RailTel's Bid Specific Additional Terms & Conditions

Information to Bidder for the "Procurement of Router, Switches, SFP, Rack etc. for Western Region for Customer Delivery and other projects"

Ref: GeM Bid No. GEM/2024/B/4824189 Dated: 26.04.2024

- 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*
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TReDS feature available	Yes, on m1xchange portal (url: https://www.m1xchange.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. Thus, all hardware required for enabling the support/feature shall be included in the offer. The technical specifications are mentioned in **Annexure-I**.

2 OEM or Authorized dealer/ distributor/ Partner/ Trader authorized by OEM specific to this bids should have a registered office in India to provide sales and 24x7 support in India. The certificate to this effect should be submitted.

3 In case of the bidder is Authorized dealer/ distributor/ Partner/ Trader authorized by OEM specific to this bid, a certificate from the OEM to this effect should be submitted as per the **Annexure-II** (MAF).

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

5 Delivery Period, Consignee Address and inspection

5.1 **Delivery Period:** The supplier will have to supply the material within **120 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.

5.1.1 If the supplier fails to deliver the stores or any installment thereof within the period fixed for such delivery in the contract or as extended or at any time repudiates the contract before the expiry of such period the Purchaser may without prejudice to his other rights recover from the Contractor, as agreed, the LD a sum equivalent to 0.5 (half) per cent of the prices of any stores (including elements of taxes, duties, freight, etc.) which the Contractor has failed to deliver, within the period fixed for delivery in the contract or as extended for each week or part of a week, during which the delivery of such stores may be in arrears, where delivery thereof is accepted, after expiry of the aforesaid period. The upper limit for recovery of liquidated damages will be 10% (Ten Percent) of Total contract value provided in the contract.

5.2 **Name of locations for Consignee Address: As per the Annexure-V.**

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

Supplier should also submit data sheet, guarantee and fitment certificate along with the supply of materials.

6 Estimated cost of tender & Earnest Money Deposit (EMD):

6.1 **Estimated cost of tender:** Estimated cost of the Tender is **Rs. 2,77,42,370/-** (Incl. GST).

6.2. **Earnest Money Deposit (EMD): Rs. 5,55,000/-** with Payment online through RTGS/ internet banking in Beneficiary name RailTel Corporation of India Limited Account No. 11037321307, IFSC Code SBIN0001821, Bank Name: State Bank of India, Branch address: Churchgate Branch, Maharshi Karve Marg, Mumbai- 400020.

6.2.1 The bidder seeking EMD exemption, must submit the valid supporting document for the relevant category as per the GeM General Terms and Conditions.

6.2.2 The Bid received without EMD/ documentary proof of exemption of EMD as per above clause will be summarily rejected.

6.2.3 No exemption is, however, applicable to these units from payment of security deposit/ Performance Bank Guarantee.

6.2.4 Earnest Money of the unsuccessful bidder will be discharged/returned as promptly as possible. No interest shall be payable on the EMD.

6.3 RailTel is registered with m1xchange TReDS platform having buyer registration number “BUYER00001496”. The URL for m1xchange platform is https://m1xchange.com. MSE suppliers/vendors are required to register themselves on m1xchange platform for availing the facility of bill discounting on TReDS portal. The bidder is mandatorily required to submit its TReDS registration number (as provided by m1xchange portal) and GRN (Goods/Service Receipt Note) Number (as provided by RailTel on delivery of Goods/Service) while submitting the invoices if requires to avail TReDS facility.

6.4 MSE vendor will bear all costs relating to availing the facility of discounting on TReDS platform including but not limited to Registration charges, Transaction charges for financing, Discounting charges, Interest on financing, or any other charges known by any name shall be borne by MSE vendor.

6.5 MSE vendor hereby agrees to indemnify, hold harmless and keep RailTel and affiliates, Directors, Officers, representative, agents and employees indemnified, from any and all damages, losses claims and liabilities (including legal costs) which may arise from Sellers submission, posting or display, participation, in any manner, on the TReDS platform or from the use of Services from the Buyer's breach of any of the terms and conditions of the Usage terms or of this agreement and any applicable Law on a full indemnity basis.

6.6 RailTel shall not be liable for any special, indirect, punitive, incidental or consequential damages or any damages whatsoever (including but not limited to damage for loss of profits or savings, business interruption, loss of information), whether in contract, tort, equity or otherwise or any other damages resulting from using TReDS platform for discounting their (MSE Vendor's) invoices.

7 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.

This bid complies with "Department of Expenditure's (DoE) Public Procurement Division Order (Public procurement no 1, 2 & 3 vide ref. F.No.6/18/2019-PPD dated 23.07.2020 & 24.7.2020 or latest regarding restrictions on procurement from a bidder of a country which shares a land border with India"

8 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 @ **5%** 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-IV.**

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.

9 Eligibility Criteria:

9.1 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.

 # Definition of similar work: Supply/ Supply and installation of IT/ Telecom equipment with satisfactory working in Government/PSUs/ Telecom Service providers/Public Listed Company in 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.

9.2 **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.

9.3 Bidder should have authorization specific to this tender from respective OEM as per **Annexure-II**. If OEM is directly participating in the Bid, self-declaration in this connection required to be submitted.

9.4 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 authorized signatory to be submitted by the Bidder.

10 Variation of Quantities at the Time of Award

i. 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 reserve 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.

ii. The provision of + (plus) 30% Option Clause shall be applicable as a Special Condition of Contract with a minimum purchase value of Rs. 1.5 Crores, for fixed quantity contracts, for procurements of materials of which the requirements are of continuing nature. However, such a threshold for inclusion of Option Clause may be decided by RailTel as deemed fit.

11 Warranty:

11.1 The materials are to be warranted for **as mentioned in the technical specification (Annexure I)** 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 item 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.

11.2 **SLA:**

After having been notified of the defects/service requirement during warranty period, Seller has to complete the required Service/Rectification within time limit of max. 7 days. If the Seller fails to complete service / rectification with in defined time limit, a penalty of 0.5% of Unit Price of the product shall be charged as penalty for each week of delay from the seller & upto max. of 100% of Unit Price of the product. Seller 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.

12 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/E-way bill
- 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

(iv) Any changes in the statutory taxes & duties during the contract period shall be on RailTel account with in the original DOC. Beyond DOC, changes in statutory taxes & duties shall be on RailTel's account only when the delay is an account of RailTel.

13 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-III**. **Non submission of a notarized 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).

14 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) EMD/Valid Documentary proof of exemption.
(ii) Clause wise compliance along with all mentioned documents/annexures for all clauses of GeM Bid and ATC (Information to bidder) documents.
(iii) Data Sheet of offered item/equipment.
(iv) Financial (Certified copies of audited balance sheets/annual reports of last three preceding financial years) and Technical Eligibility Criteria documents.
(v) Technical Compliance of all Specification of items as per ATC documents.
(vi) Proof of document required against Eligibility criteria of OEM and Bidder vide para -9.
(vii) MAF/OEM Authorization as per **Annexure-II**.
(viii) Notarized affidavit on a non-judicial stamp paper as per **Annexure-III**.
(ix) Duly notarized Power of Attorney in name of authorized signatory as per Clause No. 18.
(x) NIL deviation declarations as per **Annexure- VI.**
(xi) Declaration Regarding Minimum local content under preference to “MAKE IN INDIA” Policy as **Annexure-VII.**
(xii) Land Border Sharing Declaration as **Annexure-VIII.**

15 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 provided due date, bid may be rejected.

16 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 SOR items shall be 50% 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.

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. Bidder should submit Self Certification under preference to “MAKE IN INDIA” Policy as **Annexure-VII.**

In case of any false declaration, action shall be taken in line with the provisions of the PPP-MIII order.

In cases of procurement for a value excess of Rs. 10 crores, the ‘Class-I local supplier/ Class-II local supplier’ shall be required to 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.

17 Insurance

17.1 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.

17.2 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 item/equipment are handed over to the purchaser.

18 Power of Attorney

Power of attorney in favor of the signatory duly authorizing the signatory shall be submitted online before the due date and time of submission of the e-Tender and Original copy is needed to be submitted by the successful bidder as per the clause-15 above.

19 The guidelines and directives issued by Department of Telecommunication, Govt. of India regarding procurement of Telecommunication equipment from trusted sources shall be applicable to this tender. The offered equipment shall be trusted Products". The vendor/OEM shall submit declaration for compliance.

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/2024/B/4824189**
4) After opening of the technical bid no correspondence/ submission of document made at the initiative of the bidder will be entertained. However, the purchaser can, if required, ask for clarifications in writing which need to be submitted before a target date. The clarifications submitted as required by the purchaser before the target date will be considered.
5) 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 prevail.

Annexure-I

Technical Specification

1. Equipment should be:

i. The Electronics product should have service life for next 08 Years from date of delivery. The certificates/Undertaking for the same will have to be submitted along with bid from respective OEM.
ii. Equipped with necessary hardware/software to comply all above required / support features.
iii. 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.
iv. OEM should have its Service Centre at min 02 locations in major cities in India. Service centre details to be shared along with address and contact no. and person.
v. UL, CE and FCC Certification is not required for PMA. However, Bidder have to produce certificate from OEM that their product are equivalent to UL, CE and FCC and meets all standard and specification of UL, CE and FCC.

S N	Description of Item	Unit	Quantity
1	Router Type II as per Technical specification	Nos	2
2	Router Type IV as per Technical specification	Nos	10
3	Router Type V as per Technical specification	Nos	5
4	Router Type VIII as per Technical specification	Nos	40
5	Router Type IX as per Technical specification	Nos	1
6	Router Type X as per Technical specification	Nos	1
7	Switch Type I as per Technical specification	Nos	2
8	Switch Type IV as per Technical specification	Nos	27
9	Switch Type V as per Technical specification	Nos	57
10	Switch Type VI as per Technical specification	Nos	46
11	Telepresence Type I as per Technical specification	Nos	2
12	SFP+ 10G 10 KM BIDI as per Technical specification	Nos	14
13	SFP+ 10G 40 KM BIDI as per Technical specification	Nos	154
14	SFP 1G 40 KM BIDI as per Technical specification	Nos	46
15	SFP 1G 10 KM BIDI as per Technical specification	Nos	89
16	SFP+ 10G 60 KM BIDI as per Technical specification	Nos	26
17	SFP+ 10G 10Km Dual Fiber as per Technical specification	Nos	15
18	SFP 1G 20 KM BIDI as per Technical specification	Nos	10
19	SFP 1G 40 KM dual fiber as per Technical specification	Nos	6

20	XFP 10G 10 KM Dual Fiber as per Technical specification	Nos	2
21	QSPF-28 LR4 as per Technical specification	Nos	10
22	Wifi Router as per Technical specification	Nos	2
23	Rack - 19" 9U as per Technical specification	Nos	2
24	Outdoor 19"-6Ux600D wall mount industrial heavy duty racks as per Technical specification	Nos	2
25	Server Rack- 42U as per Technical specification	Nos	50
26	Breakout Cable (LC*4 one end, Single Mode 10 Mtr) as per Technical specification	Nos	3
27	Patch Cord E2000/APC-E2000/APC-02 Mtr as per Technical specification	Nos	30
28	Patch Cord E2000/APC-LC/PC-05 Mtr as per Technical specification	Nos	50
29	Patch Cord E2000/APC-LC/PC-10 Mtr as per Technical specification	Nos	50
30	Patch Cord E2000/APC-LC/PC-20 Mtr as per Technical specification	Nos	50
31	Patch Cord LC/PC-LC/PC-02 Mtr as per Technical specification	Nos	30
32	Patch Cord LC/PC-LC/PC-05 Mtr as per Technical specification	Nos	50
33	Patch Cord LC/PC-LC/PC-10 Mtr as per Technical specification	Nos	50
34	Patch Cord LC/PC-LC/PC-20 Mtr as per Technical specification	Nos	30
35	Attenuator LC/PC-M/F-10 dB as per Technical specification	Nos	100
36	Attenuator LC/PC-M/F-05 dB as per Technical specification	Nos	100
37	Provision of 48 Port E2000 FDMS as per Technical specification	Nos	8
38	Pigtail E2000 type APC 1m as per Technical specification	Nos	384
39	STP Cable-CAT6 as per Technical specification	drum	1
40	Provision of RJ 45 connector as per Technical specification	Nos	1000
41	UPS 2KVA as per Technical specification	Nos	3

SOR item 1: Router Type II Technical Specifications

SN	Description	Compliance
1	The Router 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, Router shall maintain a trace area in the NVRAM, which would be used for analysis/ diagnosis of the problem.	
3	Router shall have built in power on diagnostics system to detect hardware failures.	
4	Should have DC power supply arrangement without any external adaptors with redundant power supply.	
5	Router shall have suitable Visual Indicators for diagnostics and healthy/ unhealthy status of ports & modules.	
6	Router shall have 8 Nos. of Gigabit SFP ports and 4 Nos. RJ45 10/100/1000 Base – TX / SFP Port with RJ-45 SFP and 4 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	Router shall have minimum of 52 Gbps (full duplex) forwarding bandwidth at layer 2switching fabric.	
8	Router shall have a minimum of 16000 MAC address space.	
9	Bidder to propose Router having Operating and Storage Temperature as per environmental requirement. However, the Router should be capable of working at temperature 0 to 45 degree (minimum).	
10	It should be possible for the Router to be mounted on a 19-Inch rack. All accessories required for this mounting should be supplied.	
11	Should support jumbo frame.	
12	**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 signaling. It shall support MPLSFRR and L3VRF with upto 128 VRF/L2VPN/VPLS	
	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 12K MPLS labels.	
	vi. Shall support 16K for IPv4 routes and 4K 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. Should support Segment routing, TI-LFA, R-LFA, MPLS-TE	

	x. Shall support MPLS based L3, L2 VPN & VPLS services.	
	xi. It shall also support SYNC Ethernet/ IEEE 1588V2 (PTP) 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 Standards for safety requirements\ of IT Equipment.	
	xiv. Shall conform to EN55022 Class A/B or CISPR22 Class A/B or CE Class A/B for EMC for (Electro Magnetic Compatibility) or latest.	
13	Shall have the following features. All software's/hardware's/License required for this must be supplied along with the Router.	
	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 / 802.1 s MSTP	
	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). or advanced level monitoring like Performance monitoring, Statistics, Alarm logging and event management, Telemetry and SNMP Polling of data	
	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 Router 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. 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. Router should support minimum of 500 Ethernet flow points (EFP) or equivalent functionality.	
	9. L2 Protocol Tunneling.	
14	Router shall have support of following Standards:	
	i. IEEE 802.1D (STP) / 802.1 s MSTP	
	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	
15	Router shall have the following Certifications:	
	i. The model of the Routers series shall have MEF- (9 & 14)/ CE2.0 or IEEE standards or higher certification from authorized agencies.	
	ii. Deleted.	
	iii. CE / FCC.	
	iv. Shall conform to UL 60950 or IEC 60950 or EN 60950 Standards for safety requirements of IT Equipment.	
	v. Shall Confirm relevant standards of EN/CE/FCC for EMC for (Electro Magnetic Compatibility).	
	vi. Deleted.	
16	OEM should have a valid ISO 9001 & ISO 14001 certification on the date of opening of bid	
17	IPv6 feature should be ready from day 1.	
18	"Router/ Router OS should be tested and certified for EAL 2 / NDPP (Network Device Protection Profile) or above under Common Criteria Program for security related functions or under Indian Common Criteria Certification Scheme (IC3S) by STQC, DEIT, Govt. of India."	
19	**On Site OEM Warranty (Year) - 3 years**	

SOR item 2: Router Type IV Technical specification

SN	Description	Compliance
1	**Architecture:**	
1.1	Proposed Routers should support SDWAN ready	
1.2	The router should be a single box configuration for ease of management.	
1.3	It shall support hardware based VPN (3DES/ AES) Encryption, MD5, SHA, SHA-256	
1.4	The router shall support complete Firewall features.	
1.5	Router shall support minimum 100K IPv4 and 50K Ipv6 routes.	
1.6	The Router shall have enough “High-performance multicore processors capacity and 4 GB DRAM and 4GB Flash Memory from Day1. So as to efficiently meet all the functionalities laid down in the specifications.	
1.7	It shall have integrated USB port.	

