Request for Proposal of

Supply, Installation, Testing, Commissioning & Maintenance of ISP Hardware, Software and License

for

Kerala Fibre Optic Network

Tender Ref No: KSITIL/KFON/2023-24/7608

May 2023

Published by
Kerala State Information Technology Infrastructure Limited
First Floor, Saankethika, PF Road, Pattom palace P.O Thiruvananthapuram- 695004

DISCLAIMER

The information contained in this tender or subsequently provided to Applicants, whether verbally or in documentary or any other form by or on behalf of the Authority or any of its employees or advisers, is provided to Applicants on the terms and conditions set out in this tender and such other terms and conditions subject to which such information is provided.

This tender is issued by the Managing Director, Kerala State Information Technology Infrastructure Ltd. This tender is not an agreement and is neither an offer nor an invitation by the Authority to the prospective Applicants or any other person. The purpose of this tender is to provide interested parties with information that may be useful to them in the formulation of their Bid pursuant to this Tender. This Tender includes statements, which reflect various assumptions and assessments arrived at by the Authority in relation to Supply, Installation, Testing & Commissioning of ISP Hardware and Software for KFON. Such assumptions, assessments and statements do not purport to contain all the information that each Applicant may require. This Tender may not be appropriate for all persons, and it is not possible for the Authority, its employees, or advisers to consider the objectives, technical expertise and particular needs of each party who reads or uses this Tender. The assumptions, assessments, statements, and information contained in this Tender, may not be complete, accurate, adequate, or correct. Each Applicant should, therefore, conduct its own investigations and analysis and should check the accuracy, adequacy, correctness, reliability and completeness of the assumptions, assessments and information contained in this Tender and obtain independent advice from appropriate sources.

Information provided in this Tender to the Applicants is on a wide range of matters, some of which depends upon interpretation of law. The information given is not an exhaustive account of statutory requirements and should not be regarded as a complete or authoritative statement of law. The Authority accepts no responsibility for the accuracy or otherwise for any interpretation or opinion on the law expressed herein.

The Authority, its employees and advisers make no representation or warranty and shall have no liability to any person including any Applicant under any law, statute, and rules or regulations or tort, principles of restitution or unjust enrichment or otherwise for any loss, damages, cost or expense which may arise from or be incurred or suffered on account of anything contained in this Tender or otherwise, including the accuracy, adequacy, correctness, reliability or completeness of the Tender and any assessment, assumption, statement or information contained therein or deemed to form part of this Tender or arising in any way in this selection process.

The Authority also accepts no liability of any nature whether resulting from negligence or otherwise however caused arising from reliance of any Applicant upon the statements contained in this Tender. The Authority may in its absolute discretion, but without being under any obligation to do so, update, amend or supplement the information, assessment or assumption contained in this Tender. The issue of this Tender does not imply that the Authority is bound to select an Applicant or Applicants, as the case may be, for the RfP for Supply, Installation, Testing & Commissioning of ISP Hardware and Softwarefor KFON and the Authority reserves the right to reject all or any of the Proposals without assigning any reason whatsoever.

The Applicant shall bear all costs associated with or relating to the preparation and submission of its Proposal including but not limited to preparation, copying, postage,

delivery fees, expenses associated with any demonstrations or presentations which maybe required by the Authority, or any other costs incurred in connection with or relatingto its Proposal. All such costs and expenses will remain with the Applicant and the Authority shall not be liable in any manner whatsoever for the same or for any other costs or other expenses incurred by an Applicant in preparation or submission of the Bid, regardless of the conduct or outcome of the selection process.

Glossary of Terms

Abbreviation	Description
KSITIL	Kerala State Information Technology Infrastructure Limited
KFON	Kerala Fibre Optic Network
BG	Bank Guarantee
BoQ	Bill of Quantity
DD	Demand Draft
EMD	Earnest Money Deposit
EoI	Expression of Interest
GoI	Government of India
GoK	Government of Kerala
LoI	Letter of Intent
MAF	Manufacturer Authorization Form
MoU	Memorandum of Understanding
MPLS	Multi - Protocol Label Switching
SI	System Integrator
NDA	Non-Disclosure Agreement
NIT	Notice Inviting Tender
NOC	Network Operation Center
O&M	Operations & Maintenance
OEM	Original Equipment Manufacturer
OFC	Optical Fibre Cable
PBH	Primary Business Hour
PMU	Project Management Unit
PoP	Point of Presence
RfP	Request for Proposal
RoW	Right of Way
SLA	Service Level Agreement
BNG	Broadband Network Gateway
CGNAT	Carrier Grade NAT
NGFW	Next-Generation Firewall

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1 Definitions

#	Term	Definition
1.	**Agreement/ Contract**	the Agreement entered between Authority and the Successful Bidder including all attachments, schedules, annexure thereto and all documents incorporated by reference therein and all amendments, corrigendum /corrigenda, changes thereto
2.	**Client/ Authority**	Kerala State Information Technology Infrastructure Limited, represented by its Managing Director
3.	**Bidder**	The use of the term "Bidder" in the Tender means the agency participating in this tender.
4.	**Bid/Proposal**	Offer by the Bidder to fulfil the requirement of the Client/Authority under the RfP/Contract for an agreed price. It shall be a comprehensive technical and commercial response to the Tender
5.	**Breach**	A breach by Bidder of any of its obligations under this Agreement
6.	**Confidential Information**	All information including Authority's data (whether in written, oral, electronic or other format) which relates to the technical, financial and business affairs, dealers, suppliers, products, developments, operations, processes, data, trade secrets, design rights, know-how, plans, budget and personnel of each department and its affiliates which is disclosed to or otherwise learned by the other Party in the course of or in connection with this Agreement (including without limitation such information received during negotiations, location visits and meetings in connection with this Agreement);
7.	**Control**	Control means the term "Control" as defined in section 2(27) of the Companies Act, 2013

#	Term	Definition
8.	**Deliverables of the Agencies**	Products, infrastructure, and services agreed to be delivered by the Bidder in pursuance of the agreement as defined more elaborately in the RfP and includes all related documents like manuals inter alia payment and/or process related etc., source code and all its modifications
9.	**Intellectual Property Rights**	All rights in written designs and copyrights, trademarks, moral rights, rights in databases and Bespoke Software / Pre-existing work including its up-gradation systems and compilation rights (whether or not any of these are registered and including application for registration)
10.	**Month/ Week**	The Month shall mean calendar month & Week shall mean calendar week
11.	**Parties**	Shall mean Authority and Bidder for the purposes of this Agreement and "***Party***" shall be interpreted accordingly
12.	**Performance Security**	Unconditional guarantee provided by the Bidder from a Scheduled Commercial Bank/Nationalized Bank in favour of the Authority for 3% of the total contract value
13.	**Project**	Project shall mean supply and installation of necessary hardware and software to operate ISP infrastructure required to introduce new products like Internet Leased Line (ILL), Fiber To The Home (FTTH), Dark Fiber, Virtual Private Network (VPN), Co-location of Space at NOC and PoPs, Managed Cloud Services etc. and their pricing for Kerala Fibre Optic Network
14.	**Project Implementation**	Project Implementation as per the quality and testing standards and acceptance criteria prescribed by the Authority or its nominated agencies
15.	**Request for Proposal/ Tender Document**	Written solicitation that conveys to the Bidder, requirements for products/ services that the Authority intends to buy and implement

#	Term	Definition
16.	**Service Level**	The level of service and other performance criteria which will apply to the Services delivered by the Bidder, executed as part of the Service Agreement
17.	**Network System**	Network System shall mean the network infrastructure of the Kerala Fibre Optic Network
18.	**Successful Bidder**	The Bidder who is qualified & successful in the bidding process and awarded the Contract and will be referred to as L1 bidder

Table 1: Definitions

2 Bidding Data Sheet

Notice Inviting Tender		
1.	**Name of the Tender Inviting Authority**	KSITIL
2.	**Officer Tender Inviting Authority**	Managing Director, KSITIL
3.	**Name of the Tender**	RfP for Supply, Installation, Testing, Commissioning & Maintenance of ISP Hardware, Software and License for KFON
4.	**Tender Reference Number**	KSITIL/KFON/2023-24/7608
5.	**Tender Type**	Open Tender
6.	**Tender Category**	Services
7.	**Publication of Tender Document**	e-Procurement Portal of Govt of Kerala
8.	**Contact Person**	Company Secretary, KSITIL
9.	**Address**	Kerala State Information Technology Infrastructure Ltd., First Floor, Saankethika, PF Road, Pattom palace P.O, Thiruvananthapuram 695004
10.	**Contact No.**	0471-4068006; 2969640
11.	**E-Mail ID, for any clarifications**	kfon@ksitil.org
12.	**Time & last date to submit clarifications**	Time: 15:00 Hrs.; 23/05/2023
13.	**Pre-bid Meeting**	Time: 14:30 Hrs.; Date: 24/05/2023
14.	**Pre-Bid Meeting Venue**	Kerala State Information Technology Infrastructure Ltd., First Floor, Saankethika, PF Road, Pattom palace P.O, Thiruvananthapuram 695004
15.	**Procedure for Bid Submission**	Submission through e-Procurement Portal of Govt of Kerala
16.	**Bid submission start date**	Date: 31/05/2023
17.	**Last Date of Submission of Bids**	Time: 15:00 Hrs.; Date: 08/06/2023

Notice Inviting Tender		
18.	**Opening of Technical Bids**	Time: 15:00 Hrs.; Date: 09/06/2023
19.	**Bid System**	1. Technical bid 2. Commercial Bid
20.	**Tender Fee (Non-Refundable)**	Rs. 29,500/- (Rupees Twenty Nine Thousand and Five Hundred Only) including GST @18%
21.	**EMD (Refundable)**	Rs. 5,00,000/- (Rupees Five Lakh Only)
22.	**Validity of the Bid**	120 from the date of opening of bid
23.	**Contract period (For Supply)**	45 days from Contract sign off
24.	**Performance Security (PS)**	5% of the total contract value In the form of a Bank Guarantee issued by any Nationalized / Scheduled Commercial Bank in favour of "The Managing Director, Kerala State IT Infrastructure Ltd.", payable at Thiruvananthapuram. Performance Security must be furnished within 14 days from the date of receipt of notification of award (Letter of Intent)
25.	**Performance Security validity period**	Three (3) months beyond expiry of warranty/defect liability period of 60 months.
26.	**Period of Signing the Contract**	Within 14 days from the date of receipt of notification of award (Letter of Intent)
27.	**Terms & Conditions**	As per the Tender document

Table 2: Bidding Data Sheet

Note:

- Please visit https://etenders.kerala.gov.in/ for further details regarding the e-tendering process.
- All the notification/details and terms and conditions regarding this tender notice hereafter will be published online on web site https://etenders.kerala.gov.in/
- Bid submission should be through etender portal of Kerala government viz https://etenders.kerala.gov.in/
- All the clarifications / corrigendum to the queries will be published on the above said websites.

