

**BANGLADESH SUBMARINE CABLE COMPANY  
LIMITED**

**BIDDING DOCUMENT  
FOR**

**"SUPPLY, INSTALLATION, TESTING AND COMMISSIONING  
OF GATEWAY (IIG) ROUTERS AND ACCESS SWITCHES ON  
TURN-KEY BASIS"**

**BOOK – 2**

**TECHNICAL SPECIFICATIONS**

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**INVITED BY:**

**BANGLADESH SUBMARINE CABLE COMPANY LIMITED  
191, 7<sup>th</sup>-8<sup>th</sup> FLOOR, RAHMANS' REGNUM CENTER,  
TEJGAON-GULSHAN LINK ROAD, DHAKA-1208**

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## Chapter One

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### Instructions for the Preparation and Submission of the Bid

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- 1.1 The bid must be submitted in Single Stage Two (2) Envelope Method. The first Envelope titled as “Technical Proposal” shall have two parts; the first part shall contain all the “Mandatory Documents” and the second part shall contain all the “Technical Documents”. The second Envelope titled as “Financial Proposal” shall contain “Financial Documents” as per scope of work. The two envelopes i.e. the “Technical Documents” and the “Financial Documents” have to be inside another envelope. The bidder shall write the title of the tender at the top of the envelope. The bidder will also address the official of BSCCL inviting the tender at the right side of the envelope and write the bidder's company name and address at the left side. The offer must be forwarded with forwarding as per format given as “Annex A” (attached in Book-1) for Technical Proposal and as per format given as “Annex A.1” (attached in Book-1) for Financial Proposal. All the envelopes, especially the “Financial Proposal” should be sealed properly.
- 1.2 Total Two (2) sets of the Technical Proposal shall be submitted by the bidder, out of which ONE set shall be marked as “ORIGINAL” and another set shall be marked as “Copy”. A soft copy shall also be provided in CD (in PDF format) with the Original Set.
- One set of the Financial Proposal shall be submitted by the bidder, which shall be marked as “ORIGINAL”. A soft copy shall also be provided in CD (in Excel & PDF format) with Original Set. The “Financial Proposal” shall be sealed properly.
- The soft copy may be protected by password. In such case, the password shall be supplied separately with the CD.
- 1.3 Bidder shall note that any gross violation of the above instruction will result in rejection of the bid.
- 1.4 The Bidder’s **“Mandatory Documents”** shall comprise of the following documents.
- 1.4.1 Tender Document Purchase Receipt
  - 1.4.2 Forwarding of the Technical Proposal (as per “Annex A.1” attached in Book 1, duly filled up and properly signed by the bidder).
  - 1.4.3 Bid Bond (as per “Annex A.3” attached in Book 1, duly filled up and properly signed by the issuing bank authority).
  - 1.4.4 A “Bond for Spare Parts” (as per “Annex D.” attached in Book 1, duly filled up and properly signed by the bidder).
  - 1.4.5 A “Declaration on Observance of Ethics” (as per “Annex B” attached in Book 1, duly filled up and properly signed by the bidder).
  - 1.4.6 The Letter(s) of Authority from the manufacturer (s) of Internet Gateway Router and switch, if the manufacturer themselves is not the bidder.
  - 1.4.7 Power of attorney in favor of the authorized signatory for signing the bid. Both signature and initial (if used) of the authorized signatory should be attested by competent authority. The bidder shall submit the photocopy of national ID/passport of the authorized signatory with the bid.
  - 1.4.8 List of Attached Certificates as per format of Annex-E mentioned in Book-1.
  - 1.4.9 Documentary Evidences to Establish Equipment’s performance as stated in clause 1.5.1
  - 1.4.10 Documentary Evidences Establishing Bidder’s Experiences as stated in clause 1.5.2.
  - 1.4.11 Copy of Certificate of Incorporation/Registration.
  - 1.4.12 Copy of up-to-date Trade license.
  - 1.4.13 Copy of TIN Certificate.
  - 1.4.14 Copy of VAT Registration Certificate.
  - 1.4.15 Manufacturer’s Information for the major equipment as per Form F of Book 2 of the Bid

document.

## **1.5 Documentaries evidences' for Establishing Performance of the Equipment and Experience of the Bidder**

### **1.5.1 Documents to Establish Performance of the Equipment**

The bidder shall submit certificates from at least 3 (Three) different users, which will demonstrate that any model of the series, proposed by the bidder has been running as a Internet Gateway Router satisfactorily for a period of at least last two years. The equipment might not be supplied by the bidder to the user and the user may be in this country or abroad.

### **1.5.2 Documentary Evidence Establishing Bidder's Experience**

The Bidder shall have at least one experience of supplying, installing and commissioning of Telecom/Data Network Equipment consisting of Gateway/Aggregation/Core Router/Switch amounting minimum BDT 3.00 Crore or equivalent in other currencies in a single work order/contract. The bidder must provide copy of Work Order/Contract and Acceptance/Completion certificate from the relevant Client in support of his experience. No other document will be acceptable.

1.5.3 The Certificates shall be in English. If the original certificate is not in English then an official English translation have to be submitted with the certificate of original language.

1.5.4 BSCCL shall have the right to examine the authenticity of issuance and contents of all the certificates/documents mentioned in clause 1.5.1 and 1.5.2 above. BSCCL shall have the right to choose methods, timings and procedures of examining such authenticity. The procedure may include (but not limited to) among others, making direct contacts to relevant persons or gathering information from other sources like web sites, other web publishes, technical journals, newsletters of industry, professional or trade organizations etc. BSCCL shall have the authority to contact the persons/organizations issuing those certificates/documents to ascertain the authenticity of any or all submitted certificates/documents. The bidder shall keep the relevant contact persons informed about the possible contact by BSCCL.

1.6 On the day of opening of the tender document, only the envelope containing the "Technical Proposal" shall be opened by the Tender Opening Committee (TOC). After opening of the "Technical Proposal" the first part i.e., "Mandatory Documents", will be examined to check the presence of all the Mandatory Documents and asked in Clause 1.4. On the basis of such examination, a "Tender Opening Statement" along with a list of received bids shall be prepared by the TOC and the Representatives of all the bidders, present on spot, shall have to sign on the opening statement and have the right to obtain a photocopy of that statement.

1.7 On completion of the opening formalities, the Technical Proposals of the received bids will be forwarded to the Tender Evaluation Committee (TEC) for Evaluation. All the Financial Proposals will be kept in safe custody of HOPE of BSCCL.

1.8 The process of evaluation shall be carried out in two parts; i.e., "Evaluation of Technical Proposals" and "Evaluation of Financial Proposals". The bidders shall note the financial proposal of only those bidders will be evaluated whose Technical Proposals will become Eligible and Responsive in the evaluation of Technical Proposals. The Financial Proposals of those bidders whose Technical Proposals will become either 'Not Eligible' or 'Non Responsive' in the evaluation of Technical Proposals, will be returned to the respective bidders without opening.

- 1.9 During the Evaluation of Technical Proposals, the first part of the Technical Proposal i.e. the Mandatory Documents will be examined first by the TEC. During such examination, the presence and contents of "Mandatory Documents" of all the bidders will be examined. If, for any Bidder, this folder (Mandatory Documents) does not contain all of the required documents listed above in clause # 1.4, and/or the submitted documents do not fulfill the requirements of different sub-clauses of clause # 1.4; the TEC will declare that bid as "**Not Eligible**" and will not consider it for further evaluation.
- 1.10 The bids of only those Bidders, whose Technical Bids have not been considered as "not eligible" by the TEC, vide clause # 1.9 above, shall automatically be considered as "**Eligible**". The bids of only those bidders, whose bid is found to be "Eligible" shall be considered for further technical evaluation.
- 1.11 **Each set of the "Technical Documents" shall contain the following documents:**
- 1.11.1 **Brochure/Catalog** of the Manufacturer, showing model name, description and capacities etc. for the equipment offered. Downloaded documents from web site (address must be given) shall be acceptable provided that the documents contain the required information
  - 1.11.2 **Explanation of Redundancy** (whether 1+1 or N+1) of Routers
  - 1.11.3 The Bidder shall explain, in a separate and self-explanatory document with his offer, the process of expansion from the initial capacities to the final capacities of the equipments where applicable.
  - 1.11.4 **Detail Bill of Quantity (BoQ)** of all equipment, goods (up to the detailed level as far as possible) and services as per formats given in Form-C & Form-D of Book-2 but **WITHOUT PRICE**. The bid will be declared Non-Responsive if the technical offer (form A, B, C and D) contains price.
  - 1.11.5 A "**Clause by Clause Compliance Schedule**" to all the clauses and sub-clauses of the Tender Document. The schedule shall be prepared as per format shown in Annex F of Book 1 of the tender document. In the reference column of **Annex-F** the bidder must clearly mention the volume, chapter, page number(s) etc. to help the TEC to verify the claim of the bidder against the clause.
  - 1.11.6 A Face lay-out view of actual configured Router equipment. These lay-out view drawings shall include all the quoted Racks/Sub-racks/chassis, clearly showing all the slots on each equipment (Whether equipped or not). Different Cards (minor items need not be shown) quoted in BOQ shall be shown on these Racks/Sub-racks/chassis on specific slot number where these cards are to be inserted for a configured equipment to satisfy the requirements of the scope of works.
  - 1.11.7 The purchased Tender document including any clarification and/or corrections issued by BSCCL duly signed (in original) and stamped in every page by an authorized representative of the bidder
  - 1.11.8 The bidder shall also submit necessary documents proving professional and technical qualifications and competence, financial capability, managerial capability, experience in project management to perform the contract. The documents will be used for "**Post-qualification**" purpose.
  - 1.11.9 Failure to submit any of the above documents mentioned in Clause 1.11.1 to Clause 1.11.18 may result in declaration of the concerned bid as "Non-Responsive".
- 1.12 **The "Financial Proposal" of the Bidder shall include the following documents:**
- 1.12.1 A forwarding letter in the bidder's letter head/pad as per format given in Annex-A.2 of Book-1
  - 1.12.2 All BoQ Forms ( as in book-2) showing items, quantities and prices.
  - 1.12.3 Future Order Formula to be used for future expansion or for ordering of spares.
  - 1.12.4 The price offered by the bidder shall be inclusive of all Taxes, Duties including the import duty and VAT.
  - 1.12.5 BSCCL shall deduct the VAT and Income Tax (AIT) before payment of the bill of the contractor.

1.13 **Special information for the bidders**

The bidder shall note that, during submission of the bid, if it does not comply and/or disagrees to any or many specification, terms and/or conditions set forth in this document and/or proposes any alternate specification, terms and/or conditions; such **non-compliance** and/or disagreement and/or alternate specification, terms and/or conditions shall not be binding upon BSCCL until and unless such **non-compliance** and/or specification and/or terms and/or conditions have been accepted by BSCCL and has been incorporated in writing in the Purchase Contract and/or any other document which has been declared as part of the contract

===End of Chapter One===

## Chapter Two

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### Scope of Works

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2.1 Bangladesh Submarine Cable Company Limited (BSCCL) is a Core Telecommunications service provider primarily through the International Submarine Cables. Emerging in July 2008, BSCCL presently handles the SEA-ME-WE-4 and SEA-ME-WE-5 submarine cables and represents the country in the SMW-4 and SMW-5 international cable consortium. BSCCL is also an International Internet Gateway (IIG) operator in Bangladesh and provides IP transit services to its customers from their several IP PoPs. BSCCL intends to set up a gateway PoP at its Kuakata cable landing station (CLS). The scope of works of this tender is to deploy Routers and Switches to set up a gateway IP PoP at Kuakata CLS.

