Invitation for Bids – Rebidding

Date:	30 August 2022
Grant No. and Title:	3344/3345-PAK: Central Asia Regional Economic Cooperation – Regional Improving Borders Services (CAREC-RIBS) Project
Contract No. and Title:	PMU-ITTMS(ICB)/PSWDC/ICT-2022: Procurement of Information Communication Technology Product and Services for Pakistan Single Window (PSW) by the CAREC-RIBS (ITTMS) Project, Customs Wing, FBR Lot 1: Software: Supply, Installation, Configuration, & Implementation of Software for PSW Lot 2: Hardware: Supply, Installation, Configuration, Testing, Training & Implementation of Networks and Security, Compute (Servers) and Storage Equipment for PSW
Deadline for Submission of Bids:	19 October 2022, 11:00 hours (Pakistan Standard Time)

1. The Islamic Republic of Pakistan has received financing from the Asian Development Bank (ADB) toward the cost of **Central Asia Regional Economic Cooperation – Regional Improving Borders Services (CAREC-RIBS) Project**, and it intends to apply part of the proceeds of this financing to payments under the contract named above. Bidding is open to Bidders from eligible source countries of ADB.

2. The **Project Management Unit CAREC-RIBS (ITTMS), Customs Wing, FBR, Islamabad** ("the Purchaser") invites sealed bids from eligible Bidders for the Lot/Lots as mentioned above.

   The interested eligible Bidders may opt to submit bid for individual or both Lots, however, separate bid for each lot shall be required. A Bidder may be awarded one or both Lots if he submits the lowest evaluated substantially responsive bid(s) provided such bidder meets the aggregated qualification requirements for individual Lot or both Lots. Bidders wishing to offer discounts in case they are awarded more than one Lot, will be allowed to do so provided those discounts are included in the Letter of Bid.

3. **International Competitive Bidding** will be conducted in accordance with the ADB's Single Stage – Two Envelope bidding procedure and is open to all eligible Bidders as described in the Bidding Document.

4. To obtain further information and inspect the Bidding Documents, Bidders should contact:

   Mr. Azam Dil Khan, Monitoring & Evaluation Officer, Project Management Unit CAREC-RIBS (ITTMS), FBR, Federal Arcade, 1st Floor, Kurree Road, Jinnah Avenue, Islamabad, Pakistan, on (Tel Off): +92 (51) 945 0016 /+92 (51) 945 0009, Fax No. +92 (51) 945 0006
   Email: azamdkhan88@gmail.com

Asian Development Bank

5. The eligible Bidders may download the Bidding Document for Procurement of Information Communication Technology Product and Services for Pakistan Single Window (PSW) **at no cost** from the websites: www.adb.org/projects/tenders/country/pak, www.ppra.org.pk/dad_tenders.asp or www.fbr.gov.pk/tenders. For the eligibility and qualification requirements, Bidders may refer to the Bidding Documents.

6. Bidders opting to download the Bidding Documents from any of the aforesaid website, shall inform the Project Management Unit CAREC-RIBS (ITTMS), FBR, in writing at the address given in Para-5, failing which Project Management Unit CAREC-RIBS (ITTMS), FBR, will not be responsible if they do not receive clarifications and amendments, if any from the PMU.

7. Attention of prospective Bidders is drawn to the eligibility and Conflict of Interest provisions under ITB Clause-4 of the Bidding Documents. All Bidders found to have a Conflict of Interest will be disqualified.

8. A Pre-bid Meeting will take place on the date, time and place as follows:

Date:	**Thursday, 8 September, 2022**
Time:	10:30 hours (Pakistan Standard Time)
Address:	Conference Room, PMU CAREC-RIBS (ITTMS), FBR 1st Floor, Federal Arcade, Kurree Road, Jinnah Avenue, Islamabad

9. Deliver your bid:

- To the address given in Para-5.
- **On or before the deadline: 19 October 2022 at 11:00 hours (Local Pakistan Standard Time)**
- Together with a Bid Security as described in the Bidding Document.

Late bids will not be accepted.

Technical Bids will be opened promptly after the deadline for bid submission in the presence of Bidders' representatives who choose to attend, whereas the Financial Bids shall remain sealed and unopened and shall be placed locked. The price bids of only Technically Responsive and Qualified Bidders shall be opened after technical bids evaluation, whereas the price bids of those Bidders whose technical bids are not responsive and not qualified shall be returned unopened.

10. The Purchaser will not be responsible for any cost or expense incurred in the preparation and delivery of bids.

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Asian Development Bank

BIDDING DOCUMENT

Procurement of Information Communication Technology Products and Services for Pakistan Single Window (PSW)

Country:	Pakistan
Project Name:	Central Asia Regional Economic Cooperation – Regional Improving Borders Services (CAREC-RIBS) Project
Implementing Agency:	Customs Wing, Federal Board of Revenue (FBR)
Loan No:	3344-PAK/3345-Pak (SF)
Project ID No:	46378-002
Activity No.:	PMU-ITTMS(ICB)/PSWDC/ICT-2022
RFB No:	IFB/PSW-DC-ICT-2022
Procurement Method:	Open Competitive Bidding (OCB)
Bidding Procedure:	Single Stage - Two Envelope
Bids' Submission Date:	19 October 2022

Project Management Unit
CAREC-RIBS Project
Customs Wing
Federal Board of Revenue
Government of Pakistan

August, 2022
(Revised 23.08.2022)

Preface

This Bidding Document for Procurement of Information Communication Technology Products and Services has been prepared by Project Management Unit (PMU) CAREC-RIBS (ITTMS) Project, Customs Wing, Federal Board of Revenue, Islamabad, and is based on the Standard Bidding Document for the Procurement of Information Technology Products and Services issued by the Asian Development Bank dated December 2021.

Abbreviations

ADB	Asian Development Bank
BDF	Bidding Forms
BDS	Bid Data Sheet
COF	Contract Forms
CON	Historical Contract Nonperformance
DCS	Delivery and Completion Schedule
ELC	Eligible Countries
ELI	Eligibility Form
EQC	Evaluation and Qualification Criteria
EXP	Experience Form
GCC	General Conditions of Contract
ICC	International Chamber of Commerce
IFB	Invitation for Bids
Incoterms	International Commercial Terms
IT	Information Technology
ICT	Information Communication Technology
ITB	Instructions to Bidders
LITS	List of IT Products and Services
OEM	Original Equipment Manufacturer
O&M	Operation and Maintenance
OCB	Open Competitive Bidding
SBD	Standard Bidding Document
SCC	Special Conditions of Contract

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Section 1: Instructions to Bidders

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A. General

1. Scope of Bid

1.1. In connection with the Invitation for Bids (IFB) indicated in the Bid Data Sheet (BDS), the Purchaser, as indicated in the BDS, issues this Bidding Document for the supply of IT Products and Services incidental thereto as specified in Section 6 (Schedule of Requirements). The name, identification, and number of lots of the open competitive bidding (OCB) are provided in the BDS.

1.2. Throughout this Bidding Document,

(a) the term "in writing" means communicated in written (including electronic) form and delivered against receipt;

(b) except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular; and

(c) "day" means calendar day.

2. Source of Funds

2.1. The Borrower or Recipient (hereinafter called "Borrower") indicated in the BDS has applied for or received financing (hereinafter called "funds") from the Asian Development Bank (hereinafter called "ADB") toward the cost of the project named in the BDS. The Borrower intends to apply a portion of the funds to eligible payments under the contract(s) for which this Bidding Document is issued.

2.2. Payments by ADB will be made only at the request of the Borrower and upon approval by ADB in accordance with the terms and conditions of the Financing Agreement between the Borrower and ADB (hereinafter called the Financing Agreement), and will be subject in all respects to the terms and conditions of that Financing Agreement. No party other than the Borrower shall derive any rights from the Financing Agreement or have any claim to the funds.

3. Fraud and Corruption

3.1. ADB requires Borrowers (including beneficiaries of ADB-financed activity) and their personnel, as well as firms and individuals participating in an ADB-financed activity, including but not limited to, Bidders, Suppliers, Contractors, agents, subcontractors, subconsultants, service providers, sub-suppliers, manufacturers (including their respective officers, directors, employees and personnel) under ADB-financed contracts to observe the highest standard of ethics during the procurement and execution of such contracts in accordance with ADB's Anticorruption Policy (1998, as amended from time to time). In pursuance of this policy, ADB

(a) defines, for the purposes of this provision, the terms set forth below as follows:

(i) "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;

(ii) "fraudulent practice" means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;

(iii) "coercive practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

(iv) "collusive practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party;

(v) "abuse" means theft, waste, or improper use of assets related to ADB-related activity, either committed intentionally or through reckless disregard;

(vi) "conflict of interest" means any situation in which a party has interests that could improperly influence that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations; and

(vii) "integrity violation" is any act, as defined under ADB's Integrity Principles and Guidelines (2015, as amended from time to time), which violates ADB's Anticorruption Policy, including (i) to (vi) above and the following: obstructive practice, violations of ADB sanctions, retaliation against whistleblowers or witnesses, and other violations of ADB's Anticorruption Policy, including failure to adhere to the highest ethical standard.

(b) will reject a proposal for award if it determines that the Bidder recommended for award or any of its officers, directors, employees, personnel, subconsultants, subcontractors, service providers, suppliers or manufacturers has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;

(c) will cancel the portion of the financing allocated to a contract if it determines at any time that representatives of the Borrower or of a beneficiary of ADB-financing engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations during the procurement or the execution of that contract, without the Borrower having taken timely and appropriate action satisfactory to ADB to remedy the situation, including by failing to inform ADB in a timely manner at the time they knew of the integrity violations;

(d) will impose remedial actions on a firm or an individual, at any time, in accordance with ADB's Anticorruption Policy and Integrity Principles and Guidelines, including declaring ineligible, either indefinitely or for a stated period of time, to participate[1] in ADB-financed, -administered, or -supported activities or to benefit from an ADB-financed, -administered, or -supported contract, financially or otherwise, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations; and

(e) will have the right to require that a provision be included in Bidding Documents and in contracts financed, administered, or supported by ADB, requiring Bidders, suppliers, and contractors, consultants, manufacturers, service providers and other third parties engaged or involved in ADB-related activities, and their respective officers, directors, employees and personnel, to permit ADB or its representative to inspect the site and their assets, accounts and records and other documents relating to the bid submission and contract performance and to have them audited by auditors appointed by ADB.

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[1] Whether as a Contractor, Subcontractor, Consultant, Manufacturer or Supplier, or Service Provider; or in any other capacity (different names are used depending on the particular Bidding Document).

3.2. All Bidders, consultants, contractors, suppliers, manufacturers, service providers, and other third parties engaged or involved in ADB-related activities, and their respective officers, directors, employees and personnel, are obliged to cooperate fully in any investigation when requested by ADB to do so. As determined on a case by case basis by ADB, such cooperation includes, but is not limited to, the following:

(a) being available to be interviewed and replying fully and truthfully to all questions asked;

(b) providing ADB with any items requested that are within the party's control including, but not limited to, documents and other physical objects;

(c) upon written request by ADB, authorizing other related entities to release directly to ADB such information that is specifically and materially related, directly or indirectly, to the said entities or issues which are the subject of the investigation;

(d) cooperating with all reasonable requests to search or physically inspect their person and/or work areas, including files, electronic databases, and personal property used on ADB activities, or that utilizes ADB's Information and Communication Technology (ICT) resources or systems (including mobile phones, personal electronic devices, and electronic storage devices such as external disk drives);

(e) cooperating in any testing requested by ADB, including but not limited to, fingerprint identification, handwriting analysis, and physical examination and analysis; and

(f) preserving and protecting confidentiality of all information discussed with, and as required by, ADB.

3.3. All Bidders, consultants, contractors and suppliers shall require their officers, directors, employees, personnel, agents to ensure that, in contracts with its subconsultants, Subcontractors, and other third parties engaged or involved in ADB-related activities, such subconsultants, Subcontractors, and other third parties similarly are obliged to cooperate fully in any investigation when requested by ADB to do so.

3.4. The Purchaser hereby puts the Bidder on notice that the Bidder or any Joint Venture partner of the Bidder (if any) may not be able to receive any payments under the Contract if the Bidder or any of its joint venture partners, as appropriate, is, or is owned (in whole or in part) by a person or entity subject to applicable sanctions.

3.5. Furthermore, Bidders shall be aware of the provision stated in Subclause 3.2 and Subclause 35.1 (a)(iii) of the General Conditions of Contract.

4. Eligible Bidders

4.1. A Bidder may be a natural person, private entity, or government-owned enterprise subject to ITB 4.5—or any combination of them with a formal intent to enter into an agreement or under an existing agreement in the form of a Joint Venture. In the case of a Joint Venture,

(a) all parties to the Joint venture shall be jointly and severally liable; and

(b) the Joint Venture shall nominate a representative who shall have the authority to conduct all businesses for and on behalf of any and all the parties of the Joint Venture during the bidding process and, in the event the Joint Venture is awarded the Contract, during contract execution.

4.2. A Bidder, and all parties constituting the Bidder, shall have the nationality of an eligible country, in accordance with Section 5 (Eligible Countries). A Bidder shall be deemed to have the nationality of a country if the Bidder is a citizen or is

constituted, incorporated, or registered, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed Subcontractors or Suppliers for any part of the Contract, including related services.

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

(a)   they have controlling shareholders in common; or

(b)   they receive or have received any direct or indirect subsidy from any   of them; or

(c)   they have the same legal representative for purposes of this Bid; or

(d)   they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to material information about or improperly influence the Bid of another Bidder, or influence the decisions of the Purchaser regarding this bidding process; or

(e)   a Bidder participates in more than one bid in this bidding process, either individually or as a partner in a Joint Venture, except for alternative offers permitted under ITB 13. This will result in the disqualification of all Bids in which it is involved. However, subject to any finding of a conflict of interest in terms of ITB 4.3(a)–(d) above, this does not limit the participation of a Bidder as a Subcontractor in another bid or of a firm as a subcontractor in more than one Bid; or

(f)   a Bidder, Joint Venture partner, associates, parent company, or any affiliated entity, participated as a consultant in the preparation of the design or technical specifications of the IT Products and Services that are the subject of the Bid; or

(g)   a Bidder was affiliated with a firm or entity that has been hired (or is proposed to be hired) by the Purchaser or Borrower as Project Manager for the contract; or

(h)   a Bidder would be providing goods, works, or non-consulting services resulting from or directly related to consulting services for the preparation or implementation of the project specified in the BDS ITB 2.1 that it provided or were provided by any affiliate that directly or indirectly controls, is controlled by, or is under common control with that firm; or

(i)   A Bidder that has a financial or familial relationship with staff of the Purchaser including project implementing/executing agency, or of a recipient of a part of the loan who: (i) are directly or indirectly involved in the preparation of the bidding documents or specifications of the contract, and/or the bid evaluation process of such contract; or (ii) would be involved in the implementation or supervision of such contract unless the conflict stemming from such relationship has been resolved in a manner acceptable to ADB throughout the procurement process and execution of the contract.

4.4.   A firm will not be eligible to participate in any procurement activities under an ADB-financed, -administered, or -supported project while under temporary suspension or debarment by ADB pursuant to its Anticorruption Policy (see ITB 3), whether such debarment was directly imposed by ADB, or enforced by ADB pursuant to the Agreement for Mutual Enforcement of Debarment Decisions. A bid from a temporarily suspended or debarred firm will be rejected and such bid

may be in breach of debarment conditions, thereby subject to further ADB's investigation.

4.5.   Government-owned enterprises in the Borrower's country shall be eligible only if they can establish that they (i) are legally and financially autonomous, (ii) operate under commercial law, and (iii) are not dependent agencies of the Purchaser.

4.6.   A Bidder shall not be under suspension from Bidding by the Purchaser as the result of the execution of a Bid–Securing Declaration.

4.7.   Bidders shall provide such evidence of their continued eligibility satisfactory to the Purchaser, as the Purchaser shall reasonably request.

4.8.   Bidders shall be excluded if, by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower's country prohibits any import of goods from, or payments to, a particular country, person or entity in that country in respect of goods or services originating in that country. Where the Borrower's country prohibits payments to a particular person or entity or for particular goods or services by such an act of compliance, that firm shall be excluded.

5.   Eligible IT Products and Services

5.1.   All IT Products and Services to be supplied under the Contract and financed by ADB shall have their country of origin in eligible source countries as defined in ITB 4.2, and all expenditures under the Contract will be limited to such IT Products and Services.

5.2.   For the purposes of these Bidding Documents, the IT Products and Services means all:

(a)   the required information technologies, including all information processing and communications-related hardware, software, supplies, and consumable items that the Bidder is required to supply and install under the Contract, plus all associated documentation, and all other materials and products to be supplied, installed, integrated, and made operational (collectively called "the products" in some clauses of the ITB); and

(b)   the related software development, transportation, insurance, installation, customization, integration, commissioning, training, technical support, maintenance, repair, and other Services necessary for proper operation of the products to be provided by the selected Bidder and as specified in the Contract.

5.3.   For the purposes of ITB 5.1 above "origin" means the place where through software development, manufacturing, or substantial and major assembly or integration of components, a commercially recognized product results that is substantially different in basic characteristics or in purpose or utility from its components.

B. Contents of Bidding Document

6.   Sections of the Bidding Document

6.1.   The Bidding Document consists of Parts I, II, and III, which include all the sections indicated below, and should be read in conjunction with any addenda issued in accordance with ITB 8.

PART I Bidding Procedures
- Section 1   Instructions to Bidders (ITB)
- Section 2   Bid Data Sheet (BDS)
- Section 3   Evaluation and Qualification Criteria (EQC)
- Section 4   Bidding Forms (BDF)

- Section 5   Eligible Countries (ELC)

PART II Supply Requirements

- Section 6   Schedule of Requirements (SOR)

PART III Conditions of Contract and Contract Forms

- Section 7   General Conditions of Contract (GCC)
- Section 8   Special Conditions of Contract (SCC)
- Section 9   Contract Forms (COF)
- Section 10 Claims, Disputes, and Arbitration

6.2.   The IFB issued by the Purchaser is not part of the Bidding Document.

6.3.   The Purchaser is not responsible for the completeness of the Bidding Document and its addenda, if they were not obtained directly from the source stated by the Purchaser in the IFB.

6.4.   The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Document. Failure to furnish all information or documentation required by the Bidding Document may result in the rejection of the Bid.

7. Clarification of Bidding Document

7.1.   A prospective Bidder requiring any clarification on the Bidding Document shall contact the Purchaser in writing at the Purchaser's address indicated in the BDS. The Purchaser will respond in writing to any request for clarification, provided that such request is received no later than 21 days prior to the deadline for submission of Bids. The Purchaser shall forward copies of its response to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3, including a description of the inquiry but without identifying its source. If so specified in the BDS, the Purchaser shall also promptly publish its response at the web page identified in the BDS. Should the Purchaser deem it necessary to amend the Bidding Document as a result of a clarification, it shall do so following the procedure under ITB 8 and ITB 24.2.

8. Amendment of Bidding Document

8.1.   At any time prior to the deadline for submission of the Bids, the Purchaser may amend the Bidding Document by issuing addenda.

8.2.   Any addendum issued shall be part of the Bidding Document and shall be communicated in writing to all who have obtained the Bidding Document directly from the Purchaser in accordance with ITB 6.3. The Purchaser shall also promptly publish the addendum on the Purchaser's web page in accordance with ITB 7.1.

8.3.   To give prospective Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Purchaser may, at its discretion, extend the deadline for the submission of the Bids, pursuant to ITB 24.2.

C. Preparation of Bids

9. Cost of Bidding

9.1.   The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Purchaser shall in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

10. Language of Bid

10.1. The Bid, as well as all correspondence and documents relating to the Bid exchanged by the Bidder and the Purchaser, shall be written in the language specified in the BDS. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified in the

BDS, in which case, for purposes of interpretation of the Bid, such translation shall govern.

11. Documents Comprising the Bid

11.1. The Bid shall comprise two envelopes submitted simultaneously, one containing the Technical Bid and the other the Price Bid, both envelopes enclosed together in an outer single envelope.

11.2. The Technical Bid submitted by the Bidder shall comprise the following:

(a) Letter of Technical Bid;

(b) Bid Security or Bid-Securing Declaration, in accordance with ITB 21;

(c) alternative Technical Bid, if permissible, in accordance with ITB 13;

(d) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 22;

(e) documentary evidence in accordance with ITB 16, establishing the Bidder's eligibility to bid;

(f) documentary evidence in accordance with ITB 17, that the IT Products and Services to be supplied by the Bidder are of eligible origin;

(g) documentary evidence in accordance with ITB 18 and ITB 32, that the IT Products and Services conform to the Bidding Document;

(h) documentary evidence in accordance with ITB 19, establishing the Bidder's qualifications to perform the contract if its bid is accepted; and

(i) list of subcontractors, in accordance with ITB 18.4; and

(j) any other document required in the BDS.

11.3. The Price Bid submitted by the Bidder shall comprise the following:

(a) Price Bid Submission Sheet and the applicable Price Schedules, in accordance with ITB 12, ITB 14, and ITB 15;

(b) alternative Price Bid corresponding to the alternative Technical Bid, if permissible, in accordance with ITB 13; and

(c) any other document required in the BDS.

11.4. The Bidder shall furnish in the Letter of Price Bid information on commissions and gratuities, if any, paid or to be paid to agents or any other party relating to this Bid.

12. Letter of Bid and Price Schedules

12.1. The Bidder shall submit the Letter of Technical Bid and the Letter of Price Bid using the form furnished in Section 4 (Bidding Forms). These forms must be completed without any alterations to their format, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested.

12.2. The Bidder shall submit, as part of the Price Bid, the Price Schedules for IT Products and Services, according to their origin as appropriate, using the forms furnished in Section 4 (Bidding Forms) and as required in the BDS.

13. Alternative Bids

13.1. Unless otherwise indicated in the BDS, alternative Bids shall not be considered.

14. Bid Prices and Discounts

14.1. The prices and discounts quoted by the Bidder in the Letter of Price Bid and in the Price Schedules shall conform to the requirements specified below.

14.2. All items in the Schedule of Requirements must be listed and priced separately in the Price Schedules. If a Price Schedule shows items listed but not priced, their prices shall be assumed to be included in the prices of other items. Items

not listed in the Price Schedule shall be assumed not to be included in the Bid, and provided that the Bid is substantially responsive, the corresponding adjustment shall be applied in accordance with ITB 33.3. Unit rates and prices for all items in the Schedule of Supply shall be expressed in positive values. If unit rates and prices are expressed in negative values, the bid will be rejected.

14.3. The price to be quoted in the Letter of Price Bid shall be the total price of the Bid excluding any discounts offered. Absence of the total bid price in the Letter of Price Bid may result in the rejection of the Bid.

14.4. The Bidder shall quote discounts and the methodology for their application in the Letter of Price Bid.

14.5. The terms EXW, CIF, CIP, and other similar terms shall be governed by the rules prescribed in the current edition of Incoterms, published by the International Chamber of Commerce, at the date of the Invitation for Bids or as specified in the BDS.

14.6. Prices shall be quoted as specified in each Price Schedule included in Section 4 (Bidding Forms). The disaggregation of price components is required solely for the purpose of facilitating the comparison of Bids by the Purchaser. This shall not in any way limit the Purchaser's right to contract on any of the terms offered

(a) for IT products offered from within the Purchaser's country:

(i) the price of the IT products quoted EXW (ex works, ex factory, ex warehouse, ex showroom, or off-the-shelf, as applicable), including all customs duties and sales and other taxes already paid or payable on the components and raw material used in the manufacture or assembly of IT products quoted ex works or ex factory, or on the previously imported IT products of foreign origin quoted ex warehouse, ex showroom, or off-the-shelf;

(ii) sales tax and all other taxes applicable in the Purchaser's country and payable on the IT products if the Contract is awarded to the Bidder; and

(iii) the total price for the item.

(b) for IT products offered from outside the Purchaser's country:

(i) the price of the IT products quoted CIF (named port of destination), or CIP (border point), or CIP (named place of destination) in the Purchaser's country, as specified in the BDS;

(ii) the price of the IT products quoted FOB port of shipment (or FCA, as the case may be), if specified in the BDS; and

(iii) the total price for the item.

(c) for services whenever such are specified in the Schedule of Requirements:

(i) the local currency cost component of each item comprising the services; and

(ii) the foreign currency cost component of each item comprising the services, inclusive of all customs duties, sales, and other similar taxes applicable in the Purchaser's country, payable on the services, if the Contract is awarded to the Bidder.

Unless otherwise specified in the BDS, the prices must include all costs incidental to the performance of the services, as incurred by the Supplier, such as travel, subsistence, office support, communications, translation, printing of materials, etc. Costs incidental to the delivery of the services but incurred by the Purchaser or its staff, or by third parties, must be included in the price only to the extent such

obligations are made explicit in these Bidding Documents (as, e.g., a requirement for the Bidder to include the travel and subsistence costs of trainees).

14.7. Prices for Recurrent Costs beyond the scope of warranty services to be incurred during the Warranty Period, shall be quoted as service prices in accordance with ITB 14.6(c) on the Price Schedule for Recurrent Costs. Recurrent costs are all-inclusive of the costs necessary items such as spare parts, software license renewals, labor, etc., needed for the continued and proper operation of the IT Products and Services and, if appropriate, of the Bidder's own allowance for price increases.

14.8. Prices quoted by the Bidder shall be fixed during the Bidder's performance of the Contract and not subject to variation on any account, unless otherwise specified in the BDS. A Bid submitted with an adjustable price quotation shall be treated as nonresponsive and shall be rejected, pursuant to ITB 32. If in accordance with the BDS, prices quoted by the Bidder shall be subject to adjustment during the performance of the Contract but a Bid submitted with no indexes identified in the Tables of Adjustment Data will also be treated as nonresponsive and be rejected.

14.9. If so indicated pursuant to ITB 1.1, Bids are being invited for individual contracts (lots) or for any combination of contracts (packages). Unless otherwise indicated in the BDS, prices quoted shall correspond to 100% of the items specified for each lot and to 100% of the quantities specified for each item of a lot. Bidders wishing to offer any price discount for the award of more than one Contract shall specify in their bid the price discount applicable to each package, or alternatively, to individual Contracts within the package. Price discounts shall be submitted in accordance with ITB 14.4, provided the bids for all lots are submitted and opened at the same time.

15. Currencies of Bid

15.1. Bid prices shall be quoted in the following currencies:

(a) Bidders may express their bid price in any fully convertible currency. If a Bidder wishes to be paid in a combination of amounts in different currencies, it may quote its price accordingly.

(b) If some of the expenditures for the related services are to be incurred in the borrowing country, such expenditures should be expressed in the Bid and will be payable in the Purchaser's currency.

16. Documents Establishing the Eligibility of the Bidder

16.1. To establish their eligibility in accordance with ITB 4, Bidders shall

(a) complete the eligibility declarations in the Letter of Bid, included in Section 4 (Bidding Forms); and

(b) if the Bidder is an existing or intended Joint Venture in accordance with ITB 4.1, submit a copy of the Joint Venture Agreement, or a letter of intent to enter into such an agreement. The respective document shall be signed by all legally authorized signatories of all the parties to the existing or intended Joint venture, as appropriate.

17. Documents Establishing the Eligibility of the IT Products and Services

17.1. To establish the eligibility of the IT Products and Services in accordance with ITB 5, Bidders shall complete the country of origin declarations in the Price Schedule Forms included in Section 4 (Bidding Forms).

18. Documents Establishing the

18.1. To establish the conformity of the IT Products and Services to the Bidding Document, the Bidder shall furnish as part of its Bid documentary evidence that

Conformity of the IT Products and Services to the Bidding Document

the IT Products and Services conform to the requirements specified in Section 6 (Schedule of Requirements).

18.2.   The documentary evidence may be in the form of literature, drawings, or data, and shall consist of a detailed item-by-item description of the essential technical and performance characteristics of the IT Products and Services, demonstrating substantial responsiveness of the IT Products and Services to those requirements, and if applicable, a statement of deviations and exceptions to the provisions of Section 6 (Schedule of Requirements).

18.3.   Standards for workmanship, process, material, and equipment, as well as references to brand names or catalogue numbers specified by the Purchaser in Section 6 (Schedule of Requirements), are intended to be descriptive only and not restrictive. The Bidder may offer other standards of quality, brand names, and/or catalogue numbers, provided that it demonstrates, to the Purchaser's satisfaction, that the substitutions ensure substantial equivalence or are superior to those specified in Section 6 (Schedule of Requirements).

18.4.   For major items of IT Products and Services as listed by the Purchaser in Section 3 (Evaluation and Qualification Criteria), which the Bidder intends to purchase or subcontract, the Bidder shall give details of the name and nationality of the proposed Subcontractors, including manufacturers, for each of those items. In addition, the Bidder shall include in its bid information establishing compliance with the requirements specified by the Purchaser for these items. Quoted rates and prices will be deemed to apply to whichever Subcontractor is appointed, and no adjustment of the rates and prices will be permitted.

19. Documents Establishing the Qualifications of the Bidder

19.1.   The documentary evidence of the Bidder's qualifications to perform the contract, if its bid is accepted, shall establish to the Purchaser's satisfaction that the Bidder meets each of the qualification criterion specified in Section 3 (Evaluation and Qualification Criteria).

19.2.   If so required in the BDS, a Bidder that does not manufacture or produce the IT Products and Services it offers to supply shall submit the Manufacturer's Authorization using the form included in Section 4 (Bidding Forms) to demonstrate that it has been duly authorized by the manufacturer or producer of the IT Products and Services to supply these IT Products and Services in the Purchaser's country.

19.3.   If so required in the BDS, a Bidder that does not conduct business within the Purchaser's country shall submit evidence that it will be represented by an agent in the country equipped and able to carry out the Supplier's maintenance, repair, and spare parts stocking obligations prescribed in the Conditions of Contract and/or Technical Specifications.

20. Period of Validity of Bids

20.1.   Bids shall remain valid for the bid validity period specified in the BDS. The bid validity period starts from the date fixed for the bid submission deadline date prescribed by the Purchaser in accordance with ITB 24.1. A Bid valid for a shorter period shall be rejected by the Purchaser as nonresponsive.

20.2.   In exceptional circumstances, prior to the expiration of the bid validity period, the Purchaser may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. If a Bid Security is requested in accordance with ITB 21, it shall also be extended 28 days beyond the deadline of the extended bid validity and bid security validity issued by the Purchaser. A Bidder may refuse the request without forfeiting its Bid Security. A Bidder granting the request shall not be required or permitted to modify its Bid.

21. Bid Security/ Bid-Securing Declaration

21.1.   Unless otherwise specified in the BDS, the Bidder shall furnish as part of its Bid, in original form, either a Bid-Securing Declaration or a bid security as specified in the BDS. In the case of a bid security, the amount and currency shall be as specified in the BDS.

21.2.   If a Bid-Securing Declaration is required pursuant to ITB 21.1, it shall use the form included in Section 4 (Bidding Forms). The Purchaser will declare a Bidder ineligible to be awarded a Contract for a specified period of time, as indicated in the BDS, if a Bid-Securing Declaration is executed.

21.3.   If a bid security is specified pursuant to ITB 21.1, the bid security shall be, at the Bidder's option, in any of the following forms:

(a)   an unconditional bank guarantee (hard copy of the bank guarantee or in the form of SWIFT message MT760), or

(b)   an irrevocable letter of credit, or

(c)   a cashier's or certified check.

All from a reputable source from an eligible country as described in Section 5 (Eligible Countries). In the case of a bank guarantee, the bid security shall be submitted either using the Bid Security Form included in Section 4 (Bidding Forms) or another form acceptable to the Purchaser. The form must include the complete name of the Bidder. The bid security shall be valid for 28 days beyond the original validity period of the bid, or beyond any period of extension if requested under ITB 20.2.

21.4.   Unless otherwise specified in the BDS, any bid not accompanied by a substantially compliant bid security or Bid-Securing Declaration, if one is required in accordance with ITB 21.1, shall be rejected by the Purchaser as nonresponsive.

21.5.   If a bid security is specified pursuant to ITB 21.1, the bid security of substantially nonresponsive Technical Bids shall be returned before opening the Price Bids. The bid security of unsuccessful Bidders at Price Bid evaluation shall be returned promptly upon signing of the contract with the successful Bidder pursuant to ITB 46.

21.6.   If a bid security is specified pursuant to ITB 21.1, the bid security of the successful Bidder shall be returned promptly once the successful Bidder has signed the Contract Agreement and furnished the required Performance Security.

21.7.   The bid security may be forfeited or the Bid-Securing Declaration executed, if

(a)   notwithstanding ITB 26.3, a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Letter of Technical Bid, except as provided in ITB 20.2; or

(b)   the successful Bidder fails to

(i)   sign the Contract Agreement in accordance with ITB 46;

(ii)   furnish a Performance Security in accordance with ITB 47; or

(iii) accept the arithmetical corrections of its bid in accordance with ITB 36.

21.8.   If the bid security is required as per ITB 21.1, the bid security of a Joint Venture shall be in the name of the Joint Venture that submits the Bid. If the Joint Venture has not been legally constituted at the time of bidding, the bid security shall be in the name of any or all of the Joint Venture partners. If the Bid-Securing Declaration is required as per ITB 21.1, the Bid-Securing Declaration of a Joint Venture shall be in the name of the Joint venture that submits the Bid. If the Joint Venture has not

been legally constituted at the time of bidding, the Bid- Securing Declaration shall be in the names of all future partners as named in the letter of intent referred to in ITB 4.1.

22. Format and Signing of Bid	22.1.	The Bidder shall prepare one original set of the Technical Bid and one original set of the Price Bid as described in ITB 11 and clearly mark each "ORIGINAL - TECHNICAL BID" and "ORIGINAL - PRICE BID". In addition, the Bidder shall submit copies of the Technical Bid and the Price Bid, in the number specified in the BDS and clearly mark them "COPY NO… - TECHNICAL BID" and "COPY NO…. - PRICE BID". In the event of any discrepancy between the original and the copies, the original shall prevail.

22.2. The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the BDS and shall be attached to the Bid. The name and position held by each person signing the authorization must be typed or printed below the signature. If a Bidder submits a deficient authorization, the Bid shall not be rejected in the first instance. The Purchaser shall request the Bidder to submit an acceptable authorization within the number of days as specified in the BDS. Failure to provide an acceptable authorization within the period stated in the Purchaser's request shall cause the rejection of the Bid. If either the Letter of Technical Bid or Letter of Price Bid or the Bid-Securing Declaration (if applicable) is not signed, the Bid shall be rejected.

22.3. A Bid submitted by a Joint venture shall be signed so as to be legally binding on all partners.

22.4. Any amendments such as interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the bid.

22.5. For electronic bid submission, procedures for format and signing of the bid shall be as specified in the BDS.

D. Submission and Opening of Bids

23. Sealing and Marking of Bids

23.1. Bidders shall submit their Bids as specified in the BDS. Procedures for submission, sealing, and marking are as follows:

(a) Bidders submitting Bids by mail or by hand shall enclose the original of the Technical Bid, the original of the Price Bid, and each copy of the Technical Bid and each copy of the Price Bid, including alternative Bids, if permitted in accordance with ITB 13, in separate sealed envelopes, duly marking the envelopes as "ORIGINAL - TECHNICAL BID", "ORIGINAL - PRICE BID" and "COPY NO… - TECHNICAL BID" and "COPY NO…. - PRICE BID", as appropriate. These envelopes containing the original and the copies shall then be enclosed in one single envelope. The rest of the procedure shall be in accordance with ITB 23.2 to ITB 23.6.

(b) If electronic bid submission is used, Bidders shall follow the procedures specified in the BDS. In such case, manual bid submission shall not be permitted.

23.2. The inner and outer envelopes shall

(a) bear the name and address of the Bidder;

(b) be addressed to the Purchaser in accordance with ITB 24.1; and

(c)   bear the specific identification of this bidding process pursuant to ITB 1.1 and any additional identification marks as specified in the BDS.

23.3.   The outer envelopes and the inner envelopes containing the Technical Bids shall bear a warning not to open before the time and date for the opening of Technical Bids, in accordance with ITB 27.1.

23.4.   The inner envelopes containing the Price Bids shall bear a warning not to open until advised by the Purchaser in accordance with ITB 27.2.

23.5.   If all envelopes are not sealed and marked as required, the Purchaser will assume no responsibility for the misplacement or premature opening of the Bid.

23.6.   Alternative Bids, if permissible in accordance with ITB 13, shall be prepared, sealed, marked, and delivered in accordance with the provisions of ITB 22 and ITB 23, with the inner envelopes marked in addition "ALTERNATIVE NO…." as appropriate.

24. Deadline for Submission of Bids

24.1.   Bids must be received by the Purchaser at the address (or electronic portal) and no later than the date and time indicated in the BDS.

24.2.   The Purchaser may, at its discretion, extend the deadline for the submission of Bids by amending the Bidding Document in accordance with ITB 8, in which case all rights and obligations of the Purchaser and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.

25. Late Bids

25.1.   The Purchaser shall not consider any Bid that arrives after the deadline for submission of Bids, in accordance with ITB 24. Any Bid received by the Purchaser after the deadline for submission of Bids shall be declared late, rejected, and returned unopened to the Bidder.

26. Withdrawal, Substitution, and Modification of Bids

26.1.   A Bidder may withdraw, substitute, or modify its Bid after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITB 22.2 (except for withdrawal notices, which do not require copies). The corresponding substitution or modification of the bid must accompany the respective written notice. All notices must be

(a)   prepared and submitted in accordance with ITB 22 and ITB 23 (except for withdrawal notices, which do not require copies), and in addition, the respective inner and outer envelopes shall be clearly marked "WITHDRAWAL," "SUBSTITUTION," "MODIFICATION;" and

(b)   received by the Purchaser prior to the deadline prescribed for submission of bids, in accordance with ITB 24.

26.2.   Bids requested to be withdrawn in accordance with ITB 26.1 shall be returned unopened to the Bidders.

26.3.   No Bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Letter of Technical Bid or any extension thereof.

26.4.   If electronic bid submission is used, Bidders shall follow the procedures for withdrawal, substitution, and modification specified in the BDS.

27. Bid Opening

27.1.   The Purchaser shall open the Technical Bids in public at the address, on the date and time specified in the BDS in the presence of Bidders' designated representatives and anyone who chooses to attend. Any specific electronic bid

opening procedures required if electronic bidding is permitted in accordance with ITB 23.1(b), shall be as specified in the BDS.

27.2.   The Price Bids will remain unopened and will be held in custody of the Purchaser until the time of opening of the Price Bids. The date, time, and location of the opening of Price Bids will be advised in writing by the Purchaser. If the Technical Bid and the Price Bid are submitted together in one envelope, the Purchaser may reject the Bid. Alternatively, the Price Bid may be immediately resealed for later evaluation.

27.3.   First, envelopes marked "WITHDRAWAL" shall be opened, read out, and recorded, and the envelope containing the corresponding bid shall not be opened, but returned to the Bidder. No bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at bid opening.

27.4.   Next, outer envelopes marked "SUBSTITUTION" shall be opened. The inner envelopes containing the Substitution Technical Bid and/or Substitution Price Bid shall be exchanged for the corresponding envelopes being substituted, which are to be returned to the Bidder unopened. Only the Substitution Technical Bid, if any, shall be opened, read out, and recorded. Substitution Price Bid will remain unopened in accordance with ITB 27.2. No envelope shall be substituted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out and recorded at bid opening.

27.5.   Next, outer envelopes marked "MODIFICATION" shall be opened. No Technical Bid and/or Price Bid shall be modified unless the corresponding modification notice contains a valid authorization to request the modification and is read out and recorded at the opening of Technical Bids. Only the Technical Bids, both Original as well as Modification, are to be opened, read out, and recorded at the opening. Price Bids, both Original as well as Modification, will remain unopened in accordance with ITB 27.2.

27.6.   All other envelopes holding the Technical Bids shall be opened one at a time, and the following read out and recorded

(a)   the name of the Bidder;

(b)   whether there is a modification or substitution;

(c)   the presence of a bid security or a Bid-Securing Declaration, if required; and

(d)   any other details as the Purchaser may consider appropriate.

Only Technical Bids and alternative Technical Bids read out and recorded at bid opening shall be considered for evaluation. Unless otherwise specified in the BDS, all pages of the Letter of Technical Bid are to be initialed by at least three representatives of the Purchaser attending the bid opening. No Bid shall be rejected at the opening of Technical Bids except for late bids, in accordance with ITB 25.1.

27.7.   The Purchaser shall prepare a record of the opening of Technical Bids that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, modification, or alternative offer; and the presence or absence of a bid security or a Bid-Securing Declaration, if one was required. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders.

27.8.   At the end of the evaluation of the Technical Bids, the Purchaser will invite bidders who have submitted substantially responsive Technical Bids and who

have been determined as being qualified for award to attend the opening of the Price Bids. The date, time, and location of the opening of Price Bids will be advised in writing by the Purchaser. Bidders shall be given reasonable notice of the opening of Price Bids.

27.9. The Purchaser will notify in writing Bidders who have been rejected for submitting nonresponsive Technical Bids and return their Price Bids unopened together with their bid securities, before opening the Price Bids of the substantially responsive Bidders.

27.10. The Purchaser shall conduct the opening of Price Bids of all Bidders who submitted substantially responsive Technical Bids, in the presence of Bidders` representatives who choose to attend at the address, on the date, and time specified by the Purchaser. The Bidder's representatives who are present shall be requested to sign a register evidencing their attendance.

27.11. All envelopes containing Price Bids shall be opened one at a time and the following read out and recorded

(a)   the name of the Bidder;

(b) whether there is a modification or substitution;

(c) the Bid Prices, including any discounts and alternative offers; and

(d) any other details as the Purchaser may consider appropriate.

Only Price Bids, discounts, and alternative offers read out and recorded during the opening of Price Bids shall be considered for evaluation. Unless otherwise specified in the BDS, all pages of the Price Bid Submission Sheet and Price Schedules are to be initialed by at least three representatives of the Purchaser attending bid the opening. No Bid shall be rejected at the opening of Price Bids.

