RailTel's Bid Specific Additional Terms & Conditions

Information to Bidder for the "Procurement of Routers & Switches for Customer Delivery"

Ref: GeM Bid No. GEM/2021/B/1540293 Dated 27.09.2021

- The item/items in this bid should be quoted as per the technical specifications. *The details of the specifications along with consignee/site details are also available on website www.railtelindia.com*

1. In the specification wherever support for a feature has been asked for, it will mean that the feature should be available without RailTel requiring any other hardware/software/licenses. Thus, all hardware/software/licenses required for enabling the support/feature shall be included in the offer. The technical specifications are mentioned in **Annexure-I**.

2. OEM or Authorized distributor/Partner of OEM should have a registered office in India to provide sales and 24x7 support in India. The certificate to this effect should be submitted. The bidder should be either OEM or his authorized dealer/distributor.

3. In case of the authorized distributor/partner certificate from the OEM to this effect should be submitted.

4. Equipment offered shall have complete data sheets and detailed description on OEM web sites. Bidder shall provide the complete details in their bid.

5. Bidder shall submit the detailed BOM of the equipment offered duly verified and certified by the respective OEM. Unpriced BOM shall be submitted by bidder in their technical bid and priced BOM in their price bid. The bidder shall also attach unit Rate analysis of Schedule of Requirement (Cost of each sub-assembly, card, module, License, supervision of I&C charges etc.) in their Price bid. The quoted unite rates should correspond to the referred unit rate. Priced BOM/SOR submitted with technical bid will be summarily rejected.

6. GSTIN ID of vendor should be provided from where goods will be supplied.

7. **Delivery Period, Consignee Address and inspection**

7.1 **Delivery Period:** The supplier will have to supply the material within 30 days from the date of issue of confirmed PO. If material is not supplied within the approved delivery period then penalty of 0.5% of undelivered/uninstalled quantity per week to the maximum to the 10% of the contract value will be levied.

Note: Supplier should also submit internal test report, guarantee and fitment certificate along with the supply of materials.

7.2 Consignee Address:

S.No.	Consignee	Consignee Address	RailTel Region	Items to be
1	Sr. Mgr/Stores RCIL/Mumbai	RailTel Office, Mumbai	Western Region	All Qty.

7.3 Inspection:
Post Receipt Inspection at consignee Site before acceptance of stores: Nominated RailTel Executive by CA.

8. Estimated cost of tender & Earnest Money Deposit (EMD)/ Bid Security:

8.1 **Estimated cost of tender:** Estimated cost of the Tender is Rs.**73,69,668/-** (Incl. GST).

8.2 **Earnest Money Deposit (EMD)/ Bid Security:** Bidder has to give Bid Security Declaration as per format specified in **Annexure – VI**. Offer not accompanied with the above Declaration will be summarily rejected.

9. This bid complies with "Public Procurement (preference to make in India) Policy Order, 2017 or latest issued by DIPP and Public Procurement Policy for Micro and Small Enterprises (MSEs) order,2012" or latest issued by MoSME."

The bidders claiming the preference have to submit relevant documents prescribed under relevant order.

10. Security Deposit/Performance Bank Guarantee:

The successful tenderer shall submit security deposit in the form of DD or irrevocable Bank Guarantee from any scheduled bank for due fulfillment of contract as per the details given below:

i. Security Deposit/Performance Bank Guarantee @ 3% of total value of Purchase Order is required to be submitted within 30 days of issue of Purchase Order with validity of 3 months beyond warranty period, failing which a penal interest of 15% per annum shall be charged for the delay period i.e. beyond 30 (thirty) days from the date of issue of LOA/PO. PBG format specified in **Annexure-V**

ii. The security deposit/PBG shall be submitted to RCIL/WR, Mumbai.

iii. A separate advice of the BG will invariably be sent by the BG issuing bank to the RailTel's Bank through SFMS and only after this the BG will become acceptable to RailTel. It is therefore in own interest of bidder to obtain RailTel's bank IFSC code, its branch and address and advise these particulars to the BG issuing bank and request them to send advice of BG through SFMS to the RailTel's Bank.

The security deposit/Performance Bank Guarantee shall be released after successful completion of Contract obligations under the contract, duly adjusting any dues recoverable from the successful tenderer. Payment of Security Deposit in the form of Pay Order/Demand Draft should be made in favor of "RailTel Corporation of India Ltd" payable at Mumbai.

Note:

1. Any Performance security upto a value of Rs. 5Lakhs is to be submitted through online transfer only

2. No interest shall be paid on the amount of Performance Security held by RailTel, at any stage.

11. Eligibility Criteria for OEM:

- The Equipment offered by the OEM or equipment of the same series/family (an undertaking by the OEM has to be submitted in support incase of immediate predecessor) from the same OEM should have been satisfactorily working in Government/PSUs/Telecom Service Providers network for at least 12 months as on opening of bid, in India or Abroad. The certificates from the actual users will have to be submitted online. OEM shall also submit proper contact detail of clients (Firm Name, Contact person, Designation, Telephone Number, Fax, Official mail id etc.).

- The OEM should have supplied at least 35% of the tendered quantity of the equipment offered or equipment of the same series/family during last preceding 3 financial years (i.e. current year and three previous financial years) as on opening of bid to Government/PSUs/Telecom Service Providers. OEM should submit self-certificate with proper contact detail of clients along with quantities supplied (Firm Name, Contact person, Designation, Telephone Number, Fax, Official mail id etc.). The same should be issued by authorized signatory.

- The OEM should have proven facilities for Engineering, manufacture, assembly, integration and testing of Data Network equipment and basic facilities with respect to space, Engineering, Personnel, Test equipment, Manufacture, Training, Repair, Service Center Supports for at least past three years in the country from where the proposed equipment are planned to be supplied. In case OEM is located outside India, it should have training repair and service center facilities in India also. The certificates/Undertaking for the same will have to be submitted online.

  (The bidder will have to submit the proof of establishment for the facility)

- All the documents of the OEM should be in English/Hindi languages only. Document other than English/Hindi will not be entertained. However, Technical Specifications and details should be in English only.

- OEM should not have been banned/blacklisted by any Govt/Semi Govt./PSU/State Govt./Any Telecom entity in India for the supply of the material. An undertaking to this effect signed by the authorized signatory to be submitted by the OEM.

12. Eligibility Criteria:

12.1 **Technical Eligibility for Bidder:**

The tenderer must have successfully completed any of the following during last 07 (seven) years, ending last day of month previous to the one in which tender is invited:

- Three similar works each costing not less than the amount equal to 30% of advertised value of the tender, or
- Two similar works each costing not less than the amount equal to 40% of advertised value of the tender, or
- One similar work each costing not less than the amount equal to 60% of advertised value of the tender.

 # Similar Work- Supply /Supply and installation of MPLS Router/Switches with satisfactory working in Government/PSUs/Telecom Service providers/Public Listed Company in India or outside India.

Note: Work experience certificate from private individual shall not be considered. However, in addition to work experience certificates issued by any Govt. Organization, PSU or any reputed TELCO, work experience certificate issued by Public listed company having average annual turnover of Rs.500 crore and above in last 3 financial years excluding the current financial year, listed on National Stock Exchange or Bombay Stock Exchange, incorporated/registered at least 5 years prior to the date of opening of tender, shall also be considered provided the work experience certificate has been issued by a person authorized by the Public listed company to issue such certificates.

In case tenderer submits work experience certificate issued by public listed company, the tenderer shall also submit along with work experience certificate, the relevant copy of work order, bill of quantities, bill wise details of payment received duly certified by Chartered Accountant, TDS certificates for all payments received and copy of final/last bill paid by company in support of above work experience certificate.

12.2 **Financial Criteria for Bidder:**

The bidder should have minimum cumulative turnover of 150% of tendered value or above during the last 3 financial years (i.e. current year and/or three previous financial years). The bidder should provide Audited Balance Sheets / annual reports as documentary evidence and for current year, the Statutory Auditor's

certificate for turnover of current year up to the date of bid opening for which Balance Sheet/P&L may not be available. In case of photocopy of Balance Sheet/P&L the same should be certified by Chartered Accountant as true copy.

12.3 Bidder should have authorization specific to this tender from respective OEM as per **Annexure-III**.

12.4 The bidder should have registered office in India for a minimum period of 3 years as on schedule date of bid opening. Certificate of incorporation will have to be submitted.

12.5 The bidder or their promoters having equity stake or operating partnership in bidder, should not be holding valid License for Telcom Service Provider/ISP/NLD, Services License of Government of India for Telecom Operation.

12.6 Bidder should not have been banned/blacklisted by any Govt./Semi Govt./PSU/State Govt./Any Telecom entity in India for the supply of the material. An undertaking to this effect signed by the authorised signatory to be submitted by the Bidder.

13 Splitting of Quantity: Not Applicable.

14 Evaluation Criteria:

i. The bidder shall quote the equipment prices as per the price format given in the tender.

ii. Bidder should quote for all the items. The Offers will be evaluated on total cost including Long Term Maintenance Cost as quoted.

iii. The offers for respective Item will be determined on Total Unit Rate on CIP destination basis which will include basic rate, GST, freight, insurance and any other charge or cost quoted by the tenderer.

iv. Offers from the tenderers not meeting the eligibility criteria will not be considered.

v. Any optional item/modules, accessories etc. required for meeting the tender criteria may be quoted separately, if required. The bidder should indicate brand name, type / model number of the material offered.

vi. Bidders has to quote for all the items of SOR. The incomplete SOR will not be accepted and if found the bid will be rejected.

15. Variation of Quantities at the Time of Award

The purchaser reserves the right to increase or decrease the quantity to be ordered up to 30 percent at the time of placement of contract. The purchasers also reserves the right to increase the ordered quantity by up to 30% of the contracted quantity during the currency of the contract at the contracted rates. Bidders are bound to accept the orders accordingly.

16. Warranty:

The materials are to be warranted for **3 years** from date of delivery to the consignee. The tenderer shall warrant that stores to be supplied shall be new and free from all defects and faults in material, workmanship and manufacturing and shall be of the highest grade and consistent with the established and generally accepted standards of materials of the type ordered and shall perform in full conformity with the specifications and drawings.

The supplier shall be responsible for any defects that may develop under the conditions provided by the contract and under proper use, arising from faulty materials, design or workmanship such as corrosion, inadequate quantity of material to meet equipment requirements, inadequate contact protection, deficiencies in design and/ or otherwise and shall remedy such defects at his own cost when called upon to do so by the Purchaser who shall state in writing in what respect the stores are faulty.

17. Long Term Maintenance Support: <u>(Not applicable for this Bid)</u>

Tenderer (OEM) shall provide maintenance support after successful completion of the warranty obligations for a minimum period of 5 years. The long term maintenance support shall be comprehensive and include all hardware and software of equipment supplied against this contract. RailTel should be extended the benefits of periodical software patches/updates made by OEM on the system from time to time for equipment security/performance without any additional cost to RailTel.