2.2 The total scope of procurement of equipment is as follows :

Equipment Classification	Quantity	Remark
<b>Gateway Router</b>	2 (Two) numbers	Technical specification is given in Chapter Three
<b>Access Switch (LAN Switch)</b>	3 (Three) numbers	Technical specification is given in Chapter Three
<b>Standard Rack with Power Distribution Panel</b>	2 (Two) numbers	Technical specification is given in Chapter Four

2.3 Unless otherwise described in the Technical Specifications, the scope of provision shall cover manufacturing, supplying, installing, testing and commissioning of equipment and material and its related facilities on “Turn-Key” basis.

2.4 The bidder shall configure the equipment as per the network diagram given in Annexure-1 with all the services and features described in different chapters of the tender document and as per instructions of engineer in-charge of BSCCL.

2.5 Detail Technical Specifications of various components of the required system/service are given in subsequent chapters of this document.

2.6 Warranty Period

Warranty period for the whole system to be purchased shall be **2 (two) years**. The warranty period will start from the effective date of PAC to be issued by the purchaser. During the Warranty period, the bidder shall offer all material, spares, services and Maintenance support as described in relevant clauses for “Maintenance Support up to the end of Warranty Period” at their own cost.

### 2.7 *Maintenance Support up to the end of Warranty Period*

2.7.1 The Bidder, at his own cost, shall provide full maintenance support for all equipment covered by this purchase up to the end of the Warranty Period. This support service shall start from the date of effect of the PAC to be issued by the purchaser for the equipment/system to be covered by this purchase. The warranty support shall also include replacement of all types of faulty boards/units/modules of the supplied equipment during the warranty period at contractor’s cost (including all duty, Tax and VAT).

2.7.2 The maintenance support service shall cover at least (but not limited to) the following services:.



- 1) Regular visits to the relevant sites (if feel necessary) to check and monitor different aspects of the working systems
- 2) To remain stand-by to respond in the shortest possible time during any call by BSCCL
- 3) Helping BSCCL personnel to solve different software and hardware problems related to proper O&M of the equipment
- 4) Maintaining a buffer stock of spares to replace any faulty board/module/parts of the supplied equipment.
- 5) Replacing the faulty board/module/parts and any consumable item of the supplied equipment within 3 (three) days from the date of identification of the fault.
- 6) Identify and remove different bugs in the system's operational software
- 7) Helping BSCCL personnel to properly maintain relevant databases related to O&M of the system
- 8) Preparation and submission of reports to BSCCL about different aspects of O&M of the system
- 9) Giving on-the-job training to BSCCL personnel about different aspects of O&M
- 10) Advising BSCCL about different aspects of O&M, system configuration, system dimensioning, expansion, etc.
- 11) Transfer of technology to BSCCL personnel

## **2.8 Maintenance support for 3 (three) years from the end of Warranty Period**

- 2.8.1 The successful bidder shall provide maintenance support service for **3 (three) years** from the end of Warranty period. The bidder shall quote for such maintenance support service in the relevant BoQ Forms. In this connection the bidder shall provide with his offer, a list of spares and replaceable parts with unit prices as per Form D of Book 2. If any spare not included in Form D is required during the 3 (three) years maintenance support period, the contractor shall provide the spare free of charge to BSCCL. The bidder shall note that the total price of spares in Form D will be considered for financial evaluation but BSCCL will pay only for those spare parts/replaceable items which will be actually used during the 3 years Maintenance support period.
- 2.8.2 The maintenance support service shall cover at least (but not limited to) the following services:
1. Regular visits to the relevant sites (if feel necessary) to check and monitor different aspects of the working systems
  2. To remain stand-by to respond in the shortest possible time during any call by BSCCL
  3. Helping BSCCL personnel to solve different software and hardware problems related to proper O&M of the equipment
  4. Maintaining a buffer stock of spares to replace any faulty board/module/parts of the supplied equipment.
  5. Replacing the faulty board/module/parts and any consumable item of the supplied equipment within 3 (three) days from the date of identification of the fault.
  6. Identify and remove different bugs in the system's operational software
  7. Helping BSCCL personnel to properly maintain relevant databases related to O&M of the system
  8. Preparation and submission of reports to BSCCL about different aspects of O&M of the system
  9. Giving on-the-job training to BSCCL personnel about different aspects of O&M
  10. Advising BSCCL about different aspects of O&M, system configuration, system dimensioning, expansion, etc.
  11. Transfer of technology to BSCCL personnel

## **2.9 Spare Parts Guarantee**

The Bidder shall provide a separate guarantee (**as per format in Annex D in Book 1**) to the effect that, he shall guarantee the flow and availability of all spare parts and units without major design changes for at least 8(eight) years from "the date of effect" of the Final Acceptance Certificate (FAC).If within this period, there is

any major design change or stoppage of production of supplied equipment, the bidder shall bear all the costs related to provision of alternate solutions.

## 2.10 Expansion Guarantee

The Bidder shall provide a separate guarantee (as per format in Annex E.2 of book-1) to the effect that he shall guarantee the flow and availability of all equipment, materials and services required for any subsequent expansion of its offered equipment for at least 8 (eight) years from “the date of effect” of the Final Acceptance Certificate (FAC). If, within this period, there is any major design change or stoppage of production of supplied equipment, the bidder shall bear all the costs related to provision of alternate solutions.

## 2.11 Testing

### 2.11.1 Provisional Acceptance Test (PAT)

- i. Before acceptance of the installed system/equipment, BSCCL representatives shall carryout, on site, detailed tests of all equipment to ascertain working reliability, concurrence to agree technical and other specifications, inventory checking of installed equipment etc. Such tests shall be termed as “**Provisional Acceptance Test (PAT)**”. Prior to commencement of such tests, the contractor shall submit a proposed procedure for the PAT to be subsequently approved by BSCCL.
- ii. On completion of installation and self-testing of any system/ equipment, the Bidder shall submit 3(three) copies of self-test results to BSCCL and offer that system/ equipment for PAT. BSCCL shall start such test as soon as possible upon receipt of the request. The bidder may, upon agreement by the both party, offer PAT for any part or parts of the total system. Such request for partial PAT may also be asked for by BSCCL.
- iii. The bidder shall be totally responsible for arrangement of all equipment, consumables, test gears and measuring equipment required for the PAT.
- iv. The bidder’s engineer shall be liable to make necessary arrangement to complete any kinds of tests requested by BSCCL during PAT procedure.
- v. In addition, the bidder has to provide per-diem costs to PAT engineers as per following:

a.	Number of BSCCL Engineers of PAT team	4 (Four)
b.	Maximum number of days to complete the PAT	5 (Five) working days
c.	Per diem charge to BSCCL PAT members	Taka 2000/- per working day per person
d.	Other facilities	Transportation, if needed

- vi. The Provisional Acceptance Certificate (PAC) will be issued by BSCCL on the basis of the recommendations by PAT team.
- vii. The bidder shall provide notice at least 10 days before the PAT starts that the system is ready for acceptance.
- viii. The bidder’s engineers should carry out in house test and observe that all the parameters/test results are within limit before test is offered to BSCCL engineers
- ix. BSCCL has to issue the PAC within 10 days of completion the PAT. A list of minor, if any, deficiencies should be attached with the PAC and the contractor has to remove the deficiencies within one month.
- x. The minor deficiencies should not hold the payment of the contractor. In case of any major deficiencies the PAT should be repeated.

### 2.11.2 Final Acceptance Test (FAT)

- i. After completion of the PAT and cut-over of the system, the Engineers of the Bidder will take prompt necessary steps to remove all types of faults, if any, and replace all types of faulty equipment at the

cost of the supplier. Also any integration necessary will be done at this time. At the end of the “Warranty Period for the Contract”, the overall performance of all equipment supplied under the contract will be reviewed and this review shall be termed as “Final Acceptance Test (FAT)”.

- ii. The review shall include (but not limited to) the required working reliability and performance standards of the equipment to meet tender specifications, the bidder’s responsiveness to resolve all shortcomings mentioned in PAT reports and the bidder’s removal of all pending & outstanding faults or shortages within 1 Month. Then the FAT will start upon request by bidder. FAT will be finished by 3 (Three) working days.
- iii. The bidder shall be responsible for arrangement of all equipment, consumables, test gears and measuring equipment required (if any) for such review tests.

a	Number of BSCCL Engineers of FAT team	4 (Four)
b	Maximum number of days to complete the FAT	3 (Three) working days
c	Per diem charge to BSCCL PAT members	Taka 2000/- per working day per person
d	Other facilities	Transportation, if needed

- iv. The Final Acceptance Certificate (FAC) will be issued by BSCCL on the basis of the recommendations by FAT team. The Final Acceptance Test shall be offered by the bidder before one month from the date of end of the 2 years ‘Warranty Period’.

## 2.12 Training

The Bidder shall provide the training to BSCCL Engineering personnel. The course curriculum shall be designed in such a way that it shall facilitate transfer of technology to BSCCL engineering personnel for planning, designing, expanding and proper operation & maintenance of the network. Bidder shall include total price for the Training in his offer. Failure to quote shall be considered that the bidder proposes to provide this service totally “free of charge” to BSCCL.

### 2.12.1 Local Training:

The Bidder shall provide training to BSCCL personnel in Bangladesh at BSCCL premises.

Training should cover Advance Routing Switching for Internet Service Provider (Tier-1 ISP) and troubleshooting. Actual content of each item might, however, be customized to match with the architecture and solutions offered by the bidder and approved by BSCCL Authority.

Training should also cover hands on training at the time of implementation.

The format of the local training shall be as follows:

a.	Number of BSCCL Engineers	8 (Eight)
b.	Maximum number of days	7 (Seven) working days
c.	Per diem charge to BSCCL	Taka 1000/- per working day per person

### 2.12.2 Foreign Training:

The bid shall include a lab based training/OEM (bidder offered) specific Certified network administrator or better training which shall cover at least Advance Routing i.e. BGP, MPLS, Adv. QoS and troubleshooting. Actual content of each item might, however, be customized to match with the architecture and solutions offered by the bidder. The details of this course module are given below:

a.	Number of BSCCL Engineers	4 (four) persons in two batch
b.	Maximum number of days	7 (Seven) working days
c.	Per diem charge to BSCCL	US \$100 (One hundred) per day (including all holidays in between and travel days) per Person
d.	Other Facilities	Local Transportation Standard Accommodation Medical Services (if required) Both Way Full-fare Air Ticket (Economy Class)

The bidder shall submit a detail training plan in his proposal including place of training. Training schedule should be provided with Bid and finalize before start training.