3 About Kerala Fibre Optic Network

Government of Kerala has commissioned a dedicated optical fibre network capable of efficient service delivery, assured Quality of Service (QoS), reliability, interoperability, redundancy, security, and scalability, across Kerala covering 14 districts through the KFON project. This project has enabled connectivity to about 30,000 Government institutions and is about to embark on providing FTTH connectivity. For more details, please visit https://kfon.kerala.gov.in

3.1 KFON Network Architecture

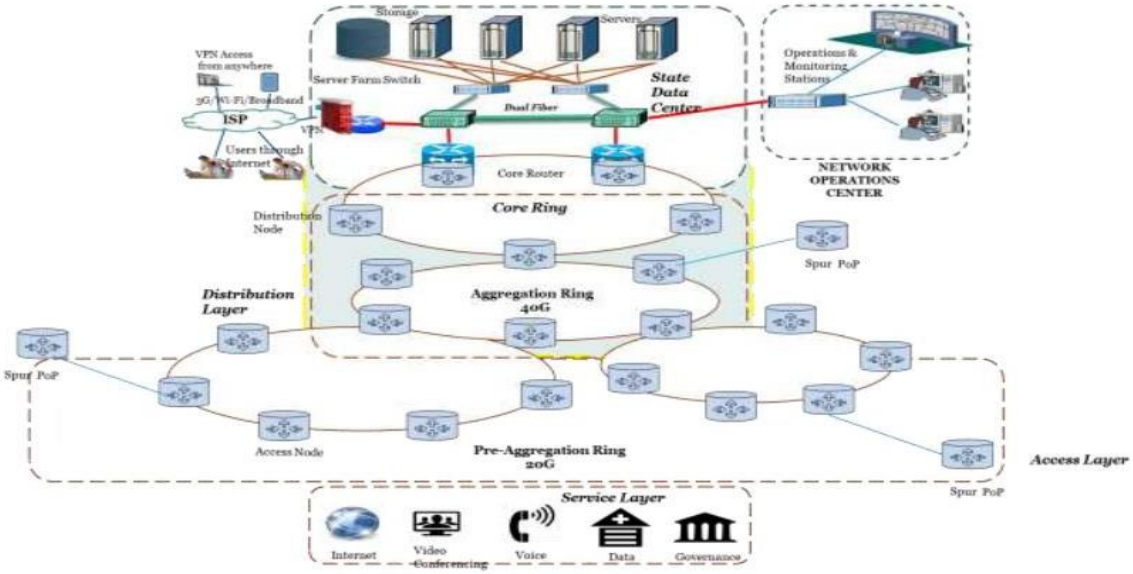


Figure 1: Network Architecture

KFON Network Description

Point of Presence (PoPs)

The PoPs for Kerala Fibre Optic Network are located inside KSEBL owned substations. These PoPs have been divided into Core, Aggregation, Pre-Aggregation and Spur PoPs. The substations which could not be brought under either core, aggregation or pre-aggregation rings shall be treated as Spur PoPs.

Core POP

One substation in each district is the Core PoP. All the Core PoPs are interconnected with NOC and State Data Centre, thus creating an inter-district route through the DWDM equipment's and Juniper MX960 Routers (2 Nos.). This ring will carry all the traffic from

the districts up to the NOC and the State Data Centre. Also, the core ring is designed to carry the traffic from one district to another. The core ring is designed to carry 100 Gbps traffic at each district which can be scaled up if required in the future.

Aggregation POP

Each district has one aggregation ring which shall connect the Core PoP with 4 or 5 PoPs within that district. This layer of the network will aggregate traffic coming from all the horizontal offices/homes/enterprises connected to the aggregation PoPs (Juniper MX 480 routers), spurs to aggregation rings and pre-aggregation rings' traffic and route it to NOC, Data Centre, and district to district through core ring. The traffic will aggregate at Core PoP of the respective district. Each Aggregation Ring is of 40 Gbps capacity which can be scaled up if required in the future.

Pre-Aggregation PoP

The remaining rings are considered as pre-aggregation rings (Juniper MX 204 HA routers) within the district, and it connects to the aggregation ring. These rings will aggregate at an aggregation PoP and will carry the traffic coming from all the horizontal offices/homes/enterprises connected to the pre-aggregation PoPs and spurs to pre-aggregation rings. There may be multiple pre-aggregation rings in a district. These rings shall be of 20 Gbps capacity which can be scaled up if required in the future.

Spur PoP

Remote location PoPs which could not be connected in the ring are termed as Spur PoPs with 10 Gbps capacity scalable if required in the future.

Network Operating Centre (NOC)

The State level NOC of Kerala Fibre Optic Network is the heart of operations and management of the state-wide network under this project. KFON has laid down the infrastructure for providing connectivity to all government institutions/home/enterprises and has the provision for leasing dark fibre and selling bulk bandwidth to various service providers to enable delivery of end-user services.

Broad Scope of Work of Bidder

The bidder shall supply necessary hardware and software required for the KFON network to provide various ISP service across Kerala for automating and provisioning of new products and services etc provided under this project but not limited to the following:

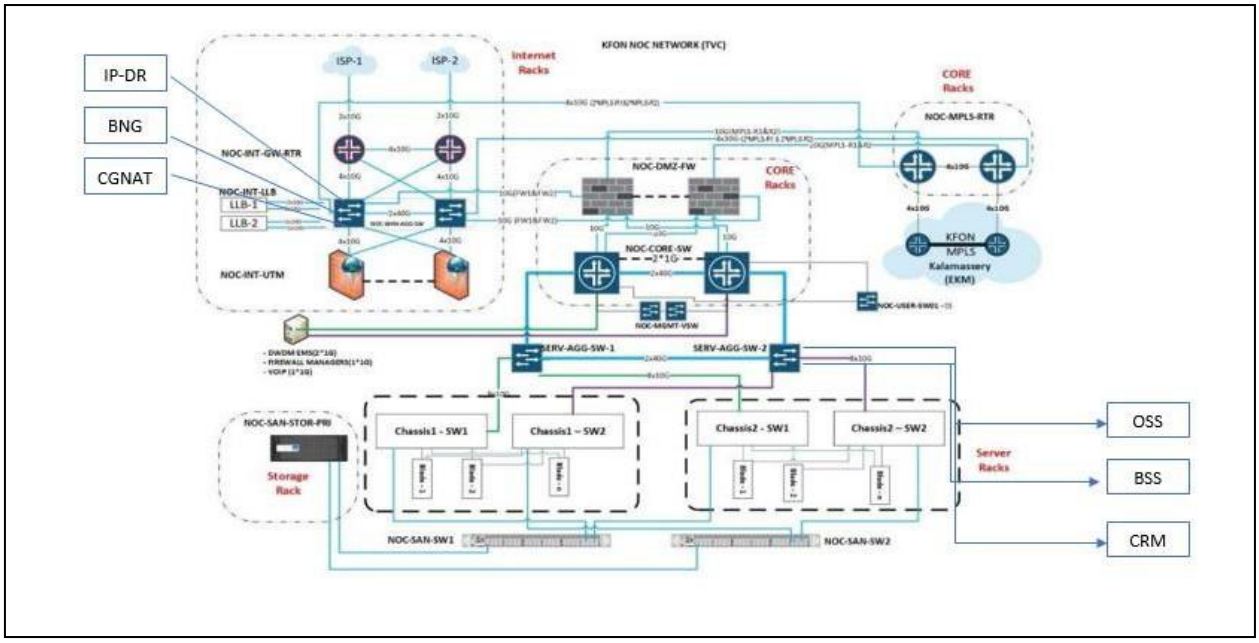
- Supply, Install, Test and Commission of all the Hardware & Software as mentioned in the Table below.
- Provide technical advisory support for KFON project network expansion.
- Coordination with KFON System Integrator (M/s. BEL and its Consortium Partners) and external stakeholders.

- Coordinate with KSITIL internal resources and third parties/vendors for execution of projects.
- Perform risk assessment management to minimize/mitigate project risks.
- Establish and maintain relationships with third parties/vendors.
- Create and maintain comprehensive project documentation.

Schedule of Requirements:

S.No	Item Description	UoM	Qty
1	BNG Solution	Lot	4
2	Distribution Switches	No	10
3	IPDR	Lot	1
4	DDoS	Lot	2
5	DWDM (2*100Gbps)	Lot	2
6	DNS Solution	Lot	2
7	Servers	Lot	1
8	Storage	Lot	1
9	OS, DB, Virtualization License	Lot	1
10	Additional OSS/ BSS Licenses (R-Converge version 5.0.0.33) for 2.5 Lakh customers	No	25,0000
11	Overall Implementation and Integration with other sub systems to make the network ready for provisioning of services	Lot	1

The present IT network design is enclosed below:



4 Instructions to Bidders

4.1 Procurement under Kerala Fibre Optic Network

MD, KSITIL invites bids from system integrators who can supply, install, test and commission ISP hardware and software for its existing KFON Project through its services.

a) Participating entities shall agree to adhere to the Terms & Conditions and Scope & Services mentioned in this tender.

b) All the terms and conditions are to be read jointly as mentioned on the website (https://etenders.kerala.gov.in/) and in this document.

c) The tender document is available on the e-Procurement portal of the Government of Kerala https://etenders.kerala.gov.in/

4.2 General

a) While every effort has been made to provide comprehensive and accurate background information, requirements and specifications, Bidders must form their own conclusions about the services required. Bidders and recipients may wish to consult their own legal advisers in relation to this RfP. Queries if any can be clarified during the Prebid meeting.

b) All information supplied by Bidders may be treated as contractually binding on the Bidders, on successful award of the assignment by the Authority on the basis of this RfP.

c) The Authority may cancel this public procurement at any time prior to a formal written contract being executed by or on behalf of the Authority.

d) This RfP supersedes and replaces any previous public documentation and communications, and Bidders should place no reliance on such communications.