1.8	It shall be supplied with necessary power cards, data cables, connectors, bracket accessories, wire managers and other appropriate accessories. Routers shall be capable of working with 110 – 240 Volts AC nominal at frequency 50 +/- 2 Hz.	
2	**Performance:**	
2.1	It shall support high performance traffic forwarding with con-current features like firewall and encryption.	
2.2	Router shall support aggregate WAN throughput of 100 Mbps from Day-1 and IPSEC Throughput of 50 Mbps from Day-1	
2.3	It shall support variety of Ethernet Interfaces – 1 RJ45 GigE and 1 SFP GigE port & 4 port LAN 10/100/1000 Mbps port.	
2.4	It shall support other IP Services like GRE unnelling, ACLs, IPSEC VPNs, Firewalling, NAT services.	
3	**High Availability:**	
3.1	It shall support non-stop forwarding for fast re-convergence of routing protocols.	
3.2	It shall support VRRP or equivalent	
4	**Protocol Support:**	
4.1	The router shall have routing protocols like IS-IS, RIP ver1 & RIP Ver.2, OSPF ver2, BGP4.	
4.2	It shall support multicast routing protocols IGMPv1/ v2/v3, PIM	
4.3	It shall support DHCP, Ipv6 QoS and Ipv6 Multicast, OSPFv3	
5	**Quality of Service (QoS) Features:**	
5.1	The router shall support the following:	
5.1.1	Classification and Marking: Policy based routing, IP Precedence, DSCP.	
5.1.2	Congestion Management: WRED, Priority queuing, Class based weighted fair queuing.	
5.1.3	Traffic Shaping and Policing for QoS	
6	**Security Features:**	
6.1	The router shall support GRE Tunneling & NAT Services.	
6.2	It shall support MD-5 route authentication	
6.3	It shall support AAA support using Radius.	
6.4	It shall support DoS prevention	
6.5	It shall support IP Access list to limit Telnet and SNMP access to router.	
6.6	It shall support multiple privilege level authentications for console and telnet access through Local database or through an external AAA Server.	
6.7	It shall support IEEE 802.1x support for MAC address authentication.	
7	**Debug, Alarms & Diagnostics:**	

7.1	The router shall have display of input and output error statistics on all interfaces.	
7.2	It shall have display of dynamic ARP table.	
7.3	Trace-route and Ping shall be available.	
8	**It should support Network Time Protocol**	
9	**Management:**	
9.1	The router shall have support for CLI, Telnet and SNMPv3.	
9.2	It shall support Secure Shell for secure connectivity.	
9.3	It shall have to have dedicated console for Local management/ login through USB port/ RJ45 port/ serial	
9.4	Event and System logging: Event and system history logging functions shall be available. The Router shall generate system alarms on events. Facility to put selective logging of events onto a separate hardware where the analysis of log shall be available.	
10	**Certification Requirements:**	
	"Router/ Router OS should be tested and certified for EAL 2/ NDPP (Network Device Protection Profile) or above under Common Criteria Program for security related functions or under Indian Common Criteria Certification Scheme (IC3S) by STQC, DEIT, Govt. of India."	
11	**On Site OEM Warranty (Year) - 3 years**	

SOR item 3: Router Type V Technical specification

SN	Specifications	Requirements	PQC/ Optional	Compliance
1	Router should support minimum 1G/ 10G SFP+ ports from day one (Including 8X10G SFP+ module).	8	PQC	
2	Router should have support for 100G Interfaces (Excluding XFP/ SFP/ QSFP).	4	PQC	
3	Total throughput (Full duplex).	Minimum 280 Gbps	PQC	
4	MAC Table Size	64K	PQC	
5	IPv4 RIB/ FIB	Minimum 1M/128K	PQC	
6	IPv6 RIB/ FIB	Minimum 512K/32K	PQC	
7	MPLS Labels	Minimum 32K	PQC	
8	Label Stack	Minimum 5	PQC	

9	L2/ L3 VPN VRF	Minimum L2 1000, Minimum L3 256	PQC	
10	Packet Forwarding Rate (IMIX traffic) in Mpps	Minimum 300	PQC	
11	Support of number of queues per system	Minimum 4K	PQC	
12	Number of VLAN support	1000	PQC	
13	Operating Temperature	(0 to 40 degree C or better)	PQC	
14	Storage Temperature	(-10 to 60 degree C or better)	PQC	
15	Router can be of either modular/ fixed type and shall have modular Operating system where it shall support individual restart of critical processes without affecting other processes or rebooting the entire operating system.		PQC	
16	All 10G interfaces should support LR, ER, and ZR		PQC	
17	Router shall have option checking configuration before committing and option of rolling back to at least five configurations.		PQC	
18	Router should have redundant DC (with the operating range of -40 to -72 VDC) power supplies		PQC	
19	Digital Optical Monitoring (DOM) should be supported, optics information retrievable including RX/ TX-power, threshold monitoring/ alarming, inventory.		PQC	
20	It shall support role based privileges for the system access and radius authentication for the System admin.		PQC	
21	The router should have a Console or Out-of-band Management.		PQC	
22	Alerts for environmental or other hardware based alarms should be visibly implemented on the chassis.		PQC	

23	All interfaces shall support services like L2VPN, L3VPN, VPLS and multicast VPN for both IPv4 and IPv6		PQC	
24	The router should have mechanism to protect itself from DDoS attack.		PQC	
25	The router should be IPv6 ready from day one.		PQC	
26	The router should support filtering based on different parameters like: src ip, dst ip, src port, dst port, protocol etc		PQC	
27	The router should support Netflow, Jflow or equivalent		PQC	
28	The router should support IP SLA or RPM (or equivalent) for performance measurements, it should also support monitoring of IP SLA/ RPM (or equivalent) probes using SNMP polling (OEM has to provide SNMP MIB information)		PQC	
29	Shall support QoS, option of traffic shaping per Interface based.		PQC	
30	Shall support following class of service features:		PQC	
	a) Classification, policing, marking, shaping, filtering			
	b) Manage congestion using a weighted random early detection (WRED) algorithm			
	c) RFC 2474, Definition of the Differentiated Services Field in the IPv4 and IPv6 Headers			
	d) Single Rate Three Color Policer RFC 2697			
	e) RFC 2698, A Two Rate Three Color Policer			
	f) Congestion Management through CBWFQ, Round- Robin or equivalent, WFQ or equivalent			
	g) RFC 2597, Assured Forwarding PHB Group			
	h) RFC 2598, An Expedited Forwarding PHB			
	i) Router should be able to classify based on 802.1 ad, 802.1 p, EXP and DSCP bits			

	j) The router shall support traffic interface mirroring in both ingress & egress directions for both IPv4 & IPv6			
31	The router shall support provision for event based scripts that shall be capable of performing actions based on certain triggers		PQC	
32	The router shall support aggregated Ethernet and it shall be possible to bundle Upto 16 links.		PQC	
33	Shall support following MPLS features		PQC	
	a) LDP and RSVP signalling			
	b) RFC 5036, LDP Specification			
	c) RFC 3212 OR Constraint-Based LSP Setup using LDP			
	d) RFC 3215, LDP State Machine			
	e) RFC 3478, Graceful Restart Mechanism for LDP			
	f) RFC 2858, Multiprotocol Extensions for BGP-4			
	g) RFC 3063, MPLS Loop Prevention Mechanism			
	h) RFC 3031, Multiprotocol Label Switching Architecture			
	i) RFC 3032, MPLS Label Stack Encoding			
	j) The router should be able to do load-balancing over multiple equal cost MPLS LSP			
34	The Router shall support MPLS Fast Reroute both link protection and Node protection.		PQC	
35	MPLS Ping, MPLS Trace Route		PQC	
36	Fast Reroute Extensions to RSVP-TE for LSP Tunnels		PQC	
37	The router shall Support of Sync-E & PTP technology (License price to be quoted separately)		PQC	
38	Shall support MPLS based VPN services		PQC	
	a) L3VPN, L2VPN (Kompella BGP/ Martini LDP)			

	b) Internet draft, draft-ietf-l2vpn-vpls-bgp-08.txt, Virtual Private LAN Service (VPLS) Using BGP for Auto-discovery and Signaling			
	c) RFC 4762 Virtual Private LAN Service (VPLS) Using Label Distribution Protocol (LDP) Signaling			
	d) Next Generation mVPN (P2MP) based on (Draft-ietf-13vpn-2547bis-mcast-01.txt) & mVPN (draft- rosen-vpn-mcast).			
39	The router shall support the following routing features		PQC	
	a) BGPv4, BGP confederations and route reflector			
	b) Dynamic Host Configuration Protocol (DHCP)			
	c) RFC 3101, The OSPF NSSA Option			
	d) RFC 2328, OSPF Version 2			
	e) RFC 3623, OSPF Graceful Restart			
	f) RFC 3630, Traffic Engineering (TE) Extensions to OSPF Version 2			
	g) RFC 1195, Use of OSI IS-IS for Routing in TCP/ IP and Dual Environments			
	h) RFC 2104, HMAC: Keyed-Hashing for Message Authentication			
	i) RFC 2973, IS-IS Mesh Groups			
	j) RFC 3358, Optional Checksums in IS-IS			
	k) RFC 3359, Reserved Type, Length and Value (TLV) Code points in IS-IS			
	l) RFC 3373, Three-Way Handshake for IS-IS Point- to-Point Adjacencies			
	m) RFC 5305, IS-IS Extensions for Traffic Engineering			
	n) RFC 3847, Restart Signalling for IS-IS			
	o) RFC 3590, Source Address Selection for Multicast Listener Discovery Protocol			

	p) IGMP v2 and v3 as described in RFC 2236 and RFC 3376 with IGMP Routing Policies to filter IGMP requests.			
40	The router shall support Virtual Router Redundancy Protocol (VRRP) as per IETF RFC 3768		PQC	
41	Router shall support SNMP v2/v3 and NTP		PQC	
42	Shall support BFD for both single hop and multihop sessions		PQC	
43	Shall support the following OAM features and actions such as syslog/ link down should be configurable on OAM event trigger:		PQC	
	a) 802.3ah			
	b) 802.1ag			
	c) Y.1731			
44	Shall support Multi-chassis LAG		PQC	
45	IPv6 Features		PQC	
	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			
	h) 6PE and 6VPE			
46	Multicast Feature: It shall support following:		PQC	
	a) It shall support IGMP snooping v2/ v3			
	b) The router shall support PIM Sparse Mode, RFC 4601 (optional)			
	c) Rendezvous Point (RP) - ability to be configured as an RP			
	d) RFC 3569, Source Specific Multicast (SSM)			
	e) RFC 2365, Administratively Scoped IP Multicast			

	f) RFC 3446, Anycast Rendezvous Point (RP) Mechanism using Protocol Independent Multicast (PIM) and Multicast Source Discovery Protocol (MSDP).			
	g) RFC 3618, Multicast Source Discovery Protocol (MSDP).			
47	The proposed router should be NEBS level 3 compliant. NEBS Certification is not required for PMA. However OEM has to produce certificate from standard lab approved or authorized by Govt. of India that the supplied Products are equivalent to NEBS and meet all standard and specification of NEBS		PQC	
48	The device should comply to the following safety standards		PQC	
	a) EN 55022 Class A Emissions (Europe)			
	b) FCC Class A (USA) Radiated Emissions			
	c) UL 60950-1 Information Technology Equipment – Safety			
	d) EN 60825-1 Safety of Laser Products			
	e) EN-61000-4-11 Voltage Dips and Sags			
	f) ETS-300386 Electromagnetic Compatibility Requirements			
	g) The device will conform to the following EN/IEC standard:			
	i. 61000-4-2 – ESD			
	ii. 1000-4-3 Radiated Immunity			
	iii. 61000-4-4 – EFT			
	iv. 61000-4-5 - Surge			
	v. 61000-4-6 – Low Frequency common immunity			
49	The offered devices must support following functionalities to support 3rd party SDN (in future)			
	a) The router should support RFC 6020, YANG - A Data Modelling Language for the Network Configuration		PQC	
	b) Protocol (NETCONF)		PQC	

	c) The solution should support the network configuration protocol (NETCONF) that provides mechanisms to install, manipulate, and delete the configuration of network devices, RFC 6241		PQC	
	d) The router should be able to act as Path computation client in the PCE architecture defined in RFC 4655.		PQC	
	e) The router should support PCECP as defined in RFC5440.		PQC	
	f) The router should support BGP link-state (BGP- LS), RFC 4655		PQC	
	g) The router should support SPRING		Optional	
50	Devices shall support following for Provisioning			
	a) Use NETCONF (RFC 6241, RFC 6242, RFC 5277)		PQC	
	b) REST based CRUD operations for configuration and management.		PQC	
	c) Web Services based operations for configuration and management		Optional	
51	The offered devices must support API/ NBIs for auto discovery of Services and Physical & Logical Topology		PQC	
52	TELEMETRY Function: It shall support following:			
	a) The router should support telemetry based on push model for monitoring network devices		PQC	
	b) The router should support various software models/ sensors for capturing different health parameters from the devices		PQC	
	c) The router should support sending telemetry data to multiple consumers simultaneously		PQC	
	d) The router shall support GPB/ GRPC/ KAFKA encoding for telemetry data		PQC	
	e) The software model/ sensors should be based on either yang, xml or open config		PQC	

	f) The solution shall use either UDP or GRPC for transport of telemetry data		PQC	
	g) The system should support streaming granularity of atleast 10 sec		PQC	
	h) The router shall have the ability to interact with open standard based tools		PQC	
	i) The system should support REST API for communication with third party tools and applications		PQC	
	j) Enabling telemetry should not have any adverse impact on the performance of the device/ router		PQC	
	k) Some of the streaming models/sensors the router should support are:		PQC	
	System			
	Chassis Environment		PQC	
	Line card utilization (memory , processor, QoS, Temp, Port utilization), errors counters		PQC	
	Controller Card sensors (memory, CPU, Temp etc)		PQC	
	Fabric statistics		Optional	
	ARP table state		Optional	
	Routing prefix information		Optional	
	Interface			
	Interface statistics (Physical and logical interfaces)		PQC	
	Interface optical diagnostic		Optional	
	Congestion and latency		Optional	
	Filter statistics		Optional	
	Protocol		Optional	
	BGP peer information		Optional	
	ISIS State, Interface, Adjacency statistics, LSDB		Optional	
	ISIS SPRING / Segment Routing Statistics		Optional	
	RSVP Interface Statistics		PQC	
	LSP statistics		PQC	

	LSP Event Export, Experimental		PQC	
	IP SLA/RPM (or equivalent) reporting		PQC	
	Segment Routing statistics		PQC	
	DHCP statistics		Optional	
53	Router should support Dual Image/ Partition with USB flash drive booting option for OS recovery		PQC	
54	Router should support jumbo frame.		PQC	
55	Router should support port mirroring		PQC	
56	Router should support security features of Broadcast/ Mulitcast/ Unicast Storm control.		PQC	
57	Router should comply to following Temperature performance parameters:		PQC	
	i. Operating Temperature: 0 to 40 degree C or better			
	ii. Storage Temperature : -10 to 60 degree C or better			
58	Routers should support following Metro Ethernet Features:		PQC	
	i. ITU-T G.8032 Ethernet Ring Protection designed for loop protection or alternate mechanism to achieve ring protection in less than 50 ms			
	ii. Should support multiple Ring up to 8 ring (main and sub ring) protection failover within 50 ms or ITU-T G.8032 v2.			
59	The operating system of the Routers category/ series/family should be MEF 9/14 or CE (Carrier Ethernet) Certified.		PQC	
60	The Router shall be designed for continuous operations with dual fan system.		PQC	
61	Router should support CFM and LFM alarms.		PQC	
62	Shall support HQoS, option of traffic shaping per VLAN based.		PQC	
	i. Shall support at least 4K Queues.			
	ii. Per-VLAN policing.			
	iii. Per-VLAN rewrite			
	iv. Per-VLAN two-rate tri-color marking.			

	v. Per-VLAN classification			
	vi. Per-VLAN filtering			
63	Support for P and PE router functionality for MPLS on the same router simultaneously and on all the interfaces.		PQC	
64	Router shall support E-Line or E-LAN MEF standards.		PQC	
65	Routers should be rack mountable to fit into a standard 19-inch rack		PQC	
66	OEM shall ensure that use of third-party optics shall not be explicitly blocked on the Router. Router must support all MSA complied Optics available in market.		PQC	
67	Segment Routing			
	i. Router should be able to support SR standards on IPv6 whenever it is firmed upto without any cost to RCIL.		PQC	
	ii. The router should support SR-MPLS data plane and protocols OSPF,IS-IS and BGP Segment routing extensions		PQC	
	iii. Traffic Steering of SR policies with Auto route Include and Segment Routing TI-LFA SRLG Protection		Optional	
	iv. LSP ping, trace-route, Pseudo wire Ping over Segment Routing, trace route for binding-SID		PQC	
	v. MPLS-LDP interworking with SR-ISIS and SR-OSPF		PQC	
	vi. TI-LFA with IGP (Link, Node, Local SRLG, Remote SRLG protection)		Optional	
	vii. Controller instantiated SR Policy (PCEP, BGP) and SR policy based on demand next hop		Optional	
	viii. Router should have capability to calculate Bandwidth based path using centralized controller.		PQC	
	ix. Shall support SR and MPLS (LDP) Interworking Mapping Server		PQC	

	x. The router shall support dynamic point-to-point interface latency performance measurement. The measurement must be integrated in the IGP and BGP LS for SDN Controller Analysis.		Optional	
	xi. Label distribution protocol and segment routing should coexist and there should support option to prefer LDP over segment routing.		PQC	
68	EVPN Features			
	i. Router should have support of Ethernet VPN (EVPN with single homing, multi homing		PQC	
	ii. Router should have support of following features on EVPN: EVPN-IRB, EVPN VPWS, EVPN VPWS Preferred Path over SR-TE Policy		Optional	
69	Router to support GRE tunnels (RFC 2784).		PQC	
70	**On Site OEM Warranty (Year) - 3 years**			

