenance of the link/equipment's every 6 months and provide a report for each and every link installed. The preventive Maintenance should include, but not limited to, following:
    - Check/Repair/Replace: connectors, clamp, antenna feeder, STP/Cat-6 cable, etc.
    - Dusting of the structure and Radio's
    - Check signal strength, realignment of antennae, etc.

Section IV: Penalties

4.1 GSWAN Bidder shall be paid Monthly Payment (MP) as per the services provided to TENDERER. The overall penalty would be generally capped at 10% of MP amount. If the cap of overall penalty is reached in two consecutive Months, the penalty cap for the third Month onwards, for each Month will increase by 5% over the penalty cap for the preceding quarter till it reaches 25% of the MP. In addition to the applicable penalty and the provisions pertaining to closure/termination of contract, the TENDERER shall be within its rights to undertake termination of contract if or anytime the penalty increases by 15% of the MP. Once the penalty cap has increased beyond 10%, if the bidder through better performance delivery for any Month, brings the leviable penalty below 10% then the computation of the 1st of the 2 consecutive months as referred above will reset and will begin afresh. Availability will be calculated on a monthly basis.

Sl. No.	SLA	Target	Penalties in case of breach in SLA	Remarks
1	Network availability SC-DC Link	99.74%	a) 99.74% or Better= NIL b) 99.50% to 99.73%=0.25% of MP c) 99.00 to 99.49% = 0.50% of MP d) less than 99% = 0.75% of MP	
2	Network availability DC – TC	99.50%	a) 99.50% or Better= NIL b) 99.00% to 99.49%=0.10% of MP c) 98.50 to 99.99% = 0.25% of MP d) less than 98.50% = 0.50% of MP	

3	Network availability DC- other PoPs, TC- other PoPs	99.50%	a) 99.50% or Better= NIL b) 99.00% to 99.49%=0.10% of MP c) 98.50 to 99.99% = 0.25% of MP d) less than 98.50% = 0.50% of MP	
4	GSWAN connectivity/service issues one or more Horizontal Links/ offices/one or more users	Non-resolution of the issue or Un escalated events/ incidents/ faults to respective agencies as per Severity defined in above sections.	Rs. 100/- per hour per Incident/issue/SR or Part thereof	Bidders are responsible for O&M of GSWAN services including HO offices. This includes fault detection, analysis, and escalation to respective agencies down-link reported in NMS or on help desk
5	GSWAN Backbone Latency	If the GSWAN Backbone Latency is more than the permissible limit as mentioned in SLA, Successful bidder has to analyze, report, escalate and get the issue resolved within 24 hours.	Rs. 2000 per hour, per instance or part thereof.	
6	GSWAN Backbone Packet Loss	If the GSWAN Backbone Packet Loss is more than the permissible limit as mentioned in SLA, Successful bidder has to analyze report, escalate and get the issue resolved within 6 hours.	Rs. 2000 per hour, per instance or part thereof.	
7	Delay or Non submission of Various MIS reports as mentioned in SLA	As mentioned in respective SLA	Rs. 1000 per instance per report	

8	Fault resolution of equipment/devices/ accessories covered under O&M and CAMC services	If any GSWAN devices/ supportive equipment's /accessories covered under O&M and CMAC services are faulty / non-working, Bidder is required to repair/replace the same as per Warranty /CAMC clause within 4 hours	Rs. 1000 per day per devices or part thereof	This penalty will be in addition to penalty on Availability of SLA of links.
9	Auto Incident resolution	Un escalated events/ incidents/ faults to respective agencies as per the time line defined in severity level section in this RFP from event generated in NMS tools/mail/ other mode of communications	Rs. 100 per hour per incident	
10	WI-FI	Uptime of Hotspot availability : Average Uptime should be > or = 99 % per site per Month for hot spot availability.	1. Average Uptime 99 % or above – No Penalty 2. Average Uptime below 99%- For each 1.0 % slab (lower) a penalty 0.5 % on MP shall be charged.	As per SLA clause following are applicable penalty for hot spot availability
		Uptime for Core Infrastructure (installed at SDC) Availability: Average Uptime should be > or = 99.50 % per Month for core system availability.	1. Average Uptime 99.50% or above- No Penalty 2. Average Uptime below 99.50 %- For each 1.0 % slab (lower) a penalty 0.1 % on MP shall be charged.	As per SLA clause following are applicable penalty for core system availability.

IMPLEMENTATION TIMELINES IN RF CONNECTIVITY

S/n	Activity	Timeline	Penalty
1	Delay in Installation and Commissioning	15 working days from work order	0.5% of order value for delayed item per week or part thereof for delay in installation and commissioning

Note: Maximum Penalty cap of 10% of contract value for Penalty for Delay in Implementation.

SERVICE LEVEL

S/n	Activity	Target	Penalty
1	Availability of Link	99.74%	a) 99.748.50% or Better= NIL b) 98.00% to 99.73 = 5% of MP per link c) 96.00% to 97.99% = 10% of MP per link d) 90.00% to 95.99% = 20% of MP per link e) 80.00% to 89.99% = 40% of MP per link d) if the link is not available for 80% or less in a month, the link will be considered as unavailable and the payment for the said link will not be considered in the MP.

Note: Successful Bidder shall be paid Monthly Payment (MP) as per the services provided to TENDERER. The penalty, if any, will be recovered against the payment invoice submitted by the selected agency. Availability will be calculated on a Monthly basis. There will be no maximum capping for penalty.

If the TENDERER fails to provide space and related clearances to carry out the job as per the agreement terms, as a result of which the installation of the equipment is delayed and the Successful Bidder is not able to adhere to the schedule for completing the Acceptance Tests. Delay solely on account of above will not be included while ascertaining actual delay.

Note: Above mentioned Penalties are all additive

4.2 Network availability

4.2.1 Network availability for a month is defined as total time (in minutes) in a month less total down time (in minutes) in a month excluding planned downtime. The network is considered available when all the services mentioned in the requirement section in full capacity are available. Bandwidth or Link downtime will not be considered as part of network downtime.

Network Uptime (%) =

$$\frac{\textbf{Sum of total minutes during the Month - Sum of downtime minutes during the Month}}{\textbf{Sum of total minutes during the Month}} \textbf{ X 100}$$

4.2.2 Bidder will take at least 7 working days prior approval from the TENDERER for the network maintenance i.e. planned downtime. Bidder's SLA and Penalty would be applicable only after final acceptance testing indicating that the link is completely functional. The Operator's request for payment shall be made at the end of each Month by invoices along with the following supporting documents:

(a) Performance statistics
(b) Log of network parameters along with Service Down time calculation and Uptime percentage.
(c) Any other document necessary in support of the service performance

acceptable to GoG.

4.2.3 The Monthly Total Downtime will be the sum of the downtime incurred in each month. The deduction/penalty will be calculated on the Monthly Total Downtime.