## **2.13 Certificates to be issued**

### **2.13.1 Provisional Acceptance Certificate (PAC)**

Upon successful completion of the PAT for any, many or all equipment covered by this purchase, the relevant authority of BSCCL, shall issue a “Provisional Acceptance Certificate” (PAC) for the equipment concerned. The exact breakdown of the purchase into various PAC components and the number of PACs to be issued shall be agreed upon between BSCCL and the bidder during contract negotiation.

### **2.13.2 Final Acceptance Certificate (FAC)**

After completion of the FAT, if and only if, no outstanding issue has been detected, one “Final Acceptance Certificate” (FAC) covering the entire purchase contract shall be issued by the relevant authority of BSCCL.

### **2.13.3 Certificate of Commencement of Work (CCW)**

On commencement of the project work and on receipt of written request from the bidder, the Project Office of BSCCL will issue “Certificate of Commencement of Work (CCW)”.

### **2.13.4 Successful Completion of Services’ Certificate (SCC)**

During implementation period of the turn-key contract, the bidder shall provide various time-bound services like training, maintenance assistance service. On completion of such service components and on receipt of written request from the bidder, the relevant office of BSCCL shall issue “Successful Completion of Services’ Certificate (SCC)” for each of such service components. The exact breakdown of the purchase into various SCC components and the number of SCCs to be issued shall be agreed upon between BSCCL and the bidder during contract negotiation.

### **2.13.5 Arrival of Goods and Materials Certificate**

During implementation period of the turn-key contract, the bidder shall ship various consignments of foreign goods and materials and shall also supply items from local market. On arrival of such consignments to BSCCL sites or BSCCL stores (whichever is applicable) and on receipt of written request from the bidder, the relevant office of BSCCL shall issue “Arrival of Goods and Materials Certificate” for each of such consignments. The number of such consignments shall be decided by the bidder in accordance with its approved implementation plan.

### **2.13.6 Certificate for Clearance of Obligations**

After the end of Performance Guarantee period, the Contractor shall give a written undertaking to the Procurement Office of BSCCL to the effect that, in relation to the turn-key execution of the contract, it has no outstanding dues, liabilities and obligations towards any organization inside Bangladesh.

## **2.14 Role and responsibility of each party.**

### **2.14.1 Survey, Network Planning & Design**

The successful Bidder shall be responsible to provide all services related to installation survey, planning & design for all equipment/system covered by this purchase. After signing the purchase contract a survey shall be conducted jointly by the contractor and BSCCL. The contractor shall be responsible for planning & designing based on the survey data. Before installation of the equipment the contractor shall submit the Installation design and drawing along with survey report to the project office for approval. Installation shall be carried out as per the approved design and drawing. No modification of design is allowed without prior approval of the project office.

### **2.14.2 Power Supply**

BSCCL shall make the necessary DC power (-48 volt) source available at sites. However, the Bidder shall have to provide necessary circuit breakers/fuses, DC power cables, wirings, cable ways, conduit etc. and services in this connection. The bidder may consider the average distance between the DC power source of BSCCL and the place where proposed equipment/system will be installed as 30 meters.

### **2.14.3 Grounding of the Equipment**

BSCCL shall make the main station grounding bar available for connection of grounding of the equipment to be provided by the contractor. The bidder shall have to connect their installed equipment (Router/Switch etc.) to the main grounding bar using at least 25 mm<sup>2</sup> size grounding copper cable (green-yellow). Bidder may consider the approximate distance between the station main grounding bar and the equipment to be installed by the successful bidder as 30 meter for each site.

The quality of the "Earthing" shall be less than 1 ohm (BSCCL responsibility outside equipment room and bidder responsibility inside equipment room) for all equipments under this purchase.

### **2.14.4 Inter-connection between different equipment/system**

The Bidder shall be responsible for making inter-connection between existing and installed equipment at all sites. The Bidder may consider the maximum length of optical patch cord for interconnection purpose as 10 meter. All costs for materials and services shall be quoted by the bidder in his offer. Failure to quote shall be treated as "non compliance" and it shall be considered that the bidder proposes to provide this "free of charge" to BSCCL.

### **2.14.5 Balancing, Integration and Configuration of supplied equipment/system and inter-working with the existing system**

The Bidder shall be responsible for executing the submitted Balancing, Integration and Configuration Plan (revised plan after BOQ finalization). The bidder shall be responsible to integrate & configure the supplied equipment/system as per finalized network topology at the time of Contract BOQ preparation and ensure integration of any inter-working with the existing network/system of BSCCL.

### **2.14.6 Environment facilities like air-conditioning, which is not covered by this tender, shall be done by BSCCL, if necessary.**

## **2.15 Installation and Commissioning Services**

The Bidder shall be responsible for providing all services related to installation, testing, commissioning and cut-over of all equipment covered by this purchase. The bidder shall provide on the job training to at least 4 BSCCL engineers during the installation of the equipment. All costs for

service shall be quoted and failure to quote shall be considered that the bidder proposes to provide this service totally "free of charge" to BSCCL.

### **2.16 Documentation**

The **successful bidder** shall supply at least (but not limited to) the following documents before **PAT**.

- i. Technical Documentation for all equipment, 2 set of hard copy and 1 set in CD.
- ii. Operational Manuals of all integrated systems, 2 set of hard copy and 1 set in CD.

### **2.17 Quotation for additional equipment**

If the bidder thinks that any additional equipment, not listed in this document, is needed for proper implementation and subsequent O&M of the proposed equipment, he shall quote for such equipment. If any such equipment is not quoted, it shall be deemed that no additional equipment is necessary for proper implementation and subsequent O&M of the proposed system. If during implementation and subsequent O&M up to guarantee period, either the bidder or the purchaser finds that any additional equipment are obligatory for proper implementation and subsequent O&M of the network, the bidder shall be liable to supply such systems or equipment, whatever be the required quantity, "**free of charge**" to BSCCL

### **2.18 Unit Price for future orders**

The unit prices for all future orders for all equipment and services covered by this purchase shall be equal to or below the prices quoted in the original contracted offer.

The Bidder shall quote, with his offer, a detailed 'Future Order Formula' separately for equipment and services in **Form F** and submit in the Financial Documents.

The new prices as per quoted future order formula shall become effective only for orders placed after Guarantee Period and up to the life time of all equipment and services as per BoQ under this purchase.

All parameters of the quoted formulae must be described clearly.

### **2.19 Possibility of change of scope of Work and BoQ**

The Bidder shall note that the tender document has been prepared based on a preliminary survey of the prevailing infrastructure and facilities in BSCCL. During BoQ finalization with the successful bidder the proposed network design may be changed depending upon the actual requirement at that time and based on that finalized network design the size, number, location etc. of different equipment may also be changed accordingly, even some item(s) may be dropped but total Bill of Quantities (BoQ) prices shall be within the amount of the purchase proposal approved by the competent authority.

### **2.20 Omission of any Mandatory Items in the BoQ**

The bidder shall note that, even if any or many work(s), equipment or service(s) mentioned in this document as mandatory, is not mentioned in the contract BoQ for any reason, the bidder shall not be automatically relieved of his responsibility for those items. But if such omission(s) has (have) previously been agreed, in writing, by BSCCL's BoQ team, the bidder shall not be made liable for such omitted items. Such approved omissions, if any, shall have to be put either into the contract document or into any other document which subsequently is declared as part of the contract.

### **2.21 Prevalence of different clauses, chapters and books**

If, the contents of a Clause (or sub-clause) of any Book contradict with the contents of any other Clause (or sub-

clause) of the same or other Book of the Tender Document, the prevalence of the Clause (or sub-clause) shall be as follows;

- a) In all cases, **regulations of Procurement and sales policy of BSCCL** shall prevail over this Tender Document
- b) In case of different Books, Book 2 shall supersede Book 1;
- c) In case of later corrections by BSCCL, corrections will prevail with its due position
- d) Later clause of the same book prevail the earlier clause for same issues.

### ***2.22 Deviation from BSCCL's requirements***

The bidder shall note that, during submission of the bid, if he does not comply to any or many requirement and/ or specification and/ or terms or conditions set forth in this document or proposes any alternate specification and/ or terms and/ or conditions; such non-compliance and/ or alternate specification and/ or terms and/or conditions shall not be binding upon BSCCL until and unless such non-compliance and/or terms and/or conditions have been incorporated in writing in the Purchase Contract.

### ***2.23 The Proposed Network Architecture***

The proposed architecture of the Network is shown in Annex-1.

### ***2.24 Obligation to follow the Scope of Works***

The Bidder shall note that all the items of Equipment/Materials and Services mention in this chapter are mandatory unless any item is mentioned as optional. Bidder must agree all the mandatory items of the Scope of Works. Any refusal or disagreement by the bidder to any mandatory item of the scope of works shall be treated as "Material Deviation". The bidder shall also note that BSCCL will treat any conditional agreement/compliance as disagreement.

=== End of Chapter-2 ===

## Chapter Three

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### Technical Specifications of Internet Gateway Router

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#### 3.1 General Requirement

The Internet gateway router will handle the high-speed Internet connection peering with multiple Tier-1 Service providers. The Internet gateway Router shall be MEF 9 and MEF14 compliant and shall have following general characteristics. The router shall be able to integrate with existing ISP and MPLS network.

##### 3.1.1 Architecture

- i. The proposed router shall be modular and scalable.
- ii. The router shall be on modular chassis and fit into a standard 19 inch rack mounting. It shall not have any dependency on any specific interface card for populating cards.
- iii. The routers shall have redundant switch fabric that connects to all slots in the chassis in a non-blocking architecture. The switch fabric shall have the capacity of 240G of bandwidth which is expandable to minimum 450G in future.
- iv. The router shall have the aggregated system throughput of minimum 10 Tbps.
- v. The router shall have N+1 DC hot swappable power redundancy.
- vi. The router shall have redundant N+1 control card to ensure high availability and optimum performance.
- vii. The router shall have redundant routing processors or engines or main processor unit to ensure high availability in case of any failure in any one of routing engines.
- viii. The router OS shall be modular with separate routing process (OSPF/ISIS/BGP). Each process shall support independent software restart or RE failover.

##### 3.1.2 Connectivity

- i. The router shall support Packet over Synchronous Optical Network (POS) and Gigabit/Fast Ethernet.
- ii. The router shall support different interface speeds such as STM-1, STM-4, STM-16 and STM-64.
- iii. The router shall support different LAN Interfaces such as GE, 10GE and 100G.
- iv. The router shall support PDH, SDH, 10G and 100G DWDM optics to ensure the connectivity with DWDM.
- v. The router shall support 802.3ad Link Aggregates.
- vi. For aggregated links GbE, 10GbE, MLPPP and 802.3ad including LACP shall be supported by the system

##### 3.1.3 Management

The management of the Router shall support the following:

- i. Command Line Interface (CLI)
- ii. Extensive Simple Network Management protocol (SNMP) support including the Service Assurance Agent

##### 3.1.4 Programmability

- i. The router shall have the ability to interact or integrate with other systems via REST API or other methods as needed.
- ii. Router shall support Segment Routing.
- iii. The router shall support RFC 6020, YANG - A Data Modeling Language for the Network Configuration Protocol (NETCONF).
- iv. The solution shall support the network configuration protocol (NETCONF) that provides mechanisms to install, manipulate, and delete the configuration of network devices, RFC 6241.
- v. The solution shall support Architecture for Network Management Using NETCONF and YANG defined in RFC 6244.