SOR item 4: Router Type VIII Technical specification

SN	Description	Compliance
1	**Architecture:**	
1.1	Proposed Routers should support SDWAN ready	
1.2	The router should be a single box configuration for ease of management.	
1.3	It shall support hardware based VPN (3DES/AES) Encryption, MD5, SHA, SHA-256	
1.4	The router shall support complete Firewall features.	
1.5	Router shall support minimum 200K IPv4 and 50K Ipv6 routes.	
1.6	The Router shall have enough “High-performance multicore processors capacity and 4 GB DRAMand 4GB Flash Memory from Day1. So as to efficiently meet all the functionalities laid down in the specifications.	
1.7	It shall have integrated USB port.	
1.8	It shall be supplied with necessary power cards, data cables, connectors, bracket accessories, wire managers and other appropriate accessories. Routers shall be capable of working with 110 – 240 Volts AC nominal at frequency 50 +/- 2 Hz.	
2	**Performance:**	
2.1	It shall support high performance traffic forwarding with con-current features like firewall andencryption	

2.2	Router shall support aggregate WAN throughput of 200Mbps from Day-1 and IPSEC Throughput of50 Mbps from Day-1.	
2.3	It shall support variety of Ethernet Interfaces – 2 SFP GigE ports & 4 port LAN 10/100/1000 Mbpsport.	
2.4	It shall support other IP Services like GRE 29unnelling, ACLs, IPSEC VPNs, Firewalling, NAT services.	
3	**High Availability:**	
3.1	It shall support non-stop forwarding for fast re-convergence of routing protocols.	
3.2	It shall support VRRP or equivalent	
4	**Protocol Support:**	
4.1	The router shall have routing protocols like IS-IS, RIP ver1 & RIP Ver.2, OSPF ver2, BGP4.	
4.2	It shall support multicast routing protocols IGMPv1/ v2/v3, PIM	
4.3	It shall support DHCP, Ipv6 QoS and Ipv6 Multicast, OSPFv3	
5	**Quality of Service (QoS) Features:**	
5.1	The router shall support the following:	
5.1.1	Classification and Marking: Policy based routing, IP Precedence, DSCP.	
5.12	Congestion Management: WRED, Priority queuing, Class based weighted fair queuing.	
5.1.3	Traffic Shaping and Policing for QoS	
6	**Security Features:**	
6.1	The router shall support GRE Tunneling & NAT Services.	
6.2	It shall support MD-5 route authentication	
6.3	It shall support AAA support using Radius.	
6.4	It shall support DoS prevention	
6.5	It shall support IP Access list to limit Telnet and SNMP access to router.	
6.6	It shall support multiple privilege level authentications for console and telnet access through Local database or through an external AAA Server.	
6.7	It shall support IEEE 802.1x support for MAC address authentication.	
7	**Debug, Alarms & Diagnostics:**	
7.1	The router shall have display of input and output error statistics on all interfaces.	
7.2	It shall have display of dynamic ARP table.	
7.3	Trace-route and Ping shall be available.	
8	**It should support Network Time Protocol**	
9	**Management:**	
9.1	The router shall have support for CLI, Telnet and SNMPv3.	
9.2	It shall support Secure Shell for secure connectivity.	
9.3	It shall have to have dedicated console for Local management/ login through USB port/ RJ45 port /Serial	
9.4	Event and System logging: Event and system history logging functions shall be available. The Routershall generate system alarms	

	on events. Facility to put selective logging of events onto a separate hardware where the analysis of log shall be available.	
10	**Certification Requirements:**	
	"Router/ Router OS should be tested and certified for EAL 2/ NDPP (Network Device Protection Profile) or above under Common Criteria Program for security related functions or under Indian Common Criteria Certification Scheme (IC3S) by STQC, DEIT, Govt. of India."	
11	**On Site OEM Warranty (Year) - 3 years**	

SOR item 5: Router Type IX Technical specification

SN	Specification- Tier 3 Router	Requirements	PQC/ Optional	Compliance
1	The router should have at least 8 numbers of 10G interfaces equipped with SFP+/XFP {10G 10KM (SMF)} of given specification. Should have additional slots/ sub-slots for at least 4 numbers of 10G interfaces for expandability apart from above 8 numbers of 10G interface requirement.		PQC	
2.a	The Router should support at least 520 Gbps (Full Duplex) throughput rate.		PQC	
2.b	Minimum 2 spare full slots are required for 100G interfaces in chassis, after populating with minimum required cards/ interfaces as per clauses 1 and 4 of tender specifications.		PQC	
3	The router should support the following functionality from the day one:-		PQC	
	a) MAC Table Size	128K		
	b) IPv4 RIB/FIB	2M/1M		
	c) IPv6 RIB/FIB	512K/128K		
	d) MPLS Labels	32K		
	e) Lable Stack	5		
	f) L2/L3 VPN	2000		
	g) Packet Forwarding Rate (IMIX traffic) in Mpps. Calculation is done based on IMIX (58.33% of 84 bytes packets, 33.33% of 614 bytes packets, 8.33% of 1538 bytes packets) + additional buffer. Reference taken from https://en.wikipedia.org/wiki/Internet_Mix	Minimum 600 Mpps		
4	The Router should have 2 number of 100G CFP2-DCO ports (without CFP2-DCO pluggable module) distributed in two slots from day one. Should have additional slot/		PQC	

	sub-slot for 4 numbers of 100G QSFP28 ports for expandability.			
5	Router should have control plane/ Forwarding plane redundancy for critical processes without affecting other processes or rebooting the entire operating system. (Minimum 1+1)		PQC	
6	All 10G interfaces shall support LR, ER, ZR and color standard.		PQC	
7	Router shall have option of checking configuration before committing and option of rolling back to at least five configurations		PQC	
8	Router should have redundant DC (with the operating range of -40 to -72 VDC) power supply.		PQC	
9	Digital Optical Monitoring (DOM) should be supported, optics information retrievable including RX/ TX-power, threshold-monitoring/ alarming, inventory		PQC	
10	It shall support role based privileges for the system access and RADIUS/TACAS authentication for the System admin		PQC	
11	The router should have a Console or Out-of-band Management.		PQC	
12	Alerts for environmental or other hardware based alarms should be visibly implemented on the chassis.		PQC	
13	All interfaces shall support services like L2VPN, L3VPN, VPLS and multicast VPN for both IPv4 and IPv6		PQC	
14	The router should have mechanism to protect itself from DDoS attack.		PQC	
15	The router should be IPv6 ready from day one		PQC	
16	The router should support filtering based on different parameters like: src ip, dst ip, src port, dst port, protocol etc		PQC	
17	The router should support Netflow, Jflow or equivalent		PQC	
18	The router should support IP SLA or RPM (or equivalent) for performance measurements, it should also support monitoring of IP SLA/ RPM (or equivalent) probes using SNMP polling (OEM has to provide SNMP MIB information)		PQC	
19	Shall support QoS, option of traffic shaping per Interface based		PQC	

20	Shall support 32K queues per system		PQC	
21	Shall support following class of service features:		PQC	
	a) Classification, policing, marking, shaping, filtering			
	b) Manage congestion using a weighted random early detection (WRED) algorithm			
	c) RFC 2474, Definition of the Differentiated Services Field in the IPv4 and IPv6 Headers			
	d) Single Rate Three Color Policer RFC 2697			
	e) RFC 2698, A Two Rate Three Color Policer			
	f) Round Robin, WFQ, CBWFQ scheduling algorithms			
	g) RFC 2597, Assured Forwarding PHB Group			
	h) RFC 2598, An Expedited Forwarding PHB			
	i) Router should be able to classify based on 802.1 ad, 802.1 p, EXP and DSCP bits			
22	The router shall support traffic interface mirroring in both ingress & egress directions for both IPv4 & IPv6		PQC	
23	The router shall support provision for event based scripts that shall be capable of performing actions based on certain triggers		PQC	
24	The router shall support aggregated Ethernet and it shall be possible to bundle upto 16 links		PQC	
25	Shall support following MPLS features		PQC	
	a) LDP and RSVP signaling			
	b) RFC 5036, LDP Specification			
	c) RFC 3212, Constraint-Based LSP Setup using LDP			
	d) RFC 3215, LDP State Machine			
	e) RFC 3478, Graceful Restart Mechanism for LDP			
	f) RFC 2858, Multiprotocol Extensions for BGP-4			
	g) RFC 3063, MPLS Loop Prevention Mechanism			

	h) RFC 3031, Multiprotocol Label Switching Architecture			
	i) RFC 3032, MPLS Label Stack Encoding			
26	The router should be able to do load-balancing over multiple equal cost MPLS LSP		PQC	
27	The Router shall support MPLS Fast Reroute both link protection and Node protection		PQC	
28	MPLS Ping, MPLS Trace Route		PQC	
29	Fast Reroute Extensions to RSVP-TE for LSP Tunnels		PQC	
30	The router shall Support of Sync-E & PTP technology		PQC	
31	Shall support MPLS based VPN services		PQC	
	a) L3VPN, L2VPN (Kompella BGP/ Martini LDP),			
	b) Internet draft, draft-ietf-12vpn-vpls-bgp-08.txt, Virtual Private LAN Service (VPLS) Using BGP for Auto- discovery and Signalling			
	c) RFC 4762 Virtual Private LAN Service (VPLS) Using Label Distribution Protocol (LDP) Signalling			
	d) Next Generation mVPN (P2MP) based on (Draft-ietf-13vpn-2547bis-mcast-01.txt) & mVPN (draft-rosen-vpn-mcast).			
32	The router shall support the following routing features		PQC	
	a) BGPv4, BGP confederations and route reflector		PQC	
	b) Dynamic Host Configuration Protocol (DHCP)		PQC	
	c) RFC 3101, The OSPF NSSA Option		PQC	
	d) RFC 2328, OSPF Version 2		PQC	
	e) RFC 3623, OSPF Graceful Restart		PQC	
	f) RFC 3630, Traffic Engineering (TE) Extensions to OSPF Version 2		PQC	
	g) RFC 1195, Use of OSI IS-IS for Routing in TCP/IP and Dual Environments		PQC	
	h) RFC 2104, HMAC: Keyed-Hashing for Message Authentication		PQC	
	i) RFC 2973, IS-IS Mesh Groups		PQC	
	j) RFC 3277, IS-IS Transient Black hole Avoidance		Optional	

	k) RFC 3358, Optional Checksums in IS-IS		PQC	
	l) RFC 3359, Reserved Type, Length and Value (TLV) Code points in IS-IS		PQC	
	m) RFC 3373, Three-Way Handshake for IS-IS Point-to-Point Adjacencies		PQC	
	n) RFC 5305, IS-IS Extensions for Traffic Engineering		PQC	
	o) RFC 3847, Restart Signalling for IS-IS.		PQC	
	p) RFC 3590, Source Address Selection for Multicast Listener Discovery Protocol		PQC	
33	IGMP v2 and v3 as described in RFC 2236 and RFC 3376 with IGMP Routing Policies to filter IGMP requests		PQC	
34	The router shall support Virtual Router Redundancy Protocol (VRRP) as per IETF RFC 3768		PQC	
35	Router shall support SNMP v2/v3 and NTP		PQC	
36	Shall support BFD for both single hop and multihop sessions		PQC	
37	Shall support the following OAM features and actions such as syslog/link down should be configurable on OAM event trigger:		PQC	
	a) 802.3ah			
	b) 802.lag			
	c) Y.1731			
38	Shall support Multi-chassis LAG		PQC	
39	IPv6 Features		PQC	
	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			
	h) 66PE and 6VPE			
40	Multicast Feature: It shall support following:		PQC	
	a) It shall support IGMP snooping v2/v3			
	b) The router shall support PIM Sparse Mode, RFC4601(optional)			
	c) Rendezvous Point (RP) - ability to be configured as an RP			
	d) RFC 3569, Source Specific Multicast (SSM)			

	e) RFC 2365, Administratively Scoped IP Multicast			
	f) RFC 3446, Anycast Rendezvous Point (RP) Mechanism using Protocol Independent Multicast (PIM) and Multicast Source Discovery Protocol (MSDP).			
	g) RFC 3618, Multicast Source Discovery Protocol (MSDP)			
41	The proposed router should be NEBS level 3 compliant. NEBS Certification is not required for PMA. However OEM has to produce certificate from standard lab approved or authorized by Govt. of India that the supplied Products are equivalent to NEBS and meet all standard and specification of NEBS		PQC	
42	The device should be comply to the following safety standards		PQC	
	a) EN 55022 Class A Emissions (Europe)			
	b) FCC Class A (USA) Radiated Emissions			
	c) UL 60950-1 Information Technology Equipment -Safety			
	d) EN 60825-1 /EN60950-1 Safety of Laser Products			
	e) EN-61000-4-11 Voltage Dips and Sags			
	f) ETS-300386 Electromagnetic Compatibility Requirements			
	g) The device will conform to the following EN/IEC standard:			
	i. 61000-4-2. ESD			
	ii. 61000-4-3 Radiated Immunity			
	iii. 61000-4-4. EFT			
	iv. 61000-4-5. Surge			
	v. 61000-4-6. Low Frequency common immunity			
43	The offered devices must support following functionalities to support 3rd party SDN (in future)		PQC	
	a) The router should support RFC 6020, YANG - A Data Modeling Language for the Network Configuration		PQC	
	b) Protocol (NETCONF)		PQC	
	c) The solution should support the network configuration protocol (NETCONF) that provides mechanisms to install,		PQC	

	manipulate, and delete the configuration of network devices, RFC 6241			
	d) The router should be able to act as Path computation client in the PCE architecture defined in RFC 4655.		PQC	
	e) The router should support PCECP as defined in RFC5440.		PQC	
	f) The router should support BGP link-state (BGP-LS), RFC 4655		PQC	
	g) The router should support SPRING		Optional	
44	Devices shall support following for Provisioning			
	a) Use NETCONF (RFC 6241, RFC 6242, RFC 5277)		PQC	
	b) REST based CRUD operations for configuration and management.		PQC	
	c) Web Services based operations for configuration and management		Optional	
45	The offered devices must support API/NBis for auto discovery of Services and Physical & Logical Topology		PQC	
46	TELEMETRY Function: It shall support following:			
	a) The router should support telemetry based on push model for monitoring network devices		PQC	
	b) The router should support various software models/sensors for capturing different health parameters from the devices		PQC	
	c) The router should support sending telemetry data to multiple consumers simultaneously		PQC	
	d) The router shall support GPB/ GRPC/ KAFKA encoding for telemetry data		PQC	
	e) The software model/ sensors should be based on either yang, xml or open config.		PQC	
	f) The solution shall use either UDP or GRPC for transport of telemetry data		PQC	
	g) The system should support streaming granularity of atleast 10 sec		PQC	
	h) The router shall have the ability to interact with open standard based tools		PQC	

	i) The system should support REST API for communication with third party tools and applications		PQC	
	j) Enabling telemetry should not have any adverse impact on the performance of the device/router		PQC	
	k) Some of the streaming models/ sensors the router should support are:			
	System			
	Chassis Environment		PQC	
	Line card utilization (memory, processor, QoS, Temp, Port utilization), errors counters		PQC	
	Controller Card sensors (memory, CPU, Temp etc)		PQC	
	Fabric statistics		Optional	
	ARP table state		Optional	
	Routing prefix information		Optional	
	Interface			
	Interface statistics (Physical and logical interfaces)		PQC	
	Interface optical diagnostic		Optional	
	Congestion and latency		Optional	
	Filter statistics		Optional	
	Protocol			
	BGP peer information		Optional	
	ISIS State, Interface, Adjacency statistics, LSDB		Optional	
	ISIS SPRING/ Segment Routing Statistics		Optional	
	RSVP Interface Statistics		PQC	
	LSP statistics		PQC	
	LSP Event Export, Experimental		PQC	
	IP SLA/RPM (or equivalent) reporting		PQC	
	Segment Routing statistics		PQC	
	DHCP statistics		Optional	
47	Router Should Support Dual Image/Partition with USB flash drive booting option for OS recovery		PQC	
48	Router should support jumbo frame.		PQC	
49	Router should support port mirroring		PQC	
50	Router should support security features of Broadcast/ Mulitcast/ Unicast Storm control		PQC	
51	Router should comply to following Temperature performance parameters:		PQC	

