Information to Bidder for the "Procurement of Routers, SFPs, UPS & other items through GeM for RailTel Customer "

Ref: GeM Bid No. GEM/2022/B/xx dated: dd-mm-yyyy

- 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*

  (The technical specs which are not available on GeM portal for the required product, same will be uploaded in ATC as one time exercise. In future all the specs will be available on GeM portal.)

1. In the specification wherever support for a feature has been asked for, it will mean that the feature should be available without RailTel requiring any other hardware/software/licenses. Thus, all hardware/software/licenses required for enabling the support/feature shall be included in the offer. The technical specifications are mentioned in **Annexure-I**.
2. OEM or Authorized distributor/Partner of OEM should have a registered office in India to provide sales and 24x7 support in India. The certificate to this effect should be submitted. The bidder should be either OEM or his authorized dealer/distributor.
3. In case of the authorized distributor/partner certificate from the OEM to this effect should be submitted. If OEM is quoting then OEM should submit the certificate confirming the same. **In the tender, either the manufacturer or its authorized dealer will be considered as valid bidders. In cases where the manufacturer has submitted the bid, the bids of its authorized dealer will not be considered and their EMD will be returned accordingly. And in case of violations, both infringing bids will be rejected.**
4. Equipment offered shall have complete data sheets and detailed description on OEM web sites.
5. Bidder shall submit the detailed BOM of the equipment offered duly verified and certified by the respective OEM.
6. GSTIN ID of vendor should be provided from where goods will be supplied.
7. **Delivery Period, Consignee Address and inspection**

   7.1 Delivery Period: The supplier will have to supply the material within 90 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.

   7.2 Consignee Address:

Consignee	Consignee Address	RailTel Region	Items to be delivered

Sr.Manager/ Stores	**RailTel Office, New Delhi**	**Northern Region**	**ALL**

7.3 Inspection: Authorized representative of RailTel will carry out the Inspection.

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

8.1 Estimated cost of tender: Estimated cost of the Tender is Rs. **1,51,30,848/-** (Incl. GST).

8.2 Earnest Money Deposit (EMD)/ Bid Security: Bid Security: Rs. 3,02,600/- in the form of Pay Order/ Demand Draft drawn in favor of RailTel Corporation of India Ltd. payable at New Delhi on or before 12:00 Hrs of 14/04/2022 (Bid Opening Date). The Bid received without EMD will be summarily rejected.

8.3 In addition to clause 8.2 above, Tenderer has an option for online submission of EMD also. The EMD should be remitted in following account of RailTel Corporation of India Limited before the stipulated time and date of bid submission:

Name of bank & address	State Bank of India, Rail Bhawan, Rafi Marg, New Delhi -01
Name of Account holder	RailTel Corporation of India limited
Account No.	38500762345
IFSC Code	SBIN0003771
Branch Code	3771

8.4 Eligible MSEs are exempted from EMD.

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

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

10. Security Deposit/Performance Guarantee:

The successful tenderer shall submit security deposit in the form of Demand Draft/ Banker Cheque/Online transfer (NEFT) only from any scheduled bank for due fulfillment of contract as per the details given below:

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

ii. The security deposit/PBG shall be submitted to RCIL/RO/NR, Shastri Park, Delhi.

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 PG issuing bank and request them to send advice of BG through SFMS to the RailTel's Bank.

The security deposit/Performance 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 New Delhi.

Note: In case value of PG comes to Rs. 5 Lakhs or less, same should be submitted in the form of DD/Banker cheque only.

11. Eligibility Criteria for OEM (Routers, UPS and SFPs):

- The Equipment offered by the OEM or equipment of the same series/family from the same OEM should have been satisfactorily working in Government/PSUs/Telecom Service Providers network for at least 12 months as on opening of bid, in India or Abroad. The certificates from the actual users will have to be submitted online.

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

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

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

12. Eligibility Criteria:

12.1Technical Eligibility for Bidder:

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

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

Similar Work# Supply /Supply and installation in the field of IT/ICT/Telecom for any Government department or Public Sector Units or public listed companies (as per note below).

Note: Work experience certificate from private individual shall not be considered. However, in addition to work experience certificates issued by any Govt. Organization, PSU or any reputed TELCO, work experience certificate issued by Public listed company having average annual turnover of Rs 500 crore and above in last 3 financial years excluding the current financial year, listed on National Stock Exchange or Bombay Stock Exchange, incorporated/registered at least 5 years prior to the date of opening of tender, shall also be considered provided the work experience certificate has been issued by a person authorized by the Public listed company to issue such certificates. In case tenderer submits work experience certificate issued by public listed company, the tenderer shall also submit along with work experience certificate, the relevant copy of work order, bill of quantities, bill wise details of payment received duly certified by Chartered Accountant, TDS certificates for all payments received and copy of final/last bill paid by company in support of above work experience certificate.

12.2 Financial Criteria for Bidder:

The tenderer must have received contractual payments in the previous three financial years and the current financial year up to the date of inviting of tender, at least 150% of the advertised value of the tender. The tenderers shall submit Certificates to this effect which may be an attested Certificate from the concerned department / client or Audited Balance Sheet duly certified by the Chartered Accountant/Certificate from Chartered Accountant duly supported by Audited Balance Sheet. (Note: Client certificate from other than Govt. Organization should be duly supported by Form 16A/26AS generated through TRACES of Income Tax Department of India).