- vi. The router shall support radius-triggered dynamic data services.
- vii. The router shall support Netconf interface for device configuration.
- viii. The router shall be able to act as Path computation client in the PCE architecture defined in RFC 4655.
- ix. The router shall be able to be a path computation element as described in RFC 4655.
- x. The router shall support IS-IS protocol extensions for PCE discovery based on RFC 5089.
- xi. The router shall support PCECP as defined in RFC 5440.
- xii. The platform shall be able to do automatic policy/constraint defined traffic routing to achieve load balancing on multiple internet peering, least cost peering, highest utilization, least latency routing etc.
- xiii. Platform provides the ability to optimize traffic path by making use of traffic engineering based on current and simulated traffic to satisfy the requirements of load-balance, resilience, latency and service level.
- xiv. Path computation can be achieved by placement of traffic engineered tunnel through programmable interface
- xv. The platform shall support the following Telemetry data
  - a. Interface Operational Data
  - b. Packet/Byte Counter
  - c. Packet/Byte Rater
  - d. IPv4 packet/byte counter
  - e. MPLS stats
  - f. BGP stats
  - g. QoS Stat
  - h. Fiber quality Monitoring

### 3.1.5 Scalability

- i. The router shall have at least 10 Tbps of switching capacity.
- ii. The router shall have at least 12M RIB routes
- iii. The router shall have at least 4M IPv4 routes
- iv. The router shall have at least 2M IPv6 routes
- v. The router shall have at least 4000 BGP peering.
- vi. The router shall support at least 1M label space.
- vii. The router shall support at least 1M mac-address
- viii. The router shall support at least 6K VRF.

### 3.1.6 Interfaces

- i. The router shall have the interfaces as mentioned in Annex 2.
- ii. The router shall support 10 GigE Ethernet interfaces compliant with IEEE 802.3ae.
- iii. The router shall support MM Sx (300m) 10 Gigabit Ethernet interface.
- iv. The router shall support 10GigEBaseLx (10km) 10 Gigabit Ethernet interface.
- v. The router shall support 10GigEBaseZR (80km) 10 Gigabit Ethernet interface.
- vi. The router shall support 10GigEBaseER (40km) 10 Gigabit Ethernet interface.
- vii. The router shall support 100GigE Gigabit Ethernet interface based on IEEE 802.3ba.
- viii. The router shall support 100GigE 80Kb.
- ix. The router shall support 64,000 logical interfaces.
- x. Gigabit Ethernet optical interface line cards shall support pluggable optics:
  - a. XFP for 10 GigE
  - b. SFP+ for 10 GigE
  - c. CFP 100G pluggable transceiver

### 3.2 General IP Features

The router shall be able to support the following general IP features.

- a. Internet Protocol- RFC 791
- b. Internet Control Message Protocol (ICMP) – RFC 792
- c. IP Multicast
  - i. The router shall support Internet Group Management Protocol (IGMP) v1, v2 and v3.

- ii. The router shall support Protocol Independent Multicast – Sparse Mode (PIM-SM) for IPv4 and IPv6
- iii. The router shall support Rendezvous Point (RP) – ability to be configured as an RP.
- iv. The router shall support Multicast ACL to ensure security.
- v. The router shall support Protocol Independent Multicast – Source Specific Multicast Groups (PIM-SSM).
- vi. The router shall support Multicast Load Balancing traffic across multiple interfaces.
- vii. The router shall support Multicast Source Discovery Protocol.
- viii. The router shall support RFC 2365, Administratively Scoped IP Multicast.
- ix. The router shall support mVPN Extranet.
- x. The router shall support Point to Multi-point LSPs.
- xi. The router shall support next generation MVPN based on BGP control signaling and MPLS Data Plane..
- xii. The router shall support mLDP.
- xiii. The router shall support fast IGMPv2/v3 leave operation.
- xiv. The router shall support anycast Bootstrap Router (BSR) Mechanism for PIM based on RFC 5059 in order to enable learning of group to RP mapping.
- xv. The router shall support Bidirectional PIM (BIDIR-PIM) based on RFC 5015 for IPv4 and IPv6.
- xvi. The router shall support static multicast join for a (\*,G) and (S,G) on an IP interface for IPv4 and IPv6.
- xvii. The router shall support static configuration of an IP interface as an outgoing interface for an (\*,G) and an (S,G) for IPv4 and IPv6.
- xviii. The router shall support Reverse Path Forwarding (RPF) check for IPv4 and IPv6.
- xix. The router shall support Inter-domain IP Multicast for IPv4 and IPv6.
- xx. The router shall support the ability to police the number of IGMP joins and leaves received on a subscriber IP interface to a configured limit in order to avert DoS attacks as a result of a malicious subscriber action, or CPE mal-functioning.
- xxi. The router shall support RFC 3446, Any cast Rendezvous Point (RP) Mechanism using Protocol Independent Multicast (PIM) and Multicast Source Discovery Protocol (MSDP) for IPv4 and IPv6.
- xxii. The router shall support INTER-AS MVPN OPTION A, B and C using RPF vector.
- xxiii. The router shall support MVPN SENDER-ONLY/RECEIVER- ONLY.
- xxiv. The router shall support Core diversity for Rosen mVPN with MDT SAFI auto-discovery.
- xxv. The router shall support MULTICAST ONLY FAST REROUTE(MOFRR) FOR NATIVE IP NETWORKS.
- xxvi. The router shall support MVPN MDT-SAFI.
- xxvii. The router shall support RFC 1112 Host Extensions for IP Multicasting (Snooping).
- xxviii. The router shall support RFC 2236 Internet Group Management Protocol, (Snooping).
- xxix. The router shall support RFC 2362 Protocol Independent Multicast-Sparse Mode (PIMSM).
- xxx. The router shall support RFC 3618 Multicast Source Discovery Protocol (MSDP) or IPv4 and IPv6.
- xxxi. The router shall support RFC 4601 Protocol Independent Multicast - Sparse Mode (PIM-SM): Protocol Specification (Revised).
- xxxii. The router shall support RFC 4604 Using IGMPv3 and MLDv2 for Source-Specific Multicast.
- xxxiii. The router shall support RFC 4607 Source-Specific Multicast for IP.
- xxxiv. The router shall support RFC 4610 Anycast-RP Using Protocol Independent Multicast (PIM) for IPv4 and IPv6.
- xxxv. The router shall support Rosen Solution for Multicast in MPLS/BGP IP VPNs RFC 6037.
- xxxvi. The router fabric used for control plane connectivity shall support multicast. A multicast mechanism can be used by the control card to distribute common information to packet processing cards more efficiently.
- xxxvii. The router shall support dedicating a P-tunnel to a Multicast VPN.
- xxxviii. The router shall support selective PMSI and the association with a P-tunnel.

- xxxix. The router shall support RFC 2365, Administratively Scoped IP Multicast.
- xl. The router shall support Reverse Path Forwarding (RPF) check for IPv4 and IPv6.
- xli. The router shall support Inter-domain IP Multicast for IPv4 and IPv6.
- xl.ii. Internet Group Management Protocol (IGMP) – RFC 1112
- xl.iii. PIM sparse mode
- xl.iiii. Multicasting BGP (MBGP)
- d. User Datagram Protocol (UDP) – RFC 768
- e. Transmission Control Protocol (TCP) – RFC 793
- f. Requirements for IPv4 Routers – RFC 1812
- g. Requirements for IPv6 Routers – RFC 7084
- h. Telnet Protocol Specification – RFC 854
- i. Network Timing Protocol (NTP) – RFC 1305
- j. DHCP

**3.3 The router shall support the following protocols from the day one.**

- a. PPP
- b. HDLC
- c. Frame Relay
- d. Multi-link PPP
- e. Link Bundling for high speed links
- f. Equal load sharing on all high speed links

**3.4 IP Routing**

The router shall support wire-speed packet forwarding for all packet sizes across all interfaces simultaneously. The routing features shall include the following .

- a. The router shall support the assignment of an IPv4 addresses and IPv6 addresses to each physical and logical interfaces.
- b. The router shall support 32 bit counters (route table updates) for all routing protocols.
- c. The router shall support load balancing of traffic across multiple interfaces (minimum of eight) using ECMP (Equal Cost Multiple Path) for static routes or any routing protocol both for IPv4 and IPv6.
- d. The router shall support fast removal of routes from FIB in the case of one of the link failure in the ECMP set and continue to load balance traffic across remaining ECMP paths with minimal impact on the forwarding plane. This shall apply to both IPv4 and IPv6.
- e. Static Routing
  - i. Static Routing shall be supported
  - ii. The router shall support the configuration of multiple static routes with the same outgoing interface.
  - iii. The router shall support cost assignment for static routes.
  - iv. The router shall support floating static routes to IPv4 destination each with an outgoing interface and an associated cost to select the best route automatically if the best cost interface for a route fails.
- f. OSPF Features support.
  - i. The router shall support at least 10 OSPF instances running at the same time on a router.
  - ii. OSPF V2 as per RFC 2328
  - iii. Shall support multi-OSPF area operations as per RFC 2328
  - iv. RFC1403, BGP-OSPF interaction
  - v. OSPF Not So Stubby Area (NSSA) RFC 3101
  - vi. RFC1850, OSPFv2 MIB
  - vii. RFC2370, Opaque LSA option
  - viii. RFC 2740, OSPFv3 for IPv6