Buyer reserves the right to enter into Long Term Maintenance @ 3.5% of ordered value of equipment after expiry of warranty period.

Bidder/OEM, shall be paid @ 3.5% of supply cost per annum towards Long Term Maintenance Support after completion of warranty period, to undertake repairs/replacements of all type of module/ card/assembly/ subassembly and update/upgrade of software released during this period and /or which may fail in the network after the warranty. Only incremental cost in % over and above this, if perceived by the OEM and Tenderer, may be indicated in Schedule of Requirement. AMC cost for 5 years shall be added towards evaluation of tender. If however the tenderer feels that his AMC Cost is less than 3.5% per annum, he should give suitable discount in equipment pricing and for AMC he will be paid @

3.5% per annum. If the Tenderer quotes a higher base rate for AMC, he will be paid at his quoted rate per annum. AMC would have to be valid for minimum period of 5 years after the warranty.

Separate agreement for AMC after warranty period shall be entered with OEM or Bidder specifically authorized by OEM by RailTel. A fresh Bank Guarantee for a value of 10% of the value of the AMC contract's 5 years value valid for a period of 64 months (4 months beyond the AMC period of 5 years) from the date of issue of LOA shall be required to be submitted by Bidder/OEM for due fulfillment of long term maintenance support obligation. This PBG of AMC shall be submitted by the bidder within 30 days from the date of issue of LOA for the AMC. In case bidder does not submit the PBG in the stipulated time period, RailTel may encash the PBG given with the original LOA.

Quarterly payment for AMC Charges as per the Service Level Agreement (SLA) at the end of every quarter would be made by RailTel after successful completion of AMC Services of that quarter and on the certificate furnished by concerned RailTel representative.

Note: The acceptance of the above clause is mandatory and specific acceptance from OEM is required to be enclosed as per Annexure-II. Any deviation / non acceptance will lead to rejection of the bid.

18 Repair and Return Services applicable for Warranty Period (Clause No. 16) as well as Long Term Maintenance Support (Clause No. 17)

18.1 Repair

18.1.1 Contractor's Responsibility:-

- The Contractor will take-over the defective equipment/component from station/site and hand-over the repaired equipment/component at the same location. The following activities will be performed by the contractor:

- After receiving a defective part request through Welcome Centre (dedicated phone line or e-mail), the defective equipment/component will be taken over by the contractor from each of the station. All the documentation including identification number (Serial number) will be provided by RailTel.

- There will be initial one time activity of all existing faulty equipment/component being repaired by Contractor before commencement of the AMC. AMC will cover only equipment which are in working condition.**(Not applicable for the Bid)**

- **Delivery Period:** The received defective part will be got repaired by the contractor within 30 days from the date of receiving and will be handed over to RailTel authorized representative at station/site. The contractor will also

give probable reason for repeated failure of equipment/component/ modules.

Uninterrupted Network: For smooth and uninterrupted traffic during the repair being carried out by the contractor.

1. RailTel will provide its own spares in the first instance for the defective equipment where spares have been procured as per the SOR. For remaining items contractor shall make spares available at his own cost.

2. If contractor fails to return the repaired equipment/module/card/SFP/part within stipulated time of 30 days from the date of receipt then the OK (good conditioned) equipment/cards/SFPs/parts etc. will be provided by the contractor for the subsequent time period free of cost till replacement is made with the repaired equipment/module/card/SFP/part.

3. All transportation, freight and insurance charges will be borne by the contractor.

4. Contractor will keep the record of repair on each defective equipment/part/cards/SFP/components with serial numbers (unique identification) particulars.

18.1.2 **RailTel Responsibility**

RailTel will hand over the equipment/defective card/SFP/Parts/etc. to the contractor's authorized representative at each of the station/site along with the following relevant information & documentation.

- Identification/serial number and location of use.
- Fault report document duly filled-in in a format as per requirements of Contractor.
- All relevant documentation including failure description, diagnostic tests results.
- Adequate packing material to protect against reasonable risk of damages.
- Provide all necessary government authorization and documentation necessary to facilitate custom clearance processing.
- Perform a physical check test on the repaired parts.

18.2 **Return**

If any part goes beyond repair due to Contractor at the time of repair being carried out, this is to be communicated to RailTel and after agreed upon, it will be labeled as "unworkable". If it will be required to deploy a new equipment/part on that location that will be provided by the contractor free of cost. To achieve this, contractor is required to always keep adequate spares with it during the period of AMC. However this excludes damaged, spoiled, rusted or misused equipment/parts. Any such equipment/parts will be not-repairable and no replacements shall be provided by contractor. RailTel will have to purchase fresh

spares in case the equipment/cards are non-repairable due to any of these above mentioned reasons.

18.3 **If the contractor fails to return the equipment/accessories within 30 days, the following penalties will be imposed:**

Equipment	Duration of repair	Deduction/Penalties
All Equipment/Module and accessories	More than 30 days and upto 40 days (from the date of receipt)	10% of the cost of affected equipment/module
All Equipment/Module and accessories	More than 40 days and upto 50 days (from the date of receipt)	25% of the cost of affected equipment/module
All Equipment/Module and accessories	More than 50 days and upto 60 days (from the date of receipt)	75% of the cost of affected equipment/module
All Equipment/Module and accessories	More than 60 days (from the date of receipt)	Full cost of affected equipment/module

Contractor can deposit the penalty with the Buyer directly else the Buyer shall have a right to recover all such penalty amount from the Performance Security (PBG) or from the running bills.

19. Payment Conditions:-

(i) 100% payment against full supply.
(ii) 80% payment against part supply. In case bidder completes the supply order for one SOR, he can claim part payment of 80% against each SOR's completed supply of the said SORs. Balance payment shall be made after full supply.
(iii) The following documents are to be submitted for payment:

- Original Tax Invoice. (With separate Tax amount, containing POS, RailTel GSTN and Supplier GSTN).
- Delivery Challan
- Original Consignee receipt with GRN No.
- Original Inspection Certificate
- Transit Insurance Certificate
- Warranty Certificate of OEM
- Copy of BG/Proof of BG Submission
- Certificate of receipt of Goods in good condition from RailTel

20. The tenderers shall submit a notarized affidavit on a non-judicial stamp paper stating that they are not liable to be disqualified and all their statement/documents

submitted along with bid are true and factual. Standard format of the affidavit to be submitted by the bidder is enclosed as **Annexure-IV**. **Non submission of an affidavit by the bidder shall result in summarily rejection of his/their bid**. And it shall be mandatorily incumbent upon the tenderer to identify state and submit the supporting **documents duly self-attested** by which they/he is qualifying the Qualifying Criteria mentioned in the Tender Document. It will not be obligatory on the part of Tender Committee to scrutinize beyond the submitted document of tenderer as far as his qualification for the tender is concerned.

The RailTel (RCIL) reserves the right to verify all statements, information and documents submitted by the bidder in his tender offer, and the bidder shall, when so required by the RailTel (RCIL), make available all such information, evidence and documents as may be necessary for such verification. Any such verification or lack of such verification by the RailTel (RCIL) shall not relieve the bidder of its obligations or liabilities hereunder nor will it affect any rights of the railway thereunder.

In case of any wrong information submitted by tenderer, the contract shall be terminated. Performance Guarantee (PG) of contract forfeited and agency barred for doing business on RailTel (RCIL) as per **Annexure-VI**

21. Online Submissions:

The bidder is required to upload and submit the following documents on line before due date & time of bid. The due date & time for closing of the bid as per GeM Bid and the bid will be opened as per GeM Bid.

(i) Bid Security Declaration as per **Annexure – VI**.
(ii) BOQ of offered equipment and unit rate analysis.
(iii) Clause wise compliance along with all mentioned documents/annexures for all clauses of GeM Bid and ATC (Information to bidder) documents.
(iv) Data Sheet of offered equipment.
(v) Financial (Certified copies of audited balance sheets/annual reports of last three preceding financial years) and Technical Eligibility Criteria documents.
(vi) Technical Compliance of all Specification of items as per ATC documents.
(vii) Undertaking of Long Term Maintenance Support from OEM as per para Annexure-II. **(Not Applicable for this bid)**
(viii) Proof of document required against Eligibility criteria of OEM and Bidder vide para 11 & 12 respectively.
(ix) MAF/OEM Authorization as per **Annexure-III**.
(x) Notarized affidavit on a non-judicial stamp paper as per **Annexure-IV**.
(xi) Duly notarized Power of Attorney in name of authorized signatory as per Clause No. 25.

22. Offline submission:

Original copy of documents shall be submitted by tenderer offline at RailTel Corporation of India Western Railway Microwave Complex, Senapati Bapat Marg Mahalaxmi (West) Mumbai - 400013 at any point of time whenever asked for verification. Incase original are not produced before due date, bid may be rejected.

23. Make in India

The provisions of the Public Procurement (Preference to Make in India) Order 2017 dated June 15, 2017 (or subsequent revisions, if any) by Department of Industrial Policy and Promotion, GoI shall apply to this tender to the extent feasible. Minimum Local Content for Router shall be 60% for purchase preference as per the Notification No. 18-10/2017-IP dated 29th August 2018 issued by Department of Telecommunications, Ministry of Communications or as per the latest notification for FY 2020-21. Bidder shall be required to give a self-certification in his bid that the item offered meets the local content and shall give details of the location(s) at which the local value addition is made. Further the bidder shall provide a certificate from the statutory auditor or cost auditor of the company (in the case of companies) or from a practicing cost accountant or practicing chartered accountant (in respect of suppliers other than companies) giving the percentage of local content. In case of any false declaration, action shall be taken in line with the provisions of the PPP-MIII order.

24. Insurance

24.1 The Contractor shall take out and keep in force a policy or policies of insurance from the date, the delivery of material starts (including the transit portion) against all liabilities of the contractor or the Purchaser. The contractor shall take out and keep in force a Policy or policies of Insurance for all materials covered in schedule of requirement irrespective of whether used up in the portion of work already done or kept for the use in the balance portion of the work until such material are provisionally handed over to RailTel. The contractor should ensure the stores brought to site, against risks as required under the Emergency Risk (Goods) Insurance Act in force from time to time up to contract value.

24.2 It may be noted that the beneficiary of the insurance policy should be RailTel or the policies should be pledged in favor of RailTel. The contractor shall keep the policy/policies current till the equipment are handed over to the purchaser.

25 Constitution of Firm and Power of Attorney

25.1 Any individual(s) signing the tender or other documents connected therewith should specify whether he is signing:-

(a) As sole proprietor of the concern or as attorney of the sole Proprietor.

(b) As partner or partners of the firm.

(c) As a Director, Manager or Secretary in the case of Limited Company duly authorized by a resolution passed by Board of Directors or in pursuance of the authority conferred by Memorandum of Association.

25.2 In the case of a firm not registered under the Indian Partnership Act, all the partners or the attorney duly authorized by all of them should sign the tender and all connected documents. The original Power of Attorney or other documents empowering the individual or individuals to sign should be furnished to the Purchaser for verification, if required.