4.3 Penalty for not providing Video-conferencing/ Web casting services

If Successful Bidder fails to provide Video conferencing services or managing VC/Web casting mentioned in the scope of work, Rs. 2000 per incidence per location will be levied.

4.4 Penalty for non-keeping the control room up-to-date

If Successful Bidder fails to keep proper cooling, electrification, cabling, cleanliness, hygiene and safety requirements, various registers and network diagram as mentioned in the scope of work, Rs. 50,000 per location per Quarter will be levied.

4.5 Penalty for not providing technical feasibility and cost-estimation Report:

If Successful Bidder fails to provide technical feasibility report for expansion and laying of new horizontal links/POPS and effort and cost estimation of the same within 5 working days from the date of intimation from TENDERER, as mentioned in scope of work, Rs. 1,000 per feasibility per day or part thereof will be levied.

4.6 Penalties for delay in takeover

If successful bidder fails to complete the taking over of existing O&M of GSWAN within the 60 working days from the project kick-off date TENDERER a Penalty of 0.50% of Monthly Payment for each week of delay or part thereof shall be levied, until the completion of take over process and signoff from TENDERER. If the delay continues beyond 12 weeks, TENDERER may terminate the Agreement and forfeit the PBG.

4.7 Penalty for Delay (Applicable in case of upgradation/replacement of existing devices/solution as per RFP scope):

S. No.	Activity	Timeline	Penalty
1	Delay in Delivery/ Supply of Hardware	T+ 60 days	0.5% of Contract value (as per Schedule-I of Price BID) per week or part thereof for delay in delivery (Delay beyond T+90 days TENDERER may terminate the contract and Forfeit the PBG).
2	Delay in Implementation	T+120 days	0.75% of Contract value (as per Schedule- I of Price BID) per week or part thereof for delay in delivery (Delay Beyond T+150 days TENDERER may terminate the contract and Forfeit the PBG)
3	Delay in FAT	T + 180 days	0.10% of Contract value (as per Schedule- I of Price BID) per week or part thereof for delay in FAT

T= O&M start date

Note: The above clause for penalties due to delay in FAT shall only be applicable for the delay attributed solely to the successful bidder as per his roles and responsibilities, delay due to other reasons shall not be considered.

4.8 Penalties for misuse

In case of misuse of bandwidth/ Internet at the instance of successful bidder, the penalty imposed on the successful bidder, without prejudice to other remedies available to TENDERER under the Agreement, shall be 200% of annual value of bandwidth/Internet costs. If the misuse continues for two months, TENDERER may terminate the Agreement

4.9 Penalties for not keeping man-power

If successful bidder does not deploy the required specified quantity & quality manpower as per deployment plan of the proposed technical solution of the RFP or a person deployed is not reporting to the duty, there would be a penalty per person per day as defined in Resource section 2.25 above and will be deducted from the monthly payment subject to a cap of 10% of the Monthly payment. If the above incidence occurs two times in one year, Tenderer may reserve the right to terminate the contract and no payment would be done for the services rendered in that particular Month.

4.10 Penalty for Delay in taking Insurance:

Successful bidder will take insurance of the equipment under O&M within Six months from the date of signing of contract. Penalty of INR 1 lakh per month after six months from the kick-off date shall be levied.

4.11 Penalty for delay in replacement of batteries:

If Successful Bidder fails to replace the internal as well as external battery banks used for UPS and other equipments at SC, DC, TC & other PoPs with new batteries two times during the contract period of 5 years as mentioned in scope of work i.e. during 9th quarter and 17th quarter of the O&M services, to begin with 5% MP of the 9th and 17th quarter would be withheld. In case the replacement of batteries is delayed beyond 10th and 18th quarter, the withheld amount shall be forfeited and from subsequent payment due, penalty @5% of the Monthly payment due will be levied till the replacement is made. Moreover, such non-performance of the scope of work may result into termination of contract. This penalty shall be exclusive of all other penalties proposed under the contract.

4.12 Penalty for delay / non-conducting of the training:

The bidder has to conduct technical as well as soft skill training to the manpower deployed in GSWAN Project on regular interval as mentioned in RFP. The penalty for delay in training will be 5000 / day.

4.13 Penalty for delay in VA / PT

The bidder has to conduct VA / PT as per defined interval as mentioned in this RFP. The penalty for delay in VA / PT attributed to bidder will be 1000 / Day.

4.14 Penalty for not conducting User Training & awareness activities

The bidder has to conduct User training & awareness activities of GSWAN users at all levels (SC, DCs & TCs) as per defined interval as mentioned in this RFP. The penalty for not conducting User training & awareness activities for GSWAN users will be Rs. 2000 per location per quarter.

4.15 Penalty for not keeping adequate Spares

The bidder has to keep adequate spares of the equipment as mentioned in this RFP document. The penalty for not keeping adequate spares will be Rs. 100000 for each such observed instances.

4.16 Operational Penalties (LAN works/GSWAN/SICN):

4.14.1 The successful bidder shall repair/ replace all faulty material covered under the warranty within the shortest possible time thus ensuring minimum downtime, failing which applicable penalty will be imposed. The following penalties for Operational Deficiencies shall apply:

4.14.1.1 The successful bidder shall be responsible for maintaining the desired performance and availability of the system/services. Successful bidder should ensure the prompt service support during warranty period.

a) If complain is made before 4 pm of the working day, resolution time shall be counted from the same day and for complain made after 4 pm, resolution time shall be counted from next working day. Timeline for resolution is, as follows.
b) Within 8 working hours for offices located at District Headquarter, including other offices.
c) Within 24 working hours for offices located at Taluka and at all other remaining locations.
d) For calculation of above penalty, if any, normal working hours of Government of Gujarat is from 10:30 am to 6:10 pm on working day.

If the successful bidder fails to resolve the call as specified above, the following penalty will be imposed on each delayed day, which will be recovered against Performance bank guarantee submitted by the successful bidder on completion of warranty period.

Site/Location	Penalty/Day, for each day, if problem is not resolved within 8 hours	Penalty/Day, for each day, if problem is not resolved after 24 hours
All Sites	Rs. 1000/- Per day	Rs. 2000/- Per day

Note:

1) If the delay continues beyond 10 weeks, Tenderer may terminate the Agreement and forfeit the PBG.
2) If complain is made before 4 pm of the working day, the same should be attended on the same day and for complain made after 4 pm, resolution time shall be counted from very next working day.
3) For calculation of above penalty, if any, normal working hours of Government of Gujarat is from 10:30am to 6:10pm on any working day.

4) In case, there is delay attributable to granting access to the equipment to be restored on the part of GoG or on part of end user, such delays shall be reduced from the time taken for call completion after due consideration by the TPA/Tenderer.