27.12.   The Purchaser shall prepare a record of the opening of Price Bids that shall include, as a minimum: the name of the Bidder, the Bid Price (per lot if applicable), any discounts, and alternative offers. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders who submitted bids on time, and posted online when electronic bidding is permitted.

E. Evaluation and Comparison of Bids

28. Confidentiality

28.1. Information relating to the examination, evaluation, comparison, and post-qualification of Bids, and recommendation of contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process until the publication of Contract award.

28.2. Any attempt by a Bidder to influence the Purchaser in the examination, evaluation, comparison, and post-qualification of the Bids or Contract award decisions may result in the rejection of its Bid.

28.3. Notwithstanding ITB 28.2, from the time of opening the Technical Bids to the time of Contract award, if any Bidder wishes to contact the Purchaser on any matter related to the bidding process, it should do so in writing.

29. Clarification of Bids

29.1. To assist in the examination, evaluation, comparison, and post-qualification of the bids, the Purchaser may, at its discretion, ask any Bidder for a clarification of its bid. Any clarification submitted by a Bidder with regard to its bid and that is not in response to a request by the Purchaser shall not be considered. The

Purchaser's request for clarification and the response shall be in writing. No change in the prices or substance of the bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Purchaser in the evaluation of the Price bids, in accordance with ITB 33.

29.2.   If a Bidder does not provide clarifications on its Bid by the date and time set in the Purchaser's request for clarification, its bid may be rejected.

30. Deviations, Reservations, and Omissions

30.1.   During the evaluation of Bids, the following definitions apply:

(a)   "Deviation" is a departure from the requirements specified in the Bidding Document;

(b)   "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document; and

(c)   "Omission" is the failure to submit part or all of the information or documentation required in the Bidding Document.

31. Examination of Technical Bids

31.1.   The Purchaser shall examine the Technical Bid to confirm that all documents and technical documentation requested in ITB 11.2 have been provided, and to determine the completeness of each document submitted.

31.2.   The Purchaser shall use the criteria and methodologies listed in this ITB and Section 3 (Evaluation and Qualification Criteria). No other evaluation criteria or methodologies shall be permitted. By applying the criteria and methodologies the Purchaser shall determine the Most Advantageous Bid.

Preliminary Examination

31.3.   The Purchaser will examine the bids, to determine whether they have been properly signed, whether required securities have been furnished, and are substantially complete (e.g., not missing key parts of the bid or silent on excessively large portions of the technical requirements). In the case where a prequalification process was undertaken for the Contract(s) for which these bidding documents have been issued, the Purchaser will ensure that each bid is from a prequalified bidder and that, in the case of a Joint Venture, partners and structure of the Joint Venture are unchanged from those in the prequalification.

Technical Evaluation

31.4.   The Purchaser will examine the information supplied by the Bidders pursuant to ITB 11 and ITB 16, and in response to other requirements in the Bidding document, taking into account the following factors:

(a)   overall completeness and compliance with, and deviations from, the Section 6 (Schedule of Requirements);

(b)   type, quantity, quality, and long-term availability of maintenance services and of any critical consumable items necessary for the operation of the IT products;

(c)   any other relevant technical factors that the Purchaser deems necessary or prudent to take into consideration;

(d)   any proposed deviations in the bid to the contractual and technical provisions stipulated in the bidding documents.

31.5.   If specified in the BDS, the Purchaser's evaluation of responsive Bids will take into account technical factors, in addition to cost factors. An Evaluated Bid Score (B) will be calculated for each responsive Bid using the formula, specified in

Section 3 (Evaluation and Qualification Criteria), which permits a comprehensive assessment of the Bid cost and the technical merits of each Bid.

31.6. Where alternative technical solutions have been allowed in accordance with ITB 13, and offered by the Bidder, the Purchaser will make a similar evaluation of the alternatives. Where alternatives have not been allowed but have been offered, they shall be ignored.

32. Responsiveness of Technical Bid

32.1. The Purchaser's determination of a Technical Bid's responsiveness is to be based on the contents of the Technical Bid itself, as defined in ITB 11.

32.2. A substantially responsive Technical Bid is one that meets the requirements of the Bidding Document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that,

(a) if accepted, would

(i) affect in any substantial way the scope, quality, or performance of the IT Products and Services specified in Section 6 (Schedule of Requirements); or

(ii) limits in any substantial way, inconsistent with the Bidding Document, the Purchaser's rights or the Bidder's obligations under the proposed Contract; or

(b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive Technical bids.

32.3. The Purchaser shall examine the technical aspects of the Bids in particular, to confirm that all requirements of Section 6 (Schedule of Requirements) have been met without any material deviation, reservation, or omission.

32.4. If a Technical Bid is not substantially responsive to the requirements of the Bidding Document, it shall not be considered further and be rejected by the Purchaser. The Bidder shall not be permitted to correct or withdraw material deviation, reservation, or omission once bids have been opened.

33. Nonmaterial Nonconformities

33.1. Provided that a Technical Bid is substantially responsive, the Purchaser may waive nonconformities in the bid that do not constitute a material deviation, reservation, or omission.

33.2. Provided that a Technical Bid is substantially responsive, the Purchaser 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 Technical Bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the Price Bid of the Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.

33.3. Provided that a Technical Bid is substantially responsive, the Purchaser shall rectify quantifiable nonmaterial nonconformities or omissions related to the Bid Price. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of the missing or nonconforming item or component. The adjustment shall be made using the method indicated in Section 3 (Evaluation and Qualification Criteria).

34. Qualification of the Bidder

34.1. The Purchaser shall determine to its satisfaction during the evaluation of Technical Bids whether Bidders meets the qualifying criteria specified in Section 3 (Evaluation and Qualification Criteria).

34.2. The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB 19. Unless permitted in the BDS, the determination shall not take into consideration the qualifications of other firms such as the Bidder's subsidiaries, parent entities, or affiliates.

34.3. An affirmative determination shall be a prerequisite for the opening and evaluation of a Bidder's Price Bid. The Purchaser reserves the right to reject the bid of any bidder found to be in circumstances described in GCC 35.2. A negative determination shall result into the disqualification of the Bid.

35. Examination of Price Bids

35.1. Following the opening of Price Bids, the Purchaser shall examine the Price Bids to confirm that all documents and financial documentation requested in ITB 11.5 have been provided, and to determine the completeness of each document submitted.

35.2. The Purchaser shall confirm that the following documents and information have been provided in the Price Bid. If any of these documents or information is missing, the offer shall be rejected:

(a) Letter of Price Bid in accordance with ITB 12.1; and

(b) Price Schedules, in accordance with ITB 12, ITB 14, and ITB 15.

36. Correction of Arithmetical Errors

36.1. During the evaluation of Price Bids, the Purchaser shall correct arithmetical errors on the following basis:

(a) If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected.

(b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected.

(c) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

36.2. If the Bidder that submitted the Most Advantageous Bid does not accept the correction of errors, its Bid shall be rejected and its bid security may be forfeited, or its Bid-Securing Declaration executed.

37. Conversion to Single Currency

37.1. For evaluation and comparison purposes, the currency(ies) of the Bid shall be converted into a single currency as specified in the BDS.

38. Domestic Preference

38.1. Unless otherwise specified in the BDS, domestic preference shall not apply.

39. Evaluation and Comparison of Price Bids

39.1. The Purchaser shall use the criteria and methodologies listed in this ITB and Section 3 (Evaluation and Qualification Criteria). No other evaluation criteria or methodologies shall be permitted. By applying the criteria and methodologies the Purchaser shall determine the Most Advantageous Bid.

Economic Evaluation

39.2. To evaluate a Price Bid, the Purchaser shall consider the following:

(a) the bid price as quoted in accordance with ITB 14;

(b) price adjustment for correction of arithmetic errors in accordance with ITB 36.1;

(c) price adjustment due to discounts offered in accordance with ITB 14.4;

(d) adjustment for nonmaterial nonconformities in accordance with ITB 33.3;

(e) assessment whether the bid is abnormally low in accordance with ITB 40;

(f) price adjustment due to application of the evaluation criteria specified in Section 3 (Evaluation and Qualification Criteria), including factors related to the characteristics, performance, and terms and conditions of purchase of the IT Products and Services, which have been expressed in monetary terms; and

(g) converting the amount resulting from applying (a) to (c) above, if relevant, to a single currency in accordance with ITB 37.

39.3. The Purchaser's evaluation of a bid will exclude and not take into account,

(a) in the case of IT products offered from within the Purchaser's country, all sales tax and all other taxes, applicable in the Purchaser's country and payable on the IT products if the Contract is awarded to the Bidder;

(b) in the case of IT products offered from outside the Purchaser's country, all customs duties, sales tax, and other taxes, applicable in the Purchaser's country and payable on the IT products if the Contract is awarded to the Bidder; and

(c) any allowance for price adjustment during the period of performance of the Contract, if provided in the Bid.

39.4. If the Bidding Document allows Bidders to quote separate prices for different lots (contracts), and the award to a single Bidder of multiple lots (contracts), the methodology to determine the price combinations offering optimum value for money, including any discounts offered in the Bid Submission Sheet, is specified in Section 3 (Evaluation and Qualification Criteria).

39.5. The Purchaser shall compare all substantially responsive Bids to determine the Most Advantageous Bid.

40. Abnormally Low Bids

40.1. An abnormally low bid is one where the bid price, in combination with other elements of the bid, appears to be so low that it raises concerns as to the capability of the Bidder to perform the contract for the offered bid price.

40.2. When the offered bid price appears to be abnormally low, the Purchaser shall undertake a three-step review process as follows:

(a) identify abnormally low costs and unit rates by comparing them with the engineer's estimates, other substantially responsive bids, or recently awarded similar contracts;

(b) clarify and analyze the bidder's resource inputs and pricing, including overheads, contingencies and profit margins; and

(c) decide whether to accept or reject the bid.

40.3. With regard to ITB 40.2 (b) above, the Purchaser shall seek written explanation of the reasons for proposed price or costs from the bidder, including a detailed analysis of its bid prices by reference to the scope, proposed methodology, schedule, and allocation of risks and responsibilities. This may also include information regarding the economy of the manufacturing process, the services

provided, the technical solutions chosen or any exceptionally favorable conditions available to the bidder for the supply of the IT Products and Services or for the execution of the work; or the originality of the work, supplies, or services proposed.

40.4. After examining the explanation given and the detailed price analyses presented by the bidder, the Purchaser may

(a) accept the bid, if the evidence provided satisfactorily accounts for the low bid price and costs, in which case the bid is not considered abnormally low;

(b) accept the bid, but require that the amount of the performance security be increased at the expense of the bidder to a level sufficient to protect the Purchaser against financial loss. The amount of the performance security shall generally be not more than 20% of the contract price; or

(c) reject the bid if the evidence provided does not satisfactorily account for the low bid price, and make a similar determination for the next ranked bid, if required.

41. Purchaser's Right to Accept Any Bid, and to Reject Any or All Bids

41.1. The Purchaser reserves the right to accept or reject any Bid, and to annul the bidding process and reject all bids at any time prior to Contract award, without thereby incurring any liability to the Bidders. In case of annulment, all Bids submitted and specifically, bid securities, shall be promptly returned to the Bidders.

42. Notice of Intention for Award of Contract

42.1. If Standstill provisions apply as specified in the BDS, the standstill period shall be defined in the BDS to specify the duration subsequent to notification of intention for award of contract (before making the actual contract award) within which any unsuccessful bidder can challenge the proposed award.

F. Award of Contract

43. Award Criteria

43.1. The Purchaser shall award the Contract to the Bidder whose offer has been determined successful in line with ITB 39 to ITB 40 above.

44. Purchaser's Right to Vary Quantities at Time of Award

44.1. At the time the Contract is awarded, the Purchaser reserves the right to increase or decrease the quantity of IT Products and Services originally specified in Section 6 (Schedule of Requirements), provided this does not exceed the percentages indicated in the BDS, and without any change in the unit prices or other terms and conditions of the Bid and the Bidding Document.

45. Notification of Award

45.1. Prior to the expiration of the period of bid validity and upon expiry of the standstill period specified in ITB 42.1, or upon satisfactory resolution of a complaint filed within standstill period, if applicable, the Purchaser shall transmit the Notification of Award using the form included in Section 9 (Contract Forms) to the successful Bidder, in writing, that its Bid has been accepted. At the same time, the Purchaser shall also notify all other Bidders of the results of the bidding.

45.2. Unless standstill period applies, upon notification of award, unsuccessful Bidders may request in writing to the Purchaser for a debriefing seeking explanations on the grounds on which their Bids were not selected. The Purchaser shall promptly respond in writing and/or in a debriefing meeting to any unsuccessful Bidder who, after publication of contract award, requests a debriefing.

45.3. Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract

45.4. Within 2 weeks of the award of contract or expiry of the standstill period, where such period applies, or, if a complaint has been filed within the standstill period, upon receipt of ADB's confirmation of satisfactory resolution of the complaint, the borrower shall publish in an English language newspaper or widely known and freely accessible website the results identifying the bid and lot or package numbers, as applicable and the following information:

(a) name of each Bidder who submitted a Bid;

(b) bid prices as read out at bid opening;

(c) name and evaluated prices of each Bid that was evaluated;

(d) name of Bidders whose Bids were rejected and the reasons for their rejection; and

(e) name of the winning Bidder, and the price it offered, as well as the duration and summary scope of the contract awarded.

46. Signing of Contract

46.1. Promptly after notification, the Purchaser shall send to the successful Bidder the Contract Agreement.

46.2. Within 28 days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the Purchaser.

47. Performance Security

47.1. Within 28 days of the receipt of notification of award from the Purchaser, the successful Bidder shall furnish the Performance Security in accordance with the GCC, subject to ITB 40.4, using for that purpose the Performance Security Form included in Section 9 (Contract Forms), or another form acceptable to the Purchaser. If the bank issuing performance security is located outside the Purchaser's country, it shall be counter-guaranteed or encashable by a bank in the Purchaser's country.

47.2. Failure of the successful Bidder to submit the abovementioned performance security or sign the Contract Agreement shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security or execution of the Bid-Securing Declaration. In that event, the Purchaser may award the Contract to the next Most Advantageous Bidder whose offer is substantially responsive and is determined by the Purchaser to be qualified to perform the Contract satisfactorily.

48. Bidding-Related Complaints

48.1. The procedures for dealing with Bidding-Related Complaints arising out of this bidding process are specified in the BDS.

Section 2: Bid Data Sheet (BDS)

A. General

ITB 1.1	The number of the Invitation for Bids (IFB) is: **IFB/PSW-DC-ICT-2022**
ITB 1.1	The Purchaser is: **PMU CAREC-RIBS (ITTMS), Customs Wing, FBR, Islamabad**
ITB 1.1	The name of the open competitive bidding (OCB) is: **International Competitive Bidding** **Procurement of Information Communication Technology Products and Services for Pakistan Single Window (PSW) by the CAREC-RIBS (ITTMS) Project, Customs Wing, FBR.** **The identification number of the ICB is: PMU-ITTMS(ICB)/PSWDC/ICT-2022** The number and identification of Lots comprising this ICB is: **(02)** **Lot 1:** Software: Supply, Installation, Configuration, & Implementation of Software for PSW. **Lot 2:** Hardware: Supply, Installation, Configuration, Testing, Training & Implementation of Networks and Security, Compute (Servers) and Storage Equipment for PSW. **A Bidder may opt to submit Bid for individual or for both lots. However, a separate bid shall be required for each lot**.
ITB 2.1	The Borrower is: **Government of Pakistan** The name of the Project is: **Central Asia Regional Economic Cooperation – Regional Improving Borders Services (CAREC-RIBS) Project**

B. Contents of Bidding Document

ITB 7.1	For **clarification purposes only**, the Purchaser's address is: Attention: **Mr. Azam Dil Khan, Monitoring & Evaluation Officer, CAREC-RIBS (ITTMS);** Street address: **PMU, Kurree Road, Federal Arcade, Islamabad;** Floor/Room number: **1st Floor, Federal Arcade, Kuree Raod, Jinnah Avenue;** City: **Islamabad;** ZIP code: **44000;** Country: **Pakistan.** Telephone: **+92 (51) 945 0009;** Fax: **+92 (51) 945 0006 ;** E-mail: **azamdkhan88@gmail.com;** Cc. to **ali.raza@carec-ribs.gov.pk** Web page: **www.carec-ribs.gov.pk** Requests for clarification should be received to PMU no later than seven (07) days before Bid Submission's due date.

C. Preparation of Bids

ITB 10.1	The language of the Bid is: **English**
ITB 11.2 (j)	The Bidder shall submit the following documents at the time of bid submission: a) Product Brochure / Solution Write-up w.r.t.. Solicited Technical Specifications b) Brand names/manufacturers represented along with Printed Technical Literature, Printed Operating and Installation Manual, recommended periodic maintenance, along with other requirements set in Technical Specifications c) Delivery Schedule d) Equipment Installation and Go-LIVE Schedule e) Warranty Coverage Details f) List of representatives/service agents throughout Pakistan and other countries in the region in respect of after sales services g) License by the regulatory authority in the country of manufacture to supply the offered goods/services h) Any other document required to be submitted as per the Schedule of Requirements Bidders who are not primary manufacturers should provide evidence that their products conform to the quality standards of the primary manufacturer, and they have the capacity to supply the specified quantities. A "*primary manufacturer*" is defined as a company that performs all the manufacturing and formulating operations.
ITB 12.2	The units and rates in figures entered into the Price Schedules should be typewritten or if written by hand, must be in print form. Price Schedules not presented accordingly may be considered nonresponsive.
ITB 13.1	Alternative Bids **shall not** be permitted.
ITB 14.5	The Incoterms edition is: **Incoterms 2020.**
ITB 14.6(b)(i)	**(i)** *In case ICT products and services are offered from outside Pakistan*: The Bidder shall quote prices using the Incoterm: **CIP 2020.** Price for inland transportation, insurance, and other local services required to convey the Goods from the named place of destination to their final destination, must also be quoted. **(ii)** *In case of ICT Products are already imported into Pakistan*: Price of the Goods, including the original import value of the Goods, plus any mark-up (or rebate), plus any other related local cost, insurance, Custom Duties and other import taxes already paid or to be paid on the Goods already imported, to Place of Destination (The bidder has to provide required evidence of import and paid duties and taxes as a mandatory requirement). The bidder located within the country of the Purchaser (Local bidder) has to offer price using the *Bidding Form: Price Schedule for IT Products to Be Offered from Within the Purchaser's Country*, efficiently and fully calculating the Custom Duties, Import, Sales & Other Taxes as applicable including all charges for inland transportation and other services, and in case the local bidder happens to be the lowest evaluated responsive bidder, the contract to the bidder shall be awarded on 'Delivered Duty Paid (DDP)' basis. **Place of Destination:** PSW Office/Data Center in Karachi, Pakistan.
ITB 14.6(c)	All costs incidental to the performance of the services, as incurred by the Supplier: **Yes.**
ITB 14.8	The prices quoted by the Bidder **shall not be adjustable.**

ITB 14.9	Prices quoted for each lot shall correspond to **100 %** of the items specified for each lot.
	Prices quoted for each item of a lot shall correspond to **100 %** of the quantities specified for this item of a lot.
	Prices not quoted for any item mentioned in the BOQs will be deemed to have been considered included in the said BOQs.
ITB 19.2	The Bidder shall include with its bid the *Manufacturer's Authorization* for all the items, products and solutions as specified in Lot-1 and Lot-2 in the **Sections-II viz. Technical Specifications, Schedule of Requirements, of the Bidding Document.**
	The Bidder is required to submit documentation to substantiate that he is an authorized dealer, distributor, or reseller of the IT products being procured.
	Manufacturer's Authorization is to be submitted **on the Form prescribed in Section-4: Bidding Forms** as required vide Criterion 2.3.3 (Production Capacity) of Section 3 (Evaluation and Qualification Criteria) of the Bidding Document.
ITB 19.3	The Bidder **is** required to include with its bid, evidence that it will be represented by an Agent in the Purchaser's country.
ITB 20.1	The bid validity period shall be **120** days.
ITB 21.1	A *Bid Security* **will be** required **in the form of an unconditional bank guarantee** included in Section 4 Bidding Forms.
	The required amounts of bid security in respect of each lot, shall be as follows, in favour of Federal Board of Revenue, Islamabad:
	Lot 1 = US$ 25,000/ **Lot 2 = US$ 72,000/-**
	A bidder may opt to submit bid security of equivalent amount denominated in local currency i.e., **Pak Rs.** as per the SBP/NBP prevailing rate of the instrument date is also acceptable. **The same must** be prepared pursuant to ITB Clause: 37.1 viz. Conversion to single Currency.
	Bid found without bid security or a bid security deficient of the required amount, will not be considered.
	Bid security validity should be at least 148 days.
	No personal cheques will be acceptable at any cost. Also, the previous bid security will not be considered or carried forward.
	Bid-Security Declaration and Insurance Guarantees shall not be acceptable.
ITB 21.2	The ineligibility period will be: **Not applicable.**
ITB 21.4	Subject to the succeeding sentences, any bid not accompanied by an irrevocable and callable bid security shall be rejected by the Purchaser as **nonresponsive**. If a Bidder submits a bid security that **(i)** deviates in form, amount, and/or period of validity, or **(ii)** does not provide sufficient identification of the Bidder (including, without limitation, failure to indicate the name of the Joint Venture or, where the Joint Venture has not yet been constituted, the names of all future Joint Venture Partners), the Purchaser shall request the Bidder to submit a compliant bid security within 14 days of receiving such a request. Failure to provide a compliant bid security within the prescribed period of receiving such a request shall cause the rejection of the Bid.

ITB 22.1	In addition to the original Bid, the number of copies is: **Two** along with **soft copy on DVD/USB.**
ITB 22.2	The written confirmation of Authorization to sign on behalf of the Bidder shall consist of:
	A *Power of Attorney* authorizing the signatory to sign the Bid on behalf of the Bidder from competent authority must be provided along with the bid. If the signatory of the Bid is duly authorized by the memorandum and article of association or the constitution of the Bidder, certified copy of the relevant section of the said constitution should be provided. In case, the Bidder is a sole proprietorship/partnership firm, necessary affidavit should be provided. Otherwise, the Bid may be rejected.
	If the Bidder is an intended or existing Joint Venture, such authorization be signed by all parties and specify the authority of the named representative to sign the Bid on behalf of, and legally bind, the intended or existing Joint Venture.
	If the Joint Venture has not yet been formed, also include written evidence from all proposed Joint Venture partners of their intent to enter into a Joint Venture in the event of a contract award in accordance with ITB 11.2.
ITB 22.2	The Bidder shall submit an acceptable authorization within **14 days.**
ITB 22.5	Electronic procedures for format and signing of the bid shall be: **Not Allowed.**

D. Submission and Opening of Bids

ITB 23.1(b)	Procedures for submitting the bid electronically shall be: **Not Applicable.**
ITB 23.2(c)	The additional identification marks are: **All pages of Bid should be duly signed by the authorized representative and stamped**.
ITB 23.6	**Not applicable.**
ITB 24.1	For **bid submission purposes** only, the Purchaser's address is:
	Attention: **Ali Raza Hanjra, Project Director CAREC-RIBS (ITTMS);**
	Street address: **PMU, Kurree Road, Federal Arcade, Islamabad;**
	Floor/Room number: **1st Floor, Federal Arcade, Kuree Road, Jinnah Avenue;**
	City: **Islamabad (ICT);**
	ZIP code: **44000;**
	Country: **Pakistan.**
	Telephone: **+92 (51) 945 0009 / +92 (51) 920 3917;**
	Fax: **+92 (51) 945 0006;**
	E-mail: **ali.raza@carec-ribs.gov.pk;**
	Web page: **www.carec-ribs.gov.pk**
ITB 24.1	**The deadline for bid submission is:**
	Date: **19 October, 2022**
	Time: **1100 hours.**

	A **Pre-Bid Meeting** will be conducted:
	Date: **08 September, 2022**
	Time: **1030 hours.**
	Venue: **PMU, Federal Arcade, 1ˢᵗ Floor, Kurree Road, Jinnah Avenue, Islamabad.**
	Maximum two (02) representatives of a bidder, will be allowed and mobile phone/recording of the proceedings will not be allowed.
ITB 26.4	Electronic procedures for withdrawal, substitution, and modification shall be: **Not Allowed**
ITB 27.1	The **Technical Bid opening** shall take place at:
	Street address: **Kurree Road, Federal Arcade, Islamabad;**
	Floor/Room number: **Conference Room, 1ˢᵗ Floor, PMU.**
	City: **Islamabad**
	Country: **Pakistan**
	Date: **19 October, 2022**
	Time: **The Bids will be opened promptly after the deadline for bid submission.**
	Maximum two representatives of bidder shall be allowed to attend. Use of mobile phones/camera/Recording equipment shall be strictly prohibited during Technical Bid opening.
ITB 27.1	The electronic bid opening procedure shall be as follows: **Not Allowed**
ITB 27.6	The Letter of Technical Bid shall be initialed by **at least two authorized representatives** of the Purchaser attending Technical Bid opening.
ITB 27.11	The Letter of Price Bid and Price Schedules shall be initialed by **at least two authorized representatives** of the Purchaser attending Financial Bid opening.

E. Evaluation and Comparison of Bids

ITB 31.5	The Purchaser's evaluation of responsive Bids will **NOT** take into account the technical factors, in addition to cost factors.
ITB 34.2	The qualifications of other firms such as the Bidder's subsidiaries, parent entities, affiliates, subcontractors **shall not** be permitted.
ITB 36.2	If the Bidder that submitted the lowest evaluated Bid does not accept the correction of errors, its Bid shall be disqualified and its bid security may be forfeited, or its Bid-Securing Declaration executed.
ITB 37.1	The currency that shall be used for bid evaluation and comparison purposes to convert all bid prices expressed in various currencies into a single currency is: **US$**
	The source of exchange rate **(Selling rate – Closing rate)** shall be: **The State Bank of Pakistan.**
	The date for the exchange rate shall be two working days before **Technical Bid opening date.**

ITB 38.1	Domestic preference **shall not** apply.
ITB 42.1	Standstill provisions **shall** apply. The duration of standstill period[2] will be **10 days** from the date of notice of intention for award of contract. The Purchaser shall, at the start of the standstill period, notify in writing each Bidder who submitted a bid, of its intention to award a contract to the successful Bidder at the end of standstill period. The notification using the form included in Section 9 (Contract Forms) shall include the following information: (a) the name of each Bidder who submitted a Bid; (b) the bid prices as read out at bid opening; (c) the name and evaluated prices of each Bid that was evaluated; (d) the name of Bidders whose bids were rejected and the reasons for their rejection; (e) the name of the winning Bidder, and the price it offered, as well as the duration and summary scope of the contract awarded; and (f) a statement of the reason(s) the bid of the unsuccessful Bidder to whom the notification is addressed was unsuccessful, unless the price information under (e) of this paragraph already reveals the reason.

F. Award of Contract

ITB 44.1	The maximum percentage by which quantities may be increased is: **15%** The maximum percentage by which quantities may be decreased is: **15%**
ITB 48.1	The procedures for Bidding-Related Complaints are referenced in Apppendix-7 of the Procurement Regulations for ADB Borrowers for Goods, Works, Non-consulting and Consulting Services, 2017. The Bidder should submit its complaint following the said procedures in writing to: Attention to: **Mr. Azam Dil Khan** Title/position: **Monitoring & Evaluation Officer, PMU, CAREC-RIBS (ITTMS)** Purchaser: **PMU CAREC-RIBS (ITTMS), FBR** E-mail address: **azamdkhan88@gmail.com**; Cc. to **ali.raza@carec-ribs.gov.pk** Fax number: **+92 (51) 945 0006**

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[2] A standstill period allows unsuccessful bidders an opportunity to challenge an intended contract award decision before the actual notification of award in ASDB Projects. This may improve levels of competition and make the procurement process transparent and fair.

Section 3: Evaluation and Qualification Criteria

Table of Criteria

1. Evaluation Criteria

The Purchaser will evaluate and compare Bids that have been determined to be substantially responsive, pursuant to ITB 31 & ITB 35.

2. Qualification Criteria

Bidders or Manufacturers for the intended equipment and services must meet the following qualification minimum criteria:

2.1 Eligibility

Criteria	Compliance Requirements				Documents
	Single Entity	Joint Venture			Submission Requirements
Requirement		All Partners Combined	Each Partner	One Partner	

2.1.1 Nationality

Nationality in accordance with ITB 4.2.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Letter of Technical Bid; Forms ELI – 1 and ELI - 2

2.1.2 Conflict of Interest

No conflicts of interest in accordance with ITB 4.3.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Letter of Technical Bid

2.1.3 ADB Eligibility

Not having been declared ineligible by ADB, as described in ITB 4.4.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Letter of Technical Bid

2.1.4 Government-Owned Enterprise

Bidder required to meet conditions of ITB 4.5.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Letter of Technical Bid; Forms ELI – 1 and ELI - 2

2.1.5 United Nations Eligibility

Not having been excluded by an act of compliance with a United Nations Security Council resolution in accordance with ITB 4.8.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Letter of Technical Bid

2.2   Historical Contract Nonperformance

2.2.1   History of Nonperforming Contracts

Criteria	Compliance Requirements				Documents
Requirement	**Single Entity**	**Joint Venture**			**Submission Requirements**
		All Partners Combined	**Each Partner**	**One Partner**	
Nonperformance of a contract[a] did not occur as a result of contractor default since 1 January 2021	Must meet requirement	Must meet requirement	Must meet requirement [b]	Not Applicable	Form CON-1

[a] *Nonperformance, as decided by the Purchaser, shall include all contracts where (a) nonperformance was not challenged by the contractor, including through referral to the dispute resolution mechanism under the respective contract, and (b) contracts that were so challenged but fully settled against the contractor. Nonperformance shall not include contracts where Purchasers decision was overruled by the dispute resolution mechanism. Nonperformance must be based on all information on fully settled disputes or litigation, i.e., dispute or litigation that has been resolved in accordance with the dispute resolution mechanism under the respective contract and where all appeal instances available to the Bidder have been exhausted.*

[b] *This requirement also applies to contracts executed by the Bidder as Joint Venture partner.*

2.2.2   Suspension Based on Execution of Bid-Securing Declaration

Criteria	Compliance Requirements				Documents
Requirement	**Single Entity**	**Joint Venture**			**Submission Requirements**
		All Partners Combined	**Each Partner**	**One Partner**	
Not under suspension based on execution of a Bid-Securing Declaration pursuant to ITB 4.6.	Must meet requirement	Must meet requirement	Must meet requirement	Not applicable	Letter of Technical Bid

2.3   Experience and Technical Capacity

2.3.1   Contractual Experience

Criteria	Compliance Requirements				Documents
Requirement	**Single Entity**	**Joint Venture**			**Submission Requirements**
		All Partners Combined	**Each Partner**	**One Partner**	
Successful completion as main supplier within the last **05 years**, of at least 02 contracts each valued at: **For Lot 1:US$ 1,500,000/** **For Lot 2: US$ 4,300,000/** with nature, and complexity similar to the scope of requirements described in Section 6 (Schedule of Requirements).	Must meet requirement	Must meet requirement	Not applicable	Not applicable	Form EXP – 1 [a]

[a] *In addition to the submission of Form EXP-1, the Bidder shall provide the Signed Contract Agreement.*

2.3.2   Technical Experience

Criteria	Compliance Requirements				Documents
Requirement	**Single Entity**	**Joint Venture**			**Submission Requirements**
		All Partners Combined	**Each Partner**	**One Partner**	
The Bidder shall demonstrate that the IT products offered have: **For Lot 1** (i) Bidders shall have to demonstrate/provide current/ valid Original Equipment Manufacturer's (OEM) partnership certificate issued by the OEM to the bidder. The Bidder must have maintained the partnership level in the last 3 years of the similar software demanded in this bidding document, and (ii) been in operation for a minimum of three (03) years	Must meet requirement	Must meet requirement	Not applicable	Not applicable	Form EXP – 2 [a]

| For Lot 2 [each major item of Hardware]

(i) Bidders shall have to demonstrate/provide current/valid Original Equipment Manufacturer's (OEM) partnership certificate issued by the OEM to the bidder. The Bidder must have maintained the partnership level in the last 3 years for the supply of all following major hardware items demanded in this bidding document:

{hardware table} | | | | | |

#	Hardware Item
1	Servers
2	Backup Appliance
3	Core Switch
4	TOR Switches
5	Core Router
6	Firewalls

a *In addition to the submission of Form EXP-1, the Bidder shall provide the Signed Contract Agreement.*

2.3.3   Production Capacity

Criteria	Compliance Requirements				Documents
Requirement	**Single Entity**	**Joint Venture**			**Submission Requirements**
		All Partners Combined	**Each Partner**	**One Partner**	
The Bidder or Manufacturer shall demonstrate^a that it can supply the type, size, and quantity of the IT products as required by Purchaser in accordance with the Delivery and Completion Schedule in **Section 6 (Schedule of Requirements).**	Must meet requirement	Must meet requirement	Not applicable	Not applicable	Form EXP – 3

a *Bidder or Manufacturer shall provide evidence of production output.*

2.4 Financial Situation

2.4.1 Historical Financial Performance

Criteria	Compliance Requirements				Documents
Requirement	**Single Entity**	**Joint Venture**			**Submission Requirements**
		All Partners Combined	**Each Partner**	**One Partner**	
Submission of audited financial statements or, if not required by the law of the Bidder's country, other financial statements acceptable to the Purchaser, for the last three **(03) years** to demonstrate the current soundness of the Bidder's financial position. As a minimum, the Bidder's net worth for the last year calculated as the difference between total assets and total liabilities should be positive.	Must meet requirement	Not applicable	Must meet requirement	Not applicable	Form FIN - 1

2.4.2 Size of Operation (Average Annual Turnover)

Criteria	Compliance Requirements				Documents
Requirement	**Single Entity**	**Joint Venture**			**Submission Requirements**
		All Partners Combined	**Each Partner**	**One Partner**	
Minimum average annual turnover of **For Lot 1: US$ 3,750,000/-** **For Lot 2: US$ 10,000,000/-** calculated as total payments received by the Bidder for contracts completed or under execution over the **last Three (03) years.**	Must meet requirement	Must meet requirement	Must meet 50% of the requirement	Must meet 100% of the requirement	Form FIN - 2

3. Economic Evaluation

3.1 Economic Criteria

3.1.1 Adjustment for Scope

3.1.1.1 Local Handling and Inland Transportation

Costs for inland transportation, insurance, and other incidental costs for delivery of the IT products from the EXW premises, or port of entry, or border point to project site as defined in Section 6 (Schedule of Requirements), shall be quoted in the Price Schedule for Services to Be Offered from Outside and Within the Purchaser's Country provided In Section 4 (Bidding Forms). These costs will be taken into account during bid evaluation. If a Bidder fails to include such costs in its Bid, then these costs will be estimated by the Purchaser on the basis of published tariffs by the rail or road transport agencies, insurance companies, or other appropriate sources, and added to EXW or CIF or CIP price. **The bidder is however, required to quote the CIP price for the ICT products and services.**

3.1.1.2 Minor Omissions or Missing Items

Pursuant to ITB 33.3, the cost of all quantifiable non-material non-conformities or omissions from the contractual and commercial conditions shall be evaluated, including technical features identified as 'Mandatory' (or implied as mandatory by the use of the word 'must') in **Section 6 (Schedule of Requirements). The product features other than Mandatory are also required to be fully compliant to the Client needs and any deviation in them is not expected to affect the functionality and performance of the product.** The Purchaser will make its own assessment of the cost of any nonmaterial nonconformities and any omissions, for the purpose of ensuring fair comparison of Bids.

3.1.2 Adjustment for Deviations from the Terms of Payment

Deviations from the Terms of Payment as specified in SCC 16.1 **are not permitted**.

3.1.3 Adjustment for Deviations in the Delivery and Completion Schedule

[Deviations from the Delivery and Completion Schedule specified in Section 6 (Schedule of Requirement) are **not permitted**.

3.1.4 Operation and Maintenance (O&M) Costs
Does not apply.

3.1.5 Spare Parts
The list of items and quantities of **spare parts, tools, major assemblies, and selected components as mentioned in the Inventory List,** likely to be required during the initial period of **01 year** and optional price of **3 years** (Including the first year) as well of on-site warranty and support (with spares) is indicated in Section 6 (Schedule of Requirements). The total cost of these items at the unit prices quoted in each Bid shall be added to the Bid Price.

3.1.6 Performance and Productivity of the IT Products
The method of calculation shall be the following: **Not Applicable**

3.2 Domestic Preference

If domestic preference is provided for under ITB 38.1, the following procedure shall apply:
Not Applicable.

3.3 Multiple Lots (Contracts)

The Purchaser will evaluate and compare Bids on the basis of a lot, or a combination of lots, or as a total of lots to arrive at the least cost combination for the Purchaser by taking into account discounts offered by Bidders in case of award of multiple contracts.

If the Bidder submits successful Bid for both Lots, the evaluation will also include as assessment of the Bidder's capacity to meet the aggregated qualifying requirement relating to Size of Operation (Average Annual Turnover).

Section 4: Bidding Forms

Table of Forms

Letter of Technical Bid

Date: _____
International Competitive Bidding (ICB) No.: _____
Invitation for Bid (IFB) No.: _____

To: [*insert complete name of the Purchaser*]

We, the undersigned, declare that:

(a)   We have examined and have no reservations to the Bidding Document, including the Addenda issued in accordance with Instructions to Bidders (ITB) 8.

(b)   We acknowledge that we have read and understand ADB's Anticorruption Policy (1998) and Integrity Principles and Guidelines (2015), both as amended from time to time.

(c)   We offer to supply in conformity with the Bidding Document and in accordance with the delivery schedule specified in Section 6 (Schedule of Requirements), the following IT Products and Services: [*insert a brief description of the IT products and services*]

(d)   Our Bid consisting of the Technical Bid and the Price Bid shall be valid for a period of [*insert validity period as specified in ITB 20.1 of the BDS*] days starts from the date fixed for the bid submission deadline in accordance with ITB 22.1, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

(e)   We undertake, if our bid is accepted, to commence work on the IT Products and Services and to achieve installation and acceptance within the respective times stated in the Bidding Documents.

(f)   We hereby certify that all the software offered in this bid and to be supplied under the Contract is either owned by us or, (ii) covered by a valid license from the proprietor of the software.

(g)   Our firm, including any subcontractors or suppliers for any part of the Contract, have nationalities from eligible countries in accordance with ITB 4.2.

(h)   We, our directors, key officers, key personnel, including any subcontractors, consultants, subconsultants, manufacturers, service providers or suppliers for any part of the contract, do not have any conflict of interest in accordance with ITB 4.3.

    If there is any conflict of interest, please state details:
    (i)   Parties involved in the conflict of interest: _____
    (ii) Details about the conflict of interest: _____

(i)   We are not participating, as a Bidder, either individually or as partner in a Joint Venture, in more than one Bid in this bidding process in accordance with ITB 4.3(e), other than alternative offers in accordance with the Bidding Document.

(j)   Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract, are not subject to, or not controlled by any entity or individual that is

subject to, a temporary suspension or a debarment imposed by the Asian Development Bank or a debarment imposed by the Asian Development Bank in accordance with the Agreement for Mutual Enforcement of Debarment Decisions between the Asian Development Bank and other development banks.[3]

(k)   Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract, are not under ongoing investigation and/or sanctions proceedings by the Asian Development Bank or any multilateral development bank.

    If under ongoing investigation and/or sanction proceedings by the Asian Development Bank or any multilateral development bank, please state details:

(i)   Name of the multilateral development bank: _____

(ii) Reason for the ongoing investigation / allegations: _____

(l)   Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the Contract, are not temporarily suspended, debarred, declared ineligible, or subject to any national and/or international sanctions by any country, any international organization, any multilateral development bank and other donor agency.

    If so temporarily suspended, debarred, declared ineligible, or subject to any national and/or international sanctions by any country, any international organization, any multilateral development bank and other donor agency, please state details (as applicable to each Joint Venture partner, their respective direct or indirect shareholders, directors, key officers, key personnel, associate, parent company, affiliate, subsidiaries, Subcontractors, consultants, subconsultants, manufacturers, service providers and/or Suppliers):

(i)   Name of Institution: _____

(ii) Period of the temporary suspension, debarment, ineligibility, or national or international sanction [*start and end date*]: _____

(iii) Reason for the temporary suspension, debarment, ineligibility, or national or international sanction: _____

(m) Our firm, Joint Venture partners, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers, Suppliers, key officers, directors and key personnel have never been charged or convicted with any criminal offense (including felonies but excluding misdemeanors) or infractions and/or violations of ordinance; nor charged or found liable in any civil or administrative proceedings in the last 10 years; or undergoing investigation for such, or subject to any criminal, civil or administrative orders, monitorship or enforcement actions.

    If so charged, convicted/found liable, under ongoing investigation, or subject to orders, monitorship or enforcement actions, please state details:

(i)   Nature of the offense, violation, proceedings, investigation, and/or monitorship or enforcement actions: _____

(ii) Court, area of jurisdiction and/or the enforcement agency: _____

(iii) Resolution [*i.e. dismissed; settled; or convicted/duration of penalty*]: _____

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[3] These institutions include African Development Bank, European Bank for Reconstruction and Development (EBRD), Inter-American Development Bank (IADB), and the World Bank Group. According to paragraph 9 of the Agreement, other international financial institutions may join upon the consent of all Participating Institutions and signature of a Letter of Adherence by the international financial institution substantially in the form provided (Annex B to the Agreement). Upon adherence, such international financial institution shall become a Participating Institution for purposes of the Agreement. Bidders are advised to check www.adb.org/integrity for updates.

(iv) Other relevant details [*please specify*]: _____

(n) Our firm, Joint Venture partners, our respective direct and indirect shareholders, directors, key officers, key personnel, associates, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers, can make and receive electronic fund transfer payments through the international banking system or otherwise discharge the Purchaser's obligation upon initiation of wire transfer.