4.3 Due Diligence

Bidder is expected to examine all instructions, forms, terms, and specifications in theTender Document. The Bid should be precise, complete and in the prescribed format

as per the requirement of the Tender Document. Failure to furnish all information required by the Tender Document or submission of a bid not responsive to the Tender Document in every respect will be at the Bidder's risk and may result in rejection of the bid.

4.4 Cost of Bidding

Bidder shall bear all costs associated with the preparation and submission of its Bid and the Authority shall in no event be held responsible or liable for these costs, regardless of the conduct or outcome of the bidding process.

4.5 Language of the Bid

The bids prepared by the Bidder and all subsequent correspondence and documents relating to the Bids exchanged by the Bidder and the Authority shall be written in the English language. Any printed literature furnished by the Bidder, written in another language, shall be accompanied by an accurate English translation, in which case, for purposes of interpretation of the Bid, the English translation shall prevail.

4.6 Pre-Bid Meeting & Clarifications

a) The Authority will host a Pre-Bid meeting for answering queries (if any) by the prospective bidders. The purpose of the pre-bid meeting is to provide a forum to the bidders to clarify their doubts / seek clarification or additional information necessary for them to submit their Bid. The Authority reserves the right to hold or re-schedule the Pre-Bid meeting.

b) The Pre-Bid meeting will be held on the date and venue as specified in the Bidding Data Sheet. The bidder or the representatives of the bidders as authorized in writing by the respective organization (limited to two) may attend the pre-bid meeting at their own cost.

c) The Bidders will have to ensure that their queries for Pre-Bid meeting should reach the Authority by **email only** kfon@ksitil.org **(Excel File)** on or before the last date for sending pre-bid queries mentioned in the Bidding Data Sheet of this document by the bidder/authorized representative of the Bidder with subject line: "RFP FOR SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF ISP HARDWARE AND SOFTWARE PRE-BID QUERY".

d) The queries should necessarily be submitted in the following format:

Sl. No.	Page No.	Section No.	Content/Clause of the RfP requiring clarification	Clarification Sought

e) Queries submitted post the deadline mentioned on the website or which do not adhere to the above-mentioned format may not be responded to. The Authority shall not be responsible for ensuring that they have received the Bidder's queries.

f) Bidders are requested to submit the e-mail address, mobile no. of the bidder/authorized representatives and registered address for all communications.

4.6.1 Responses to Pre-Bid Queries and Issue of Corrigendum

a) The Authority shall provide timely response to the queries. However, the Authority makes no representation or warranty as to the completeness or accuracy of any response made in good faith, nor does the Authority undertake to answer all the queries that have been posted by the Bidders.

b) At any time prior to the last date for receipt of bids, the Authority may, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Bidder, modify the RfP document by a corrigendum.

c) The Corrigendum (if any) & clarifications to the queries from all bidders will be posted only on the e-Procurement Portal of the Government of Kerala https://etenders.kerala.gov.in/.

d) Any such Corrigendum shall be deemed to be incorporated into this RfP. In each instance in which provisions of the Corrigenda contradict or are inconsistent/ inapplicable with the provisions of the Tender Document, the provisions of the Corrigenda shall prevail and govern, and the contradicted or inconsistent/inapplicable provisions of the Tender shall be deemed amended accordingly.

e) In order to provide prospective Bidders reasonable time for taking the Corrigendum into account, the Authority may, at its discretion, extend the last date for the receipt of Proposals.

4.6.2 Tender Fees

Bidder needs to pay tender fee as per the Bidding Data Sheet.

4.6.3 Earnest Money Deposit (EMD)

a) Bidders should submit the EMD as per the Bidding Data Sheet.

b) The EMD of all unsuccessful bidders will be refunded, on receipt of letter of acceptance from Successful Bidder along with security deposit.

c) The EMD amount is interest free and will be refundable without any accrued interest on it.

d) The EMD shall be returned to the Successful Bidder upon signing of contract and submission of Performance Security.

e) The Bid submitted without EMD, mentioned above, will be summarily rejected.

f) The EMD may be forfeited:

- If a Bidder withdraws its bid during the period of bid validity
- If the Successful Bidder fails to sign the contract or submit Performance Security within the stipulated period.

4.6.4 Completeness of Response

a) Bidders are advised to study all instructions, forms, terms, requirements, appendices, and other information in this RfP document carefully. Online submission of the bid / proposal shall be deemed to have been done after careful study and examination of the RfP document with full understanding of its implications.

b) Failure to comply with the requirements of this paragraph may render the Proposal non-compliant and the Proposal may be rejected. Bidders must:

- Comply with all requirements contained in this RfP.
- Include all supporting documentations specified in this RfP.
- All pages of the Bid must be numbered and duly signed by the Authorized Signatory accompanied by a Power of Attorney/Board Resolution.

4.6.5 Bid Prices

a) The Bidder shall indicate in the proforma prescribed, the unit rates and total bid prices for the services, it proposes to provide under the Agreement. Prices should be shown separately for each item as detailed in this Tender Document. The price quoted shall be inclusive of all charges excluding GST. GST shall be payable extra at actual rates.

b) The Bidder shall carry out all the tasks in accordance with the requirement of the tender documents and with due diligence. It shall be the responsibility of the Bidder to fully meet all the requirements of the Tender Documents and to meet objectives of the Project.

4.6.6 Firm Prices

a) Prices quoted in the bid must be firm and final and shall not be subject to any modifications, on any account whatsoever. The bid prices shall be indicated in Indian Rupees (INR) only.

b) The Commercial Bid should clearly indicate the price quoted without any ambiguity / qualifications whatsoever and should include all applicable taxes, duties, fees, levies, and other charges as may be applicable, excluding GST (to be quoted in separate column in the commercial bid) in relation to the activities proposed to be carried out.

c) Prices in any form or by any reason before opening the Commercial Bid should not be revealed, failing which the offer shall be liable for rejection.

4.7 Conditional bids by the bidders

The Bidder should abide by all terms and conditions specified in the Tender Document. Conditional offers shall be liable for dis-qualification.

4.7.1 Bid Validity Period

Bids shall be valid for a period as mentioned in the Bidding Data Sheet. A Bid valid for shorter period may be considered as non-responsive. In exceptional circumstances, at its discretion, the Authority may solicit the Bidder's consent for an extension of the validity period. The request and the responses thereto shall be made in writing or email.

4.8 Local Conditions

a) Each Bidder is expected to become fully acquainted with the local conditions and factors, which may affect the performance of the contract and /or the cost.

b) The Bidder is expected to know all conditions and factors, which may have any effect on the execution of the contract after issue of Letter of Intent as described in the bidding document. The Authority shall not entertain any request for clarification from the Bidder regarding such local conditions.

c) It is the Bidder's responsibility that such factors have been properly investigated and considered before submitting the proposal. No claim, whatsoever, including that for financial adjustment to the contract awarded under the bidding document will be entertained by the Authority. Neither any change in the time schedule of the contract nor any financial adjustments arising there-of shall be permitted by the Authority on account of failure of the Bidder to know the local laws / conditions.

4.9 Tender Opening

Received bids will be opened at the Head Office of KSITIL on the date and time provided in the Bid data Sheet or published in the **https://etenders.kerala.gov.in** Portal of the Government of Kerala. The result of bids will be published in the above portal.

4.10 Clarification of Bids

To assist in the scrutiny, evaluation and comparison of bids, the Authority may, at its discretion, ask some or all Bidders for clarifications with regards to their Bid. The request for such clarifications and the response will necessarily be in writing. Failure of a Bidder to submit additional information or clarification as sought by the Authority within the prescribed period will be considered as a non-compliance and the Bid may be evaluated based on the limited information furnished along with the Bids.

4.11 Right to accept any Bid and reject any or all Bids

The Authority reserves the right to accept or reject any Bid, and to annul the tendering process and reject all Bids at any time prior to award of contract, without thereby incurring any liability to the affected Bidder(s) or any obligation to inform the affected Bidder(s) of the grounds for such action.

4.12 Notification of Award

The Authority will notify the Successful Bidder via letter/email of its intent of accepting the Bid. The Successful Bidder shall be required to sign the LoI and return the same to the address and within the specified time period in the Bidding Data Sheet as a token of acceptance of the LoI.

4.13 Performance Security (PS)

As a condition precedent to execution of the Agreement, the Successful Bidder after the tender for Request for Proposal for Supply, Install, Test & Commissioning of ISP hardware and Software of Kerala Fibre Optic Network, shall ensure submissionof the requisite unconditional irrevocable Bank Guarantee, in the prescribed format within the time period prescribed in the Bidding Data Sheet as a Performance Security for the services to be performed under the resultant Agreement. The Bank Guarantee amount and its validity shall be equivalent to that mentioned in the Bidding Data Sheet. Performance Security may be subject to forfeiture as per the clauses mentioned in the Tender Document.

EMD of the Successful Bidder shall be returned on submission of PS by Successful Bidder after successful execution of the Agreement.

The Performance Security may be liquidated by the Authority as penalty / liquidated damages resulting from the agency's failure to honour its obligations under the resultant Agreement. The Performance Security shall be returned by the Authority to the Bidder within thirty (30) days of the term/expiration of the resultant Agreement after applicable deductions as per the Agreement, if any.