	i. Operating Temperature: 0 to 40 degree C or better			
	ii. Storage Temperature: -10 to 60 degree C or better			
52	Routers should support following Metro Ethernet Features:		PQC	
	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.			
53	The operating system of the Routers category/ series/ family should be MEF-9/14 or CE(Carrier Ethernet) or latest Certified/compliant.		PQC	
54	The Router shall be designed for continuous operations with dual fan system		PQC	
55	Router should support CFM and LFM alarms		PQC	
56	Shall support HQoS, option of traffic shaping per VLAN based.		PQC	
	i. Shall support at least 32K Queues.			
	ii. Per-VLAN policing			
	iii. Per-VLAN rewrite			
	iv. Per-VLAN two-rate tri-color marking.			
	v. Per-VLAN classification			
	vi. Per-VLAN filtering			
57	Support for P and PE router functionality for MPLS on the same router simultaneously and on all the interfaces.		PQC	
58	Router shall support E-Line or E-LAN MEF standards.		PQC	
59	Routers should be rack mountable to fit into a standard 19-inch rack		PQC	
60	OEM shall ensure that use of third party optics shall not be explicitly blocked on the Router. Router must support all MSA complied Optics available in market		PQC	
61	Segment Routing			
i.	Router should be able to support SR standards on IPv6 whenever it is firmed upto without any cost to RCIL		PQC	
ii.	The router should support SR-MPLS dataplane and protocols OSPF,IS- IS and BGP Segment routing Extensions		PQC	

iii.	Traffic Steering of SR policies with Autoroute Include and Segment Routing TI-LFA SRLG Protection.		Optional	
iv.	LSP ping, trace-route, Pseudo wire Ping over Segment Routing, trace route for binding-SID		PQC	
v.	MPLS-LDP interworking with SR-ISIS and SR-OSPF		PQC	
vi.	TI-LFA with IGP (Link, Node, Local SRLG, Remote SRLG protection)		Optional	
vii.	Controller instantiated SR Policy (PCEP, BGP) and SR policy based on On demand next hop		Optional	
viii.	Router should have capability to calculate Bandwidth based path using centralized controller.		PQC	
ix.	Shall support SR and MPLS (LDP) Interworking Mapping Server		PQC	
x.	The router shall support dynamic point-to-point interface latency performance measurement. The measurement must be integrated in the IGP and BGP LS for SDN Controller Analysis		Optional	
xi.	Label distribution protocol and segment routing should coexist and there should support option to prefer LDP over segment routing.		PQC	
62	EVPN Features			
i.	Router should have support of Ethernet VPN (EVPN with single homing, multi homing		PQC	
ii.	Router should have support of following features on EVPN: EVPN-IRB, EVPN VPWS, EVPN VPWS Preferred Path over SR-TE Policy		Optional	
63	All slots supporting interface modules should be universal i.e. any card in any slot.		PQC	
64	Router to support GRE tunnels (RFC 2784).		PQC	
65	**On Site OEM Warranty (Year) - 3 years**			

SOR item 6: Router Type X Technical specification

MPLS Super Core Router			
SN	**Specifications**	**Requirements**	**Compliance**
1	The router should have 8 x 100G QSFP28 ports supporting LR, SR, ER and ZR optics.		

2	The router should have option for 4x100G on QSFP28 ports , 4x400G on QSFP-DD Ports and BNG functionality by upgrading the Hardware/ license/ OS/ Optics .		
3	The Router Hardware should support at least 2.4Tbps (Full Duplex) throughput rate .		
4	The router should support the following functionality from the day one:-		
	a) IPv4 RIB/FIB	10M / 4M	
	b) Ipv6 RIB/FIB	6M / 1M	
	c) MPLS Labels	64K	
	d) Label Stack	8	
	e) L2/L3 VPN	32 L3/L2 MPLS VPN	
	f) Packet Forwarding Rate	1Bpps	
	g) Firewall Filters	8K	
	h) RSVP LSP ingress/transit	16K/96K	
	i) Segment Routing IGP prefix Scale	48K	
5	Proposed Router can either be modular or fixed type.		
6	Router shall have option of checking configuration before committing and option of rolling back to at least five configurations		
7	Router should have redundant DC (with the operating range of -40 to -72 VDC) power supply.		
8	Digital Optical Monitoring (DOM) should be supported, optics information retrievable including RX/ TX-power, threshold-monitoring/ alarming, inventory.		
9	It shall support role-based privileges for the system access and RADIUS/ TACAS authentication for the System admin.		
10	The router should have a Console or Out-of-band Management.		
11	Alerts for environmental or other hardware-based alarms should be supported via SNMP		
12	All interfaces shall support services like L2VPN, L3VPN and multicast VPN (in future if required) for both Ipv4 and Ipv6		
13	Security:		
	a) The router should have mechanism to protect itself from DdoS attack.		
	b) The router should have ability to support MACSEC if required by Upgrading OS/License.	Optional	
14	The router should be Ipv6 ready from day one.		
15	The router should support filtering based on different parameters like: src ip, 40s tip, src port, dst port, protocol etc		

16	The router should support IPFIX/ Netflow/ Jflow or equivalent if required by upgrading OS/License	Optional	
17	The router should support IP SLA or RPM (or equivalent) for performance measurements, it should also support monitoring of IP SLA/RPM (or equivalent) probes using SNMP polling (OEM has to provide SNMP MIB information) or through syslog		
18	Shall support QoS, option of traffic shaping per Interface based.		
19	Shall support following class of service features:		
	a) Classification, policing, marking, shaping, filtering		
	b) Manage congestion using a weighted random early detection (WRED) algorithm		
	c) RFC 2474, Definition of the Differentiated Services Field in the Ipv4 and Ipv6 Headers		
	d) Single Rate Three Color Policer RFC 2697		
	e) RFC 2698, A Two Rate Three Color Policer		
	f) Round Robin, WFQ, CBWFQ scheduling algorithms		
	g) Router should be able to classify based on 802.1 ad, 802.1 p, EXP and DSCP bits		
20	The router shall support traffic interface mirroring in both ingress & egress directions for both Ipv4 & Ipv6. It should also be able to mirror local and multicast traffic (in future if required).		
21	The router shall support provision for event based scripts that shall be capable of performing actions based on certain triggers		
22	The router shall support aggregated Ethernet and it shall be possible to bundle Upto 64 links Shall support following MPLS features		
	a) LDP and RSVP signaling		
	b) RFC 5036, LDP Specification		
	c) RFC 3478, Graceful Restart Mechanism for LDP		
	d) Support for MPLS Traffic engineering using RSVP-TE protocol mechanisms and compliance with RFC3209		
	e) RFC 3564 or IETF compliant Diffserv aware MPLS TE		
	f) RFC 4105 Support for Inter-Area TE		
	g) Support for P2MP LSPs and the ability to map native multicast traffic on the P2MP LSP Tunnels in future if required.	Optional	
	h) Support for P2MP LSPs for building a PIM free MVPN Core	Optional	

	i) Support for LFA and Ti-LFA		
	j) Support for FRR for P2MP LSPs in future if required.	Optional	
	k) Support for RSVP fast hellos		
	l) MPLS ping and traceroute		
	m) Fast Reroute Extensions to RSVP-TE for LSP Tunnels		
23	The router should be able to do load-balancing over multiple equal cost MPLS LSP		
24	The Router shall support MPLS Fast Reroute both link protection and Node protection.		
25	Shall support MPLS based VPN services		
	a) L3VPN		
	b) L2VPN (Kompella BGP/ Martini LDP/EVPN-VPWS)		
	c) NG-MVPN (P2MP) in future if required		
26	The router shall support the following routing features		
	a) RFC compliant BGP v4		
	b) RFC7911 Advertisement of Multiple Paths in BGP		
	c) RFC2385 TCP MD5		
	d) RFC7752 BGP-LS		
	e) RFC8669 Segment Routing Prefix SID extensions for BGP		
	f) RFC8360 RPKI support		
	g) RFC1587/RFC3101		
	h) RFC2154 OSPF MD5		
	i) RFC2328 OSPF v2		
	j) RFC3623 Graceful OSPF Restart		
	k) RFC5340 OSPF v3		
	l) RFC2362 PIM SM		
	m) PIM DM/PIM- SSM		
	n) RFC 3630, Traffic Engineering (TE) Extensions to OSPF Version 2		
	o) RFC 5305, IS-IS Extensions for Traffic Engineering		
	p) RFC 3847, Restart Signaling for IS-IS		
	q) IGMP v2 and v3 as described in RFC 2236 and RFC 3376 with IGMP Routing Policies to filter IGMP requests.		
	r) Router shall support SNMP v2/v3 and NTP		
	s) Shall support BFD : single hop, multi-hop and micro BFD or equivalent features		
	t) Router to support GRE tunnels (RFC 2784)	Optional	
27	Ipv6 Features :		
	a) Ipv6 Ping		

	b) Ipv6 trace route		
	c) OSPF v3		
	d) IS-IS		
	e) Ipv6 CoS (classification & rewrite, scheduling based on TC)		
	f) Ipv6 ACL		
	g) 6PE and 6VPE		
28	The proposed router should be NEBS level 3 compliant. NEBS Certification is not required for PMA. However, OEM has to produce certificate from standard lab approved or authorized by Govt. of India that the supplied Products are equivalent to NEBS and meet all standard and specification of NEBS.		
29	The device should comply to the following safety standards		
	a) EN 55022/EN55032 Class A Emissions (Europe)		
	b) FCC Class A (USA) Radiated Emissions		
	c) UL 60950-1 Information Technology Equipment – Safety		
	d) EN 60825-1 /EN60950-1 Safety of Laser Products		
30	The offered devices must support following functionalities to support 3rd party SDN (in future)		
	a) The router should support RFC 6020, YANG – A Data Modeling Language for the Network Configuration		
	b) Protocol (NETCONF)		
	c) The solution should support the network configuration protocol (NETCONF) that provides mechanisms to install, manipulate, and delete the configuration of network devices, RFC 6241/RFC 4741		
	d) The router should be able to act as Path computation client in the PCE architecture defined in RFC 4655.	Optional	
	e) The router should support PCECP as defined in RFC5440		
	f) The router should support BGP link-state (BGP-LS), RFC 4655		
	g) The router should support SPRING		
	h) The router should have support for NBI/API interfaces and protocols that would allow auto discovery of nodes, services, topology by NMS/EMS, Controller, Orchestration systems etc.		
31	TELEMETRY Function: It shall support following:		
	a) The router should support telemetry based on push model for monitoring network devices		

	b) The router should support various software models/sensors for capturing different health parameters from the devices		
	c) The router should support sending telemetry data to multiple consumers simultaneously		
	d) The router shall support GPB/GRPC/KAFKA encoding for telemetry data	Optional	
	e) The software model/sensors should be based on either yang, xml or open config		
	f) The solution shall use either UDP or GRPC for transport of telemetry data		
	g) The system should support streaming granularity of at least 10 sec		
	h) The router shall have the ability to interact with open standard based tools		
	i) The system should support REST API for communication with third party tools and applications		
	j) Enabling telemetry should not have any adverse impact on the performance of the device/router		
32	Router Should Support Dual Image/ Partition with USB flash drive booting option for OS recovery		
33	Router should support jumbo frame.		
34	Router should comply to following Temperature performance parameters:		
	i. Operating Temperature: 0 to 40 degree C or better		
	ii. Storage Temperature -10 to 60 degree C or better		
35	The operating system of the Routers category/series/family should be MEF-9/14 or CE(Carrier Ethernet) or latest Certified/compliant if not then roadmap for the same shall be submitted at the time of bidding.		
36	The Router shall be designed for continuous operations with dual fan system.		
37	Routers should be rack mountable to fit into a standard 19-inch rack		
38	The OEM shall ensure that the use of third-party optics shall not be explicitly blocked on the Router. Router must support all MSA complied optics available in market		
39	Segment Routing		
	a) The router should support SR-MPLS data plane.		
	b) Traffic Steering of SR policies with Autoroute Include and Segment Routing TI-LFA		

	c) LSP ping, trace-route over Segment Routing, trace route for binding-SID		
	d) MPLS-LDP interworking with SR-ISIS and SR-OSPF		
	e) Router should have capability to calculate Bandwidth based path using centralized controller.		
	f) Shall support SR and MPLS (LDP) Interworking Mapping Server		
	g) Label distribution protocol and segment routing should coexist.		
40	Deleted.		
41	The router should support third Party standard optical modules like QSFP+, QSFP28, QSFP56-DD and etc		
42	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. Any license fee required to be paid for hardware & software during the life cycle of the equipment shall be included in the rate quoted by the tenderer. There shall be no post contractual liability of license fee on RailTel for hardware & software supplied by tenderer.		
43	**On Site OEM Warranty (Year) - 3 years**		

SOR item 7: Switch Type I Technical specification

SN	Specification	Compliance
1	The LAN switch shall be standalone/ rack mountable with the following ports:	
2	**20 Nos. 10G SFP+ and 2 Nos. QSFP+ 40G ports.**	
3	The switch should support RJ-45 console port and industry standard CLI	
4	The switch should support Reset button to make switch reset to default.	
5	The switch should support RJ-45 management port	
6	Switch should have 02 power supply in 1+1 in redundant mode. It should support type (-48v DC supply) of power source supply on a Single Power Port.	
7	**General Specification:**	
8	The LAN Switch should support below specs Min **256MB RAM, 16MB flash, 1.5MB buffer.**	

9	The LAN switch shall be available with minimum Switching Fabric. 128 Gbps	
10	The LAN switch shall have minimum packet forwarding rate at 64-byte packet length 95 Mpps	
11	The LAN switch shall support minimum 16K MAC address.	
12	The LAN switch shall support 1024 static MAC address entries	
13	The LAN switch shall have 1K IGMP and 1K MLD snooping groups.	
14	Switch should support Dying Gasp or Syslog/SNMP-Trap for quick trouble shooting during power failures/ system shut down.	
15	**Layer-2 Features:**	
16	The LAN switch shall support IEEE 802.1Q VLAN up to 255 Active VLANs and 4094 VLAN ID.	
17	Deleted	
18	Deleted	
19	It shall support edge port in STP, RSTP, MSTP (16 instances), BPDU filtering.	
20	It shall support 802.1d, 802.1p, 802.1Q, 802.1s, 802.1w, 802.1x, 802.3x, 802.1ab.	
21	It shall support spanning-tree root guard and loop guard to prevent other edge switches becoming the root bridge.	
22	It shall support IGMP snooping v1, v2 and v3, IGMP Proxy, IGMP Qurier and MLD/MLD Qurier.	
23	It shall support Link Aggregation Protocol (LACP) as per IEEE 802.3ad and and 8 groups per device/8 ports per group.	
24	It shall Support for Detection of Unidirectional links and to disable them to avoid problems such as spanning tree loops and support Unidirectional Link Detection (UDLD) or any other industry equivalent protocol	
25	It shall have supports L2/L3/L4 QoS/CoS solutions help ensure that critical network services such as VoIP, ERP, Intranet, and video conferencing are served with proper priority.	
26	It shall support unknown unicast and multicast port blocking to allow tight control by filtering packets that the switch has not already learned how to forward.	
27	It shall support unicast MAC filtering to prevent the forwarding of any type of packet with a matching MAC address.	
28	Switch shall support for Admission Control features to improve the network's ability to automatically identify, prevent, and respond to security threats and also to enable the switches to collaborate with third-party solutions for security-policy compliance and enforcement before a host is permitted to access the network.	