Credentials if submitted in foreign currency shall be converted into Indian currency i.e., Indian Rupee as under: The conversion rate of US Dollars into Rupees shall be the daily representative exchange rates published by the Reserve Bank of India for the relevant date. Where, relevant date shall be as on the last day of month previous to the one in which tender is invited. In case of any other currency, the same shall first be converted to US Dollars as on the last day of month previous to the one in which tender is invited, and the amount so derived in US Dollars shall be converted into Rupees at the aforesaid rate. The conversion rate of such currencies shall be the daily representative exchange rates published by the International Monetary Fund for the relevant date

12.3 Bidder should have authorization specific to this tender from respective OEM (Routers, UPS, Rack, SFPs) as per Annex-III.

13. **Splitting of Quantity**:

13.1 Deleted

13.2 In case bidder claims PMA, Government of India Guideline/Instruction regarding splitting of order to Local supplier shall be applicable. Govt. Guidelines in regard to MSME shall be followed.

14. Warranty:

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

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

14.2 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.

14.3 Purchaser's Right to Vary Quantities:

The purchaser shall be at liberty to enhance or reduce the quantity mentioned in the

LOA as indicated in below para without assigning any reasons. The bidder shall comply with such modifications unconditionally provided these are made before completion of the deliveries under the purchase order/LOA.

(A) Upto maximum extent of +/- 50% subject to following condition
i. Upto +25% with no rebate.

ii. From +25% to +40% with 2% rebate

iii. From +40% to +50% with 4% rebate

(B) For variation beyond +50% of the quantity mentioned in the SOR may be done after proper negotiation with the selected bidder.

(C) AMC rates for items under Variation Order will be at same percentage as finalized in the main contract.

15. Long Term Maintenance Support (For SOR item 1 to 6):

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

Buyer reserves the right to enter into AMC @ 3.5% of ordered value of equipment before 30 days of expiry of warranty period. In case bidder refuses to enter into AMC, PG will be forfeited. Separate agreement for AMC (Long term Maintenance Support) before expiry of warranty period shall be entered into with OEM/the authorized partner of OEM by RailTel. A fresh Performance Guarantee valid for Five years and four months for 3 % of the Long Term Maintenance Support cost of five years, shall be required to be submitted by bidder for due fulfillment of long term maintenance support obligation. Quarterly payment for AMC Charges would be made by RailTel after successful completion of AMC Services of that quarter and on the certificate furnished by concerned RailTel representative.

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

16. 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. The following documents are to be submitted for payment:

- Original Tax Invoice. (With separate Tax amount, containing POS, RailTel GSTN and Supplier GSTN).
- Delivery Challan.
- Original Consignee receipt with GRN No.

- Original Inspection Certificate.
- Transit Insurance Certificate.
- Warranty Certificate of OEM.
- Copy of proof of BG submitted.
- Certificate of receipt of Goods & installation thereof from RailTel.

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

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

In case of any wrong information submitted by tenderer, the contract shall be terminated. Performance Guarantee (PG) and Security Deposit (SD) of contract forfeited and agency barred for doing business on RailTel(RCIL) for 5 (five) years.

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 before issuance of PO.

19. On line 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 is ____ Hrs of __.__.____ and the bid will be opened at ____ Hrs of __.__.____.

(i) EMD Submission details.
(ii) BOQ of offered equipment.
(iii) Clause wise compliance along with all mentioned documents/annexures for all clauses of GeM Bid and ATC documents.

(iv) Data Sheet of offered equipment.
(v) Financial (Certified copies of audited balance sheets/annual reports of last three preceding financial years) and Technical Eligibility Criteria documents.
(vi) Technical Compliance of all Specification of items as per GeM Bid and ATC documents.
(vii) Certificate from the End user against the Eligibility criteria for OEM para 11.
(viii) Proof of document required against Eligibility criteria of OEM and Bidder vide para 11 & 12 respectively.
(ix) Signed ITB Document
(x) Power of Attorney
(xi) Nil Deviation as per Proforma attached in Annexure-VI.
(xii) MAF/OEM Authorizations per Annexure-III.
(xiii) Notarized affidavit on a non-judicial stamp paper as per Annexure-IV.
(xiv) Acceptance from OEM for Long Term Maintenance Support as per Annexure-II.

Note: 1) The bidder is required to give acceptance of all the clauses mentioned in the **"Information to the Bidders"** document is mandatory. 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 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: _____.**

In case, If any contradiction between GeM Additional Terms & Conditions and General Terms & Conditions, RailTel Terms & Conditions will prevails.

Annexure-I

Technical Specifications

1. All Equipment should be:

i. With 3 years warranty & 5 years AMC.

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. OEMs (Routers, UPS and SFPs) should have its Service Centre at min 04 locations in major cities in India. Service center details to be shared along with address and contact no. and person.

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

2. SOR wise details are as:

SOR	Item Description	Unit	Qty
SOR 1	Routers TYPE-I as per technical specifications of SOR-1 of Information to Bidder	Nos	12
SOR 2	Routers TYPE-II as per technical specifications of SOR-2 of Information to Bidder	Nos	7
SOR 3	Routers TYPE-III as per technical specifications of SOR-3 of Information to Bidder	Nos	3
SOR 4	Routers TYPE-IV as per technical specifications of SOR-4 of Information to Bidder	Nos	1
SOR 5	Routers TYPE-V as per technical specifications of SOR-5 of Information to Bidder	Nos	21
SOR 6	1 KVA Online UPS as per technical specifications of SOR-6 of Information to Bidder	Nos	19
SOR 7	Patch Cord Type-I as per technical specifications of SOR-7 of Information to Bidder	Nos	128
SOR 8	Patch Cord Type-II as per technical specifications of SOR-8 of Information to Bidder	Nos	140
SOR 9	Patch Cord Type-III as per technical specifications of SOR-9 of Information to Bidder	Nos	12
SOR 10	Patch Cord Type-IV as per technical specifications of SOR-10 of Information to Bidder	Nos	4
SOR 11	Patch Cord Type-V as per technical specifications of SOR-11 of Information to Bidder	Nos	16
SOR 12	Rack Type-I as per technical specifications of SOR-12 of Information to Bidder	Nos	9