25.3 The RailTel will not be bound by Power of Attorney granted by the tenderer or by the changes in the composition of the firm made subsequent to the execution of the contract agreement.

25.4 In case where Power of Attorney partnership deed has not been executed in English, the true and authenticated of copies of the translation of the same by Advocate, authorized translators of Courts and licensed Petition Writers should be supplied by the contractor(s), while tendering of the work.

25.5 The duly notarized Power of Attorney shall be submitted in original at the time of bid submission as per Clause 22 above.

Note: 1) The bidder is required to give acceptance of all the clauses of **GeM bid, ATC** and RailTel's Bid Specific **ATC** document. Any deviation / non-acceptance may lead to rejection of the bid.

2) Information to Bidder viz. corrigendum /addendum/ amendments etc. for this bid shall be posted on www.railtelindia.com and GeM only.

3) This bid is governed by the Specific Additional Terms & Conditions and General Terms & Conditions laid down by the GeM against **GeM Bid No: GEM/2021/B/1540293.**

In case, if any contradiction between GeM Bid, Additional Terms & Conditions, RailTel's Bid Specific Additional Terms & Conditions and General Terms & Conditions, RailTel's Bid Specific Additional Terms & Conditions will prevails.

Annexure-I

Technical Specification

1. With 3 years warranty. The product should not be declared EOL or EoS by OEM for next 8 Years.

2. Equipped with necessary hardware/software to comply all above required / support features.

3. Back to Back warranty with respective OEMs for both Hardware and Software. The certificates/Undertaking for the same will have to be submitted along with bid from respective OEM.

4. UL, CE and FCC Certification is not required for PMA. However they have to produce certificate from standard lab approved/ authorized by Govt. of India that their product are equivalent to UL,CE and FCC and meets all standard and specification of UL,CE and FCC.

5. All equipment should be compatible with each other.

S. N.	Description of Item	Unit	Quantity
SOR-1	Router Type- I as per specification	Nos.	1
SOR-2	Router Type- II as per specification	Nos.	12
SOR-3	Router Type- III as per specification	Nos.	9
SOR-4	Router Type -IV as per specification	Nos.	8
SOR-5	Switch Type -I as per specification	Nos.	11
SOR-6	Switch Type- II as per specification	Nos.	34
SOR-7	Switch Type -III as per specification	Nos.	7

Schedule of Requirement (SOR) wise technical Specification:

SOR item 1: Router Type -I

MPLS Router 100G (Type-A)		
SN	**Technical specification**	**Compliance**
1(a)	MPLS router shall have 8 Nos. of 10 Gigabit SFP+ ports & the ports should be fully populated.	
1(b)	The MPLS router should have 2 x100G optical ports on Day1 provided with DAC cable and should have option to support upto two additional 100G ports at no additional cost to RailTel.	
2	Router shall have minimum 400 Gbps forwarding bandwidth	
3	Router shall have minimum 400 million packets (64 Byte packets) per second forwarding rate.	
4	Router shall have a minimum of 128K MAC address space.	
5	Router should have minimum 4K VLANs.	
6	Router should have inbuilt redundant power DC supply (-48 V) and The Power (DC) shall be -48 V Telco nominal to -60V Telco nominal.	
7	Should provide Dual Images.	
8	Should support Optical Transceiver Digital Diagnostic Monitoring.	
9	Should support port mirroring and jumbo frame.	
10	Should support BFD for single hop and multihop sessions.	
11	**Should have the following security features viz.:**	
	i. Web Management (HTTPS)/SSH,	
	ii. Broadcast/Multicast/Unicast Storm Control,	
	iii. DoS Attack Prevention	
	iv. The Router should have mechanism to protect its control plane in case of volumetric attack.	
12	**Router should have following SNMP traps or Syslog:-**	
	i. Interface UP & Down.	
	ii. Optical power SFP threshold alarms.	
	iii. STP Topology Changes and New root bridge.	
	iv. LLDP table changes.	
	v. Power Supply (Primary and Secondary) down and Up alarms in case of redundant power supply.	
	vi. Threshold traps like CPU, Chassis Temperature and Memory.	
	vii. CFM and LFM alarms.	
13	**Router should comply to following Temperature performance parameters :**	

	i. Operating Temperature - min -0 to 45 °C	
	ii. Storage Temperature - min -40 to 70 °C (-40 to 158 °F)	
14	The device shall be designed for continuous operations with have a dual fan system or better. The vendor shall state if it is a fan less architecture.	
15	Should be IPv6 feature ready from day 1	
16	Device should have IP SLA monitoring (or equivalent functionality) for Latency, Packet drop, Jitter etc. and should also support SNMP polling for IP SLA monitoring.	
17	**MPLS router should support following Metro Ethernet Features.**	
	i. ITU-T G.8032 Ethernet Ring Protection designed for loop protection.	
	ii. Should support multiple Ring up to 8 ring (Main and Sub Ring) protection failover within 50 ms. Or ITU-T G.8032 v2.	
18	The operating system of the router category/series/family should be MEF-9/14 or CE (Carrier Ethernet) Certified/compliant or latest.	
19	Routers should be NEBS certified.	
20	**Devices should support following MPLS/IP Features.**	
	i. The Router shall support E-Line and E-LAN MEF standards	
	ii. The Router shall support MPLS-FRR and IP-FRR to ensure high availability	
	iii. The Router shall support Ethernet protection based on ITU-T G.8032 with OAM (Ethernet OAM compliant with IEEE 802.3ah/Y.1731) features like LFM, CFM and Performance monitoring.	
	iv. The Router shall support point to point VPWS and multipoint Virtual Private LAN service	
	v. The Router shall support an IGMP/IGMPv3 snooping function.	
	vi. The Router shall support PIM-SM. Static RP/BSR/Auto-rp support is required.	
	vii. The Router shall support policy QoS including - policy based classification, bandwidth control and scheduling.	
21	**MPLS router should have following IPv6 features:**	
	a) IPv6 Ping	
	b) IPv6 trace route	
	c) OSPF v3	
	d) IS-IS	
	e) VRRPv3	
	f) IPv6 CoS (classification & rewrite, scheduling based on TC)	
	g) IPv6 ACL	

22	**Router should support following features and Scaling values.**	
	i. Should support min 256K number of IPv4 Routes	
	ii. Should support min 25K number of IPv6 Routes	
	iii. Should support 5 level of MPLS Labels lookup	
	iv. Should support maximum 32k number of MPLS Labels	
	v. Should support maximum 1000 No of L3VRF/L2VPN	
	vi. Should support MPLS label-Switching router (LSR & LER) functionality	
23	Interfaces of MPLS routers should have hardware support of synchronization protocols like SyncE & 1588v2 PTP and should be enabled by additional licenses or OS upgradation, if required.	
24	Should support VPLS,H-VPLS and VPLS Multihomed Layer 2 Switch Ring	
25	Shall support GRE tunneling	
26	**Shall support HQoS along with the following features:** i. Shall support at least 32K Queues ii. Policing iii. Rewrite iv. Two-Rate Tri-Color marking v. Classification vi. Filtering	
27	**Shall provide the following BRAS/BNG functionality from day 1 :**	
	i. 16 K IPOE subscribers for Wifi or Wireline connectivity.	
	ii. Shall provide 300subs/sec bring up rate	
	iii. Shall support RADIUS authentication for services	
	iv. Shall support Delivery of service policies through RADIUS	
	v. Shall support service accounting and prepaid accounting	
	vi. It shall provide support to AAA for Accounting and charging support	
	vii. Periodic or Interim Accounting records generation shall be supported, configurable time intervals (minimum of ten minutes) shall be supported. Wifi GATEWAY shall provide RADIUS accounting based on volume and time.	
	viii. BNG/BRAS shall support shall support URL redirection to captive portal	
	ix. Should be able to do portal based authentication with the support of AAA and captive portal server.	
	x. Shall support DHCP server and client functionality, it shall support DHCPv6 server/ relay as well.	
	xi. Shall support DHCP based option 82	
	xii. Shall be able to cater to Open SSID traffic.	

	xiii. Shall be able to provision different type of policies for free subscribers and premium subscribers with the support of AAA.	
28	**Management & SDN**	
	i. Should support telemetry based on push model for monitoring network devices	
	ii. Should support sending telemetry data to multiple consumers simultaneously	
	iii. Shall support GPB/GRPC/KAFKA encoding for telemetry data	
	iv. The software model/sensors should be based on either yang, xml or open config	
	v. The system should support streaming granularity of atleast 10 sec	
	vi. Some of the telemetry models/sensors the Switch should support are: Chassis Environment, linecard utilization, WAG subscriber statics, IP SLA/ RPM stats, routing/prefix sensor	
	vii. The solution should support the network configuration protocol (NETCONF) that provides mechanisms to install, manipulate, and delete the configuration of network devices, RFC 6241	
	viii. The solution shall support provision for event based scripts that shall be capable of performing actions based on certain triggers	
	ix. Should support RFC 6020, YANG - A Data Modeling Language for the Network Configuration	
	x. Should be able to act as Path computation client in the PCE architecture defined in RFC 4655.	
	xi. Should support PCECP as defined in RFC5440.	
	xii. Should support BGP link-state (BGP-LS), RFC 4655	
29	**TEC-GR**	
Note: 1	The offered equipment should support the Compliance to TEC GR No. TEC/GR/IT LSW-001/05/MAR 2014 or Latest for **CATEGORY-II LAN SWITCHES** (**Low Range: Metro Ethernet Access)** & RailTel's Technical requirements.	
Note: 2	OEM vetted Clause wise compliances to TEC GR should be submitted.	
Note: 3	In case of a mismatch between tender clause and TEC GR clause, tender clause will prevail and in case of deviation from the TEC GR specifications, the compliance to relevant ITU-T specification shall be submitted by tenderer.	