   If unable to make or receive funds through the international banking system or otherwise discharge the Purchaser's obligation upon initiation of wire transfer, please state the details:
   (i)   Nature of the restriction: _____
   (ii) Jurisdiction of the restriction: _____
   (iii) Other relevant details: _____

(o) Our firm, Joint Venture partners, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers, key officers, directors and key personnel are not from a country which is prohibited to export goods or services to, or receive any payments from the Purchaser's country and/or are not prohibited to receive payments for particular goods or services by the Purchaser's country by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations.

(p) We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract.**4**

Name of Recipient	Address	Reason	Amount
....	....	....	....
....	....	....	....

(q) We understand that it is our obligation to notify the Purchaser of any changes in connection with the matters described in paragraphs (h), (j), (k), (l), (m), (n), (o) and (p) of this Letter of Technical Bid.

(r) [We are not a government-owned enterprise] / [We are a government-owned enterprise but meet the requirements of ITB 4.5].[5]

(s) We have not been suspended nor declared ineligible by the Purchaser based on execution of a Bid-Securing Declaration in accordance with ITB 4.6.

(t) At any time following submission of our Bid, we shall permit, and shall cause our Joint Venture partners, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract to permit ADB or its representative to inspect our site, assets, accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by ADB. We understand that failure of this obligation may constitute obstructive practice that may result in debarment and/or contract termination.

(u) Regardless of whether the contract will be awarded to us, we shall preserve all accounts, records and other documents related to bid submission for at least 3 years from the date of submission of the bid or the period prescribed in applicable law, whichever is longer.

(v) If we are awarded the contract, we shall preserve all accounts, records and other documents related to the procurement and execution of the contract for at least 5 years after completing the

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4 If none has been paid or is to be paid, indicate "None".
[5] Use one of the two options as appropriate.

works contemplated in the relevant contracts or the period prescribed in applicable law, whichever is longer.

(w)   We certify on behalf of the Bidder, that the information provided in the bid has been fully reviewed, given in good faith, and to the best of our knowledge is true and complete. We understand that it is our obligation to inform the Purchaser of any changes to the information as and when it becomes known to us. We understand that any misrepresentation that knowingly or recklessly misleads, or attempts to mislead may lead to the automatic rejection of the Bid or cancellation of the contract, if awarded, and may result in remedial actions, in accordance with ADB's Anticorruption Policy (1998, as amended to date) and Integrity Principles and Guidelines (2017, as amended from time to time).

Name _____

In the capacity of _____

Signed _____

Duly authorized to sign the Bid for and on behalf of _____

Date _____

Country of Origin Declaration Form

Name of Bidder _____ **IFB Number** _____ **Page** ___ **of** ___

Item	Description	Country of Origin

Letter of Price Bid

Date: _____

International Competitive Bidding (ICB) No.: _____

Invitation for Bid (IFB) No.: _____

To: [*insert complete name of the Purchaser*]

We, the undersigned, declare that:

(a)   We have examined and have no reservations to the Bidding Document, including Addenda issued in accordance with Instructions to Bidders (ITB) 8.

(b)   We acknowledge that we have read and understand ADB's Anticorruption Policy (1998) and Integrity Principles and Guidelines (2015), both as amended from time to time.

(c)   We offer to supply in conformity with the Bidding Document and in accordance with Section 6 (Schedule of Requirements), the following IT Products and Services: [*insert a brief description of the IT products and services*]

(d)   The total price of our Bid, excluding any discounts offered in item (d) below, is

> [*amount of foreign currency in words], [amount in figures], and [amount of local currency in words], [amount in figures*]
>
> *The total bid price from the price schedules should be entered by the bidder inside this box. Absence of the total bid price in the Letter of Price Bid may result in the rejection of the bid.*

(e)   The discounts offered and the methodology for their application are as follows:

Discounts: If our Bid is accepted, the following discounts shall apply: [*specify in detail each discount offered and the specific item of the Schedule of Requirements to which it applies*]

Methodology of Application of the Discounts: The discounts shall be applied using the following method: [*specify in detail the method that shall be used to apply the discounts*]

(f)   Our Bid shall be valid for a period of [*insert validity period as specified in ITB 20.1 of the BDS.*] days starts from the date fixed for the bid submission deadline in accordance with ITB 22.1, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

(g)   If our Bid is accepted, we commit to obtain a Performance Security in accordance with the Bidding Documents.

(h)   We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed.

(i)   We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

(j) At any time following submission of our Bid, we shall permit, and shall cause our Joint Venture partners, directors, key officers, key personnel, associates, parent company, affiliates or subsidiaries, including any Subcontractors, consultants, subconsultants, manufacturers, service providers or Suppliers for any part of the contract to permit ADB or its representative to inspect our site, assets. accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by ADB. We understand that failure of this obligation may constitute obstructive practice that may result in debarment and/or contract termination.

(k) Regardless of whether the contract will be awarded to us, we shall preserve all accounts, records and other documents related to bid submission for at least 3 years from the date of submission of the bid or the period prescribed in applicable law, whichever is longer.

(l) If we are awarded the contract, we shall preserve all accounts, records and other documents related to the procurement and execution of the contract for at least 5 years after completing the works contemplated in the relevant contracts or the period prescribed in applicable law, whichever is longer.

(m) We confirm and stand by our commitments and other declarations made in connection with the submission of our Letter of Technical Bid.

(n) We certify on behalf of the Bidder, that the information provided in the bid has been fully reviewed, given in good faith, and to the best of our knowledge is true and complete. We understand that it is our obligation to inform the Purchaser of any changes to the information as and when it becomes known to us. We understand that any misrepresentation that knowingly or recklessly misleads, or attempts to mislead may lead to the automatic rejection of the Bid or cancellation of the contract, if awarded; and may result in remedial actions, in accordance with ADB's Anticorruption Policy (1998, as amended to date) and Integrity Principles and Guidelines (2015, as amended from time to time).

Name _____

In the capacity of _____

Signed

_____

Duly authorized to sign the Bid for and on behalf of _____

Date _____

Price Schedules

The Bidder shall complete and submit with its Bid the Price Schedules pursuant to ITB 12 and in accordance with Part 2 Supply Requirements, Section 6 (Schedule of Requirements). The list of items in column 1 of the Price Schedules shall coincide with the List of IT Products and Services specified by the Purchaser in the Schedule of Requirements

The units and rates in figures entered into the Price Schedules should be typewritten or if written by hand, must be in print form. Price Schedules not presented accordingly may be considered nonresponsive. Any necessary alterations due to errors, etc., shall be signed by the Bidder.

Price Schedule for IT Products
to Be Offered from Within the Purchaser's Country

Name of Bidder _____ IFB Number _____ Page ___ of ___

Item	Description	Country of Origin	Domestic Value Added in Percent	Quantity and Unit of Measurement	Unit Price EXW	Total EXW Price per item	Sales and Other Taxes Per Item	Total Price per Item including Taxes
1	2	3	4	5	6	7 = 5 x 6	8	9 = 7 + 8
						Total Amount		

Notes:

Column 4:   In accordance with margin of preference ITB 38, if applicable.
Domestic Value Added comprises domestic labor, the domestic content of materials, domestic overheads and profits from the stage of mining the raw material until final assembly.

Column 6:   Incoterm in accordance with ITB 14
Currency in accordance with ITB 15
Price shall include all customs duties and sales and other taxes already paid or payable on the components and raw materials used in the manufacture or assembly of the item or the customs duties and sales and other taxes already paid on previously imported items.

Column 8:   Payable in the Purchaser's country if Contract is awarded

Name _____

In the capacity of _____

Signed _____

Duly authorized to sign the Bid for and on behalf of _____

Date _____

Price Schedule for IT Products
to Be Offered from Outside the Purchaser's Country

Name of Bidder _____ IFB Number _____ Page ___ of ___

Item	Description	Country of Origin	Quantity and Unit of Measurement	Unit Price CIF (...) or CIP (...)	Unit Price FOB (...) or FCA (...)	Total Price CIF or CIP per Item	Total Price FOB or FCA per Item
1	2	3	4	5	6	7 = 4 x 5	8 = 4 x 6
					Total Amount		

Notes:

Columns 5 and 6:	Incoterm in accordance with ITB 14
	Currency in accordance with ITB 15

Column 6:	Only to be used if the Purchaser wishes to reserve transportation and insurance to domestic companies or other designated sources. Identification of the lowest evaluated bid must be on the basis of the CIF or CIP price, but the Purchaser may sign the contract on FOB or FCA terms and make its own arrangement for transportation and/or insurance.

Name _____

In the capacity of _____

Signed _____

Duly authorized to sign the Bid for and on behalf of _____

Date _____

Price Schedule for Services
to Be Offered from Outside and Within the Purchaser's Country

Name of Bidder _____ IFB Number _____ Page ___ of ___

Item No.	Description	Country of Origin	Quantity and Unit of Measure-ment	Unit Price		Total Price per Item	
				(a) Foreign Currency	(b) Local Currency	(a) Foreign Currency	(b) Local Currency
1	**2**	**3**	**4**	**5(a)**	**5(b)**	**6(a) = 4 x 5(a)**	**6(b) = 4 x 5(b)**
						Total Amount	

Notes:

Columns 5 and 6:   Currencies in accordance with ITB 15

Prices are to be quoted inclusive of all customs duties, sales and other similar taxes applicable in the Purchaser's country and payable on the Related Services, if the Contract is awarded to the Bidder

Name _____

In the capacity of _____

Signed _____

Duly authorized to sign the Bid for and on behalf of _____

Date _____

Price Schedule for Recurrent Costs

Item	Recurrent Item	Maximum all-inclusive Costs						Total Prices	
		Warranty Period			Post-Warranty Service Period			Local Currency	Foreign Currency
		Y1	Y2	Y3	Y4	Y5	Yn		
Total Amount: Cumulative Recurrent (to be carried to Grand Summary Costs)									

Name _____

In the capacity of _____

Signed _____

Duly authorized to sign the Bid for and on behalf of _____

Date _____

Grand Summary

Price Component	Total Price	
	Local Currency	**Foreign Currency**
Price Schedule for IT Products to Be Offered from Within the Purchaser's Country		
Price Schedule for IT Products to Be Offered from Outside the Purchaser's Country		
Price Schedule for Services to Be Offered from Outside and Within the Purchaser's Country		
Total Bid Price **(to be carried forward to the Letter of Price Bid)**		

Name _____

In the capacity of _____

Signed _____

Duly authorized to sign the Bid for and on behalf of _____

Date _____

Bid Security

When requested in the Bid Data Sheet, the Bidder shall furnish as part of its bid, an unconditional guarantee issued and verified by a bank, as bid security, using the Bid Security Form included in this section. The Form must include the complete name of the Bidder. The bid security shall be valid for number of days as specified in the BDS beyond the original validity period of the Bid, or beyond any period of extension if requested under ITB 20.2 in Section-I of the Bidding Document.

Bid Security
Bank Guarantee

[insert bank's name, and address of issuing branch or office] **6**

Beneficiary: *[insert name and address of the Purchaser]*
Date: *[insert date]*
Bid Security No.:   *[insert number]*

We have been informed that *[insert name of the bidder]* (hereinafter called "the Bidder") has submitted to you its bid dated *[insert date (as day, month, and year)]* (hereinafter called "the Bid") for the execution of *[insert name of contract]* under Invitation for Bids No. *[insert IFB number]* ("the IFB").

Furthermore, we understand that, according to your conditions, bids must be supported by a bid guarantee.

At the request of the Bidder, we *[insert name of bank]* hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of *[insert amount in words]* *[insert amount in figures]* upon receipt by us of your first demand in writing accompanied by a written statement, stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder

(a)   has withdrawn its Bid during the period of bid validity specified by the Bidder in the Letter of Technical Bid; or

(b)   does not accept the correction of errors in accordance with the Instructions to Bidders (hereinafter "the ITB"); or

(c)   having been notified of the acceptance of its Bid by the Purchaser during the period of bid validity, (i) fails or refuses to execute the Contract Agreement; or (ii) fails or refuses to furnish the Performance Security, in accordance with the ITB.

This guarantee will expire (a) if the Bidder is the successful Bidder, upon our receipt of copies of the Contract Agreement signed by the Bidder and the Performance Security issued to you upon the instruction of the Bidder; or (b) if the Bidder is not the successful Bidder, upon the earlier of (i) our receipt of a copy of your notification to the Bidder of the name of the successful Bidder, or (ii) 28 days after the expiration of the Bidder's bid.

Consequently, any demand for payment under this guarantee must be received by us at the office indicated above on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revisions, ICC Publication No. 758.**7**

[Authorized signature(s) and bank's seal (where appropriate)]

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6   All italicized text is for use in preparing this form and shall be deleted from the final document.
7   Or the purchaser may use "Uniform Rules for Demand Guarantees (URDG), ICC Publication No. 458" as appropriate.

Manufacturer's Authorization

Date: *[insert date (as day, month, and year) of bid submission]*

OCB No.: *[insert number of bidding process]*

To: *[insert complete name of the Purchaser]*

WHEREAS

We *[insert complete name of the manufacturer]*, who are official manufacturers of *[insert type of goods manufactured]*, having factories at *[insert full address of manufacturer's factories]*, do hereby authorize *[insert complete name of the bidder]* to submit a bid the purpose of which is to provide the following IT Products and Services, manufactured by us *[insert name and/or brief description of the goods]*, and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with Clause 28 of the General Conditions, with respect to the goods offered by the above firm.

Signed: *[insert signature(s) of authorized representative(s) of the manufacturer]*

Name: *[insert complete name(s) of authorized representative(s) of the manufacturer]*

Title: *[insert title]*

Duly authorized to sign this Authorization on behalf of *[insert complete name of the manufacturer]*

Dated on _____ day of _____, _____ *[insert date of signing]*

-- Note --

All italicized text is for use in preparing this form and shall be deleted from the final document.

The bidder shall require the manufacturer to fill out this form in accordance with the instructions indicated. This letter of authorization should be signed by a person with the proper authority to sign documents that are binding on the manufacturer. The bidder shall include it in its bid, if so indicated in the Bid Data Sheet (BDS).

Bidder's Qualification

To establish its qualifications to perform the contract in accordance with Section 3 (Evaluation and Qualification Criteria), the Bidder shall provide the following information requested in the corresponding Information Sheets.

Form ELI - 1: Bidder's Information Sheet

Bidder's Information			
		Information of the Bidder	**If the Bidder is a subsidiary or branch, information of any parent company/companies**
Names	**Full legal name(s)**		
	Full trading name(s) (if any)		
Addresses	**Registered address(es)**		
	Trading address(es)		
	Postal address(es) (if different from trading address)		
Type of organization			
Country of constitution/incorporation/registration			
Year of constitution/incorporation/ registration			
Corporate or registration number			
In case of a Joint Venture, legal name of each partner			
Bidder's authorized representative (name, address, telephone number(s), fax number(s) and e-mail address)			

Attached are copies of the following documents:

1. In case of a single entity, articles of incorporation or constitution and company incorporation/registration of the legal entity named above, in accordance with ITB 4.1 and ITB 4.2

2. Authorization to represent the firm or Joint Venture named above, in accordance with ITB 22.2

3.In case of a Joint Venture, a letter of intent to form a Joint Venture or Joint Venture agreement, in accordance with ITB 4.1

4.In case of a government-owned enterprise, any additional documents not covered under 1 above required to comply with ITB 4.5

Form ELI - 2: Joint Venture Information Sheet

Each partner of the Joint Venture must fill out this form separately.

Joint Venture Information		
Bidder's legal name		
	Information of Joint Venture Partner	**If any Joint Venture Partner is a subsidiary or branch, information of any parent company/companies**
Names / **Full legal name(s)**		
Names / **Full trading name(s) (if any)**		
Addresses / **Registered address(es)**		
Addresses / **Trading address (es)**		
Addresses / **Postal address (es) (if different from trading address)**		
Type of organization		
Country of constitution/incorporation/ registration		
Year of constitution/incorporation/ registration		
Corporate or registration number		
Joint Venture Partner's authorized representative information (name, address, telephone number(s), fax number(s) and e-mail address)		
Attached are copies of the following documents: 1. Articles of incorporation or constitution and company incorporation/registration of the legal entity named above, in accordance with ITB 4.1 and ITB 4.2 2. Authorization to represent the firm named above, in accordance with ITB 22.2 3. In the case of a government-owned enterprise, in accordance with ITB 4.5		

Form CON – 1: Historical Contract Nonperformance

Each Bidder must fill out this form in accordance with Criteria 2.2.1 and 2.2.3 of Section 3 (Evaluation and Qualification Criteria) to describe any history of nonperforming contracts and pending litigation or arbitration formally commenced against it.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name:

Joint Venture Partner: _____

4. Table 1: History of Nonperforming Contracts

Choose one of the following:
- ❑ No nonperforming contracts.
- ❑ Below is a description of nonperforming contracts involving the Bidder (or each Joint Venture partner if Bidder is a Joint Venture).

Year	Description	Amount of Nonperformed Portion of Contract ($ equivalent)	Total Contract Amount ($ equivalent)
[insert year]	Contract Identification: *[indicate complete contract name/ number, and any other identification]* Name of Purchaser: *[insert full name]* Address of Purchaser: *[insert street/city/country]* Reason(s) for nonperformance: *[indicate main reason(s)]*	*[insert amount]*	*[insert amount]*

5. Table 2: Pending Litigation and Arbitration

Choose one of the following:
- ❑ No pending litigation, arbitration or any other material events impacting the net worth and/or liquidity of the bidder.
- ❑ Below is a description of all pending litigation, arbitration involving the Bidder or any other material events impacting the net worth and/or liquidity of the bidder (or each Joint Venture partner if Bidder is a Joint Venture).

Year	Matter in Dispute	Value of Pending Claim in $ Equivalent	Value of Pending Claim as a Percentage of Net Worth
[insert year]	Contract Identification, as applicable: *[indicate complete contract name/ number, and any other identification]* Name of Purchaser: *[insert full name]* Address of Purchaser, parties involved in the material events impacting the net worth and/or liquidity of the bidder: *[insert street/city/country]* Matter of Dispute, parties involved in the material events impacting the net worth and/or liquidity of the bidder: *[indicate full description of dispute]* Party who initiated the dispute: *[indicate "Purchaser" or "Contractor"]* Status: *[indicate status of dispute]*	*[insert amount]*	*[insert amount]*

- Note -

Table 2 of this form shall only be included if Criterion 2.2.3 of Section 3 (Evaluation and Qualification Criteria) is applicable.

Form EXP - 1: Contractual Experience

Fill out one (1) form per contract. Each contract shall be supported by documents such as Signed Contract Agreement.

Contractual Experience		
Contract No . . . . . . **of**	**Contract Identification**	
Award Date	**Completion Date**	
Role in Contract	❑ **Manufacturer** ❑ **Supplier**	❑ **Subcontractor**
Total Contract Amount	$	
If partner in a Joint Venture or subcontractor, specify participation of total contract amount	**Percent of Total**	**Amount**
Purchaser's name **Address** **Telephone/Fax Number** **E-mail**		
Description of the Similarity in Accordance with 2.3.1 of Section 3 **(Evaluation and Qualification Criteria)**		

- Note -

This form shall only be included if Criterion 2.3.1 of Section 3 (Evaluation and Qualification Criteria) is applicable.

Form EXP - 2: Technical Experience

Fill out one (1) form per contract. Each contract shall be supported by documents such as Signed Contract Agreement.

Technical Experience	
Name of Product	
Manufacturer:	**Address and Nationality:**
Requirements in Accordance with Criterion 2.3.2 of Section 3 (Evaluation and Qualification Criteria)	
Lot-1:	
(i) Bidders shall have to demonstrate / provide current / valid Original Equipment Manufacturer's (OEM) partnership certificate issued by the OEM to the bidder. The Bidder must have maintained the partnership level in the last 3 years of the similar software demanded in this bidding document, and	
(ii) been in operation for a minimum of three (03) years	
For Lot-2:	
(i) Bidders shall have to demonstrate / provide current / valid Original Equipment Manufacturer's (OEM) partnership certificate issued by the OEM to the bidder. The Bidder must have maintained the partnership level in the last 3 years for the supply of all following major hardware items demanded in this bidding document: <table><tr><th>#</th><th>Hardware Item</th></tr><tr><td>1</td><td>Servers</td></tr><tr><td>2</td><td>Backup Appliance</td></tr><tr><td>3</td><td>Core Switch</td></tr><tr><td>4</td><td>TOR Switches</td></tr><tr><td>5</td><td>Core Router</td></tr><tr><td>6</td><td>Firewalls</td></tr></table>	

- Note -

This form shall only be included if Criterion 2.3.2 of Section 3 (Evaluation and Qualification Criteria) is applicable. Add pages as necessary. The Purchaser reserves the right to verify authenticity of Bidder submissions.

Form EXP - 3: Production Capacity

Fill out one (1) form per product and manufacturer.

Production Capacity		
Name of Product		
Manufacturer:		**Address and Nationality:**
Requirements in Accordance with Criterion 2.3.3 of Section 3 (Evaluation and Qualification Criteria)		
Production facility 1 (include location):		
Production facility 2 (include location):		
Production facility 3 (include location):		

- Note -

This form shall only be included if Criterion 2.3.3 of Section 3 (Evaluation and Qualification Criteria) is applicable. The Purchaser reserves the right to verify authenticity of Bidder submissions.

Form FIN - 1: Historical Financial Performance

Each Bidder must fill out this form.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name:

Joint Venture Partner: _____

Financial Data for Previous ___ Years [$ Equivalent]		
Year 1:	**Year 2:**	**Year __:**

Information from Balance Sheet

Total Assets (TA)			
Total Liabilities (TL)			
Net Worth = TA-TL			
Current Assets (CA)			
Current Liabilities (CL)			
Working Capital = CA - CL			

Most Recent Working Capital		To be obtained for most recent year and carried forward to FIN - 3 Line 1; in case of Joint Ventures, to the corresponding Joint Venture Partner's FIN - 3.

Information from Income Statement

Total Revenues			
Profits Before Taxes			
Profits After Taxes			

❑ Attached are copies of financial statements (balance sheets including all related notes, and income statements) for the last _____ years, as indicated above, complying with the following conditions:

- Unless otherwise required by Section 3 of the Bidding Documents, all such documents reflect the standalone financial situation of the legal entity or entities comprising the Bidder and not the Bidder's parent companies, subsidiaries, or affiliates.

- Historical financial statements must be audited by a certified accountant.

- Historical financial statements must be complete, including all notes to the financial statements.

- Historical financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted).

- Note -

This form shall only be included if Criterion 2.4.1 of Section 3 (Evaluation and Qualification Criteria) is applicable.

Form FIN - 2: Size of Operation (Average Annual Turnover)

Each Bidder must fill out this form.

The information supplied should be the Annual Turnover of the Bidder or each partner of a Joint Venture for the total certified payments received from the clients for contracts in progress or completed, converted to US dollars at the rate of exchange at the end of the period reported.

In case of a Joint Venture, each Joint Venture Partner must fill out this form separately and provide the Joint Venture Partner's name:

Joint Venture Partner: _____

Annual Turnover Data for the Last _____ Years			
Year	Amount Currency	Exchange Rate	$ Equivalent
		Average Annual Turnover	

- Note -
This form shall only be included if Criterion 2.4.2 of Section 3 (Evaluation and Qualification Criteria) is applicable.

Form FIN - 3: Cash Flow Capacity (Not Applicable)

Specify proposed sources of financing, such as working capital, liquid assets,[8] lines of credit, and other financial resources (other than any contractual advance payments) available to meet the cash flow requirements indicated under Criterion 2.4.3 of Section 3 (Evaluation and Qualification Criteria)

Financial Resources		
No.	**Source of financing**	**Amount ($ equivalent)**
1		
2		
3		

- Note -

This form shall only be included if Criterion 2.4.3 of Section 3 (Evaluation and Qualification Criteria) is applicable.

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[8]   Liquid assets mean cash and cash equivalents, short-term financial instruments, short-term available-for-sale-securities, marketable securities, trade receivables, short-term financing receivables, and other assets that can be converted into cash within one (1) year.

Section 5: Eligible Countries

"All ADB member countries as per the list obtainable from www.adb.org/about/members, except the ones sanctioned under United Nations Security Council Resolutions currently in vogue; and Debarred entities (firms and individuals) in ADB's published Sanctioned List and on MDBs' Cross-Debarment List."

Section 6: Schedule of Requirements

Contents

1. List of IT Products and Services

Lot No.: **1**				
Lot Name: <u>Software</u>: Supply, Installation, Configuration, & Implementation of Softwares for PSW.				
Item No.	Name of IT Products and Services	Description	Unit of Measurement	Quantity
As mentioned in the Section of Technical Specifications				

Lot No.: **2**				
Lot Name: <u>Hardware</u>: Supply, Installation, Configuration, Testing, Training & Implementation of Networks and Security, Compute (Servers) and Storage Equipment for PSW.				
Item No.	Name of IT Products and Services	Description	Unit of Measurement	Quantity
As mentioned in the Section of Technical Specifications				

2. Delivery and Completion Schedule

The delivery period shall start from the date of signing of Contract Agreement

Item No.	Description of IT Products and Services	Delivery Schedule (Duration)	Location	Completion Date for Services

	As mentioned for Lot-1 and Lot-2 in the section of List of Products and Services	**120 days**	**Karachi Port** (PSW Office is in Karachi, presently located at 4th Floor, Bahria Complex III, MT Khan Road. However, data center shall be at other place (Service Provider's location) also located in the vicinity of Karachi City at the time of delivery. Exact location would be identified well before the delivery).	**Lot 1: 60 days** **Lot 2: 60 days**

3. Technical Specifications

Lot-1:   <u>Software</u>: Supply, Installation, Configuration, & Implementation of Softwares for PSW.

Note: All Microsoft Software licensing must be Perpetual under Open Value Program with Software Assurance Model

1.0   Windows Licenses:

Supply, installation, testing, configuration and commissioning of windows Licenses for physical servers, complete in all respect for solution provided.

Microsoft Windows Server Standard 2019 or above, 16 core Base License.

Bidder to verify with complete proposed solution

2.0   Windows Licenses:

Supply, installation, testing, configuration and commissioning of windows Licenses for Virtualized servers, complete in all respect for solution provided.

Microsoft Windows Server Standard 2019 or above, Additional 2 core License Pack.

Bidder to verify with complete proposed solution

3.0   MS SQL:

Supply, installation, testing, configuration and commissioning of MS SQL Licenses for physical servers, complete in all respect for solution provided.

Microsoft SQL Server Enterprise 2019, 2 core License with 3 year Software Assurance under open value program.

Bidder to verify with complete proposed solution

4.0   MS Exchange:

Supply, installation, testing, configuration and commissioning of MS Microsoft Exchange Server 2019 Standard with s 50 User CAL - complete in all respect.

5.0   End Point Protection with 1 year subscription/license. (If bidder is proposing Microsoft Defender than Plan 2 will be required)

Lot-2: <u>Hardware</u>: Supply, Installation, Configuration, Testing, Training & Implementation of Networks and Security, Compute (Servers) and Storage Equipment for PSW.

A. Supply, Installation, Configuration, Implementation of Servers, Storage and Backup Replication, virtualization and data base.

Scope of the work

The Bidder/Solution Provider should implement required configuration, HA, VMs, interlink connections, cables and communication Fiber/Copper cabling, Software and any other services should be performed as per PSW's Requirement.

General Requirement

- Bidder / Solution provider can provide/propose the equivalent solution / equipment / hardware / OEM supplied software as requested in below specifications. For any proprietary technology / terminology, Bidder / Solution Provider may propose equivalent or better technology / terminology / functionality as per their proposed equipment / technology as requested in technical specifications.
- In case local authorized partner/representative (bidder) of a manufacturer/OEM fails to deliver the required services during and after installation/deployment, including but not limited to warranty and/or after sales services related to Operations & Maintenance, the manufacturer/OEM shall be invariably responsible to address the related issue/O&M through its certified and owned technical resources without any extra/additional cost and up to the satisfaction of the purchaser. Written confirmation from the Manufacturer/OEM is required to be submitted in the bid(s) on letter head.
- All features requested below should be available from day 1 and should be verified at the time of deployment.
- Foreign training from OEM with certification for each individual system(s) as quoted in the bid (Hardware + Software – both Lots) for 4 persons from ITTMS & PSW technical team at the OEM certified training facility. All boarding/lodging and other expenses are to be covered. It should be OEM training at the certified training facility with certified trainer having industry experience of 10+ years in private and government institutions/organization.
- Training for complete solution deployed and operations training to be provided before the delivery of the equipment.
- Any/All equipment quoted should not have end of sale date for 2 years from the date of contract and should not be end of life/support within 5 years from the date of operational acceptance.
- Successful Bidder/Solution Provider is responsible for providing all sort of functional test as specified in the proposed system or subsystem as per manufacturer's guideline, PSW requirement and documentation.
- End User Certificate (EUC) if required and any other relevant documentation should be signed / approved by the Employer before the delivery of equipment.

- The Successful bidder/solution provider shall be responsible from the commencement to handover of the complete project on turnkey basis.
- The Successful bidder/solution provider UAT Scripts for complete scope prior to testing. The Successful bidder/solution provider must acquire UAT for completely new systems from PSW
- All Equipment with warranty coverage should have quarterly Preventive Maintenance during warranty/Support coverage timeline.
- Kubernetes implementation and support.

SERVICES

1. Product Upgrades:

At any point during performance of the Contract, should technological advances be introduced by the Bidder for the IT Products and Services originally offered by the Bidder in its bid and still to be delivered, the Bidder shall be obligated to offer to the Purchaser the latest versions of the available information technologies having equal or better performance or functionality at the same or lesser unit prices, pursuant to GC Clause 11.2.

At any point during performance of the Contract, for IT Products and Services still to be delivered, the Bidder will also pass on to the Purchaser any cost reductions and additional and/or improved support and facilities that it offers to other clients of the Supplier in the Purchaser's country, pursuant to GC Clause 11.2.

During performance of the Contract, the Bidder shall offer to the Purchaser all new versions, releases, and updates of standard software, as well as related documentation and technical support services within 30 days of their availability from the Bidder to other clients of the Bidder in the Purchaser's country, and no later than 12 months after they are released in the country of origin. In no case will the prices for this software exceed those quoted by the Bidder in the recurrent costs tables in its bid.

During the warranty period, unless otherwise specified in the PC, the Bidder will provide at no additional cost to the Purchaser all new versions, releases, and updates for all standard software that are used in with the IT Products and Services within 30 days of their availability from the Bidder to other clients of the Bidder in the Purchaser's country, and no later than 12 months after they are released in the country of origin of the software.

The Purchaser shall introduce all new versions, releases or updates of the software within 18 months of receipt of a production-ready copy of the new version, release, or update, provided that the new version, release, or update does not adversely affect system operation or performance or require extensive reworking of the system. In cases where the new version, release, or update adversely affects system operation or performance, or requires extensive reworking of the system, the Supplier shall continue to support and maintain the version or release previously in operation for as long as necessary to allow introduction of the new version, release, or update. In no case shall the Bidder stop supporting or maintaining a version or release of the software less than 24 months after the Purchaser receives a production-ready copy of a subsequent version, release, or update. The Purchaser shall use all reasonable endeavors to implement any new version, release, or update as soon as practicable, subject to the 24-month-long stop date.

2. Operation & Maintenance

2.1 The Bidder shall be responsible for the O&M including:

      i.   Provide a planned/recurring and reactive maintenance and repair service for the system installed.

      ii.   Perform/provide product/software/firmware upgrades, security patches, licenses renewals as per the OEM's recommendations.

      iii.   Hold the necessary Employers and Public Liability insurances.

      iv.   Identify and comply with all relevant legislation and Health and Safety regulations relating to the services that are to be the subject of this contract.

    v.   Maintain records of actual performance results against the Client's key delivery expectations with regard to the Services. The Key Performance Indicators (KPIs) may be established during the course of the Contract by agreement between both Parties.

    vi.   Take prompt action to satisfactorily resolve complaints from the point of being made aware of the existence of such complaints, and shall address any Service-related problems that may be identified by the client during the course of this Contract.

    vii.   In relation to performance measurement, include activity reporting summarizing the performance results against the KPIs. It may include provision of a general summary regarding the nature of the work undertaken. This will highlight any relevant key points or issues that may be of interest to the client.

    viii.   Will produce trend and graphical representation of current equipment status or conditions where possible, and will discuss the results with the Client.

    ix.   Liaise with the operators on site in order to identify and comply with any general regulations and requirements at premises where the client's systems are installed and in particular will be responsible for obtaining, prior to starting any work; any necessary security passes and permits to work.

    x.   The contactor shall be responsible to provision the required materials, tools & plant at the site.

3. Documentation

3.1 The Bidder shall provide detailed installation and configuration manual for the Networking equipment, Security equipment, Compute & Storage, Software (O/S and System/Application) along with data / electrical cabling layout including equipment placement inside the data racks.

3.2 The Bidder will maintain a log book for each of the client's equipment. OEM In-charge will be expected to update this record on every maintenance visit with details of work done to the equipment, including the results of services performed.

3.3 On completion of any work to the equipment, whether in the course of a planned or reactive maintenance visit, the OEM In-charge will be expected (before leaving the premises) to complete a service or work report, showing, as a minimum:

    i.   The time of the technician arrival on, and departure from the site.

    ii.   Confirmation that the equipment has been tested and is operating correctly.

    iii.   Details of any work carried out and/or which in consultation with the client's local representative is agreed or proposed to be undertaken at a later date.

    iv.   A copy of the service or work report is to be left on site with the client's local officer.

4. Onsite Operational Trainings & Development of SOP's

    4.1 Trainings for ICT Infrastructure.

        The Bidder shall be responsible for the on-site trainings of the client's team. The subject trainings shall enable the End Users team to optimize the performance and productivity of the site staff. Bidder shall prepare and offer fully customized training sessions by Manufacturer trained/authorized trainers. For each training module the teaching outline shall include the following:

        i.   System design and operational philosophy.

        ii.   Review of documentation.

        iii.   Operations.

iv.   Adjustments.

4.2 Awareness Programs
The Bidder shall initiate the first step to familiarize the on-ground team via various Awareness Programs. The awareness sessions would contain the following Core competencies:
i.   Updates Policies
ii.   Cultural and Functional Changes
iii.   User and Management Requirements
iv.   Incident Handling
v.   ICT Security Awareness
vi.   Threat Sensitivity
vii.   Alerts and Advisories

5. TESTING & COMMISSIONING
5.1 GENERAL REQUIREMENTS
The Bidder shall carry out all necessary inspection, testing and commissioning during installation period to ensure that all components and systems are in a satisfactory and safe condition and to demonstrate that the equipment installation can meet the functional, performance as well as statutory requirements. The testing and commissioning shall be carried out in accordance with the requirements of Purchaser and the manufacturers' recommendations and specifications. When such inspection, testing and commissioning are required to be witnessed by the Purchaser, the Bidder shall give due advance notice of such intention and provide details of the event to be performed.

The Bidder shall provide supervision and support to the statutory inspection in the inspection, testing and examination of the equipment as required. The Bidder shall be responsible to provide the latest hardware and software for the equipment offered. The Bidder shall ensure manufacturer compliance to the offered configurations/equipment selection. The equipment offered shall have manufacturer support for spares and services for at least 5 years after the successful commissioning and handover.

The Bidder shall have the responsibility to ensure that the inspection, testing and commissioning of the equipment installations are carried out in a safe manner in order to protect the safety and health of other persons in the site.

Throughout the execution of the installation, the Bidder shall be responsible for ensuring compliance with the relevant Ordinances and Regulations and shall notify the Purchaser or its representatives of any infringement which directly or indirectly detracts from the safe and satisfactory operation of the installations. All sub-standard works or defects found during inspection, testing and commissioning shall be rectified or replaced to the satisfaction of the Purchaser.

Prior to any testing and commissioning works, Bidder shall check the completion of the works, the associated builder's works, the associated

building services installations and all other prerequisites to ensure that testing and commissioning can be proceeded in a safe and satisfactory manner without obstruction.

5.2 LABOUR, MATERIALS AND TECHNICAL SUPPORT

All labor, materials, tools and instrument necessary for carrying out the work shall be provided by the Bidder. The Purchaser will provide electricity supply, cooling, data racks and network cabling at a 3rd party data center / co-location service provider.

5.3 MATERIALS AND EQUIPMENT DELIVERED TO SITE

The Bidder shall provide details of materials and equipment delivered to site including material and equipment list, delivery order, record of delivery, payment vouchers and all other relevant documents to the Purchaser for identification and verification of the materials and equipment delivered to site are in compliance with the approved submissions. The Bidder shall give due advance notice of the delivery of materials and equipment to the Purchaser for conducting the checking.

5.4 INSPECTION AND TESTING

Visual inspection and checking of 'work in progress' will be made by the Purchaser or its representatives from time to time during the installation period.

The Bidder shall be responsible for arranging adequate provisions to facilitate site inspections of the work in progress to be carried out by the Purchaser or its representatives from time to time. The Bidder shall keep such inspection records for checking from time to time. The Bidder shall give due advance notice to the Purchaser or its representatives prior to the inspection.

Works to be permanently covered up shall be subject to inspection before covering up. During the inspection if the Purchaser or its representatives discovers any work that has been covered up before inspection, this work shall be uncovered for inspection to the satisfaction of the Purchaser or its representatives. Any cost incurred to uncover the work, inspect and re-conceal the work together with any consequential economic losses shall be borne by the Bidder.

Any defective works or sub-standard works found during visual inspection shall be rectified or replaced before proceeding with further tests.

5.5 TESTING AND COMMISSIONING

The Bidder shall arrange to enable the Purchaser or its representatives to witness the complete testing and commissioning. Unless otherwise approved by the Employer, testing and commissioning carried out by the Bidder without the witness of the Purchaser or its representatives shall not be allowed.

The Bidder shall give due advance notice of at least 72 hours, in writing, when any part or parts of the installation to be tested or commissioned. The Bidder shall satisfy himself that the installation is tested and/or commissioned to his satisfaction before inviting the Purchaser or its representatives for witness.

Prior to carrying out any test and commissioning the installation, the Bidder shall submit detailed procedures and a programme for testing and commissioning the installation. The programme shall specify, but not be limited to, various stages of testing and commissioning works; breakdown of the tests during installation; allowable float time; milestone dates, if applicable, with the association of fire services statutory inspections; and handover dates of various works etc. to the Purchaser for approval.

The Bidder shall plan the testing and commissioning programme to minimize the overlapping of different tests to be arranged simultaneously in different locations.

5.6 GENERAL TESTING AND COMMISSIONING REQUIREMENTS

The Bidder shall commission the installation and carry out complete performance tests for all components and equipment installed by him, making all necessary adjustments and checking the operation of all equipment and devices in accordance with the international standards, and the manufacturers' instructions and up to the satisfaction of the Purchaser.

The inspections, tests and examinations of the installation shall be undertaken by the experienced Engineers who are employed by the Bidder. The work of inspection, test and examination shall comply with the requirements stipulated in standards and manufacturer recommendations.

Any defect of installation, configuration, workmanship, materials and performance which become apparent during testing and commissioning shall be rectified by the Bidder at no additional cost to the Purchaser. This particular part of testing and commissioning procedures shall be repeated at the Bidder's expenses.

5.7 HANDOVER INSPECTION

The Bidder shall carry out detailed inspections for all components and equipment installed by him, and make all necessary checking including operational settings for all equipment and systems in accordance with the instructions and recommendations from the manufacturer and to the satisfaction of the Purchaser before the handover of the complete installation.

5.8 COMPLETION

As soon as the IT products and installation services have, in the opinion of the Supplier, been delivered, pre-commissioned, and made ready for Commissioning and Operational Acceptance Testing in accordance with the Schedule of Requirements, and the Agreed and Finalized Project Plan, the Supplier shall so notify the Purchaser in writing.

The project manager shall, within 14 days after receipt of the Bidder's notice, either issue an Installation Certificate in the form specified in the Sample Forms Section in the Bidding Documents, stating that the installation of the IT products has been achieved by the date of the Supplier's notice, or notify the Bidder in writing of any defects and/or deficiencies, including, but not limited to, defects or deficiencies in the interoperability or integration of the various components making up the IT products and installation services. The Bidder shall use all

reasonable endeavors to promptly remedy any defect and/or deficiencies that have been notified to the Bidder by the project manager. The Bidder shall then promptly carry out retesting of the IT products and installation services and, when in the Bidder's opinion they are ready for Commissioning and Operational Acceptance Testing, notify the Purchaser in writing. The procedure shall be repeated, as necessary, until the Installation Certificate is issued.

If the project manager fails to issue the Installation Certificate and fails to inform the Bidder of any defects and/or deficiencies within 14 days after receipt of the Bidder's notice, or if the Purchaser puts the IT products and installation services into production operation, then the IT products and installation services shall be deemed to have achieved successful installation as of the date of the Bidder's notice or repeated notice, or when the Purchaser put the IT products and installation services into production operation, as the case may be.

5.9 AS-BUILT DRAWINGS/MAINTENANCE MANUAL CHECKLIST

Following shall constitute as a minimum:

i.   As -Built Drawings
ii.   List of drawings
iii.   Electrical power & data cabling Layouts of all data racks.
iv.   Manufacturer's As-built Drawings
v.   Circuit Labeling Sheets
vi.   Data Cables Labelling Sheets
vii.   Cable Schedule
viii.   Equipment name plate data
ix.   Equipment Installation Test
x.   Equipment (Factory & Field Commissioning)
xi.   Cable (Factory & Field)
xii.   Technical Literature of Installed Equipment Including User/Maintenance Manuals

SOW for VMware and Veeam

- Solution based Training for 4 persons for minimum 8 days before Project deployment.