SOR 13	Rack Type-II as per technical specifications of SOR-13 of Information to Bidder	Nos	28
SOR 14	SFP Type-I as per technical specifications of SOR-14 of Information to Bidder	Nos	26
SOR 15	SFP Type-II as per technical specifications of SOR-15 of Information to Bidder	Nos	30
SOR 16	SFP Type-III as per technical specifications of SOR-16 of Information to Bidder	Nos	16
SOR 17	SFP Type-IV as per technical specifications of SOR-17 of Information to Bidder	Nos	12
SOR 18	SFP Type-V as per technical specifications of SOR-18 of Information to Bidder	Nos	5
SOR 19	SFP Type-VI as per technical specifications of SOR-19 of Information to Bidder	Nos	33
SOR 20	SFP Type-VII as per technical specifications of SOR-20 of Information to Bidder	Nos	15
SOR 21	SFP Type-VIII as per technical specifications of SOR-21 of Information to Bidder	Nos	60
SOR 22	MPO and Breakout Cable QSFP+ (4X10G) LR/IR as per technical specifications of SOR-22 of Information to Bidder	Set	20

SOR1: Type-I Router

SN	Description
1	Router should support minimum 1G/10G SFP+ ports (Including 8X10G SFP+ module) and 4 number of 100G interface (excluding XFP/SFP/QSFP) from day one.
2	Total throughput (Full duplex): Minimum 280 Gbps
3	MAC Table Size : 64K
4	IPv4 RIB/FIB : Minimum 1M/128K
5	IPv6 RIB/FIB : Minimum 512K/32K
6	MPLS Labels : Minimum 32K
7	Label Stack : 5
8	L2 / L3 VPN VRF : Minimum L2 1000, Minimum L3 256
9	Support of number of queues per system : Minimum 4K
10	Number of VLAN support : 1000
11	Operating Temperature : (0 to 40 degree C or better)
12	Storage Temperature : (-10 to 60 degree C or better)
13	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.
14	All 10G interfaces should support LR, ER and ZR.
15	Router shall have option checking configuration before committing and option of rolling back to at least five configurations.
16	Router should have redundant DC (with the operating range of -40 to -72 VDC) power supplies
17	Digital Optical Monitoring (DOM) should be supported, optics information retrievable including RX/TX-power, threshold-monitoring/alarming, inventory.
18	It shall support role based privileges for the system access and radius authentication for the System admin.
19	The router should have a Console or Out-of-band Management.

20	Alerts for environmental or other hardware based alarms should be visibly implemented on the chassis.
21	All interfaces shall support services like L2VPN, L3VPN, VPLS and multicast VPN for both IPv4 and IPv6
22	The router should have mechanism to protect itself from DDoS attack.
23	The router should be IPv6 ready from day one.
24	The router should support filtering based on different parameters like: src ip, dst ip, src port, dst port, protocol etc
25	The router should support Netflow, Jflow or equivalent
26	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)
27	Shall support QoS, option of traffic shaping per Interface based.
28	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) 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
29	The router shall support provision for event based scripts that shall be capable of performing actions based on certain triggers
30	The router shall support aggregated Ethernet and it shall be possible to bundle Upto 16 links.
31	Shall support following MPLS features
	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
32	The Router shall support MPLS Fast Reroute both link protection and Node protection.
33	MPLS Ping, MPLS Trace Route
34	Fast Reroute Extensions to RSVP-TE for LSP Tunnels
35	The router shall Support of Sync-E & PTP technology (License price to be quoted separately)
36	Shall support MPLS based VPN services
	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).
37	The router shall support the following routing features
	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.
38	The router shall support Virtual Router Redundancy Protocol (VRRP) as per IETF RFC 3768
39	Router shall support SNMP v2/v3 and NTP
40	Shall support BFD for both single hop and multihop sessions
41	Shall support the following OAM features and actions such as syslog/link down should be configurable on OAM event trigger:
	a) 802.3ah
	b) 802.1ag
	c) Y.1731
42	Shall support Multi-chassis LAG
43	IPv6 Features
	a) IPv6 Ping
	b) IPv6 trace route
	c) OSPF v3
	d) IS-IS
	e) VRRPv3
	f) IPv6 CoS (classification & rewrite, scheduling based on TC)
	g) IPv6 ACL
	h) 6PE and 6VPE
44	Multicast Feature: It shall support following:
	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).
45	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.

46	The device should comply to the following safety standards
	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. 61000-4-3 Radiated Immunity
	iii. 61000-4-4 – EFT
	iv. 61000-4-5 – Surge
	v. 61000-4-6 – Low Frequency common immunity
47	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
	(d) The router should be able to act as Path computation client in the PCE architecture defined in RFC 4655.
	(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
48	Devices shall support following for Provisioning
	(a) Use NETCONF (RFC 6241, RFC 6242, RFC 5277)
	(b) REST based CRUD operations for configuration and management.
	(c) Web Services based operations for configuration and management
49	The offered devices must support API/NBIs for auto discovery of Services and Physical & Logical Topology
50	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
	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 atleast 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
	k) Some of the streaming models/sensors the router should support are:
	System
	Chassis Environment
	Line card utilization (memory , processor, QoS, Temp, Port utilization), errors counters