Note: 4	It may kindly be noted that in the specification wherever support for a feature has been asked for, it will mean that the feature should be available without RailTel requiring any other hardware/software/ licenses. Thus all hardware/software/ licenses required for enabling the support/feature shall be included in the offer.	
Note: 5	Bidder should submit the vetted BOM from their respective OEMs	
Note: 6	OEM should be having valid ISO 9000 & ISO 14000 certification on the date of opening of bid "OR" OEM should have figured in latest Gartner Report in field of Ethernet Switches.	
Note: 7	**Following clauses of the said GRs are desired but not mandatory:**	
	a) GR Clause no. 3.3.1 (xi), 3.3 (iv), 3.5(iv),3.3.5 (vii), 3.5.5 (vii)	
	b) GR Clause 3.6.4. (vi) to (xii) , (xvi) and (xvii), 3.3.6(ii), 3.6.4(xiii), 3.6.4(xv)(xviii)(xxi)	
	c) GR Clause 3.6.5 (viii), (ix) and (xiii).	
	d) GR Clause (b),(c),(d),(e) Chapter 5	
	e) GR Clause no Chapter 6 Note-3 – CISPR 11/ EN 55011	
	f) GR Clause (i) & (iii) Chapter 7 Safety Requirements	
	g) GR Clause no 8.2 (v), (a) and (c)	
	h) GR Clause 8.5, 9.3, 9.6	
	i) GR Clause no. 9.3	
	j) GR Clause no. 9.6	
	k) GR Clause 9.8 (d),(e),(f),(g),(j),(m)	
Note: 8	**NEBS Certification is not required for PMA. However they have to produce certificate from standard lab approved/ authorized by Govt. of India that their product are equivalent to NEBS and meets all standard and specification of NEBS.**	
Note: 9	Bidder should be responsible to integrate the BRAS functionality with RailTel AAA system (Free Radius) and billing system.	
Note: 10	Bidder to supply two nos of 100G DAC cable of 5 meters length with each router	
30	**BNG Assurance Tool Specs**	
i.	The systems should have the ability to establish function-level, role-based permissions (e.g., who can use what functions of the product)	
ii.	The systems should support user-based roles with different management privileges	
iii.	Compute hardware must be generic purpose servers (x86)	
iv.	Alarm notification is required automatically, when fault conditions occur	

v.	Engineers shall be notified during threshold crossing alarm generated in Performance Management system	
vi.	Customized dash board illustrating the status of NE's/EMS/ NMS and Alarms in the form of GUI	
vii.	The detailed customized fault report shall be accessed by secure WEB access as well as can be presented in different form (excel/pdf)	
viii.	The solution shall run a Reporting Engine on top of the alarm archived database.	
ix.	The solution shall create high-level real time dashboards or scorecards (bar charts, pie charts, tables, etc) to visualize the summary view of the overall health of the network and services	
x.	Support for different icons or colors to denote different alarm states, e.g. unacknowledged alarms shall be showed with different icon or color to active alarms	
xi.	Logical partitioning for different domains should be possible in the tool	
xii.	The dashboards shall include fault management information for the hour, day, week, month etc	
xiii.	**The system should be capable of reporting the following health information of the BNGs:** 1. CPU utilization & Memory utilization 2. Line card statistics tracked by resource monitor 3. Session and Service denies 4. Event Rate statistics 5. Per process Monitoring	
xiv.	**System should have mechanism for reporting:** 1. AAA Radius & DHCP Server latency (ave + peak response times) including counts per message types (requests, accepts, rejects, timeouts, COAs) Drop counts for DHCP protocol control messages (DHCPv4 & DHCPv6) DHCP bindings	
xv.	The monitoring tool will notify the admin of Subscriber session counts by client session type (DHCP, VLAN, PPP, PPPoE, L2TP, Static)	
xvi.	Monitor Subscriber low/high watermark (Total addresses avail, addresses in use) over a period of time and report baseline anomalies	
xvii.	**Reporting of:** 1. Queue stats for dynamic subscribers 2. Traffic class rates for QoS enabled subscribers against shaping rate 3. Utilization for lag bundles and ports(Packet, Octet) (ipv4, ipv6)	
xviii.	latency, packet loss and jitter – to be collected from IPSLA/RPM or equivalent	

xix.	**Reporting of** 1. CRC Errors & Discards 2. Link Utilization & Link throughput per interface/NE 3. QoS reports (Queues, Passed Packets, Dropped Packets)	
xx.	Solution should support IPv6	
xxi.	System should be based on SDN architecture and should have inherent support for telemetry for data collection	
xxii.	Provide a web browser-based GUI to allow users to monitor network performance and generate performance reports.	
xxiii.	The user must have the capability to drill-down from the global overview to more detailed views by simple clicks	
xxiv.	Widget showing with the change of color due to change in network behavior described by Thresholds.	
xxv.	The solution shall support the creation of reports on an ad hoc, daily, hourly, weekly, monthly and annual basis.	
xxvi.	Capability to export data to another application via a API	
xxvii.	Create a repository, and synchronize all device software images across network.	

SOR item 2: Router Type II

SN	Description	Compliance
1	The switch shall be designed for continuous operations .The bidder shall furnish the MTBF (Mean Time between Failures) and MTRR (Mean Time to Restore) and predicted and observed values along with calculations by manufacturer.	
2	In case of full system failure, Switches shall maintain a trace area in the NVRAM, which would be used for analysis /diagnosis of the problem.	
3	Switch shall have built in power on diagnostics system to detect hardware failures.	
4	Should have AC/ DC power supply arrangement as given below in chassis without any external adaptors:	
	i. AC Power Supply 100 to 240 V AC with 50 to 60 Hz,	
	ii. -48V DC.	
	RailTel will specific the requirement of power supply arrangement at the time sub purchase order. In case not specified, Tenderer should seek clarification on the power supply arrangement.	
5	Switches shall have suitable Visual Indicators for diagnostics and healthy/ unhealthy status of ports & modules.	

6	Switch shall have minimum 6 Nos. of Gigabit SFP ports and 4 Nos. 10/100/1000 Base –TX with 2 Nos. of 10 Gigabit SFP+ ports complying to IEEE 802.3, IEEE 802.3u and 802.3ab standard , supporting half duplex mode ,full duplex mode and auto negotiation on each port of 1G to optimize bandwidth.	
7	Switch shall have minimum of 30 Gbps (full duplex) forwarding bandwidth at layer 2 switching fabric.	
8	Switch shall have minimum 45 million packets (64 Byte packets) per second forwarding rate.	
9	Switches shall have a minimum of 16000 MAC address space.	
10	Shall be temp hardened with a range of -40 to 65C and shall be 1/2 RU compliant in size.	
11	It should be possible for the switches to be mounted on a 19-Inch rack. All accessories required for this mounting should be supplied.	
12	Should support jumbo frame.	
13	Router based solution is also acceptable.	
14	**Shall have the following MPLS features.**	
	i. Shall support Static IPv4 and Ipv6 routing. It shall also support OSPFv2 and OSPFv3.	
	ii. Shall also support BGP and ISIS based routing.	
	iii. Shall also support MPLS with RSVP and LDP signalling. It shall support MPLS FRR and L3VRF with upto 64 VRF.	
	iv. Shall support a scale of 250 VLAN and shall support Ethernet OAM features like BFD, 802.3ah, 802.1ag and Y.1731	
	v. Shall support at least 1K MPLS labels.	
	vi. Shall support 10K for IPv4 routes and 1K for IPv6 routes.	
	vii. It shall support LSP ping and trace.	
	viii. It shall support 8 hardware queues per port and shall support ingress policing and egress shaping.	
	ix. Shall support MPLS based L3 and L2 VPN services.	
	x. It shall also support SYNC Ethernet and SNMPv3.	
	xi. Shall support remote telnet and SSH capabilities and it shall be possible to integrate with NMS system	
	xii. Shall conform to UL 60950 or IEC 60950 or equivalent Standards for safety requirements of IT Equipment's.	
	xiii. Shall conform to EN55022 Class A/B or CISPR22 Class A/B or CE Class A/B for EMC for (Electro Magnetic Compatibility) or equivalent standards.	
15	**Shall have the following features. All software's/ hardware's/ License required for this must be supplied along with the switch.**	
	i. Link Aggregation Control (LCAP) as per IEEE 802.3ad.	
	ii. Support for IEEE 802.1Q VLAN on all ports.	
	iii. Support for minimum 256 VLANs.	
	iv. Support for IEEE 802.1 D spanning tree protocol.	
	v. Support for IEEE 802.1 s MSTP.	

	vi.	Support Dynamic Host Configuration Protocol (DHCP).	
	vii.	Support Auto –MDIX (Media Dependent Interface Cross over)	
	viii.	Support Inter VLAN IP routing for full layer -3 routing.	
	ix.	Support for IPv6.	
	x.	Support Strict Priority Queuing.	
	xi.	Support Network Time Protocol (NTP) / Simple Network Time Protocol (SNTP) based.	
	xii.	RFC 1305 / 2030 for synchronization of date & time from the Central NTP Server.	
	xiii.	Support RADIUS protocol for console access restriction and authentication as per RFC 2138.	
	xiv.	Support 4 group of embedded RMON (history, static's and alarms).	
	xv.	Support multiple privilege level to provide different level of access on console port and telnet sessions	
	xvi.	Support classification and scheduling as per IEEE 802.1P on all ports.	
	xvii.	Support Port Spanning functionally for measurements using a networks analyzer.	
	xviii.	Support all the standard MIBs (MIB-I&II).	
	xix.	Support for console port Interface for configuration and diagnostics purposes.	
	xx.	Support Port Spanning functionally for measurements using a networks analyzer.	
	xxi.	ITU-T G.8032 Ethernet Ring Protection designed for loop protection and fast convergence times (sub 50 ms) in ring topologies	
	xxii.	Should support multiple Ring up to 8 ring (Main and Sub Ring) protection failover within 50 ms (up to 10 Switches in ring) or ITU-T G.8032 v2 (Confirmed roadmap within a year time is also acceptable for ITU-T G.8032 v2 with no additional cost to RailTel).	
	xxiii.	Should support Optical Transceiver Digital Diagnostic Monitoring.	
	xxiv.	Priority queues: Eight hardware-based queues per port for flexible QoS management	
	xxv.	Traffic prioritization: Flow-based QoS with internal and external (a.k.a., remarking) prioritization	
	xxvi.	Bandwidth management: Flow-based bandwidth management, ingress rate limiting; egress rate shaping per port.	
	xxvii.	Queue management: Configurable scheduling algorithms — Strict Priority Queuing (SPQ), Weighted Round Robin (WRR) and Deficit Round Robin (DRR) or better. Rack Mountable clamps for standard 19 inch Rack for each item.	
	xxviii.	The following Metro Ethernet features should support:	

	1. IEEE 802.1ad Provider Bridge.	
	2. Transparent LAN Services with Service VLAN (SVLAN) and Customer VLAN (CVLAN) concept.	
	3. CVLAN to SVLAN translation and mapping	
	4. IEEE 802.1ag Ethernet OAM: Connectivity Fault Management (Support 32 MEPs).	
	5. Ethernet OAM compliant with IEEE 802.3ah.	
	6. ITU-T G.8032 Ethernet Ring Protection designed for loop protection and fast convergence times (sub 50 ms) in ring topologies.	
	7. Should support Optical Transceiver Digital Diagnostic Monitoring.	
	8. Switch should support real time performance monitoring like Latency, Packet drop, Jitter and etc. Same should be accessible using the command-line interface (CLI) or Simple Network Management Protocol (SNMP) and SYSLOG Management Information Bases (MIBs).	
16	**Switch shall have support of following Standards:**	
	i. IEEE 802.1D (STP)	
	ii. IEEE 802.1p (CoS)	
	iii. IEEE 802.1Q (VLANs)	
	iv. IEEE 802.1ag (Connectivity Fault Management)	
	v. IEEE 802.1s (MSTP)	
	vi. IEEE 802.3x (Flow Control)	
	vii. IEEE 802.3z (Gigabit Ethernet)	
	viii. IEEE 802.3ab (1000Base-T)	
	ix. IEEE 802.3ac (VLAN Tagging)	
	x. IEEE 802.3ad (Link Aggregation)	
	xi. IEEE 802.3ae (10 Gigabit Ethernet)	
	xii. IEEE 802.3ah	
	xiii. ITU-T G.8032/Y.1344 2010: Ethernet Ring	
17	**Switch shall have the following Certifications or Equivalent Indian Standard Certificate:**	
	i. The model of the Switches series/family shall have MEF-(9 & 14)/CE2.0 or any other equivalent or higher certification from authorized agencies.	
	ii. Switches should be NEBS or equivalent certified.	
	iii. CE / FCC or any other equivalent	
	iv. Shall conform to UL 60950 or IEC 60950 Standards or equivalent for safety requirements of IT Equipment's.	
	v. Shall Confirm to EN55022 Class A/B or CISPR22 Class A/B or CE Class A/B or CE Class A/B or equivalent for EMC for (Electro Magnetic Compatibility).	