29	It shall be able to discover the neighboring device of the same OEM giving the details about the platform, IP Address, Link connected through etc, thus helping in troubleshooting connectivity problems. It shall support LLDP or LLDP-MED for network discovery	
30	There shall be support for Asynchronous data flows upstream and downstream from the end station or on the uplink using ingress policing and egress shaping	
31	It shall support Optical Transceiver Digital Diagnostic Monitoring and link layer monitoring through 802.3ah or UDLD/ IPSLA/ TWAMP	
32	It shall support configuration rollback to replace current configuration with any saved configuration file	
33	Deleted	
34	**Quality of Service (QoS) Features:**	
35	The LAN switch shall have per-port broadcast, multicast, and unicast storm control.	
36	There shall be 8 or better hardware-based queues per port for flexible QoS management	
37	There shall be Shaping and Scheduling supports of WRR/ WRED/ SRR	
38	The switch should support QOS based on Switch port, 802.1p priority queues, vLAN ID, MAC addresses, IPv4/ Ipv6 addresses, DSCP, ToS, Protocol type, TCP/UDP ports,Ipv6 traffic class	
39	It should support Time-Based QOS	
40	It shall support BPDU filtering feature, to shut down Spanning Tree Protocol Port Fast enabled interfaces when BPDUs are received to avoid accidental topology loops.	
41	**Network Security Features:**	
42	The LAN switch shall support IEEE 802.1x to allow dynamic, port-based security, providing user authentication, Dynamic VLAN assignment	
43	The LAN Switch shall support Compound Authentication and Change of authorization	
44	It shall support unicast MAC filtering to prevent the forwarding of any type of packet with a matching MAC address.	
45	It shall support unknown unicast and multicast port blocking to allow tight control by filtering packets that the switch has not already learned how to forward	
46	It shall support IGMP filtering to provide multicast authentication by filtering out no subscribers and limits the number of concurrent multicast streams available per port	
47	It shall support for SSHv2, SSL v2/v3, SNMPv3 to provide network security by encrypting administrator traffic during Telnet, SSH and SNMP sessions.	
48	It shall support IMPB, DHCP snooping, IPSG and dynamic/static ARP inspection	

49	The switch shall be able to work on both Ipv4 and Ipv6 (dual stack) from day one	
50	It shall support Port Mirroring (minimum 4 mirror session) based on port basis/ VLAN basis to support intrusion prevention system deployment in different VLANs.	
51	It shall support RADIUS authentication to enable centralized control of the switch and restrict unauthorized users from altering the configuration.	
52	It shall support MAC address notification to allow administrators to be notified of users added to or removed from the network	
53	It shall support port security up to 1K MAC address to secure the access to an access or trunk port based on MAC address. After a specific timeframe, the aging feature should remove the MAC address from the switch to allow another device to connect to the same port.	
54	It shall support multilevel security on console access to prevent unauthorized users from altering the switch configuration.	
55	It shall support BPDU filtering feature, to shut down Spanning Tree Protocol Port Fast enabled interfaces when BPDUs are received to avoid accidental topology loops.	
56	It shall support Spanning-Tree Root Guard (STRG) to prevent edge devices not in the network administrator's control from becoming Spanning Tree Protocol root nodes.	
57	**Management:**	
58	Deleted	
59	It shall support Unidirectional Link Detection (UDLD) or similar mechanism to detect Unidirectional Link Fault.	
60	It shall have Layer 2 trace route to ease troubleshooting by identifying the physical path that a packet takes from source to destination	
61	It shall support Web based or Trivial File Transfer Protocol (TFTP) and File Transfer Protocol (FTP), SCP	
62	It shall support Simple Network Time Protocol/ Network Timing Protocol (SNTP/ NTP) to provide an accurate and consistent time stamp to all intranet switches	
63	It shall support RMON v1 and v2 standards and 4 RMON groups	
64	It shall support SNMPv1, SNMPv2c, and SNMPv3 and Telnet interface support to deliver comprehensive in-band management, and a CLI-based management console to provide detailed out-of-band management and Web Management for better manageability.	
65	It should support routing protocol static and RIP/OSPF.	
66	Switch should support Surge Protection on power input	
67	Switch should support Surge Protection to ± 2 kV (line-earth) and ± 2 kW (line-line) on power input	
68	Loopback Detection (LBD)	
69	It should support 63 IP interface, 8 loopback interfaces and Intervlan routing	

70	It shall support default routing and static routing Support for 128 static Ipv4 routes and Support 64 static Ipv6 routes	
71	It shall support VRRP v2	
72	Should support authentication to allow an IP phone and a PC to authenticate on the same switch port while being placed on the appropriate voice and data VLANs or Should Support 802.1x based access control.	
73	Deleted	
74	It should support Port-based VLAN, MAC-based VLAN, VLAN Trunking, Voice VLAN and Surveillance VLAN, Private VLAN, GVRP, GARP/VTP, IP-Subnet Based VLAN and ISM VLAN (MVR)/IGMP filtering, Guest VLAN	
75	Should have the ability to disable per-VLAN MAC learning	
76	Should support MAC Authentication Bypass (MAB)	
77	Switch must support Zero Touch Deployment feature so that it can automatically obtain IP address and configuration file from remote server	
78	It should support flex link or Back up link.	
79	Deleted	
80	It should support Ethernet Ring Protection Switching ERPS v1 and v2 **for main ring and sub rings**: G.8032 ERPS Ring Protection Switching provides loop avoidance with redundancy in Layer-2 Ethernet networks using concept of RPL (Ring Protection Link). The switch completion time (transfer time) for a failure on a ring link shall be less than 50ms.	
81	It should support IEEE 802.1QinQ mechanism and VLAN translation	
82	It shall support built-in power-on diagnostics and system monitoring capabilities to detect hardware failures.	
83	Bandwidth management: Flow-based bandwidth management, ingress rate-limiting; egress rate shaping per port.	
84	It shall loopback detection and shut or disable a physical port and VLAN based on detection of loop on that interface	
85	To check support for Standard and Extended Access Lists	
86	It shall support access list based on Ipv4/v6 address Protocol type Ipv6 flow label VLAN-ID MAC-ID DSCP Ipv6 traffic class TCP/UDP Port and User-defined packet content	
87	Switch shall support Time based ACL	
88	The Switch should support minimum 1K Ingress Access Control Entries	
89	To check IGMP static join feature.	
90	Deleted	
91	To check Login and Access control List violations shall generate alarms to Network Management System and a log of the same shall be generated.	
92	It should support of ICMPv4, ICMPv6, Telnet v4, Telnet v6, SNMP v4 and SNMP v6	
93	Switch should support PVST or equivalent.	

94	Switch should support CPU monitoring, Memory monitoring and password recovery.	
95	It should support MAC flapping feature to block a duplicate MAC to learn from uplink and downlink interface	
96	It should support duplicate address inspection	
97	Support multiple privilege level to provide different level of access on console port and telnet sessions	
98	Switch should support traffic segmentation	
99	It should support DOS attack prevention and URPF	
100	Switch should support sflow or netfow	
101	Switch should support Ipv6 Neighbor Discovery (ND)	
102	Deleted	
103	It should support DHCP Client, DHCP Server and DHCP Relay with option 82	
104	It should support IEEE 802.1ag Ethernet OAM: Connectivity Fault Management (Support 32 MEPs)	
105	It should support Ethernet OAM compliant with IEEE 802.3ah/Y.1731	
106	It should support Radius and TACACS + Switch, Local Database	
107	It should support L2 Protocol Tunnelling for STP	
108	Should support port and vlan mirroring and jumbo frame 9K.	
109	Switch should support system log, traceroute, PING Size up to 9000 bytes or more.	
110	**Switch should have dual image. Switch shouldn't go in monitor in any case mode if power off during firmware upgrade.**	
111	Should support Optical Transceiver Digital Diagnostic Monitoring for All SFP ports of 1/10G.	
112	**Switch should support following SNMP traps or syslog**	
113	i. Interface UP & Down	
114	ii. Optical power SFP threshold alarms	
115	iii. STP Topology Changes and New root bridge	
116	iv. LLDP table changes	
117	v. Threshold alarms for Temperature.	
118	vi. Ethernet OAM SNMP alarms.	
119	Deleted	
120	Switch should comply to following Temperature performance parameters :	
121	i. Operating Temperature – min 0 to 50 °C	
122	ii. Storage Temperature - min -20 to 70 °C	
123	**Safety Requirement :-**	
124	Switch should have safety compliance of CE or FCC or equivalent	
125	**Electromagnetic Compatibility (EMC) Requirements:-**	
126	Switch should have EMC compliance of CE or equivalent	
127	Deleted	

128	Deleted	
129	Should be allowed Ipv6 ready from Day One.	
130	It shall have comprehensive debugging features required for software & hardware fault diagnosis.	
131	Switch should come with default accessories like Switch 3PIN Power cable, RJ-45 console cable, 2 mounting brackets for 19" rack mounting, Mounting kit, Quick Installation Guide.	
132	Deleted	
133	All 10G interfaces shall be of SFP+ type and shall support LR/ER/ZR. Use of third party optics should not be locked for all interfaces	
134	**On Site OEM Warranty (Year) – 3 years**	

SOR item 8: Switch Type IV Technical specification

SN	Description	Compliance
1	Should have 8 ports 10/100/1000 Mbps Base T	
2	Should have support for 2 ports SFP Based Gigabit ports.	
3	Should have at least 20 Gbps switching fabric.	
4	Should support at least 8K entries in the MAC table.	
5	Packet forwading rates 14 million PPS	
6	Should Support 255 minimum VLANs.	
7	Switch should support IEEE 802.3af & IEEE 802.3at on Ethernet ports & Min 120W PoE Power Budget	
8	Should have AC Power Supply 100 to 240 V AC with 50 to 60 Hz and equipped with 3 pin plug.	
9	Should support Dual Images.	
10	Should support port mirroring and jumbo frame.	
11	**Should support following for min. 64 Groups :**	
	i. IGMP Snooping,	
	ii. IGMP v1/v2/v3 awareness Snooping,	
	iii. IGMP Snooping Queried.	
12	Should support RSTP, spanning-tree root guard, Port Fast and BPDU Guard/Filter or similar functionalities.	
13	**Switch should support :**	
	i. Surge protection of ± 2 kV (line-earth) and ± 1 kW (line-line) on power	
	ii. Surge protection of ± 4 kV on Ethernet ports and this will be applicable in case switch has copper ports.	
14	**Should support following security features viz.:**	
	i. Web Management (HTTPS),	
	ii. Broadcast/Multicast/Unicast Storm Control	
	iii. DoS Attack Prevention	

15	**Switch should support 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. Threshold alarms for Temperature.	
16	**Switch should comply to following Temperature performance parameters :**	
	i. Operating Temperature - min 0 to 50 °C	
	ii. Storage Temperature - min -0 to 70 °C (-40 to 158 °F)	
17	It shall support MAC address notification to allow administrators to be notified of users added to or removed from the network.	
18	The switch shall be designed for continuous operations.	
19	IPv6/v4-L3 and IPv6-Multicast functionalities/features for Switches are desired but not mandatory.	
20	**Safety Requirement :-**	
	Switch should have safety compliance of UL.	
21	**Electromagnetic Compatibility (EMC) Requirements:-**	
	Switch should have EMC compliance of CE and FCC.	
22	The LAN switch shall support a console port or auxiliary/Ethernet port for the purpose of local and remote configuration and diagnostics.	
23	IPv6 feature should be ready from day 1.	
24	**Qualitative Requirements:-**	
	i. The MTBF (Mean Time Between Failure) and MTTR (Mean Time To Repair) predicted and observed values shall be furnished along with calculations by the manufacturer.	
25	**On Site OEM Warranty (Year) - 3 years**	
26	Use of third party optics should not be locked for all interfaces	

SOR item 9: Switch Type V Technical specification

SN	Description	Compliance
1	Should have 24 ports SFP Based Gigabit ports.	
2	Should have support for 4 ports SFP+ Based 10G ports.	
3	Should have at least 120 Gbps switching fabric.	
4	Packet forwading rates 90 million PPS	
5	Should support at least 16K entries in the MAC table.	
6	Should Support 255 minimum VLANs.	
7	**Switch should have 02 power supply in 1+1 in redundant mode as given below:**	

	A. It should support both type (-48v DC & 240v AC supply) of power source supply. DC power supply should work as a redundant power supply to power-on the switch in case failure of AC power supply. **OR** B. Switch should have support AC Power Supply 100 to 240 V AC with 50 to 60 Hz in redundant mode	
8	Should support Dual Images.	
9	Should support Optical Transceiver Digital Diagnostic Monitoring for All SFP ports of 1G and 10G	
10	Should support port mirroring and jumbo frame.	
11	**Should support following for min. 64 Groups :**	
	i. IGMP Snooping	
	ii. IGMP v1/v2/v3 awareness Snooping	
	iii. IGMP Snooping Queried.	
12	Should support RSTP, MSTP, spanning-tree root guard, Port Fast and BPDU Guard/Filter or similar functionalities.	
13	**Should support following security features viz.:**	
	i. Web Management (HTTPS),	
	ii. Broadcast/Multicast/Unicast Storm Control,	
	iii. DoS Attack Prevention	
14	**Switch should support following SNMP traps or syslog**	
	i. Interface UP & Down	
	ii. Optical power SFP threshold ala1rms	
	iii. STP Topology Changes and New root bridge	
	iv. LLDP table changes	
	v. Threshold alarms for Temperature.	
	vi. Ethernet OAM SNMP alarms.	
15	**Switch should comply to following Temperature performance parameters :**	
	i. Operating Temperature - min 0 to 50 °C	
	ii. Storage Temperature - min -0 to 70 °C (-40 to 158 °F)	
16	It shall support MAC address notification to allow administrators to be notified of users added to or removed from the network.	
17	The switch shall be designed for continuous operations.	
18	IPv6/v4-L3 and IPv6-Multicast functionalities/features for Switches are desired but not mandatory.	
19	**Safety Requirement :-**	
	Switch should have safety compliance of UL.	
20	**Electromagnetic Compatibility (EMC) Requirements:-**	
	Switch should have EMC compliance of CE and FCC.	
21	The LAN switch shall support a console port or auxiliary/Ethernet port for the purpose of local and remote configuration and diagnostics.	

22	The LAN switch shall support built in power diagnostics system to detect hardware failures.	
23	IPv6 feature should be ready from day 1.	
24	**Qualitative Requirements:-**	
	i. The MTBF (Mean Time Between Failure) and MTTR (Mean Time To Repair) predicted and observed values shall be furnished along with calculations by the manufacturer.	
25	**Switch should support following Metro Ethernet Features:**	
	i. Q in Q , Double VLAN (Q-in-Q) ,Port-based Q-in-Q and VLAN Translation	
	ii. IEEE 802.1ag Ethernet OAM: Connectivity Fault Management	
	iii. Ethernet OAM compliant with IEEE 802.3ah/Y.1731	
	iv. ITU-T G.8032 Ethernet Ring Protection designed for loop protection and fast convergence times (sub 50 ms) in ring topologies.	
	v. L2 Protocol Tunneling.	
	vi. Loopback Detection	
26	The operating system of the Switches category/ series/ family should be MEF-9/14 or CE (Carrier Ethernet) Certified/compliant.	
27	Use of third party optics should not be locked for all interfaces	
28	**On Site OEM Warranty (Year) - 3 years**	

SOR item 10: Switch Type VI Technical specification

SN	Description	Compliance
1	Switch shall be Managed, Non-PoE	
2	Should have 24 Number of 1G Copper Ports	
3	Should have 4 No. of 1 G SFP Port (Uplink)	
4	Switch should have Redundant Power supply (from day one) (AC)	
5	Switching Capacity shall be Non Blocking 56 Gbps	
6	Switch Throughput shall be minimum 41.67 MPPS	
7	Switch should have the following Basic Layer-3 Protocol: Static route IPv4 & IPv6	
8	Switch should have the following Security Features: SSH v1/ v2, SSL v1/v2/v3 , Port Security, Up to 64 MAC addresses per port	
9	Should support the following Management Protocol: CLI, GUI, Telnet, SNMP	
10	Switch should have (RJ-45 Type) Console port	
11	Switch Should support Quality of Service (QoS) features viz: CoS based on, Switch port , 802.1p priority , VLAN ID, MAC address, Ether Type	

12	Switch should comply to following performance parameters: i. Operating Temperature - min 0 to 50 °C ii. Minimum Operating Humidity (%RH) 10 - 95	
13	Switch should have EMI CERTIFICATE of FCC/IC /CE	
14	Switch should have SAFETY CERTIFICATE of UL	
15	The operating system of the Switches series/family shall have MEF-9 & 14 or CE (Carrier Ethernet) certified /compliant.	
16	Switch should support ERPS protocol	
17	Switch should support DHCP Server.	
18	Switch should support 6kv surge for Ethernet ports	
19	**On Site OEM Warranty (Year) - 3 years**	
20	Use of third party optics should not be locked for all interfaces	