	Controller Card sensors (memory, CPU, Temp etc)
	Fabric statistics
	ARP table state
	Routing prefix information
	Interface
	Interface statistics (Physical and logical interfaces)
	Interface optical diagnostic
	Congestion and latency
	Filter statistics
	Protocol
	BGP peer information
	ISIS State, Interface, Adjacency statistics, LSDB
	ISIS SPRING / Segment Routing Statistics
	RSVP Interface Statistics
	LSP statistics
	LSP Event Export, Experimental
	IP SLA/RPM (or equivalent) reporting
	Segment Routing statistics
	DHCP statistics
51	Router should support Dual Image/Partition with USB flash drive booting option for OS recovery
52	Router should support jumbo frame.
53	Router should support port mirroring
54	Router should support security features of Broadcast/Mulitcast/Unicast Storm control.
55	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
56	Routers should support following Metro Ethernet Features:
	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 with in 50 ms or ITU-T G.8032 v2.
57	The operating system of the Routers category/series/family should be MEF-9/14 or CE(Carrier Ethernet) Certified.
58	The Router shall be designed for continuous operations with dual fan system.
59	Router should support CFM and LFM alarms.
60	Shall support HQoS, option of traffic shaping per VLAN based.
	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
61	Support for P and PE router functionality for MPLS on the same router simultaneously and on all the interfaces.
62	Router shall support E-Line or E-LAN MEF standards.
63	Routers should be rack mountable to fit into a standard 19-inch rack
64	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.
65	Segment Routing

i	Router should be able to support SR standards on IPv6 whenever it is firmed upt without any cost to RCIL.
ii	The router should support SR-MPLS dataplane and protocols OSPF,IS-IS and BGP Segment routing extensions
iii	Traffic Steering of SR policies with Autoroute Include and Segment Routing TI-LFA SRLG Protection
iv	LSP ping, trace-route, Pseudo wire Ping over Segment Routing, trace route for binding-SID
v	MPLS-LDP interworking with SR-ISIS and SR-OSPF
vi	TI-LFA with IGP (Link, Node, Local SRLG, Remote SRLG protection)
vii	Controller instantiated SR Policy (PCEP, BGP) and SR policy based on On demand next hop
viii	Router should have capability to calculate Bandwidth based path using centralized controller.
ix	Shall support SR and MPLS (LDP) Interworking Mapping Server
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.
xi	Label distribution protocol and segment routing should coexist and there should support option to prefer LDP over segment routing.
66	EVPN Features
i	Router should have support of Ethernet VPN (EVPN with single homing, multi homing
ii	Router should have support of following features on EVPN: EVPN-IRB, EVPN VPWS, EVPN VPWS Preferred Path over SR-TE Policy
67	i) Specification Router to support GRE tunnels (RFC 2784).
Note	**NEBS Certification is not required for PMA. However, they have to produce certificate from standard lab approved/ authorized by Govt. of India that their product are equivalent to NEBS and meets all standard and specification of NEBS.**

SOR 2: Type II Routers:

SN.	Technical specification
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	Router should have inbuilt power DC supply (-48 V).
5	Router shall have suitable Visual Indicators for diagnostics and healthy /unhealthy status of ports & modules.
6	Router shall have 4 Nos. of 10 Gigabit XFP/SFP+ ports and 2 Nos. of Gigabit ports with complying to IEEE 802.3, IEEE 803.3u and 802.3ab standard,

	supporting half duplex mode ,full duplex mode and auto negotiation on each port to optimize bandwidth
7	Router shall have minimum of 40 Gbps (full duplex) forwarding bandwidth at layer 2 and layer 3 switching fabric.
8	Router shall have minimum 60 million packets per second forwarding rate.
9	Router shall have a minimum of 16000 MAC address space.
10	Routers shall have a minimum of 12000 ipv4 and 2000 ipv6 routes support
11	Shall be operate at temp with a range of 0 to 40 C
12	It should be possible for the router to be mounted on a 19-Inch rack. All accessories required for this mounting should be supplied.
13	The following MPLS Features router shall be supported with OS/License up gradation
	a) It shall also support MPLS with RSVP and LDP signalling. It shall support MPLS FRR and L3VRF with up to 64 VRF.
	b) It shall support a scale of 500 VLAN and shall support Ethernet OAM features like BFD, 802.3ah, 802.1ag and Y.1731
	c) It shall support LSP ping and trace
	d) It shall support 8 hardware queues per port and shall support ingress policing and egress shaping.
	e) Shall support MPLS based L3 and L2 VPN services.
	f) It shall also support SNMPv3
	g) Shall support ip routing features like Static , OSPF , ISIS and BGP.
	h) Shall support MPLS features like L3 VPN , L2 VPN,LDP and RSVP.
14	Shall support redundant power supply.
15	Deleted
16	For each Router , bidder has to quote four SFP-LX (10 km) of 10 GE single mode.
17	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.
	v) Support for IEEE 802.1 s MSTP