    - o VMware vCloud Suite, Tanzu Standard – Setup, Install and Features - 5 Days Hands On
    - o Veeam Availability Suite v11 - Features – Setup and Install - 4 Days Hands On

    - o On-Site/Remote VMware/Veeam Software based SLA for 3 year - Including Software upgradation Service & Health Check Service.
- Installation of 30+ Windows Server based Virtual Machines
- Installation of 20+ ESXi 7.x OS
- Installing Configuring an ESXi Host as per best practices
- Installing/deploying/Configuring vCenter Server Infrastructure with HA
- Installation, configuration of all components of vCloud Suite
- Installation and configuration of vmware management cluster
- Configuration of System parameters for vCenter Server Infrastructure
- Local Backup of vCenter Server Appliance
- Remote backup of vCenter Server Appliance
- Remote replication of vCenter Server Appliance if required
- Configuring vSphere Update Manager
- Host Mapping with vCenter Server
- Applying specific affinity rules where required.
- FC Mapping with Servers with Datastore Mapping
- Creating a vSphere Standard Switch with a kernel Network
- Customizing vSphere Standard Switches
- Tweaking vSphere Standard Switch for Load Balancing and Security
- Tuning Virtual Machines for Near Native Physical Server Performance
- Optimizing Virtual Port Groups
- Configuring Kernel Networking
- Customizing Autostart
- Configuration of NTP
- Configuration of SMTP
- Firewall Configuration
- Resource Pool Configuration
- Optimized BIOS Configuration for Servers for VMware
- Adjusting Quedepts. for FC
- Security Users Creation
- Swap Configuration
- Setting IOPS parameters
- IOPS parameters for VM's
- Customizing Logging
- Configuring Virtual Machine Networking
- Configuration of Standard High Availability
- Configuration of Fault Tolerance
- Mapping/Prioritizing of vSwitches
- Tweaking VMware Snapshots for performance for Veeam
- Installation of Windows Server OS for Veeam B&R

- Configuration of Windows Server OS for Veeam B&R Server
- Customizing Windows Server OS for Veeam B&R Server
- Installation of Veeam Backup and Replication Server with Prox. & Rep. & WA
- Configuration of Database for Veeam B&R
- Licensing of Veeam Backup and Replication Server
- Replica Creation of VM's
- Installation Configuration of Veeam ONE/Reporter/Business View
- Storage Optimization for Vmware
- Backup Optimization for Vmware
- Network Optimization for Vmware
- Dedup Configuration for Veeam
- Multipathing with Adapter failure tolerance
- VMware Certified plugins installation for Integrated hardware and software devices/solutions.
- Intelligent Vmware/Hardware connectivity with Storage and Network Devices to avoid Single point of failure.

Note: Bidder should provide the on-site maintenance and support for back-to-back OEM supported warranty with Service Level Agreement of 3 years included in the base price for 24x7x365 with resolution within 4 hours on PSW appointed premises. Resolution beyond 4 hours will be subject to penalty. Bidder/Solution provider should be authorized service partner and should acquire MAF to be submitted with the bid / proposal.

Note: Bidder is responsible for provisioning of support and services required to integrate and assist other solution providers for items that are broken down in other sections / lots and will be liable to provide support in order to integrate the complete setup/functionality required by PSW.

1.0 Blade Chassis

Solution Requirement
- The solution should have software-defined intelligence that can compose to rapidly deploy and update physical compute nodes with operating environments for fast virtualized image changeovers, quick updates, and image compliance.
- Can do Auto-Discovery of Compute, Memory, Storage and Fabrics within a Frame or across multiple connected Chassis.
- Solution should support API to integrate into popular management tools such as Microsoft Systems Center and VMWare vCenter and into open-source automation and DevOps tools such as Chef, Docker and OpenStack.
- Solution should be able to customize OS per deployment plan
- Solution should allow multiple types of Compute, Storage, and fabric components in a variety of configurations to meet the workload requirements

Blade Chassis
- Solution to house the required number of blade servers in smallest number of enclosures.
- Should support full height and half height blades in the same enclosure, occupying not more than 14U rack height
- Should support minimum 8-12 half height servers or 4-6 full height servers
- Should support six interconnect bays to configure 3+3 redundancy
- Enclosure should support Intel Xeon processors based 2 CPU and 4 CPU blades and storage Blades
- Should support built-in management software appliance in redundancy with separate management network from production network
- Should support technology built-in to every chassis for Auto-Discovery of resources
- Chassis should provide display port and USB port to connect Laptop/Monitor and KVM locally
- Should support linking multiple enclosures together to form single management ring to reduce complexity and provide single console of management for connected enclosures
- If Bidder's solution for all half and full height blades can accommodate in less than 4 blade chassis as per BOQ, Bidder is allowed to propose/quote less quantity.

Interconnect Support
- Should support housing of FCoE, Ethernet, FC and SAS interconnect fabrics offering redundancy as a feature. Also, should support network switches with 25/50 GB downlinks and (4) 40/100G QSFP28 uplink per switch to DC switch.

Interconnect Switching
- 4 x Interconnect Switches (ToR) must support 25/50 Gbps downlinks to the Blades in redundancy supporting carving 2 NICs with dual 25/50 Gbps connections per NIC and at least 2 x QSFP28 40G uplinks per switch.
- 2 x Interconnect Switches must support 32 Gbps Fibre Channel downlinks to the Blades in redundancy supporting carving 1 HBA with dual 32Gb downlink per HBA and at least 4 x 32Gb QSFP uplinks per switch.
- Each HBA should support to transport Fiber Channel Block Access at minimum 32 GB/s
- Should support multi-module link aggregation (MLAG) for resiliency against interconnect failure
- If there is a difference in technology (ToR) as per above requirement, OEM/Bidder shall provide the equivalent, appropriate and required switching internal or external.

Power Supplies
- The enclosure should be populated fully with power supplies of the highest capacity available with the vendor. Power supplies should support N+N as well as N+1 redundancy configuration, where N is greater than 1.
- Should offer a single-phase power subsystem enabled with technologies for lower power consumption.

Cooling
- Each blade enclosure should have a cooling subsystem consisting of redundant hot pluggable fans or blowers enabled with technologies for improved power consumption and acoustics

System Software
- Management/controlling software have to be from the OEM.
- Should support auto-discovery of Compute, Memory, Storage and Fabrics within an enclosure or on multiple connected enclosures.
- Should support activity, Health and Power LEDs for immediate status
- Should support software-defined intelligence for configuring profiles to provision compute, storage, fabrics and images
- Should support Firmware and OS Driver updates for the servers using profile templates to monitor, flag, and remediate
- Should offer collaborative user interface which support logical resources to physical resources mapping, Smart Search, Activity Log, HTML5 mobile access, and Customizable Dashboard
- Should provide a dedicated 1/10GbE management network for multi-enclosure communications, separate from data plane
- Should support frictionless Firmware and OS Driver updates using profile templates to monitor, flag, and remediate
- Should support reporting capabilities for;
  - Asset and inventory information for the devices in the enclosures

- o Thermal and power information, including real-time actual power usage per server and per enclosure
  - Reports should be exportable to CSV or Microsoft Excel format

Integration with virtualization and open-source software
- Should support integration with popular virtualization offerings VMware vCenter and Microsoft system center or equivalent
- Should support integration with open-source automation and DevOps tools such as Chef, Docker, Kubernetes and OpenStack

1.1 Blade Servers Half Height (2 sockets)

Solution Requirement

CPU	2 x Intel Xeon Platinum 8260 or 8352Y or better
Motherboard	Intel C621 Series Chipset or Equivalent
Memory	8 x 64GB RDIMMs 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots. Server should support 2TB Ram.
Memory Protection	Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,
Storage	2 x 256 GB SSD with OEM recommended RAID 1
Storage Controller	RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 1 GB flash-backed write cache/or equivalent 4 SAS lanes across an internal SAS port 6Gb/s SATA technology Mixed Mode
Networking features	4 * 25/50 Gbps Ethernet Connections to Interconnect Modules
FC features	32Gb Dual Port Fiber Channel Host Bus Adapter PCIe 3.0 x8 NVMe over Fiber Channel Ready
Interfaces	One (1) internal Micro SDHC card slot One (1) internal USB 3.0 connector One (1) external USB port
Bus Slots	Minimum of 3 Nos of x16 PCIe 3.0 based mezzanine slots supporting Converged Ethernet, Ethernet, FC adapters and SAS adaptors

System Security
- Power-on password
- Administrator's password
- Keyboard password
- Remote management On System Management Chipset with SSL encryption, Secure Shell version 2, Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface, AES and RC4 encryption of video or equivalent
- External USB port enable/disable

- Network server mode
- Serial interface control
- TPM (Trusted Platform Module) 1.2 or 2.0 option
- Advanced Encryption Standard (AES)
- Intel® Advanced Encryption Standard-New Instructions (AES-NI)

OS support
- Microsoft Windows Server
- Microsoft Hyper-V Server
- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server
- VMware ESXi
- VMware vSphere

Server Management
- Software should support dashboard view to quickly scan the managed resources to assess the overall health of the data center. It should provide an at-a-glance visual health summary of the resource's user is authorized to view.
- Software should provide automated, policy-driven provisioning of storage resources. It can provision and manage SAN storage used by a server as you manage the server – all as a single resource. It can view and monitor storage systems and their storage pools, Provision new or existing SAN storage volumes for servers
- It can Create volume templates to provision multiple volumes with the same configuration.
- Management software should support integration with popular virtualization platform management software like vCenter, and SCVMM, equivalent
- Should help provide proactive notification of actual or impending component failure alerts on critical components like CPU, Memory and HDD.
- Should provide an online portal that can be accessible from anywhere. The portal should provide one stop, online access to the product, support information and provide information to track warranties, support contracts and status. The Portal should also provide a personalized dashboard to monitor device heath, hardware events, and contract and warranty status. Should provide a visual status of individual devices and device groups. The Portal should be available on premise (at our location - console based).
- Should help to proactively identify out-of-date BIOS, drivers, and Server Management agents and enable the remote update of system software/firmware components.
- The Server Management Software should be of the same brand as of the server supplier.
- Should support shared console.
- Should support USB Media that allows to boot the remote server from the client machine (or anywhere on the client's network),and execute functions remotely.
- Should have Remote System logs record.

1.2   Blade Servers Full Height (4 Socket)

Solution Requirement

CPU	4 x Intel Xeon Platinum 8260 or 8352Y or better
Motherboard	Intel C621 Series Chipset or Equivalent
Memory	32 x 64GB RDIMMs 2933 MT/s or 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots. Server should support 4TB Ram.
Memory Protection	Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,
Storage	2 x 256 GB SSD with OEM recommended RAID 1
Storage Controller	RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache/or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology Mixed Mode
Networking features	4 * 25/50 Gbps Ethernet Connections to Interconnect Modules
FC Features	32Gb Dual Port Fiber Channel Host Bus Adapter PCIe 3.0 x8 NVMe over Fiber Channel Ready
Interfaces	One (1) internal Micro SDHC card slot One (1) internal USB 3.0 connector One (1) external USB port
Bus Slots	Minimum of 6 Nos of x16 PCIe 3.0 based mezzanine slots supporting Converged Ethernet, Ethernet, FC adapters and SAS adaptors

Industry Standard Compliance
- Power-on password
- Administrator's password
- Keyboard password
- Remote management On System Management Chipset with SSL encryption, Secure Shell version 2, Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface, AES and RC4 encryption of video
- External USB port enable/disable
- Network server mode
- Serial interface control
- Advanced Encryption Standard (AES)
- Intel® Advanced Encryption Standard-New Instructions (AES-NI) or equivalent

System Security
- Power-on password
- Administrator's password
- Keyboard password

- Remote management On System Management Chipset with SSL encryption, Secure Shell version 2, Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface, AES and RC4 encryption of video
- External USB port enable/disable
- Network server mode
- Serial interface control
- TPM (Trusted Platform Module) 1.2 or 2.0 option
- Advanced Encryption Standard (AES)
- Intel® Advanced Encryption Standard-New Instructions (AES-NI)

OS support
- Microsoft Windows Server
- Microsoft Hyper-V Server
- Red Hat Enterprise Linux
- SUSE Linux Enterprise Server
- VMware ESXi
- VMware vSphere

Server Management
- Software should support dashboard view to quickly scan the managed resources to assess the overall health of the data center. It should provide an at-a-glance visual health summary of the resource's user is authorized to view.
- Software should provide automated, policy-driven provisioning of storage resources. It can provision and manage SAN storage used by a server as you manage the server – all as a single resource. It can view and monitor storage systems and their storage pools, Provision new or existing SAN storage volumes for servers
- It can Create volume templates to provision multiple volumes with the same configuration.
- Management software should support integration with popular virtualization platform management software like vCenter, and SCVMM, equivalent
- Should help provide proactive notification of actual or impending component failure alerts on critical components like CPU, Memory and HDD.
- Should provide an online portal that can be accessible from anywhere. The portal should provide one stop, online access to the product, support information and provide information to track warranties, support contracts and status. The Portal should also provide a personalized dashboard to monitor device heath, hardware events, and contract and warranty status. Should provide a visual status of individual devices and device groups. The Portal should be available on premise (at our location - console based).
- Should help to proactively identify out-of-date BIOS, drivers, and Server Management agents and enable the remote update of system software/firmware components.

- The Server Management Software should be of the same brand as of the server supplier.
- Should support shared console.
- Should support USB Media that allows to boot the remote server from the client machine (or anywhere on the client's network),and execute functions remotely.

2.0   Rack Mount Server for Production Database

Solution Requirement

CPU	2 x Intel Xeon Platinum 8268 or 8352Y or better
Motherboard	Intel C621 Series Chipset or Equivalent
Memory	16 x 64GB RDIMMs 3200 MT/s or Equivalent. Should support at least 48 x DIMM slots. Server should support 4TB Ram.
Memory Protection	Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,
microSD Flash Memory Card	32GB microSD Flash Memory Card
Storage Controller	RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology
Networking features	2 x Ethernet 10/25Gb 2-port SFP28 Adapter
SSD	2 x 1.92TB SAS 12G Mixed Use SFF SSD
NVMe - SFF - Solid State Drives	1 x 750GB+ NVMe Gen3+ High Performance Low Latency Write Intensive SFF (HHHL form factor, PCI 3.0 x 4) or higher capacity
Fiber Channel features	2 x 32Gb Single Port Fiber Channel Host Bus Adapter
Interfaces	One (1) internal Micro SDHC card slot Two (2) rear, Two (2) front, One USB connector One (1) serial port One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)
Bus Slots	Support for 12 PCIe 3.0 slots
Optical Drive	None
Fans	8 hot plug fans, n+1 redundant or as per OEM Design equivalent
Cable Management and Railing Kit	Should have 1 Cable Management arm with railing Kit
Power Supply	Fully redundant 1500W+ Power supply or as per OEM Design Equivalent
Form Factor	Minimum 2U+

3.0   Rack Mount Server for Production Reporting

Solution Requirement

CPU	2 x Intel Xeon Platinum 8268 or 8352Y or better
Motherboard	Intel C621 Series Chipset or Equivalent
Memory	8 x 64GB RDIMMs 3200 MT/s or Equivalent. Should support at least 48 x DIMM slots. Server should support 4TB Ram.
Memory Protection	Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,
microSD Flash Memory Card	32GB microSD Flash Memory Card
Storage Controller	RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology
Networking features	2 x Ethernet 10/25Gb 2-port SFP28 Adapter
SSD	2 x 960GB SAS 12G Mixed Use SFF SSD
NVMe - SFF - Solid State Drives	1 x 750GB+ NVMe Gen3+ High Performance Low Latency Write Intensive (HHHL form factor, PCI 3.0 x 4) or higher capacity
Fiber Channel features	2 x 32Gb Single Port Fiber Channel Host Bus Adapter
Interfaces	One (1) internal Micro SDHC card slot Two (2) rear, Two (2) front USB connector One (1) serial port One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)
Bus Slots	3 PCIe 3.0 slots available, support for 14 PCIe 3.0 slots
Optical Drive	None
Fans	8 hot plug fans, n+1 redundant or as per OEM Design equivalent
Cable Management and Railing Kit	Should have 1 Cable Management arm with railing Kit
Power Supply	Fully redundant 1500W+ Power supply or as per OEM Design Equivalent
Form Factor	Minimum 2U+

4.0   Rack Mount Server for Production Backup Server

Solution Requirement

CPU	2 x Intel Xeon 8253 or 6326 or better
Motherboard	Intel C621 Series Chipset or Equivalent
Memory	2 x 16GB RDIMMs 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots.
Memory Protection	Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,
Storage Controller	RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology VMware Virtual SAN certified Mixed Mode
SSD	2 x 960GB SAS 12G Mixed Use SFF SSD
Networking features	2 x Ethernet 10/25Gb 2-port SFP28 Adapter
Fiber Channel features	2 x 32Gb Dual Port Fiber Channel Host Bus Adapter
Interfaces	One (1) internal Micro SDHC card slot Two (2) rear, One (1) front USB connector One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)
Bus Slots	support for 6 PCIe 3.0 slots
Optical Drive	None
Fans	6 hot plug fans, N+1 redundant or as per OEM Design equivalent
Cable Management and Railing Kit	Should have 1 Cable Management arm with railing Kit
Power Supply	Fully redundant 800W Power supply or as per OEM Design Equivalent

5.0   Rack Mount Server for Production Data Warehouse

Solution Requirement

CPU	4 x Intel Xeon Platinum 8268 or 8352Y or better
Motherboard	Intel C621 Series Chipset or Equivalent
Memory	32 x 64GB RDIMMs 3200 MT/s or Equivalent Should support at least 48 x DIMM slots. Server should support 4TB Ram.
Memory Protection	Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,
microSD Flash Memory Card	32GB microSD Flash Memory Card
Storage Controller	RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology
Networking features	2 x Ethernet 10/25Gb 2-port SFP28 Adapter
SSD	2 x 960GB SAS 12G Mixed Use SFF SSD
Fiber Channel features	2 x 32Gb Single Port Fiber Channel Host Bus Adapter
Interfaces	One (1) internal Micro SDHC card slot Two (2) rear, Two (2) front USB connector One (1) serial port One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)
Bus Slots	Support for 3 PCIe 3.0 slots
Optical Drive	None
Fans	8 hot plug fans, N+1 redundant or as per OEM Design equivalent
Cable Management and Railing Kit	Should have 1 Cable Management arm with railing Kit
Power Supply	Fully redundant 1500W+ Power supply or as per OEM Design Equivalent
GPU	should support NVidia GPU accelerator cards by OEM

6.0   Rack Mount Server for Production IRMS

Solution Requirement

CPU	2 x Intel Xeon Platinum 8268 or 8352Y or better
Motherboard	Intel C621 Series Chipset or Equivalent
Memory	8 x 64GB RDIMMs 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots.
Memory Protection	Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,
microSD Flash Memory Card	32GB microSD Flash Memory Card
Storage Controller	RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology
SSD	2 x 960GB SAS 12G Mixed Use SFF SSD
Networking features	2 x Ethernet 10/25Gb 2-port SFP28 Adapter
Fiber Channel features	2 x 32Gb Single Port Fiber Channel Host Bus Adapter
Interfaces	One (1) internal Micro SDHC card slot Two (2) rear, One (1) front USB connector One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)
Bus Slots	Support for 6 PCIe 3.0 slots
Optical Drive	None
Fans	6 hot plug fans, Nn+1 redundant or as per OEM Design equivalent
Cable Management and Railing Kit	Should have 1 Cable Management arm with railing Kit
Power Supply	Fully redundant 800W Power supply or as per OEM Design Equivalent

7.0   Rack Mount Server for Production Dev-QA – Database

Solution Requirement

CPU	2 x Intel Xeon Platinum 8353H or better
Motherboard	Intel C621 Series Chipset or Equivalent
Memory	2 x 16GB RDIMMs 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots.
Memory Protection	Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,
microSD Flash Memory Card	32GB microSD Flash Memory Card
Storage Controller	RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology
SSD	2 x 960GB SAS 12G Mixed Use SFF SSD
Networking features	2 x Ethernet 10/25Gb 2-port SFP28 Adapter
Fiber Channel features	2 x 32Gb Single Port Fiber Channel Host Bus Adapter
Interfaces	One (1) internal Micro SDHC card slot Two (2) rear, One (1) front USB connector One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)
Bus Slots	Support for 4 PCIe 3.0 slots
Optical Drive	None
Fans	6 hot plug fans, N+1 redundant or as per OEM Design equivalent
Cable Management and Railing Kit	Should have 1 Cable Management arm with railing Kit
Power Supply	Fully redundant 800W Power supply or as per OEM Design Equivalent

8.0   Rack Mount Server for Production Dev-QA - PA Model Server

Solution Requirement

CPU	2 x Intel Xeon Platinum 8268 or 8352Y or better
Motherboard	Intel C621 Series Chipset or Equivalent
Memory	2 x 64GB RDIMMs 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots.
Memory Protection	Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,
microSD Flash Memory Card	32GB microSD Flash Memory Card
Storage Controller	RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology
SSD	2 x 960GB SAS 12G Mixed Use SFF SSD
Networking features	2 x Ethernet 10/25Gb 2-port SFP28 Adapter
Fiber Channel features	2 x 32Gb Single Port Fiber Channel Host Bus Adapter
Interfaces	One (1) internal Micro SDHC card slot Two (2) rear, One (1) front USB connector One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)
Bus Slots	Support for 6 PCIe 3.0 slots
Optical Drive	None
Fans	6 hot plug fans, N+1 redundant or as per OEM Design equivalent
Cable Management and Railing Kit	Should have 1 Cable Management arm with railing Kit
Power Supply	Fully redundant 1500W+ Power supply or as per OEM Design Equivalent
GPU	Should support NVidia GPU accelerator cards by oem

9.0   Rack Mount Server for Production Dev-QA - Warehouse Server

Solution Requirement

CPU	2 x Intel Xeon Platinum 8268 or 8352Y or better
Motherboard	Intel C621 Series Chipset or Equivalent
Memory	2 x 32GB RDIMMs 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots.
Memory Protection	Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,
microSD Flash Memory Card	32GB microSD Flash Memory Card
Storage Controller	RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology
SSD	2 x 960GB SAS 12G Mixed Use SFF SSD
Networking features	2 x Ethernet 10/25Gb 2-port SFP28 Adapter
Fiber Channel features	2 x 32Gb Single Port Fiber Channel Host Bus Adapter
Interfaces	One (1) internal Micro SDHC card slot Two (2) rear, One (1) front USB connector One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)
Bus Slots	Support for 6 PCIe 3.0 slots
Optical Drive	None
Fans	6 hot plug fans, N+1 redundant or as per OEM Design equivalent
Cable Management and Railing Kit	Should have 1 Cable Management arm with railing Kit
Power Supply	Fully redundant 800W Power supply or as per OEM Design Equivalent

10.0 Rack Mount Server for Production Dev-QA - Reserved Server

Solution Requirement

CPU	2 x Intel Xeon Platinum 8268 or 8352Y or better
Motherboard	Intel C621 Series Chipset or Equivalent
Memory	8 x 64GB RDIMMs 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots.
Memory Protection	Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,
microSD Flash Memory Card	32GB microSD Flash Memory Card
Storage Controller	RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology
SSD	2 x 960GB SAS 12G Mixed Use SFF SSD
Networking features	2 x Ethernet 10/25Gb 2-port SFP28 Adapter
Fiber Channel features	2 x 32Gb Single Port Fiber Channel Host Bus Adapter
Interfaces	One (1) internal Micro SDHC card slot Two (2) rear, One (1) front USB connector One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)
Bus Slots	Support for 6 PCIe 3.0 slots
Optical Drive	None
Fans	6 hot plug fans, N+1 redundant or as per OEM Design equivalent
Cable Management and Railing Kit	Should have 1 Cable Management arm with railing Kit
Power Supply	Fully redundant 800W Power supply or as per OEM Design Equivalent

11.0 Rack Mount Server for Production Management Server

Solution Requirement

CPU	2 x Intel Xeon 8253 or 6326 or better
Motherboard	Intel C621 Series Chipset or Equivalent
Memory	2 x 16GB RDIMMs 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots.
Memory Protection	Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,
microSD Flash Memory Card	32GB microSD Flash Memory Card
Storage Controller	RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology
SSD	2 x 960GB SAS 12G Mixed Use SFF SSD
Networking features	2 x Ethernet 10/25Gb 2-port SFP28 Adapter
Interfaces	One (1) internal Micro SDHC card slot Two (2) rear, One (1) front USB connector One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)
Bus Slots	Support for 6 PCIe 3.0 slots
Optical Drive	None
Fans	6 hot plug fans, N+1 redundant or as per OEM Design equivalent
Cable Management and Railing Kit	Should have 1 Cable Management arm with railing Kit
Power Supply	Fully redundant 800W Power supply or as per OEM Design Equivalent

12.0 Storage Solution for Virtualized Hosts

- Offered Storage array shall be end-to end 12Gbps enabled which means that both Front-end Fiber channel ports and Back-end engines shall be operated at minimum 12Gbps speed.
- Consolidated dashboard and alerting
- Thin Provisioning
- Deduplication/Compression
- Quality of Service
- VVols
- (NVMe) All-Flash Array Storage

Operating System & Clustering Support
- The storage array should support industry-leading Operating System platforms including: Windows 2016/2019, VMware, Solaris, HP-UX, IBM AIX and Linux.

Capacity & Scalability
- 102TB usable capacity on Hypervisor required with high performance low latency (< 2 ms) drives with RAID protection and 3 Hot Spares for protection with minimum 150,000 IOPS.

Cache
- Offered Storage Array shall be given with minimum of 192GB usable with dual controller
- Cache shall exclude any performance acceleration module, Flash Cache, PAM card, SSD Cache

Architecture & Processing Power
- Controllers shall be true active-active so that a single logical unit can be shared across all offered controllers in symmetrical fashion, while supporting all the major functionalities like Thin Provisioning. End to End NVMe should be supported.

  Each storage processor should connect to one side of each of two redundant pairs of four-lane x 12 Gb/s Serial Attached SCSI (SAS) buses or RDMA/IB/PCIe, providing continuous drive access to hosts in the event of a storage processor or bus fault.

No Single point of Failure
- Offered Storage Array shall be configured in a No Single Point of configuration including Array Controller card, Cache memory, FAN, Power supply etc.

Raid Support & Virtualization
- Offered Storage Subsystem shall support Raid 5 & 6 or better.
- Offered storage array shall have native VMware/Virtualization support

Data Protection
- In case of Power failure, Storage array shall have de-stage feature to avoid any data loss.

Protocols
- Offered Storage array shall support all well-known protocols like FC, iSCSI, VMware Virtual Volumes (VVols) FC & ISCSI, etc.

Host Ports and Back-end Ports
- Offered Storage shall have minimum of 16 host ports for connectivity to servers running at 32Gbps speed without SAN Switches.
- Offered storage shall have 16 number of SAS Back-end lanes running at 12Gbps speed.
- The offered storage should support min of 512 Hosts.
- 4 x 10 GbE SFP+ for Ethernet

Hot Spare
- Offered Storage Array shall support hot Spare for offered Disk drives.

Performance and Quality of service
- Should have capability to expand LUN till 256 TB or more.

Thin Provisioning and Space optimization
- Offered storage array shall support thin provisioning.
- Offered Storage array shall support data reduction feature of De-duplication and Compression.
- Offered storage array shall be tightly integrated with VMware so that Eager zero disks layout can be used with thin provisioning.

Snapshot / Point in time copy / Thin Clone
- Offered Storage shall have support to make the snapshot and full copy (Clone) on the volumes if original volume is created on thick or vice-versa.
- The storage array should have support for both controller-based snapshots functionality (At-least 1000 attached snapshots).

Storage Array Configuration & Management Software
- Vendor shall provide Storage Array configuration and Management software.
- Software shall be able to manage more than one array of same family.

Remote Replication
- Native Asynchronous Block
- Native Synchronous Block
- The storage array should support hardware-based data replication at the array controller level across all models of the offered family.
- Replication shall support incremental replication after resumption from Link Failure or failback situations.

Virtualization Support

- VMware Site Recovery Manager (SRM) Integration
- Virtualization API Integration: VMware: VAAI and VASA. Hyper-V: Offloaded Data Transfer (ODX) and Offload Copy for File

13.0 Storage Solution for Physical Servers

- Offered Storage array shall be end-to end 12Gbps enabled which means that both Front-end Fiber channel ports and Back-end engines shall be operated at minimum 12Gbps speed.
- Consolidated dashboard and alerting
- Thin Provisioning
- Deduplication/Compression
- Quality of Service
- VVols
- (NVMe) All-Flash Array Storage

Operating System & Clustering Support

- The storage array should support industry-leading Operating System platforms including: Windows 2012, Windows 2016, VMware, Solaris, HP-UX, IBM AIX and Linux.

Capacity & Scalability

- 100TB usable capacity on Hypervisor required with high performance low latency (< 2 ms) drives with RAID protection and 3 Hot Spares for protection with minimum 150,000 IOPS

Cache

- Offered Storage Array shall be given with minimum of 192GB controller cache with dual controller
- Cache shall exclude any performance acceleration module, Flash Cache, PAM card, SSD Cache

Architecture & Processing Power

- Controllers shall be true active-active so that a single logical unit can be shared across all offered controllers in symmetrical fashion, while supporting all the major functionalities like Thin Provisioning. End to End NVMe should be supported.

  Each storage processor should connect to one side of each of two redundant pairs of four-lane x 12 Gb/s Serial Attached SCSI (SAS) buses or RDMA/IB/PCIe, providing continuous drive access to hosts in the event of a storage processor or bus fault.

No Single point of Failure

- Offered Storage Array shall be configured in a No Single Point of configuration including Array Controller card, Cache memory, FAN, Power supply etc.

Raid Support & Virtualization

- Offered Storage Subsystem shall support Raid 5 & 6 or better.

- Offered storage array shall have native VMware/Virtualization support

Data Protection
- In case of Power failure, Storage array shall have de-stage feature to avoid any data loss.

Protocols
- Offered Storage array shall support all well-known protocols like FC, iSCSI, VMware Virtual Volumes (VVols) FC & ISCSI etc.

Host Ports and Back-end Ports
- Offered Storage shall have minimum of 16 host ports for connectivity to servers running at 32Gbps speed without SAN Switches.
- Offered storage shall have 16 number of SAS Back-end lanes running at 12Gbps speed.
- The offered storage should support min of 512 Hosts.
- 4 x 10 GbE SFP+ for Ethernet

Hot Spare
- Offered Storage Array shall support hot Spare for offered Disk drives.

Performance and Quality of service
- Should have capability to expand LUN till 256 TB or more.

Thin Provisioning and Space optimization
- Offered storage array shall support thin provisioning.
- Offered Storage array shall support data reduction feature of De-duplication and Compression.
- Offered storage array shall be tightly integrated with VMware so that Eager zero disks layout can be used with thin provisioning.

Snapshot / Point in time copy / Thin Clone
- Offered Storage shall have support to make the snapshot and full copy (Clone) on the volumes if original volume is created on thick or vice-versa.
- The storage array should have support for both controller-based snapshots functionality (At-least 1000 attached snapshots).

Storage Array Configuration & Management Software
- Vendor shall provide Storage Array configuration and Management software.
- Software shall be able to manage more than one array of same family.

Remote Replication
- Native Asynchronous Block
- Native Synchronous Block
- The storage array should support hardware-based data replication at the array controller level across all models of the offered family.

- Replication shall support incremental replication after resumption from Link Failure or failback situations.

Virtualization Support
- VMware Site Recovery Manager (SRM) Integration
- Virtualization API Integration: VMware: VAAI and VASA. Hyper-V: Offloaded Data Transfer (ODX) and Offload Copy for File

14.0 Purpose Built Backup Appliance

- Purpose built storage optimized for backup
- Consolidated dashboard and alerting
- Native in-line Deduplication/Compression
- Ransomware Protection
- Ability to flexibly emulate tape drive/ multiple tape formats LTO-Gen5, LTO-Gen6, and LTO-Gen7 etc.
- Offered Backup appliance shall be compatible/support to work with Backup application vendor ISV like HPE, Veritas, Dell-EMC, Veeam, Commvault or equivalent etc.

Operating System & Clustering Support
- The storage array should support industry-leading Operating System platforms including: Windows 2019, VMware, Solaris, HP-UX, IBM AIX and Linux.

Capacity & Scalability
- 200TB useable or more backup capacity without deduplication and compression to be published on backup server.
- 20 GB frontend licensing to be considered
- Dual Spare drive(s) as per Manufacturer best practices.
- The storage array should support up to 3 PB capacity

Architecture & Processing Power
- Native inline, variable length global deduplication
- Connectivity Requirement
    - 2 x 25Gb SFP
    - 4 x 1GbE
- Can sustain 20TB/hr or more backup processing
- 2 x 32Gb Fiber Channel adapter with required Cables

No Single point of Failure
- Offered Backup appliance shall be configured in a No Single Point of configuration including FAN, Power supply etc.

Raid Support & Virtualization
- Offered backup appliance shall support Raid 1, 5 and Raid 6 and/ or as per OEM best practices
- Offered backup appliance shall have native VMware/Virtualization for backup/data protection

Data Protection
- In case of Power failure, backup appliance shall have feature to avoid any data loss.

Host Ports and Back-end Ports

- Offered Backup Storage shall have minimum of 8 host ports for connectivity to servers.

Hot Spare
- Offered Backup appliance shall be provided with hot spare drives as per the OEM/industry best practices.

Space optimization
- Offered Backup Appliance shall support data reduction feature of In-line De-duplication and Compression.

Storage Array Configuration & Management Software
- Vendor shall provide Backup Appliance configuration and Management software.
- Software shall be able to manage more than one appliance of same family from a single centralized console/dashboard.

Remote Replication
- Should provide replication including bandwidth throttling
- Replication shall support network optimized replication in all topologies e.g. 1:1, 1:many, many:1.
- Offered disk-based backup device shall also support encryption functionality.
- Offered backup Appliance Fiber channel ports shall support connectivity of servers either directly or via SAN switches while supporting the both source and Target based de-duplication.

15.0 SAN Switches

- 48 ports -32Gb FC Switches
- LC/LC Multi-mode OM4 2 Fiber 5m or suggested Cable for all Servers, Storage, Backup Storage, Tape Library for FC connectivity
- Each FC Switch must have 48 active(Loaded) ports with required Short Wave QSFP.
- Hot plug, redundant power supplies and fans
- Should be NVMe-ready.
- ISL Trunking
- Proactively and non-intrusively monitors storage device IO performance and behavior through integrated network sensors at the storage tier, providing deep insight into problems and ensuring service levels
- Should provide policy-based monitoring tool with pre-built rules and automation that simplifies fabric-wide threshold configuration and monitoring. Configuration and Operational Monitoring Policy
- Should have a software that simplifies deployment, safeguards consistency, and increases operational efficiencies of larger environments with automated switch and fabric configuration services. Administrators can configure a template or adopt an existing configuration to seamlessly deploy a configuration across the fabric.
- Capable of optical and signal integrity for Fiber Channel optics and cables, simplifying deployment and support of high-performance fabrics.
- Should have a comprehensive tool that enables administrators to identify, monitor, and analyze specific application data flows in order to simplify troubleshooting, maximize performance and avoid congestion without using taps to ensure optimized performance
- Should have a simple browser-based user interface (UI) streamlining common workflows, such as configuration, zoning, deployment, troubleshooting, and reporting
- Max AC Power Consumption 205 W per switch or equivalent
- Back-to-front airflow (non-port-side intake); power from back, 1U

Management access

- 10/100/1000 Mbps Ethernet (RJ-45), in-band over Fiber Channel, serial port (RJ-45 or min-USB), and one USB port The console/serial port may be an RJ-45 or a mini-USB depending on model. The correct cables and adapters are to be provided to connect to either an RJ-45 or RS-232

Security

- DH-CHAP (between switches and end devices), FCAP switch authentication; HTTPS, IPsec, IP filtering, LDAP with IPv6, OpenLDAP, Port Binding,

RADIUS, TACACS+, user-defined Role-Based Access Control (RBAC), Secure Copy (SCP), Secure RPC, Secure Syslog, SFTP, SSH v2, SSL, Switch Binding,
Trusted Switch, Secure boot, TLS v1.2/v1.3

16.0 KVM Switches

- Should have remote management of all servers, network devices, and technology infrastructure.
- 1U Rack Mount LCD KVM Console features an integrated 16 Port Multi-Platform IP KVM Switch module.
- 16-port KVM Switch with 17-in. LCD, keyboard and touchpad
- Connect and control up to 256 computers locally or remotely
- KVM switches should provide Smart Card or Common Access Card (CAC) support to the server
- Should support two-factor authentication
- Should include full remote KVM functionality for full remote KVM control of servers and serially attached devices at near local performance
- Can eeasily load and update software and firmware from anywhere on the LAN or WAN
- Web-based control allows client access using a standard browser - eliminating licensing costs and simplifying usage

Console Kit

- Rackmount Console Kit with support of high-performance KVM console
- Form Factor 1U
- Should allow a KVM console switch to be mounted directly behind it
- Should support 1600 x 1200 at 60 to 75 Hz refresh rates
- 1 Cable management arm, power adapter with brace rail
- 1U Console Rails

17.0 Tape Library

- Form Factor 3U/4U or as per OEM recommended
- Base Module with 40 slots
- 2 x LTO-8 FC Tape Drive
- Rack-mount hardware
- Dual Redundant Power Supply
- Should have a verification software that proactively validates and scans, no disruptively, the quality of data stored on 100 LTO tape cartridges
- Advanced analytics feature makes use of predictive analytics to predict the likelihood of failures, bottlenecks and load balancing issues in the tape infrastructure. It has unique capabilities of analytics around drive health and life as well as cartridge health and life.
- 4 x Cleaning Cartridge
- 2 x LTO-8 RW Bar Code Label Pack

- 2 x LTO-8 30TB RW Non-Custom Labeled Library Pack 20 Data Cartridges with Cases
- Tape Library should be supported with San Switch.

Drive Technology Supported
- LTO-8
- LTO-7
- LTO-6

Maximum Number of Drives
- 20, Maximum Capacity
- 1.2 PB (LTO-8, 40 slots)

Mail Slots
- 5 per unit/module

Data Encryption
- KMIP 1.2 protocol

Drive Interface
- 8 Gb Native Fiber Channel
- 6 Gb/sec SAS
- (4) LC/LC Multi-mode OM4 2 Fiber 5m Cable

Management
- Status information on the drive and system
- System configuration operations and reporting
- System error and status logs
- Library and drive firmware upgrade capabilities
- Diagnostic tests and information
- Cartridge movement for maintenance and management purposes
- Cleaning cartridge support
- Security and access control
- SNMP support for IP communication
- Partitioning and Encryption management
- HTTPS capable
- IPv6 and IPv4 network protocol support

18.0 Rack Mount Server for Ngnix

Solution Requirement

CPU	2 x Intel Xeon Platinum 8268 or 8352M or better
Motherboard	Intel C621 Series Chipset or Equivalent
Memory	4 x 64GB RDIMMs 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots.
Memory Protection	Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,
microSD Flash Memory Card	32GB microSD Flash Memory Card
Storage Controller	RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology
SSD	2 x 1TB M2 NVME SSD
Networking features	2 x Ethernet 10/25Gb 2-port SFP28 Adapter
Interfaces	One (1) internal Micro SDHC card slot Two (2) rear, One (1) front USB connector One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)
Bus Slots	Support for 6 PCIe 3.0 slots
Optical Drive	None
Fans	6 hot plug fans, N+1 redundant or as per OEM Design equivalent
Cable Management and Railing Kit	Should have 1 Cable Management arm with railing Kit
Power Supply	Fully redundant 800W Power supply or as per OEM Design Equivalent

B. Supply, Installation, Configuration, Implementation of Networks and Security solution for PSW.

General Requirement

- All features mentioned should be available from day one. Future or roadmap for items will not be considered.
- All features requested below should be available from day 1 and should be verified at the time of deployment. PSW reserves right to request demo if required during technical valuation.
- All licenses for Switching and Routing should be perpetual. If only subscription licenses are available then 5 years subscription shall be quoted.
- In case local authorized partner/representative (bidder) of a manufacturer/OEM fails to deliver the required services during and after installation/deployment, including but not limited to warranty and/or after sales services related to Operations & Maintenance, the manufacturer/OEM shall be invariably responsible to address the related issue/O&M through its certified and owned technical resources without any extra/additional cost and up to the satisfaction of the purchaser. Written confirmation from the Manufacturer/OEM is required to be submitted in the bid(s) on letter head.
- Foreign training from OEM with certification for each individual system(s) as quoted in the bid (Hardware + Software – both Lots) for 4 persons from ITTMS & PSW technical team at the OEM certified training facility. All boarding/lodging and other expenses are to be covered. It should be OEM training at the certified training facility with certified trainer having industry experience of 10+ years in private and government institutions/organization.
- Any/All equipment quoted should not have end of sale date for 2 years from the date of contract and should not be end of life/support within 5 years from the date of operational acceptance.
- At the time of delivery, product(s) MUST not be announced as End of Life/End of Sale/End of Support. If any product comes under these criteria before the delivery, OEM recommended replacement should be provided / delivered.
- Successful Bidder/Solution Provider is responsible for providing all sort of functional test as specified in the proposed system or subsystem as per manufacturer's guideline, PSW requirement and documentation.
- The Successful bidder/solution provider shall be responsible from the commencement to handover of the complete project on turnkey basis.
- The Successful bidder/solution provider UAT Scripts for complete scope prior to testing. The Successful bidder/solution provider must acquire UAT for completely new systems from PSW
- All Equipment with warranty coverage should have quarterly Preventive Maintenance during warranty coverage timeline.

- Develop Logic, LLD Design and/or Shop Drawings for complete solution.
- Provide a Network Resident Engineer with Mid-level/Professional Certification and 10 years deployment experience for a period of 1 year at PSW office.

Note: Bidder/Solution provider can provide/propose the equivalent Solution / equipment / hardware / software / operating system as requested in below specifications. For any proprietary technology/terminology, Bidder/Solution Provider can provide/propose equivalent or better proprietary technology/terminology as per their proposed equipment/technology as requested in below specifications.