4.17 Improvement strategy & Incentive

a) The bidder is expected to put in efforts to improve the complaint management processes by improving on the response as well as resolution time of the incidents like network downtime of GSWAN services. Also, seamless availability of GSWAN services heavily depends on multiple factors like:

- Co-ordination between resources of various agencies like power utility, bandwidth, O&M operator & GoG offices, etc.
- Proactive monitoring & analysis of occurrence of incidents (downtime & type of complaints)
- Proper user education & awareness for proper handling of GSWAN equipment facilities at GoG office level
- Uptime of GSWAN networking equipment

b) The successful bidder shall implement a process improvement strategy for improvement & up keeping of GSWAN services. The improvement strategy shall focus on the proactive monitoring and analysis of historical incidents & its frequency of occurrence; standard operating process & measures for effective co-ordination between the stakeholders (within & outside GoG) & proactive measures in reducing the incidents resulting in loss of GSWAN services; educating the users to proactively act as first responders to do the right thing for availing & maintaining GSWAN services. The bidder may suggest technological tool for defect management & its resolution tracking. Regardless of the cause/factor resulting into non-availability of GSWAN services, the ultimate objective of this improvement strategy is to achieve improvement in-

- Response & resolution time for network downtime
- Availability of GSWAN services by reducing incidents resulting into network downtime
- Satisfaction of GSWAN users

c) In addition to the Payment terms, the selected O & M agency shall be eligible for incentives as per the criteria given below and the same shall be paid on a quarterly basis, subject to a maximum of 5% in a year. Selected O & M agency shall make a claim for incentives based on the monthly reports submitted by them. The tenderer or its designated agency shall evaluate the reports and take a decision on awarding the incentive to the selected O & M agency. The decision of tenderer in this regard shall be final, undisputable and binding on the selected O & M agency. With a goal to achieve zero complaint resulting into the better availability of GSWAN services, the tenderer shall incentivize the appointed O&M agency on following Parameters:

Sr. No.	Deliverable	Targets	Incentive Amount / %

1	Resolution of registered User Complaints	90% of the total complaints of registered users for Level 3 & Level 4 incidents resolved on the same day / 12 working hours during a particular month	0.25% of Monthly O&M invoice
2	Network availability DC- other PoPs	More than 99.70% for 3 consecutive months	More than 99.70%: Rs. 50000/- More than 99.80%: Rs.1,00,000/- to be paid once in three months.
3	Network availability TC- other PoPs	More than 99.70% for 3 consecutive months	More than 99.70%: Rs. 50000/- More than 99.80%: Rs.1,00,000/- to be paid once in three months.
4	Feedback from Top Officers of the district / Taluka. (Collector / Mamlatdar & other high rank class – I officers)	Quarterly (Best Feedbacks / Comments received from top officials)	Top Performer award along with appreciation letter will be given by DST.

- For Point no. 2, definition of Level of Incidents, please refer Section 3.7.2 of Volume – II
- The overall incentive will be capped at maximum 5% of monthly payment value

Section V: Specification

5.1 CABLE LAYING WORKS

5.1.1 General

The Underground OFC/JFC are extensively used in outdoor network of GSWAN/SCAN/SICN networks. The cables are laid from GSWAN nodes to Distribution Points (DPs). For the purpose of flexibility, Pillars / Junction boxes are introduced in the network. The primary cables, which are of higher size, are laid from GSWAN / SCAN locations to Pillars / Junction boxes. The distribution cables are laid from Pillar / Junction box to DP. The capacity of Pillars and DPs are decided in accordance with demand and size of the network. The quality of construction of U/G cable Net Work decides the quality and reliability of GSWAN/SCAN services, delivered to the users to a large extent. Therefore, the construction practices of the U/G cables should be of very high quality, strictly in accordance with constructions specifications.

Bidder should supply/install all required accessories whether it is mentioned explicitly or not to adhere to the scope of work of this RFP**.** All active network components should be IPv6 compatible and should be with IPv6 ready from Day1.

5.1.2 Construction Specifications:

5.1.2.1 Classification of Soil: For the purpose of trenching, the soil shall be categorized as under.

5.1.2.1.1 Soft Soil

This will include all types of soils- soft soil/hard soil / morrum i.e any strata, such as sand, gravel, loam, clay, black cotton morrum, single, river or nalla bed boulders, soiling of roads, paths, densely pebbles/stones etc., lime concrete, mud concrete and their mixtures which for excavation yields to the application of picks, shovels, sacrifiers, ripper and other manual digging implements including chiseling.

5.1.2.1.2 Footpaths / Along Road Side:

Trenching on Foot Path or along Road on carpeted surface may be necessary in certain stretches where roads have been metaled edge to edge and there is no un-metaled corridor or footpath available for trenching and laying the cables.

(i) Tarmac (Asphalt) Foot Path/ Road: means Foot path / Road with tarmac surface with or without compacted strata below the tarmac surface, irrespective of thickness of Tarmac/Metal.

(ii) Kharanja: means Footpath / Road covered with various types of bricks with or without compacted strata below the surface, irrespective of thickness of bricks.

(iii) Tiled Foot Path/ Roads**:** means Footpath / Road covered with various types of tiles/stone slabs with or without compacted strata below the tiled surface, irrespective of thickness of tiles / stone slabs.

(iv) Cement Concrete Foot Path Road: means the surface on Footpath / Road covered with CC (Cement Concrete) with or without compacted strata below the surface, irrespective of thickness of cement concrete.

5.1.2.2 Road Crossings:

(i) "Tarmac or Asphalt Road" means the road surface, which is metaled by asphalt/tarmac normally having compacted strata below the metaled surface, irrespective of thickness of asphalt/tarmac.

(ii) Kharanja Road: means road covered with various types of bricks with or without compacted strata below the tiled road surface, irrespective of thickness of bricks.

(iii) Tiled/CC Road: means road made of tiles of any type/stone slabs/bricks or CC road normally having compacted strata below the tiled/CC surface, irrespective of thickness of tiles/CC.

(iv) RCC Road: means the surface made of cement concrete duly reinforced with steel bars normally having compacted strata below RCC, irrespective of thickness of RCC.

(v) WBM road: means water bound mecadam surface made of stone, metal and gravel and rolled with road roller. At road crossings, the trenches shall be so dug that top of RCC pipe shall be at one-meter depth from ground level.

5.1.2.3 Excavation of Trenches

Before excavation of trenches the route should be marked for trenching. Care should be taken to see that the route of the trench to excavate is reasonably straight avoiding the existing underground service.

The Bidder should take trial pits to locate the underground services before commencement of actual trenching. These trial pits shall be 30 cms. wide, 120 cms. deep and 120 cms. long at right angles to the proposed trench at an interval of 20 to 50 Mtrs along the proposed cable route. If a slab is encountered, the same may be removed and trial pits may be made.