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

	a) IEEE 802.1ad Provider Bridge
	b) Transparent LAN Services with Service VLAN (SVLAN) and Customer VLAN (CVLAN) concept
	c) CVLAN to SVLAN translation and mapping
	d) IEEE 802.1ag Ethernet OAM: Connectivity Fault Management (Support 32 MEPs)
	e) Ethernet OAM compliant with IEEE 802.3ah
	f) ITU-T G.8032 Ethernet Ring Protection designed for loop protection and fast convergence times (sub 50 ms) in ring topologies.
	g) Should support Optical Transceiver Digital Diagnostic Monitoring.
	h) Router should support minimum of 4000 Ethernet flow points(EFP).
	i) L2 Protocol Tunnelling.
	j) Loopback Detection.
18	**Router shall have support of following Standards**
	i) IEEE 802.1D (STP)
	ii) IEEE 802.1p (CoS)
	iii) IEEE 802.1Q (VLANs)
	iv) IEEE 802.1ag (Connectivity Fault Management)
	v) IEEE 802.1s (MSTP)
	vi) IEEE 802.3x (Flow Control)
	vii) IEEE 802.3z (Gigabit Ethernet)
	viii) IEEE 802.3ab (1000Base-T)
	ix) IEEE 802.3ac (VLAN Tagging)
	x) IEEE 802.3ad (Link Aggregation)
	xi) IEEE 802.3ae (10 Gigabit Ethernet)
	xii) IEEE 802.ah (Ethernet first mile)
	xiii) ITU-T G.8032/Y.1344 2010: Ethernet Ring
19	**Router shall have the following Certifications**
	i) The operating system of the Router series shall have MEF-9 & 14 or higher certification from authorized agencies.

	ii) Router should be NEBS certified
Note:	**NEBS Certification is not required for PMA. However, they have to produce certificate from standard lab approved/ authorized by Govt. of India that their product are equivalent to NEBS and meets all standard and specification of NEBS.**

SOR 3: Type III Routers

SN.	Technical specification
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, Routers 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	Router should have inbuilt power DC supply (-48 V).
5	Routers shall have suitable Visual Indicators for diagnostics and healthy /unhealthy status of ports & modules.
6	Router shall have 6 Nos. of Gigabit SFP ports and 4 Nos. 10/100/1000 Base –TX with 2 Nos. of 10 Gigabit SFP+ ports complying to IEEE 802.3, IEEE 803.3u and 802.3ab standard , supporting half duplex mode ,full duplex mode and auto negotiation on each port to optimize bandwidth.
7	Router shall have minimum of 30 Gbps (full duplex) forwarding bandwidth at layer 2 switching fabric.
8	Router shall have minimum 45 million packets (64 Byte packets) per second forwarding rate.
9	Routers shall have a minimum of 16000 MAC address space.
10	It should be possible for the routers to be mounted on a 19-Inch rack. All accessories required for this mounting should be supplied.
11	Should support jumbo frame.
12	Should support MPLS features like L2 VPN , L3VPN with OS/License up gradation
13	Deleted
14	Shall support redundant power supply option.
15	Bidder has to quote four SFP–LX (10 km) of GE single mode and two SFP+-LX (10 km) of 10GE single mode .
16	**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.
	v) Support for IEEE 802.1 s MSTP
	vi) Support Dynamic Host Configuration Protocol (DHCP)
	vii) Support Auto –MDIX (Media Dependent Interface Cross over
	viii) Support Inter VLAN IP routing for full layer -3 routing
	ix) Support for IPv6.
	x) Support Strict Priority Queuing.
	xi) Support Network Time Protocol (NTP) / Simple Network Time Protocol (SNTP) based
	xii) RFC 1305 / 2030 for synchronization of date & time from the Central NTP Server.
	xiii) Support RADIUS protocol for console access restriction and authentication as per RFC 2138.
	xiv) Support 4 group of embedded RMON (history, static's and alarms).
	xv) Support multiple privilege level to provide different level of access on console port and telnet sessions.
	xvi) Support classification and scheduling as per IEEE 802.1P on all ports.
	xvii) Support Port Spanning functionally for measurements using a networks analyzer.
	xviii) Support all the standard MIBs (MIB-I&II).
	xix) Support for console port Interface for configuration and diagnostics purposes.
	xx) Support Port Spanning functionally for measurements using a networks analyzer.
	xxi) ITU-T G.8032 Ethernet Ring Protection designed for loop protection and fast convergence times (sub 50 ms) in ring topologies.
	xxii) Should support multiple Ring up to 8 ring (Main and Sub Ring) protection failover within 50 ms (up to 10 Switches in ring). orITU-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).
17	The following Metro Ethernet features should support
	a) IEEE 802.1ad Provider Bridge
	b) Transparent LAN Services with Service VLAN (SVLAN) and Customer VLAN (CVLAN) concept
	c) CVLAN to SVLAN translation and mapping
	d) IEEE 802.1ag Ethernet OAM: Connectivity Fault Management (Support 32 MEPs)
	e) Ethernet OAM compliant with IEEE 802.3ah
	f) ITU-T G.8032 Ethernet Ring Protection designed for loop protection and fast convergence times (sub 50 ms) in ring topologies.
	g) Should support Optical Transceiver Digital Diagnostic Monitoring.
	h) Router should support minimum of 4000 Ethernet flow points(EFP).
	i) L2 Protocol Tunnelling.
	j) Loopback Detection.
18	**Router shall have support of following Standards**
	i) IEEE 802.1D (STP)
	ii) IEEE 802.1p (CoS)
	iii) IEEE 802.1Q (VLANs)
	iv) IEEE 802.1ag (Connectivity Fault Management)
	v) IEEE 802.1s (MSTP)
	vi) IEEE 802.3x (Flow Control)
	vii) IEEE 802.3z (Gigabit Ethernet)
	viii) IEEE 802.3ab (1000Base-T)
	ix) IEEE 802.3ac (VLAN Tagging)

	x) IEEE 802.3ad (Link Aggregation)
	xi) IEEE 802.3ae (10 Gigabit Ethernet)
	xii) IEEE 802.ah (Ethernet first mile)
	xiii) ITU-T G.8032/Y.1344 2010: Ethernet Ring
19	**Router shall have the following Certifications**
	i) The operating system of the Routers series shall have MEF-9 & 14 or higher certification from authorized agencies.
	ii) Routers should be NEBS certified.
Note:	**NEBS Certification is not required for PMA. However they have to produce certificate from standard lab approved/ authorized by Govt. of India that their product are equivalent to NEBS and meets all standard and specification of NEBS.**

SOR 4: Type IV Routers

SN	Description
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 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 200Mbps from Day-1 and IPSEC Throughput of 50 Mbps from Day-1
2.3	It shall support variety of Ethernet Interfaces – 2 SFP GigE ports & 4 port LAN 10/100/1000 Mbps port.
2.4	It shall support other IP Services like GRE tunneling, 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."