SOR item 3: Router Type III

S.No	Description	Compliance
1	The switch shall be designed for continuous operations .The bidder shall furnish the MTBF (Mean Time between Failures) and MTRR (Mean Time to Restore) and predicted and observed values along with calculations by manufacturer.	
2	In case of full system failure, Switches shall maintain a trace area in the NVRAM, which would be used for analysis /diagnosis of the problem.	
3	Switch shall have built in power on diagnostics system to detect hardware failures.	
4	Should have AC/ DC power supply arrangement as given below in chassis without any external adaptors:	
	i) AC Power Supply 100 to 240 V AC with 50 to 60 Hz,	
	ii) -48V DC.	
	RailTel will specific the requirement of power supply arrangement at the time sub purchase order. In case not specified, Tenderer should seek clarification on the power supply arrangement.	
5	Switches shall have suitable Visual Indicators for diagnostics and healthy/ unhealthy status of ports & modules.	
6	Switch shall have minimum 4 Nos. of Gigabit SFP ports and 6 Nos. 10/100/1000 Base –TX with 2 Nos. of 10 Gigabit SFP+ ports complying to IEEE 802.3, IEEE 802.3u and 802.3ab standard, supporting half duplex mode, full duplex mode and auto negotiation on each port of 1G to optimize bandwidth.	
7	Switch shall have minimum of 30 Gbps (full duplex) forwarding bandwidth at layer 2 switching fabric.	
8	Switch shall have minimum 45 million packets (64 Byte packets) per second forwarding rate.	
9	Switches shall have a minimum of 16000 MAC address space.	
10	Shall be temp hardened with a range of -40 to 65C and shall be 1/2 RU compliant in size.	
11	It should be possible for the switches to be mounted on a 19-Inch rack. All accessories required for this mounting should be supplied.	
12	Should support jumbo frame.	
13	Router based solution is also acceptable.	
14	**Shall have the following MPLS features.**	
	i. Shall support Static IPv4 and Ipv6 routing. It shall also support OSPFv2 and OSPFv3.	
	ii. Shall also support BGP and ISIS based routing	
	iii. Shall also support MPLS with RSVP and LDP signalling. It shall support MPLS FRR and L3VRF with up to 64 VRF.	
	iv. Shall support a scale of 250 VLAN and shall support Ethernet OAM features like BFD, 802.3ah, 802.1ag and Y.1731	
	v. Shall support at least 1K MPLS labels.	
	vi. Shall support 10K for IPv4 routes and 1K for IPv6 routes.	

	vii.	It shall support LSP ping and trace.	
	viii.	It shall support 8 hardware queues per port and shall support ingress policing and egress shaping.	
	x.	Shall support MPLS based L3 and L2 VPN services.	
	xi.	It shall also support SYNC Ethernet and SNMPv3.	
	xii.	Shall support remote telnet and SSH capabilities and it shall be possible to integrate with NMS system	
	xiii.	Shall conform to UL 60950 or IEC 60950 or equivalent Standards for safety requirements of IT Equipment's.	
	xiv.	Shall conform to EN55022 Class A/B or CISPR22 Class A/B or CE Class A/B or equivalent for EMC for (Electro Magnetic Compatibility).	
15	**Shall have the following features. All software's/hardware's/License required for this must be supplied along with the switch.**		
	i.	Link Aggregation Control (LCAP) as per IEEE 802.3ad.	
	ii.	Support for IEEE 802.1Q VLAN on all ports.	
	iii.	Support for minimum 256 VLANs.	
	iv.	Support for IEEE 802.1 D spanning tree protocol.	
	v.	Support for IEEE 802.1 s MSTP.	
	vi.	Support Dynamic Host Configuration Protocol (DHCP).	
	vii.	Support Auto –MDIX (Media Dependent Interface Cross over)	
	viii.	Support Inter VLAN IP routing for full layer -3 routing.	
	ix.	Support for IPv6.	
	x.	Support Strict Priority Queuing.	
	xi.	Support Network Time Protocol (NTP) / Simple Network Time Protocol (SNTP) based.	
	xii.	RFC 1305 / 2030 for synchronization of date & time from the Central NTP Server.	
	xiii.	Support RADIUS protocol for console access restriction and authentication as per RFC 2138.	
	xiv.	Support 4 group of embedded RMON (history, static's and alarms).	
	xv.	Support multiple privilege level to provide different level of access on console port and telnet sessions	
	xvi.	Support classification and scheduling as per IEEE 802.1P on all ports.	
	xvii.	Support Port Spanning functionally for measurements using a networks analyzer.	
	xviii.	Support all the standard MIBs (MIB-I&II).	
	xix.	Support for console port Interface for configuration and diagnostics purposes.	
	xx.	Support Port Spanning functionally for measurements using a networks analyzer.	
	xxi.	ITU-T G.8032 Ethernet Ring Protection designed for loop protection and fast convergence times (sub 50 ms) in ring topologies	

	xxii.	Should support multiple Ring up to 8 ring (Main and Sub Ring) protection failover within 50 ms (up to 10 Switches in ring) or ITU-T G.8032 v2 (Confirmed roadmap within a year time is also acceptable for ITU-T G.8032 v2 with no additional cost to RailTel).	
	xxiii.	Should support Optical Transceiver Digital Diagnostic Monitoring.	
	xxiv.	Priority queues: Eight hardware-based queues per port for flexible QoS management	
	xxv.	Traffic prioritization: Flow-based QoS with internal and external (a.k.a., remarking) prioritization	
	xxvi.	Bandwidth management: Flow-based bandwidth management, ingress rate limiting; egress rate shaping per port.	
	xxvii.	Queue management: Configurable scheduling algorithms — Strict Priority Queuing (SPQ), Weighted Round Robin (WRR) and Deficit Round Robin (DRR) or better. Rack Mountable clamps for standard 19 inch Rack for each item.	
	xxviii.	The following Metro Ethernet features should support:	
	1.	IEEE 802.1ad Provider Bridge.	
	2.	Transparent LAN Services with Service VLAN (SVLAN) and Customer VLAN (CVLAN) concept.	
	3.	CVLAN to SVLAN translation and mapping	
	4.	IEEE 802.1ag Ethernet OAM: Connectivity Fault Management (Support 32 MEPs).	
	5.	Ethernet OAM compliant with IEEE 802.3ah.	
	6.	ITU-T G.8032 Ethernet Ring Protection designed for loop protection and fast convergence times (sub 50 ms) in ring topologies.	
	7.	Should support Optical Transceiver Digital Diagnostic Monitoring.	
	8.	Switch should support real time performance monitoring like Latency, Packet drop, Jitter and etc. Same should be accessible using the command-line interface (CLI) or Simple Network Management Protocol (SNMP) and SYSLOG Management Information Bases (MIBs).	
16	**Switch shall have support of following Standards:**		
	i.	IEEE 802.1D (STP)	
	ii.	IEEE 802.1p (CoS)	
	iii.	IEEE 802.1Q (VLANs)	
	iv.	IEEE 802.1ag (Connectivity Fault Management)	
	v.	IEEE 802.1s (MSTP)	
	vi.	IEEE 802.3x (Flow Control)	
	vii.	IEEE 802.3z (Gigabit Ethernet)	
	viii.	IEEE 802.3ab (1000Base-T)	
	ix.	IEEE 802.3ac (VLAN Tagging)	
	x.	IEEE 802.3ad (Link Aggregation)	
	xi.	IEEE 802.3ae (10 Gigabit Ethernet)	
	xii.	IEEE 802.3ah	

	xiii. ITU-T G.8032/Y.1344 2010: Ethernet Ring	
17	**Switch shall have the following Certifications or Equivalent Indian Standard Certificate:**	
	i. The model of the Switches series/family shall have MEF-(9 & 14)/ CE2.0 or equivalent /higher certification from authorized agencies.	
	ii. Switches should be NEBS or equivalent certified.	
	iii. CE / FCC or equivalent certified.	
	iv. Shall conform to UL 60950 or IEC 60950 or equivalent standards for safety requirements of IT Equipment's.	
	v. Shall Confirm to EN55022 Class A/B or CISPR22 Class A/B or CE Class A/B or CE Class A/B or equivalent for EMC for (Electro Magnetic Compatibility).	

SOR item 4: Router Type IV

S. No	Description	Spoke Location	Compliance
1	Total minimum onborad Ports	8x1GbE	
2	Minimum Onboard RJ-45 Ports	6x1GbE	
3	Minimum onboard small form-factor pluggable (SFP) transceiver ports	2x1GbE	
4	Minimum MACsec-capable ports	2x1GbE	
5	Console (RJ-45 + mini USB)	1	
6	USB 3.0 ports (typeA)	1	
	Memory and Storage		
7	Minimum System memory (RAM)	4GB	
8	Minimum Storage (flash)	8GB	
	Dimensions and Power		
9	Form Factor	1U/Desktop	
10	Power Supply	AC	
11	Class A FCC classification or equivalent		
12	RoHS 2 RoHS compliance or equivalent		
	Performance and Scale		
13	Minimum Routing with packet mode(IMIX packet size) in Mbps	800	
14	Minimum Stateful firewall (IMIX packet size) in Mbps	500	
15	Minimum Ipsec VPN (IMIX packet size) in Mbps	100	
16	Minimum Route table size (RIB/FIB) (IPv4 or IPv6)	256,000/25,000	
17	Maximum concurrent sessions (IPv4 or IPv6)	64000	
18	Maximum security policies	1000	
19	Minimum Connections per second	5000	