- ix. OSPF Stub Area
  - x. Shall support RFC 3101 OSPF NSSA Options
  - xi. Shall support RFC 3137 OSPF Stub Router Advertisement
  - xii. Shall support the configuration of OSPF graceful restart timers
  - xiii. Shall support RFC 3630 Traffic Engineering (TE) Extensions to OSPF Version 2
  - xiv. Shall support RFC 5185 OSPF Multi-Area Adjacency
  - xv. Shall support OSPF Route Summarization.
  - xvi. Shall support OSPF Load Sharing (ECMP).
  - xvii. The router shall provide an OSPF (TE/DS-TE) implementation that provides the following capabilities upon the detection of a link failure/recovery in a LAG:
    - a. OSPF DS-TE shall adjust the IP link bandwidth associated with the link bundle and the unreserved bandwidth per TE-class and re-advertise the associated LSP accordingly.
    - b. OSPF-TE shall adjust the IP link bandwidth information (link bandwidth, reserve-able bandwidth, maximum reserve-able bandwidth, reserve-able bandwidth per priority).
    - c. OSPF (TE/DS-TE) shall declare the IP link down when the number of active links in the bundle goes below a configured limit.
- g. IS-IS
- i. The router shall support IS-IS routing protocol (ISO 10589, with extensions for supporting IPv4 (Internet Protocol) as specified in RFC 1195.
  - ii. Shall support ISIS Route Summarization.
  - iii. Shall support ISIS Load Sharing (ECMP).
  - iv. Shall support multi-topology ISIS
  - v. Shall support IS-IS Transient Blackhole Avoidance mechanism as specified in RFC 327
  - vi. Shall support ISIS registration with 1-hop BFD on an IS-IS link.
  - vii. Shall support the configuration of ISIS graceful restart timers
  - viii. RFC 1195 Use of OSI IS-IS for Routing in TCP/IP and Dual Environments
  - ix. Shall support Domain-wide Prefix Distribution with Two-Level IS-IS as specified in RFC
  - x. RFC 2973 IS-IS Mesh Groups
  - xi. IPv6 support for IS-IS
- h. The router shall support following BGP protocol features: Route Target, Site of Origin, Route Refresh, ASN Override, Outbound Route Filters (ORF), VPNv4 routes filtering based on route target, Inter-AS MPLS VPN model, and BGP route reflector functionality. The other BGP Features to be supported are:
- i. The router shall support BGP-4 as defined in IETF RFC 4271
  - ii. Shall support segment routing.
  - iii. SR based egress peer engineering.
  - iv. The router shall support capabilities advertisements with BGP-4 as in RFC 3392.
  - v. The router shall support BGP extended community attribute based on RFC 4360.
  - vi. The router shall support BGP transport over IPv6.
  - vii. The router shall support the exchange of BGP/MPLS IPv6 VPN routes in support of BGP MPLS IPv6 VPNs based on RFC 4659 (6vPE).
  - viii. The router shall support the exchange of MPLS-labeled IPv6 routes in support of 6PE operation based on RFC 4798.
  - ix. The router shall support the exchange of BGP/MPLS IPv4 VPN routes in support of BGP MPLS IPv4 VPNs based on RFC 4364.
  - x. The router shall support 4-byte AS numbers based on RFC 4893.
  - xi. The router shall support BGP transport over IPv6.
  - xii. The router shall support BGP route flap damping based on RFC 2439.
  - xiii. The router shall support the ability to configure IPv4 and IPv6 routes advertised through a

- particular BGP session.
  - xiv. The router shall allow route advertisement interval control.
  - xv. The router shall support storing of routes learned from a BGP peer in its rib-in for both iBGP and eBGP whether they are selected as best routes or not.
  - xvi. The router shall support configuration of all timers associated with BGP graceful restart.
  - xvii. The router shall support the immediate withdrawal of any BGP route that was not learnt from any BGP peer after restart.
  - xviii. The router shall support BGP ECMP load balancing to different BGP next hops including forwarding over LSPs to the next hops.
  - xix. The router shall support recursive route lookup for BGP routes.
  - xx. The router shall support BGP ECMP fast reroute for IPv4 routes (including VPN routes) upon the failure of a BGP next hop out of two or more equal-cost BGP next hops for a route. The target is to achieve a total reroute time on the order of sub-100 msec after failure detection. This is expected to be achieved by adjusting the forwarding entry, removing a failed BGP next hop, prior to BGP route re-selection.
  - xxi. The router shall support BGP ECMP fast reroute for IPv6 routes (including VPN routes) upon the failure of a BGP next hop out of two or more equal-cost BGP next hops for a route. The target is to achieve a total reroute time on the order of sub-100 msec after failure detection.
  - xxii. The router shall support BGP graceful restart for the following routes based on RFC 4724 and RFC 4781, as they apply.
  - xxiii. BGP policy based auto TE tunnel for segment routing.
  - xxiv. RFC1771 & 1772, BGPv4
  - xxv. RFC1997, BGP Communities Attribute
  - xxvi. RFC 2270: Using a Dedicated AS for Sites Homed to a Single Provider.
  - xxvii. RFC 2385: Protection of BGP Session via the TCP MD5 Signature Option.
  - xxviii. RFC 2439, BGP Route Flap Damping
  - xxix. RFC 2796, BGP Route Reflection – An Alternative to Full Mesh IBGP
  - xxx. RFC 2918, Route Refresh Capability for BGP-4
  - xxxi. RFC 3065, Autonomous System Confederations for BGP
  - xxxii. RFC 3107, Carrying Label Information in BGP-4
  - xxxiii. BGP Extended Communities Attribute
  - xxxiv. BGP4 Multi path support to enable load balancing between multiple exterior BGP peers from the same downstream router.
  - xxxv. Prefix List tracking & Control to enable network administrators to control peering requirements with exterior BGP peers.
  - xxxvi. Policy Routing to enable flexibility in making changes to the normal routing process based on the characteristics of the traffic.
- i. RIPv1 and RIPv2
  - j. MPLS
    - i. The router shall support the uniform mode, pipe and short pipe modes of RFC 3270.
    - ii. The router shall support label stack encoding as it applies to MPLS PWs per RFC 3032.
    - iii. The router shall support MPLS encapsulation over Ethernet interfaces
    - iv. The router shall support MPLS encapsulation over Ethernet 802.3ad Link Aggregates [LAGs].
    - v. The router shall support enabling RSVP-TE over any type of logical interface [e.g., Ethernet port, 802.3ad LAG, VLAN, aggregate interface]
    - vi. The router shall support enabling LDP over any type of logical interface [e.g., Ethernet port, 802.3ad LAG, VLAN, aggregate interface]
    - vii. The router shall support RSVP-TE based on RFC 3209 on any IP interface defined on an Ethernet interface, an 802.3ad LAG, a VLAN on an Ethernet interface or an 802.3ad LAG.

Support for IPv4 and IPv6 as defined in RFC3209 shall be provided.

- viii The router shall support traffic-driven auto-bandwidth adjustment of an RSVP-TE tunnel when traffic-driven auto-bandwidth is enabled by configuration for the tunnel at the tunnel head-end.
- ix The router shall be capable of functioning simultaneously as a PW PE as defined in RFC3985, Layer3 PE based on RFC4364 and RFC 4659, LER, 6PE based on RFC4798 and Label Switch Router (LSR).
- x The router shall support RSVP MD5 authentication using the integrity object.
- xi The router shall support TTL processing in MPLS networks based on RFC3443. The pipe and uniform modes shall be supported
- xii The router shall support the information model described in "Multiprotocol Label Switching (MPLS) Label Switching Router (LSR) Management Information Base (MIB)", RFC 3813.
- xiii The router shall support the information model defined in "Management Information Base for the Differentiated Services Architecture", RFC 3289 as it applies to MPLS-DiffServ statistics counters, queue configuration, drop profile configuration and classification rule modified to apply to MPLS
- xiv The router shall support the configuration of the same VRF to hold both IPv4 and IPv6 routes simultaneously.
- xv The router shall support a stack of at least 5 labels. Pushing and popping of labels shall have no impact on the forwarding performance.
- xvi The router shall support topology-driven LDP, based on RFC 3036 over any IP interface (Ethernet link, 802.3ad LAG, VLAN on an Ethernet interface or 802.3ad LAG). Specifically, Core Router shall support unsolicited downstream, ordered, and targeted control modes of label distribution for IPv4 FEC.
- xvii The router shall support RFC 2702 Requirements for Traffic Engineering over MPLS.
- xviii The router shall support RFC 3209 Extensions to RSVP for Tunnels.
- xix The router shall support RFC 3906 Calculating Interior Gateway Protocol (IGP) Routes Over Traffic Engineering Tunnels

### **3.5 The router shall support shall support the following MPLS/VPN features**

- i. MPLS RFC 2547bis MPLS L3 VPN.
- ii. MPLS E-LSP and MPLS Fast Re-Route.
- iii. MPLS L2 VPN (Ethernet, VLAN, FR, PPP, HDLC, ATM over MPLS)
- iv. The router shall support 1000 VRF.
- v. Scheduling/ queuing for 8 classes that provide configurable minimum bandwidth allocation to each class, based on 802.1p and IP TOS bits.
- vi. Mapping of 802.1p and IP TOS bits into MPLS EXP bits.
- vii. The router shall support mapping of 802.1q VLAN tags into MPLS labels.
- viii. RFC 3031, Multi-protocol Label Switching Architecture.
- ix. RFC 3032, MPLS Label Stack Encoding
- x. LDP specification as per RFC 3036.
- xi. RFC 3270, Multi-Protocol Label Switching (MPLS) Support of Differentiated Services.
- xii. RFC 3443, Time To Live (TTL) Processing in Multi-Protocol Label Switching (MPLS) Networks.
- xiii. RFC 3469, Framework for Multi-Protocol Label Switching (MPLS)-based Recovery.
- xiv. RFC 3564, Requirements for Support of Differentiated Services-aware MPLS Traffic Engineering.
- xv. Dynamic MPLS LSP setup with signaling protocol shall be supported on all the router interfaces.
- xvi. Shall support LSP path optimization. When new LSPs are added, LSP re-optimization allows rerouting LSPs to follow a lower cost path with no data loss to existing traffic.
- xvii. The router shall support LSP Ping, LSP Trace route and L2VPN OAM functionalities.

3.6 An essential feature for Router is to support differentiated Quality of Service (QoS) for IP packets. The router must be able to deliver the following IP QoS to allow service providers to offer differentiated IP

- service plans to their subscribers. .
- i. Simple traffic classification (DSCP or TOS bits). The router shall support Low latency-Low Jitter for VOIP Class of service in addition to Assured Services and Best effort services.
- ii. Traffic Control
- iii. Traffic shaping
- iv. Congestion control based on Weighted Fair Queuing
- v. Congestion avoidance based on RED and Weighted RED
- vi. Support of DiffServ
- vii. Wire-speed complex traffic classification, hardware-based implementation
- viii. Hardware-based implementation of QOS, not affecting the forwarding performance
- ix. The router shall support SLA probes to monitor the packet loss, Jitter, latency parameter with Tier-1 Peering ISPs and also the downstream service providers and corporate customers. The frequency of checking and number of packets are configurable. The SLA parameter is able to collect by SNMP MIBs by the central performance Management software.

### **3.7 The Other High Availability Feature Support**

- i. Virtual Router Redundancy Protocol (VRRP)
- ii. Bi directional Failure Detection (BFD)
- iii. Graceful Restart and Non Stop forwarding for BGP, OSPF, ISIS
- iv. State-full switchover/ Graceful Switchover
- v. LAG

### **3.8 The Router shall provide the following security features**

#### **3.8.1 Security Features**

- i. Ensuring hierarchical user authorities, preventing unauthorized configuration of equipment.
- ii. Providing SSH, ensuring security for administrator accounts.
- iii. Supporting the application of complex ACL policies on host ports, preventing illegal access to the equipment.
- iv. Supporting the application of complex ACL policies on host ports, preventing illegal access to the equipment.
- v. The router shall support Carrier Grade NAT for IPv6 Migration
- vi. The router shall support minimum 20M NAT translations/flows per slot/Card/NPU.
- vii. The router shall support minimum setup rate of 140000 sessions per second for CGN translations.
- viii. The router shall support throughput of minimum 10Gbps per slot for CGN traffic

#### **3.8.2 Protocol Security**

- i. Supporting plain text authentication, MD5 and SHA (SHA-2/HMAC-SHA) authentication for common routing protocols, avoiding importing invalid routing information.
- ii. Supporting SNMP V3

#### **3.8.3 Security Auditing**

- i. Providing various security-related statistic information and system logs
- ii. Flow-based filtration
- iii. Flow-based redirection
- iv. Flow-based sampling

### **3.9 Hardware configuration and Performance Requirement**

The Router shall have the following capabilities.”