SOR-5: Router Type-V

SN	Description
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 tunneling, 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."

SOR6: 1KVA UPS

SN	Specification	
i.	Capacity	1KVA/800 W, better as per actual requirement
ii.	Technology	IGBT
iii.	Wave form	Pure Sine wave
iv.	Display	LCD/LED
v.	Input power factor correction	0.9
vi.	Input configuration	1Ph, L-N+PE
vii.	Output Power factor	0.8 or better
viii.	frequency (Input)	45-70Hz frequency
ix.	frequency (output)	50Hz +/- 0.5Hz frequency
x.	Voltage Range (Bypass)	230VAC+/-15%
xi.	V threshold	3% max full linear load, 6% max on Nonlinear load
xii.	Crest factor	3.0 or better
xiii.	AC-AC Efficiency	85% or better
xiv.	Transfer time Main-Battery	0
xv.	Transfer time Inverter-Bypass	4 m sec
xvi.	Emergency Power off function	Yes
xvii.	Monitoring software for	Battery, health of UPS, any critical parameter change
xviii.	Communication	SNMP V1/V2/V3
xix.	Port	USB
xx.	Battery Type	SMF
xxi.	Battery backup	30 Minutes. on full load (Single bank) with 800 (minimum)VAH battery size (Battery to be installed in separate floor mount cabinet)
xxii.	**Environmental Parameter**	
A	Operating Temperature Range	0-40 deg

SN	Specification	
B	Over Temperature, Load on Battery, Battery on Charge, Battery low, Mains on	Indication required
C	Input AC mains and output power supply surge protection	inbuilt
D	Humidity	0% to 95% non-condensing
E	Noise Level	50 dBA max
F	Size	Floor mounted
xxiii.	**Protection**	IP20
A	Mechanical Parameter	EMI or equivalent BIS/IS standard
B	Safety	EN or equivalent BIS/IS/IEC standard
C	Performance	IEC/EN or equivalent BIS/IS standard
	Voltage Range	175-276 VAC (1-phase) @ 100% load

SOR 7: Patch cord-SC/APC-LC/PC-5 mt,

SOR 8: Patch cord-LC/PC-LC/PC , 5mtr,

SOR 9: Patch cord-LC/PC-SC/PC , 5mtr,

SOR 10: Patch cord-LC-FC-10m &

SOR 11: Patch Cord-FC-SC-5 Mtr

The Patch cords for SOR 7 to SOR 11 should be confirming to TEC NO.: TEC/GR/TX OFJ-01/05/NOV-09 with latest amendment No. TEC/T/OFC-OFJ/155/2013. However the Patch cords should have the following:

i) Operating Temperature: -40ºC to +85ºC.

ii) Insertion Loss:

a) Insertion Loss of complete patch cord including adapter when tested from each direction in all conditions of operations: ≤ 0.3 dB

b) Insertion Loss of Adaptors: ≤ 0.1 dB

iii) Return Loss for each connector of patch cord:

a) **Type-I FC-PC : ≥ 50 dB**

b) **Type-II SC-PC : ≥ 50 dB**

c) **Type-III SC-APC : ≥ 65 dB**

d) **Type-IV LC : ≥ 50 dB**

e) **E2K/APC : ≥ 60 dB**

iv) The length and type of connector of each Patch Cord: As per SOR.

V) The connectors must be make of reputed OEMs 3M, Huber-Shuner, R&M, TE Connectivity/Raychem. any other CACT approved Manufacturer/s having a valid approval against specification number TEC/GR/TX/OFJ-01-NOV.09 for the tendered connected type.

vi) Connector Body:

a) **FC-PC : Ni plated brass body (Ni plating shall be as per BIS Standards)**

b) **SC-PC & SC-APC : Engineering thermoplastic (Glass filled PBT: Polybutylene Terephthalate)**

c) **LC : PEI (Polyetherimide)/ PPS (Polyphenylene Sulphide)**

vii) Color of connector body:

a) **FC-PC connector: Ni plated Brass**

b) **SC-PC connector: Blue**

c) **SC-APC connector: Green**

d) **LC connector: Blue**

viii) Radius of curvature:

a) **FC-PC : 10 to 25 mm**

b) **SC-PC : 10 to 25 mm**

c) **SC-APC : 5 to 12 mm**

d) **LC : 10 to 25 mm**

ix) Minimum bending radius of the cable:

a) **Loaded : 50 mm**

b) **Unloaded : 30 mm**

SOR 12: 19" 42U Rack (Rack Type I)