20	NAT rules	1000	
21	Minimum MAC table size	15000	
22	Minimum Ipsec VPN tunnels	256	
23	Minimum Number of remote access users	25	
24	Minimum GRE Tunnels	256	
25	Maximum number of security zones	16	
26	Maximum number of virtual routers	32	
27	Maximum number of VLANs	1000	
28	It should support IPv4,IPv6,ISO,Connectionless Network Service (CLNS) protocol		
29	It should support Static Routes		
30	It should support RIP v1/v2		
31	It should support OSPF/OSPF v3		
32	It should support BGP with Route Reflector		
33	It should support IS-IS		
34	It should support Multicast: Internet Group Management Protocol (IGMP) v1/v2, protocol independent multicast (PIM) sparse mode (SM)/dense mode (DM)/source-specific multicast (SSM), session description protocol (SDP), Distance vector Multicast routing protocol (DVMRP), Multicast Source Discovery Protocol (MSDP), Reverse Path Forwarding (RPF)		
35	It should support Encapsulation: VLAN		
36	Virtual routers		
37	It should support Policy-based routing, source-based routing		
38	It should support Equal-cost multipath (ECMP)		
	QoS Features		
39	Support for 802.1p, DiffServ code point (DSCP), EXP		
40	Classification based on VLAN, interface, bundles, or multifield filters		
41	marking, policing, and shaping		
42	Classification and scheduling		
43	Weighted random early detection (WRED)		
44	Guaranteed and maximum bandwidth		
45	Ingress traffic policing		
46	Virtual Channels		
47	Hierarchial Shaping and policing		
	Switching Features		
48	ASIC-based Layer 2 Forwarding		
49	MAC address learning		
50	VLAN addressing and integrated routing and bridging (IRB) support		
51	Link aggregation and LACP		
52	LLDP and LLDP-MED		
53	STP, RSTP, MSTP		
54	MVRP		
55	802.1x authentication		

	Firewall Services	
56	Stateful and stateless firewall	
57	Zone-based firewall	
58	Screens and distributed denial of service (DDoS) protection	
59	User role-based firewall	
60	SSL Inspection (Forward-proxy)	
	Network Address Translation	
61	Source NAT with Prot Address Translation (PAT)	
62	Bidirectional 1:1 static NAT	
63	Destination NAT with PAT	
64	Persistent NAT	
65	IPv6 address translation	
	VPN Features	
66	Tunnels: Generic routing encapsulation (GRE)3, IP-IP3, IPSec	
67	Site-site IPSec VPN, group VPN	
68	IP Sec crypto algorithms: Data Encryption Standard (DES), Advanced Encryption Standard (AES-256), AES-GCM	
69	Ipsec authentication algorithms: MD5, SHA-1, SHA-128,SHA-256	
70	Pre-Shared key and Public key infrastructure (PKI) (X.509)	
71	Perfect forward secrecy, anti-reply	
72	IPv4 and IPv6 Ipsec VPN	
73	Multi-Proxy ID for site-site vpn	
74	Internet Key Exchange (IKEv1, IKEv2), NAT-T	
75	Virtual router and quality of service (QoS) aware	
76	Standard-based dead peer detection (DPD) support	
77	VPN monitoring	
	Network services	
78	Dynamic host Configuration Protocol (DHCP) client/server/realy	
79	Domain Name System (DNS) proxy, dynamic DNS (DDNS)	
80	Real-time performance monitoring (RPM) and IP Monitoring	
	High Availability Features	
81	Virtual Router Redundancy Protocol (VRRP)	
82	Stateful high availability	
83	Dual box clustering	
84	Active/Passive	
85	Active/active	
86	Configuration synchronization	
87	Firewall session synchronization	
88	Device/link detection	
89	IP Monitoring with route and interface failover	
	Management Automation, Logging and reporting	
90	SSH, Telnet, SNMP	
91	Smart image download	
92	CLI and web UI	

93	Python	
94	Application and bandwidth usage reporting	
95	Auto installation	
96	Debug and troubleshooting tools	
97	Zero-Touch Provisioning	
	Advanced Routing Services	
98	Packet Mode	
99	MPLS (RSVP, LDP)	
100	Circuit cross connect (CCC) translational cross-connect (TCC)	
101	L2/L3 MPLS VPN, pseudowires	
102	Virtual private LAN service (VPLS), next-generation multicast VPN (NG-MVPN)	
103	MPLS traffic engineering and MPLS fast reroute	

SOR item 5: Switch Type I

S. No	Description	Compliance
1	The switch shall be designed for continuous operations .The bidder shall furnish the MTBF (Mean Time between Failures) and MTRR (Mean Time to Restore) and predicted and observed values along with calculations by manufacturer.	
2	In case of full system failure, Switches shall maintain a trace area in the NVRAM, which would be used for analysis /diagnosis of the problem.	
3	Switch shall have built in power on diagnostics system to detect hardware failures.	
4	Switch should have inbuilt redundant DC (-48 V) power supply	
5	Switches shall have suitable Visual Indicators for diagnostics and healthy/ unhealthy status of ports & modules.	
6	Switch shall have minimum 24 Nos. 10/100/1000 Base –TX auto sensing ports with 4 Nos. of 10 Gigabit SFP+ ports and should have minimum nos. QSFP+ based 40 GE ports complying to IEEE 802.3, IEEE 803.3u, IEEE 802.3ab and IEEE 802.3ba standard, supporting half duplex mode, full duplex mode and auto negotiation on each port to optimize bandwidth.	
7	Switch shall have minimum of 140Gbps (full duplex) forwarding bandwidth at layer 2 switching fabric.	
8	Switch shall have minimum 200 million packets (64 Byte packets) per second forwarding rate.	
9	Switches shall have a minimum of 32000 MAC address space.	
10	It should be possible for the switches to be mounted on a 19-Inch rack. All accessories required for this mounting should be supplied.	
11	Should support jumbo frame.	
14	Switch should support port mirroring for minimum 4 mirroring sessions	
15	**Shall have the following features. All software's/hardware's/License required for this must be supplied along with the switch.**	

	i.	Link Aggregation Control (LCAP) as per IEEE 802.3ad.	
	ii.	Support for IEEE 802.1Q VLAN on all ports.	
	iii.	Support for minimum 256 VLANs.	
	iv.	Support for IEEE 802.1 D spanning tree protocol.	
	v.	Support for IEEE 802.1 s MSTP	
	vi.	Support Dynamic Host Configuration Protocol (DHCP)	
	vii.	Support Auto –MDIX (Media Dependent Interface Cross over)	
	viii.	Support Inter VLAN IP routing for full layer -3 routing	
	ix.	Support for 802.1x for authentication and access control	
	x.	Support for 802.3x flow control	
	xi.	Support for IPv6.	
	xii.	Support Strict Priority Queuing.	
	xiii.	Should support jumbo frame.	
	xiv.	Should support OSPF v2, IGMP v1/v2/v3, PIM, VRRP, BFD	
	xv.	Should support OSPFv3 , VRRPv3	
	xvi.	Should support Netconf/Yang models	
	xvii.	Should support REST API	
	xviii.	Support Network Time Protocol (NTP) / Simple Network Time Protocol (SNTP) based for IPv4/IPv6	
	xix.	RFC 1305 / 2030 for synchronization of date & time from the Central NTP Server.	
	xx.	Support RADIUS protocol for console access restriction and authentication as per RFC 2138.	
	xxi.	Support 4 group of embedded RMON (history, static's and alarms).	
	xxii.	Support multiple privilege level to provide different level of access on console port and telnet sessions.	
	xxiii.	Support classification and scheduling as per IEEE 802.1P on all ports.	
	xxiv.	Support Port Spanning functionally for measurements using a networks analyzer.	
	xxv.	Support all the standard MIBs (MIB-I&II).	
	xxvi.	Support for console port Interface for configuration and diagnostics purposes.	
	xxvii.	Support Port Spanning functionally for measurements using a networks analyzer.	
	xxviii.	Should support Optical Transceiver Digital Diagnostic Monitoring.	
	xxix.	Queues: 12 hardware-based queues per port for flexible QoS management	
	xxx.	Traffic prioritization: QoS with internal and external (a.k.a., remarking) prioritization.	
	xxxi.	Bandwidth management: Flow-based bandwidth management, ingress rate-limiting; egress rate shaping per port.	
	xxxii.	Queue management: Configurable scheduling algorithms — Strict Priority Queuing (SPQ), Weighted Round Robin (WRR) and Deficit Round Robin (DRR).	

16	**The following Metro Ethernet features should support with software upgrade or additional licenses.**	
	i. Transparent LAN Services with Service VLAN (SVLAN) and Customer VLAN (CVLAN) concept	
	ii. CVLAN to SVLAN translation and mapping	
	iii. IEEE 802.1ag Ethernet OAM: Connectivity Fault Management (Support 32 MEPs)	
	iv. Ethernet OAM compliant with IEEE 802.3ah	
	v. Ethernet Ring Protocol (ERP) support for multiple ring instances on the same physical ring	
	vi. Should support Optical Transceiver Digital Diagnostic Monitoring.	
	vii. L2 Protocol Tunneling.	
	viii. Loopback function/detection.	
	ix. Switch should support real time performance monitoring like Latency, Packet drop, Jitter and etc. Same should be accessible using the command-line interface (CLI) or Simple Network Management Protocol (SNMP) and SYSLOG Management Information Bases (MIBs).	
17	**Switch shall have support of following Standards**	
	i. IEEE 802.1D (STP)	
	ii. IEEE 802.1p (CoS)	
	iii. IEEE 802.1Q (VLANs)	
	iv. IEEE 802.1ag (Connectivity Fault Management)	
	v. IEEE 802.1s (MSTP)	
	vi. IEEE 802.3x (Flow Control)	
	vii. IEEE 802.3z (Gigabit Ethernet)	
	viii. IEEE 802.3ab (1000Base-T)	
	ix. IEEE 802.3ac (VLAN Tagging)	
	x. IEEE 802.3ad (Link Aggregation)	
	xi. IEEE 802.3ae (10 Gigabit Ethernet)	
18	**Switch shall have the following Certifications or equivalent Indian standard certificate**	
	i. UL/EN 60950-1 Information Technology Equipment	
	ii. EN 60825-1 Safety of Laser Products	
	iii. FCC 47CFR Part 15 Class A (USA)	
	iv. EN 55022 Class A Emissions (Europe)	
	v. EN 61000-3-2 Power Line Harmonics	
	vi. EN 61000-3-3 Voltage Fluctuations and Flicker	
	vii. EN 61000-4-2 ESD	
	viii. EN 61000-4-3 Radiated Immunity	
	ix. EN 61000-4-4 EFT	
	x. EN 61000-4-5 Surge	
	xi. EN 61000-4-6 Low Frequency Common Immunity	
	xii. EN 61000-4-11 Voltage Dips and Sags	