4.14 Signing of Contract

Subsequent to the Authority's notification to the Successful Bidder by way of a LOI, acceptance of the LOI and submission of the Performance Security, the Successful Bidder shall execute the Agreement with the Authority. Failure of the Successful Bidder to furnish the Performance Security or execute the agreement within the prescribed time shall cause the EMD of the Successful Bidder to be liquidated. In such an event, the Authority may choose to negotiate with the next eligible Bidder. The Successful Bidder will be liable to indemnify the Authority for any additional cost or expense, incurred on account of failure of the Successful Bidder to execute the Agreement.

Notwithstanding anything to the contrary mentioned above, the Authority at its sole discretion shall have the right to extend the timelines for execution of Agreement on the request of the Successful Bidder, provided the same is bona fide.

4.15 Terms and conditions of the Tender

Bidder is required to enter into a Master Service Agreement for all the terms and conditions (including project timelines) to be adhered to by the Successful Bidder

during Project implementation. The following documents shall be deemed to formand be read and construed as part of the Agreement viz.:

i. The Master Service Agreement confirmed by the Authority with the successful bidder.

ii. The Letter of Intent.

iii. The RfP.

iv. The Proposal and any other documents submitted by the bidder to the extent accepted by the Authority.

5 Evaluation Framework

5.1 Two Stage Bid System

a) Complete bidding process will be in two stage –bid system. All the notification and details terms and conditions regarding, this tender notice hereafter will be published online on the portal https://etenders.kerala.gov.in/

b) Bidder should submit closed bid as specified in the Tender Document through the e-Procurement Portal of the Government of Kerala.

c) Technical bids will be opened as per the timeline specified in the datasheet.

d) The rates should be quoted in the Commercial Bid format attached with the tender.

e) The Authority reserves the right to accept or reject any or all the tenders without assigning any reason.

f) Wherever a specific form is prescribed in the RfP document, the Bidder shall use the form to provide relevant information. If the form does not provide space for any required information, space at the end of the form or additional sheets shall be used to convey the required information. For all other cases, the Bidder shall design a form to hold the required information.

g) The Authority reserves the right to ask for a technical elaboration/clarification in the form of a technical presentation from the Bidder on the already submitted technical bid at any point of time before opening the Commercial Bid. The Bidder shall furnish the required information to the Authority and its appointed representative on the date asked for, at no cost to the Authority. The Bidder‘s name, the Bid Price, the total amount of each Bid and other such details as the Tendering Authority may consider appropriate, will be announced, and recorded by the Authority at the opening of bid.

The two stage-Bid to be submitted by the Bidder shall consist of the following:

Technical Bid (Cover-1)	• The Bidder shall furnish, Technical Proposal, documents establishing the technical qualifications, documents supporting technical proposals, proof of registered office in India, Project experience etc. to perform the Contract.

	• The Technical Bid shall be prepared in accordance with the requirements specified in this Tender and in the formats prescribed in the Tender Document. • Technical Bid should be submitted along with a certified true copy of a board resolution/Power of Attorney empowering authorized signatory to sign/act/execute documents binding the Bidder organization to the terms and conditions detailed in this proposal. • The authorized signatory of the bidder shall sign on all the statements, documents, certificates uploaded by them, owning responsibility for their correctness/ authenticity. • Technical Bid should not contain commercials of the Project, in either explicit or implicit form. • Conditional Technical Bid is liable for rejection.
Commercial Bid (Cover-2)	• Forms and formats specified in the tender document need to be scrupulously followed. Any deviation in it (without proper justification) may lead to disqualification of the Bid. • Price quotation accompanied by vague and conditional expressions such as "subject to immediate acceptance", "subject to confirmation", etc. will be treated as being at variance and shall be liable to be summarily rejected. • The price quoted shall be inclusive of all charges excluding GST. GST shall be payable extra at actual rates.

The Authority will not accept submission of a bid in any manner other than that specified in the Tender Document. Bids submitted in any other manner shall be treated as defective, invalid, and rejected.

Bids must be direct, concise, and complete. The Authority will evaluate Bidder's bid based on its clarity and completeness of its response to the requirements of the project as outlined in this Tender.

5.2 Bid Evaluation

a) Initial Bid scrutiny will be held. Bid will be treated as non-responsive if it is

- Not submitted in the format as specified in this RfP document.
- Received without the Letter of Authorization (Power-of-Attorney)
- Found with suppression of details.
- Without complete information, subjective, conditional offers and partial offers submitted.
- Submitted without the documents requested in the checklist
- Have non-compliance of any of the clauses stipulated in the RfP
- With lesser validity period.

5.3 Examination of Bid documents against Eligibility Criteria

The Bid document will be examined to determine whether the bidder meets the eligibility criteria, whether the proposal is complete in all respects, whether the documents have been properly signed and whether the bids are generally in order. Any bids found to be non-responsive for any reason or not meeting the minimum levels of the performance or eligibility criteria specified in various sections of this Bid Document will be rejected and will not be considered further.

5.4 Evaluation of document

A detailed evaluation of the bids shall be carried out in order to determine whether the bidders are competent enough and whether the technical aspects are substantially responsive to the requirements set forth in this RfP Document.

All supporting document submitted in support of Eligibility and Technical Evaluation Criteria should comply the following:

a) Supporting documents should be submitted.
b) Supporting document should clearly indicate value of the completed project, and the scope of work/ services should be clearly highlighted.
c) Completion certificate should clearly indicate the value and duration of the project.
d) In case the Bidder is having Non-Disclosure Agreement (NDA) with their client, no such experience will be counted (if agreement copy not submitted).
e) Incomplete order copy submitted by the Bidder will not be considered for evaluation.
f) In case of projects where order for recurring /Extension and subsequent order has been placed on the Bidder only the mentioned order value will be considered for evaluation.
g) Bidders failing to comply any of the above, may result in rejection of their bid.

5.5 Eligibility Criteria

The bidder must be an Indian registered company under the Companies Act 1956/2013. Bidder must possess the requisite experience, strength, and capability in providing the services necessary to meet the requirements as described in this RfP document. The bidder must also possess the technical know-how, qualified resources and tools that would be required to successfully execute the system integration services for KFON designing, implementation, testing and commissioning of IP MPLS network architecture with BNG Gateway, CGNAT, Billing System and CRM etc. The bidders shall submit duly filled compliance with the technical specification as mentioned in the Technical Compliance Sheet in the annexure.

The bids must be complete in all respects and should cover the entire scope of work as stipulated in this RfP document. The invitation to proposal is open to all bidderswho qualify the pre-qualification criteria as given below:

Sl. No	Minimum Criteria	Supporting Documents
1	Registered Indian Company	Certificate of Incorporation from the Registrar of Companies.
2	The company should not be blacklisted by any Government institution/ Government PSU	Self-declaration, in case this is discovered to be otherwise, the bidder will be declared ineligible at any stage of the tender.
3	Company should have supplied at least 15 crores worth of IT hardware (routers, switches, firewall, servers etc.) to central/state Government or PSUs during last 5 years.	Work order copy and completion project certificate. If the Project is ongoing, a certificate to that effect.
4	The Bidder, a single legal entity registered in India, should have an average annual turnover of not less than Rs. 25 (Twenty-Five) Crores from IT/ITES, SystemIntegration & Facility Management Services for the last three financial years (2020-2021, 2021-2022,2022-2023)	A copy of the audited Balance sheet of the bidding company showing turnover of the bidding company for last three years.
5	The Bidder should have ISO 9001:2008, ISO 20000 and ISO 27001:2005	Copy of certificate needs to be attached.
6	GST Registration Number	GST Registration Certificate

Table 3: Eligibility Criteria

- MSME / Start-ups with Udyog Aadhar registration or any other body specified by the Ministry of Micro, Small and Medium Enterprises working within the State of Kerala will be exempted from payment of Tender fee, Earnest Money Deposit and Performance security (If contract is awarded) only. No other exemption/relaxation shall be applicable for MSME/Start-ups.

5.6 Technical Evaluation Criteria

SL No.	Technical Evaluation Parameter	Supporting Documents Required	Marks
1	Experience in working with ISP/ state-wide telecom network		Max: 20 Marks
		Work Order/ Work Completion certificate from client.	1 Project – 10 Marks
		If the Project is ongoing, a certificate to that effect.	2 or more Projects- 20 Marks
2	Company should have supplied at least 15 crores worth of IT hardware (routers, switches, firewall, servers etc.) to central/state Government or PSUs during last 5 years.	Work Order/Work Completion certificate from client. If the Project is ongoing, a certificate to that effect.	Max: 20 Marks, (Each Project should have a minimum value of 15 Crores)
			1 project- 10 marks
			2 or more projects- 20 marks
3	Experience in implementing OSS/BSS for ISP/State-wide telecom network state/Central government or PSUs.	Work Order/ Work Completion certificate from client. If the Project is ongoing, a certificate to that effect.	Max: 20 Marks
			1 project- 10 marks
			2 or more projects- 20 marks
4	Average Turnover for last 3 years	Audited balance sheet/Turn Over certificate	Max: 10 Marks
			25-50 Crores - 5 Marks
			More than 50 Crores - 10 Marks
5	Overall Technical Capability	Technical presentation	30 Marks

Table 4: Technical Evaluation Criteria

5.7 Evaluation of Commercial Bid

a) Evaluation of bids shall be done on the basis of commercial bids.

b) The bidder shall mandatorily quote for all items in the BOQ

c) **Bidders should obtain the requisite minimum marks under each criterion and minimum of 60 marks in the overall technical evaluation to qualify for opening of the Commercial Bid.** The evaluation will be carried out if Commercial bid are complete and computationally correct. Authority's evaluation in this regard shall be final and binding on the Bidder.

d) **The L1 bidder shall be treated as the successful bidder.**

5.8 Rejection Criteria

Besides other conditions and terms highlighted in the Tender Document, bids maybe rejected under following circumstances:

5.8.1 General rejection criteria

a) Conditional Bids.

b) If the information provided by the Bidder is found to be incorrect / misleading / fraudulent at any stage / time during the Tendering Process.

c) Any effort on the part of a Bidder to influence the bid evaluation, bid comparison or contract award decisions; Bidder shall not approach Authority's officers from the time of the proposal opening till the time the Contract is awarded.

d) Bids received after the prescribed time and date for receipt of bids.

e) Bids without signature of person (s) duly authorized on required pages of the bid.

f) Bids without power of attorney/ board resolution.

g) Any other reasons mentioned in this RfP elsewhere.