SOR item 11: Telepresence Type I Technical specification

SN	Category	Specification	RailTel Requirement	Compliance
1	General	Type of Endpoint	Point to Point / upgradable to 1+3	
2		Does it require mandatory registration with MCU/Gatekeeper	Supported	
3		Video Conferencing system resolution	Up to 4K	
4		Minimum Bandwidth required for Specified video quality at End point/far-site-end	1 Mbps	
5	Camera	Type of Camera	PTZ	
6		Camera Positioning System	Supported	
7		Type of sensor	CMOS	
8		Camera Control (focus, brightness, white balance)	Automatic and Manual both	
9		Multiple Camera System	Single	
10		Optical Zoom	12x or more	
11		Digital Zoom	NA	
12		Field of View at Zoom	70	
13		Pan range Minimum to Maximum (+/- Degree)	(+/-)130	
14		Tilt Range (Degree)	90,-20	
15		Power Cord and Connector to be supplied for codec and camera	Yes	
16	Audio/ Video Specs	System delivers Full HD video and voice and Full HD Content for an over	Yes	

		Full HD/ 1080P experience at specified bandwidth		
17		Video Coding Protocol	H.264 and H.265	
18		System has G 722, G 711, G729 or equivalent wideband audio coding support	Yes	
19		It is possible to see both the near and far site on one screen thus making most efficient use of single display area	Yes	
20		System is equipped with one or more omni directional microphones as required to cover large conference room Mic should have a pickup of at least 10ft	Yes	
21		Min. Number of Microphone Supplied (Port)	2 (3 ports)	
22		Min. Number of camera support from the same OEM	1	
23	Network Parameters	Min. Number of Ethernet connection points for System supports for RJ-45, 10/100/1000 Mbps Base-T Ethernet connection	Yes	
24		Wi-Fi Connectivity	Yes	
25		If Yes, Type of Wi-Fi connectivity	Wi-Fi 802.11a/b/g/n/ ac	
26	Encryption	System supports AES Encryption video calls, system has encryption on and off facility	Yes	
27	Peripherals	Video Codec shall support 16:9 format	Yes	
28		Power Supply 230 + or - 10% volts, 50 Hz	Yes	
29		Shall come with easy to use infra-red hand held remote control/Touch panel with operating distance	Yes	
30		All equipment are in compliance with the requirements of ITU-T (SIP Protocol and H.323) standard related to video conferencing, BFCP and H.239 for content sharing	Yes	
31		System to IPv6 ready from Day One	Yes	

32		System uses standard based protocols and the offered system is inter operable with existing H.323 AVC/SVC based equipment in a P2P call on VC endpoint. All H/w and s/w required to make it interoperable is included in scope of supply	Yes	
33		Min. Number of Input DVI Ports	0	
34		Min. Number of Input HDMI/ HDCI ports	2	
35		Min. Number of Output HDMI ports	2	
36		Min. Number of Input USB ports	1	
37		System supplied complete with the following components a) Codec b) Camera c) 2 Microphones with suitable connectivity of length 15 mtr d) Touch panel e) Necessary cables (including 15 Mtrs HDMI cable content sharing -1 nos)	Yes	
38		Microphone type	Omnidirectional	
39		BIS Registry under CRS of MeitY	Yes	
40		UL/CE Certification	Yes	
41		Min Operating temperature (Deg C)	0	
42		Max Operating temperature (Deg C)	35 or more	
43		Min Operating/ non operating humidity (%RH)	10	
44		Max Operating/ non operating humidity (%RH)	90	
45		Free installation and commissioning	NA	
46		**On Site OEM warranty (Years)**	**3**	
47		Audio 3.5 mm stereo line in/out jacks for integration with External Audio System	Yes	
48		USB Support for integration with PC for sharing codec mics and camera	NA	
49		System has Automatic Noise Suppression, Echo cancellation	Yes	
50		Management access to Codec via Web, SSH/Telnet for min 2 users	Yes	
51		System Supports external cameras via HDMI input and Consumer Electronics Control (CEC) 2.0	Yes	

52		System supports FECC	Yes	
53		Should Support standard Packet loss recovery/packet loss based down speeding	Yes	
54		The proposed solution should be interoperable with the existing video conferencing solution present in Railtel network:	Yes	
55	Integration of the device with the existing TPaaS infrastructure at Railtel	The Proposed VC endpoints should seamlessly integrated with existing Central VC system (MCU- Cisco Meeting server -2000 , Gatekeeper and Scheduler) and shall be able to access the devices 24/7 for operations, software updating, change request and reporting through monitoring Server, **In case existing infra not supporting the remote configuration and provisioning, Bidders should supply and install central infra (Scheduler/ Manager with adequate licenses), without any additional cost in both DC and DR .**	Yes	
56		The existing central management system should be able to remote configure and take backup of the configuration of the proposed VC endpoints.	Yes	
57		The existing central management system should be able to do provisioning and configuration of the proposed endpoints.	Yes	
58	Web Interface Support	The options mentioned here should be present in the web interface. These options should not require any restart and remote user should be able to change them during a live call	Yes	
59		i. It should support registration over SIP and H.323 on Cisco Video Communication Server version 8.1 or higher.	Yes	
60		ii. It must be inter-operable with Cisco meeting server version 3.1 and Content sharing over both SIP and H.323.	Yes	

61		iii. Audio: It should be possible to control the input and output volume, mute unmute control. The echo control automatic or be available for adjusting	Yes	
62		iv. Camera: Backlight, Brightness, Foucs, White balance, Zoom and adjustment, automatic snapshots to be shown on webpage.	Yes	
63		v. Conference: Auto answer, Call Protocols: H.323 and SIP settings, Default protocol, Call Rate, Do Not Disturb control, Content channel rate, video channel rate, phonebook	Yes	
64		vi. Network: DHCP, IPv4, IPv6, MTU, QoS, DNS, HTTP/ HTTPS, SNMP, NTP, Telnet/ SSH	Yes	
65		vii. Security: User control, Logging level (admin, user), Remote server settings, logs (audio, video, call diag.)	Yes	
66		viii. System Settings: Name, Language	Yes	
67		ix. Video IN/OUT: Quality, Resolution, Multiple display mode, Remote operation, Layouts, Self view settings	Yes	
68		x. Active Call Monitoring: Call Information which must include: A/V Codecs used, transmit/ receive rate, A/V Channel Rate, A/V Packet loss, Jitter, Frame rate, encryption mode.	Yes	
69	Local Setting	Manual IP configuration on Codec using touch Panel		
70	Software upgrade	Bidder/OEM should provide software Upgrade/update during warranty period without any additional cost		
71	POC	POC required at Secunderabad to demonstrate features		

SOR item 12: SFP+ 10G 10 KM BIDI Technical specification

Parameter	Value	Compliance
Module Form Factor	SFP	
Aggregate Data Rate	10 Gb/s or more	
Link Length Support	10 Km or more	
Protocols Supported	Ethernet	
Fiber type	Single Fibre, Simplex LC Connector	
temperature range	-40°C to +85°C	
Power dissipation	< 1.5W	
Receiver Sensitivity (OMA)	Max -12.6 Dbm or better	
@ 10.5Gb/s		
Wavelength Range	1260-1340 nm	
Average Launch Power Transmitter	Min. -8.2 dbm & Max +0.5 Dbm or better	
Built in Digital Diagonistic Function	YES	
Should have RoHS Compliant	YES	
OEM must have ISO 9001 & 14001 Certificates	YES	
Should have RoHS-6 Compliant		
Should have XLPPI Electrical Interface		
Built in Digital Diagonistic Function		
OEM must have ISO 9001 & 14001 Certificates		
Product must be IEC 60825(Laser Safety) and IEC 60950 (Electrical Safety) certified by CSA or equivalent		
Manufacturer should be able to provide Factory test report for supplied transceiver parts.		
SFP should support all OEM Vendors devices and open all optic ports		
On Site OEM Warranty (Year) - 3 years		

SOR item 13: SFP+ 10G 40 KM BIDI Technical specification

SN	Description	Compliance
1	SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment.	
2	Should support 20-40 kms optical distance on single fiber	
3	Should have LC type connector	
4	Should have 10 Gigabit Ethernet capacities on single mode fiber.	
5	Should support DDMI feature. Option should be available for both SFP+ and XFP	
6	Should be having valid ISO 9000 & ISO 14000 certification on the date of opening of bid.	

7	Should have CE and FCC regulatory compliances.	
8	Operating Temperature of the SFP Should be mini 0 to 65 °C (23 to 149 °F)	
9	**On Site OEM Warranty (Year) - 3 years**	

SOR item 14: SFP 1G 40 KM BIDI Technical specification

1. Should be compatible with OEM equipments like Cisco Juniper, Edgecore and D Link. IT should be MSA Complaint.
2. Should support minimum 40 km optical distance on Single Fiber (ITU-G 652D) (Bi Directional on Single Mode Fiber).
3. Should have LC type connector.
4. Should have 1 Gigabit Ethernet throughput on single mode fiber.
5. Important Parameters:
   A. Link Budget (Max Tx Power- Receiver Sensitivity) 19 dB or better.
   B. Transceiver supply voltage: 3.3 V (Nominal)
   C. The case operating temperature -20 Degree Centigrade to +70 Degree Centigrade.
   D. The storage Temp: -40 Degree Centigrade to +85 Degree Centigrade
   E. Wavelength- 1270/1330 or 1550/1310 or 1490/1550
6. Should support Digital Diagnostic Monitoring (MSA-SFF 8472 Compliant) feature with following operating parameters:
   A. Transceiver temperature
   B. Laser bias current
   C. Launch Optical Power
   D. Received optical power
   E. Transceiver supply voltage:
   F. It will provide alarm and warning flags to alert the user when particular operating parameters are outside of a factory set normal range.
7. Complies with SFF-8431/8432 SFP+ MSA (Multi-Source Agreements Standards)
8. Applications- 1 Gbps Ethernet
9. Performance Certificate: The bidder will submit a satisfactory performance certificate from Telecom Service Provider/ ISP/ Govt/ PSU for the offered make of the SFP.
10. Regulatory Compliance
    A. EMI/EMC compatible with FCC/ EN/ IEC
    B. Laser Safety compatible with FDA/ EN/ IEC
    C. RoHS compliant
11. SFP should support all OEM Vendors devices and open all optic ports
12. **On Site OEM Warranty (Year) - 3 years**

SOR item 15: SFP 1G 10 KM BIDI Technical specification

1. Should be compatible with OEM equipments like Cisco Juniper, Edgecore and D Link. IT should be MSA Complaint.
2. Should support minimum 10 km optical distance on Single Fiber (ITU-G 652D) (Bi Directional on Single Mode Fiber).

3. Should have LC type connector.
4. Should provide quantity in such a way that matching pair (BX U & D) can be achieved.
5. Should have 1 Gigabit Ethernet throughput on single mode fiber.
6. Important Parameters:
   A. Link Budget (Max Tx Power- Receiver Sensitivity) 5 dB or better.
   B. Transceiver supply voltage: 3.3 V (Nominal)
   C. The case operating temperature -20 Degree Centigrade to +70 Degree Centigrade.
   D. The storage Temp: -40 Degree Centigrade to +85 Degree Centigrade
   E. Wavelength- 1270/1330 or 1550/1310 or 1490/1550
7. Should support Digital Diagnostic Monitoring (MSA-SFF 8472 Compliant) feature with following operating parameters:
   A. Transceiver temperature
   B. Laser bias current
   C. Launch Optical Power
   D. Received optical power
   E. Transceiver supply voltage:
   F. It will provide alarm and warning flags to alert the user when particular operating parameters are outside of a factory set normal range.
8. Complies with SFF-8431/8432 SFP+ MSA (Multi-Source Agreements Standards)
9. Applications- 1 Gbps Ethernet
10. Performance Certificate: The bidder will submit a satisfactory performance certificate from Telecom Service Provider/ ISP/ Govt/ PSU for the offered make of the SFP.
11. Regulatory Compliance
    A. EMI/EMC compatible with FCC/ EN/ IEC
    B. Laser Safety compatible with FDA/ EN/ IEC
    C. RoHS compliant
12. SFP should support all OEM Vendors devices and open all optic ports
13. **On Site OEM Warranty (Year) - 3 years**

SOR item 16: SFP+ 10G 60 KM BIDI Technical specification

1. Should be compatible with OEM equipments like Cisco Juniper, Edgecore and D Link. IT should be MSA Complaint.
2. Should support minimum 60 km optical distance on Single Fiber (ITU-G 652D) (Bi Directional on Single Mode Fiber).
3. Should have LC type connector.
4. Should provide quantity in such a way that matching pair (BX U & D) can be achieved.
5. Should have 10 Gigabit Ethernet throughput on single mode fiber.
6. Important Parameters:

   A. Link Budget (Max Tx Power- Receiver Sensitivity) 25 dB or better.
   B. Transceiver supply voltage: 3.3 V (Nominal)
   C. The case operating temperature -0 Degree Centigrade to +70 Degree Centigrade.
   D. The storage Temp: -40 Degree Centigrade to +85 Degree Centigrade
   E. Wavelength- 1270/1330 or 1310/1550 or 1490/1550 (Nominal)

7. Should support Digital Diagnostic Monitoring (MSA-SFF 8472 Compliant) feature with following operating parameters:

   A. Transceiver temperature
   B. Laser bias current
   C. Launch Optical Power
   D. Received optical power
   E. Transceiver supply voltage:
   F. It will provide alarm and warning flags to alert the user when particular operating parameters are outside of a factory set normal range.

8. Complies with SFF-8431/8432 SFP+ MSA (Multi-Source Agreements Standards)
9. Applications- 10 Gbps Ethernet
10. Performance Certificate: The bidder will submit a satisfactory performance certificate from Telecom Service Provider/ISP/Govt/PSU for the offered make of the SFP.
11. Regulatory Compliance
    A. EMI/EMC compatible with FCC/EN/IEC
    B. Laser Safety compatible with FDA/EN/IEC
    C. RoHS compliant

12. SFP should support all OEM Vendors devices and open all optic ports
13. **On Site OEM Warranty (Year) - 3 years**

SOR item 17: SFP+ 10G 10Km Dual Fiber Technical specification

1. Should be compatible with OEM equipment's like Cisco Juniper, Edgecore and D Link. IT should be MSA Complaint.
2. Should support minimum 10 km optical distance on Single mode Fiber (ITU-G652D) should have LC type connector.
3. Should have 10 Gigabit Ethernet throughput on single mode fiber.
4. Important Parameters:
   A. Link Budget (Max Tx Power- Receiver Sensitivity) 5 dB or better.
   B. Transceiver supply voltage: 3.3 V (Nominal)
   C. The case operating temperature -20 Degree Centigrade to +70 Degree Centigrade.
   D. The storage Temp: -40 Degree Centigrade to +85 Degree Centigrade
   E. Wavelength- 1310nm (Nominal)
5. Should support Digital Diagnostic Monitoring (MSA-SFF 8472 Compliant) feature with following operating parameters:
   A. Transceiver temperature
   B. Laser bias current
   C. Launch Optical Power
   D. Received optical power
   E. Transceiver supply voltage:

F. It will provide alarm and warning flags to alert the user when particular operating parameters are outside of a factory set normal range.