- i. The Switching capacity shall be not less than 450 Gbps.
- ii. The Router shall support the forwarding rate of minimum of 2 billion packets per second.
- iii. The Router shall have at least 8 slots for line cards.



- iv. The router shall forward the packet on Line-rate on all the interfaces.
- v. The router shall have N+1 redundant DC power supply (-48V).
- vi. All interface modules shall support hot swapping.
- vii. Loss of the management link to the Network Management System must not affect the normal operation of the Router.
- viii. Ready for IPv6.
- ix. The processing and interface capabilities of the router shall be able to be upgraded to the final capacity mentioned in the relevant clause and Annex-2 with the same chassis offered in the bid
- x. Router Processor shall be supplied with minimum of 32 GB RAM and 1 GB Flash.
- xi. The router shall be supplied with 1+1 hot-standby redundancy of Control and Switch module. Failure of one Switch module shall not lead to:
  - a. Degradation in the performance of router.
  - b. Degradation in any service levels.
  - c. Reduction in switching capacity

### 3.10 Present and Final interface capacities

The present and final interface capacities are mentioned in Annex-2.

## Technical Specifications of Access Switch

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The prime objective of this Switch is to deliver Controlled Internet Bandwidth to high bandwidth users over the optical fiber cable. The offered series of LAN switch must be compliant with Metro Ethernet Forum specifications. Documentary evidence shall be submitted with the offer to prove that the Metro Ethernet Forum passes the series of quoted LAN switches.

### 3.11 General Feature

The switch shall support the following general features. Spanning Tree Protocol (IEEE 802.1d)

- i. Rapid Spanning Tree Protocol(RSTP) (IEEE 802.1w)
- ii. Logical Link Control (IEEE 802.2)
- iii. Flow Control (IEEE 802.3x)
- iv. TFTP (RFC 783), Telnet (RFC 854)
- v. Jumbo Frames
- vi. Ether Channel / multilink compatible trunking.
- vii. Port trunking capability at Layer 2.
- viii. SNMP v1/ v2/ v3
- ix. Support for 802.1x.
- x. Multicast IGMP v2 snooping as per RFC 2236.
- xi. Multicast group and source port filters
- xii. Rate limiting per port
- xiii. Traffic Shaping per Port
- xiv. Dual Images for resilient firmware upgrades.
- xv. Embedded RMON software agent supports 4 RMON groups (history, statistics, alarms and events) for enhanced traffic management, monitoring and analysis
- xvi. 1Gport shall support SFP transceiver module
- xvii. 10Gport shall support SFP+ transceiver module
- xviii. 10Gports shall support both uplink and downlink



### 3.12 Network Protocol Feature

The switch shall support the following network protocol feature.

- i. The Switch shall learn the MAC address using static commands or dynamic.
- ii. All ports shall work on either Half or Full duplex. The System shall support manual or auto negotiation feature for defining the Half or Full Duplex mode of operation
- iii. Should generate Syslog and SNMP trap for all the events.

### 3.13 VLAN Feature

The switch shall support the following VLAN features

- i. IEEE 802.1Q tagging and 802.1p traffic priority
- ii. IEEE 802.1w VLAN RSTP (Rapid Spanning Tree) and IEEE 802.1s
- iii. VLAN shall be possible to be created among ports of different types as well as ports on the interface cards.
- iv. 4000 VLANs (as per IEEE 802.1Q) shall be supported and minimum no. of active VLAN is 256.
- v. Shared VLANs should be supported. Many customer connections on a single VLAN should be supported with all traffic being forwarded to the router terminating the VLAN.
- vi. Shall allow MAC/IP Addresses bound to a port/ VLAN.
- vii. Shall have management VLAN
- viii. Shall support protocol-based VLAN

### 3.14 Routing Feature

The switch shall support the following routing features

- i. Static Route and Default Route
- ii. Classless inter Domain Routing
- iii. Shall support IPv4 and IPv6

### 3.15 Security Feature

The switch shall support the following security features.

- i. Hierarchical management over the users and password protection
- ii. Support ACL (Access Control List), Layer 2, 3, and 4 information filter (such as packet filter based on port, based on VLAN, source/destination MAC addresses, and packet filter based on source/destination IP addresses and upper layer protocol type). The ACL should be applied in both inbound and outbound direction.
- iii. Support the simple text authentication and MD5 encrypted text authentication for the Routing protocols
- iv. Terminal Access User Security Mechanism
- v. Secured Shell
- vi. Shall support SNMP v1/v2/v3 for traps.

### 3.16 Hardware Configuration and Performance Requirement

The switch shall support the following capacity and configuration features.

- i. The switch shall support minimum of 8000 MAC address.
- ii. The switch shall support minimum of 120 Gbps non-blocking switch capacity and 35.7 million packets per second forwarding performance.
- iii. The switch shall be supplied with 1+1 hot-standby redundant Control and Switching module and 1+1 hot-standby redundant DC (-48V) Power supply.
- iv. The switch shall be supplied with 4GB RAM .
- v. Hardware queue per port shall not be less than 8 (Eight).

### **3.17 Quality of Service Feature**

The switch shall support the following Quality of Service features.

- i. Shall support port base QoS
- ii. Shall support priority based 802.1P VLAN
- iii. Shall support IPv4 precedence, ToS and DSCP
- iv. Shall support DiffServ
- v. Shall support classification and re-making ACL's

### **3.18 Present And Final Interface Capacity**

The present and final interface capacity of the switch is mentioned in Annexure-3.

===== End of Chapter three=====

## Chapter Four

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### Specification for Rack

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#### 4.1 *Main Features of the Rack*

- i) The rack shall be of standard ETSI Cabinet type and shall house the proposed Routers/Switch
- ii) Height of the rack shall preferably be 2000 mm; bidder shall mention the width and depth of the proposed rack/cabinet.
- iii) The proposed rack/cabinet shall be Contemporary, sleek appearance and of strong frame structure.
- iv) The rack/cabinet shall be of multiple vendor equipment compatibility.
- v) The rack/cabinet should have excellent ventilation/ Super thermal management.
- vi) The rack/cabinet shall fitted with Fully Perforated Front & Rear door and Roof Top.
- vii) There shall be Plug and play side panels in the proposed cabinet/rack to simplify maintenance and equipment installation.
- viii) All enclosure doors of the cabinet/rack shall offer a quick release mechanism and can easily be removed during service and maintenance.
- ix) Color of the rack/cabinet shall preferably be black and there shall be Global vertical Cabling Section; 6"WX7"HX13.52"D in two sides of the rack.
- x) There shall be a DC PDU at the top of the rack/cabinet to provide necessary DC power to the equipment.
- xi) There shall be two power inputs in each PDU that back up each other and they will work in load-sharing mode.
- xii) There shall be necessary numbers of DC circuit breakers of appropriate capacity in each side of the PDU to provide necessary DC power to the equipment.
- xiii) Concrete floor installation kit shall have to be provided with each rack/cabinet.

#### 4.2 *Environmental and Other Requirements for Router and Switch*

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##### 4.2.1 Physical Requirement

All equipment racks, sub-racks and slots shall be clearly marked in English letters for proper recognition. The racks, sub-racks and slots shall also be provided with proper earthing and shall be protected against any surge.

##### 4.2.2 Operating Voltage

The Routers and LAN Switches must operate satisfactorily on the nominal voltage of -48V DC and within a voltage range of -42 to -58 Volts DC.

##### 4.2.3 Operating Temperature and Humidity

- a. Nominal Operating Temperature: 0°C to 45°C
- b. Nominal Operating Relative Humidity: Up to 90% at non-condensing

=== End of Chapter Four ===

## Chapter Five

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### Evaluation of the Bids and Determination of the Successful Bidder

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- 5.1 Notwithstanding whatever is stated in other clauses of the tender documents, the criteria for evaluation of substantial responsiveness of the received bids of this tender shall be according to clauses described in this chapter of the tender document. If any bidder refuses to agree to any of the clauses of this chapter, his bid shall automatically be considered as **“substantially non responsive”**.
- 5.2 However, relevant clause(s) stated elsewhere in this document shall also be applicable if such clause(s) do(es) not contradict any clause(s) of this chapter.
- 5.3 The Tender is in two Envelop method as stated in chapter one. Hence, evaluation of the “Technical Proposal” of all the bids received within stipulated date and time will be carried out first. After completion of evaluation of the Technical Proposals and approval of the result of the Technical Evaluation by the HOPE, the bidders who’s Technical Proposal will become “eligible” as well as “Responsive” through the evaluation process will be notified in writing along with the date of opening of the “Financial Proposal”. The bidder who’s Technical Proposal will become either “Not Eligible” or “Non Responsive” through the evaluation process will also be notified in writing and their unopened Financial Proposal will be returned to them. The Financial Proposals of only those bidders who’s Technical Proposal will become “eligible” and “Responsive” will be opened by the Tender Opening committee on the date and time mentioned in the notification letters sent to them. After opening of the Financial Proposals the offered prices in the bids will be recorded in front of the bidders present (if any) during the opening. The bidder may get the photo copy of the opening statement of Financial Proposals (if they wish). After opening of the Financial Proposals, evaluation of the Financial Proposals will be carried out in order to determine the “Successful Bidder”.
- 5.4 Process of Evaluation of the Technical Proposal
- 5.4.1 Evaluation of Technical Proposals will be carried out in following two stages:
- i. Determination of Eligibility of the Bids.
  - ii. Evaluation of Responsiveness of the eligible Bids.
- 5.5 Determination of Eligibility of the Bids
- The first step of Evaluation of Technical Proposals is determination of eligibility. During this step the Mandatory Documents part of the Technical Proposal will be examined to ensure whether all the mandatory documents asked in Clause 1.14 (sub-clauses 1.14.1 to sub-clause 1.14.15) have been submitted properly and the contents of the submitted documents meet the requirements of the relevant clauses/sub-clauses. Any negative determination shall result in declaration of the concerned bid as **“Not Eligible”**.
- 5.5.1 Any bid declared as “Not Eligible” by the TEC will not be considered for further evaluation.
- 5.5.2 The Bids of only those Bidders, whose Bids have not been treated as **“Not Eligible”** by the TEC of BSCCL shall automatically be considered as **“Eligible”** and shall be considered for further evaluation.
- 5.5.3 Any Bid, declared by TEC of BSCCL to be **“Not Eligible”**, can not be declared **“Eligible”** later on.

5.6 Evaluation of Responsiveness of the Eligible Bids

In the second step of evaluation of Technical Proposals the Technical documents of the "Eligible" bids will be examined by the TEC of BSCCL to determine their responsiveness with respect to different requirements stated in the bid document of BSCCL.

- 5.6.1 TEC's determination of the responsiveness of a Technical Proposal is to be based on the contents of the Tender itself without recourse to extrinsic evidence.
- 5.6.2 A responsive Technical Proposal is one that conforms in all respects to the requirements of the Bid Document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that:
  - (a) affects in any substantial way the scope, quality, or performance of the Equipment/Goods and related services specified in the Bid Document; or
  - (b) limits in any substantial way, or is inconsistent with the Bid Documents, the Procuring Entity's rights or the Bidder's obligations under the Contract; or
  - (c) if rectified would unfairly affect the competitive position of other Bidders presenting responsive bids.