Note: Bidder is responsible for provisioning of support and services required to integrate and assist other solution providers for items that are broken down in lots and will be liable to provide support in order to integrate the complete setup/functionality required by PSW.

Network HLD
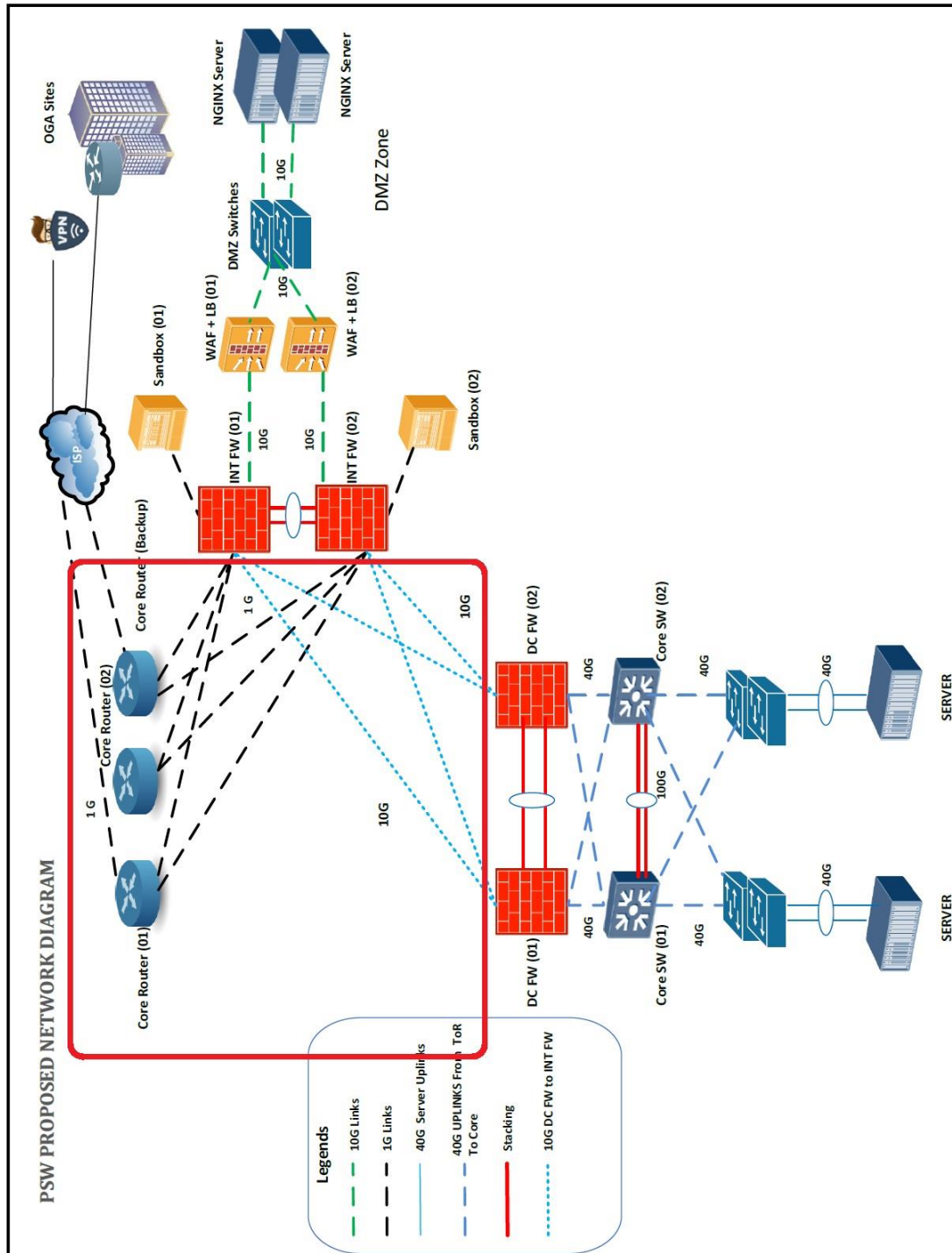
1.0   Core Switch

- Advance Layer 3, Data Center class Chassis switch with at least 8 line card slots, dual redundant supervisors, redundant Advance Layer 3, Data Center class Chassis switch with at least 8 line card slots, dual redundant supervisors, redundant power supplies.
- Switching throughput of the chassis should not be less than 20 Tbps.
- Forwarding throughput capacity of at least 10 Bpps.
- Switch should support cell switching so that a single flow can be load balanced to multiple fabric modules to improve the Fabric modules utilization.
- Switch should support 1:N virtualization. One physical switch can be virtualized into a multiple logical switch.
- Per line card slot bandwidth should be at least 2 Tbps.
- Mac address table should be not less than 32,000.
- IPv4/IPv6 routing table should be at least 50,000.
- Switch should support at least 200 VRFs.
- Switch should support 1G/10G (Fiber/Optical), 25G/40G/100G line cards from day one.
- Switch should support SDN feature from day 1 for future evolution without any change in hardware.
- Switch should be supplied with 36 x 40G/100G QSFP28 ports.
- All SFP/SFP+/QSFP+ modules must be from the Principal OEM.
- Appropriate 40G transceivers shall be used to connect ToR switches and Firewalls.
- Dual redundant supervisor modules should be supported however due to redundant chassis, only 1 supervisor module should be loaded if system functionality and operations are not degraded. If dual supervisor modules are required to achieve full system performance than 2 or more supervisor modules shall be provided.
- Fabric module should support N+1 design. If one fabric module fails, system performance should not downgrade.
- Any accessory not mentioned explicitly in the specs but is required for complete and successful operation of the switch shall be provided with redundancy where applicable (for e.g., Fabric modules, daughter cards etc.).
- Line card slots are for devices connectivity only. Dedicated 8 or above line card slots are required. Supervisor, Fabric modules etc. should not be considered as line card slots.
- Core switches need to be stacked/clustered with technologies such as MLAG, vPC etc. Dual 100G DAC cables or transceivers shall be used to provide this connectivity. If proprietary stacking technology is used than make sure stacking bandwidth should not be less than 200G (400G Full duplex).
- Switch should not be reaching its EoS/EoL date at the time of bidding and procurement.
- Switch should provide advance layer 2, layer 3 functionality from day one. All features relevant to campus and data center core switch should be enabled. Some of them are highlighted below.
- Switch should support 4000 Vlans

- Switch should support VxLAN bridging and routing.
- Switch should support Centralized and Distributed Layer 3 gateway.
- Switch should support distributed layer 3 anycast gateway.
- Switch should support symmetric IRB distributed layer 3 gateway.
- EVPN should be supported with clustering technology OEM is providing.
- Switch should support iBGP and eBGP for EVPN.
- Switch should support MAC Mobility.
- Switch should support extensions of MP-BGP for EVPN
- Switch should support multicast over VxLAN or equivalent functionality.
- Switch should support packet storm protection
- Switch should support for advance QoS, rate limiting, 802.1p, port based rate limiting
- Switch should support for Radius/TACACS+
- Switch should support for 802.1ab – LLDP, CDP or equivalent functionality
- Switch should support for VRRP
- Switch should support for sFlow/Netflow/Jflow or equivalent functionality
- Switch should support for UDLD / DLDP or equivalent functionality
- Switch should support for Dual stack - IPv4 and IPv6
- Switch should support for SNMP v2c/v3
- Switch should support for 802.3x
- Switch should support for 802.3az
- Switch should support for STP + RSTP + MSTP + RPVST+ or equivalent functionality
- Switch should support for Policy based Routing
- Switch should support for Static IP Routing + RIP + OSPFv2 + BGP + MP-BGP
- Switch should support for Static IPv6 Routing + RIPng + OSPFv3 + MP-BGP
- Switch should support for PIM-SM, PIM-DM, MLD
- Switch should support for ECMP
- Switch should support for access control lists
- Switch should support for Port mirroring
- Switch should support for Telnet / SSHv2

2.0   ToR Switches

- Advance Layer 3, Data Center class ToR switch, redundant power supplies.
- Switching throughput of the switch should be at least 3.5 Tbps or above
- Forwarding throughput capacity of at least 900 Mpps or better
- Mac address table should be not less than 32,000.
- IPv4/IPv6 routing table should be at least 32,000.
- Switch should support at least 200 VRFs.
- Switch should support at least 48x10G/25G SFP28 ports.
- Switch should support minimum 4 or above 100G/40G QSFP28 ports.
- All SFP/SFP+/QSFP+ modules must be from the Principal OEM.
- Any accessory not mentioned explicitly in the specs but is required for complete and successful operation of the switch shall be provided with redundancy where applicable (for e.g. Fabric modules, daughter cards etc).
- ToR switches need to be stacked/clustered with technologies such as MLAG, vPC etc. Dual 100G DAC cables or transceivers shall be used to provide this connectivity. If proprietary stacking technology is used than make sure stacking bandwidth should not be less than 200G (400G Full duplex).
- Switch should not be reaching its EoS/EoL date at the time of bidding and procurement.
- Switch should provide advance layer 2, layer 3 functionality from day one. All features relevant to campus and data center core switch should be enabled. Some of them are highlighted below.
- Switch should support SDN feature from day 1 for future evolution without any change in hardware.
- Switch should support 4000 Vlans
- Switch should support VxLAN bridging and routing.
- Switch should support Centralized and Distributed Layer 3 gateway.
- Switch should support distributed layer 3 anycast gateway.
- Switch should support symmetric IRB distributed layer 3 gateway.
- EVPN should be supported with clustering technology OEM is providing.
- Switch should support iBGP and eBGP for EVPN.
- Switch should support MAC Mobility.
- Switch should support extensions of MP-BGP for EVPN
- Switch should support multicast over VxLAN or equivalent functionality.
- Switch should support packet storm protection
- Switch should support for advance QoS, rate limiting, 802.1p, port based rate limiting
- Switch should support for Radius/TACACS+
- Switch should support for 802.1ab – LLDP, CDP or equivalent functionality
- Switch should support for VRRP
- Switch should support for sFlow/Netflow/Jflow or equivalent functionality
- Switch should support for UDLD / DLDP or equivalent functionality
- Switch should support for Dual stack - IPv4 and IPv6
- Switch should support for SNMP v2c/v3
- Switch should support for 802.3x

- Switch should support for 802.3az
- Switch should support for STP + RSTP + MSTP + RPVST+ or equivalent functionality
- Switch should support for Policy based Routing
- Switch should support for Static IP Routing + RIP + OSPFv2 + BGP + MP-BGP
- Switch should support for Static IPv6 Routing + RIPng + OSPFv3 + MP-BGP
- Switch should support for PIM-SM, PIM-DM, MLD
- Switch should support for ECMP
- Switch should support for access control lists
- Switch should support for Port mirroring
- Switch should support for Telnet / SSHv2

3.0   Core Router

- Enterprise grade high performance router with dual redundant supervisor and dual power supplies and should support minimum of 4 expansion slots.
- N+1 Design Topology
- Router should have 8 x 1G Copper ports.
- Router should have 4 x 1G/10G SFP ports.
- Forwarding performance should be atleast 36 Mpps
- IPSec encryption throughput should be atleast 8 Gbps or above
- Router should support minimum of 6000 IPSec tunnels
- Router should support embedded hardware encryption
- Router should support for Data Center Interconnect Technologies such as OTV, VxLAN or equivalent functionality
- Router should support SDN-WAN feature from day 1 for future evolution without any change in hardware.
- Router should support for Packet Storm Protection
- Router should support for sFlow/Netflow/Jflow/ or Equivalent functionality
- Router should support for IPv4 Static Routing/ RIP/OSPF/BGP-4
- Router should support for IPv6 Static Routing /RIPng/OSPFv3/BGP+
- Router should support for BFD
- Router should support for IPv6 Tunneling
- Router should support for NAT / GRE
- Router should support for WAN optimization
- Router should support for Hierarchical QoS
- Router should support for Advance QoS, FIFO, CQ, PQ, WFQ, CBQ, RTPQ
- Router should support for zone based firewall
- Router should support for IPSec VPN
- Router should support for Radius / TACACS+
- Router should support for URPF
- Router should support for Telnet / SSHv2
- Router should support for IGMP, PIM-SM, PIM-DM, MSDP
- Router should support for MP-BGP
- Router should support for HSRP / VRRP
- Router should support for Snmp v1/2/3
- Router should support for FTP/TFTP/SFTP
- Router should support for NTP
- Router should be capable of providing data of service quality measurement and tracking in real time.
- Fully managed with CLI

4.0   Branch Router

- Enterprise Grade Router - Should not be listed under SMB products on the OEM website. OS should be same as of Core Router.
- The OS of branch router and HO router must be same.
- Router should support SDN-WAN feature from day 1 for future evolution without any change in hardware.
- 1G Rj45 LAN ports - 8 at least
- 1G WAN ports - 2 at least
- Forwarding performance - 300 Kpps
- IPSec encryption throughput - 150 Mbps
- Router should support embedded hardware encryption
- Router should support for Packet Storm Protection
- Router should support for sFlow/Netflow/Jflow or equivalent functionality
- Router should support for IPv4 Static Routing/ RIP/OSPF/BGP-4
- Router should support for IPv6 Static Routing /RIPng/OSPFv3/BGP+
- Router should support for DMVPN or equivalent functionality
- Router should support for BFD
- Router should support for IPv6 Tunneling
- Router should support for NAT / GRE
- Router should support for Advance QoS, FIFO, CQ, PQ, WFQ, CBQ, RTPQ
- Router should support for zone-based firewall
- Router should support for IPSec VPN
- Router should support for Radius / TACACS+
- Router should support for URPF
- Router should support for Telnet / SSHv2
- Router should support for IGMP, PIM-SM, PIM-DM,PIM-SSM, MSDP
- Router should support for MP-BGP
- Router should support for HSRP / VRRP
- Router should support for Snmp v1/2/3
- Router should support for FTP/TFTP/SFTP
- Router should support for NTP
- Router should be capable of providing data of service quality measurement and tracking in real time.
- Fully managed with CLI

5.0   **Data Center Firewall**

- The proposed product shall support robust GUI configurations of both IPv4 and IPv6 firewall policies.
- The proposed products should have onboard SSD internal storage for storage of logs, event etc.
- The proposed product must be based on hardware architecture for Security features inspection (NG Firewalling, SSL/TLS inspection, IPS, Antimalware etc) in the hardware.
- The proposed system shall minimally provide management access through:
  - GUI using HTTP or HTTPs access
  - CLI console using console port, SSHv2, telnet or from GUI console
- The administrator authentication shall be facilitated by a local database, PKI & remote services such as Radius, LDAP and TACACS+.
- The proposed product should be able to facilitate administration audits by logging detailed activities to event log - management access and also configuration changes.
- Administrators shall be able to configure both IPv4 and IPv6 DHCP service on an interface of the proposed product.
- Administrators shall be able to configure multiple loopback interfaces on the proposed product.
- Administrators shall be able to configure Secondary IP addresses to an interface
- Administrators shall be able to group interfaces, both physical and virtual, into zones that simplifies the creation of security policies.
- The proposed product shall support static routing and policy-based routing
- The proposed product shall support Open Shortest Path First (OSPF) and Border Gateway Protocol (BGP) for both IPv4 and IPv6.
- The proposed product must support active-passive (failover HA), active-active (load balancing HA) and Clustering.
- The proposed product shall support the upgrade of the firmware without interrupting communication through the cluster
- The proposed product shall support various traffic engineering techniques such as Traffic policing, Traffic shaping and Queuing etc.
- The proposed product shall support clientless and client-based SSL Remote Access VPNs.
- The proposed product shall support IPsec based Remote Access VPNs.
- The proposed product shall support both Route based and policy-based site to site IPsec VPNs.
- The proposed product shall provide Secure sockets layer (SSL) content scanning and inspection abilities that allow organizations to apply antivirus scanning, application control, web/URL filtering, and IPS inspection to encrypted traffic
- The proposed product shall provide the ability to exempt web sites from SSL scanning by site reputation, address, category, or using a whitelist.
- The proposed product shall support content / file filtering feature where exploitable content (within PDF and Microsoft Office files) can be removed and replaced with content that is known to be safe

- The proposed product shall support Advanced Malware Protection for proactive detection and prevention against known and unknown threats.
- The proposed product shall provide ability to allow/monitor, block and quarantine attachments or downloads after malware detection using various technologies:
    - Malware signature database
    - External file analysis with integration with on-prem or cloud-based sandbox service.
    - File checksums query using cloud-based malware database or Equivalent functionality
- The proposed product shall be capable of blocking Botnet server communications.
- The proposed product shall support category based dynamic web filtering by querying real-time cloud-based categorization database.
- The proposed product shall provide ability to use local categories (that override the cloud-based database rating) and remote categories (external URL list) as part of the URL rating function.
- The proposed product shall detect over 4,000+ applications for Application visibility and Control.
- The proposed product shall support custom application detection and control.
- The proposed product's IPS engine shall offer:
    - Signature based detection using real time updated database or equivalent functionality
    - Anomaly based detection that is based on thresholds or equivalent functionality
- The proposed product's IPS database shall have over 8,000+ up-to-date signatures and should support custom IPS signatures. A signature can be selected by searching for its corresponding CVE-ID (if applicable).
- The proposed product shall provide the ability to apply DNS category filtering to control user access to web resources.
- The proposed product shall allow administrator to prevent sensitive data from leaving the network. Administrator shall be able to define sensitive data patterns, and data matching these patterns that will be blocked and/or logged when passing through the unit.
- The proposed product shall support virtual firewalls that divide the Firewall into two or more virtual units that function independently.
- The proposed system shall provide explicit web proxy capabilities for proxying IPv4 and IPv6 HTTP and HTTPS traffic. Security components such as AV scanning, web filtering, IPS, application control, DLP and SSL/SSH inspection can be applied to proxied traffic within the system itself.
- The proposed product shall allow configuration of virtual systems resource limiting and management.
- The proposed product shall support Virtual routing and forwarding (VRF).
- The proposed product shall support various logging facilities:
    - Local memory
    - Local Storage
    - Multiple concurrent syslog servers.
- Analyzer software for monitoring and management of firewall shall be provided.

- o The Proposed reporting appliance virtual/physical should be able to collect and parse logs for NGFW.
- o The proposed reporting solution must support predefined and customized dashboards delivered through a single-pane-of-glass interface for actionable view of threat and log data
- o The proposed reporting solution should have the capability of aiding with threat hunting by tracking details such as such as end user's IP addresses, host name, group, OS, overall threat rating and historical scan of logs against latest threat intelligence
- o The proposed reporting solution should have a capability to forward logs to an external system
- o The proposed reporting solution should have a capability to forward logs to an external system

Firewall Performance/Specs	
Firewall throughput PPS	40 Mpps or above
IPSEC throughput	45Gbps or above
IPS throughput	20Gbps or above
NGFW throughput	16Gbps or above
Threat Protection throughput	15Gbps or above
SSL/TLS inspection throughput	16Gbps
App Control throughput	50 Gbps or above
Concurrent session	20 Million
New sessions/sec	1 Million
Interfaces (Loaded)	Minimum, 4x40G or higher

6.0   Internet Firewall

- The proposed product shall support robust GUI configurations of both IPv4 and IPv6 firewall policies.
- The proposed products should have onboard SSD internal storage for storage of logs, event etc.
- The proposed product must be based on hardware architecture for Security features inspection (NG Firewalling, SSL/TLS inspection, IPS, Antimalware etc) in the hardware.
- The proposed system shall minimally provide management access through:
  - o GUI using HTTP or HTTPs access
  - o CLI console using console port, SSHv2, telnet or from GUI console
- The administrator authentication shall be facilitated by a local database, PKI & remote services such as Radius, LDAP and TACACS+.
- The proposed product should be able to facilitate administration audits by logging detailed activities to event log - management access and also configuration changes.
- Administrators shall be able to configure both IPv4 and IPv6 DHCP service on an interface of the proposed product.
- Administrators shall be able to configure multiple loopback interfaces on the proposed product.
- Administrators shall be able to configure Secondary IP addresses to an interface
- Administrators shall be able to group interfaces, both physical and virtual, into zones that simplifies the creation of security policies.
- The proposed product shall support static routing and policy-based routing
- The proposed product shall support Open Shortest Path First (OSPF) and Border Gateway Protocol (BGP) for both IPv4 and IPv6.
- The proposed product must support active-passive (failover HA), active-active (load balancing HA) and Clustering.
- The proposed product shall support the upgrade of the firmware without interrupting communication through the cluster
- The proposed product shall support various traffic engineering techniques such as Traffic policing, Traffic shaping and Queuing etc.
- The proposed product shall support clientless and client-based SSL Remote Access VPNs.
- The proposed product shall support IPsec based Remote Access VPNs.
- The proposed product shall support both Route based and policy-based site to site IPsec VPNs.
- The proposed product shall provide Secure sockets layer (SSL) content scanning and inspection abilities that allow organizations to apply antivirus scanning, application control, web/URL filtering, and IPS inspection to encrypted traffic
- The proposed product shall provide the ability to exempt web sites from SSL scanning by site reputation, address, category, or using a whitelist.
- The proposed product shall support content / file filtering feature where exploitable content (within PDF and Microsoft Office files) can be removed and replaced with content that is known to be safe
- The proposed product shall support Advanced Malware Protection for proactive detection and prevention against known and unknown threats.

- The proposed product shall provide ability to allow/monitor, block and quarantine attachments or downloads after malware detection using various technologies:
  - Malware signature database
  - External file analysis with integration with on-prem or cloud-based sandbox service.
  - File checksums query using cloud-based malware database or equivalent functionality
- The proposed product shall be capable of blocking Botnet server communications.
- The proposed product shall support category based dynamic web filtering by querying real-time cloud-based categorization database.
- The proposed product shall provide ability to use local categories (that override the cloud-based database rating) and remote categories (external URL list) as part of the URL rating function.
- The proposed product shall detect over 4,000+ applications for Application visibility and Control.
- The proposed product shall support custom application detection and control.
- The proposed product's IPS engine shall offer:
  - Signature based detection using real time updated database or equivalent functionality
  - Anomaly based detection that is based on thresholds or equivalent functionality
- The proposed product's IPS database shall have over 8,000+ up-to-date signatures and should support custom IPS signatures. A signature can be selected by searching for its corresponding CVE-ID (if applicable).
- The proposed product shall provide the ability to apply DNS category filtering to control user access to web resources.
- The proposed product shall allow administrator to prevent sensitive data from leaving the network. Administrator shall be able to define sensitive data patterns, and data matching these patterns that will be blocked and/or logged when passing through the unit.
- The proposed product shall have an in-built token server that provisions and manages hard and mobile tokens for multi-factor authentication.
- The proposed product shall support virtual firewalls that divide the Firewall into two or more virtual units that function independently.
- The proposed system shall provide explicit web proxy capabilities for proxying IPv4 and IPv6 HTTP and HTTPS traffic. Security components such as AV scanning, web filtering, IPS, application control, DLP and SSL/SSH inspection can be applied to proxied traffic within the system itself.
- The proposed product shall allow configuration of virtual systems resource limiting and management.
- The proposed product shall support Virtual routing and forwarding (VRF).
- The proposed product shall support various logging facilities:
  - Local memory
  - Local Storage
  - Multiple concurrent syslog servers.
- Make/OEM of Internet Firewall shall be different from Data Center firewall.
- Analyzer software for monitoring and management of firewall shall be provided.

- o The Proposed reporting appliance virtual/physical should be able to collect and parse logs for NGFW.
- o The proposed reporting solution must support predefined and customized dashboards delivered through a single-pane-of-glass interface for actionable view of threat and log data.
- o The proposed reporting solution should have the capability of aiding with threat hunting by tracking details such as such as end user's IP addresses, host name, group, OS, overall threat rating and historical scan of logs against latest threat intelligence
- o The proposed reporting solution should have a capability to forward logs to an external system

- Firewall shall provide Remote Access VPN services to remote clients using software VPN client compatible with Windows 10/Android/iOS and/or upcoming latest versions. This VPN should be configured with 2 Factor Authentication. Industry standard 2FA should be provided as part of this solution.
  - o VPN users : 10,000 at least

Firewall Performance/Specs	
Firewall throughput	40Gbps or above
IPSEC throughput	45Gbps or above
IPS throughput	10Gbps or above
NGFW throughput	7Gbps or above
Threat Protection throughput	6Gbps or above
SSL/TLS inspection throughput	6Gbps
App Control throughput	13Gbps
Concurrent session	6 Million
New sessions/sec	400,000
Interfaces (loaded)	Minimum 6 x10G SFP+,5xSFP ports, 2x40G

7.0   **Load Balancer**

- The proposed ADC solution should be Hardware based appliance.
- The proposed hardware appliance should support 10 Gbps of L7 throughput from Day one .
- The proposed ADC solution should support 16GB RAM from Day one
- The ADC appliance should support minimum 200GB enterprise class SSD disk from Day one
- The proposed solution Should support 0.4 Million L7 HTTP Requests per Sec
- The proposed solution Should support minimum 4000 SSL TPS at 2K for SSL offloading
- The proposed solution should support minimum 1700 ECDHE TPS for SSL offloading
- The proposed appliance should support at least 2 x 10GE SFP+ interfaces
- The proposed solution should support at least 6 x 10/100/1000 Copper interfaces
- The proposed solution should support AC dual power supply from Day one
- The system must be able to act as a Reverse Proxy
- The system must support TCP/UDP Load Balancing
- The system preferably have dedicated CPU core for management, and separate CPU cores for packet handling or equivalent functionality.
- The Appliances must support GUI based content switching creation, and not rely on an external scripting language.
- The system must support HTTP Load Balancing with Multiplexing
- The system must support DataStream for Microsoft SQL Server and MySQL server; with Switching algorithms including SQL query parameters such as user and database names and command parameters.
- The system must support Rate-based Policy Enforcement based on:
- Trigger policies based upon connections per second, packets per second, or bandwidth used
- Source or destination-based upon header or payload information
- The system must support RESTFUL API
- The system must support Rules-Based App Expert Policies without the use of Scripting languages
- The system must support least packets load balancing algorithms
- The system must support TLS 1.3 RFC standard in GA builds
- The system must be able to score an A+ from SSLlabs with SSL profile
- The system must provide dashboard visibility of all ADC within a single dashboard for Expiration Alerts, categorization of certificates by strengths
- The system must support IPv6 with ipv6 VIP ipv4 service, ipv4 VIP and ipv6 service, ipv6 VIP and ipV6 service, DNS64, and ipv6 RNAT
- The system must support Server side TCP Multiplexing
- The system must support Westwood TCP implementation
- The system must support Multi-path TCP (MPTCP)
- The system support DNSSEC with DNS signing
- The system is able to provide Cookie Encryption

- Must be able to auto config policy based on input from 3rd party scanners such as Qualys, Cenzic, IBM AppScan, Trend Micro, Whitehat or equivalent etc.
- The system should provide Web Traffic Real-time and historical end-user experience monitoring using Agentless method on a separate Reporting Virtual Machine showing Realtime & Historical stats for Client side latency, Server side latency, Server Processing Time, Page Load Time, Server Response Time, Bandwidth, Page Render Time, Top URL by hits/Load Time/Render Time, Top clients by Requests/ Render Time/Client Network Latency, Top Server by Hits/Processing Time/Latency/Bandwidth, Top Applications by Hits/Bandwidth/Response Time
- The Appliances must support built in real time and historical graphing.
- The Appliances must also support the ability to generate customizable reports based on user selectable counters.
- The system must support AppFlow, an extension of IPFIX protocol defined in RFC 5101
- The system must provide a single SSL Dashboard showing the following Summary charts in graphical via a separate Management Module which is included showing:
- Number of expired SSL certs; number of expiring SSL certs within (one week, 30 days, 90 days, after 90 days);
  - o Number of Self-signed SSL certs vs CA signed
  - o SSL signature algorithms used on SSL certs
  - o SSL key strengths used on SSL certs and which are the non-recommended SSL key strengths deployed

8.0   Web Application Firewall

- The proposed ADC solution should be Hardware based appliance.
- The proposed hardware appliance should support 5 Gbps of L7 throughput from Day one
- The proposed ADC solution should support 16GB RAM from Day one
- The ADC appliance should support minimum 200GB enterprise class SSD disk from Day one
- The proposed solution Should support 0.4 Million L7 HTTP Requests per Sec
- The proposed solution Should support minimum 4000 SSL TPS at 2K for SSL offloading
- The proposed solution should support minimum 1700 ECDHE TPS for SSL offloading
- The proposed appliance should support at least 2 x 10GE SFP+ interfaces
- The proposed solution should support at least 6 x 10/100/1000 Copper interfaces
- The proposed solution should support AC dual power supply from Day one
- The system must support Layer 7 DDoS
- The system is able to provide Cookie Encryption
- The system must support application firewall capability.
- The Application Firewall must support both Negative & Positive Security Model
- The Application Firewall must be ICSA Labs Certified
- The Application Firewall must be able prevent the OWASP top 10 attacks.
- The Application Firewall must support XML security.
- The Negative Security Model should support Signature Updates based on SNORT or equivalent
- Must be able to auto config policy based on input from 3rd party scanners such as Qualys, Cenzic, IBM AppScan, Trend Micro, Whitehat or Equivalent etc
- The system must provide IP reputation blacklisting in an automated process; with reputation updates every 5mins.
- The system must provide Bot Management with these 6 different detection techniques using: white list, black list, IP Reputation, Device fingerprinting, rate limiting and bot signatures.
- Must support Dynamic Profiling - The learning feature is a pattern filter that observes and learns activities on the back-end server. Based on the observation, the learning engine generates up to 2000 rules or exceptions (relaxations) for each security check.
- Built-in or add on Analyzer software for monitoring and management of WAF shall be provided.

9.0   On-premise Sandbox

- The proposed product should have a Sandboxing performance of 3000 files/hour
- The proposed product should have a Signature based AV scanning performance of 3500 files/hour
- The proposed product should have a Real-world Effective Throughput of 300 Files/Hour when all VMs are enabled.
- The proposed product should have 1 Gig RJ45 Interfaces.
- The proposed product should also have 1Gig SFP slots
- The proposed product should have 1 TB of inbuilt HDD.
- The proposed product should have a dual Redundant, Hot-swappable Power supply
- The proposed product must support GUI or CLI configurations
- The proposed product must support offline/sniffer mode, On-demand file/url submission, file/url submission from integrated device(s), Web based API submission capability, Network Share files scanning, MTA or BCC mode for emails, ICAP Clients file submission.
- The proposed product must support the option to create a simulated network for scanned file to access in a closed network environment
- The proposed product must be provided with AV, IPS, Web Filtering, File Query and Sandbox Engine Subscription licenses.
- The proposed product must provide AI-powered Sandbox Malware Analysis comprised of two stages to uncover the full attack life cycle.
- The proposed product must support Heuristic/Pattern/Reputation-based analysis
- The proposed product must provide the tools that allows Security Operations (SecOps) team to download captured packets, original file, tracer log, and malware screenshot, and STIX 2.0 compliant IOCs
- The proposed product must integrate with various security products (from the same vendor or third-party security vendors through the open API) to automates the breach protection strategy
- The proposed product must share the risk ratings and the local intelligence in real time with security devices and third-party security appliances using the open API provided by the offered sandbox.
- The proposed product should integrate with existing Next Generation Firewalls and proposed Email / Endpoint security products for zero-day threat prevention.
- The proposed product must support the manual interaction with the malware in a simulated environment by the SOC team i.e. Sandbox Interactive Mode.
- The proposed product must support file submission from ICAP client devices.
- The proposed product should have the facility to submit URLs for analysis of malwares hosted in the remote sites
- The proposed product should support Inspection of new threats including ransomware and malwares.
- The proposed product must support Anti-evasion techniques like sleep calls, process and registry queries
- The proposed product must support Callback Detection like malicious URL visit, Botnet C&C communication, and attacker traffic from activated malware

- The proposed product must support a huge range of file types: .7z, .ace, .apk, .arj, .bat, .bz2, .cab, .cmd, .dll, .doc, .docm, .docx, .dot, .dotm, .dotx, .exe, .gz, .htm, html, .htmnojs, .jar, .js, .kgb, .lnk, .lzh, .msi, .pdf, .pot, .potm, .potx, .ppam, .pps, .ppsm, .ppsx, .ppt, .pptm, .pptx, .ps1, .rar, .rtf, .sldm, .sldx, .swf, .tar, .tgz, .upx, url, .vbs, WEBLink, .wsf, .xlam, .xls, .xlsb, .xlsm, .xlsx, .xlt, .xltm, .xltx, .xz, .z, .zip
- The proposed product should have the ability to develop and forward the dynamically generated signature to all the registered devices on detection of a zero-day malware
- The proposed product must support OT services
- The proposed product should support third-party YARA rules for malware detection.
- The proposed product should have the options to Download Capture packets, Original File, Tracer log, Screenshot, and videos of malware interaction during sandbox scanning.
- The proposed product should be scalable by clustering additional appliances to improve files/hour performance.
- The proposed product should be able to send logs to the existing Centralized Logging and Reporting Appliance
- The proposed product must support Mitre ATT&CK-based reporting on malware techniques such as file modification, process behaviors, registry behaviors, and network behaviors or equivalent functionality
- The proposed product must support the Real-Time Monitoring Widgets such as, scanning result statistics, scanning activities (over time), top targeted hosts, top malware, top infectious URLs, top callback domains
- Built-in or add on Analyzer software for monitoring and management of Sandbox shall be provided.
- By design integration with Internet firewall as well as Integration of DC firewall with Sandboxing solution is required

10.0 SIEM

Note: For the total assets, please consider this bid document BOQ along with standard benchmarking for the application and production environment. Bidders may add 30% for the purpose of unforeseen sizing.

- The solution should have comprehensive predefined security configuration assessment check (settings) for different supported platforms as per industry standards such as ISO27001, PCI-DSS, OWASP, CIS etc.
- The application should allow search of assets based on IP, Location, Owner and Department
- The application should support multiple approaches for vulnerability assessment.
  - Automated Vulnerability Assessment (over the network)
  - Manual Vulnerability Assessment in case automated VA is not allowed
- Appliance based solution or supplier should propose associated hardware and storage to meet and optimized technical requirements as per OEM recommendation.
- Minimum support 1000 EPS/MPS/EPC/MPC or similar with scalability up to 10,000 EPS/MPS/EPC/MPC or similar
- Minimum support 10000 network flow/m with scalability up to 100,000 network flow/m
- Support healthy database for logs, events and network activities collection and processing such that all information can be access from a single GUI in efficient manner
- Support integration with vulnerability and patch management, Identity Access module, Network Admission Control, WLAN Controller, AAA, IPS and Threat intelligence etc. solutions.
- All standard rules as defined by international good practices must be included
- Additions of rules should be easy and manageable
- Should support full stack monitoring & management
- Support both manual and automatic update of configuration information with minimal user intervention. For example, security taxonomy updates, rule updates, device support, upgrades, patches etc.
- Real time dashboard of proposed system internal health checks and performance indicators statistics, i.e., memory, storage, CPU, I/Os, network traffic etc. and notify the system administrator when problems arise
- The system administrator is able to define role base access to the system by log source, assets group, functional area or dashboard. This includes being able to restrict a user's access to information to only those systems from a specific group or functions or dashboard including, but not limited to, administration, reporting, event filtering, correlation, and/or dashboard viewing.
- The solution deliver customizable dashboards (i.e. for Security Operation Center, threat management, compliance management, privileged users monitoring, monitored assets view, top security events view, network activities and attacks view, use cases view, malware/virus views, suspicious/malicious activities view, incidents and alarms views etc.).
- Support and provide predefined templates for dashboards and wizard to build new ones dashboards as per customer requirement or institution IT or business environment.
- Support standard protocols (like DNS, NetBIOS, SNMP, NTP, SMTP, HTTPS, SSH).

- Log collection and archive architecture that supports both short-term (online i.e. 3 months) and long-term (offline) event storage.
- The solution support industry log collection methods (Syslog, Windows Management Instrumentation (WMI), Remote Procedure Call (RPC), Windows Events Collection, FTP, SFTP, SNMP, SMTP, JDBC, SDEE etc.)
- The solution / system generate audit logs of all administrator / user actions within system/SIEM Accounting Audit including logs/event tamper monitoring.
- The solution categorizes log data into a human-readable format to eliminate the need-to-know OEM specific event IDs

11.0 NMS

- Industry leading network monitoring solution capable of monitoring multivendor wired and wireless devices
- Solution should cover all the devices/interfaces/components as in this tender and additional 20%, capacity of current infrastructure
- Features include
    - o Real time visibility and control
    - o Centralized monitoring via integrated dashboard
    - o Network health, servers (physical & virtual), storage, applications and micro services performance monitoring
    - o Service desk and incident management with 15 technician licenses
    - o Traffic analysis
    - o On prem solution physical, no virtual appliance

12.0 Display Solution

- 2 x 3 UHD 4K 65-inch 1920 x 1080 video wall solution
- Bezel width of less than 1 mm
- Anti-glare screens
- Minimum 700 nits
- Designed to operate 24 x 7 control room operations
- Two (02) ultra-wide, high-resolution monitors with associated PC and relevant hardware
- Include all accessories such as gold-plated HDMI cables, frame, electrical cabling, video wall controller preferably from the same OEM as of display screens otherwise in case of 3rd party controllers, full compatibility, integration and support is required. UPS, DBs and any other required hardware/software component for screen mounting and operations deemed to be included.
- EMC class B & ISTA 6 packaging certified

13.0 Video Conferencing Solution

MCU & General Requirements

- The Solution should be appliance based with redundant power supplies
- Must Support and compatible with proposed VC Endpoints
- Must Support and compatible with 3rd party end points and office 365 from day 1
- Should connect all type in meetings i.e Room based, Desktop Video Systems, mobile clients or browsers
- MCU should be at HD108060fps (transmit and receive) up to 4-6Mbps or equivalent
- MCU should be scalable by just adding the license without changing the hardware
- MCU should support SIP, H.323 standards for communications
- MCU should support H.263, H.264, WebM / VP8, Microsoft RTV, HTML5/WebRTC
- 5 concurrent meeting licenses
- Should support dual stream protocols
- Content sharing using standard H.239 and BFCP
- Support encryption in SIP and H.323 modes
- Should also support G.711, G.729A, G.722, G.722.1, AAC-LD or better
- Automatic Gain Control and noise cancellation
- Support aspect ratio of 16:9 and 4:3
- Resolution mix should be supported. End point should get the maximum at his capacity without reducing the capacity of other
- Shall support user management by implementing strong password, aging rule for password, displaying login records, implementing maximum no of concurrent user session and user session timeout
- Recording (local); 2 port at least; if it requires separate server than it should be part of the solution
- DTMF and Echo cancellation
- AES encryption on H.235 and TLS for SIP or better
- Must support continuous presence and must ensure that continuous presence can be sent and receive between endpoints
- All licenses must be inclusive for 3 years
- List active and upcoming meeting for a 24 Hour period as well as the ability to search and filter
- List participants in an ongoing meeting/conference
- Ability to mute/unmute audio for individual / all / group or new participant
- Meeting events logs including call statistic video, audio or presentation

VC End Points

- Codec based System with 1920x1080 camera with Horizontal FoV 80 degrees and vertical FoV 48.8 degrees or better codec, Microphone Array, cables, and control panel
- The unit should support H.323, SIP standards for communications
- Video standards: H.264, H.265
- The unit should support 1080p 60 fps

- Should support content sharing using standard based H.239 and SIP
- Wired or wireless Presentation Sharing
- Supports dual content sources for local meetings. 4K content sharing (local 30 fps, remote 5 fps)
- Audio standards: G.711A/U, G.722, G.722.1, G.729A, AAC-LD
- 20kHz bandwidth or better with crystal clear audio and stereo sound
- Automatic Gain Control and Automatic Noise Suppression
- Keyboard noise reduction and instant adaptation echo cancellation
- One HDMI input supports formats up to maximum 1080p60
- Two HDMI inputs support formats up to maximum 4K (3840 x 2160) at 30 fps including HD1080p60
- Support for multiple microphones, each with separate echo cancellers and noise reduction; all microphones can be set for balanced line level
- 2 or 3 x Microphone Input; 2 x desktop / tabletop microphones to be included
- Two HDMI outputs support formats up to 3840 x 2160p60 (4Kp60)
- Camera Minimum 12 x zoom or better
- Automatic or manual focus/brightness/white balance
- IPv4 and IPv6 support
- Auto Gatekeeper Discovery
- IP Precedence
- H.323 based Packet Lost Recovery
- Embedded Encryption: H.323 and SIP point-to-point, Standards based: H.235 v3 and Advanced Encryption Standard (AES) and Automatic key generation and exchange
- 86 inch 4K display screenWarranty: 3 years for entire hardware, software and accessories

14.0 Smart Display Board

General Requirements
- Multitouch technology
- Response time of 9ms or better
- Frame rate 150Hz or better
- Accuracy of 1.5mm over 90% of area
- Minimum object size of 5mm
- Tools to include: 2 x pens; 2 x erasers, multicolor four pen bundle, highlighter pen, stamps and cubes, magic pen or equivalent
- Screen size of 86 inches, LED, aspect ratio of 16:9, 4K UHD, refresh rate of 60Hz
- Viewing angle of 178 degrees or better
- Glass thickness of 4mm, fully heat tempered, anti-glare that resists smudges and fingerprints
- Convenience buttons: power, home, volume, screen shade, freeze frame
- External touch tablet control (if offered) to be provided
- Sensors: proximity, ambient light, infrared, room temperature and humidity
- Audio: 2 integrated 15W speakers or higher

Software
- Android 8.0 or above
- Digital whiteboard, Web browser, Screen sharing, Personalized home screen and settings, Live input preview, Interactive widgets, Templates, graphic organizers and manipulatives, File and app libraries, google drive and onedrive access
- Ability to run thirty party applications, cloud storage access, object awareness supported
- PC Computing: OPS Support, OPS PC with Windows 10 Pro, all power requirements must be met

Input/Output/Cables
- Input: HDMI, VGA video (direct or through external adapter), stereo 3.5mm, RS-232 (optional), RJ 45, USB type C , USB 2.0 type A, USB 3.0 type A and B
- Output: HDMI, Stereo 3.5mm, S/PDIF, RS-232
- Cables and Accessories: power cable, external adapters, 5m USB 2.0 cable, Pens, Erasers or equivalent functionality, External dual band 2.4 and 5 GHz antenna, remote control, wall mount kit

Hardware
- 4 GB DDR Memory or better
- 32 GB or better storage
- 2 x RJ 45, WIFI dual band, Bluetooth (direct or through external adapter)

Warranty
- 3 years including hardware, software and accessories

4. Bill of Quantities

[The bidder shall be required to offer the prices using the Price Schedule Forms, given at P 4/52 – 4/56, as appropriate to the situation/type, in addition to filling the rates in the following Bill of Quantities. The rates must correspondence to each other and in case of any discrepancy amongst any rate(s), the rate(s) offered in Price Schedule shall take precedence].