6. Complies with SFF-8431/8432 SFP+ MSA (Multi-Source Agreements Standards)
7. Applications- 10 Gbps Ethernet
8. Performance Certificate: The bidder will submit a satisfactory performance certificate from Telecom Service Provider/ ISP/ Govt/ PSU for the offered mak of the SFP.
9. Regulatory Compliance:
   A. EMI/EMC compatible with FCC/ EN/ IEC
   B. Laser Safety compatible with FDA/ EN/ IEC
   C. RoHS compliant
10. **On Site OEM Warranty (Year) - 3 years**

SOR item 18: SFP 1G 20 KM BIDI Technical specification

SN	Description	Compliance
1	SFP module should comply with multi-source agreement (MSA), enabling compatibility with other vendor equipment.	
2	Should support 20 km optical distance on single fiber	
3	Should have LC type connector	
4	Should quote rate in pair (BX U & D)can be achieved	
5	Should have 01 Gigabit Ethernet capacity on single mode fiber.	
6	Should support Digital Diagnostic Monitoring feature with following operating parameters: Transceiver temperature" 0 ~ 70 degC Laser bias current Transmitted optical power: 0 ~ -5dBm Received optical power: -17dBm Transceiver supply voltage: 3.3V It also provides a sophisticated system of alarm and warning flags	
7	OEM should be having valid ISO 9000 Certificate	
8	Should have CE and FCC and UL regulatory Certificate	
9	Operating temperature of the SFP should be minimum 0 to 70°C (23 to 149 °F)	
10	Complies with SFF-8431 SFP+ MSA (Multi-Source Agreements Standards)	
11	Complies with 1310nm/1550nm DFB laser transmitter & CPRI Option 7, 8	
12	Should support 1G to 1.25Gb/s Multi-Rate & 2-wire interface for management and diagnostic monitor compliant with SFF-8472	
13	**On Site OEM Warranty (Year) - 3 years**	

SOR item 19: SFP 1G 40 KM dual fiber Technical specification

1. Should be compatible with OEM equipments like Cisco Juniper, Edgecore and D Link. IT should be MSA Complaint.
2. Should support minimum 40 km optical distance on Single Fiber (ITU-G 652D) Should have LC type connector.
3. Should have 1 Gigabit Ethernet throughput on single mode fiber.
4. Important Parameters:
   A. Link Budget (Max Tx Power- Receiver Sensitivity) 19 dB or better.
   B. Transceiver supply voltage: 3.3 V (Nominal)
   C. The case operating temperature -20 Degree Centigrade to +70 Degree Centigrade.
   D. The storage Temp: -40 Degree Centigrade to +85 Degree Centigrade
   E. Wavelength- 1310nm or 1550nm
5. Should support Digital Diagnostic Monitoring (MSA-SFF 8472 Compliant) feature with following operating parameters:
   A. Transceiver temperature
   B. Laser bias current
   C. Launch Optical Power
   D. Received optical power
   E. Transceiver supply voltage:
   F. It will provide alarm and warning flags to alert the user when particular operating parameters are outside of a factory set normal range.
6. Complies with SFF-8431/8432 SFP+ MSA (Multi-Source Agreements Standards)
7. Applications- 1 Gbps Ethernet
8. Performance Certificate: The bidder will submit a satisfactory performance certificate from Telecom Service Provider/ ISP/ Govt/ PSU for the offered make of the SFP.
9. Regulatory Compliance
   A. EMI/EMC compatible with FCC/ EN/ IEC
   B. Laser Safety compatible with FDA/ EN/ IEC
   C. RoHS compliant
10. **On Site OEM Warranty (Year) - 3 years**

SOR item 20: XFP 10G 10 KM Dual Fiber Technical specification

Parameter	Value	Compliance
Module Form Factor	XFP	
Aggregate Data Rate	10 Gb/s	
Maximum Link Length	10 Km.	
Protocols Supported	OTN/FEC protocals OTU1e & OTU2e	
Fiber type	Dual Fibre, Duplex LC Connector	
temperature range	-5°C to 70°C	
Power dissipation	< 1.5W	
Receiver Sensitivity (OMA) @ 10.5Gb/s	Max -12.6 Dbm	

Transmitter & Dispertion Penalty (TDP)	Max 3.2 Dbm	
Average Launch Power	Min. -6.0 dbm & Max 0.5 Dbm	
Should have RoHS-6 Compliant		
Should have XLPPI Electrical Interface		
Built in Digital Diagonistic Function		
OEM must have ISO 9001 & 14001 Certificates		
Product must be IEC 60825 (Laser Safety) and IEC 60950 (Electrical Safety) certified by CSA or equivalent		
Manufacturer should be able to provide Factory test report for supplied transceiver parts.		
SFP should support all OEM Vendors devices and open all optic ports		
On Site OEM Warranty (Year) - 3 years		

SOR item 21: QSPF-28 LR4 Technical specification

SN	Description	Compliance
1	Optics Should be compatible with OEM equipments like Cisco, Juniper, D-Link, Zyxel, Edge Core, Ciena	
2	Optics Should support upto 10 km optical distance on single mode fiber	
3	Connector type Dual LC	
4	Signaling rate, each channel 25.78125 GBd +/-100 ppm	
5	Standards compliance (Ethernet/OTN Standard, for e.g. 100GBASE-LR4) IEEE 802.3ba-2010	
6	Operating Temperature (range) 0° C to 70° C	
7	Transmitter output power, each lane (minimum, maximum) –4.3 dBm,4.5 dBm	
8	Cable type SMF	
9	Receiver input power, each lane (minimum, maximum)	
10	**Transmitter wavelengths (range):** 1294.53nm ~ 1296.59 nm 1299.02nm ~1301.09 nm 1303.54nm ~ 1305.63 nm 1308.09nm ~ 1310.19 nm	
11	**Should support below Digital Diagnostic Monitoring features:** Transceiver temperature Laser bias current (4-Channel) Transmitted optical power (4-Channel) Received optical power (4-Channel) Transceiver supply voltage Power consumption < 3.5W	
12	**On Site OEM Warranty (Year) – 3 years**	

SOR item 22: Wifi Router Technical specification

WiFi Outdoor Access Points				
SN	**Reference**	**Parameters**	**Technical specification**	**Compliance**
1	CT2HW1	Hardware	Access Points proposed must include radios for both 2.4 GHz and 5 GHz.	
2	CT2HW2	Hardware	Must have a robust design for durability, without visible vents	
3	CT2HW3	Hardware	Must include dual band antennas to support both the 2.4GHz and 5GHz operations simultaneously.	
4	CT2HW4	Hardware	Proposed access point shall support MDO(Mobile Data offload)	
5	CT2HW5	Hardware	Mounting kit should be standard which shall be used for mounting access point	
6	CT2HW5	Hardware	Must support operating humidity of 10 to 90% (noncondensing)	
7		Hardware	The Quoted Access Points shall be MTCTE Certified as per the Notification of TEC, DOT and the Bidder shall Submit the TEC / MTCTE Certificate of the OEM.	
8	CT2WS1	wireless Standard	Must support 2X2 multiple-input multiple-output (MIMO) with TWO spatial streams	
9	CT2WS2	wireless Standard	Must support simultaneous 802.11n on both the 2.4 GHz and 5 GHz radios. And must support 802.11ac Wave 2 on 5ghz .	
		wireless Standard		
10	CT2WS3	wireless Standard	Must support data rates unto 800 Mbps on 5Ghz radio and 140mbps on 2.4Ghz radio.	
11	CT2WS4	wireless Standard	Must support 40 MHz and 80 MHz wide channels in 5 GHz.	
12	CT2WS5	wireless Standard	Antenna Gain of Access Points must be +2dBm or better Must Support following minimum transmit power for both2.4Ghz and 5Ghz radio.	
			(i) 2.4-Ghz band : +21dBm	

			(ii) 5.0-Ghz band: +24dBm	
13	CT2WS6	wireless Standard	AP should support VLAN trunking (802.1q) and VLAN based SSID for user traffic.	
		wireless Standard		
		wireless Standard		
		wireless Standard		
14	CT2RF1	RF	The Wireless AP should have the technology to improve downlink performance.	
15	CT2RF2	RF	The AP shall be able to load-balance between 2.4Ghz and 5Ghz band.	
16	CT2RF3	RF	Must have -90dB to -100dB or better Receiver Sensitivity.	
17	CT2RF4	RF	Must incorporate radio resource management for power, channel, coverage hole detection and performance optimization	
18	CT2RF6	RF	Should support configurable carrier sense threshold	
19	CT2M1	Mesh	The Wireless Backhaul shall operate in 5Ghz	
20	CT2M2	Mesh	Support Encrypted and authenticated connectivity between all backhaul components	
21	CT2M3	Mesh	Access point shall have wired uplink interfaces i.e. 1X10/100/1000BASE-T Ethernet	
22	CT2R1	Roaming	Must support Proactive Key Caching and/or other methods for Fast Secure Roaming.	
23	CT2S1	Security	Must support Management Frame Protection.	
24	CT2S2	Security	Should support locally-significant certificates on the APs using a Public Key Infrastructure (PKI) or preinstalled certs on AP for authentication	
25	CT2S3	Security	Provision of Wireless IPS to filter malicious traffic	
26	CT2E1	Encryption	Access Points must support a distributed encryption/decryption model.	

27	CT2E2	Encryption	Access Points must support hardware or software based encryption	
28	CT2M1	Monitoring	Must support the ability to serve clients or monitor the RF environment.	
29	CT2M2	Monitoring	AP model proposed must be able to be both a client-serving AP and Parallely monitor- Intrusion Prevention services.	
30	CT2F1	Flexibility:	Should support mesh capabilities for temporary connectivity in areas with no Ethernet cabling.	
31	CT2F2	Flexibility:	Should support QoS for voice over wireless.	
32	CT2F3	Flexibility:	Must support Controller-based and standalone(autonomous) deployments	
33	CT2F4	Flexibility:	Must support 16 WLANs per AP for SSID deployment flexibility.	
34	CT2O1	Operational:	Must support telnet or SSH or console login to APs directly for troubleshooting flexibility.	
35	CT2O2	Operational:	Must support automatic detection of dropped connection to controller,	
36	CT2O3	Operational:	Must support automatic failover to secondary controller, upon detecting lost connection to controller	
37	CT2O4	Operational:	Must support DHCP Option 82, defined in RFC 3046, including support for Sub-option 01 (Circuit-Id) and Sub-option 02 (Remote Id) fields.	
38	CT2O5	Operational:	With Controller APs (from a data-plane plane perspective) must support:	
			- Ethernet over GRE IPv6 tunnel	
			- Automatic detection of failed tunnel termination, with configurable connection retry and timeout.	
			- Automatic failover to secondary tunnel termination address.	
39	CT2O6	Operational:	Support for basic AP monitoring statistics for each radio: Bytes Sent, Bytes Received, Packets Sent, Packets Received,	
			Radio Channel Utilization, Noise.	
40	CT2O7	Operational:	Must support data-plane split tunneling in which ACLs may be configured to enable a range of destination net blocks and/or IPs to bypass the data-plane	

			tunnel and be bridged on the wired interface.	
41	CT2O8	Operational:	AP should have capability to split tunnel for both IPv4 and IPv6 tunnel to segregate the management and data traffic.	
42	CT2O9	Operational:	AP should have capability to split tunnel for specific destination IP/Subnet (For implementing policy based Caching solutions) using local NAT and forward user traffic.	
43	CT2O10	Operational:	The AP shall support 200 concurrent Clients per AP	
44	CT2O11	Operational:	APs shall support SNMP v1 Or higher (V2/V3)	
45	CT2P1	Power:	Must support Power over Ethernet/PoE+/UPoE/Power Injector/AC/DC .	
46	CT2Q1	Quality of Service:	shall have the support of 802.11e and WMM	
47	CT2Q2	Quality of Service:	Should be Wi-Fi Alliance certified and WPC Approved and ETA Certified	
48	CT2Q3	Quality of Service:	Must support QoS to prioritize video ,voice and Data traffic	
	CT2Q4	Quality of Service:		
49	CT2EES1	Environmental and Electrical Specifications	Must support QoS and Video Call Admission Control capabilities.	
50	CT2EES2	Environmental and Electrical Specifications	Access point shall support powering from POE/PoE+/UPoE /Power Injector/AC/DC.	
51	CT2EES3	Environmental and Electrical Specifications	Access point shall support pole, wall, and roof mounting options.	
52	CT2EES4	Environmental and Electrical Specifications	Geographic orientation flexibility – tilt angle for pole, wall, and roof mounting units	
53	CT2EES5	Environmental and Electrical Specifications	The equipment shall support up to 100 MPH sustained winds & 140 MPH wind gusts.	

54	CT2EES6	Environmental and Electrical Specifications	The Access point shall be IP67 certified.	
55	CT2EES7	Environmental and Electrical Specifications	The Access point shall be rated for operation over an ambient temperature range of 0C to +55 C	
		Environmental and Electrical Specifications		
56	CT2EES8	Environmental and Electrical Specifications	Should Support Surge Protection on Ethernet Ports to meet the requirement at High Voltage Transmission Line running across the Railway Platform. If any OEM/Bidder can't provide inbuilt surge protection in AP, external surge protection must be proposed. Surge protection of ± 2 kV on copper Ethernet ports.	
57	**On Site OEM Warranty (Year) - 3 years**			

SOR item 23: Rack - 19" 9U Technical specification

SN	Specification	Compliance
1	19" Rack: 9U 600mmwidth/500mm depth, Steel frame structure design, metal top cover with 2 fan provision and cable entry provision covered with edge protected rubber grommet, bottom cover with cable entry provision covered with edge protected rubber grommet provide , Powder coated finish Texture Matt – 60 to 80Um	
2	Corrosion Resistance: Salt spray test according to ISO 9227 (NSS test) and IEC EN 60068-2-11 (Ka test) for 168 hours: degree of Rusting Ri1 according to ISO 4628-3, propagation ≤1 mm according to ISO 4628-8.	
3	Front glass single door with cam lock & key	
4	Front panel mounting hardware. – 1 No.	
5	Cantilever Tray 255mm D – 1 No.	
6	230V A/C 90 CFM fan mounted on top cover - 2 Nos.	
7	PDU 6 sockets 6A Sockets– 1 No.	
8	Horizontal Cable Manager 1U with PVC loops – 1 No.	
9	**On Site OEM Warranty (Year) - 3 years**	

SOR item 24: Outdoor 19"-6Ux600D wall mount industrial heavy duty racks Technical specification

i. Supply of Outdoor 19"-6Ux 600D wall mount industrial heavy duty racks.
ii. Racks shall have front glass door, side openable & removable doors with proper ventilation with inbuilt lock-key arrangement at each door
iii. Inside of rack four AC operated 90 CFM fans and spike guard with fuse with pole brackets, clamps and other fixing accessories.
iv. **On Site OEM Warranty (Year) - 3 years**

SOR item 25: Server Rack- 42U Technical specification

Supply of heavy duty 42U Rack of size 2.2 mtr of size 600 mm width x 650 mm depth Rack should have the following:

S N	Description	Qty	Compliance
	ACCESSORIES INCLUDED IN EACH RACK ARE:		
1	Moducab Front Glass Door- 42U -600W - Cam Lock - Ventilation - Duscky Fine Tex - Assembly	1	
2	Moducab Honeycomb {Performax} Flat Pain Door - 42U - 600W - Cam Lock - Ventilation - Duscky Fine Tex - Assembly	1	
3	Double Fan For Mcab/ProTek FS	1	
4	Mounting Hardware Packet {Containing 1 Nos Each of 3} - 20 Set	1	
5	Metal Cable Channel - 01U - Plastic Cable Loop's Mountable - Pastal Fine Tex- Assembly	2	
6	Metal Cable Channel - 100 mm Width - 1600 mm Height - Pastal Fine Tex - Assembly	2	
7	Power Distribution Unit - 06/13 Amp Multi-standard - 08 Socket - Single Pole/Screw Mountable/ 16Amp MCB/ Alternating current - 16 Amp 3 Pin Plug with Power Cable 2.5 sq. mm 3 meter Length - Black Fine Tex - Assembly	1	
8	3 Inch Castor Set ModuCab	1	
9	Earthing Strip - 150mm - Nickel Plating - Assembly	1	
10	**On Site OEM Warranty (Year) - 3 years**		

SOR item 26: Breakout Cable (LC*4 one end, Single Mode 10 Mtr) Technical specification

1. MPO to LC*4 Single Mode
2. Breakout cable – 10Mtr in length
3. Compliant with IEC61754-7, TIA/EIA 604-5, GR-326, GR-1435
4. LSZH supported

5. 12-ribbon single mode fiber-cable with female MPO connector
6. 12-ribbon single mode fiber-cable with female MPO connector
7. MPO Insertion standard loss. (<0.75dB)
8. Return Loss (<-20dB)
9. MPO X/Y End-face Angel (-0.2 ~ 0.2 um)
10. Operating Temperature Range (Degree C) -40 ~ +70 C
11. 40G QSFP PSM4-LR 10KM (MPO) with MPO connector and for MPO to LC*4 Single Mode LSZH Breakout cable shall be from same OEM or OEM certified one to avoid interoperability issues.
12. **On Site OEM Warranty (Year) - 3 years**

SOR item 27 to 34: Patch Cords Technical specification

A) Patch Cords:

1. The patch cords shall be suitable for use on SDH and DWDM systems with the type of connectors specified in the BOQ.

2. All the patch cords shall be Single Mode (G657A), Simplex type, and of lengths as specified in the BOQ unless stated otherwise. The manufacturer shall provide a test certificate from Govt. approved or NABL-approved lab for conformity of G657A fiber used in the manufacturing of patch cords.

3. The connectors shall be securely connected to both ends of the patch cords without any play/looseness.

4. The fiber used for making the patch cord shall be Corning or equivalent.

5. **Ferrule with metallic flange:** Zirconia ceramic/Conical Zirconia ceramic (spring loaded anti- rotation keyed) Note: The type of ferrule used for each type of connector is to be specified by the manufacturer.

6. **Fibre Reinforcement:** Secondary coated fibre shall be covered with Aramid yarn and shall be distributed equally over the entire periphery. The manufacturer shall indicate the Detex value and quantity of the Aramid yarn used in the patch cord and pigtails. The specification for Aramidyarn shall be as per GR No. TEC-GR-TX-ORM-001-05-DEC-17 (Section–XVII).