In city areas, the trench will normally follow the footpath or the road except where it may have to come to the edge of carriage way or cutting across roads with the specific permission from the concerned authorities maintaining the road (such permission shall be obtained by the Bidder). Outside the city limits, the trench will normally follow the boundary of the roadside land. However, where the roadside land is full of burrow pits or when the cables have to cross culverts / bridges or streams, the trench may come closer to the road edge or in some cases, over the embankment or shoulder of the road (Permission for such deviations for cutting the embankment as well as shoulder of the roads shall be obtained by the Bidder).

The alignment of the trench will be decided by Engineer-In-Charge or by TPA. Once the alignment is marked, no deviation from the alignment is permissible except with the approval of Engineer-In-Charge or TPA. While marking the alignment only the centre line

will be marked and the Bidder shall set out all other works to ensure that, the excavated trench is as straight as possible. The Bidder shall provide all necessary assistance and labour, at his own cost for marking the alignment. Bidder shall remove all bushes, undergrowth, stumps, rocks and other obstacles to facilitate marking the centre line without any extra charges. It is to be ensured that minimum number of bushes and shrubs shall be removed to clear the way and the Bidder shall give all consideration to the preservation of the trees.

The line-up of the trench must be such that cables shall be laid in a straight line except at locations where it has to necessarily take a bend because of change in the alignment or gradient of the trench.

5.1.3 Methods of Excavation:

In city limits as well as in built up areas, the Bidder shall resort to use of manual labour only to ensure that no damage is caused to any underground or surface installations belonging to other public utility services and / or private parties. However, along the Highways and across country routes, there shall be no objection to the Bidder resorting to mechanical means of excavation, provided that no underground Installations exist in the path of excavation, if any, are damaged. There shall be no objection to resort to horizontal boring to bore a hole of required size and to push through G.I. Pipe through horizontal bore at road crossing or rail crossing or small hillocks etc.

Necessary barricades, night lamps, warning boards and required watchman shall be provided by the Bidder to prevent any accident to pedestrians or vehicles. When trenches are excavated in slopes, uneven ground, inclined portion, and the lower edge shall be treated as normal level of the ground for the purpose of measurement of depth of the trench. In certain locations, such as uneven ground, hilly areas and all other places, due to any reason whatsoever it can be ordered to excavate beyond standard depth of 100 Cms. above the cable to keep the bed of the trench as smooth as possible.

If excavation is not possible to the minimum depth of 100 Cms. above the cable, as detailed above, full facts shall be brought to the notice of the Engineer-In- Charge / TPA in writing giving details of location and reason for not being able to excavate that particular portion. Approval may be granted in writing under genuine circumstances. The Bidder shall be responsible for all necessary arrangements to remove or pump out water from trench. The Bidder should survey the soil conditions encountered in the section and make his own assessment about dewatering arrangements that may be necessary. Wherever the soil is hard due to dry weather conditions, if watering is to be done for wetting the soil to make it loose, the same will be done by the Bidder.

5.1.3.1 Trenching near culverts / Bridges:

At bridges and culverts the cable shall be laid in GI pipe of suitable size with the permission of concerned authorities maintaining the roads/bridges. Such permission shall be obtained by the Bidder. While carrying out the work on bridges and culverts, adequate arrangement for cautioning the traffic by way of caution boards during day time and danger lights at night shall

be provided. The GI pipe should be clamped to the outside of the parapet wall of the culvert or bridge with the help of clamps, nails, nuts, bolts and screws of suitable size to ensure that the pipe is securely fixed. The GI clamps should be of minimum 25 mm width and 3 mm thickness and should be fixed at an interval of 50 cms. If necessary, the pipe should be taken to the parapet walls at the ends where the wall diverges away from the roads. The work should be carried out in consultation with the authorities concerned maintaining the roads and bridges.

In case of small bridges and culverts, where there is a likelihood of their subsequent expansion and remodeling, the cable should be laid with some curve on both sides of the culvert or the bridge to make some extra length available for readjustment of the cable at the time of reconstruction of culvert or the bridge.

5.1.3.2 Excavation in Surfaced Strata:

5.1.3.2.1 Excavation on Footpath

The excavation of trenches in all types of footpaths including dismantling of asphalt/all type of tiles/CC and WBM shall be done up to a depth such that the top of the cable is 1.0 M below the normal ground level. The excavation on the footpaths will be done manually. The Bidder shall have to provide shoring wherever necessary, in case the depth of trench is more than one meter. It is expected that the other services may be present below the footpath, therefore, extra care need to be exercised while excavation of trenches.

5.1.3.2.2 Excavation of Trenches along the roads (which are carpeted end to end)

The excavation of trenches along the roads which are carpeted from end to end including dismantling of' asphalt, concrete and WBM shall be done up to a depth such that the top of the cable is 1.0 M below the normal ground level. The excavation along the roads shall be done manually. The Bidder shall have to provide shoring wherever necessary, in case the depth of trench is more than one meter. It is expected that the other services may be present below the roads, therefore, extra care need to be exercised while excavation of trenches.

5.1.3.2.3 Excavation at Road Crossings:

The excavation of trenches in all types of roads including dismantling of asphalt / all type of tiles / CC and WBM shall be done up to a depth such that the top of the RCC pipe Is 1.0 meter below the normal ground level. After excavation of trench, RCC Pipes of 100mm/ 150mm/225mm /300mm dia. shall be laid at the road crossings. The roads, which are broad, may be opened for half their width, allowing the other half for use of vehicular traffic. The second half of the width should be opened after laying pipes and reinstating the first half of the trench. Pipes laid in the second half should be coupled firmly with those laid in the first half. Care must be taken to couple the pipes fully. The pipes should be laid with a slight slope from the center to the sides of the road to prevent collection of water. 8 mm PP Rope shall be drawn through the laid pipes to facilitate cleaning and cable pulling at a later date before closing the trench.

As the work on road crossings entails lot of inconvenience to vehicular traffic and pedestrians, it is desirable to bury extra pipes for future expansion at the initial stage itself. The spare pipes must be sealed properly at both the ends of the road to obviate the possibility of pipe getting chocked due to settlement of sedimentation etc. The Bidder shall have to provide shoring, wherever necessary, in case the depth of trench is more than one meter. Necessary barricades, night lamps, warning boards and required watchman shall be provided by the Bidder to prevent any accident to pedestrians or vehicles.

5.1.4 Trenches of Less Depth:

The depth of trench is very important for future life of cables. Therefore, it is very much necessary for Bidder to ensure that the standard depth is maintained in normal circumstances. However, due to obstructions, if the standard depth cannot be achieved, lower depths up to certain limits are acceptable by the authorities with extra protection as per specifications. The relaxation shall be obtained from the Engineering in charge/ TPA, giving reasons for not achieving standard depth.