	All Microsoft Software licensing must be Perpetual under Open Value Program with Software Assurance Model				
	Software Lot - 1				
	PSW Software Component - Primary DC				
S.No	**Description**	**Qty**	**Unit**	**Unit Price USD**	**Total Price USD**
1	**Windows Licenses** Supply, installation, testing, configuration and commissioning of windows Licenses for physical servers, complete in all respect for solution provided. Microsoft Windows Server Standard 2019 or above , 16 core Base License. Govt Discount (D)Should be applied. Bidder to verify with complete proposed solution	21	No.s		
2	**Windows Licenses** Supply, installation, testing, configuration and commissioning of windows Licenses for Virtualized servers, complete in all respect for solution provided. Microsoft Windows Server Standard 2019 or above , Additional 2 core License Pack. Govt Discount (D)Should be applied. Bidder to verify with complete proposed solution	250	No.s		
3	**MS SQL** Supply, installation, testing, configuration and commissioning of MS SQL Licenses for physical servers, complete in all respect for solution provided. Microsoft SQL Server Enterprise 2019 , 2 core License with 3 year Software Assurance under open value program. Govt Discount (D)Should be applied. Bidder to verify with complete proposed solution	96	No.s		
4	**MS Exchange** Supply, installation, testing, configuration and commissioning of MS Microsoft Exchange Server 2019 Standard with 50 User CAL - complete in all respect.	1	No.s		
5	**End Point Protection** with 1 year subscription/license. (If bidder is proposing Microsoft Defender than Plan 2 will be required)	200	No.s		

Note: BOQ should be read in conjunction with Technical Specification and Drawings. All features and functions mentioned, will be the part of BOQ Item.								
Hardware Lot - 2A (Server & Storage)								
PSW Server and Storage Component - Primary DC								
S.No	**Description**	**Qty**	**Unit**	**Tech. Spec. A Ref.**	**Brand**	**Model**	**Unit Price USD**	**Total Price USD**
1	**Blade Chassis** Supply, installation, testing, configuration and commissioning of Blade Chassis, complete in all respect. Refer to technical Specifications reference for required specification.	4	No.s	1				
1.1	**Blade Server Half Height** Supply, installation, testing, configuration, HA and commissioning of Blade Server for virtualized environment, above specified chassis, complete in all respect. Refer to technical Specifications reference for required specification.	14	No.s	1.1				
1.2	**Blade Server Full Height** Supply, installation, testing, configuration, HA and commissioning of Blade Server for virtualized environment, above specified chassis, complete in all respect. Refer to technical Specifications reference for required specification.	6	No.s	1.2				
2	**Rack Mount Server for Production Database** Supply, installation, testing, configuration and commissioning of rack mount server, complete in all respect. Refer to technical Specifications reference for required specification.	2	No.s	2				
3	**Rack Mount Server for Production Reporting** Supply, installation, testing, configuration and commissioning of rack mount server, complete in all respect.	2	No.s	3				

	Refer to technical Specifications reference for required specification.							
4	**Rack Mount Server for Production Backup Server** Supply, installation, testing, configuration and commissioning of rack mount server, complete in all respect. Refer to technical Specifications reference for required specification.	1	No.s	4				
5	**Rack Mount Server for Production Data Warehouse** Supply, installation, testing, configuration and commissioning of rack mount server, complete in all respect. Refer to technical Specifications reference for required specification.	2	No.s	5				
6	**Rack Mount Server for Production IRMS** Supply, installation, testing, configuration and commissioning of rack mount server, complete in all respect. Refer to technical Specifications reference for required specification.	2	No.s	6				
7	**Rack Mount Server for Production Dev-QA (Database)** Supply, installation, testing, configuration and commissioning of rack mount server, complete in all respect. Refer to technical Specifications reference for required specification.	2	No.s	7				
8	**Rack Mount Server for Production Dev-QA (PA Model Server)** Supply, installation, testing, configuration and commissioning of rack mount server, complete in all respect. Refer to technical Specifications reference for required specification.	1	No.s	8				
9	**Rack Mount Server for Production Dev-QA (Warehouse Server)** Supply, installation, testing, configuration and commissioning of rack mount server, complete in all respect.	1	No.s	9				

	Refer to technical Specifications reference for required specification.							
10	**Rack Mount Server for Reserved** Supply, installation, testing, configuration and commissioning of rack mount server, complete in all respect. Refer to technical Specifications reference for required specification.	2	No.s	10				
11	**Rack Mount Server for Management Server for vCenter** Supply, installation, testing, configuration and commissioning of rack mount server, complete in all respect. Refer to technical Specifications reference for required specification.	2	No.s	11				
12	**Storage for Virtualized Environment** Supply, installation, testing, configuration and commissioning, complete in all respect. Refer to technical Specifications reference for required specification.	1	No.s	12				
13	**Storage for Physical Servers** Supply, installation, testing, configuration and commissioning, complete in all respect. Refer to technical Specifications reference for required specification.	1	No.s	13				
14	**Purpose Built Backup Appliance** Supply, installation, testing, configuration and commissioning, complete in all respect. Refer to technical Specifications reference for required specification.	1	No.s	14				
15	**FC SAN Switches** Supply, installation, testing, configuration, setup and commissioning, complete in all respect. San Switch support shall be included as per OEM policy/solution. Refer to technical Specifications reference for required specification.	2	No.s	15				

16	**IP KVM with Console Kit** Supply, installation, testing, configuration, setup and commissioning, complete in all respect. Refer to technical Specifications reference for required specification.	4	No.s	16				
17	**Tape Library** Supply, installation, testing, configuration, setup and commissioning, complete in all respect. Refer to technical Specifications reference for required specification.	1	No.s	17				
18	**Rack Mount Server for NGNIX** Supply, installation, testing, configuration and commissioning of rack mount server, complete in all respect. Refer to technical Specifications reference for required specification.	2	No.s	18				
20	**Licenses for Virtualization** Supply, installation, testing, configuration of services, and commissioning of Virtualized licenses for virtual Servers, complete in all respect. Implementation for Kubernetes should be provided. VMware vCloud Suite Standard 1 Processor 1yr E-LTU support OR Equivalent with 3 year Tanzu Standard Refer to technical Specifications reference for required specification.	58	No.s	N/A				
20.1	**Licenses for Virtualization** Supply, installation, testing, configuration of services setup and commissioning of multi host environment for above virtualized interfaces, complete in all respect. VMware vCenter Server Standard for vSphere (per Instance) 1yr E-LTU Support and subscription OR Equivalent	1	No.s	N/A				

	Refer to technical Specifications reference for required specification.							
20.2	**Licenses for Virtualization for Backup Server** Supply, installation, testing, configuration of services, and commissioning of Virtualized licenses for virtual Servers, complete in all respect. VMware vSphere Standard 1 Processor 1yr E-LTU Support OR Equivalent Refer to technical Specifications reference for required specification.	2	No.s	N/A				
21	**Licenses for Backup and Replication** Supply, installation, testing, configuration of services, and commissioning of Backup and Replication, complete in all respect. Veeam Availability Suite Enterprise Plus (Capacity/VM based license) with E-LTU support OR Equivalent Refer to technical Specifications reference for required specification.	40	No.s	N/A				

Note: BOQ should be read in conjunction with Technical Specification and Drawings. All features and functions mentioned, will be the part of BOQ Item.								
Harware Lot - 2B (Network)								
Network Component - Primary DC								
S.No	**Description**	**Qty**	**Unit**	**Tech. Spec. C Ref.**	**Brand**	**Model**	**Unit Price USD**	**Total Price USD**
1	**Core Switch** Supply, installation, testing, configuration, and commissioning of network core switches, complete in all respect. Refer to technical Specifications reference for required specification.	2	No.s	1				
2	**TOR Switches** Supply, installation, testing, configuration and commissioning of TOR access switches, complete in all respect. Refer to technical Specifications reference for required specification.	4	No.s	2				
2.1	**DMZ Switches** Supply, installation, testing, configuration and commissioning of DMZ access switches, complete in all respect. Refer to technical Specifications reference for required specification.	2	No.s	2				
3	**Core Router** Supply, installation, testing, configuration and commissioning of Core Router, complete in all respect. Refer to technical Specifications reference for required specification.	3	No.s	3				
4	**Branch Router** Supply, installation, testing, configuration and commissioning of Branch Router, complete in all respect. Refer to technical Specifications reference for required specification.	10	No.s	4	-			-
5	**Data Center Firewall** Supply, installation, testing, configuration and commissioning of	2	No.s	5				

	Note: BOQ should be read in conjunction with Technical Specification and Drawings. All features and functions mentioned, will be the part of BOQ Item.							
	Harware Lot - 2B (Network)							
	Network Component - Primary DC							
S.No	**Description**	**Qty**	**Unit**	**Tech. Spec. C Ref.**	**Brand**	**Model**	**Unit Price USD**	**Total Price USD**
	Data Center firewall, complete in all respect. Refer to technical Specifications reference for required specification.							
6	**Internet Firewall** Supply, installation, testing, configuration and commissioning of Internet firewall, complete in all respect. Refer to technical Specifications reference for required specification.	2	No.s	6				
6.1	Supply and installation of hardware tokens for 2FA	700	No.s	6				
7	**Load Balancer** Supply, installation, testing, configuration and commissioning of Load Balancer, complete in all respect. Refer to technical Specifications reference for required specification.	2	No.s	7				
8	**Web Application Firewall** Supply, installation, testing, configuration and commissioning of web application firewall, complete in all respect. Refer to technical Specifications reference for required specification.	2	No.s	8				
9	**On-premise Sandbox** Supply, installation, testing, configuration and commissioning of On-premise Sandbox, complete in all respect. Refer to technical Specifications reference for required specification.	2	No.s	9				
10	**SIEM** Supply, installation, testing, configuration and commissioning of SIEM, complete in all respect.	1	No.s	10				

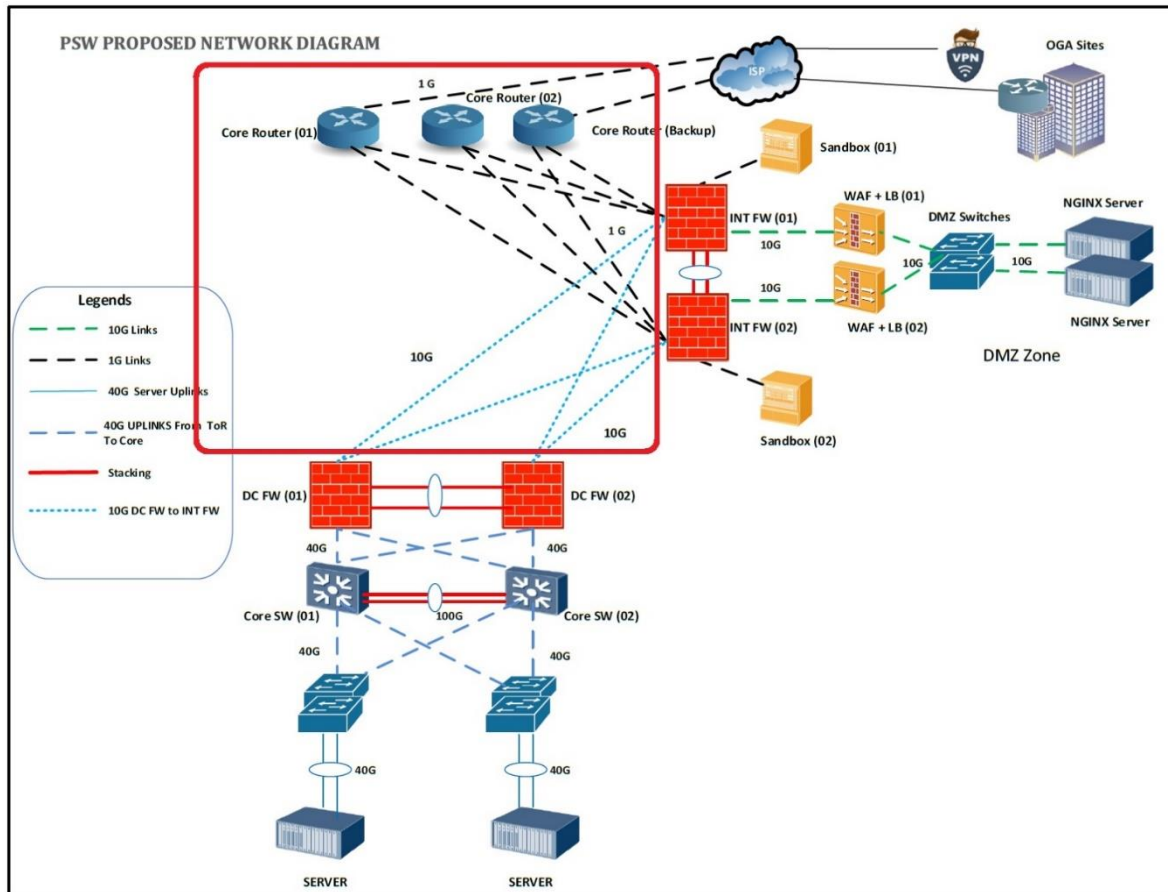|	Note: BOQ should be read in conjunction with Technical Specification and Drawings. All features and functions mentioned, will be the part of BOQ Item.							
	Harware Lot - 2B (Network)							
	Network Component - Primary DC							
S.No	**Description**	**Qty**	**Unit**	**Tech. Spec. C Ref.**	**Brand**	**Model**	**Unit Price USD**	**Total Price USD**
	Refer to technical Specifications reference for required specification.							
11	**NMS** Supply, Installation, testing, migration and configuration of Network Monitoring System capable of multivendor wired and wireless devices, performance, servers and application monitoring Solution should cover all the devices/components as in this tender and additional 20%, for devices of current infrastructure. Features: - Real-time Visibility and Control - Centralized Monitoring - Network Health/Performance - Traffic Analysis	**1**	No.s	**11**				
12	Supply and Installation of Fiber Transceivers of same OEM as for above solution							
12.1	40G SR Transceivers (Core Switch)	48	No.s					
12.2	10G SR Transceivers (ToR to Server) and DMZ	42	No.s					
12,3	40G SR Transceivers (ToR Switch)	24	No.s					
12.4	100G DAC Cable for TOR Switches 1Meter	6	No.s					
12.5	100G DAC Cable for Core Switches 1Meter	2	No.s					
13	Supply and Installation of SPARES Fiber Transceivers of same OEM as for above solution							
13.1	40G SR Transceivers (Core Switch)	10	No.s					
13.2	10G SR Transceivers (ToR to Server) and DMZ	10	No.s					
13.3	40G SR Transceivers (ToR Switch)	10	No.s					
13.4	100G DAC Cable for TOR Switches 1Meter	2	No.s					

	Note: BOQ should be read in conjunction with Technical Specification and Drawings. All features and functions mentioned, will be the part of BOQ Item.							
	Harware Lot - 2B (Network)							
	Network Component - Primary DC							
S.No	**Description**	**Qty**	**Unit**	**Tech. Spec. C Ref.**	**Brand**	**Model**	**Unit Price USD**	**Total Price USD**
13.5	100G DAC Cable for Core Switches 1Meter	2	No.s					
14	Supply and installation of communication cabling as per design requirement. Bidder to review and propose equivalent cable type as per PSW Server,Storage,netowrks. solution requirement.	1	Lot					
14.1	LC/LC Multi-mode OM4 Fiber patch cord 5Meter	85	No.s					
14.2	LC/LC Multi-mode OM4 Fiber patch cord 7Meter	64	No.s					
14.3	LC/LC Multi-mode OM4 Fiber patch cord 10Meter	75	No.s					
14.4	LC/LC Multi-mode OM4 Fiber patch cord 15Meter	35	No.s					
14.5	Metallic Horizontal Cable Manager 1U	20	No.s					
14.6	CAT6A Patch Cord 3/5 Meter	30	No.s					
15	Supply and Installation of 55" Screens with bezel width less than 1mm, resolution of each screen minimum 1920x1080, Anti-Glare, 700nits, 24x7 operation gold plated HDMI Cables, frame, electrical cabling, UPS, Db and any required hardware/component for screen mounting.	1	Lot	**12**				
16	Video Conferencing Solution (On premises) with 70 inch full HD screen complete in all aspects	2	Lot	**13**				
17	Smart Display Board	2	Lot	**14**				

5. Drawings

PSW PROPOSED NETWORK DIAGRAM

As shown above with respective equipment schema

B. Product Evaluation of the Network & Server / Storage Section

Items marked with '**M'** are mandatory. Noncompliance to the said category will be considered as a material deviation such as defined in ITB 32.2 and shall lead to rejection of the bid as per ITB 32.4, while the Non-Mandatory Compliance category shall be dealt with as per ITB 33.1, 33.2 and 33.3. Bidders should provide reference to the Data Sheet, solution writeup and any other documentary evidence to support the compliance criteria.

Network Section:

S. No.	Item	Technical Description	Non-Mandatory Compliance Y/N	Mandatory Compliance	Reference / Remarks
1.0	**Core Switch**	Advance Layer 3, Data Center class Chassis switch with at least 8 line card slots, dual redundant supervisors, redundant Advance Layer 3, Data Center class Chassis switch with at least 8 line card slots, dual redundant supervisors, redundant power supplies.		M	
		Switch should support cell switching so that a single flow can be load balanced to multiple fabric modules to improve the Fabric modules utilization.		M	
		Switching throughput of the chassis should not be less than 20 Tbps.		M	
		Forwarding throughput capacity of at least 10 Bpps.		M	
		Per line card slot bandwidth should be at least 2 Tbps.		M	
		Mac address table should be not less than 32,000.		M	
		IPv4/IPv6 routing table should be at least 50,000.		M	
		Switch should support SDN feature from day 1 for future evolution without any change in hardware.		M	
		All SFP/SFP+/QSFP+ modules must be from the Principal OEM.		M	
		Fabric module should support N+1 design. If one fabric module fails, system performance should not downgrade.		M	
		Switch should support at least 200 VRFs		M	
		Switch should support 1G/10G (Fiber/Optical), 25G/40G/100G line cards from day one.		M	
		Switch should be supplied with 36 x 40G/100G QSFP28 ports.		M	
		Switch should support 1:N virtualization. One physical switch			

S. No.	Item	Technical Description	Non-Mandatory Compliance Y/N	Mandatory Compliance	Reference / Remarks
		can be virtualized into a multiple logical switch.			
		Appropriate 40G transceivers shall be used to connect ToR switches and Firewalls.			
		Dual redundant supervisor modules should be supported however due to redundant chassis, only 1 supervisor module should be loaded if system functionality and operations are not degraded. If dual supervisor modules are required to achieve full system performance than 2 or more supervisor modules shall be provided.			
		Any accessory not mentioned explicitly in the specs but is required for complete and successful operation of the switch shall be provided with redundancy where applicable (for e.g., Fabric modules, daughter cards etc.).			
		Line card slots are for devices connectivity only. Dedicated 8 or above line card slots are required. Supervisor, Fabric modules etc. should not be considered as line card slots.			
		Core switches need to be stacked/clustered with technologies such as MLAG, vPC etc. Dual 100G DAC cables or transceivers shall be used to provide this connectivity. If proprietary stacking technology is used than make sure stacking bandwidth should not be less than 200G (400G Full duplex).			
		Switch should not be reaching its EoS/EoL date at the time of bidding and procurement.			
		Switch should provide advance layer 2, layer 3 functionality from day one. All features relevant to campus and data center core switch should be enabled. Some of them are highlighted below.			
		Switch should support 4000 Vlans			
		Switch should support VxLAN bridging and routing.			

S. No.	Item	Technical Description	Non-Mandatory Compliance Y/N	Mandatory Compliance	Reference / Remarks
		Switch should support Centralized and Distributed Layer 3 gateway.			
		Switch should support distributed layer 3 anycast gateway.			
		Switch should support symmetric IRB distributed layer 3 gateway.			
		EVPN should be supported with clustering technology OEM is providing.			
		Switch should support iBGP and eBGP for EVPN.			
		Switch should support MAC Mobility.			
		Switch should support extensions of MP-BGP for EVPN			
		Switch should support multicast over VxLAN or equivalent functionality.			
		Switch should support packet storm protection			
		Switch should support for advance QoS, rate limiting, 802.1p, port based rate limiting			
		Switch should support for Radius/TACACS+			
		Switch should support for 802.1ab – LLDP, CDP or equivalent functionality			
		Switch should support for VRRP			
		Switch should support for sFlow/Netflow/Jflow or equivalent functionality			
		Switch should support for UDLD / DLDP or equivalent functionality			
		Switch should support for Dual stack - IPv4 and IPv6			
		Switch should support for SNMP v2c/v3			
		Switch should support for 802.3x			
		Switch should support for 802.3az			
		Switch should support for STP + RSTP + MSTP + RPVST+ or equivalent functionality			
		Switch should support for Policy based Routing			
		Switch should support for Static IP Routing + RIP + OSPFv2 + BGP + MP-BGP			
		Switch should support for Static IPv6 Routing + RIPng + OSPFv3 + MP-BGP			

S. No.	Item	Technical Description	Non-Mandatory Compliance Y/N	Mandatory Compliance	Reference / Remarks
		Switch should support for PIM-SM, PIM-DM, MLD			
		Switch should support for ECMP			
		Switch should support for access control lists			
		Switch should support for Port mirroring			
		Switch should support for Telnet / SSHv2			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		Switching throughput of the switch should be at least 3.5 Tbps		M	
		Forwarding throughput capacity of at least 900 Mpps.		M	
		Mac address table should be not less than 32,000.		M	
		IPv4/IPv6 routing table should be at least 32,000.		M	
		Switch should support at least 200 VRFs.		M	
		Switch should support at least 48x10G/25G SFP28 ports.		M	
		Switch should support atleast 4 x 100G/40G QSFP28 ports.		M	
		All SFP/SFP+/QSFP+ modules must be from the Principal OEM.		M	
		Switch should support 4000 Vlans		M	
		Switch should support SDN feature from day 1 for future evolution without any change in hardware.		M	
2.0	ToR Switches	Advance Layer 3, Data Center class ToR switch, redundant power supplies.			
		Any accessory not mentioned explicitly in the specs but is required for complete and successful operation of the switch shall be provided with redundancy where applicable (for e.g. Fabric modules, daughter cards etc).			
		ToR switches need to be stacked/clustered with technologies such as MLAG, vPC etc. Dual 100G DAC cables or transceivers shall be used to provide this connectivity. If proprietary stacking technology is used than make sure stacking bandwidth should not be less than 200G (400G Full duplex).			
		Switch should not be reaching its EoS/EoL date at the time of bidding and procurement.			
		Switch should provide advance layer 2, layer 3 functionality from day one. All features relevant to campus and data center core switch should be enabled. Some of them are highlighted below.			
		Switch should support VxLAN bridging and routing.			
		Switch should support Centralized and Distributed Layer 3 gateway.			

		Switch should support distributed layer 3 anycast gateway.			
		Switch should support symmetric IRB distributed layer 3 gateway.			
		EVPN should be supported with clustering technology OEM is providing.			
		Switch should support iBGP and eBGP for EVPN.			
		Switch should support MAC Mobility.			
		Switch should support extensions of MP-BGP for EVPN			
		Switch should support multicast over VxLAN or equivalent functionality.			
		Switch should support packet storm protection			
		Switch should support for advance QoS, rate limiting, 802.1p, port based rate limiting			
		Switch should support for Radius/TACACS+			
		Switch should support for 802.1ab – LLDP, CDP or equivalent functionality			
		Switch should support for VRRP			
		Switch should support for sFlow/Netflow/Jflow or equivalent functionality			
		Switch should support for UDLD / DLDP or equivalent functionality			
		Switch should support for Dual stack - IPv4 and IPv6			
		Switch should support for SNMP v2c/v3			
		Switch should support for 802.3x			
		Switch should support for 802.3az			
		Switch should support for STP + RSTP + MSTP + RPVST+ or equivalent functionality			
		Switch should support for Policy based Routing			
		Switch should support for Static IP Routing + RIP + OSPFv2 + BGP + MP-BGP			
		Switch should support for Static IPv6 Routing + RIPng + OSPFv3 + MP-BGP			
		Switch should support for PIM-SM, PIM-DM, MLD			
		Switch should support for ECMP			
		Switch should support for access control lists			
		Switch should support for Port mirroring			

		Switch should support for Telnet / SSHv2			
		Enterprise grade high performance router with dual redundant supervisor and dual power supplies and should support minimum of 4 expansion slots.		**M**	
		Router should have 8 x 1G Copper ports.		**M**	
		Router should have 4 x 1G/10G SFP ports.		**M**	
		Forwarding performance should be atleast 36 Mpps		**M**	
		IPSec encryption throughput should be atleast 8 Gbps		**M**	
		Router should support minimum of 6000 IPSec tunnels		**M**	
		Router should support SDN-WAN feature from day 1 for future evolution without any change in hardware.		**M**	
3.0	**Core Router**	Router should support for IPv6 Tunneling		**M**	
		N+1 Design Topology			
		Router should support for Data Center Interconnect Technologies such as OTV, VxLAN or equivalent functionality			
		Router should support for Packet Storm Protection			
		Router should support for sFlow/Netflow/Jflow/ or Equivalent functionality			
		Router should support for IPv4 Static Routing/ RIP/OSPF/BGP-4			
		Router should support for IPv6 Static Routing /RIPng/OSPFv3/BGP+			
		Router should support for BFD			
		Router should support for NAT / GRE			
		Router should support for WAN optimization			
		Router should support for Hierarchical QoS			
		Router should support for Advance QoS, FIFO, CQ, PQ, WFQ, CBQ, RTPQ			
		Router should support for zone based firewall			
		Router should support for IPSec VPN			
		Router should support for Radius / TACACS+			
		Router should support for URPF			
		Router should support for Telnet / SSHv2			

		Router should support for IGMP, PIM-SM, PIM-DM, MSDP			
		Router should support for MP-BGP			
		Router should support for HSRP / VRRP			
		Router should support for Snmp v1/2/3			
		Router should support for FTP/TFTP/SFTP			
		Router should support for NTP			
		Router should be capable of providing data of service quality measurement and tracking in real time.			
		Fully managed with CLI			

SI. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
4.0	**Branch Router**	Enterprise Grade Router - Should not be listed under SMB products on the OEM website.		M	
		OS should be same as of Core Router.		M	
		Router should support SDN-WAN feature from day 1 for future evolution without any change in hardware.		M	
		1G RJ45 LAN ports - 8 at least		M	
		1G WAN ports - 2 at least		M	
		Forwarding performance - 300 Kpps		M	
		IPSec encryption throughput - 150 Mbps		M	
		Router should support embedded hardware encryption		M	
		Router should support for DMVPN or equivalent functionality		M	
		Router should support for NAT / GRE		M	
		Router should support for Packet Storm Protection			
		Router should support for sFlow/Netflow/Jflow or equivalent functionality			
		Router should support for IPv4 Static Routing/ RIP/OSPF/BGP-4			
		Router should support for IPv6 Static Routing /RIPng/OSPFv3/BGP+			
		Router should support for BFD			
		Router should support for Advance QoS, FIFO, CQ, PQ, WFQ, CBQ, RTPQ			
		Router should support for zone-based firewall			
		Router should support for IPSec VPN			
		Router should support for Radius / TACACS+			
		Router should support for URPF			
		Router should support for Telnet / SSHv2			
		Router should support for IGMP, PIM-SM, PIM-DM,PIM-SSM, MSDP			
		Router should support for MP-BGP			
		Router should support for HSRP / VRRP			
		Router should support for SNMP v1/2/3			
		Router should support for FTP/TFTP/SFTP			
		Router should support for NTP			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		Router should be capable of providing data of service quality measurement and tracking in real time.			
		Fully managed with CLI			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		The proposed products should have onboard SSD internal storage for storage of logs, event etc.		**M**	
		The proposed product must be based on hardware architecture for Security features inspection (NG Firewalling, SSL/TLS inspection, IPS, Antimalware etc) in the hardware.		**M**	
		The proposed system shall minimally provide management access through: • GUI using HTTP or HTTPs access CLI console using console port, SSHv2, Telnet or from GUI console		**M**	
		The proposed product shall support static routing and policy-based routing		**M**	
		The proposed product shall support Open Shortest Path First (OSPF) and Border Gateway Protocol (BGP) for both IPv4 and IPv6.		**M**	
5.0	**Data Center Firewall**	The proposed product must support active-passive (failover HA), active-active (load balancing HA) and Clustering.		**M**	
		Firewall Performance/Specs Firewall throughput PPS: 40Mpps or above IPSEC throughput: 45Gbps or above IPS throughput: 20Gbps or above NGFW throughput: 16Gbps or above Threat Protection throughput: 15Gbps or above SSL/TLS inspection throughput : 16Gbps App Control throughput: 50Gbps or above Concurrent sessions: 20 Million New sessions/sec: 1 Million Interfaces (Loaded): Minimum , 4x/40G		**M**	
		The proposed product should be able to facilitate administration audits by logging detailed activities to event log -		**M**	

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		management access and also configuration changes.			
		Administrators shall be able to group interfaces, both physical and virtual, into zones that simplifies the creation of security policies.		M	
		The proposed product shall support clientless and client-based SSL Remote Access VPNs.		M	
		The proposed product's IPS database shall have over 8,000+ up-to-date signatures and should support custom IPS signatures. A signature can be selected by searching for its corresponding CVE-ID (if applicable).		M	
		The proposed product shall support virtual firewalls that divide the Firewall into two or more virtual units that function independently.		M	
		The proposed product shall support Virtual routing and forwarding (VRF).		M	
		The proposed product shall support robust GUI configurations of both IPv4 and IPv6 firewall policies.			
		The administrator authentication shall be facilitated by a local database, PKI & remote services such as Radius, LDAP and TACACS+.			
		Administrators shall be able to configure both IPv4 and IPv6 DHCP service on an interface of the proposed product.			
		Administrators shall be able to configure multiple loopback interfaces on the proposed product.			
		Administrators shall be able to configure Secondary IP addresses to an interface			
		The proposed product shall support the upgrade of the firmware without interrupting communication through the cluster			
		The proposed product shall support various traffic engineering			

SI. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		techniques such as Traffic policing, Traffic shaping and Queuing etc.			
		The proposed product shall support IPsec based Remote Access VPNs.			
		The proposed product shall support both Route based and policy-based site to site IPsec VPNs.			
		The proposed product shall provide Secure sockets layer (SSL) content scanning and inspection abilities that allow organizations to apply antivirus scanning, application control, web/URL filtering, and IPS inspection to encrypted traffic.			
		The proposed product shall provide the ability to exempt web sites from SSL scanning by site reputation, address, category, or using a whitelist.			
		The proposed product shall support content / file filtering feature where exploitable content (within PDF and Microsoft Office files) can be removed and replaced with content that is known to be safe			
		The proposed product shall support Advanced Malware Protection for proactive detection and prevention against known and unknown threats.			
		The proposed product shall provide ability to allow/monitor, block and quarantine attachments or downloads after malware detection using various technologies: • Malware signature database • External file analysis with integration with on-prem or cloud-based sandbox service. • File checksums query using cloud-based malware database or Equivalent functionality.			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		The proposed product shall be capable of blocking Botnet server communications.			
		The proposed product shall support category based dynamic web filtering by querying real-time cloud-based categorization database.			
		The proposed product shall provide ability to use local categories (that override the cloud-based database rating) and remote categories (external URL list) as part of the URL rating function.			
		The proposed product shall detect over 4,000+ applications for Application visibility and Control.			
		The proposed product shall support custom application detection and control.			
		The proposed product's IPS engine shall offer: • Signature based detection using real time updated database or equivalent functionality • Anomaly based detection that is based on thresholds or equivalent functionality			
		The proposed product shall allow administrator to prevent sensitive data from leaving the network. Administrator shall be able to define sensitive data patterns, and data matching these patterns that will be blocked and/or logged when passing through the unit.			
		The proposed system shall provide explicit web proxy capabilities for proxying IPv4 and IPv6 HTTP and HTTPS traffic. Security components such as AV scanning, web filtering, IPS, application control, DLP and SSL/SSH inspection can be applied to proxied traffic within the system itself.			
		The proposed product shall allow configuration of virtual systems resource limiting and management.			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		The proposed product shall provide the ability to apply DNS category filtering to control user access to web resources.			
		The proposed product shall support various logging facilities: • Local memory • Local Storage • Multiple concurrent syslog servers.			
		Analyzer software for monitoring and management of firewall shall be provided. • The Proposed reporting appliance virtual/physical should be able to collect and parse logs for NGFW. • The proposed reporting solution must support predefined and customized dashboards delivered through a single-pane-of-glass interface for actionable view of threat and log data • The proposed reporting solution should have the capability of aiding with threat hunting by tracking details such as such as end user's IP addresses, host name, group, OS, overall threat rating and historical scan of logs against latest threat intelligence • The proposed reporting solution should have a capability to forward logs to an external system • The proposed reporting solution should have a capability to forward logs to an external system			

SI. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		The proposed products should have onboard SSD internal storage for storage of logs, event etc.		**M**	
		The proposed product must be based on hardware architecture for Security features inspection (NG Firewalling, SSL/TLS inspection, IPS, Antimalware etc) in the hardware.		**M**	
		The proposed system shall minimally provide management access through: • GUI using HTTP or HTTPs access CLI console using console port, SSHv2, Telnet or from GUI console		**M**	
		The proposed product shall support static routing and policy-based routing		**M**	
		The proposed product shall support Open Shortest Path First (OSPF) and Border Gateway Protocol (BGP) for both IPv4 and IPv6.		**M**	
6.0	Internet Firewall	The proposed product must support active-passive (failover HA), active-active (load balancing HA) and Clustering.		**M**	
		Firewall Performance/Specs Firewall throughput PPS: 75 Gbps or above IPSEC throughput: 45 Gbps or above IPS throughput: 10 Gbps or above NGFW throughput: 7 Gbps or above Threat Protection throughput: 6 Gbps or above SSL/TLS inspection throughput: 6 Gbps App Control throughput: 13 Gbps or above Concurrent sessions: 6 Million New sessions/sec: 400,000 Interfaces (Loaded): Minimum 6 x10G SFP+,5xSFP ports, 2x40G		**M**	
		The proposed product should be able to facilitate administration audits by logging detailed activities to event log - management access and also configuration changes.		**M**	
		Administrators shall be able to group interfaces, both physical and virtual, into zones that simplifies the creation of security policies.		**M**	

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		The proposed product shall support various traffic engineering techniques such as Traffic policing, Traffic shaping and Queuing etc.		M	
		The proposed product shall support clientless and client-based SSL Remote Access VPNs.		M	
		The proposed product shall provide Secure sockets layer (SSL) content scanning and inspection abilities that allow organizations to apply antivirus scanning, application control, web/URL filtering, and IPS inspection to encrypted traffic		M	
		The proposed product shall allow administrator to prevent sensitive data from leaving the network. Administrator shall be able to define sensitive data patterns, and data matching these patterns that will be blocked and/or logged when passing through the unit.		M	
		The proposed product shall support virtual firewalls that divide the Firewall into two or more virtual units that function independently.		M	
		The proposed product shall support Virtual routing and forwarding (VRF)		M	
		Firewall shall provide Remote Access VPN services to remote clients using software VPN client compatible with Windows 10/Android/iOS and/or upcoming latest versions. This VPN should be configured with 2 Factor Authentication. Industry standard 2FA should be provided as part of this solution. VPN users: 10,000 at least		M	
		The proposed product shall support robust GUI configurations of both IPv4 and IPv6 firewall policies.			
		The administrator authentication shall be facilitated by a local database, PKI & remote services such as Radius, LDAP and TACACS+.			
		Administrators shall be able to configure both IPv4 and IPv6 DHCP service on an interface of the proposed product.			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		Administrators shall be able to configure multiple loopback interfaces on the proposed product.			
		Administrators shall be able to configure Secondary IP addresses to an interface			
		The proposed product shall support the upgrade of the firmware without interrupting communication through the cluster			
		The proposed product shall support IPsec based Remote Access VPNs.			
		The proposed product shall support both Route based and policy-based site to site IPsec VPNs.			
		The proposed product shall provide the ability to exempt web sites from SSL scanning by site reputation, address, category, or using a whitelist.			
		The proposed product shall support content / file filtering feature where exploitable content (within PDF and Microsoft Office files) can be removed and replaced with content that is known to be safe			
		The proposed product shall support Advanced Malware Protection for proactive detection and prevention against known and unknown threats.			
		The proposed product shall provide ability to allow/monitor, block and quarantine attachments or downloads after malware detection using various technologies: • Malware signature database • External file analysis with integration with on-prem or cloud-based sandbox service. • File checksums query using cloud-based malware database or equivalent functionality			
		The proposed product shall be capable of blocking Botnet server communications.			
		The proposed product shall support category based dynamic web filtering by querying real-time cloud-based categorization database.			
		The proposed product shall provide ability to use local categories (that			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		override the cloud-based database rating) and remote categories (external URL list) as part of the URL rating function.			
		The proposed product shall detect over 4,000+ applications for Application visibility and Control.			
		The proposed product shall support custom application detection and control.			
		The proposed product's IPS engine shall offer: • Signature based detection using real time updated database or equivalent functionality • Anomaly based detection that is based on thresholds or equivalent functionality			
		The proposed product's IPS database shall have over 8,000+ up-to-date signatures and should support custom IPS signatures. A signature can be selected by searching for its corresponding CVE-ID (if applicable).			
		The proposed product shall provide the ability to apply DNS category filtering to control user access to web resources.			
		The proposed product shall have an in-built token server that provisions and manages hard and mobile tokens for multi-factor authentication.			
		The proposed system shall provide explicit web proxy capabilities for proxying IPv4 and IPv6 HTTP and HTTPS traffic. Security components such as AV scanning, web filtering, IPS, application control, DLP and SSL/SSH inspection can be applied to proxied traffic within the system itself.			
		The proposed product shall allow configuration of virtual systems resource limiting and management.			
		The proposed product shall support various logging facilities: • Local memory • Local Storage • Multiple concurrent syslog servers.			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		Make/OEM of Internet Firewall shall be different from Data Center firewall.			
		Analyzer software for monitoring and management of firewall shall be provided. • The Proposed reporting appliance virtual/physical should be able to collect and parse logs for NGFW. • The proposed reporting solution must support predefined and customized dashboards delivered through a single-pane-of-glass interface for actionable view of threat and log data. • The proposed reporting solution should have the capability of aiding with threat hunting by tracking details such as such as end user's IP addresses, host name, group, OS, overall threat rating and historical scan of logs against latest threat intelligence • The proposed reporting solution should have a capability to forward logs to an external system			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		The proposed ADC solution should be Hardware based appliance.		**M**	
		The proposed hardware appliance should support 10 Gbps of L7 throughput from Day one		**M**	
		The proposed ADC solution should support 16GB RAM from Day one		**M**	
		The ADC appliance should support minimum 200GB enterprise class SSD disk from Day one		**M**	
		The proposed solution Should support 0.4 Million L7 HTTP Requests per Sec		**M**	
		The proposed solution Should support minimum 4000 SSL TPS at 2K for SSL offloading		**M**	
		The proposed solution should support minimum 1700 ECDHE TPS for SSL offloading		**M**	
		The proposed appliance should support at least 2 x 10GE SFP+ interfaces		**M**	
7.0	Load Balancer	The proposed solution should support at least 6 x 10/100/1000 Copper interfaces		**M**	
		The system must support DataStream for Microsoft SQL Server and MySQL server; with Switching algorithms including SQL query parameters such as user and database names and command parameters.		**M**	
		The system must be able to act as a Reverse Proxy		**M**	
		The system must support TCP/UDP Load Balancing		**M**	
		The system preferably have dedicated CPU core for management, and separate CPU cores for packet handling or equivalent		**M**	
		The Appliances must support GUI based content switching creation, and not rely on an external scripting language.		**M**	
		The system must support HTTP Load Balancing with Multiplexing		**M**	
		The system must support Rate-based Policy Enforcement		**M**	

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		The system must support RESTFUL API		M	
		The system must support Rules-Based App Expert Policies without the use of Scripting languages		M	
		The system must support least packets load balancing algorithms		M	
		The system must provide dashboard visibility of all ADC within a single dashboard for Expiration Alerts, categorization of certificates by strengths		M	
		The system must support IPv6 with ipv6 VIP ipv4 service, ipv4 VIP and ipv6 service, ipv6 VIP and ipV6 service, DNS64, and ipv6 RNAT		M	
		The proposed solution should support AC dual power supply from Day one			
		Trigger policies based upon connections per second, packets per second, or bandwidth used			
		Source or destination-based upon header or payload information			
		The system must support TLS 1.3 RFC standard in GA builds			
		The system must be able to score an A+ from SSLlabs with SSL profile			
		The system must support Server side TCP Multiplexing			
		The system must support Westwood TCP implementation			
		The system must support Multi-path TCP (MPTCP)			
		The system support DNSSEC with DNS signing			
		The system is able to provide Cookie Encryption			
		Must be able to auto config policy based on input from 3rd party scanners such as Qualys, Cenzic, IBM AppScan, Trend Micro, Whitehat or equivalent etc.			
		The system should provide Web Traffic Real-time and historical end-user experience monitoring using Agentless method on a separate Reporting Virtual Machine showing Realtime & Historical stats for Client side			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		latency, Server side latency, Server Processing Time, Page Load Time, Server Response Time, Bandwidth, Page Render Time, Top URL by hits/Load Time/Render Time, Top clients by Requests/ Render Time/Client Network Latency, Top Server by Hits/Processing Time/Latency/Bandwidth, Top Applications by Hits/ Bandwidth/ Response Time			
		The Appliances must support built in real time and historical graphing.			
		The Appliances must also support the ability to generate customizable reports based on user selectable counters.			
		The system must support AppFlow, an extension of IPFIX protocol defined in RFC 5101			
		The system must provide a single SSL Dashboard showing the following Summary charts in graphical via a separate Management Module which is included showing: Number of expired SSL certs; number of expiring SSL certs within (one week, 30 days, 90 days, after 90 days); • Number of Self-signed SSL certs vs CA signed • SSL signature algorithms used on SSL certs • SSL key strengths used on SSL certs and which are the non-recommended SSL key strengths deployed			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
8.0	**Web Application Firewall**	The proposed ADC solution should be Hardware based appliance.		**M**	
		The proposed hardware appliance should support 5 Gbps of L7 throughput from Day one		**M**	
		The proposed ADC solution should support 16GB RAM from Day one		**M**	
		The ADC appliance should support minimum 200GB enterprise class SSD disk from Day one		**M**	
		The proposed solution Should support 0.4 Million L7 HTTP Requests per Sec		**M**	
		The proposed solution Should support minimum 4000 SSL TPS at 2K for SSL offloading		**M**	
		The proposed solution should support minimum 1700 ECDHE TPS for SSL offloading		**M**	
		The proposed appliance should support at least 2 x 10GE SFP+ interfaces		**M**	
		The proposed solution should support at least 6 x 10/100/1000 Copper interfaces		**M**	
		The system must support Layer 7 DDoS		**M**	
		The proposed solution should support AC dual power supply from Day one		**M**	
		The Application Firewall must support both Negative & Positive Security Model		**M**	
		The Application Firewall must be ICSA Labs Certified		**M**	
		The Application Firewall must be able prevent the OWASP top 10 attacks.		**M**	
		The Application Firewall must support XML security .		**M**	
		Must be able to auto config policy based on input from 3rd party scanners such as Qualys, Cenzic, IBM AppScan, Trend Micro, Whitehat or Equivalent etc		**M**	
		Must support Dynamic Profiling - The learning feature is a pattern filter that observes and learns activities on the back-end server. Based on the observation, the learning engine generates up to 2000 rules or exceptions		**M**	

SI. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		(relaxations) for each security check.			
		The system is able to provide Cookie Encryption			
		The system must support application firewall capability.			
		The Negative Security Model should support Signature Updates based on SNORT or equivalent			
		The system must provide IP reputation blacklisting in an automated process; with reputation updates every 5mins.			
		The system must provide Bot Management with these 6 different detection techniques using: white list, black list, IP Reputation, Device fingerprinting, rate limiting and bot signatures.			
		Built-in or add on Analyzer software for monitoring and management of WAF shall be provided.			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		The proposed product should have a Sandboxing performance of 3000 files/hour		M	
		The proposed product should have a Signature based AV scanning performance of 3500 files/hour		M	
		The proposed product should have a Real-world Effective Throughput of 300 Files/Hour when all VMs are enabled.		M	
		The proposed product should have 1 Gig RJ45 Interfaces.		M	
		The proposed product should also have 1Gig SFP slots		M	
		The proposed product should have 1 TB of inbuilt HDD.		M	
		The proposed product must be provided with AV, IPS, Web Filtering, File Query and Sandbox Engine Subscription licenses.		M	
		Built-in or add on Analyzer software for monitoring and management of Sandbox shall be provided		M	
9.0	On-Premise Sandbox	The proposed product must support GUI or CLI configurations		M	
		The proposed product must support the option to create a simulated network for scanned file to access in a closed network environment		M	
		The proposed product must integrate with various security products (from the same vendor or third-party security vendors through the open API) to automates the breach protection strategy		M	
		The proposed product must support the manual interaction with the malware in a simulated environment by the SOC team i.e. Sandbox Interactive Mode.		M	
		The proposed product should have a dual Redundant, Hot-swappable Power supply			
		The proposed product must support offline/sniffer mode, On-demand file/url submission, file/url submission from integrated device(s), Web based API submission capability, Network Share files scanning, MTA or BCC mode for emails, ICAP Clients file submission.			