SOR item 6: Switch Type II

S.No.	Description	Compliance
1	The switch shall be designed for continuous operations .The bidder shall furnish the MTBF (Mean Time between Failures) and MTRR (Mean Time to Restore) and predicted and observed values along with calculations by manufacturer.	
2	In case of full system failure, Switches shall maintain a trace area in the NVRAM, which would be used for analysis /diagnosis of the problem.	
3	Switch shall have built in power on diagnostics system to detect hardware failures.	
4	Switch should have inbuilt DC (-48 V) power supply	
5	Switches shall have suitable Visual Indicators for diagnostics and healthy/ unhealthy status of ports & modules.	
6	Switch shall have minimum 24 Nos. 10/100/1000 Base –TX auto sensing ports with 4 Nos. of 10 Gigabit SFP+ ports complying to IEEE 802.3, IEEE 803.3u and 802.3ab standard , supporting half duplex mode ,full duplex mode and auto negotiation on each port to optimize bandwidth.	
7	Switch shall have minimum of 64Gbps (full duplex) forwarding bandwidth at layer 2 switching fabric.	
8	Switch shall have minimum 95 million packets (64 Byte packets) per second forwarding rate.	
9	Switches shall have a minimum of 16000 MAC address space.	
10	It should be possible for the switches to be mounted on a 19-Inch rack. All accessories required for this mounting should be supplied.	
11	Should support jumbo frame.	
14	Switch should support port mirroring for minimum 4 mirroring sessions	
15	**Shall have the following features. All software's/hardware's/ License required for this must be supplied along with the switch.**	
	i. Link Aggregation Control (LCAP) as per IEEE 802.3ad.	
	ii. Support for IEEE 802.1Q VLAN on all ports.	
	iii. Support for minimum 256 VLANs.	
	iv. Support for IEEE 802.1 D spanning tree protocol.	
	v. Support for IEEE 802.1 s MSTP	
	vi. Support Dynamic Host Configuration Protocol (DHCP)	
	vii. Support Auto –MDIX (Media Dependent Interface Cross over)	
	viii. Support Inter VLAN IP routing for full layer -3 routing	
	ix. Support for 802.1x for authentication and access control	
	x. Support for 802.3x flow control	
	xi. Support for IPv6.	
	xii. Support Strict Priority Queuing.	

	xiii.	Should support jumbo frame.	
	xiv.	Should support OSPF v2, IGMP v1/v2/v3, PIM, VRRP, BFD	
	xv.	Should support OSPFv3 , VRRPv3	
	xvi.	Should support Netconf/Yang models	
	xvii.	Should support REST API	
	xviii.	Support Network Time Protocol (NTP) / Simple Network Time Protocol (SNTP) based for IPv4/IPv6	
	xix.	RFC 1305 / 2030 for synchronization of date & time from the Central NTP Server.	
	xx.	Support RADIUS protocol for console access restriction and authentication as per RFC 2138.	
	xxi.	Support 4 group of embedded RMON (history, static's and alarms).	
	xxii.	Support multiple privilege level to provide different level of access on console port and telnet sessions.	
	xxiii.	Support classification and scheduling as per IEEE 802.1P on all ports.	
	xxiv.	Support Port Spanning functionally for measurements using a networks analyzer.	
	xxv.	Support all the standard MIBs (MIB-I&II).	
	xxvi.	Support for console port Interface for configuration and diagnostics purposes.	
	xxvii.	Support Port Spanning functionally for measurements using a networks analyzer.	
	xxviii.	Should support Optical Transceiver Digital Diagnostic Monitoring.	
	xxix.	Queues: 12 hardware-based queues per port for flexible QoS management	
	xxx.	Traffic prioritization: QoS with internal and external (a.k.a., remarking) prioritization.	
	xxxi.	Bandwidth management: Flow-based bandwidth management, ingress rate-limiting; egress rate shaping per port.	
	xxxii.	Queue management: Configurable scheduling algorithms — Strict Priority Queuing (SPQ), Weighted Round Robin (WRR) and Deficit Round Robin (DRR).	
16	**The following Metro Ethernet features should support with software upgrade or additional licenses.**		
	i.	Transparent LAN Services with Service VLAN (SVLAN) and Customer VLAN (CVLAN) concept	
	ii.	CVLAN to SVLAN translation and mapping	
	iii.	IEEE 802.1ag Ethernet OAM: Connectivity Fault Management (Support 32 MEPs)	
	iv.	Ethernet OAM compliant with IEEE 802.3ah	

	v. Ethernet Ring Protocol (ERP) support for multiple ring instances on the same physical ring	
	vi. Should support Optical Transceiver Digital Diagnostic Monitoring.	
	vii. L2 Protocol Tunneling.	
	viii. Loopback function/detection.	
	ix. Switch should support real time performance monitoring like Latency, Packet drop, Jitter and etc. Same should be accessible using the command-line interface (CLI) or Simple Network Management Protocol (SNMP) and SYSLOG Management Information Bases (MIBs).	
17	**Switch shall have support of following Standards**	
	i. IEEE 802.1D (STP)	
	ii. IEEE 802.1p (CoS)	
	iii. IEEE 802.1Q (VLANs)	
	iv. IEEE 802.1ag (Connectivity Fault Management)	
	v. IEEE 802.1s (MSTP)	
	vi. IEEE 802.3x (Flow Control)	
	vii. IEEE 802.3z (Gigabit Ethernet)	
	viii. IEEE 802.3ab (1000Base-T)	
	ix. IEEE 802.3ac (VLAN Tagging)	
	x. IEEE 802.3ad (Link Aggregation)	
	xi. IEEE 802.3ae (10 Gigabit Ethernet)	
18	**Switch shall have the following Certifications or equivalent Indian standard certificate**	
	i. UL/EN 60950-1 Information Technology Equipment	
	ii. EN 60825-1 Safety of Laser Products	
	iii. FCC 47CFR Part 15 Class A (USA)	
	iv. EN 55022 Class A Emissions (Europe)	
	v. EN 61000-3-2 Power Line Harmonics	
	vi. EN 61000-3-3 Voltage Fluctuations and Flicker	
	vii. EN 61000-4-2 ESD	
	viii. EN 61000-4-3 Radiated Immunity	
	ix. EN 61000-4-4 EFT	
	x. EN 61000-4-5 Surge	
	xi. EN 61000-4-6 Low Frequency Common Immunity	
	xii. EN 61000-4-11 Voltage Dips and Sags	

SOR item 7: Switch Type III

S. No.	Description	Compliance
1	The switch shall be designed for continuous operations .The bidder shall furnish the MTBF (Mean Time between Failures) and MTRR (Mean Time to Restore) and predicted and observed values along with calculations by manufacturer.	
2	In case of full system failure, Switches shall maintain a trace area in the NVRAM, which would be used for analysis /diagnosis of the problem.	
3	Switch shall have built in power on diagnostics system to detect hardware failures.	
4	Switch should have inbuilt AC (1.25 A at 240 VAC) power supply	
5	Switches shall have suitable Visual Indicators for diagnostics and healthy/ unhealthy status of ports & modules.	
6	Switch shall have 24 Nos. 10/100/1000 Base –TX auto sensing ports with 4 Nos. of 10 Gigabit SFP+ ports complying to IEEE 802.3, IEEE 803.3u and 802.3ab standard, supporting half duplex mode, full duplex mode and auto negotiation on each port to optimize bandwidth.	
7	Switch shall have minimum of 64Gbps (full duplex) forwarding bandwidth at layer 2 switching fabric.	
8	Switch shall have minimum 95 million packets (64 Byte packets) per second forwarding rate.	
9	Switches shall have a minimum of 16000 MAC address space.	
10	It should be possible for the switches to be mounted on a 19-Inch rack. All accessories required for this mounting should be supplied.	
11	Should support jumbo frame.	
14	Switch should support port mirroring for minimum 4 mirroring sessions	
15	**Shall have the following features. All software's/hardware's/ License required for this must be supplied along with the switch.**	
	i. Link Aggregation Control (LCAP) as per IEEE 802.3ad.	
	ii. Support for IEEE 802.1Q VLAN on all ports.	
	iii. Support for minimum 256 VLANs.	
	iv. Support for IEEE 802.1 D spanning tree protocol.	
	v. Support for IEEE 802.1 s MSTP	
	vi. Support Dynamic Host Configuration Protocol (DHCP)	
	vii. Support Auto –MDIX (Media Dependent Interface Cross over)	
	viii. Support Inter VLAN IP routing for full layer -3 routing	
	ix. Support for 802.1x for authentication and access control	
	x. Support for 802.3x flow control	
	xi. Support for IPv6.	
	xii. Support Strict Priority Queuing.	

	xiii.	Should support jumbo frame.	
	xiv.	Should support OSPF v2, IGMP v1/v2/v3, PIM, VRRP, BFD	
	xv.	Should support OSPFv3 , VRRPv3	
	xvi.	Should support Netconf/Yang models	
	xvii.	Should support REST API	
	xviii.	Support Network Time Protocol (NTP) / Simple Network Time Protocol (SNTP) based for IPv4/IPv6	
	xix.	RFC 1305 / 2030 for synchronization of date & time from the Central NTP Server.	
	xx.	Support RADIUS protocol for console access restriction and authentication as per RFC 2138.	
	xxi.	Support 4 group of embedded RMON (history, static's and alarms).	
	xxii.	Support multiple privilege level to provide different level of access on console port and telnet sessions.	
	xxiii.	Support classification and scheduling as per IEEE 802.1P on all ports.	
	xxiv.	Support Port Spanning functionally for measurements using a networks analyzer.	
	xxv.	Support all the standard MIBs (MIB-I&II).	
	xxvi.	Support for console port Interface for configuration and diagnostics purposes.	
	xxvii.	Support Port Spanning functionally for measurements using a networks analyzer.	
	xxviii.	Should support Optical Transceiver Digital Diagnostic Monitoring.	
	xxix.	Queues: 12 hardware-based queues per port for flexible QoS management	
	xxx.	Traffic prioritization: QoS with internal and external (a.k.a., remarking) prioritization.	
	xxxi.	Bandwidth management: Flow-based bandwidth management, ingress rate-limiting; egress rate shaping per port.	
	xxxii.	Queue management: Configurable scheduling algorithms — Strict Priority Queuing (SPQ), Weighted Round Robin (WRR) and Deficit Round Robin (DRR).	
16	**The following Metro Ethernet features should support with software upgrade or additional licenses.**		
	i.	Transparent LAN Services with Service VLAN (SVLAN) and Customer VLAN (CVLAN) concept	
	ii.	CVLAN to SVLAN translation and mapping	
	iii.	IEEE 802.1ag Ethernet OAM: Connectivity Fault Management (Support 32 MEPs)	
	iv.	Ethernet OAM compliant with IEEE 802.3ah	
	v.	Ethernet Ring Protocol (ERP) support for multiple ring instances on the same physical ring	

	vi. Should support Optical Transceiver Digital Diagnostic Monitoring.	
	vii. L2 Protocol Tunneling.	
	viii. Loopback function/detection.	
	ix. Switch should support real time performance monitoring like Latency, Packet drop, Jitter and etc. Same should be accessible using the command-line interface (CLI) or Simple Network Management Protocol (SNMP) and SYSLOG Management Information Bases (MIBs).	
17	**Switch shall have support of following Standards**	
	i. IEEE 802.1D (STP)	
	ii. IEEE 802.1p (CoS)	
	iii. IEEE 802.1Q (VLANs)	
	iv. IEEE 802.1ag (Connectivity Fault Management)	
	v. IEEE 802.1s (MSTP)	
	vi. IEEE 802.3x (Flow Control)	
	vii. IEEE 802.3z (Gigabit Ethernet)	
	viii. IEEE 802.3ab (1000Base-T)	
	ix. IEEE 802.3ac (VLAN Tagging)	
	x. IEEE 802.3ad (Link Aggregation)	
	xi. IEEE 802.3ae (10 Gigabit Ethernet)	
18	**Switch shall have the following Certifications or equivalent Indian standard certificate**	
	i. UL/EN 60950-1 Information Technology Equipment	
	ii. EN 60825-1 Safety of Laser Products	
	iii. FCC 47CFR Part 15 Class A (USA)	
	iv. EN 55022 Class A Emissions (Europe)	
	v. EN 61000-3-2 Power Line Harmonics	
	vi. EN 61000-3-3 Voltage Fluctuations and Flicker	
	vii. EN 61000-4-2 ESD	
	viii. EN 61000-4-3 Radiated Immunity	
	ix. EN 61000-4-4 EFT	
	x. EN 61000-4-5 Surge	
	xi. EN 61000-4-6 Low Frequency Common Immunity	
	xii. EN 61000-4-11 Voltage Dips and Sags	

Note :- In the specification wherever support for a feature has been asked for, it will mean that the feature should be available without RailTel requiring any other hardware/software/licenses. Thus all hardware/software/licenses required for enabling the support/feature shall be included in the offer.