5.1.5 Laying of Cables:

After excavation of trenches, approximately 5 Cms thick bed of soft soil/ or sand (in case the excavated material contains sharp pieces of rock/stones) is laid before directly laying the cable. Adequate care shall be exercised while laying the cables so that the cables are not put to undue tension/pressure as this may adversely affect the electrical characteristics of cables with passage of time. Sharp bends shall be avoided. Bends, if any, the radius of curvature should be more than at least six times the diameter of the cable. After the completion of laying, sand/ sieved earth, free of stones etc., shall be placed over the cable to a height of 7.5 Cms. duly levelled and rammed lightly to form a bedding for warning bricks or Half round RCC pipes/ stone slab/ Pre cast RCC slab for mechanical protection.

The cables may be required to be pulled through RCC/ GI Pipes at road crossings, Extra care should be taken to avoid damage to the cable while pulling through pipes which may occur due to kinks. The Bidder should have the required tools and equipments for the purpose to complete the job in a professional manner. The Bidder shall ensure that trenching and cable laying activities are continuous, without leaving patches or portions incomplete in between. When there are number of cables of the same size in the same trench it becomes difficult to identify the particular cable at time of maintenance. Therefore, identification collars bearing L.I. Number of the cable shall be tagged to all the cables. The identification collars shall be provided at an interval of not more than 2 meters.

5.1.5.1 Laying of OFC through Horizontal Directional Drilling (H.D.D.)

Excavation of trench and laying of HDPE Pipes through H.D.D. technique. The Optical Fibre Cable

shall be laid through PLB HDPE pipes. Back filling and dressing of the excavated trenches. Blowing/puling of Optical Fiber Cable with proper tools and accessories.

5.1.6 Placing of Half Round RCC Pipes / Layer of Bricks

After laying of cables, it is covered by a consolidated layer of 8 Cms. of soft earth (or sand in special cases where excavated material contains sharp stones/objects) which should be free from stones or other sharp objects, carefully pressed and lightly tamped. On this layer of soft earth, a layer of half round RCC pipes (100/l50 mm dia) / Bricks is placed as a warning layer and also as a mechanical protection. The choice for protection layer out of half round RCC Pipes or bricks may be decided based on availability and comparative cost.

5.1.7 Back Filling and Compacting of the Excavated Trenches:

After laying the cables and providing warning/protection layer as per specifications, the remaining portion of the trench shall be filled in and well tamped in steps. The trench should be back filled in layers not exceeding 20 cms. each at a time and rammed. The Bidder shall remove the excess earth from the site and leave only a crown of earth rising approximately 5 cms. in the centre. This allows for natural subsidence. When digging on footpaths, along roads and crossings, care should be taken to see that the road is made motorable as soon as the work is completed. The permanent reinstatement of roads and pavement shall be done by the local authorities.

5.1.8 Erection of Pillars:

The pillars should be installed in safe places on footpaths at suitable locations convenient and accessible for maintenance. The positions close to the edge of footpaths, near transformers or below Electric Lines particularly H.T. Lines must be avoided. The location of pillar, which may obstruct the view of drivers of vehicles as on kerb lines at street intersections, locations in which the doors of the pillars when opened constitute a danger to pedestrians or traffic must be avoided. In general, the pillar shall be so located that reasonable and safe working conditions to the staff are possible throughout the year. The height of the pillar shall be such that the pillar does not get submerged during rains.

5.1.9 Erection of DPs:

The Distribution Points (DPs) are fitted on poles, walls or in the staircase walls easily accessible for maintenance, to terminate distribution cables coming from pillars. The items of work in erection of DPs are as under:

I) Fixing of 20/32 mm G.I. Pipe with the help of clamps, nails and saddles at every 30 cms. The clamps should be made of 25 mm wide and 3 mm thick G.I. strips properly galvanized.

II) Pulling of L.I. Cable (5 Pairs/10 pairs/20 pairs/50 pairs) through 20/32 mm dia G. I. Pipe of approximately 7 to 10 ft. and terminating the cable pairs in DP box and fixing of DP box on the wall with the help of suitable raw plugs/wooden gitti and screws.

5.1.10 Termination of Cables in MDF and Pillars:

The U.G. Cables are terminated on tag blocks on line side of the MDF. The MDF consists of iron

frame work and line side tag blocks are fitted on verticals. In the department, depending upon the height of the MDF room, MDFs of different sizes are erected. For simplicity and uniformity, a standard numbering scheme of verticals, tag blocks and tag numbers in the tag block is followed.

While terminating the cables in MDFs and Pillars, the correspondence of pairs shall be maintained from the point of view of counting of pairs and maintenance of the cables. In case of armored cables, the armor of the cable shall be connected to the C.T box mounting frame in the pillar and to the verticals of MDF, which are earthed.

The work of "termination on MDF and pillars "includes:

I. Fixing of tag blocks on MDF vertical/CT boxes in Pillars.
II. Drawing the cable in to the pillar and removing the cable sheath for required length.
III. Providing earth continuity with the armor of the cable(s).
IV. Cleaning the insulated conductor and covering the formed bunches with PVC sleeve/tape.
V. Termination of cable pairs in Tag blocks/CT boxes.
VI. Sign writing with white enamel paint of reputed brand on inner panel of the pillar shall be done indicating the termination details. On MDF, the written labels shall be put in place provided for it indicating the termination details. The details of sign writing shall be given by the Engineer-in-charge.
VII. The termination of cables should be done using standard tools.

5.1.11 Jointing of cables:

The quality of jointing work is of immense importance and therefore, the jointing work should be done experienced jointers using standard tools and accessories. The work of cable jointing involves jointing of pairs by twisting. The quality of joint is vital for overall electrical characteristics and quality of transmission of the subscriber loop and therefore, the same has to be done meticulously. The items of work involved in jointing are as under:

I. Digging the Pit for the Joint.
II. Preparation of cable ends for jointing.
III. Jointing of cable conductors by twisting or by machine jointing using modular connectors.
IV. Closing the joint and Flooding of the joint (Flooding of Joints shall be mandatory).
V. Providing protection to the joint with half round RCC Pipe/ Briks
VI. Back filling and compacting.
VII. Providing joint indicator and noting distances from three permanent points for future reference to locate the joints.

The Bidder shall make hundred percent pairs available from end to end. To ensure the availability of 100% pairs end to end it is a good practice not to close the joints until all the pairs are tested from MDF to pillar for primary cable work and from pillar to DP for distribution cable work. In case of some pairs missing, the defects should be rectified at this stage itself, as the joints are still kept open. Once, all the pairs are available, joint shall be closed properly using jelly and other accessories as per instructions. Proper and adequate filling of jelly in the joints is of importance as any water ingress and trapped in the cavities will result into low insulation fault

at later date.