SI. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		The proposed product must provide AI-powered Sandbox Malware Analysis comprised of two stages to uncover the full attack life cycle.			
		The proposed product must support Heuristic/Pattern/Reputation-based analysis			
		The proposed product must provide the tools that allows Security Operations (SecOps) team to download captured packets, original file, tracer log, and malware screenshot, and STIX 2.0 compliant IOCs			
		The proposed product must share the risk ratings and the local intelligence in real time with security devices and third-party security appliances using the open API provided by the offered sandbox.			
		The proposed product should integrate with existing Next Generation Firewalls and proposed Email / Endpoint security products for zero-day threat prevention.			
		The proposed product must support file submission from ICAP client devices.			
		The proposed product should have the facility to submit URLs for analysis of malwares hosted in the remote sites			
		The proposed product should support Inspection of new threats including ransomware and malwares.			
		The proposed product must support Anti-evasion techniques like sleep calls, process and registry queries			
		The proposed product must support Callback Detection like malicious URL visit, Botnet C&C communication, and attacker traffic from activated malware			
		The proposed product must support a huge range of file types: .7z, .ace, .apk, .arj, .bat, .bz2, .cab, .cmd, .dll, .doc, .docm, .docx, .dot, .dotm, .dotx, .exe, .gz, .htm, html, .htmnojs, .jar, .js, .kgb, .lnk, .lzh, .msi, .pdf, .pot, .potm, .potx, .ppam, .pps, .ppsm, .ppsx, .ppt, .pptm, .pptx, .ps1, .rar, .rtf, .sldm, .sldx, .swf, .tar,			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		.tgz, .upx, url, .vbs, WEBLink, .wsf, .xlam, .xls, .xlsb, .xlsm, .xlsx, .xlt, .xltm, .xltx, .xz, .z, .zip			
		The proposed product should have the ability to develop and forward the dynamically generated signature to all the registered devices on detection of a zero-day malware			
		The proposed product must support OT services			
		The proposed product should support third-party YARA rules for malware detection.			
		The proposed product should have the options to Download Capture packets, Original File, Tracer log, Screenshot, and videos of malware interaction during sandbox scanning.			
		The proposed product should be scalable by clustering additional appliances to improve files/hour performance.			
		The proposed product should be able to send logs to the existing Centralized Logging and Reporting Appliance			
		The proposed product must support Mitre ATT&CK-based reporting on malware techniques such as file modification, process behaviors, registry behaviors, and network behaviors or equivalent functionality			
		The proposed product must support the Real-Time Monitoring Widgets such as, scanning result statistics, scanning activities (over time), top targeted hosts, top malware, top infectious URLs, top callback domains			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
10.0	**SIEM**	The solution should have comprehensive predefined security configuration assessment check (settings) for different supported platforms as per industry standards such as ISO27001, PCI-DSS, OWASP, CIS etc.		**M**	
		The application should support multiple approaches for vulnerability assessment. • Automated Vulnerability Assessment (over the network) Manual Vulnerability Assessment in case automated VA is not allowed		**M**	
		Appliance based solution or supplier should propose associated hardware and storage to meet and optimized technical requirements as per OEM recommendation.		**M**	
		Minimum support 1000 EPS/MPS/EPC/MPC or similar with scalability up to 10,000 EPS/MPS/EPC/MPC or similar		**M**	
		Minimum support 10000 network flow/m with scalability up to 100,000 network flow/m		**M**	
		Support integration with vulnerability and patch management, Identity Access module, Network Admission Control, WLAN Controller, AAA, IPS and Threat intelligence etc. solutions.		**M**	
		The application should allow search of assets based on IP, Location, Owner and Department			
		Support healthy database for logs, events and network activities collection and processing such that all information can be access from a single GUI in efficient manner			
		All standard rules as defined by international good practices must be included			
		Additions of rules should be easy and manageable			
		Should support full stack monitoring & management			
		Support both manual and automatic update of configuration information with minimal user intervention. For example, security taxonomy updates, rule updates, device support, upgrades, patches etc.			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		Real time dashboard of proposed system internal health checks and performance indicators statistics, i.e., memory, storage, CPU, I/Os, network traffic etc. and notify the system administrator when problems arise			
		The system administrator is able to define role base access to the system by log source, assets group, functional area or dashboard. This includes being able to restrict a user's access to information to only those systems from a specific group or functions or dashboard including, but not limited to, administration, reporting, event filtering, correlation, and/or dashboard viewing.			
		The solution deliver customizable dashboards (i.e. for Security Operation Center, threat management, compliance management, privileged users monitoring, monitored assets view, top security events view, network activities and attacks view, use cases view, malware/virus views, suspicious/malicious activities view, incidents and alarms views etc.).			
		Support and provide predefined templates for dashboards and wizard to build new ones dashboards as per customer requirement or institution IT or business environment.			
		Support standard protocols (like DNS, NetBIOS, SNMP, NTP, SMTP, HTTPS, SSH).			
		Log collection and archive architecture that supports both short-term (online i.e 3 months) and long-term (offline) event storage.			
		The solution support industry log collection methods (Syslog, Windows Management Instrumentation (WMI), Remote Procedure Call (RPC), Windows Events Collection, FTP, SFTP, SNMP, SMTP, JDBC, SDEE etc.)			
		The solution / system generate audit logs of all administrator / user actions within system/SIEM Accounting Audit including logs/event tamper monitoring.			

SI. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		The solution categorizes log data into a human-readable format to eliminate the need-to-know OEM specific event IDs			

Sl. No.	Item	Technical Description	Compliance Y/N	Reference / Remarks
11.0	**NMS**	Industry leading network monitoring solution capable of monitoring multivendor wired and wireless devices		
		Solution should cover all the devices/interfaces/components as in this tender and additional 20%, capacity for devices of current infrastructure		

		Features include
		  • Real time visibility and control
		  • Centralized monitoring via integrated dashboard
		  • Network health, servers (physical & virtual), storage, applications and micro services performance monitoring
		  • Service desk and incident management with 15 technician licenses
		  • Traffic analysis
		  • On prem solution, no virtual appliance		

12.0	**Display Solution**	2 X 3 UHD 4K 55-inch 1920 x 1080 video wall solution		
		Bezel width of less than 1 mm		
		Anti-glare screens		
		Minimum 700 nits		
		Designed to operate 24 x 7 control room operations		
		Two (02) ultra-wide, high-resolution monitors with associated PC and relevant hardware		
		Include all accessories such as gold-plated HDMI cables, frame, electrical cabling, video wall controller preferably from the same OEM as of display screens otherwise in case of 3rd party controllers, full compatibility, integration and support is required. UPS, DBs and any other required hardware/software component for screen mounting and operations deemed to be included.		
		EMC class B & ISTA 6 packaging certified		

SI. No.	Item	Technical Description	Compliance Y/N	Reference / Remarks
13.0	**Video Conferencing Solution**	The Solution should be appliance based with redundant power supplies		
		Must Support and compatible with proposed VC Endpoints		
		Must Support and compatible with 3rd party end points and office 365		
		Should connect all type in meetings i.e Room based, Desktop Video Systems, mobile clients or browsers		
		MCU should be at HD108060fps (transmit and receive) up to 4-6Mbps or equivalent		
		MCU should be scalable by just adding the license without changing the hardware		
		MCU should support SIP, H.323 standards for communications		
		MCU should support H.263, H.264, WebM / VP8, Microsoft RTV, HTML5/WebRTC		
		5 concurrent meeting licenses		
		Should support dual stream protocols		
		Content sharing using standard H.239 and BFCP		
		Support encryption in SIP and H.323 modes		
		Should also support G.711, G.729A, G.722, G.722.1, AAC-LD or better		
		Automatic Gain Control and noise cancellation		
		Support aspect ratio of 16:9 and 4:3		
		Resolution mix should be supported. End point should get the maximum at his capacity without reducing the capacity of other		
		Shall support user management by implementing strong password, aging rule for password, displaying login records, implementing maximum no of concurrent user session and user session timeout		
		Recording (local); 2 port at least		
		DTMF and Echo cancellation		
		AES encryption on H.235 and TLS for SIP or better		
		Must support continuous presence and must ensure that continuous presence can be sent and receive between endpoints		
		All licenses must be inclusive for 3 years		
		List active and upcoming meeting for a 24 Hour period as well as the ability to search and filter		

		List participants in an ongoing meeting/conference		
		Ability to mute/unmute audio for individual / all / group or new participant		
		Meeting events logs including call statistic video, audio or presentation		
		VC End Points		
		Codec based System with 1920x1080 camera with Horizontal FoV 80 degrees and vertical FoV 48.8 degrees or better codec, Microphone Array, cables, and control panel		
		The unit should support H.323, SIP standards for communications		
		Video standards: H.264, H.265		
		The unit should support 1080p 60 fps		
		Should support content sharing using standard based H.239 and SIP		
		Wired or wireless Presentation Sharing		
		Supports dual content sources for local meetings. 4K content sharing (local 30 fps, remote 5 fps)		
		Audio standards: G.711, G.722, G.722.1, G.729, AAC-LD		
		20kHz bandwidth or better with crystal clear audio and stereo sound		
		Automatic Gain Control and Automatic Noise Suppression		
		Keyboard noise reduction and instant adaptation echo cancellation		
		One HDMI input supports formats up to maximum 1080p60		
		Two HDMI inputs support formats up to maximum 4K (3840 x 2160) at 30 fps including HD1080p60		
		Support for multiple microphones, each with separate echo cancellers and noise reduction; all microphones can be set for balanced line level		
		2 or 3 x Microphone Input; 2 x desktop / tabletop microphones to be included		
		Two HDMI outputs support formats up to 3840 x 2160p60 (4Kp60)		
		Camera Minimum 20 x zoom or better		
		Automatic or manual focus/brightness/white balance		
		IPv4 and IPv6 support		
		Auto Gatekeeper Discovery		
		IP Precedence		
		H.323 based Packet Lost Recovery		

		Embedded Encryption: H.323 and SIP point-to-point, Standards based: H.235 v3 and Advanced Encryption Standard (AES) and Automatic key generation and exchange		
		70 inch 4K display screen		
		Warranty: 3 years for entire hardware, software and accessories		

Sl. No.	Item	Technical Description	Compliance Y/N	Reference / Remarks
14.0	**Smart Display Board**	Multitouch technology		
		Response time of 9ms or better		
		Frame rate 150Hz or better		
		Accuracy of 1.5mm over 90% of area		
		Minimum object size of 5mm		
		Tools to include: 2 x pens; 2 x erasers, multicolor four pen bundle, highlighter pen, stamps and cubes, magic pen		
		Screen size of 86 inches, LED, aspect ratio of 16:9, 4K UHD, refresh rate of minimum 60Hz		
		Viewing angle of 178 degrees or better		
		Glass thickness of 4mm, fully heat tempered, anti-glare that resists smudges and fingerprints		
		Convenience buttons: power, home, volume, screen shade, freeze frame		
		Sensors: proximity, ambient light, infrared, room temperature and humidity		
		Audio: 2 integrated 20W speakers or better		
		Software		
		Android 8.0 or above		
		Digital whiteboard, Web browser, Screen sharing, Personalized home screen and settings, Live input preview, Interactive widgets, Templates, graphic organizers and manipulatives, File and app libraries, google drive and one drive access		
		Ability to run thirty party applications, cloud storage access, object awareness supported		
		PC Computing: OPS Support, OPS PC with Windows 10 Pro, all power requirements must be met		
		Input/Output Cables		
		Input: HDMI, VGA video, stereo 3.5mm, RS-232, RJ 45, USB type C , USB 2.0 type A, USB 3.0 type A and B		
		Output: HDMI, Stereo 3.5mm, S/PDIF, RS-232		
		Cables and Accessories: power cable, 5m USB 2.0 cable, Pens, Erasers, External dual band 2.4 and 5 GHz antenna, remote control, wall mount kit		
		Hardware		
		4 GB DDR Memory or better		
		32 GB or better storage		
		2 x RJ 45, WIFI dual band, Bluetooth		
		Warranty		
		3 years including hardware, software and accessories		

Product Evaluation for the Servers & Storage Section:

S. No.	Item	Technical Requirement Description			Reference / Remarks
		Minimum Requirement	**Compliance Y/N**	**Mandatory Compliance**	
	VMware and Veeam	Solution based Training for 4 persons for minimum 8 days before Project deployment. • VMware vCloud Suite, Tanzu Standard, Setup, Install and Fatures - 5 Days Hands On • Veeam Availability Suite v11 - Features – Setup and Install - 4 Days Hands On • On-Site/Remote VMware/Veeam Software based SLA for 3 year - Including Software upgradation Service & Health Check Service		M	
		Installation of 30+ Windows Server based Virtual Machines		M	
		Installation of 20+ ESXi 7.x OS		M	
		Installing Configuring an ESXi Host as per best practice		M	
		Installing/deploying/Configuring vCenter Server Infrastructure with HA		M	
		Configuration of System parameters for vCenter Server Infrastructure		M	
		Installation and Configuration of all components of vCloud Suite		M	
		Installation and configuration of vmware management cluster		M	
		Local Backup of vCenter Server Appliance		M	
		Remote backup of vCenter Server Appliance		M	
		Remote replication of vCenter Server Appliance if require		M	
		Configuring vSphere Update Manager		M	
		Host Mapping with vCenter Server		M	
		Applying specific affinity rules where required.		M	
		FC Mapping with Servers with Datastore Mapping		M	
		Creating a vSphere Standard Switch with a kernel Network		M	
		Customizing vSphere Standard Switches		M	
		Tweaking vSphere Standard Switch for Load Balancing and Security		M	
		Tuning Virtual Machines for Near Native Physical Server Performance		M	
		Optimizing Virtual Port Groups		M	
		Configuring Kernel Networking		M	
		Customizing Autostart		M	
		Configuration of NTP		M	

		Configuration of SMTP		**M**	
		Firewall Configuration		**M**	
		Resource Pool Configuration		**M**	
		Optimized BIOS Configuration for Servers for VMware		**M**	
		Adjusting Quedepts. for FC		**M**	
		Security Users Creation		**M**	
		Swap Configuration		**M**	
		Setting IOPS parameters		**M**	
		IOPS parameters for VM's		**M**	
		Customizing Logging		**M**	
		Configuring Virtual Machine Networking		**M**	
		Configuration of Standard High Availability		**M**	
		Configuration of Fault Tolerance		**M**	
		Mapping/Prioritizing of vSwitches		**M**	
		Tweaking VMware Snapshots for performance for Veeam		**M**	
		Installation of Windows Server OS for Veeam B&R		**M**	
		Configuration of Windows Server OS for Veeam B&R Server		**M**	
		Customizing Windows Server OS for Veeam B&R Server		**M**	
		Installation of Veeam Backup and Replication Server with Prox. & Rep. & WA		**M**	
		Configuration of Database for Veeam B&R		**M**	
		Licensing of Veeam Backup and Replication Server		**M**	
		Replica Creation of VM's		**M**	
		Installation Configuration of Veeam ONE/Reporter/Business View		**M**	
		Storage Optimization for Vmware		**M**	
		Backup Optimization for Vmware		**M**	
		Network Optimization for Vmware		**M**	
		Dedup Configuration for Veeam		**M**	
		Multipathing with Adapter failure tolerance		**M**	
		VMware Certified plugins installation for Integrated hardware and software devices/solutions.		**M**	
		Intelligent Vmware/Hardware connectivity with Storage and Network Devices to avoid Single point of failure .		**M**	

SI. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		Should support full height and half height blades in the same enclosure, occupying not more than 14U rack height		M	
		Should support minimum 8-12 half height servers or 4-6 full height servers		M	
		Should support six interconnect bays to configure 3+3 redundancy		M	
		Enclosure should support Intel Xeon processors based 2 CPU and 4 CPU blades and storage Blades		M	
		Should support housing of FCoE, Ethernet, FC and SAS interconnect fabrics offering redundancy as a feature. Also, should support network switches with 25/50 GB downlinks and (4) 40/100G QSFP28 uplink per switch to DC switch.		M	
1.0	Blade Chassis	4 x Interconnect Switches (ToR) must support 25/50 Gbps downlinks to the Blades in redundancy supporting carving 2 NICs with dual 25/50 Gbps connections per NIC and at least 2 x QSFP28 40G uplinks per switch.		M	
		2 x Interconnect Switches must support 32 Gbps Fibre Channel downlinks to the Blades in redundancy supporting carving 1 HBA with dual 32Gb downlink per HBA and at least 4 x 32Gb QSFP uplinks per switch.		M	
		Management/controlling software have to be from the OEM.		M	
		Solution to house the required number of blade servers in smallest number of enclosures.			
		Should support built-in management software appliance in redundancy with separate management network from production network			
		Should support technology built-in to every chassis for Auto-Discovery of resources			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		Chassis should provide display port and USB port to connect Laptop/Monitor and KVM locally			
		Should support linking multiple enclosures together to form single management ring to reduce complexity and provide single console of management for connected enclosures			
		If Bidder solution for all half and full height blades can accommodate in less than 4 blade chassis as per boq, Bidder is allowed to propose/quote less quantity.			
		Each HBA should support to transport Fiber Channel Block Access at minimum 32 GB/s			
		Should support multi-module link aggregation (MLAG) for resiliency against interconnect failure			
		If there is a difference in technology (ToR) as per above requirement, OEM/Bidder shall provide the equivalent, appropriate and required switching internal or external.			
		The enclosure should be populated fully with power supplies of the highest capacity available with the vendor. Power supplies should support N+N as well as N+1 redundancy configuration, where N is greater than 1.			
		Should offer a single-phase power subsystem enabled with technologies for lower power consumption.			
		Each blade enclosure should have a cooling subsystem consisting of redundant hot pluggable fans or blowers enabled with technologies for improved power consumption and acoustics			
		Should support auto-discovery of Compute, Memory, Storage and Fabrics within an enclosure or on multiple connected enclosures.			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		Should support activity, Health and Power LEDs for immediate status			
		Should support software-defined intelligence for configuring profiles to provision compute, storage, fabrics and images			
		Should support Firmware and OS Driver updates for the servers using profile templates to monitor, flag, and remediate			
		Should offer collaborative user interface which support logical resources to physical resources mapping, Smart Search, Activity Log, HTML5 mobile access, and Customizable Dashboard			
		Should provide a dedicated 1/10GbE management network for multi-enclosure communications, separate from data plane			
		Should support frictionless Firmware and OS Driver updates using profile templates to monitor, flag, and remediate			
		Should support reporting capabilities for; • Asset and inventory information for the devices in the enclosures • Thermal and power information, including real-time actual power usage per server and per enclosure			
		Reports should be exportable to CSV or Microsoft Excel format			
		Should support integration with popular virtualization offerings VMware vCenter and Microsoft system center or equivalent			
		Should support integration with open-source automation and DevOps tools such as Chef, Docker, Kubernetes and OpenStack			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
1.1	**Blade Server Half Height**	CPU: 2 x Intel Xeon Platinum 8260 or 8352Y or better		**M**	
		Motherboard: Intel C621 Series Chipset or Equivalent		**M**	
		Memory: 8 x 64GB RDIMMs 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots. Server should support 2TB Ram.		**M**	
				M	
		2 x 256 GB SSD with OEM recommended RAID 1		**M**	
		Storage Controller: RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 1 GB flash-backed write cache or equivalent 4 SAS lanes across an internal SAS port 6Gb/s SATA technology Mixed Mode		**M**	
		Networking features: 4 * 25/50 Gbps Ethernet Connections to Interconnect Modules		**M**	
		FC features: 32Gb Dual Port Fiber Channel Host Bus Adapter PCIe 3.0 x8 NVMe over Fiber Channel Ready		**M**	
		Interfaces: One (1) internal Micro SDHC card slot One (1) internal USB 3.0 connector One (1) external USB port		**M**	
		Bus Slots: Minimum of 3 Nos of x16 PCIe 3.0 based mezzanine slots supporting Converged Ethernet, Ethernet, FC adapters and SAS adaptors		**M**	
		Power-on password			
		Administrator's password			
		Keyboard password			
		Remote management On System Management Chipset with SSL encryption, Secure Shell version 2, Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface, AES and			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		RC4 encryption of video or equivalent			
		External USB port enable/disable			
		Network server mode			
		Serial interface control			
		TPM (Trusted Platform Module) 1.2 or 2.0 option			
		Advanced Encryption Standard (AES)			
		Intel® Advanced Encryption Standard-New Instructions (AES-NI)			
		Microsoft Windows Server			
		Microsoft Hyper-V Server			
		Red Hat Enterprise Linux			
		SUSE Linux Enterprise Server			
		VMware ESXi			
		VMware vSphere			
		Software should support dashboard view to quickly scan the managed resources to assess the overall health of the data center. It should provide an at-a-glance visual health summary of the resource's user is authorized to view.			
		Software should provide automated, policy-driven provisioning of storage resources. It can provision and manage SAN storage used by a server as you manage the server – all as a single resource. It can view and monitor storage systems and their storage pools, Provision new or existing SAN storage volumes for servers			
		It can Create volume templates to provision multiple volumes with the same configuration.			
		Management software should support integration with popular virtualization platform management software like vCenter, and SCVMM, equivalent			
		Should help provide proactive notification of actual or impending component failure alerts on critical components like CPU, Memory and HDD.			
		Should provide an online portal that can be accessible from			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		anywhere. The portal should provide one stop, online access to the product, support information and provide information to track warranties, support contracts and status. The Portal should also provide a personalized dashboard to monitor device heath, hardware events, and contract and warranty status. Should provide a visual status of individual devices and device groups. The Portal should be available on premise (at our location - console based).			
		Should help to proactively identify out-of-date BIOS, drivers, and Server Management agents and enable the remote update of system software/firmware components.			
		The Server Management Software should be of the same brand as of the server supplier.			
		Should support shared console.			
		Should support USB Media that allows to boot the remote server from the client machine (or anywhere on the client's network),and execute functions remotely.			
		Should have Remote System logs record.			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
1.2	**Blade Server Full Height**	CPU: 4 x Intel Xeon Platinum 8260 or 8352Y or better		M	
		Motherboard: Intel C621 Series Chipset or Equivalent		M	
		Memory: 32 x 64GB RDIMMs 2933 MT/s or 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots. Server should support 4TB Ram.		M	
		Memory Protection: Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,		M	
		2 x 256 GB SSD with OEM recommended RAID 1		M	
				M	
		Storage Controller: RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology Mixed Mode		M	
		Networking Features: 4 * 25/50 Gbps Ethernet Connections to Interconnect Modules		M	
		FC Features: 32Gb Dual Port Fiber Channel Host Bus Adapter PCIe 3.0 x8 NVMe over Fiber Channel Ready		M	
		Interfaces: One (1) internal Micro SDHC card slot One (1) internal USB 3.0 connector One (1) external USB port		M	
		Bus Slots: Minimum of 6 Nos of x16 PCIe 3.0 based mezzanine slots supporting Converged Ethernet, Ethernet, FC adapters and SAS adaptors		M	
		Power-on password			
		Administrator's password			
		Keyboard password			
		Remote management On System Management Chipset			

SI. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		with SSL encryption, Secure Shell version 2, Advanced Encryption Standard (AES) and Triple Data Encryption Standard (3DES) on browser, CLP and XML scripting interface, AES and RC4 encryption of video			
		External USB port enable/disable			
		Network server mode			
		Serial interface control			
		Advanced Encryption Standard (AES)			
		Intel® Advanced Encryption Standard-New Instructions (AES-NI) or equivalent			
		Microsoft Windows Server			
		Microsoft Hyper-V Server			
		Red Hat Enterprise Linux			
		SUSE Linux Enterprise Server			
		VMware ESXi			
		VMware vSphere			
		Software should support dashboard view to quickly scan the managed resources to assess the overall health of the data center. It should provide an at-a-glance visual health summary of the resource's user is authorized to view.			
		Software should provide automated, policy-driven provisioning of storage resources. It can provision and manage SAN storage used by a server as you manage the server – all as a single resource. It can view and monitor storage systems and their storage pools, Provision new or existing SAN storage volumes for servers			
		It can Create volume templates to provision multiple volumes with the same configuration.			
		Management software should support integration with popular virtualization platform management software like vCenter, and SCVMM, equivalent			
		Should help provide proactive notification of actual or impending component failure			

SI. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		alerts on critical components like CPU, Memory and HDD.			
		Should provide an online portal that can be accessible from anywhere. The portal should provide one stop, online access to the product, support information and provide information to track warranties, support contracts and status. The Portal should also provide a personalized dashboard to monitor device heath, hardware events, and contract and warranty status. Should provide a visual status of individual devices and device groups. The Portal should be available on premise (at our location - console based).			
		Should help to proactively identify out-of-date BIOS, drivers, and Server Management agents and enable the remote update of system software/firmware components.			
		The Server Management Software should be of the same brand as of the server supplier.			
		Should support shared console.			
		Should support USB Media that allows to boot the remote server from the client machine (or anywhere on the client's network), and execute functions remotely.			

S. No.	Item	Technical Requirement Description			Reference / Remarks
		Minimum Requirement	**Compliance Y/N**	**Mandatory Compliance**	
2.0	**Rack Mount Server for Production Database**	CPU: 2 x Intel Xeon Platinum 8268 or 8352Y or better		**M**	
		Motherboard: Intel C621 Series Chipset or Equivalent		**M**	
		Memory: 16 x 64GB RDIMMs 3200 MT/s or Equivalent. Should support at least 48 x DIMM slots. Server should support 4TB Ram.		**M**	
		Memory Protection: Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,		**M**	
		microSD Flash Memory Card: 32GB microSD Flash Memory Card		**M**	
		Storage Controller: RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology		**M**	
		Networking Features: 2 x Ethernet 10/25Gb 2-port SFP28 Adapter		**M**	
		SSD: 2 x 1.92TB SAS 12G Mixed Use SFF SSD		**M**	
		NVMe - SFF - Solid State Drives : 1 x 750GB+ NVMe Gen3+ High Performance Low Latency Write Intensive SFF (HHHL form factor, PCI 3.0 x 4) or higher capacity		**M**	
		Fiber Channel features: 2 x 32Gb Single Port Fiber Channel Host Bus Adapter		**M**	
		Interfaces : One (1) internal Micro SDHC card slot Two (2) rear, Two (2) front, One USB connector One (1) serial port One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)		**M**	
		Bus Slots: Support for 12 PCIe 3.0 slots		**M**	
		Optical Drive: None		**M**	
		Fans: 8 hot plug fans, n+1 redundant or equivalent		**M**	
		Cable Management and Railing Kit: Should have 1 Cable Management arm with railing Kit		**M**	

		Power Supply: Fully redundant 1500W+ Power supply or as per OEM Design Equivalent		**M**	
		Form Factor: Minimum 2U+		**M**	

S. No.	Item	Technical Requirement Description			Reference / Remarks
		Minimum Requirement	**Compliance Y/N**	**Mandatory Compliance**	
3.0	**Rack Mount Server for Production Reporting**	CPU: 2 x Intel Xeon Platinum 8268 or 8352Y or better		**M**	
		Motherboard: Intel C621 Series Chipset or Equivalent		**M**	
		Memory: 8 x 64GB RDIMMs 3200 MT/s or Equivalent. Should support at least 48 x DIMM slots. Server should support 4TB Ram.		**M**	
		Memory Protection: Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,		**M**	
		microSD Flash Memory Card: 32GB microSD Flash Memory Card		**M**	
		Storage Controller: RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology		**M**	
		Networking Features: 2 x Ethernet 10/25Gb 2-port SFP28 Adapter		**M**	
		SSD: 2 x 960 GB SAS 12G Mixed Use SFF SSD		**M**	
		NVMe - SFF - Solid State Drives : 1 x 750GB+ NVMe Gen3+ High Performance Low Latency Write Intensive SFF (HHHL form factor, PCI 3.0 x 4) or higher capacity		**M**	
		Fiber Channel features: 2 x 32 Gb Single Port Fiber Channel Host Bus Adapter		**M**	
		Interfaces: One (1) internal Micro SDHC card slot Two (2) rear, Two (2) front, One USB connector One (1) serial port One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)		**M**	
		Bus Slots: 3 PCIe 3.0 slots available, support for 14 PCIe 3.0 slots		**M**	
		Optical Drive: None		**M**	

		Fans: 8 hot plug fans, n+1 redundant or as per OEM Design Equivalent		**M**	
		Cable Management and Railing Kit: Should have 1 Cable Management arm with railing Kit		**M**	
		Power Supply: Fully redundant 1500W+ Power supply or as per OEM Design Equivalent		**M**	
		Form Factor: Minimum 2U+		**M**	

S. No.	Item	Technical Requirement Description			Reference / Remarks
		Minimum Requirement	**Compliance Y/N**	**Mandatory Compliance**	
4.0	**Rack Mount Server for Production Backup**	CPU: 2 x Intel Xeon Platinum 8253 6326 or better		**M**	
		Motherboard: Intel C621 Series Chipset or Equivalent		**M**	
		Memory: 2 x 16GB RDIMMs 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots.		**M**	
		Memory Protection: Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,		**M**	
		SSD: 2 x 960GB SAS 12G Mixed Use SFF SSD		**M**	
		Networking Features: 2 x Ethernet 10/25Gb 2-port SFP28 Adapter		**M**	
		Fiber Channel features: 2 x 32Gb Dual Port Fiber Channel Host Bus Adapter		**M**	
		Interfaces: One (1) internal Micro SDHC card slot Two (2) rear, One (1) front USB connector One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)		**M**	
		Bus Slots: support for 6 PCIe 3.0 slots		**M**	
		Optical Drive: None		**M**	
		Fans: 6 hot plug fans, N+1 redundant or as per OEM Design Equivalent		**M**	
		Cable Management and Railing Kit: Should have 1 Cable Management arm with railing Kit		**M**	
		Power Supply: Fully redundant 800W Power supply or as per OEM Design Equivalent		**M**	
		Form Factor: Minimum 2U+		**M**	

S. No.	Item	Technical Requirement Description	Reference / Remarks

		Minimum Requirement	**Compliance Y/N**	**Mandatory Compliance**	
5.0	**Rack Mount Server for Production Data Warehouse**	CPU: 4 x Intel Xeon Platinum 8268 or 8352Y or better		**M**	
		Motherboard: Intel C621 Series Chipset or Equivalent		**M**	
		Memory: 32 x 64GB RDIMMs 3200 MT/s or Equivalent Should support at least 48 x DIMM slots. Server should support 4TB Ram.		**M**	
		Memory Protection: Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,		**M**	
		microSD Flash Memory Card: 32GB microSD Flash Memory Card		**M**	
		Storage Controller: RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology		**M**	
		Networking Features: 2 x Ethernet 10/25Gb 2-port SFP28 Adapter		**M**	
		SSD: 2 x 960GB SAS 12G Mixed Use SFF SSD		**M**	
		Fiber Channel features: 2 x 32Gb Dual Port Fiber Channel Host Bus Adapter		**M**	
		Interfaces: One (1) internal Micro SDHC card slot Two (2) rear, Two (2) front USB connector One (1) serial port One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)		**M**	
		Bus Slots: support for 3 PCIe 3.0 slots		**M**	
		Optical Drive: None		**M**	
		Fans: 8 hot plug fans, N+1 redundant or as per OEM Design Equivalent		**M**	
		Cable Management and Railing Kit: Should have 1 Cable Management arm with railing Kit		**M**	
		Power Supply: Fully redundant 1500W+ Power supply or as per OEM Design Equivalent		**M**	
		GPU: should support NVidia GPU accelerator cards by OEM		**M**	

S. No.	Item	Technical Requirement Description			Reference / Remarks
		Minimum Requirement	**Compliance Y/N**	**Mandatory Compliance**	
6.0	**Rack Mount Server for Production IRMS**	CPU: 2 x Intel Xeon Platinum 8268 or 8352Y or better		**M**	
		Motherboard: Intel C621 Series Chipset or Equivalent		**M**	
		Memory: 8 x 64GB RDIMMs 3200 MT/s or Equivalent Should support at least 48 x DIMM slots. Server should support 4TB Ram.		**M**	
		Memory Protection: Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,		**M**	
		microSD Flash Memory Card: 32GB microSD Flash Memory Card		**M**	
		Storage Controller: RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology		**M**	
		Networking Features: 2 x Ethernet 10/25Gb 2-port SFP28 Adapter		**M**	
		SSD: 2 x 960GB SAS 12G Mixed Use SFF SSD		**M**	
		Fiber Channel features: 2 x 32Gb Dual Port Fiber Channel Host Bus Adapter		**M**	
		Interfaces: One (1) internal Micro SDHC card slot Two (2) rear, Two (2) front USB connector One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)		**M**	
		Bus Slots: support for 3 PCIe 3.0 slots		**M**	
		Optical Drive: None		**M**	
		Fans: 8 hot plug fans, N+1 redundant or as per OEM Design Equivalent		**M**	
		Cable Management and Railing Kit: Should have 1 Cable Management arm with railing Kit		**M**	
		Power Supply: Fully redundant 800W Power supply or as per OEM Design Equivalent		**M**	

S. No.	Item	Technical Requirement Description			Reference / Remarks
		Minimum Requirement	Compliance Y/N	Mandatory Compliance	
		CPU: 2 x Intel Xeon Platinum 8353H or better		**M**	
		Motherboard: Intel C621 Series Chipset or Equivalent		**M**	
		Memory: 2 x 16GB RDIMMs 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots.		**M**	
		Memory Protection: Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,		**M**	
		microSD Flash Memory Card: 32GB microSD Flash Memory Card		**M**	
7.0	**Rack Mount Server for Production Dev-QA – Database**	Storage Controller: RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology		**M**	
		Networking Features: 2 x Ethernet 10/25Gb 2-port SFP28 Adapter		**M**	
		SSD: 2 x 960GB SAS 12G Mixed Use SFF SSD		**M**	
		Fiber Channel features: 2 x 32Gb Single Port Fiber Channel Host Bus Adapter		**M**	
		Interfaces: One (1) internal Micro SDHC card slot Two (2) rear, One (1) front USB connector One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)		**M**	
		Bus Slots: support for 4 PCIe 3.0 slots		**M**	
		Optical Drive: None		**M**	
		Fans: 6 hot plug fans, N+1 redundant or as per OEM Design Equivalent		**M**	
		Cable Management and Railing Kit: Should have 1 Cable Management arm with railing Kit		**M**	
		Power Supply: Fully redundant 800W Power supply or as per OEM Design Equivalent		**M**	

S. No.	Item	Technical Requirement Description			Reference / Remarks
		Minimum Requirement	**Compliance Y/N**	**Mandatory Compliance**	
8.0	**Rack Mount Server for Production Dev-QA – PA Model Server**	CPU: 2 x Intel Xeon Platinum 8268 or 8352Y or better		**M**	
		Motherboard: Intel C621 Series Chipset or Equivalent		**M**	
		Memory: 2 x 64GB RDIMMs 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots.		**M**	
		Memory Protection: Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,		**M**	
		microSD Flash Memory Card: 32GB microSD Flash Memory Card		**M**	
		Storage Controller: RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology		**M**	
		Networking Features: 2 x Ethernet 10/25Gb 2-port SFP28 Adapter		**M**	
		SSD: 2 x 960GB SAS 12G Mixed Use SFF SSD		**M**	
		Fiber Channel features: 2 x 32Gb Single Port Fiber Channel Host Bus Adapter		**M**	
		Interfaces: One (1) internal Micro SDHC card slot Two (2) rear, One (1) front USB connector One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)		**M**	
		Bus Slots: support for 6 PCIe 3.0 slots		**M**	
		Optical Drive: None		**M**	
		Fans: 6 hot plug fans, N+1 redundant or as per OEM Design Equivalent		**M**	
		Cable Management and Railing Kit: Should have 1 Cable Management arm with railing Kit		**M**	
		Power Supply: Fully redundant 1500W+ Power supply or as per OEM Design Equivalent		**M**	
		GPU: Should support NVidia GPU accelerator cards by OEM		**M**	

S. No.	Item	Technical Requirement Description			Reference / Remarks
		Minimum Requirement	**Compliance Y/N**	**Mandatory Compliance**	
9.0	**Rack Mount Server for Production Dev-QA – Warehouse Server**	CPU: 2 x Intel Xeon Platinum 8268 or 8352Y or better		**M**	
		Motherboard: Intel C621 Series Chipset or Equivalent		**M**	
		Memory: 2 x 32GB RDIMMs 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots.		**M**	
		Memory Protection: Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,		**M**	
		microSD Flash Memory Card: 32GB microSD Flash Memory Card		**M**	
		Storage Controller: RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology		**M**	
		Networking Features: 2 x Ethernet 10/25Gb 2-port SFP28 Adapter		**M**	
		SSD: 2 x 960GB SAS 12G Mixed Use SFF SSD		**M**	
		Fiber Channel features: 2 x 32Gb Single Port Fiber Channel Host Bus Adapter		**M**	
		Interfaces: One (1) internal Micro SDHC card slot Two (2) rear, One (1) front USB connector One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)		**M**	
		Bus Slots: support for 6 PCIe 3.0 slots		**M**	
		Optical Drive: None		**M**	
		Fans: 6 hot plug fans, N+1 redundant or as per OEM Design Equivalent		**M**	
		Cable Management and Railing Kit: Should have 1 Cable Management arm with railing Kit		**M**	
		Power Supply: Fully redundant 800W Power supply or as per OEM Design Equivalent		**M**	