5.8.2 Technical Rejection Criteria

a) Technical Bid containing commercial details.

b) Revelation of prices in any form or by any reason before opening the Commercial Bid;

c) Failure to furnish all information required by the Tender Document or submission of a bid not substantially responsive to the Tender Document in every respect.

d) Bidders not quoting for the complete scope of work as indicated in the Tender Documents, addendum (if any) and any subsequent information given to the Bidder.

e) Bidder not submitting Manufacturer Authorization Form (MAF) for all the major components.

f) Bidders not complying with the technical and general terms and conditions as stated in the Tender Documents.

g) Bidder not confirming unconditional acceptance of full responsibility of providing services in accordance with the scope of work of this tender.

h) Any other reasons mentioned in this RfP elsewhere.

5.8.3 Commercial Rejection Criteria

a) Incomplete Price Bid.

b) Price Bids that do not conform to the Tender's price bid format.

c) Total price quoted by the Bidder shall exclude all statutory taxes and levies applicable.

d) If there is an arithmetic discrepancy in the commercial Bid calculations, the Technical Committee shall rectify the same. If the Bidder does not accept the correction of the errors, its bid may be rejected.

e) If there is discrepancy in numerical and words, prices in word shall prevail;

f) If there is discrepancy in unit rates and total, unit rates shall prevail.

5.8.4 Fraud and Corrupt Practices

i. The Bidders and their respective officers, employees, agents, and advisers shall observe the highest standard of ethics during the Selection Process.

ii. Notwithstanding anything to the contrary contained in this tender, the Authority shall reject a Proposal without being liable in any manner whatsoever to the Bidder, if it determines that the Bidder has, directly or indirectly or through an agent, engaged in corrupt practice, fraudulent practice, coercive practice, undesirable practice, or restrictive practice (collectively the — Prohibited Practices‖) in the Selection Process. In such an event, the Authority shall, without prejudice to its any other rights or remedies, forfeit and appropriate the Bid Security or Performance Security, as the case may be, as mutually agreed genuine pre-estimated compensation and damages payable to the Authority for, inter alia, time, cost, and effort of the Authority, in regard to the tender, including consideration and evaluation of such Bidders Proposal.

iii. Without prejudice to the rights of the Authority under Clause above and the rights and remedies which the Authority may have under the LoI or the Agreement, if a Bidder or Systems Implementation Agency, as the case may be, is found by the Authority to have directly or indirectly or through an agent, engaged or indulged in any corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice during the Selection Process, or after the issue of the LoI or the execution of the Agreement, such Bidder shall not be eligible to participate in any tender or tender issued by the Authority during a period of < period, suggested 2 (two) > years from the date such Bidder, as the case may be, is found by the Authority to have directly or through an agent, engaged or indulged in any corrupt practice, fraudulent practice, coercive practice, undesirable practice or restrictive practice, as the case may be.

iv. For the purposes of this Section, the following terms shall have the meaning hereinafter respectively assigned to them.

"Corrupt practice" means

a) the offering, giving, receiving, or soliciting, directly or indirectly, of anything of value to influence the action of any person connected with the Selection Process (for avoidance of doubt, offering of employment to or employing or engaging in any manner whatsoever, directly or indirectly, any official of the Authority who is or has been associated in any manner, directly or indirectly with the Selection Process or the LoI or has dealt with matters concerning the Agreement or arising there from, before or after the execution thereof, at any time prior to the expiry of one year from the date such official resigns or retires from or otherwise ceases to be in the service of the Authority, shall be deemed to constitute influencing the actions of a person connected with the Selection Process); or

b) save as provided herein, engaging in any manner whatsoever, whether during the Selection Process or after the issue of the LoI or after the execution of the Agreement, as the case may be, any person in respect of any matter relating to the Project or the LoI or the Agreement, who at any time has been or is a legal, financial, or technical consultant/ adviser of the Authority in relation to any matter concerning the Project.

- **"fraudulent practice"** means a misrepresentation or omission of facts or disclosure of incomplete facts, in order to influence the SelectionProcess;

- **"Coercive practice"** means impairing or harming or threatening to impair or harm, directly or indirectly, any persons or property to influence any person's participation or action in the Selection Process;

"Undesirable practice" means

a) establishing contact with any person connected with or employed or engaged by Authority with the objective of canvassing,

b) lobbying or in any manner influencing or attempting to influence theSelection Process; or

c) having a Conflict of Interest; and

"Restrictive practice" means

Forming a cartel or arriving at any understanding or arrangement among Bidders with the objective of restricting or manipulating a full and fair competition in the Selection Process.

5.8.5 Conflict of Interest

The Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to be in a conflict of interest with one or more parties in the bidding process if including but not limited to:

a) they have controlling shareholders in common; or
b) they receive or have received any direct or indirect subsidy from any of them; or
c) they have the same legal representative for purposes of this bid; or
d) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to material information about or improperly influence the Bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or

6 Scope of Work

KFON is commissioning a statewide Optical High speed information infrastructure to provide connectivity to the rural areas of the state where other Telecom service providers and other cable TV operators do not have network coverage. Two typesof cables have been used one is the OPGW cable running over the EHT power lines between the districts and the other one is the ADSS cable running on the KSEBL distribution poles. 4 Pairs of optical core fibers on the OPGW and 10 pairs of optical core fibers are available on the ADSS paths.

KFON Ltd is inviting bids from eligible system integrator for the supply, installation testing and commissioning of the requisite hardware and software for the launching of ISP services over the KFON network.

The successful bidder shall deploy its resources for achieving the objectives of this project but not limited to the following.

1. Supply, installation, testing and commissioning of BNG gateway solution (Including CGNAT) on existing routers (Juniper MX Series) or as a separate solution (Hardware/software/appliance) to handle 2.5 lakh scalable to 5 lakhs FTTH subscribers.
2. Supply, installation, testing and commissioning of IPDR, DHCP and DNS solution to handle 2.5 lakh scalable to 5 lakhs FTTH subscribers.
3. Supply, installation, testing and commissioning of DDOS solution to handle traffic of 10Gbps scalable to 40Gbps in active – active.
4. Supply, installation, testing and commissioning of DWDM solution.
5. Supply, installation, testing and commissioning of required Servers.
6. Obtain required OS, DB, Virtualization License.
7. Supply, installation, testing and commissioning of required Storage.
8. Supply of additional OSS/BSS licenses to support up to 2.5 lakh scalable to 5 lakhs FTTH customers in the existing BSS solution along with Auto-Config server to manage 2.5 Lakh scalable to 5 Lakhs FTTH CPEs.
9. Provide warranty for 5 years.
10. Maintain the system for 5 years after successful commissioning and handing over to the Authority.
11. Comply with all statutory and regulatory licensing requirements and support for KFON network expansion projects.

7 Project Deliverable and Timelines

The bidder shall be responsible to ensure the timely completion of the project as per the approved plan and flag issues to the Authority proactively wherever delay is anticipated if it fails to resolve the same. The bidder shall be responsible for submission of supporting documents to the Authority/for their validation. Similarly, the invoices submitted by the bidder at different milestones shall be verified and submitted to the Authority for validation and subsequent approval. Bidder would be bound by stipulated time schedule and damages, focusing on timely completion of audit and certification processes as well as the verification by the Authority. The Authority reserves the right to verify the reports being submitted to ascertain their accuracy.

8 Resources to be Deployed.

i. The bidder shall carry out all necessary activities during execution of the work and all along thereafter as may be necessary for proper fulfilling of the obligations under the contract.

ii. Bidder shall ensure that the installation/configuration should be carried out by the experts from OEMs/OEM's authorized partners only.

iii. Adequate training, required to carry out the activities mentioned in the scope of work above, shall be provided by Bidder to all deployed resources.

iv. Boarding, lodging, transportation, and all other expenses of the deployed resources are to be borne by bidder,

v. The Authority shall be at liberty to object to and require the bidder to remove from the works any person who in his opinion misconducts himself or is incompetent or negligent in the performance of his duties or whose employment is otherwise considered by the Authority to be undesirable. Such person shall not be employed again at works site without the written permission of the Authority and the persons so removed shall be replaced with in a week's time by competent substitutes.

vi. The Authority has agreement with the bidder only, it is the responsibility of the bidder to ensure all due diligence is carried out for background verification of resources deployed. And in any case, the Authority will not be responsible for the violation of due diligence or offence committed by the bidder or any of its resources.

9 Payment Schedule

The payment cycle for the Successful Bidder would start from the date of signing of contract or deployment of resources whichever is later. The payment to be made to the Successful Bidder shall be subject to the SLAs (Service Level Agreements) to be signed by the bidder post issuance of work order.

Payment to the Successful Bidder shall be made as per the table given below.

S. No.	Milestone / Deliverable	Payment Terms
1.	**Supply of hardware/Software/Licenses**	50% of the item rate quoted against submission of invoices and delivery challan.
2.	**Installation, Testing & Commissioning**	40% of the item rate after Installation, testing, commissioning and go-live of Hardware/Software/Licenses
3.	**Operations and Maintenance**	0.5% of the total contract value paid quarterly as AMC charges for 5 years.

All payments shall be released after sign-off by the Authority. The Authority shall make all efforts to make the payment within 30 days of receipt of the invoice.

FORMAT FOR TECHNICAL BID COVER LETTER

(On Company Letter Head)

To,

Managing Director
Kerala State Information Technology Infrastructure Limited,First
Floor, Saankethika, PF Road,
Pattom palace P.O, Thiruvananthapuram 695004, Kerala

Sub: Submission of the response to the Tender No. <<tender id>>. Request for Proposal for Supply, Installation, Testing, Commissioning & Maintenance of ISP Hardware, Software and License for KFON.