5.1.12 End-to-End Testing:

The cables are to be tested for continuity of pairs and electrical and transmission characteristics of the cable pairs, between MDF and pillar in case of primary cables and pillar and DPs in case of distribution cables separately. Broadly the following Parameters are tested

I. Insulation
II. Cross Insulation
III. Continuity
IV. Loop resistance
V. Transmission loss
VI. Cross talk level.

5.1.13 Cable route and Joint Indicators:

Cable route and joint indicators are to be provided to indicate the cable route and location joints. The route and joint indicators are to be used for cables laid in rural areas as availability of land marks over wide expanse of lands is scanty. The route indicators are to be placed at every 200 mts. and at every place where the cable changes direction. Joint indicators are to be provided at all joints. For the sake of uniformity and from viewpoint of identification of cable at later date for maintenance, the route / joint indicators shall be provided in the alignment of the trench. The route/Joint indicators shall be painted with Primer before painting with oil paint. The route indicators shall be painted with yellow paint and joint indicators shall be painted with red paint.

5.1.14 Documentation:

The documentation, consisting of route diagrams, depicting joint locations, termination details of cables on MDF, pillars and D.Ps., is of immense help at the time of maintenance or undertaking any re-arrangement work. The documentation shall be prepared primary cable wise for one or more than one primary cables with all its pillars shown and for all its pillars the distribution cables shown pillar wise, for each work order. Vender will have to undertake preparation of route diagram depicting alignment of cables on roadsides on a geographical map. Though it is desirable to prep are these diagrams on geographical maps to the scale but in case geographical maps are not available, the maps should be constructed to a reasonable accuracy by taking details from the local bodies of the area. On this diagram, besides showing alignment of the cable, the topographical details of the road, location of pillars and landmarks along side should also be shown to locate the cable(s) easily as and when required.

5.2 FOR LAN WORKS

For OFC (Single Mode):

- Type of fiber: Single Mode (9/125 µm)
- Cable Type: Armored Outdoor Fiber cable (with HDPE Jacket)
- Type of Armor: Corrugated Steel Tape Armor
- Standard: ISO/IEC-11801, ITU G.652D

- Quoted OFC should be ETL/UL/TEC/CE, GoI/Meity certified/approved as on bid submission date and manufactured in India only. The bidder has to submit the Manufacturer test reports.
- OEM must have minimum presence of 5 years in India as on bid submission date
- The Manufacturer of the product (OEM) should have ISO 9001:2008 or latest
- Performance Warranty: 20 years

For OFC (Multi Mode):

- Type of fiber: Multi Mode (62.5/125 µm)
- Cable Type: Armored Outdoor Fiber cable (with HDPE Jacket)
- Type of Armor: Corrugated Steel Tape Armour
- Standard: ISO/IEC-11801, ITU G.652D
- Quoted OFC should be ETL/UL/TEC/CE, GoI/Meity certified/approved as on bid submission date and manufactured in India only. The bidder has to submit the Manufacturer test reports.
- OEM must have minimum presence of 5 years in India as on bid submission date
- The Manufacturer of the product (OEM) should have ISO 9001:2008 or latest
- Performance Warranty: 20 years

For the CAT-6A cables:

- Unshielded Twisted Pair (UTP), Category 6A, Conductor Size: 23 AWG, Conductor: Bare Copper, Standards: ANSI/TIA/EIA-568 C.2, ISO/IEC-11801, Jacket/ Sheath Type: LSZH (Low Smoke Zero Halogen)
- Quoted CAT6A cables should be ETL/UL/TEC/CE, GoI/Meity certified/approved as on bid submission date and manufactured in India only. The bidder has to submit the Manufacturer test reports.
- OEM must have minimum presence of 5 years in India as on bid submission date
- The Manufacturer of the product (OEM) should have ISO 9001:2008 or latest
- Performance Warranty: 20 years

For the Passive Networking Components:

- OEM must have minimum presence of 5 years for items like Patch Panels, Information Outlets in India as on bid submission date
- The Manufacturer of the items like Patch Panels, Information Outlets (OEM) should have ISO 9001:2008 or latest

For the Active Networking Components:

- OEM must have minimum presence of 5 years in India as on bid submission date
- The Manufacturer of the product (OEM) should have ISO 9001:2008 or latest

For HDPE pipe: ISI approved HDPE pipe. The pipes shall be supplied with ISI mark on each pipe. (The pipe offered shall bear ISI marking with License number. The copy of the valid ISI license issued by Bureau of Indian Standard to the manufacturer for the offered pipe shall be attached.)

For Casing Capping: ISI approved Casing Capping (The copy of the valid ISI license issued by Bureau of Indian Standard to the manufacturer for the offered Casing Capping shall be attached).

For Raceway; ISI approved Raceway (The copy of the valid ISI license issued by Bureau of Indian Standard to the manufacturer for the offered Casing Capping shall be attached).

For Flexible PVC Pipe: ISI approved Flexible PVC pipe. The pipes shall be supplied with ISI mark on each pipe. (The pipe offered shall bear ISI marking with License number. The copy of the valid ISI license issued by Bureau of Indian Standard to the manufacturer for the offered pipe shall be attached.

For Rigid PVC Pipe: ISI approved Rigid PVC pipe. The pipes shall be supplied with ISI mark on each pipe. (The pipe offered shall bear ISI marking with License number. The copy of the valid ISI license issued by Bureau of Indian Standard to the manufacturer for the offered pipe shall be attached.

For Rack: Certifications like ISO 9001:2008 (All rack should be supplied with 6 socket AC power distribution unit, 4 Fan for cooling and 1U cable manager)

CAT-6A Patch Cord (1, 2 & 3 Meter)
Category 6A, UTP Patch Cord, Conductor: 24 AWG or better, Conductor: standard copper wire, Standard Compliance: ANSI/TIA/EIA-568 C.2

CAT-6A Patch Panel (12 & 24 Port)
Panel Frame: Steel with Black Painting, Easy Port Labeling Identification Provision

I/o Box for CAT6A Cable
Category 6A keystone jacks suitable for 22-26 AWG, Standards: ANSI/TIA/EIA-568 C.2, ISO/IEC-11801

Fiber Patch Cord
Product: Optical Patch Cord, Standard: ANSI/TIA-568-C.3, ISO/IEC 11801

During the installation activities, records and route layout diagram must be kept of all items installed, including reference to cable pathways used, final location, identity of cables and equipment. The presentation of all of these records will provide the "As-Installed" basis for all future reference to the installation. The Optical Fiber and UTP cabling shall be installed in accordance with manufacturer's installation instructions. The installer will ensure that the manufacturer's specifications for the Optical Fiber cable and the UTP cables meet the transmission characteristics required by Cabling Standards. All installed cables, termination boxes, distribution panels and wall outlets shall be marked and numbered in accordance with Administration Standard for the Telecommunications Infrastructure. The documentation

required at the completion of the installation phases shall contain all of the following information, together with any other information the installer has acquired during the installation.