Annexure-II

PROFORMA FOR THE LONG-TERM MAINTENANCE SUPPORT
(To be signed by the O.E.M.)

RGM/WR **Dated: …….**
RailTel Corporation of India Ltd.
……
……...
……...

Applicable for OEM directly participating in the Bid.

I / We ……. hereby confirm that we have read specifications & conditions of GeM Bid No. ……..and accept that the requirement of Long Term Maintenance Support as per Clause 17 shall be met by us **directly or through our subsidiary in India** as per rates quoted in the Price Bid. I / We shall provide services as per terms and conditions pertaining to Long Term Maintenance Support of tender document.

Or

Applicable for Authorized Distributor/Partner of OEM

I / We ……. hereby confirm that we have read specifications & conditions of GeM Bid No. ……..and accept that the requirement of Long Term Maintenance Support as per Clause 17 shall be met by Authorized Distributor/Partner of OEM. However, if Authorized Distributor/Partner fails to fulfil the support obligation due to any un-foreseen circumstances, the same shall be provided by us **directly or through our subsidiary in India for the mentioned/remaining period at the quoted prices by the bidder. I/We have gone through the requirement mentioned in the Bid Document and shall provide services as per terms and conditions pertaining to Long Term Maintenance Support of Bid document.**

(Signature of Firm's Authorized Officer)

Seal

Signature of witness:

……

……

Note: Please Strike out whichever is not applicable.

Annexure-III

RGM/WR **Dated: …….**
RailTel Corporation of India Ltd.
……
……....
……....

Subject: Manufacturer Authorisation form (MAF) to M/s ……. for ……
Ref: GeM Bid No. GEM/2021/B/1540293 dated 27.09.2021

Dear Sir,
We, M/s……, are established and reputed manufacturer and service provider of ……..(Product details), having our registered office at ……..
We hereby authorise M/s …….. (bidder name), Office ……. to participate in bid and subsequently upon award of the bid to execute the supply and Installation & Commissioning of our range of products against your above said bid.
We further extend our warranty for …… years for our range of products offered by M/s ……..against the above-said bid.

Thanking you,
Best regards,

Authorised Signatory

****

Annexure-IV

FORMAT FOR AFFIDAVIT TO BE UPLOADED BY TENDERER ALONGWITH THE TENDER DOCUMENTS

(To be executed in presence of Public notary on non-judicial stamp paper of the value of Rs.100/-. The stamp paper has to be in the name of the tenderer) **

I…….. (Name and designation)** appointed as the attorney/authorized signatory of the tenderer (including its constituents), M/s._____ (hereinafter called the tenderer) for the purpose of the Tender documents for the work of _____
as per the tender No._____ of (-------Railway), do hereby solemnly affirm and state on the behalf of the tenderer including its constituents as under:

(i) I/We the tenderer (s) am/are signing this document after carefully reading the contents.

(ii) I/we the tenderer(s) also accept all the conditions of the tender and have signed all the pages in confirmation thereof.

(iii) I/We hereby declare that I/We have downloaded the tender documents from RailTel's website www.railtelindia.com or GeM Portal gem.gov.in. I/We have verified the content of the document from the website and there is no addition, no deletion or no alteration to the content of the tender document. In case of any discrepancy noticed at any stage i.e. evaluation of tenderers, execution of work or final payment of the contract, the master copy available with the railway Administration shall be final and binding upon me/us.

(iv) I/We declare and certify that I/we have not made any misleading or false representation in the forms, statements and attachments in proof of the qualification requirements.

(v) I/We also understand that my/our offer will be evaluated based on the documents/credentials submitted along with the offer and same shall be binding upon me/us.

(vi) I/We declare that the information and documents submitted alongwith the tender by me/us are correct and I/we are fully responsible for the correctness of the information and documents submitted by us.

(vii) I/We undersigned that if the certificates regarding eligibility criteria submitted by us are found to be forged/false or incorrect at any time during process for evaluation of tenders, it shall lead to forfeiture of the tender EMD besides banning of business for five year on entire IR. Further, I/we (*insert name of*

the tenderer) ** _____ and all my/our constituents understand that my/our offer shall be summarily rejected.

(viii) I/we also understand that if the certificates submitted by us are found to be false/forged or incorrect at any time after the award of the contract, it will lead to termination of the contract, along with forfeiture of EMD/SD and Performance Guarantee besides any other action provided in the contract including banning of business for five year on entire IR.

DEPONENT
SEAL AND SIGNATURE
OF THE TENDERER

VERIFICATION
I/We above named tenderer do hereby solemnly affirm and verify that the contents of my/our above affidavit are true and correct. Nothing has been concealed and no part of it is false.

DEPONENT
SEAL AND SIGNATURE
OF THE TENDERER

Place:
Dated:

** The contents in Italics are only for guidance purpose. Details as appropriate are to be filled in suitably by tenderer. Attestation before Magistrate/Notary Public.

Annexure - V

PROFORMA FOR PERFORMANCE BANK GUARANTEE BOND

(On Stamp Paper of Rs One Hundred)

(To be used by approved Scheduled Banks)

1. In consideration of the RailTel Corporation of India Limited, having its registered office at Plate A, 6th Floor, Office Block Tower -2, East Kidwai Nagar, New Delhi-110023 (Herein after called RailTel) having agreed to exempt ……(Hereinafter called "the said Contractor(s)") from the demand, under the terms and conditions of an Purchase Order/LOA No.……dated……made between……and…….. for (hereinafter called " the said Agreement") of security deposit for the due fulfillment by the said Contractor (s) of the terms and conditions contained in the said Agreement, on production of a Bank Guarantee for Rs. ……(Rs …….. only). We …… (indicate the name of the Bank) hereinafter referred to as "the Bank") at the request of ……. ……. Contractor(s) do hereby undertake to pay the RailTel an amount not exceeding Rs. ……. against any loss or damage caused to or suffered or would be caused to or suffered by the RailTel by reason of any breach by the said Contractor(s) of any of the terms or conditions contained in the said Agreement.

2. We , ……. Bank do hereby undertake to pay the amounts due and payable under this Guarantee without any demur, merely on demand from the RailTel stating that the amount is claimed is due by way of loss or damage caused to or would be caused to or suffered by the RailTel by reason of breach by the said Contractor(s) of any of terms or conditions contained in the said Agreement or by reason of the Contractor(s) failure to perform the said Agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs . ……

3. We, …….. bank undertake to pay to the RailTel any money so demanded notwithstanding any dispute or disputes raised by the Contractor(s) / Bidder(s) in any suit or proceedings pending before any court or Tribunal relating thereto our liability under this present being, absolute and unequivocal. The payment so made by us under this Bond shall be a valid discharge of our liability for payment there under and the Contractor(s) / Bidder(s) shall have no claim against us for making such payment.

4. We,……. Bank further agree that the Guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and that it shall continue to be enforceable till all the dues of the RailTel under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till

RailTel certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this Guarantee. Unless a demand or claim under the Guarantee is made on us in writing on or before the ……. …… We shall be discharged from all liability under this Guarantee thereafter.

5. We,…… (indicate the name of Bank) further agree with the RailTel that the RailTel shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the Agreement or to extend time of to postpone for any time or from time to time any of the powers exercisable by the RailTel against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation, or extension to the said Contractor(s) or for any forbearance, act or omission on the part of RailTel or any indulgence by the RailTel to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have affect of so relieving us.
6. This Guarantee will not be discharged due to the change in the Constitution of the Bank or the Contractor(s) Supplier(s).
7. We, …… (indicate the name of Bank) lastly undertake not to revoke this Guarantee during its currency except with the previous consent of the RailTel in writing.
8. Notwithstanding anything contained herein,
    1. Our liability under the Bank guarantee shall not exceed Rs. …….. (In Rupees)
    2. This Bank Guarantee shall be valid up to ……and
    3. We are liable to pay the guaranteed and or any part thereof under this Bank Guarantee only and only if you serve upon is a written claims or demand or before
    ……. (date of expiry of guarantee).

Dated the day of 2021

for ……..
(indicate the name of the Bank)

Witness

1. Signature
   Name

2. Signature
   Name

Annexure - VI

Format for Bid Security Declaration

(On Non-judicial stamp paper of Rs. 100/-)

Whereas, I/We _____(Name of Agency) has submitted bid for _____ (Name of Work and Tender No.) and whereas Earnest Money Deposit is being exempted in the aforesaid tender to give relief to the bidders as per Govt. of India guidelines due to severe financial crunch on account of slowdown in the economy due to the pandemic,

I/We hereby submit the following "Bid Security Declaration" in lieu of exemption from submitting Earnest Money Deposit :-

1) If I/We withdraw or modify my/our bid during the bid validity period (including extended validity of tender) specified in the tender documents;

Or

2) If, after the award of work, I/We fail to accept LOA/LOI, or to sign the contract agreement or fail to submit performance guarantee or fail to commence the work within stipulated time period prescribed in tender documents;

Or

3) If I/We furnish any incorrect or false statement / information/ document;

Or

4) If I/We hide any relevant information or do not disclose any material fact in the tender;

Or

5) If I/We commit any breach of integrity Pact;

I/We may be disqualified and banned for a period of three years and shall not be eligible to bid for future tenders in RailTel Corporation of India Ltd. for the period of three years from date of issue of such orders.

(Signed by the Authorized Representative of Firm)

Name of Authorized Representative
Name of Firm
Date

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