SN	Item	Description
1	Dimension	42U (Height) x 800mm (Width) x 1000 mm(Depth)
2	Side panels	To be provided across whole height of the rack should be openable with latching arrangement at top and bottom.
3	Front door	Rack should have front door tough and transparent glass fitted on MS/CRCA sheet on sides with Lock and key.
i.	Rear side	Shall be perforated for appropriate level as per industry standard.
ii.	Top & Bottom	Rack top and bottom should be MS/CRCA steel made with cab leen try provision with gland satboth side.
iii.	Fan module	Compact fan module of 90 CFM working on AC power supply 4 Nos teach rack properly fitted at top of rack.
iv.	Earthing Provision	Rack Should have earthing provisions.
v.	Cable manager	2nos.horizontaland2nos.verticalcablemanagerwithcableloopstobe providedwitheachrack.
vi.	Power Distribution Unit(PDU)	Adequate and Redundant power distribution units with electronically controlled circuits for surge and spike protection, isolated input to ground and output to ground.
vii.	Material used	CRCA/MS with Thickness varying from 1.6 Mm to 2.0 mm
viii.	The rack should be fitted with one modem tray 19"	
ix.	The earthing kit consisting of copper bus bar with dimensions 20 inch length, 1.0 inch breadth & 5mm thickness (min.) having appropriate number of M6 tapped holes and 3 brass nut bolts and washers for fixing of earthing cables shall be fixed near the bottom of the rack.	
x.	Thegoodqualitypowdercoatinglightgreyincolourshallbeusedforpaintingoftherack	
xi.	The rack should be fitted with dual source power supply distribution board.	
xii.	"RailTel Logo along with Year" in bold and easily recognizable fonts should be written at the front top of the rack preferably in black or blue color.	
xiii.	OEM should have a valid ISO 9001 certification on the date of opening of bid.	
xiv.	Rack should also comply with EIA 310/DIN 41494 standards.	

SOR 13: 9 U 19", wall mountable Telecom Rack (Rack Type II)

No.	Item	Description
1	Type	Closed Telecom Rack wall mounted
2	Dimension	9U (Height) x 550mm (Width) x 500 mm(Depth)
3	Mounting	Rack should have wall mounting provision with heavy wall brackets and fastners.
4	Front door	Rack should have front door tough and transparent glass fitted on MS/CRCA sheet on sides with Lock and key.
5	Rear Cover	Rear Bolted cover
6	Top & Bottom	Rack top and bottom should be MS/CRCA steel made with cable entry provision with glands at both side.
7	Fan module	Compact fan module of 90 CFM working on 230VAC 1nos.with each rack properly fitted atop of rack
8	Earthing Provision	Rack Should have earthing provisions.

9	Cable manager	1no.horizontal cable manager with cable loops to be provided with each rack.
10	Power Distribution Unit(PDU)	PDU is of 6 Sockets of branded make such as Havells or equivalent with 6Amp with switch.
11	Material used	CRCA/MS with Thickness varying from 0.8 mm or higher.
12	The rack should be fitted with one modem tray19”	
13	The good quality powder coating light grey in colour shall be used for painting of the rack.	
14	“RAILTEL along with Year” in bold and easily recognizable fonts should be written at the front top of the rack preferably in black or blue color.	
15	OEM should have a valid ISO 9001 certification on the date of opening of bid.	
16	Rack should also comply with EIA 310/DIN 41494 standards.	

SOR 14: SFP TYPE-I (SFP 1G (10Km) (BIDI))

SN	Description
1	SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment.
2	Should support 10 km optical distance on single fiber.
3	Should have LC type connector.
4	Should have capacity of bidirectional transmission.
5	Should have 1 Gigabit Ethernet capacity on single mode fiber.
6	Should support DDMI feature.
7	OEM should be having valid ISO 9000 & ISO 14000 certification on the date of opening of bid.
8	Should have CE and FCC regulatory compliances.
9	Operating Temperature of the SFP Should be mini 0 to 65 °C (23 to 149 °F)

SOR 15: SFP TYPE-1I (SFP 1G (10 km) (Dual Fiber))

SN	Description
1	SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment.
2	Should support 10 km optical distance (1550/1310 nm) on dual fiber.
3	Should have LC type connector.
4	Should have 1 Gigabit Ethernet capacity on single mode fibre.
5	Should support DDMI feature.

6	OEM 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)

SOR 16: SFP TYPE-III (SFP 10G (10 km) (BIDI))

SN	Description
1	SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment.
2	Should support 10 km optical distance (1550/1310 nm) **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 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)

SOR 17: SFP TYPE-IV (SFP 10G (40 km) (BIDI))

SN	Description
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 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).

SOR 18: SFP TYPE-V (SFP 10G (60Km) (BIDI))

SN	Description
1	SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment.
2	Should support 40-60 km optical distance on single fiber
3	Should have LC type connector.
4	Should provide the cost in pair (BX U & D)
5	Should have 10 Gigabit Ethernet capacity on single mode fiber
6	Should support Digital Diagnostic Monitoring feature
7	OEM should be having valid ISO 9000 & ISO 14000 certification on the date of opening of bid
8	Should have CE and FCC and UL regulatory compliance
9	Operating temperature of the SFP should be minimum 0 to 65 °C (23 to 149 °F)
10	Tx/Rx wavelength should be either in the range of 1300nm or 1500nm
11	For Tx/Rx wavelength in the range of 1300nm (1270nm/1330nm) power budget should be minimum 21 dBm
12	For Tx/Rx wavelength in the range of 1500nm (1490nm/1550nm) power budget should be minimum 16 dBm

SOR 19: SFP TYPE-VI (SFP+ 10G (10 km) (Dual Fiber)

SN	Description
1	SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment.
2	Should support 10 kms optical distance on dual fiber
3	Should have LC type connector
4	Should have 10 Gigabit Ethernet capacities on single mode module fiber.
5	Should support DDMI feature. Option should be available for both SFP+ and XFP
6	Should 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)

SOR 20: SFP TYPE-VII (SFP 1G Electrical)

SN	Description
1	SFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment.
2	Should support 90 meter distance on copper cable.
3	Should have RJ45 Connector
4	Should have 1 Gigabit Ethernet capacities
5	Should should be having valid ISO 9000 & ISO 14000 certification on the date of opening of bid.
6	Should have CE and FCC regulatory compliances.
7	Operating Temperature of the SFP Should be mini 0 to 65 °C (23 to 149 °F)