We, the undersigned, offer to provide services for Request for Proposal for Supply of ISP hardware and Software of Kerala Fibre Optic Network for KSITIL in response to the request for proposal dated <insert date> and tender reference no <> "**Request for Proposal for Supply, Installation, Testing, Commissioning & Maintenance of ISP Hardware, Software and License for KFON**". We are hereby submitting our proposal online, which includes the pre-qualification, technical bid, and commercial bid.

We hereby declare that all the information and statements made in this technical bid are true and accept that any misinterpretation contained in it may lead to our disqualification.

We undertake, if our proposal is accepted, to initiate the implementation services related to the assignment not later than the date indicated in this tender.

We agree to abide by all the terms and conditions of the RfP and related corrigendum(s)/ addendum(s). We would hold the terms of our bid valid for 6 months from the date of opening of the commercial bid as stipulated in the RfP.

We hereby declare that as per RfP requirement, we have not been black listed/ debarred by any Central/ State Government and we are not the subject of legal proceedings for any of the foregoing.

We understand you are not bound to accept any proposal you receive.

Signature of Bidder …….. Place:

Name …….. Date:

FORMAT FOR COMMERCIAL BID COVER LETTER

To,

Managing Director

Kerala State Information Technology Infrastructure Limited,First

Floor, Saankethika, PF Road,

Pattom palace P.O

Thiruvananthapuram 695004

Kerala

Dear Sir,

We, the undersigned Bidder, having read and examined in detail all the tender documents with respect to **Request for Proposal for Supply, Installation, Testing, Commissioning & Maintenance of ISP Hardware, Software and License for KFON** do hereby propose to provide services as specified in the tender reference No. _____.

Price and Validity

a. All the prices mentioned in our bid are in accordance with the terms & conditions as specified in the RfP. The validity of bid is 6 months from the date of opening of the commercial bid.

b. We are an Indian firm and do hereby confirm that our prices are inclusive of all duties, levies etc., excluding GST.

c. We have studied the clause relating to Indian Income Tax and hereby declare that if any income tax, surcharge on income tax, professional and any other corporate tax in altercated under the law, we shall pay the same.

Unit rates: We have indicated in the relevant schedules enclosed, the unit monthly rates for the purpose of accounting of payments as well as for price adjustment in case of any increase / decrease from the scope of work under the contract.

Deviations: we declare that all the services shall be performed strictly in accordance with the RfP irrespective of whatever has been stated to the contrary anywhere else in our bid. Further, we agree that additional conditions, if any, found in our bid documents, shall not be given effect to.

We had remitted an EMD as specified in the tender document terms.

Tender pricing: we further confirm that the prices stated in our bid are in accordance with your instruction to bidders included in tender documents.

Qualifying data: we confirm having submitted the information as required by you in your instruction to bidders. In case you require any other further information/ documentary proof in this regard before evaluation of our tender, we agree to furnish the same in time to your satisfaction.

Bid price: we declare that our bid price is for the entire scope of the work as specified in the RfP. These prices are indicated in annexure-commercial bid format attached with our tender as part of the tender.

Performance bank guarantee: we hereby declare that in case the contract is awarded to us, we shall submit the performance bank guarantee. We hereby declare that our tender is made in good faith, without collusion or fraud and the information contained in the tender is true and correct to the best of our knowledge and belief. We understand that our tender is binding on us and that you are not bound to accepta tender you receive.

Signature of Bidder …….. Place:

Name …….. Date:

TECHNICAL COMPLIANCE SHEET

BNG Solution:

In Existing Router Upgradation: (Juniper MX 960/480)

- The router shall support following type of interfaces – 400GE, 100GE, 40G, 25GE, 10GE, 1GE interfaces.
- The Router should be upgraded with following interfaces
  (i) 8 x 100GE interfaces distributed across minimum two cards equipped with 4 x LR + 4 x SR 100G optics.
  (ii) 2 x 400G interfaces, equipped with 400G SR optics.
- The router shall support minimum throughput of 1Tbps per slot.
- The router must be able to be equipped with 64K licenses on Day-1.
- BNG Gateway should have minimum 100Gbps CGNAT Capacity in HA Day one.
- Ability to configure hierarchical queues in hardware for IP QoS at the egress to the edge. Minimum 256K queues per router

In case of separate solution:

Make Offered			
Model Offered			
BNG (BNG Solution including CGNAT)			
S No.	**Minimum Requirement Description**	**Compliance (Yes / No)**	**Remarks**
1	Router should be chassis based & should have modular architecture for scalability		
2	Chassis should be 19" rack mountable type		
3	Should support redundant controller cards for high availability		
4	Should have AC power supplies and fan redundancy.		
5	There should not be any impact on the router performance in case of single power failure.		
6	All interface modules, line cards should be hot swappable for high availability		
7	All interfaces on the routers shall provide wire-rate throughput		
8	The router shall support following type of interfaces – 400GE, 100GE, 40G, 25GE, 10GE, 1GE interfaces		
9	The router must support multi-rate interfaces: 1/10GE, 10GE/25GE, 40GE/100GE, 100GE/400GE		
10	The Router should be supplied with following interfaces on Day-One:- (i) 8 x 100GE interfaces distributed across minimum two line cards equipped with 4 x LR + 4 x SR optics. (ii) 2 x 400G interfaces, equipped with 400G SR optics.		
11	The Router should be supplied with all applicable feature and interface perpetual-licenses from day one.		
12	After fulfilling Day One interface requirements, the router must have minimum of 2 interface slots vacant for future expansion.		

13	All line-card slots should be universal. All the line-cards should be capable to be configured on all given line-card slots without any restriction		
14	All the interfaces requested in RFP must be provided on modular interface cards which should be field replicable so that the modular ports from modular line cards can be re-used in routers at different locations for granular usability.		
15	The operating system of the router shall be modular		
16	The modular operating system shall run all critical functions like various routing protocol, forwarding plane and management functions in separate memory protected modules. Failure of one module shall not impact operations of rest of the OS		
17	Router shall support minimum non-blocking capacity of 2 Tbps full-duplex or higher at full services scales		
18	The router shall support minimum throughput of 1Tbps per slot.		
19	The router should have capability of minimum 2 million IPv4, 1 Million IPv6 routes		
20	The router should support minimum 512K MAC address.		
21	Router should support 64k multicast routes.		
22	Router should support 128K MPLS PW.		
23	Router should support 1K VPLS.		
24	Router should support 512 MPLS L3 VPN		
25	In case the primary route processor fails on the router, there should be ZERO packet loss on the whole router for both unicast and multicast traffic		
26	Shall support On-line insertion and removal for cards, fast reboot for minimum network downtime, VRRP or equivalent		
27	Shall support Non-Stop forwarding for fast re-convergence of routing protocols (BGP, OSPF, IS-IS)		
28	Shall support multiple storage of multiple images and configurations		
29	Shall support link aggregation using LACP as per IEEE 802.3ad and MC-LAG		
30	Should have IPv4 Routing, Segment Routing, Segment Routing Traffic-Engineering, Border Gateway Protocol, IS-IS, and Open Shortest Path First (OSPFv2 and OSPFv3), Virtual Router Redundancy Protocol (VRRP), IPv6 Routing, BGP Prefix Independent Convergence, static and BGP SR policy		
31	The proposed router should support synchronization using IEEE 1588v2 and Sync E and must be configured with the required licenses from Day 1		
32	Should have Multicast routing protocols IGMPv1, v2, v3, PIM-SM (RFC2362) and PIM-SSM, MSDP, IGMP v2 snooping		
33	Should have OSPFv3 for IPv6, 6PE & 6VPE		
34	The router must support multiple instances of protocol OSPF (v2 & v3) and IS-IS		
35	Shall support MPLS Provider/Provider Edge functionality. MPLS VPN, MPLS mVPN (Multicast VPN), MPLS TE (Fast re-route), Inter-AS VPN, Resource Reservation Protocol (RSVP), VPLS, VPWS, Ethernet over MPLS, EVPN, Segment routing and Segment routing Traffic engineering		

36	The router should support Netconf, YANG, and other modern system management protocols		
37	Router shall support MPLS OAM, Ethernet OAM protocols - CFM (IEEE 802.1ag), Link OAM (IEEE 802.3ah) and ITU Y.1731		
38	The router shall support IEEE 802.3ad link aggregation of minimum of 16 links within a single bundle.		
39	Should support 32 ECMP (equal cost multipath).		
40	The routers shall support both L2 and L3 services on all interfaces		
41	Configuration Roll Back to recover the mis-configured router to last good configuration		
42	The Proposed router should have capability to support BNG, CG-NAT, SecG/W, and stateful firewall functionality.		
43	The device should support YANG - A Data Modelling Language for the Network Configuration		
44	The solution should support the network configuration protocol (NETCONF) that provides mechanisms to install, manipulate, and delete the configuration of network devices		
45	the router should support PCECP.		
46	The router should support BGP link-state (BGP-LS).		
47	the router should support telemetry based on push model for monitoring network devices		
48	The Router should support various software models/sensors for capturing different health parameters from the devices		
49	The router shall support GPB/GRPC/KAFKA encoding for telemetry data		
50	The software model/sensors should be based on either yang, xml or open config		
51	The solution shall use either UDP or GRPC for transport of telemetry data		
52	The router shall have the ability to interact with open standard based tools		
53	Enabling telemetry should not have any adverse impact on the performance of the device.		
54	The router should support jumbo frame.		
55	The router should support port mirroring		
56	The router must support BNG, CGNAT, IPSEC features.		
57	The router must support be able to support 200K IPoE / PPPoE dual stack subscribers. The router must be able to equipped with 100K licenses on Day-1. However, the system must be upgradeable to proposed limits in future just by addition of licenses.		
58	BNG Gateway should have minimum 100Gbps CGNAT Capacity in HA day one. CGNAT service can achieved with BNG Gateway internal service card or external service card. The router must be upgradeable to proposed throughput 200Gbps in HA in future by addition of hardware / licenses.		
59	The proposed platform shall support CGNAT functionalities like Deterministic, fixed Network Address Translation (NAT) and Port block allocation (PBA).		