- "As-Installed" documentation, showing total cabling and connections installed using floor space plans and cable record sheets. This documentation must show all cables and outlets incorporating the full numbering and marking convention supplied.
- All test results and certification information, identified by cable, connection and numbering convention, necessary for all Optical Fiber and copper cables.
- Bidder is required to update the details of Hardware installed in the Assets Master of IWDMS before completion of FAT.

5.3 LAST MILE EQUIPMENTS

5.3.1 8 Port Manageable Gigabit Fiber Switch without SFP module (unloaded)

Min. Technical Specification	Minimum 8 No's of (full Duplex) 1G SFP port.
	All ports should have features of auto- negotiate, flow control (802.3x), port- based network access control (802.1x), port security, MAC filtering etc.
	Minimum Switching capacity of 8 Gbps or more
	MAC address table of minimum of 8k per switch
	Should be IPv4 and IPv6 ready from day one
	Should have IEEE 802.1.d STP, 802.1w RSTP / 802.1s MSTP, IEEE 802.1Q VLAN
	Features of DHCP, NTP/SNTP or equivalent, SNMPv1, v2 and v3, TELNET/ SSH, TFTP, Web/SSL
	IGMP versions 1 and 2 snooping: supports 1K multicast groups
	Should have console port for administration and management, CLI/ web based GUI
	Support for IEEE 802.3ad Link Aggregation Control Protocol (LACP), Up to 6 groups, Up to 8 ports per group
	All necessary interfaces, connectors, patch cords (if any) and licenses must be delivered along with the switch from day one.
	The Switch should be Rack mountable and the switch should be supplied with Indian standard AC power cord.
	Relay of DHCP traffic to DHCP server in different VLAN. Works with DHCP Option 82 ping, trace route, RADIUS/LDAP/ TACACS+, syslog, DNS client

5.3.1.2 L2 Switch: Gigabit Ethernet Manageable Switch

A) 16 Port Gigabit Ethernet Manageable Switch:

Min. Technical Specification	Minimum 16 No's of 10/100/1000 Base-Tx PoE ports (full Duplex) and 2 x 1GE Uplink port. Switch PoE Power rating should be 150w or more
	All ports should have features of auto- negotiate, flow control (802.3x), port- based network access control (802.1x), port security, MAC filtering etc.
	Minimum Switching capacity of 30 Gbps or more
	MAC address table of minimum of 8k per switch
	Should be IPv4 and IPv6 ready from day one
	Should have IEEE 802.1.d STP, 802.1w RSTP / 802.1s MSTP, IEEE 802.1Q VLAN

	Features of DHCP, NTP/SNTP or equivalent, SNMPv1, v2 and v3, TELNET/ SSH, TFTP, Web/SSL
	IGMP versions 1 and 2 snooping: supports 1K multicast groups
	Should have console port for administration and management, CLI/ web based GUI
	Support for IEEE 802.3ad Link Aggregation Control Protocol (LACP), Up to 6 groups, Up to 8 ports per group
	All necessary interfaces, connectors, patch cords (if any) and licenses must be delivered along with the switch from day one.
	The Switch should be Rack mountable and the switch should be supplied with Indian standard AC power cord.
	Relay of DHCP traffic to DHCP server in different VLAN. Works with DHCP Option 82 ping, traceroute, RADIUS/LDAP/ TACACS+, syslog, DNS client

B) 24 Port Gigabit Ethernet Manageable Switch:

Min. Technical Specification	Minimum 24 No's of 10/100/1000 Base-Tx PoE ports (full Duplex) and 2 x 1GE Uplink port. Switch PoE Power rating should be 180w or more
	All ports should have features of auto- negotiate, flow control (802.3x), port-based network access control (802.1x), port security, MAC filtering etc.
	Minimum Switching capacity of 50 Gbps or more
	MAC address table of minimum of 8k per switch
	Should be IPv4 and IPv6 ready from day one
	Should have IEEE 802.1.d STP, 802.1w RSTP/802.1s MSTP, IEEE 802.1Q VLAN,
	Features of DHCP, NTP/SNTP or equivalent, SNMPv1, v2 and v3, TELNET/ SSH, TFTP, Web/SSL
	IGMP versions 1 and 2 snooping: supports 1K multicast groups
	Should have console port for administration and management, CLI/web-based GUI
	Support for IEEE 802.3ad Link Aggregation Control Protocol (LACP), Up to 6 groups, Up to 8 ports per group
	All necessary interfaces, connectors, patch cords (if any) and licenses must be delivered along with the switch from day one.
	The Switch should be Rack mountable and the switch should be supplied with Indian standard AC power cord.
	Relay of DHCP traffic to DHCP server in different VLAN. Works with DHCP Option 82 ping, trace route, RADIUS/LDAP/ TACACS+, syslog, DNS client

C) 48 Port Gigabit Ethernet Manageable Switch:

Min. Technical Specification	Minimum 48 No's of 10/100/1000 Base-Tx PoE ports (full Duplex) and 2 x 1GE Uplink port. Switch PoE Power rating should be 370w or more
	All ports should have features of auto- negotiate, flow control (802.3x), port-based network access control (802.1x), port security, MAC filtering etc.
	Minimum Switching capacity of 100 Gbps or more
	MAC address table of minimum of 8k per switch
	Should be IPv4 and IPv6 ready from day one
	Should have IEEE 802.1.d STP, 802.1w RSTP /802.1s MSTP, IEEE 802.1Q VLAN
	Features of DHCP, NTP/SNTP or equivalent, SNMPv1, v2 and v3, TELNET/ SSH, TFTP, Web/SSL

	IGMP versions 1 and 2 snooping: supports 1K multicast groups
	Should have console port for administration and management, CLI/ web-based GUI
	Support for IEEE 802.3ad Link Aggregation Control Protocol (LACP), Up to 6 groups, Up to 8 ports per group
	All necessary interfaces, connectors, patch cords (if any) and licenses must be delivered along with the switch from day one.
	The Switch should be Rack mountable and the switch should be supplied with Indian standard AC power cord.
	Relay of DHCP traffic to DHCP server in different VLAN. Works with DHCP Option 82 ping, traceroute, RADIUS/LDAP/ TACACS+, syslog, DNS client

D) Router for Horizontal offices:

S/N	Specifications Requested as per bid	Minimum Requirement
1	Type of Router	WAN
2	No. of Gigabit Ethernet Interface Ports (10/100/1000 Base-T)	1 or More
3	No. of 1G SFP Slot (Fiber/Copper)	1 or More
4	Number of Gigabit Ethernet LAN Ports	4 or More
5	Packet Forwarding Rate (MPPS)	0 or More
6	Aggregated Throughput (Mbps)	100 or More
7	IPSec Throughput (Mbps)	50 or More
8	On site OEM Warranty(Years)	5