SOR 21: SFP TYPE-VIII (XFP 10G (10 km) (Dual Fiber)

SN	Description
1	XFP modules should comply with multi-source agreement (MSA), enabling compatibility with other vendors equipment.
2	Should support 10 kms optical distance on dual fiber
3	Should have LC type connector
4	Should have 10 Gigabit Ethernet capacities on single mode module fiber.
5	Should support DDMI feature. Option should be available for both SFP+ and XFP
6	Should 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 XFP Should be mini 0 to 65 °C (23 to 149 °F)

SOR 22: Specification for MPO to LC*4 Single Mode LSZH Breakout cable -10Mtr

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

Annexure-II

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

Jt. General Manager/NTP. **Dated: …….**
RailTel Corporation of India Ltd.
……
……....
……....

I / We ……. hereby confirm and accept that against RailTel Tender No. …….. , there is a requirement of Long Term Maintenance Support as per Clause 15. We confirm that Long Term Maintenance Support shall be met by us directly or through Authorized partner, as the case may be based on contracts. I / We have gone through the requirement mentioned in the Tender document and shall provide services for the offered supply items.

(Signature of Firm's Authorized Officer)

Seal

Signature of witness:

1. ……
2. …….

Annexure-III

Jt. General Manager/NTP **Dated: …….**
RailTel Corporation of India Ltd.
……
……....
……....

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

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

Thanking you,
Best regards,

Authorised Signatory

****

Annexure-IV

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

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

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

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

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

(xvii) I/We hereby declare that I/We have downloaded the tender documents from electronic-tender portal. 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.

(xviii) 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.

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

(xx) 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.

(xxi) 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 be disqualified and banned for a period of three years and shall not be eligible to bid for future tenders in RailTel Corporation of India Ltd. for the period of three years from date of issue of such orders. Further, I/we (*insert name of the tenderer*)** _____ and all my/our constituents understand that my/our offer shall be summarily rejected.

(xxii) 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, alongwith forfeiture of EMD/SD and Performance Guarantee besides any other action provided in the contract including banning of business for five year on entire IR.

DEPONENT
SEAL AND SIGNATURE
OF THE TENDERER

VERIFICATION

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

DEPONENT
SEAL AND SIGNATURE
OF THE TENDERER

Place:
Dated:

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

Annexure-V

Performa for Performance Guarantee

PERFORMANCE GURANTEE BOND
(On Stamp Paper of Rs. One Hundred)
(To be used by approved Scheduled Banks)

In consideration of the RailTel Corporation of India Limited, Delhi IT Park , Block-III, 6TH Floor,Shastri Park,New Delhi-110053 (Herein after called RailTel) having agreed to exempt …….. (Hereinafter called "the said Contractor(s)") from the demand, under the terms and conditions of an Agreement No. …… …… dated …… made between …… and …….. for (hereinafter called " the said Agreement") of security deposit for the due fulfillment by the said Contractor (s) of the terms and conditions contained in the said Agreement, or production of a Performance Bank Guarantee for Rs. …….. (Rs. …….. only). We, ……(indicate the name of the Bank) hereinafter referred to as " the Bank") at the request of ……. ……. Contractor(s) do hereby undertake to pay the RailTel an amount not exceeding Rs. ……. Against any loss or damage caused to or suffered or would be caused to or suffered by the RailTel by reason of any breach by the said Contractor(s) of any of the terms or conditions contained in the said Agreement.

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

1. We, …….. bank 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 there under and the Contractor(s) / Supplier(s) shall have no claim against us for making such payment.

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

and conditions of the said Agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this Guarantee. Unless a demand or claim under the Guarantee is made on us in writing on or before the ……. (1) ……. We shall be discharged from all liability under this Guarantee thereafter.

We,……We, ……. (indicate the name of Bank) Further agree with the RailTel that the RailTel shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the Agreement or to extend time of to postpone for any time or from time to time any of the powers exercisable by the RailTel against the said contractor(s) and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by reason of any such variation, or extension to the said Contractor(s) or for any forbearance, act or omission on the part of RailTel or any indulgence by the RailTel to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have affect of so relieving us.

This Guarantee will not be discharged due to the change in the Constitution of the Bank or the Contractor(s) Supplier(s).

(indicate the name of Bank) lastly undertaken not to revoke this Guarantee during its currency except with the previous consent of the RailTel in writing.

Dated the day of 2021

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

Witness

1. Signature
   Name

2. Signature
   Name

****

Annexure-VI

PROFORMA FOR "NIL DEVIATION COMPLIANCE UNDERTAKING

(To be signed by the Bidder)

To,

The Joint General Manager/NTP,
RailTel Corporation of India Limited
6th Floor, IIIrd Block,
Delhi Technology Park, Shastri Park,
New Delhi-110053

Tender Reference No.:

Sub: NIL Deviation Compliance

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

1. All SOR item proposed in scope supplies are compliant to the technical specifications of the equipment as mentioned in the Annexure-I of ITB Document.

2. We will also ensure our unconditional compliance of all the terms and conditions as mentioned in the Tender document including all corrigenda.

3. List of deviations (Partial Compliance and Non-compliance) from terms and conditions as mentioned in the Tender document including all corrigenda, if any, is enclosed as Annexure with this form. We understand that any partial compliance or non-compliance, may result in **REJECTION** of our bid.

Seal and signature of the bidder

Place:

Date:

(This letter should be on the letterhead of the bidder duly signed by an authorized signatory)