During the evaluation of Bids, the following definitions shall apply:

**"Deviation"** is a departure from the requirements specified in the Tender Document;

**"Reservation"** is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Tender Document; and

**"Omission"** is the failure to submit part or all of the information or documentation required in the Tender Document.

- 5.6.3 If a Tender is not responsive against the requirements set out in the Bid Document, shall not subsequently be made responsive by correction of the material deviation, reservation, or omission by the Bidder
- 5.6.4 There shall be no requirement as to the minimum number of responsive bids.
- 5.6.5 There shall be no automatic exclusion of Bids which are above or below the official estimate.
- 5.6.6 Provided that a Bid is responsive, TEC may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities or omissions in the Tender related to documentation requirements. Such omission shall not be related to any aspect of the rates of the Bid reflected in the completed Price Schedule or any mandatory criteria. Failure of the Bidder to comply with the request may result in the consideration of its Bid as Non-Responsive.
- 5.6.7 The TEC may regard a Technical Proposal as responsive even if it contains;
  - (a) minor or insignificant deviations which do not meaningfully alter or depart from the technical specifications, characteristics and commercial terms and, conditions or other mandatory requirements set out in the Bid Document; or
  - (b) errors or oversights, that if corrected, would not alter the key aspects of the Bid

## 5.7 Clarification on the Bid

- 5.7.1 TEC may ask Bidders for clarification of their Bid, in order to facilitate the examination and evaluation of Bids. The request for clarification by the TEC and the response from the Bidder shall be in writing, and Bidder's clarifications which may lead to a change in the substance of the Bid or in any of the key elements of the Bid will neither be sought nor be permitted.
- 5.7.2 Change in the Bid price shall not be sought or permitted, except to confirm correction of arithmetical errors discovered by the Procuring Entity in the evaluation of the Financial Proposals,
- 5.7.3 Any request for clarifications by the TEC shall not be directed towards making an apparently non-responsive Bid responsive and reciprocally the response from the concerned Bidder shall not be articulated towards any addition, alteration or modification to its Bid.
- 5.7.4 If a Bidder does not provide clarifications of its Bid by the date and time set in the TEC's written request for clarification, its Bid shall not be considered in the evaluation.

## 5.8 Restriction on Disclosure of Information

- 5.8.1 Following the opening of Bids until issuance of Notification of Award, no Bidder shall, unless requested to provide clarification to its Bid or unless necessary for submission of a complaint, communicate with the concerned Procuring Entity.
- 5.8.2 Bidders shall not seek to influence in anyway, the examination and evaluation of the Bids.
- 5.8.3 Any effort by a Bidder to influence a Procuring Entity in its decision concerning the evaluation of Bids and/or Contract awards may result in the rejection of its Bid as well as further action in accordance with Section 64 (5) of the Public Procurement Act 2006. All clarification requests shall remind Bidders of the need for confidentiality and that any breach of confidentiality on the part of the Bidder may result in their Bid being non-responsive.

## 5.9 Preparation and Submission of Evaluation Reports on the Technical Proposals

After completion of evaluation of the Technical Proposals of the Bidders the TEC shall prepare an Evaluation Report on the Technical Proposals where the TEC shall clearly mention their determination on the Technical Proposal of each Bidder. After preparation of the Evaluation Report on the Technical Proposals the Convener of the TEC will submit the Evaluation Report with a forwarding letter to the Head of Procuring Authority (HOPE).

## 5.10 Evaluation of the Financial Proposal

- 5.10.1 The Financial Proposals of the Bidders whose bids have been determined as Eligible as well as Responsive in evaluation of Technical Proposals will be opened by the TEC
- 5.10.2 The total price quoted by the bidder in the bid i.e., "The Quoted Total Price" shall not be the criteria for selection of the "Successful Bidder".
- 5.10.3 During Financial Evaluation all the "Responsive" bids will be further evaluated to calculate the "Evaluated Total Price" of the bid.
- 5.10.4 The TEC shall evaluate the contents of all of the Prescribed Forms submitted with the Financial Proposal. During such evaluation, the unit prices and discount (if any) quoted by the bidder shall be considered as final. Change of unit prices after opening of the Technical Proposals shall not be allowed.
- 5.10.5 There shall be full conformity between the summary or total prices and their related breakups of unit prices. If any discrepancy is found, the relevant unit price shall be considered as a reference price.

- 5.10.6 The bidder shall quote for all items which is necessary for turn-key completion of all scopes of works described in this tender. No subsequent addition of any new item(s) in the BoQ will be allowed with new unit price.
- 5.10.7 The Bidder shall quote for all items as per the schedule of requirements and as per the unpriced BoQ Forms submitted with the Technical Proposal. For any item listed in the BoQ Forms, but shown un-priced in the Price column of the BoQ Form, it shall be assumed that the price is included in the prices of other items.
- 5.10.8 The TEC shall correct arithmetic errors and errors made during transfer of data from one Form to other, that are identified during the evaluation of Financial Proposals. The TEC shall give prompt notice of any such correction to the respective bidder. If bidder does not accept such correction as arithmetic error, the bid of the concerned bidder will be rejected and will not be considered for determination of the Successful Bidder.
- 5.10.9 If the Bidder has quoted the price for any item as “free” or “zero”, it shall be understood that the price would be same (i.e. free or zero) for any subsequent expansion up to the final capacity of the system.
- 5.10.10 If, during evaluation, it is found that the Bidder has not quoted any mandatory item(s), it shall be considered that the Bidder proposes to supply the non-quoted items of required quantities “free of charge” to BSCCL.
- 5.10.11 If, during evaluation, it is found that the Bidder has quoted for less quantity of any mandatory item, it shall be considered that the Bidder proposes to supply the shortfall quantity “free of charge” to BSCCL.
- 5.10.12 The Bidder shall not quote different unit price for same equipment/ card/spare/accessory in different forms. If Bidder quote different unit price for same equipment/card /spare/accessory in different forms, the lowest unit price of respective equipment/card/ spare/accessory shall be considered for evaluation considering arithmetic correction. It shall be understood that such lowest price shall remain same for the contract and for any subsequent expansion up to the final capacity of the system.
- 5.10.13 The Bidder shall be responsible for turn-key implementation of the project and during execution of the contract if any shortfall of quantity of any item is detected; it shall be considered that the Contractor will supply required quantities of respective item without any additional charges to BSCCL under this purchase.
- 5.10.14 In case of any item, other than mandatory has been quoted as additional/optional and if BSCCL decided to purchase such item(s), its price shall be considered for evaluation and the unit price shall be taken from the bidder’s own quotation.
- 5.10.15 If the bidder wishes to give any discount in its financial proposal, it shall be given after the “Total Price” of the bid, either as a lump sum or as a percentage. If the bid contains any irregular discount, the irregular discount will not be considered for evaluation. If the bidder has given any regular discount in the bid, such discount shall be treated in percentage of the total bid price and each of the unit prices of the bid shall be re-fixed by reduction with the same percentage [i.e., new unit price = (discounted total price ÷ total price before discount) x quoted unit price]. Such re-fixed unit prices shall be regarded as the final unit prices for that relevant item of the bid. Such re-fixed unit prices shall be valid for any subsequent purchases up to the entire life-time of the project.
- 5.10.16 For each of the “responsive” bid, the TEC shall calculate the “Evaluated Total Price” after making the relevant and necessary corrections as stated in this chapter. The Evaluated Total Price may be equal to or less than or higher than the Quoted Total Price.

5.10.17 The responsive bids will be listed in chronology of the “Evaluated Total Price”. The bid with the lowest value of the “Evaluated Total Price” shall be on top of the list; the bidder with the next higher value of the “Evaluated Total Price” shall be on second place and so on.

5.11 Determination of the Successful Bidder

5.11.1 The bidder whose Technical Proposal has been considered as ‘Eligible as well as Responsive’ and has the lowest value of the “Evaluated Total price” shall be considered as the “Successful Bidder” for this bid.

5.11.2 The TEC shall clearly recommend for the successful bidder mentioning the Total Evaluated Price of the Successful Bidder in their Evaluation Report of the Financial Proposals and the Convener of the TEC will submit the Financial Evaluation Report to the HOPE with a forwarding letter.

=====End of Chapter Five =====



# *ANNEXURES*

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## Annex-1

### The Proposed Network Architecture and Configuration

The proposed architecture of the network is shown in Figure-1 presented in this chapter.

The mentioned two routers will act as Internet Gateway Routers and also will be installed at Kuakata Data Center of BSCCL, Potuakhali, Bangladesh. The Internet gateway router will handle the high-speed Internet connection peering with multiple Tier-1 Internet Service providers, multiple peering with content provider like google and IX peering.

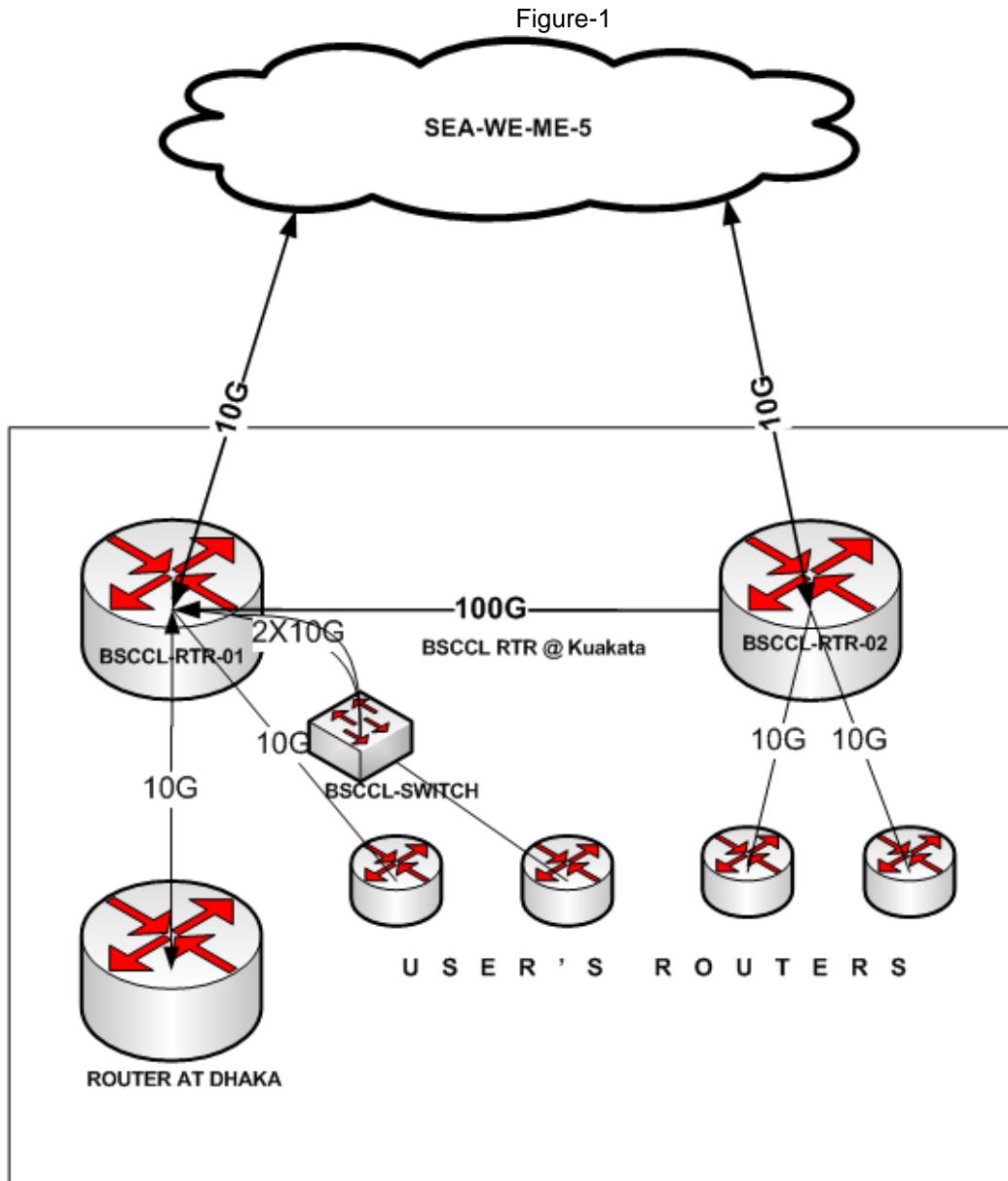


Figure-1

## Annex -2

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### Capacity Requirements of the Internet Gateway Router