60	Proposed CGNAT platform shall support minimum 30 Million concurrent established connections from day 1.		
61	The CGNAT must employ endpoint-independent mapping		
62	The CGNAT must support “hair pinning” (when both the source and destination are managed by the same CGNAT)		
63	The CGNAT must support NAT44, NAT64		
64	The CGNAT must support monitoring the actual usage of ports per outside address/port pool, and associated logging of threshold crossing.		
65	The CGNAT must provide a configurable limit for sessions per subscriber.		
66	The CGNAT must provide means to prohibit mapping of the privileged/well-known TCP and UDP ports (<1024).		
67	The CGNAT must support thresholds for monitoring the actual usage of sessions per subscriber.		
68	Shall support the following:		
69	Traffic Classification using various parameters like source physical interfaces, source/destination IP subnet, protocol types (IP/TCP/UDP), source/destination ports, IP Precedence, 802.1p, MPLS EXP, DSCP		
70	Shall support Strict Priority Queuing or Low Latency Queuing to support real time application like Voice and Video with minimum delay and jitter		
71	Congestion Management: Priority queuing, Class based weighted fair queuing		
72	Traffic Conditioning: Committed Access Rate/Rate limiting		
73	Router should support interface Per VLAN QoS.		
74	Platform must support hierarchical shaping, scheduling, and policing for the control upstream and downstream traffic		
75	Router should have 4 level of scheduling for HQOS		
76	Ability to configure hierarchical queues in hardware for IP QoS at the egress to the edge. Minimum 256K queues per router		
77	Shall support at least 8 hardware queues to be available for each GE interface on the router		
78	Platform must support hierarchical QOS policies		
79	Support Access Control List or similar to filter traffic based on Source & Destination IP Subnet, Source & Destination Port, Protocol Type (IP, UDP, TCP, ICMP etc) and Port Range etc.		
80	Support per-user Authentication, Authorization and Accounting through RADIUS or TACACS		
81	The routers shall support IETF Netflow/cFlow/J-Flow/equivalent feature.		
82	The router MD-5 authentication for OSPF, IS-IS, and BGP		
83	DHCP server/snooping, control plane policing		
84	SNMPv3 authentication, SSHv2		
85	Multiple privilege level authentications for console and ssh/telnet access through Local database or through an external AAA Server		
86	Support for monitoring of Traffic flows for Network planning and Security purposes		

87	Display of input and output error statistics on all interfaces		
88	Display of Input and Output data rate statistics on all interfaces		
89	Display of Dynamic ARP table		
90	Telnet, Trace-route, Ping and extended Ping		
91	Router shall support System & Event logging functions as well as forwarding of these logs onto a separate Server for log management		
92	The router should have following accounting features:		
93	Packet & Byte Counts		
94	Start Time Stamp & End Time Stamps		
95	Network Time Protocol		
96	Input & Output interface ports		
97	Type of service, TCP Flags & Protocol		
98	Source & Destination IP addresses		
99	Source & Destination TCP/UDP ports		
100	Should have to support Out of band management through Console / external modem for remote management		
101	The router should support SNMP/NETCONF/Yang / JSON for network management & provisioning functions.		
102	After fulfilling Day One interface requirements, the router must have minimum of 2 interface slots vacant for future expansion.		
103	Operating temperature: +5°C to +40°C guaranteed		
104	Humidity: 5% to 85% non-Condensing		
105	The Router should be NEBS Level 3 compliant		
106	The router should support CE/MEF services framework. The router (model/family) must be MEF CE 2.0 or better certified		

DDoS Solution:

Make Offered			
Model Offered			
DDoS Solution			
S No.	**Minimum Requirement Description**	**Compliance (Yes / No)**	**Remarks**
1	The Proposed DDoS solution deployed at NOC(Gateway) location.		
2	The DDoS solution should be Network-based filtering (using existing/proposed BNG router)		
3	The Proposed DDoS solution should protect broadband users, Internet leased lines uses.		
4	DDoS protection that self-heals the network through rapid identification, precise decision making, automated mitigation at strategic places in the network, and continuous monitoring.		
5	Network Security DDoS solution should highly effective, automated, and should be scalable from 10 Gbps day one scalable to 40 Gbps capacity.		

	The solution should have packet-level inspection for accurate volumetric DDoS detection.		
6	The solution should support automatic filtering via machine analysis, for intelligent mitigation.		
7	The solution should support Open integration APIs for autonomic response and SecOps.		
8	The solution should support DDoS Solution should be AI/ML engine for optimized mitigation.		
9	The solution have GUI to define, manage and implement complex security policies.		
10	Device should be configured in High Availability		

Distribution Switch:

Make Offered			
Model Offered			
Distribution Switch			
S No.	**Minimum Requirement Description**	**Compliance (Yes / No)**	**Remarks**
1	Should have redundant power and fan system and should be 19" rack 1U size.		
2	Should have minimum 48 SFP+ based 10G and 6 nos. QSFP28 based 40/100G ports day one.		
3	Should have at least 1.44 Tbps switching fabric.		
4	Should have minimum 600 Mpps (64 Byte) throughput		
5	Should support transceiver Digital Diagnostic Monitoring for optical ports.		
6	Should have support for 802.3x flow control.		
7	Should support at least 128000 entries in the MAC table.		
8	Should support at least 4000 active VLANs.		
9	Should support jumbo frame (9000 Byte or above)		
10	Should support Port-based VLAN, 802.1Q Tagged VLAN.		
11	Should support LLDP or similar functionality.		
12	Should support port mirroring.		
13	Switch should support IPv6.		
14	Should support 802.1D spanning tree control/RSTP support and MSTP Support.		
15	Should support spanning-tree port fast for fast convergence or similar functionality.		
16	Should support spanning-tree root guard or similar functionality.		
17	Should support spanning-tree bpdu guard, bpdu filter or similar functionality.		
18	Should Support VRRP.		
19	Should support ITU-T G.8032 Ethernet Ring Protection designed for loop protection and fast convergence times (sub 50 ms) in ring topologies		
20	Should be Ethernet OAM compliant with IEEE 802.3ah/Y.1731.		
21	Should support IGMP v1/v2/v3 and IGMP Snooping		
22	Should support security features Broadcast, Multicast and Unicast Storm Control		
23	Should support security features DoS Attack Prevention		
24	Should support console port and telnet/ssh based management.		
25	Should support Static IPv4 and Ipv6 routing. It shall also support OSPFv2 and OSPFv3.		
26	Should support OSPFv2, OSPFv3 day one.		
27	Should support BFD for OSPF.		
28	Should support multicast routing PIM-SM.		
29	Should support minimum 64K for IPv4 FIB routes and 16K for IPv6 FIB routes.		
30	Should Support for minimum 256 VLANs SVI or RVI interfaces.		
31	Should Support VRRP, DHCP local server, DHCP relay and DHCP snooping.		
32	Should support management features SNMP, NTP, RFC 2138 RADIUS		
33	Should support 802.1Q VLAN, 802.1p priority queues.		
34	Should support 8 hardware queues per port and shall support ingress policing and egress shaping.		

35	Should support Quality Of Service (QoS): i) Priority Queue, ii) Ingress policer, iii) Rate Limiting (Bandwidth Control),		
36	Should support automation NETCONF/YANG/OpenConfig		
37	Should have redundant AC Power Supply 100 to 240 V AC.		
38	Should have redundant fan modules		
39	Switch to be mounted on a 19-Inch rack and should consume maximum 1 RU. All accessories required for this mounting and commissioning should be supplied.		
40	Switch should comply to Operating Temperature range 0°C to 40 °C		
41	Switch optics loaded with 10G SR 10Nos, 10G LR (40 km distance) 10Nos and 100G SR 2 Nos in day one.		

Servers:

Make Offered			
Model Offered			
Servers			
S No.	**Minimum Requirement Description**	**Compliance (Yes / No)**	**Remarks**
1	Server can be Rack mountable/ Blade Server. If blade server solution, chassis should be 19" rack-mountable, capable of accommodating minimum 8 or higher hot pluggable blades with Two hot-plugs/hot-swap redundant modules for connectivity to the external TOR Switches and to storage device.		
2	Server should have a minimum of 2 processors per each physical server.		
3	Server Processor should be Latest series/ generation of 64-bit x86 processor(s) with 10 or higher Cores and 2.1 GHz base freq. or better.		
4	server should have minimum 128 GB Memory per physical server. Memory should be supplied in balanced configuration.		
5	server should have minimum Internal storage 2x300 GB SSD per physical server.		
6	Server should have minimum 2 nos. of 1 Gbps Copper Ethernet with additional dedicated management ethernet interface port and minimum 2 nos of 10G Fibre Ethernet ports along with transceivers for providing connectivity.		
7	Server/chassis should have redundant hot swappable power supply.		
8	Server should have remote management with support capabilities include KVM over IP, power on, off & reset, virtual media, SNMPv2 or higher with appropriate perpetual licenses.		
9	Server should support industry leading virtualization like VMWare VCentre, Citrix XenServer, Hyper V, KVM.		
10	Server should provide with required power cables and rack mounting kit.		

*Bidder shall analyze the overall server and Storage requirement and arrive at the total requirement of server Hardware and submit the BoQ which includes the details of Server, Storage, OS/DB/VM licenses requirement.

IPDR Solution:

The Bidder shall supply IPDR solution in compliance with format notified vide DoT letter no 8520-01/98-LR/Vol.(IX) Pt. I dated 16.11.2021. or the latest amendments if any.

OSS/BSS Solution with Auto-Config Server:

KFON has already implemented a BSS solution, bidders are requested to supply additional subscriber licenses along with Auto-config server (ACS) based on TR-069 CPE WAN Management protocol module to manage the end CPEs. The ACS module shall have the following features.