7. **Outer Jacket Sheath:** A circular sheath of suitable low smoke zero halogens (LSZH) grade of material and of yellow in color free from pinholes and scratches and other defects etc. shall be provided. The specification for Low smokes zero halogens (LSZH) shall be as per GR No. TEC- GR-TX-ORM-001-05-DEC-17 (Section–XX).

   a) Outer sheath diameter: 2.00mm + 0.2 mm (LC-LC) & 2.90 mm + 0.15 mm (all other type ofpatch cords)

b) Thickness of sheath: 0.30mm to 0.35 mm (LC-LC) & 0.45 mm to 0.55 mm (all other type ofpatch cords)

8. The patch cords shall be suitable for use in the temperature range of –60^{o} to +85^{o}C.

9. Maximum insertion loss for a patch cord should be <0.2 dB@1310nm and 1550nm wavelength.

10. All the patch cords with E2000 connectors shall be supplied with **Angle Polish** type

11. Return loss: ≥ 60db for PC/UPCFC/SC/LC and ≥ 65db for APC @@1310nm and 1550nmwavelength.

12. Durability: 500 times, Typical change: <0.05db (Max.)

13. Party should have a manufacturer certificate from the authorized laboratories/organizations

14. The internal/lab test reports in support of the above-mentioned technical parameters shall beprovided by the supplier unless stated otherwise.

15. All the patch cords should be as per **TEC-GR-TX-OFJ-001-05-NOV-09** with the latest amendment if any

B) Connectors:

1. Material for FC connector body shall be Nickel Plated Brass/ Zinc Alloy.
2. Materials for the LC connector body shall be PEI or PPS.
3. Material for SC connector body shall be Glass filled PBT.
4. Materials for all connector boots shall be polyester (Modified Thermo Polyester Ethelene).
5. Maximum insertion loss shall be < 0.3dB when connecting the patch cords through the adaptor.
6. FC-PC 0dB adaptors shall be square in shape such that they can be mounted on standard FODP.

C) Guarantee:

The material shall be guaranteed for a period of 12 months from the date of taking over, or 18 months from the date of delivery, which is earlier. If during the Guarantee period any defect shall
be found in the design, engineering, materials, and workmanship of the material, the contractor shall promptly, in consultation and agreement with the employer replace at its own cost the faulty material.

The Contractor shall submit a Contract Performance Guarantee (CPG) in the amount equivalent to Ten percent (10%) of the Contract Price, with validity up to Ninety (90) days beyond the warranty period. If the manufacturer fails to submit the same then the security amount (equivalent to CPG) shall be kept on hold from the bills.

The Contract Performance Guarantee (CPG) shall be released only after the successful completion of the warranty period.

D) Quality Requirements:

1. The Optical Fiber Jumpers and Hybrid jumpers Adapters and Hybrid Adapters should be manufactured in accordance with International Quality Standards ISO 9001-2000 for whichthe manufacturer should be duly accredited. A quality manual shall be submitted by the manufacturer.

2. The Optical Fiber Jumper and, Hybrid jumpers, Adapters, and Hybrid Adapters shallconform to the requirements for the Environment test specified in IEC Document No. 60874-1 (1993- 02), IEC 60874-1 (1994-03) and IEC 60794-1. The requirements of the particular test have been specified in the relevant test.

E) Marking and Packing:

Identification and Marking:

1. Marking on the optical fiber jumpers shall be of durable quality and it shall withstand the rubbing (20 times) with dry tissue paper in both directions.

2. Marking on Jumpers shall include the following: a) Name of manufacturer c) Type of fiber d) LSZH material e) Manufacturer's identification mark f) Manufacturer's part number. g) Manufacturing date code (year/month etc.) h) Variant identification number(s)/ (Sr. No. of product) i) Any other additional marking required.

3. Marking on the adapters shall include the following: a. Manufacturer‘s name/ model no. b.Manufacturer's identification mark. c. Manufacturing date code (year/month etc.) Note: Additional information if required by the buyer may be provided on the packing or as a separate test report.

Packing:

1. Each Optical Fibre Jumper (Patch cord/Pigtail) shall be packed separately in transportable packing with the test report on the manufacturer’s letterhead which shall include the following: (a) Insertion loss at 1310 nm and 1550 nm (b) Return loss at 1310 nm & 1550 nm. (c) Length of the patch cord/pigtail. (d) Precautions for handling and cleaning.

2. Each connector adapter shall be packed separately and supplied with the

following details:
a) Insertion loss at 1310 nm and 1550 nm b) Each connector and Adapter shall be coveredwith dust cover. FC and SC connectors will be supplied with Dual dust covers (Ferrule cap and hanging type dust cover), while LC connectors shall be supplied with Ferrule dust cover. FC adapters shall have threaded-type dust covers and SC & LC adapters shall have compatible dust covers.

Note 1: The manufacturer supplying the parts of the optical connector and optical connector adapter shall also are required to have ISO 9001-2000 accreditation/ISO certified manufacturing facility. The complete quality plan of such vendors from whom the parts are being procured by the manufacturer seeking approval shall also be required to be submitted along with the drawings & dimensions of each part clearly marked with tolerances of individual parts. Manufacturer/ Vendor marking shall also be provided.

Note 2: The test certificate of the Ceramic Zerconia Sleeve used along with its drawing & dimensions and the test report shall also be required to be submitted which shall be mandatory. Ceramic Zerconia Sleeve shall be tested for the following parameters:

1. Material of Zirconia Sleeve: Min. 94% Zirconia ceramic.
2. Withdrawal Force: 0.2Kg to 0.6Kg for FC and SC sleeves; 0.1Kg to 0.250 Kg for LCsleeves.
3. Durability: Change in attenuation after 500 mating shall be less than 0.05 dB.

F) On Site OEM Warranty (Year) - 3 years

SOR item 35 & 36: Attenuator Technical specification

1. The Attenuator supplies should be as per TEC/GR/TX/OPA-003/03/OCT-14 with the latest amendment if any for fixed Attenuator.

2. **On Site OEM Warranty (Year) - 3 years**

SOR item 37: Provision of 48 Port E2000 FDMS Technical specification

1. Provision of 48 Port E2000 FDMS 24 Fiber Armoured type input and 24 F output 19" rack mount FDM of Dimension of 4U (Height)X 600 mm(Width) X 300mm (Depth) with Patch Penal for 48, E2000/APC type connectors of R&M/ Huber/ and Schuner/ Diamond make and Pigtails should be of corning fiber of length 5m & 900 microns with all installation material. The adaptors have to be fixed on separate removal patch plates for easy maintenance of adaptors and pigtails in FDMS during O&M operation. The Top

cover should be with telescopic sliders. The FDMS should be supplied with all above mentioned accessories.

2. **On Site OEM Warranty (Year) - 3 years**

SOR item 38: Pigtail E2000 type APC 1m Technical specification

SN	Parameter	Specification	Compliance
1	Connector type (Connector End)	E2000	
2	Jacket material (Sheath material)	LSZH	
3	Fiber type	Single Mode OS1	
4	Cable Size (dia, in mm)	0.9	
5	Cable Length (in m)	1	
6	Jacket thickness (inmm)	0.9	
7	Cable color	Yellow	
8	Bend radius, Min., (inmm)	30	
9	Retention strength(in N)	20	
10	Cable Type	Simplex	
11	Operating temperature	-20 deg.C to +60degC	
12	Connector Insertionloss, Max. (in dB)	0.2	
13	Connector Returnloss , Min. (in dB)	50	
14	Material of Ferrule	Ceramic	
15	Durability	500 Mating cycle	
16	**On Site OEM Warranty (Year)**	**3 years**	

SOR item 39: Supply of STP Cable-CAT6 Technical specification

i. Supports Gigabit Ethernet (1000 baseT) standard
ii. Conductor: 23 AWG Solid bare Copper
iii. Insulation: High Density Polyethylene
iv. Pairs: 2 Insulated conductors twisted together
v. Shield: Aluminum / Polyester Foil Tinned copper Braiding
vi. Sheath: PVC / LSZH
vii. **On Site OEM Warranty (Year) - 3 years**

SOR item 40: Provision of RJ 45 connector Technical specification

1. CAT6 RJ45 CRIMPING CONNECTORS - Shielded RJ45 Modular Plugs
2. **On Site OEM Warranty (Year) - 3 years**

SOR item 41: UPS 2KVA Technical specification

SN	Parameter	Specification	Compliance
1	Rated Capacity	2 KVA / 1800 Watts	
2	Rated Capacity	2 KVA / 1800 Watts	
3	Input Voltage Range (Load <50%)	118 ~ 295 V (± 5 V)	
4	Input Voltage Range (Load >50%)	160 ~ 295 V (± 5 V)	
5	Frequency	40 ~ 70 Hz	
6	Phase	Single Phase with Ground	
7	Power Factor	≥ 0.99 @ full load	
8	Output Voltage Range	208 / 220 / 230 / 240 V AC	
9	Frequency Range (Synchronized Range) Frequency Range (Battery Mode)	47 ~ 53 Hz or 57 ~ 63 Hz 50 Hz ± 0.1 Hz or 60Hz ± 0.1 Hz	
10	Crest Fector	3:1 (Max)	
11	Short Circuit Protection	5 cycles turn Off Inverter, no transfer to Bypass, provide Alarm (AC Mode), 5 cycles turn Off Inverter, provide Alarm (Battery Mode), Input Fuse blown or Breaker action	
12	Waveform	Pure Sinewave	
13	Transfer Time (AC Mode to Battery Mode) (Inverter to Bypass)	ZERO <4 ms	
14	Efficiency	85%~ 92%	
15	DC Voltage	72 V(7 AH* 6 Nos. Battery inside)	
16	Charge Current	1.5 Amps	
17	Communication Interface	RS232,SNMP (Optional)	
18	Indication	LCD Display	
19	Noise Leval	Less than 50dBA @ 1 Meter (With Fan Speed Control)	
20	UPS Overload / UPS Short Circuit	110% / 300%	
21	**Warranty**	**Two Years on Electronics & One Year on Battery**	

Annexure-II

Principal Executive Director/WR
Dated: …….
RailTel Corporation of India Ltd.
……
……....
……....

Subject: Manufacturer Authorization form (MAF) to M/s ……. for ……
Ref: GeM Bid No. GEM/2024/B/4824189 dated: 26.04.2024

Dear Sir,
We, M/s……, are established and reputed manufacturer and service provider of ……..(Product details), having our registered office at ……..
We hereby authorize 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-III

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 RailTel/WR, 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 -IV

Guarantee Bond for Performance Guarantee
(On Stamp Paper of requisite value)
(To be used by approved Scheduled Banks)

1. In consideration of the RailTel Corporation of India Limited, Registered office at Plate-A, 6th Floor, Office Block, Tower-2, East Kidwai Nagar, New Delhi-110023 and Regional office at RailTel Corporation of India Ltd, Mahalaxmi Railway Microwave Compound, Senapati Bapat Marg, Mahalaxmi- Mumbai- 400 013 (hereinafter called "the RailTel") having agreed to exempt ……. **(Name and address of the Company/ Contractor both Registered and Regional office address)** (hereinafter called "the said Contractor(s)") from the demand, under the terms and conditions of an L.O.A No.…… Dated…….. [L.O.A Date] made between ……. and RailTel Corporation of India Limited, for ……..…… [Name of Work/Supply of Materials] (hereinafter called "the said Agreement") of **Performance Guarantee** for the due fulfillment by the said contractor's) of the terms and conditions contained in the said Agreement, or production of a Bank Guarantee for Rs…….. (Rs. …….. Only). We, …….. (indicate the name of the Bank and address) hereinafter referred to as "the Bank") at the request of. M/s…….. 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 (indicate the name of the Bank and address) do hereby undertake to pay the amount 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 b**y 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 (indicate the name of the Bank and address) undertake to pay to the **RailTel** any money so demanded notwithstanding any dispute or disputes raised by the Contractor(s) / Supplier(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 thereunder and the Contractor(s) / Supplier(s) shall have no claim against us for making such payment.

4. We, ……. Bank (indicate the name of the Bank and address) 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 the Bank and address) 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 2024 for

……

(Indicate the name of the Bank)

Witness:

1. Signature

   Name

2. Signature

   Name

Annexure - V

Consignee Details:

S.No.	Consignee	Consignee Address	RailTel Region	Items to be delivered
1	Chief Mgr/Stores RCIL/Mumbai	RailTel Office, Mumbai	Western Region	All Items and Quantities

Note: All the locations/stations name given above are tentative and may change. Successful Bidder may ask the final location with complete address after finalizing the tender. RailTel has the right to change location within RailTel Western Region area & firm has to supply & commission at location given by RailTel.

Annexure-VI

PROFORMA FOR Nil Deviation Component Compliance
Undertaking Letter
(TO BE SIGNED BY BIDDER)

To,
Principal Executive Director/WR
RailTel Corporation of India Ltd.
Mahalaxmi, Mumbai-400013

Dear Sir,

Sub: NIL Deviation Compliance for **GeM Bid No. GEM/2024/B/4824189 Dt 26.04.2024**

Over and above all our earlier conformations and submissions as per your requirements of the bid, we confirm that,

We will ensure our unconditional compliance of all the terms and conditions as mentioned in the Tender document. In case of any deviation, the same should be attached as an Annexure (as per Format given below) to this form. In case of any deviation, RailTel reserves the right to reject the bid without giving any justification. Format of Annexure (Deviation Statement)

S. No.	Clause No. & Chapter No.	Existing Clause of Tender	Proposed Clause	Remarks, if any

All the proposed items to be supplied as per SOR for the technical specifications as mentioned in Annexure-I of Bid.

We hereby certify that the items/materials mentioned in our offer are complete.

We confirm that there is no requirement of any other hardware and software to fulfill requirements as per scope against the bid. If any additional hardware and software is required to meet in scope requirements, then it would be provided by us at no extra cost to RailTel.

Place:
Date: Seal and signature of the bidder

(This Form along with Annexure (if required) should be on the letterhead of the bidder duly signed by an authorized signatory)

Annexure-VII

DECLARATION REGARDING MINIMUM LOCAL CONTENT IN LINE WITH REVISED PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA), ORDER 2017 DATED 04TH JUNE, 2020 AND SUBSEQUENT ORDER(S)

(To be typed and submitted in the Letter Head of the Entity/Firm providing certificate as applicable)

To,

(Write Name & Address of Officer of RCIL inviting the Tender)

Dear Sir,

Sub: Declaration reg. minimum local content in line with Public Procurement (Preference to Make in India), Order 2017-Revision, dated 04th June, 2020 and subsequent order(s).
Ref : 1) NIT/Tender Specification No: ……,
2) All other pertinent issues till date

We hereby certify that the items/works/services offered by…… *(specify the name of the organization here)* has a local content of _____ % and this meets the local content requirement for **'Class-I local supplier' / 'Class II local supplier' **** as defined in Public Procurement (Preference to Make in India), Order 2017-Revision dated 04.06.2020 issued by DPIIT and subsequent order(s).

The details of the location(s) at which the local value addition is made are as follows:

1. _____ 2. _____
3. _____ 4. _____

Thanking you,
Yours faithfully,

(Signature, Date & Seal of Authorized Signatory of the Bidder)

****** - *Strike out whichever is not applicable.*

Note:

1. Bidders to note that above format Duly filled & signed by authorized signatory, shall be submitted along with the techno-commercial offer.
2. In case the bidder's quoted value is in excess of Rs. 10 crores, the authorized signatory for this declaration shall necessarily be the statutory auditor or cost auditor of the company (in the case of companies) or a practising cost accountant or practicing chartered accountant (in respect of suppliers other than companies).
3. In the event of false declaration, actions as per the above order and as per RCIL Guidelines shall be initiated against the bidder.

Annexure-VIII

Land Border Sharing Declaration

(To be submitted in the bidder's letter head)

In-line with Department of Expenditure's (DoE) Public Procurement Division Order vide ref. F.No.6/18/2019-PPD dated 23.07.2020 & 24.7.2020

GeM Bid No . …….

Job: ……..

"I/ we have read the clauses pertaining to Department of Expenditure's (DoE) Public Procurement Division Order (Public procurement no 1, 2 & 3 vide ref. F.No.6/18/2019-PPD dated 23.07.2020 & 24.7.2020) regarding restrictions on procurement from a bidder of a country which shares a land border with India. I/We hereby certify that I/ we the bidder < name of the bidder……> is / are

a) Not from such a country and eligible to be considered for this tender.

OR

b) From such country, has been registered with the competent authority and eligible to be considered for this tender. (Evidence of valid registration by the competent authority shall be attached)

For and behalf of _____ (Name of the bidder)

(Signature, date & seal of authorized representative of the bidder)"

****