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Sl. No.	Interface	Initial Capacity (per Router)	Final Capacity (per Router)
1	10GE	30 (In redundant slots)	60 (In redundant slots)
2	100GE	1	4 (In redundant slots)

## Annex 3

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### Capacity Requirements of Access Switch

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Sl. No.	Interface	Initial Capacity (per Switch)	Final Capacity (per Switch)
1	1GE/10GE (SFP+)	24* (see note below)	32

Note: Initially there shall be 8 numbers of 10 GE SFP and 16 numbers of 1 GE SFP

=== End of Annexure ===

# **FORMS FOR FINANCIAL PROPOSAL**

## Form A

### SUMMARY PRICE FOR THE BID

Sl. No.	Name of the Item	Total Price BDT
<b>A.</b>	<b><i>Price of Equipment, Materials/Goods</i></b>	
01	Total Price of Router and Access Switch Equipment & Materials ( <i>From Form B.1</i> )	
02	Total Price of Spares for three years maintenance support period after the end of Warranty period ( <i>From Form D</i> )	
<b>X</b>	Total Price of Equipment & Materials and Spares (A01 ~ A02)*	
<b>B</b>	<b><i>Price of Services</i></b>	
01	Total Price of Installation, Testing and Commissioning Services for Routers and Switches ( <i>From Form B.2</i> )	
02	Total Price of Other Services ( <i>From Form B.3</i> )	
<b>Y</b>	<b>Total Price for all Services (B01 ~ B02)</b>	
	<b>Grand Total for Equipment, Materials and Services (X+Y)*</b>	

In Words: BD Taka ..... only

- Note 1: The price shall be inclusive of all Duties, Taxes and VAT including the import duties of the imported Equipment/Goods

## Form B.1

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### SUMMARY PRICE FOR ROUTER AND ACCESS SWITCH EQUIPMENT

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SI	Name of Item	Quantity	Total Price BDT
A	Price for Router Equipment and related Accessories/Goods		
01	Total Price of Router Equipment and related Accessories/Goods <i>(From Form C.1.1)</i>	2	
02	Total Price of Access Switch Equipment and related Accessories/Goods <i>(From Form C.1.2)</i>	3	
	<b>Total Price of Router and Access Switch Equipment and related Accessories/Goods (A01~A02)*</b>		

In Words: BD Taka ..... only

Note 1: The price shall be inclusive of all Duties, Taxes and VAT including the import duties of the imported Equipment/Goods

## Form B.2

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### SUMMARY PRICE FOR INSTATTATION, TESTING AND COMMISSIONING SERVICES

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SI	Name of Item	Quantity	Total Price BDT
01	<b>Installation, Testing and Commissioning services for Router Equipment</b> ( <i>From Form C.2</i> )	02 set	
02	<b>Installation, Testing and Commissioning services for Access Switch Equipment</b> ( <i>From Form C.2</i> )	03 set	
	<b>Total Price for Installation, Testing and Commissioning services for Router and Access Switch Equipment (01+02)</b>		

In Words: BD Taka ..... only

Note 1: The price shall be inclusive of all Duties and Taxes



## Form B.3

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### SUMMARY PRICE FOR OTHER SERVICES

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Sl	Name of Item	Quantity	Total Price(BDT)
A	Total Price for Other services		
01	Total Price for O&M Support up to end of Warranty Period (From Form C.3)		
02	Total Price for 3 (Three) years O&M Support after the end of Warranty Period (From Form C.3)		
03	Total Price for Factory Test (From Form C.3)		
04	Total Price for Foreign Training (From Form C.3)		
05	Total Price for Local Training (From Form C.3)		
06	Total Price for Provisional Acceptance Test (From Form C.3)		
07	Total Price for Final Acceptance Test (From Form C.3)		
08	Price for Project Implementation Administrative Services including Project Management (From Form C.3)		
09	Price for Local Transportation (From Form C.3)		
	<b>Total for Other Services (01~09)</b>		

In Words: BD Taka ..... only

Note 1: The price shall be inclusive of all Duties and Taxes

## Form C.1.1

### DETAIL BoQ FOR ROUTER EQUIPMENT

SI	Name of Item	Quantity	Unit Price BDT	Total Price BDT
A	Price for Router	02		
	The Bidder shall show the detail BoQ of hardware and software as per his choice and shall satisfy all requirements specified in this tender document			
	Sub-Total for Router Equipment			
B	Price for ancillary materials such as rack, power distribution unit for the equipment, cable tray (if necessary), DC power cables, patch cord and other installation ancillaries	02 lot		
	The Bidder shall show the detail BoQ as per his choice and shall satisfy all requirements specified in this tender document			
	Sub-Total for ancillary materials such as rack, power distribution unit for the equipment, cable tray(if necessary), DC power cables, patch cord and other installation ancillaries			
C	Documentation			
	O&M Manual for Router	2 set		
	As-built Drawing for Router	2 set		
	<b>Total Price of two sets of Routers including necessary Accessories (A~C)</b>			

In Words: BD Taka ..... only

Note 1: The price shall be inclusive of all Duties, Taxes and VAT including the import duties of the imported Equipment/Goods

## Form C.1.2

### DETAIL BoQ FOR ACCESS SWITCH EQUIPMENT

SI	Name of Item	Quantity	Unit Price BDT	Total Price BDT
A	Price for Access Switch	03		
	The Bidder shall show the detail BoQ of hardware and software as per his choice and shall satisfy all requirements specified in this tender document			
	Sub-Total for Access Switch Equipment			
B	Price for ancillary materials such as DC power cables, patch cord and other installation ancillaries	03 lot		
	The Bidder shall show the detail BoQ as per his choice and shall satisfy all requirements specified in this tender document			
	Sub-Total for ancillary materials such as DC power cables, patch cord and other installation ancillaries			
C	Documentation			
	O&M Manual for Access Switch	3 set		
	As-built Drawing for Access Switch	3 set		
	<b>Total Price of three sets of Access Switch including necessary Accessories (A~C)</b>			

In Words: BD Taka ..... only

Note 1: The price shall be inclusive of all Duties, Taxes and VAT including the import duties of the imported Equipment/Goods

## Form C.2

### DETAIL PRICE FOR INSTALLATION, TESTING AND COMMISSIONING SERVICES FOR ROUTER AND ACCESS SWITCH

SI	Name of Item	Quantity	Unit Price	Total Price
			BDT	BDT
A	For Router Equipment			
01	Installation Service for Router Equipment	02 set		
02	Testing and Commissioning Services for Router Equipment	02 set		
X	Sub-Total of Installation, Testing and Commissioning Services for Router Equipment (A01~A02)			
B	For Access Switch Equipment			
01	Installation Service for Access Switch Equipment	03 set		
02	Testing and Commissioning Services for Access Switch Equipment	03 set		
Y	Sub-Total of Installation, Testing and Commissioning Services for Access Switch Equipment (A01~A02)			
	<b>Grand total for Installation, Testing and Commissioning Services for Router and Access Switch Equipment (X+Y)</b>			

In Words: BD Taka ..... only

Note 1: The price shall be inclusive of all Duties and Taxes

## Form C.3

### DETAIL BoQ FOR OTHER SERVICES

SI	Name of Item	Quantity	Unit Price BDT	Total Price BDT
01	O&M Support up to the end of Warranty Period	1 lot		
	<i>Please give detail break-up as felt necessary</i>			
02	O&M Support for Three years after the end of Warranty Period	1 lot		
	<i>Please give detail break-up as felt necessary</i>			
03	Factory Testing	1 lot		
	<i>Please give detail break-up to satisfy the requirements of the tender document</i>			
04	Foreign Training	1 lot		
	<i>Please give detail break-up to satisfy the requirements of the tender document</i>			
05	Local Training	1 lot		
	<i>Please give detail break-up to satisfy the requirements of the tender document</i>			
06	Provisional Acceptance Test	1 lot		
	<i>Please give detail break-up to satisfy the requirements of the tender document</i>			
07	Final Acceptance Test	1 lot		
	<i>Please give detail break-up to satisfy the requirements of the tender document</i>			
08	Project Implementation Administrative Services including Project Management	1 lot		
	<i>Please give detail break-up as felt necessary</i>			
09	Local Transportation	1 lot		
	<i>Please give detail break-up as felt necessary</i>			
	<b>Total Price for Other Services (01~09)</b>			

In Words: BD Taka ..... only

Note 1: The price shall be inclusive of all Duties and Taxes

## Form D

### UNIT PRICE OF SPARES FOR USE DURING 3 YEARS O&M PERIOD AFTER THE END OF WARRANTY PERIOD

Sl. No.	Name of the Item	No./Qty	Unit Price BDT
A	Spares for Router Equipment		
	Bidder shall include each of the replaceable board/module/unit (Including SFP/CFP modules) of the proposed Router equipment in the list.	01	
X	Sub-Total Router Spares		
B	Spares for Access Switch Equipment		
	Bidder shall including each of the replaceable board/module/unit (Including SFP/CFP modules) of the proposed Router equipment in the list.	01	
Y	Sub-Total Access Switch Spares		
	Total for Spares of Router and Access Switch Equipment (X+Y)		

In Words: BD Taka ..... only

Note 1: The price shall be inclusive of all Duties, Taxes and VAT including the import duties of the imported Equipment/Goods

## Form E

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### QUOTATION FOR FUTURE ORDER

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(a) Future Order Formula for Router and Access Switch Equipment:

(b) Future Order Formula for Various Services:

## Form F

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### MANUFACTURER'S INFORMATION OF MAJOR EQUIPMENT

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Sl	Name of Item	Model Number & Name	Manufacturer's Name	Country of Manufacture and Manufacturer's Address	Country of Origin
1	<i>Router Equipment</i>				
2	<i>Access Switch Equipment</i>				