The CPE WAN Management Protocol is intended to support a variety of functionalities to manage a collection of CPE, including the following primary capabilities:

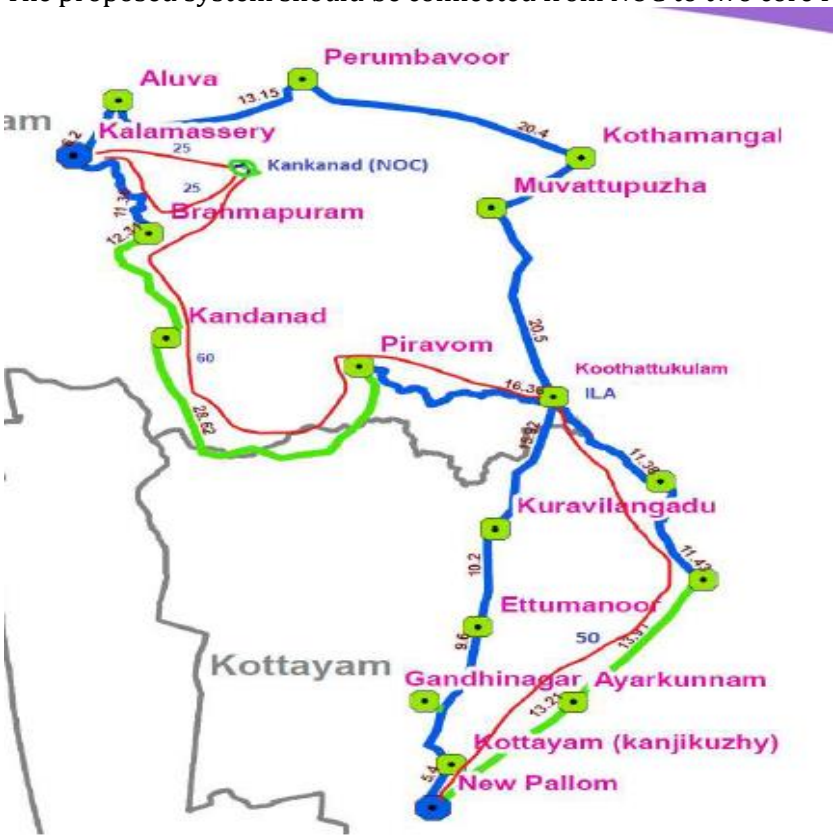
- Auto-configuration and dynamic service provisioning
- Software/firmware image management
- Software module management
- Status and performance monitoring
- Diagnostics

Make Offered:	
Model Offered:	

Sl no	Functional Requirements	Parameters	Compliance Yes/No	Pg. No in Supporting Doc.
1	WAN	support Profile creation and modification		
		support PPPoE/IPoE encapsulation mode		
		support IPv4, IPv4&IPv6		
		support both Router/bridge service mode selection		
		support static/dynamic/PPPoE/IPoE IPv4 acquisition		
		support static/DHCPv6 IPv6 acquisition		
		support static/automatic/DHCPv6 IPv6 prefix acquisition		
		support DS-Lite Mode enable/disable		
		Should be able to write PPPoE username, password, VLAN ID, DNS, NAT etc		
		Support of MTU/MRU value modification		
		Should be able to provide CPE optical parameters, WAN status, bandwidth utilization etc		
2	LAN	Should support LAN pool configuration like pool, subnet mask, DNS, lease time, port status, LAN client details including MAC, traffic statistics etc		
		IPv6 link local address and IPv6 prefix allocation method		
3	WLAN	SSID mapping to WAN profile		
		Security parameters		
		WLAN enable/disable		
		SSID broadcast enable/disable		
		SSID creation/modification		
		client details including MAC address and RSSI value		
		client traffic statistics		
4	Radio	channel		
		Channel region		
		Tx Power		
		Radio status		
5	Troubleshooting and O&M Options	Ping		
		Traceroute		
		CPE firmware upgradation (Batch/Standalone/Scheduled)		
		CPE remote restart (Batch/Standalone/Scheduled)		
		Speed test		
		Neighboring AP's		
6	Multicast	IGMP snooping		
		Multicast		

DWDM Solution:

The proposed system should be connected from NOC to two core POPs, as shown in below typical diagram.



Traffic Requirement:

Kakkanad (NOC) to Kalamassery 2x100G (Protected over two fiber paths)
Kakkanad (NOC) to New Pallom 2x100G

Chassis:

- ILA and Core POP DWDM should be AC/DC power. In case of DC supply AC to DC converter should supplied. The AC to DC converter should be 19" rack mountable with monitoring functionality.
- OTN Switching chassis can be AC/DC power. In case of DC supply AC to DC converter should supplied.
- At NOC two OTN chassis should supplied to avoid single point of failure.
- NOC OTN should have redundant service card to drop the bandwidth.
- OTN service card should have full card capacity license day one.
- For solution can be use existing switching chassis in Kalamassery & New Pallom location
- System Design Fiber Loss Parameters:

  0.3 dB for OPGW (Green Color)
  0.4 dB for ADSS (Blue Color)

  Fiber Margin link (Kakkanad (NOC) to New Pallom): 4dB
  Fiber Margin link (Kakkanad (NOC) to Kalamassery): 2dB

The DWDM based transmission network should support minimum 80 Lambdas of 100G and day one should provide 40 Lambda Mux/Demux. The requisite hardware in terms of EDFA amplifiers etc. for all route directions shall be supplied as part of the DWDM system.

System Architecture:

The system shall support a Modular Architecture, in order to allow scaling, the equipment size in accordance with the requirement of growth of network. The modular architecture should facilitate identification of faults and replacement of faulty cards/modules in a hitless manner.

1. Robustness: The system should provide carrier grade robustness (sub 50ms change over without data, voice or video traffic deterioration) and redundancy with no single point of failure.
2. Scalability: The core network must be able to grow and expand using open-ended software/ hardware. The network must be scalable from NMS perspective and should cater for future expansion.
3. Flexibility: The offered transmission system should allow flexibility of configuration, addition, alteration or removal of cards/components without affecting the functionality of the system.
4. Continuous Operation: The network should be operational on 24x7x365 days basis. It should be possible to add lambdas or upgrade the channels by addition of cards or other necessary hardware in a hitless operation.
5. Flexible Management and Control: The System should provide flexible management and control and should be designed to simplify network planning, engineering and operation, enable simplified testing and improve system reliability
6. Safety: The system must provide the necessary features to guarantee the safety of personnel operating the equipment. The equipment should be compliant with the ETSI/ NEBS standards.
7. EMS: The Management System shall be able to discover the NEs and the corresponding connections between the NEs and create the sub-networks and the different types of NEs (e.g., ROADMs, cross connect nodes and ILAs) within a sub-network shall also be identified and distinguished. If existing OEM the additional license should be provided.
8. UNMS Integration: The system should be integrated with Enterprise Management System/UNMS through supplied OEM EMS.

- The amplifiers should have flexibility to be Software-configured as pre-amplifier, post-amplifier Required number of additional amplifier wherever required based on the distance and loss to be provided by the bidder.
- There shall be active control of express traffic to adapt instantly the amplifier-pair to wavelength count never being affected by any degradation arising out from rapid reconfigurations.
- Sudden addition/removal of channels at intermediate site must not affect whole transmission of DWDM signals.
- The optical amplifiers shall respond automatically to changes in the number of channels without the need for manual intervention or realignment.
- The adaptation response for restoration after ILA fault, fibre-plant restoration or change in power levels etc., shall be immediate.
- The In Post Amplifier and Pre-Amplifier shall support optical spectrum monitoring, which will not only apply the correction to channels to keep the spectrum flat, but also shall be used for the monitoring of optical monitoring as per ITU-T G.697.
- The optical amplifiers must implement the following mechanisms to maintain error free system operation under dynamic conditions:
    - Fast gain control loop: to protect against short term transient conditions such sudden loss of channels.
    - Slow output power control loop: to protect against long term conditions such fibre aging.
- 100G DWDM line card must use a coherent receiver with a receive and transmit DSP. The receive DSP performs compensation for Chromatic Dispersion (CD), Polarization impairments, performs carrier phase estimation and FEC decoding. The transmit DSP performs CD pre-compensation, Nyquist shaping and FEC coding.
- The modulation scheme for 100G DWDM must be CPDQPSK (Coherent Polarized Differential Quadrature Phase Shift Keying) also called PM-QPSK.
- The Coherent DWDM transmitter and receiver must support at least 80 channels in the C-Band rom 1528.77 and 1566.72nm (C-Band – 50 GHz) The Coherent DWDM Transponder must have a gridless

laser i.e. tunable in increments of +/- 0.1 GHz. The maximum reach of the 100G CP-DQPSK DWDM signal for G.652 fibre with standard specifications of loss coefficient, CD , PMD should be minimum 1000 km

- The Minimum Chromatic dispersion tolerance for 100G CP-QPSK DWDM signal should be minimum 18,000 ps/nm or better Support for G.709 Generic Communication Channel GCC of the 100G DWDM interface
- The 100-Gbps DWDM Trunk provides support for both Transparent and Non-Transparent signal transport Performance Monitoring
- The proposed DWDM solution should support OTN functionality without changing the entire DWDM system.
- The NOC OTN system shall provide up to 2.5Tbps OTN switching capacity. The OTN switching capacity shall be aptly chosen on basis of the service matrix day one.
- The solution shall support OTN switching to enable switching and grooming of traffic onto the 100G/200G Line side.
- The OTN protection switching time in the offered DWDM network shall be less than 50ms.
- The system shall support a level of protection, such as APS Linear or path protection.
- The system shall support OTU, ODU bidirectional loopbacks.
- The system shall support channel protection in linear, ring and mesh network topology.
- The system shall support revertive, non-revertive and manual protection switching.
- The proposed OTN system at NOC location should be less than 6RU size.

ANNEXURE 1 - FORMAT FOR PROJECT EXPERIENCE CITATIONS

Sl. No.	Item	Bidder's Response
1	Name of Bidder entity	
2	Assignment Name	
3	Name & Address of Client	
4	Approximate Value of the Contract (in INR Crores)	
5	Duration of Assignment (months)	
6	Start Date (month/year)	
7	Completion Date (month/year)	
8	Narrative description of the project	
9	Details of Work that defines the scope relevant to the	
10	Documentary Evidence attached	

EXISTING NETWORK COMPONENTS AND CONFIGURATION