- Routers and Compatible SFP modules to be provided. SFP Module should be Single Mode and minimum 1000 base LX to cover the distance of 10KM. SFP Module must be compatible with Router.
- Device should allow configuration of at least one LAN port as a WAN port without modification in the Router Hardware"
- Router must support TCP/IP, PPP, IPSec and Bridging
- Router should support all standard routing protocols like BGP, OSPF, RIP, Static routes, IP-tunneling, NAT, NTP, etc.
- Router should have a dedicated Management/ Console port for WebUI/CLI Access, SNMP (v1, v2, v3), TFTP, etc."
- Router should support AAA features using Radius/LDAP, etc.
- All necessary Connectors, patch cords (if any) must be delivered along with the Router from day one.
- The Router should be supplied with Indian Standard power cables.
- It should be possible to use Router ports as Switch mode.
- The Router should be supplied with all applicable Licenses from day one.
- Router should have minimum Throughput of 100 Mbps

E) Wireless Radio for Horizontal offices:

Sr. No	Specification
Wireless Radio	
1.	Should support communication requirement including voice, video, data applications
2.	Should operate in 5.8GHz frequency band (ISM band)
3.	Should support point-to-point mode
4.	Should provide minimum throughput of 30Mbps
5.	Should be able to connect locations at a distance of up to 30kms
6.	Should support different type of antenna (Uni-directional, Omni-directional, Sectorial, etc.)
7.	Should have 10/100 Base-Tx Ethernet interface to connect to WAN/LAN port
8.	Should support 802.3u encoding
9.	Should be manageable through Console, SNMP (v1, v2, v2c), Http/ssl.
10.	Should support IPv6 from day 1
11.	Should be discoverable in the existing NMS tool
12.	The outdoor unit should be IP65 compliant
13.	Operating Ambient Temperature: 0 to 55 ºC The bidder has to take into consideration the internal temperature adjustment of the bracket/Enclosure and other outdoor conditions at the location
14.	Should have inbuilt surge protection mechanism
15.	Should support traffic encryption
16.	Should be WPC compliant / TEC approved at the time of bidding

5.3.2 Transceiver/ Media Converter

(a) **MiniGBIC Transceiver Single Mode type for Manageable switch:** Small Form Factor Pluggable module — Mini GBIC 100 FX or 1000 based LX module to support 100FX or Gigabit speeds over 9/125 Single mode Fiber up to a distance of 10 kms

(b) **MiniGBIC Transceiver Multi Mode type for Manageable switch**: Small Form Factor Pluggable module — Mini GBIC 100FX or 1000 based SX module to support 100FX or Gigabit speeds over 62.5/125 Multi mode Fiber up to a distance of 220 mts for 1000 based SX and 2kms for 100FX

(c) **Media Converter: For Multi-Mode Fiber (10/ 100 Mbps) for 1 Port**

- One RJ-45 10/ 100 BASE-TX port ST or SC 100 BASE-FX fiber port
- Data Transfer rate – 10/100 Mbps Full Duplex
- Fiber Cable: 62.5/125 micron
- Cable Length: upto 2 Km
- UTP Cable Type: Category 6

- Indicators: Power Indication, FX/RX Link Indication, UTP/RX Link Indication, Full/Half Duplex Indication
- Compatibility: Standards IEEE 802.3 10Base-T, 802.3u 100 Base-TX and 100 Base-FX Protocol CSMA / CD
- Connection Specification: One RJ-45, ST or SC Option, as required

(d) Media Converter: For Single-mode Fiber (10 / 100Mbps) for 1 port

- One RJ-45 10 / 100 BASE-TX port ST or SC 100 BASE-FX fiber port
- Data Transfer rate – 10/100 Mbps Full Duplex
- Fiber Cable: 9/125 micron
- Cable Length:2 Km or above
- UTP Cable Type: Category 6
- Indicators: Power Indication, FX/RX Link Indication, UTP/RX Link Indication, Full/Half Duplex Indication
- Compatibility: Standards IEEE 802.3 10Base-T, 802.3u 100 Base-TX and 100 Base-FX Protocol CSMA/ CD
- Connection Specification: One RJ-45, ST or SC Option, as required

5.3.3 Voltage Stabilizer

S/N	Parameter	Minimum Specification
1	Device capacity	400VA
2	Voltage Correction	Automatic, IC Controlled
3	Input Voltage Range	130 V to 280 V
4	Frequency Range	50 Hz +/- 5 %
5	Output Voltage Range	200 V to 230 V, +/-5 %
6	Efficiency	> 95%
7	Protection/Cut off	Over Voltage and over Current Protection, Thermal and Electronic Overload
8	Device Construction	Compact and modular construction for easy handling and servicing
9	Power Outlets	4 Nos. 5 Amp Indian Standard Power Outlets
10	Operating Temperature	0-55 ° C. The bidder has to take into consideration of the internal temperature adjustment of the junction box
11	Status Display/ Indicator	Should display status of device like on/off, Low-high voltage indicator

5.3.4 Surge Protector

S/N	Parameter	Minimum Specification
1	Clamping Voltage	240 V
2	Response time	<10 ns
3	Energy Dissipation	Min 500 joules
4	Max voltage Spike protection	Up to 400 Volts
5	Max current Spike Protection	5000 Amps
6	Cable	Heavy duty Cable of standard Length

7	Power Outlet	Min. 4 Nos. 5 Amp Indian Standard Power Outlets
8	Operating Temperature	0-55 ° C. The bidder has to take into consideration of the internal temperature adjustment of the junction box

5.3.5 For Jelly Filled Cable (armoured 0.5 mm, 10, 20, 50, 100, 200 Pairs):

- Diameter: 0.5 mm
- Conductor: Copper
- Insulation Material: High density polyethylene
- Quoted JFC should be ETL/UL/TEC/CE, GoI/Meity certified/approved as on bid submission date and manufactured in India only. The bidder has to submit the Manufacturer test reports.
- OEM must have minimum presence of 5 years in India as on bid submission date
- The Manufacturer of the product (OEM) should have ISO 9001:2008 or latest

5.3.6 New Analog telephone (Push Button Type)

- Type: Corded Phone
- Headset Jack: Yes
- Automatic Redial: Yes
- Keypad: Large numerical with Multi-functional Keys
- Dedicated Buttons: Flash Button
- Other Indicators: Indicator Type-Ring
- Keypad Features: Pause, Mute Button, Redial, large numeric keypad is easy to press, Ringer Volume Control, Flash, Large Numeric Keys, Numerical

5.3.7 New Plan telephone (1+1 for Boss Secretary Feature with speaker)

- Type: Corded Phone
- Headset Jack: Yes
- Automatic Redial: Yes
- Keypad: Large numerical with Multi-functional Keys
- Dedicated Buttons: Flash Button
- Other Indicators: Indicator Type-Ring
- Features: Office Boss-Secretary Phone Call Transfer facility, Ringer volume control switch, Mute button and redial function, Flash and pause function, Intercom facility, Call transfer, Holding the lines/music on hold