S. No.	Item	Technical Requirement Description			Reference / Remarks
		Minimum Requirement	**Compliance Y/N**	**Mandatory Compliance**	
10.0	**Rack Mount Server for Production Dev-QA - Reserved Server–**	CPU: 2 x Intel Xeon Platinum 8268 or 8352Y or better		**M**	
		Motherboard: Intel C621 Series Chipset or Equivalent		**M**	
		Memory: 8 x 64GB RDIMMs 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots.		**M**	
		Memory Protection: Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,		**M**	
		microSD Flash Memory Card: 32GB microSD Flash Memory Card		**M**	
		Storage Controller: RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology		**M**	
		Networking Features: 2 x Ethernet 10/25Gb 2-port SFP28 Adapter		**M**	
		SSD: 2 x 960GB SAS 12G Mixed Use SFF SSD		**M**	
		Fiber Channel features: 2 x 32Gb Single Port Fiber Channel Host Bus Adapter		**M**	
		Interfaces: One (1) internal Micro SDHC card slot Two (2) rear, One (1) front USB connector One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)		**M**	
		Bus Slots: support for 6 PCIe 3.0 slots		**M**	
		Optical Drive: None		**M**	
		Fans: 6 hot plug fans, N+1 redundant or as per OEM Design Equivalent		**M**	
		Cable Management and Railing Kit: Should have 1 Cable Management arm with railing Kit		**M**	
		Power Supply: Fully redundant 800W Power supply or as per OEM Design Equivalent		**M**	

S. No.	Item	Technical Requirement Description			Reference / Remarks
		Minimum Requirement	**Compliance Y/N**	**Mandatory Compliance**	
11.0	**Rack Mount Server for Production Management Server**	CPU: 2 x Intel Xeon 8253 or 6326 or better		**M**	
		Motherboard: Intel C621 Series Chipset or Equivalent		**M**	
		Memory: 2 x 16GB RDIMMs 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots.		**M**	
		Memory Protection: Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,		**M**	
		microSD Flash Memory Card: 32GB microSD Flash Memory Card		**M**	
		Storage Controller: RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache or equivalent 8 SAS lanes across an internal SAS port 6Gb/s SATA technology		**M**	
		Networking Features: 2 x Ethernet 10/25Gb 2-port SFP28 Adapter		**M**	
		SSD: 2 x 960GB SAS 12G Mixed Use SFF SSD		**M**	
		Interfaces: One (1) internal Micro SDHC card slot Two (2) rear, One (1) front USB connector One (1) Display port (VGA) One (1) Network Management port (iLO/iDRAC/iLOM)		**M**	
		Bus Slots: support for 6 PCIe 3.0 slots		**M**	
		Optical Drive: None		**M**	
		Fans: 6 hot plug fans, N+1 redundant or as per OEM Design Equivalent		**M**	
		Cable Management and Railing Kit: Should have 1 Cable Management arm with railing Kit		**M**	
		Power Supply: Fully redundant 800W Power supply or as per OEM Design Equivalent		**M**	

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
12.0	**Storage Solution for Virtualized Hosts**	Offered Storage array shall be end-to end 12Gbps enabled which means that both Front-end Fiber channel ports and Back-end engines shall be operated at minimum 12Gbps speed.		M	
		Consolidated dashboard and alerting		M	
		Thin Provisioning		M	
		Deduplication/Compression		M	
		Quality of Service		M	
		VVols		M	
		(NVMe) All-Flash Array Storage		M	
		102TB usable capacity on Hypervisor required with high performance low latency (< 2 ms) drives with RAID protection and 3 Hot Spares for protection with minimum 150,000 IOPS.		M	
		Offered Storage Array shall be given with minimum of 192GB usable with dual controller		M	
		Controllers shall be true active-active so that a single logical unit can be shared across all offered controllers in symmetrical fashion, while supporting all the major functionalities like Thin Provisioning. End to End NVMe should be supported.		M	
		Offered Storage Subsystem shall support Raid 5 & 6 or better.		M	
		Offered Storage array shall support all well-known protocols like FC, iSCSI, VMware Virtual Volumes (VVols) FC & ISCSI, etc.		M	
		Offered Storage shall have minimum of 16 host ports for connectivity to servers running at 32Gbps speed without SAN Switches.		M	
		Vendor shall provide Storage Array configuration and Management software.		M	
		Cache shall exclude any performance acceleration module, Flash Cache, PAM card, SSD Cache		M	
		Each storage processor should connect to one side of each of two redundant pairs of four-lane x 12 Gb/s Serial Attached SCSI (SAS) buses or RDMA/IB/PCIe, providing continuous drive access to hosts in the event of a storage processor or bus fault.		M	

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		Offered Storage Array shall be configured in a No Single Point of configuration including Array Controller card, Cache memory, FAN, Power supply etc.		M	
		Offered storage shall have 16 number of SAS Back-end lanes running at 12Gbps speed.		M	
		The offered storage should support min of 512 Hosts.		M	
		4 x 10 GbE SFP+ for Ethernet		M	
		Offered Storage Array shall support hot Spare for offered Disk drives.		M	
		Should have capability to expand LUN till 256 TB or more.		M	
		Offered Storage array shall support data reduction feature of De-duplication and Compression.		M	
		The storage array should support industry-leading Operating System platforms including: Windows 2016/2019, VMware, Solaris, HP-UX, IBM AIX and Linux.			
		Offered storage array shall have native VMware/Virtualization support			
		In case of Power failure, Storage array shall have de-stage feature to avoid any data loss.			
		Offered storage array shall support thin provisioning.			
		Offered storage array shall be tightly integrated with VMware so that Eager zero disks layout can be used with thin provisioning.			
		Offered Storage shall have support to make the snapshot and full copy (Clone) on the volumes if original volume is created on thick or vice-versa.			
		The storage array should have support for both controller-based snapshots functionality (At-least 1000 attached snapshots).			
		Software shall be able to manage more than one array of same family.			
		Native Asynchronous Block			
		Native Synchronous Block			
		The storage array should support hardware-based data replication at the array controller level across all models of the offered family.			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		Replication shall support incremental replication after resumption from Link Failure or failback situations.			
		VMware Site Recovery Manager (SRM) Integration			
		Virtualization API Integration: VMware: VAAI and VASA. Hyper-V: Offloaded Data Transfer (ODX) and Offload Copy for File			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
13.0	**Storage Solution for Physical Servers**	Offered Storage array shall be end-to-end 12Gbps enabled which means that both Front-end Fiber channel ports and Back-end engines shall be operated at minimum 12Gbps speed.		**M**	
		Consolidated dashboard and alerting		**M**	
		Thin Provisioning		**M**	
		Deduplication/Compression		**M**	
		Quality of Service		**M**	
		VVols		**M**	
		(NVMe) All-Flash Array Storage		**M**	
		100 TB usable capacity on Hypervisor required with high performance low latency (< 2 ms) drives with RAID protection and 3 Hot Spares for protection with minimum 150,000 IOPS.		**M**	
		Offered Storage Array shall be given with minimum of 192GB usable with dual controller		**M**	
		Controllers shall be true active-active so that a single logical unit can be shared across all offered controllers in symmetrical fashion, while supporting all the major functionalities like Thin Provisioning. End to End NVMe should be supported.		**M**	
		Offered Storage Subsystem shall support Raid 5 & 6 or better.		**M**	
		Offered Storage array shall support all well-known protocols like FC, iSCSI, VMware Virtual Volumes (VVols) FC & ISCSI, etc.		**M**	
		Offered Storage shall have minimum of 16 host ports for connectivity to servers running at 32Gbps speed without SAN Switches.		**M**	
		Vendor shall provide Storage Array configuration and Management software.		**M**	
		Cache shall exclude any performance acceleration module, Flash Cache, PAM card, SSD Cache		**M**	
		Each storage processor should connect to one side of each of two redundant pairs of four-lane x 12 Gb/s Serial Attached SCSI (SAS) buses or RDMA/IB/PCIe, providing continuous drive access to hosts in the event of a storage processor or bus fault.		**M**	
		Offered Storage Array shall be configured in a No Single Point of		**M**	

SI. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		configuration including Array Controller card, Cache memory, FAN, Power supply etc.			
		In case of Power failure, Storage array shall have de-stage feature to avoid any data loss.		M	
		Offered storage shall have 16 number of SAS Back-end lanes running at 12Gbps speed.		M	
		The offered storage should support min of 512 Hosts.		M	
		4 x 10 GbE SFP+ for Ethernet		M	
		Offered Storage Array shall support hot Spare for offered Disk drives.		M	
		Should have capability to expand LUN till 256 TB or more.		M	
		Offered Storage array shall support data reduction feature of De-duplication and Compression		M	
		The storage array should support industry-leading Operating System platforms including: Windows 2016/2019, VMware, Solaris, HP-UX, IBM AIX and Linux.			
		Offered storage array shall have native VMware/Virtualization support			
		Offered storage array shall support thin provisioning.			
		Offered storage array shall be tightly integrated with VMware so that Eager zero disks layout can be used with thin provisioning.			
		Offered Storage shall have support to make the snapshot and full copy (Clone) on the volumes if original volume is created on thick or vice-versa.			
		The storage array should have support for both controller-based snapshots functionality (At-least 1000 attached snapshots).			
		Software shall be able to manage more than one array of same family.			
		Native Asynchronous Block			
		Native Synchronous Block			
		The storage array should support hardware-based data replication at the array controller level across all models of the offered family.			
		Replication shall support incremental replication after resumption from Link Failure or failback situations.			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		VMware Site Recovery Manager (SRM) Integration			
		Virtualization API Integration: VMware: VAAI and VASA. Hyper-V: Offloaded Data Transfer (ODX) and Offload Copy for File			

Sl. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
14.0	**Purpose Built Backup Appliance**	Purpose built storage optimized for backup		**M**	
		Consolidated dashboard and alerting		**M**	
		Native in-line Deduplication/Compression		**M**	
		200TB or more backup capacity without deduplication and compression to be published on backup server.		**M**	
		Dual Spare drive(s) as per Manufacturer best practices.		**M**	
		The storage array should support up to 3 PB capacity		**M**	
		Native inline, variable length global deduplication		**M**	
		Connectivity Requirement: • 2 x 25Gb SFP 4 x 1GbE		**M**	
		Can sustain 20TB/hr or more backup processing		**M**	
		2 x 32Gb Fiber Channel adapter with required Cables		**M**	
		Offered backup appliance shall support Raid 1, 5 and Raid 6 and/or as per OEM best practices		**M**	
		Vendor shall provide Backup Appliance configuration and Management software.		**M**	
		Ability to flexibly emulate tape drive/ multiple tape formats LTO-Gen5, LTO-Gen6, and LTO-Gen7 etc.		**M**	
		Offered backup appliance shall have native VMware/Virtualization for backup/data protection		**M**	
		Ransomware Protection			
		Offered Backup appliance shall be compatible/support to work with Backup application vendor ISV like HPE, Veritas, Dell-EMC, Veeam, Commvault or equivalent etc.			
		The storage array should support industry-leading Operating System platforms including: Windows 2019, VMware, Solaris, HP-UX, IBM AIX and Linux.			
		Offered Backup appliance shall be configured in a No Single Point of configuration including FAN, Power supply etc.			

SI. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		In case of Power failure, backup appliance shall have feature to avoid any data loss.			
		Offered Backup Storage shall have minimum of 8 host ports for connectivity to servers.			
		Offered Backup appliance shall be provided with hot spare drives as per the OEM/industry best practices.			
		Offered Backup Appliance shall support data reduction feature of In-line De-duplication and Compression.			
		Software shall be able to manage more than one appliance of same family from a single centralized console/dashboard.			
		Should provide replication including bandwidth throttling			
		Replication shall support network optimized replication in all topologies e.g. 1:1, 1:many, many:1.			
		Offered disk-based backup device shall also support encryption functionality.			
		Offered backup Appliance Fiber channel ports shall support connectivity of servers either directly or via SAN switches while supporting the both source and Target based de-duplication			

Sl. No.	Item	Technical Description	Compliance Y/N	Reference / Remarks
15.0	**SAN Switches**	48 ports -32Gb FC Switches		
		LC/LC Multi-mode OM4 2 Fiber 5m or suggested Cable for all Servers, Storage, Backup Storage, Tape Library for FC connectivity		
		Each FC Switch must have 48 active(Loaded) ports with required Short Wave QSFP.		
		Hot plug, redundant power supplies and fans		
		Should be NVMe-ready.		
		ISL Trunking		
		Proactively and non-intrusively monitors storage device IO performance and behavior through integrated network sensors at the storage tier, providing deep insight into problems and ensuring service levels		
		Should provide policy-based monitoring tool with pre-built rules and automation that simplifies fabric-wide threshold configuration and monitoring. Configuration and Operational Monitoring Policy		
		Should have a software that simplifies deployment, safeguards consistency, and increases operational efficiencies of larger environments with automated switch and fabric configuration services. Administrators can configure a template or adopt an existing configuration to seamlessly deploy a configuration across the fabric.		
		Capable of optical and signal integrity for Fiber Channel optics and cables, simplifying deployment and support of high-performance fabrics.		
		Should have a comprehensive tool that enables administrators to identify, monitor, and analyze specific application data flows in order to simplify troubleshooting, maximize performance and avoid congestion without using taps to ensure optimized performance		
		Should have a simple browser-based user interface (UI) streamlining common workflows, such as configuration, zoning, deployment, troubleshooting, and reporting		
		Max AC Power Consumption 205 W per switch or equivalent		
		Back-to-front airflow (non-port-side intake); power from back, 1U		

SI. No.	Item	Technical Description	Compliance Y/N	Reference / Remarks
		10/100/1000 Mbps Ethernet (RJ-45), in-band over Fiber Channel, serial port (RJ-45 or min-USB), and one USB port The console/serial port may be an RJ-45 or a mini-USB depending on model. The correct cables and adapters are to be provided to connect to either an RJ-45 or RS-232		
		DH-CHAP (between switches and end devices), FCAP switch authentication; HTTPS, IPsec, IP filtering, LDAP with IPv6, OpenLDAP, Port Binding, RADIUS, TACACS+, user-defined Role-Based Access Control (RBAC), Secure Copy (SCP), Secure RPC, Secure Syslog, SFTP, SSH v2, SSL, Switch Binding, Trusted Switch, Secure boot, TLS v1.2/v1.3		

SI. No.	Item	Technical Description	Compliance Y/N	Reference / Remarks
16.0	**KVM Switches**	Should have remote management of all servers, network devices, and technology infrastructure.		
		1U Rack Mount LCD KVM Console features an integrated 16 Port Multi-Platform IP KVM Switch module.		
		16-port KVM Switch with 17-in.		
		LCD, keyboard and touchpad		
		Connect and control up to 256 computers locally or remotely		
		KVM switches should provide Smart Card or Common Access Card (CAC) support to the server		
		Should support two-factor authentication		
		Should include full remote KVM functionality for full remote KVM control of servers and serially attached devices at near local performance		
		Can easily load and update software and firmware from anywhere on the LAN or WAN		
		Web-based control allows client access using a standard browser - eliminating licensing costs and simplifying usage		
	Console Kit	Rackmount Console Kit with support of high-performance KVM console		
		Form Factor 1U		
		Should allow a KVM console switch to be mounted directly behind it		
		Should support 1600 x 1200 at 60 to 75 Hz refresh rates		
		1 Cable management arm, power adapter with brace rail		
		1U Console Rails		

SI. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		Base Module with 40 slots		M	
		2 x LTO-8 FC Tape Drive		M	
		Rack-mount hardware		M	
		Dual Redundant Power Supply		M	
		Should have a verification software that proactively validates and scans, no disruptively, the quality of data stored on 100 LTO tape cartridges		M	
		Tape Library should be supported with San Switch.		M	
		LTO-8 – Drive technology supported		M	
		LTO-7– Drive technology supported		M	
		LTO-6– Drive technology supported		M	
17.0	Tape Library	Form Factor 3U			
		Advanced analytics feature makes use of predictive analytics to predict the likelihood of failures, bottlenecks and load balancing issues in the tape infrastructure. It has unique capabilities of analytics around drive health and life as well as cartridge health and life.			
		4 x Cleaning Cartridge			
		2 x LTO-8 RW Bar Code Label Pack			
		2 x LTO-8 30TB RW Non-Custom Labeled Library Pack 20 Data Cartridges with Cases			
		20, Maximum Capacity – maximum no. of drives			
		1.2 PB (LTO-8, 40 slots)			
		5 per unit/module – Mail slots			
		KMIP 1.2 protocol – Data encryption			
		8 Gb Native Fiber Channel			
		6 Gb/sec SAS			
		(4) LC/LC Multi-mode OM4 2 Fiber 5m Cable			
		Status information on the drive and system			
		System configuration operations and reporting			
		System error and status logs			

SI. No.	Item	Technical Description	Compliance Y/N	Mandatory Compliance	Reference / Remarks
		Library and drive firmware upgrade capabilities			
		Diagnostic tests and information			
		Cartridge movement for maintenance and management purposes			
		Cleaning cartridge support			
		Security and access control			
		SNMP support for IP communication			
		Partitioning and Encryption management			
		HTTPS capable			
		IPv6 and IPv4 network protocol support			

S. No.	Item	Technical Requirement Description			Reference / Remarks
		Minimum Requirement	**Compliance Y/N**	**Mandatory Compliance**	
18.0	**Rack Mount Server for Ngnix**	CPU: 2 x Intel Xeon Platinum 8268 or 8352M or better		**M**	
		Motherboard: Intel C621 Series Chipset or Equivalent		**M**	
		Memory: 4 x 64GB RDIMMs 3200 MT/s or Equivalent. Should support at least 24 x DIMM slots.		**M**	
		Memory Protection: Advanced ECC with multi-bit error protection, Online spare with Rank Spare Mode,		**M**	
		microSD Flash Memory Card: 32GB microSD Flash Memory Card		**M**	
		Storage Controller: RAID 0, 1, 5, 6, 10, 12Gb/s SAS and PCIe 3.0, 2 GB flash-backed write cache 8 SAS lanes across an internal SAS port 6Gb/s SATA technology		**M**	
		Networking Features: 2 x Ethernet 10/25Gb 2-port SFP28 Adapter		**M**	
		SSD: 2 x 1TB M2 NVME SSD		**M**	
		Interfaces: One (1) internal Micro SDHC card slot Two (2) rear, One (1) front USB connector One (1) Display port One (1) Network Management port		**M**	
		Bus Slots: support for 6 PCIe 3.0 slots		**M**	
		Optical Drive: None		**M**	
		Fans: 6 hot plug fans, N+1 redundant		**M**	
		Cable Management and Railing Kit: Should have 1 Cable Management arm with railing Kit		**M**	
		Power Supply: Fully redundant 800W Power supply or as per OEM Design Equivalent		**M**	

Note:
Non compliance to the Mandatory compliance requirement will be considered as a material deviation such as defined in ITB 32.2 and shall lead to rejection of the bid as per ITB 32.4, while non compliance to the Non mandatory compliance requirement shall be dealt with as per ITB 33.1, 33.2 and 33.3.

Section 7: General Conditions of Contract

Table of Clauses

1. Definitions The following words and expressions shall have the meanings hereby assigned to them:

1.1 "ADB" is the Asian Development Bank.

1.2 "Adjudicator" means the person named in Appendix 1 (Adjudicator) of the Contract, or otherwise appointed by agreement between the Purchaser and the Supplier to make a decision on, or to settle any, dispute or difference between the Purchaser and the Supplier referred to him or her by the parties, pursuant to GC Clause 10 (Settlement of Disputes).

1.3 "Arbitration" means the application of judicial methods to the settlement of disputes.

1.4 "Contract" means the Agreement entered into between the Purchaser and the Supplier, together with the Contract Documents referred to therein, including all attachments, appendixes, and all documents incorporated by reference therein.

1.5 "Contract Documents" means the documents listed in the Agreement, including any amendments thereto.

1.6 "Contract Price" means the price payable to the Supplier as specified in the Agreement, subject to such additions and adjustments thereto or deductions therefrom, as may be made pursuant to the Contract.

1.7 "Day" means calendar day.

1.8 "Delivery" means the transfer of the IT products from the Supplier to the Purchaser in accordance with the terms and conditions set forth in the Contract.

1.9 "Completion" means the fulfillment of the services by the Supplier in accordance with the terms and conditions set forth in the Contract.

1.10 "Eligible Countries" means the countries and territories eligible as listed in Section 5.

1.11 "GCC" means the General Conditions of Contract.

1.12 "IT products" means all of the commodities, raw material, machinery and equipment, and/or other materials that the Supplier is required to supply to the Purchaser under the Contract.

1.13 "Purchaser's Country" is the country specified in the Special Conditions of Contract (SCC).

1.14 "Purchaser" means the entity purchasing the IT Products and Services, as specified in the SCC.

1.15 "Services" means the services incidental to the supply of the IT products, such as insurance, installation, training and initial maintenance and other similar obligations of the Supplier under the Contract.

1.16 "SCC" means the Special Conditions of Contract.

1.17 "Subcontractor" means any natural person, private or government entity, or a combination of the above, including its legal successors or permitted assigns, to whom any part of the IT products to be supplied or execution of any part of the services is subcontracted by the Supplier.

1.18 "Supplier" means the natural person, private or government entity, or a combination of the above, whose bid to perform the Contract has been accepted by the Purchaser and is named as such in the Agreement, and includes the legal successors or permitted assigns of the Supplier.

1.19 "The Site," where applicable, means the place named in the SCC.

2. Contract Documents

2.1 Subject to the order of precedence set forth in the Agreement, all documents forming the Contract (and all parts thereof) are intended to be correlative, complementary, and mutually explanatory.

3. Fraud and Corruption

3.1 If the Purchaser determines, based on reasonable evidence, that the Supplier has engaged in corrupt, fraudulent, collusive or coercive practices, or other integrity violations, including the failure to disclose any required information which constitutes a fraudulent practice, in competing for or in executing the Contract, then the Purchaser may, after giving 14 days' notice to the Supplier, terminate the Contract and expel him from the Site, and the provisions of Clause 35 shall apply as if such termination had been made under Sub-Clause 35.1 (iii) [Termination].

3.2 Should any employee of the Supplier be determined, based on reasonable evidence, to have engaged in corrupt, fraudulent or coercive practice or other integrity violations during the supply of IT Products and Services then that employee shall be removed.

3.3 ADB's Anticorruption Policy (1998, as amended to date) requires Borrowers (including beneficiaries of ADB-financed activity), as well as Bidders, Suppliers, and Contractors under ADB-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, ADB

3.4 defines, for the purposes of this provision, the terms set forth below as follows:

3.5 "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party;

3.6 "fraudulent practice" means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;

3.7 "coercive practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;

3.8 "collusive practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party;

3.9 "abuse" means theft, waste, or improper use of assets related to ADB-related activity, either committed intentionally or through reckless disregard;

3.10 "conflict of interest" means any situation in which a party has interests that could improperly influence that party's performance of official duties or responsibilities, contractual obligations, or compliance with applicable laws and regulations; and

3.11 "integrity violation" is any act, as defined under ADB's Integrity Principles and Guidelines (2015, as amended from time to time), which violates ADB's Anticorruption Policy, including (i) to (vi) above and the following: obstructive practice, violations of ADB sanctions, retaliation against whistleblowers or witnesses, and other violations of ADB's Anticorruption Policy, including failure to adhere to the highest ethical standard.

3.12 will reject a proposal for award if it determines that the Bidder recommended for award or any of its officers, directors, employees, personnel, subconsultants, subcontractors, service providers, suppliers or manufacturers has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the Contract;

3.13 will cancel the portion of the financing allocated to a contract if it determines at any time that representatives of the Borrower or of a beneficiary of ADB-financing engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations during the procurement or the execution of that contract, without the Borrower having taken timely and appropriate action satisfactory to ADB to remedy the situation, including by failing to inform ADB in a timely manner at the time they knew of the integrity violations;

3.14 will impose remedial actions on a firm or an individual, at any time, in accordance with ADB's Anticorruption Policy and Integrity Principles and Guidelines, including declaring ineligible, either indefinitely or for a stated period of time, to participate[9] in ADB-financed, -administered, or -supported activities or to benefit from an ADB-financed, -administered, or -supported contract, financially or otherwise, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations; and

3.15 will have the right to require that a provision be included in bidding documents and in contracts financed, administered, or supported by ADB, requiring Bidders, suppliers and contractors, consultants, manufacturers, service providers and other third parties engaged or involved in ADB-related activities, and their respective officers, directors, employees and personnel, to permit ADB or its representative to inspect

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[9] Whether as a Contractor, Nominated Subcontractor, Consultant, Manufacturer or Supplier, or Service Provider; or in any other capacity (different names are used depending on the particular Bidding Document).

the site and their assets, accounts and records and other documents relating to the bid submission and contract performance and to have them audited by auditors appointed by ADB.

3.16   All Bidders, consultants, contractors, suppliers, manufacturers, service providers, and other third parties engaged or involved in ADB-related activities and their respective officers, directors, employees and personnel, are obliged to cooperate fully in any investigation when requested by ADB to do so. As determined on a case by case basis by ADB, such cooperation includes, but is not limited to, the following:

(a)   being available to be interviewed and replying fully and truthfully to all questions asked;

(b)   providing ADB with any items requested that are within the party's control including, but not limited to, documents and other physical objects;

(c)   upon written request by ADB, authorizing other related entities to release directly to ADB such information that is specifically and materially related, directly or indirectly, to the said entities or issues which are the subject of the investigation;

(d)   cooperating with all reasonable requests to search or physically inspect their person and/or work areas, including files, electronic databases, and personal property used on ADB activities, or that utilizes ADB's Information and Communication Technology (ICT) resources or systems (including mobile phones, personal electronic devices, and electronic storage devices such as external disk drives);

(e)   cooperating in any testing requested by ADB, including but not limited to, fingerprint identification, handwriting analysis, and physical examination and analysis; and

(f)   preserving and protecting confidentiality of all information discussed with, and as required by, ADB.

3.17   All Bidders, consultants, contractors and suppliers shall require their officers, directors, employees, personnel, agents to ensure that, in its contracts with its subconsultants, Subcontractors and other third parties engaged or involved in ADB-related activities, such subconsultants, Subcontractors and other third parties similarly are obliged to cooperate fully in any investigation when requested by ADB to do so.

3.18   The Supplier shall permit ADB or its representative to inspect the Supplier's site, assets, accounts and records and other documents relating to the bid submission and contract performance of the Supplier and to have them audited by auditors appointed by ADB, if so required by ADB.

3.19   The Supplier undertakes that no fees, gratuities, rebates, gifts, commissions or other payments, other than those shown in the bid, have

been given or received in connection with the procurement process or in the contract execution.[10]

3.20   ADB's right to inspect the Site and/or the Supplier's accounts and records relating to the performance of the Contract stated in in this Sub-Clause and GCC 3.3(e) shall survive termination and/ or expiration of this Contract.

3.21   The Supplier has the obligation to notify the Purchaser of any changes in connection with the matters described in paragraphs (i), (k), (l), (m), (n), (o), (p) and (t) of the Letter of Bid.

3.22   If the Supplier is debarred or temporarily suspended by ADB, it shall inform the Purchaser of such debarment or suspension, and that the endorsement of ADB's Office of Anticorruption and Integrity is required for any variations, extensions or modifications to the Contract.

4. Interpretation   4.1 If the context so requires it, singular means plural and vice versa.

4.2 Incoterms

(a)   The meaning of any trade term and the rights and obligations of parties thereunder shall be as prescribed by Incoterms.

(b)   EXW, CIF, CIP, and other similar terms, shall be governed by the rules prescribed in the current edition of Incoterms, published by the International Chamber of Commerce at the date of the Invitation for Bids or as specified in the SCC.

4.3 Entire Agreement

The Contract constitutes the entire agreement between the Purchaser and the Supplier and supersedes all communications, negotiations, and agreements (whether written or oral) of parties with respect thereto made prior to the date of Contract.

4.4   Amendment

No amendment or other variation of the Contract shall be valid unless it is in writing, is dated, expressly refers to the Contract, and is signed by a duly authorized representative of each party thereto.

4.5   Nonwaiver

(a)   Subject to GCC Sub-Clause 4.5(b) below, no relaxation, forbearance, delay, or indulgence by either party in enforcing any of the terms and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect, or restrict the rights of that party under the Contract, neither shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.

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[10] The undertaking also applies during the period of performance of the contract.

(b) Any waiver of a party's rights, powers, or remedies under the Contract must be in writing, dated, and signed by an authorized representative of the party granting such waiver, and must specify the right and the extent to which it is being waived.

4.6 Severability

If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity, or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.

5. Language

5.1 The Contract as well as all correspondence and documents relating to the Contract exchanged by the Supplier and the Purchaser, shall be written in the language specified in the SCC. Supporting documents and printed literature that are part of the Contract may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified in the SCC, in which case, for purposes of interpretation of the Contract, this translation shall govern.

5.2 The Supplier shall bear all costs of translation to the governing language and all risks of the accuracy of such translation.

6. Joint Venture

6.1 If the Supplier is a Joint Venture all of the parties shall be jointly and severally liable to the Purchaser for the fulfillment of the provisions of the Contract and shall designate one party to act as a leader with authority to bind the Joint Venture. The composition or the constitution of the Joint Venture shall not be altered without the prior consent of the Purchaser.

7. Eligibility

7.1 The Supplier and its Subcontractors shall have the nationality of an eligible country. A Supplier or Subcontractor shall be deemed to have the nationality of a country if it is a citizen or constituted, incorporated, or registered, and operates in conformity with the provisions of the laws of that country.

7.2 All IT Products and Services to be supplied under the Contract and financed by ADB shall have their origin in Eligible Countries. For the purpose of this clause, "country of origin" means the country where the IT products have been grown, mined, cultivated, produced, manufactured, or processed; or through manufacture, processing, or assembly, another commercially recognized article results that differs substantially in its basic characteristics from its imported components.

8. Notices

8.1 Any Notice given by one party to the other pursuant to the Contract shall be in writing to the address specified in the SCC. The term "in writing" means communicated in written form with proof of receipt.

8.2 A Notice shall be effective when delivered or on the Notice's effective date, whichever is later.

9. Governing Law

9.1 The Contract shall be governed by and interpreted in accordance with the laws of the Purchaser's country, unless otherwise specified in the SCC.

10. Settlement of Disputes

10.1 The Purchaser and the Supplier shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.

10.2 If the parties fail to resolve such a dispute or difference by mutual consultation within 28 days from the commencement of such consultation, either party may require that the dispute be referred for resolution to the formal mechanisms specified in the SCC.

11. Scope of Requirements

11.1 Subject to the SCC, the IT Products and Services to be supplied shall be as specified in Section 6 (Schedule of Requirements).

11.2 Unless otherwise stipulated in the Contract, the Scope of Supply shall include all such items not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for attaining Delivery and Completion of the IT Products and Services as if such items were expressly mentioned in the Contract.

12. Delivery

12.1 Subject to GCC Sub-Clause 33.1, the Delivery of the IT products and Completion of the services shall be in accordance with the Delivery and Completion Schedule specified in the Section 6 (Schedule of Requirements). The details of shipping and other documents to be furnished by the Supplier are specified in the SCC.

13. Supplier's Responsibilities

13.1 The Supplier shall supply all the IT Products and Services included in the Scope of Supply in accordance with GCC Clause 11, and the Delivery and Completion Schedule, as per GCC Clause 12.

14. Purchaser's Responsibilities

14.1 Whenever the supply of IT Products and Services requires that the Supplier obtain permits, approvals, and import and other licenses from local public authorities, the Purchaser shall, if so required by the Supplier, make its best effort to assist the Supplier in complying with such requirements in a timely and expeditious manner.

14.2 The Purchaser shall pay all costs involved in the performance of its responsibilities, in accordance with GCC Sub-Clause 14.1.

15. Contract Price

15.1 The Contract Price shall be as specified in the Agreement subject to any additions and adjustments thereto, or deductions therefrom, as may be made pursuant to the Contract.

15.2 Prices charged by the Supplier for the IT products delivered and the services performed under the Contract shall not vary from the prices quoted by the Supplier in its bid, with the exception of any price adjustments authorized in the SCC.

16. Terms of Payment

16.1 The Contract Price shall be paid as specified in the SCC.

16.2 The Supplier's request for payment shall be made to the Purchaser in writing, accompanied by invoices describing, as appropriate, the IT products delivered and services performed, and by the documents submitted pursuant to GCC Clause 12 and upon fulfillment of all the obligations stipulated in the Contract.

16.3 Payments shall be made promptly by the Purchaser, no later than 60 days after submission of an invoice or request for payment by the Supplier, and the Purchaser has accepted it.

16.4 The currency or currencies in which payments shall be made to the Supplier under this Contract shall be specified in the SCC.

17. Taxes and Duties

17.1 For IT products supplied from outside the Purchaser's country, the Supplier shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside the Purchaser's country.

17.2 For IT products supplied from within the Purchaser's country, the Supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted IT products to the Purchaser.

17.3 If any tax exemptions, reductions, allowances or privileges may be available to the Supplier in the Purchaser's Country, the Purchaser shall use its best efforts to enable the Supplier to benefit from any such tax savings to the maximum allowable extent.

18. Performance Security

18.1 The Supplier shall, within 28 days of the notification of Contract award, provide a Performance Security for the due performance of the Contract in the amounts and currencies specified in the SCC.

18.2 The proceeds of the Performance Security shall be payable to the Purchaser as compensation for any loss resulting from the Supplier's failure to complete its obligations under the Contract.

18.3 The Performance Security shall be denominated in the currencies of the Contract, or in a freely convertible currency acceptable to the Purchaser, and shall be in one of the forms stipulated by the Purchaser in the SCC, or in another form acceptable to the Purchaser.

18.4 The Performance Security shall be discharged by the Purchaser and returned to the Supplier not later than 28 days following the date of completion of the Supplier's performance obligations under the Contract, including any warranty obligations, unless specified otherwise in the SCC.

19. Copyright

19.1 The copyright in all drawings, documents, and other materials containing data and information furnished to the Purchaser by the Supplier herein shall remain vested in the Supplier, or, if they are furnished to the Purchaser directly or through the Supplier by any third party, including suppliers of materials, the copyright in such materials shall remain vested in such third party.

20. Confidential Information

20.1 The Purchaser and the Supplier shall keep confidential and shall not, without the written consent of the other party hereto, divulge to any third party any documents, data, or other information furnished directly or indirectly by the other party hereto in connection with the Contract, whether such information has been furnished prior to, during or following completion or termination of the Contract. Notwithstanding the above, the Supplier may furnish to its Subcontractor such documents, data, and other information it receives from the Purchaser to the extent required for the Subcontractor to perform its work under the Contract, in which event the Supplier shall obtain from such Subcontractor an undertaking of

confidentiality similar to that imposed on the Supplier under GCC Clause 20.

20.2   The Purchaser shall not use such documents, data, and other information received from the Supplier for any purposes unrelated to the Contract. Similarly, the Supplier shall not use such documents, data, and other information received from the Purchaser for any purpose other than the design, procurement, or other work and services required for the performance of the Contract.

20.3   The obligation of a party under GCC Sub-Clauses 20.1 and 20.2 above, however, shall not apply to information that

(a)   the Purchaser or Supplier needs to share with ADB or other institutions participating in the financing of the Contract;

(b)   now or hereafter enters the public domain through no fault of that party;

(c)   can be proven to have been possessed by that party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other party; or

(d)   otherwise lawfully becomes available to that party from a third party that has no obligation of confidentiality.

20.4   The above provisions of GCC Clause 20 shall not in any way modify any undertaking of confidentiality given by either of the parties hereto prior to the date of the Contract in respect of the Supply or any part thereof.

20.5   The provisions of GCC Clause 20 shall survive completion or termination, for whatever reason, of the Contract.

21. Subcontracting   21.1   The Supplier shall notify the Purchaser in writing of all subcontracts awarded under the Contract if not already specified in the Bid. Subcontracting shall in no event relieve the Supplier from any of its obligations, duties, responsibilities, or liability under the Contract.

21.2   Subcontracts shall comply with the provisions of GCC Clauses 3 and 7.

22. Specifications and Standards   22.1   Technical Specifications and Drawings

(a)   The Supplier shall ensure that the IT Products and Services comply with the technical specifications and other provisions of the Contract.

(b)   The Supplier shall be entitled to disclaim responsibility for any design, data, drawing, specification or other document, or any modification thereof provided or designed by or on behalf of the Purchaser, by giving a notice of such disclaimer to the Purchaser.

(c)   The IT Products and Services supplied under this Contract shall conform to the standards mentioned in Section 6 (Schedule of Requirements) and, when no applicable standard is mentioned, the standard shall be equivalent or superior to the official standards whose application is appropriate to the country of origin of the IT products.

22.2   Wherever references are made in the Contract to codes and standards in accordance with which it shall be executed, the edition or the revised version of such codes and standards shall be those specified in the Section 6 (Schedule of Requirements). During Contract execution, any changes in any such codes and standards shall be applied only after approval by the Purchaser and shall be treated in accordance with GCC Clause 33.

23. Packing and Documents

23.1   The Supplier shall provide such packing of the IT products as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the Contract. During transit, the packing shall be sufficient to withstand, without limitation, rough handling and exposure to extreme temperatures, salt and precipitation, and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the final destination of the IT products and the absence of heavy handling facilities at all points in transit.

23.2   The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract, including additional requirements, if any, specified in the SCC, and in any other instructions ordered by the Purchaser.

24. Insurance

24.1   Unless otherwise specified in the SCC, the IT products supplied under the Contract shall be fully insured, in a freely convertible currency from an eligible country, against loss or damage incidental to manufacture or acquisition, transportation, storage, and delivery, in accordance with the applicable Incoterms or in the manner specified in the SCC.

25. Transportation

25.1   Unless otherwise specified in the SCC, obligations for transportation of the IT products shall be in accordance with the Incoterms specified in Section 6 (Schedule of Requirements).

26. Inspections and Tests

26.1   The Supplier shall at its own expense and at no cost to the Purchaser carry out all such tests and/or inspections of the IT Products and Services as are specified in Section 6 (Schedule of Requirements).

26.2   The inspections and tests may be conducted on the premises of the Supplier or its Subcontractor, at point of delivery, and/or at the final destination of the IT products, or in another place in the Purchaser's country as specified in the SCC. Subject to GCC Sub-Clause 26.3, if conducted on the premises of the Supplier or its Subcontractor, all reasonable facilities and assistance, including access to drawings and production data, shall be furnished to the inspectors at no charge to the Purchaser.

26.3   The Purchaser or its designated representative shall be entitled to attend the tests and/or inspections referred to in GCC Sub-Clause 26.2, provided that the Purchaser bear all of its own costs and

expenses incurred in connection with such attendance including, but not limited to, all traveling and board and lodging expenses.

26.4   Whenever the Supplier is ready to carry out any such test and inspection, it shall give a reasonable advance notice, including the place and time, to the Purchaser. The Supplier shall obtain from any relevant third party or manufacturer any necessary permission or consent to enable the Purchaser or its designated representative to attend the test and/or inspection.

26.5   The Purchaser may require the Supplier to carry out any test and/or inspection not required by the Contract but deemed necessary to verify that the characteristics and performance of the IT products comply with the technical specifications, codes, and warrantys under the Contract, provided that the Supplier's reasonable costs and expenses incurred in the carrying out of such test and/or inspection shall be added to the Contract Price. Further, if such test and/or inspection impedes the progress of manufacturing and/or the Supplier's performance of its other obligations under the Contract, due allowance will be made in respect of the Delivery Dates and Completion Dates and the other obligations so affected.

26.6   The Supplier shall provide the Purchaser with a report of the results of any such test and/or inspection.

26.7   The Purchaser may reject any IT products or any part thereof that fail to pass any test and/or inspection or do not conform to the specifications. The Supplier shall either rectify or replace such rejected IT products or parts thereof or make alterations necessary to meet the specifications at no cost to the Purchaser, and shall repeat the test and/or inspection, at no cost to the Purchaser, upon giving a notice pursuant to GCC Sub-Clause 26.4.

26.8   The Supplier agrees that neither the execution of a test and/or inspection of the IT products or any part thereof, nor the attendance by the Purchaser or its representative, nor the issue of any report pursuant to GCC Sub-Clause 26.6, shall release the Supplier from any warranties or other obligations under the Contract.

27. Liquidated Damages

27.1   Except as provided under GCC Clause 32, if the Supplier fails to deliver any or all of the IT products or perform the services within the period specified in the Contract, the Purchaser may without prejudice to all its other remedies under the Contract, deduct from the Contract Price, as liquidated damages, a sum equivalent to the percentage specified in the SCC of the Contract Price for each week or part thereof of delay until actual delivery or performance, up to a maximum deduction of the percentage specified in the SCC. Once the maximum is reached, the Purchaser may terminate the Contract pursuant to GCC Clause 35.

28. Warranty

28.1   The Supplier warrants that all the IT products are new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials, unless provided otherwise in the Contract.

28.2   Subject to GCC Sub-Clause 22.1, the Supplier further warrants that the IT products shall be free from defects arising from any act or omission of the Supplier or arising from design, materials, and

workmanship, under normal use in the conditions prevailing in the country of final destination.

28.3   Unless otherwise specified in the SCC, the warranty shall remain valid for 12 months after the IT products, or any portion thereof as the case may be, have been delivered to and accepted at the final destination indicated in the SCC, or for 18 months after the date of shipment or loading in the country of origin, whichever period concludes earlier.

28.4   The Purchaser shall give Notice to the Supplier, stating the nature of any such defects together with all available evidence thereof, promptly following the discovery thereof. The Purchaser shall afford all reasonable opportunity for the Supplier to inspect such defects.

28.5   Upon receipt of such Notice, the Supplier shall, within the period specified in the SCC, expeditiously repair or replace the defective IT products or parts thereof, at no cost to the Purchaser.

28.6   If having been notified, the Supplier fails to remedy the defect within the period specified in the SCC, the Purchaser may proceed to take within a reasonable period such remedial action as may be necessary, at the Supplier's risk and expense and without prejudice to any other rights which the Purchaser may have against the Supplier under the Contract.

29. Patent Indemnity

29.1   The Supplier shall, subject to the Purchaser's compliance with GCC Sub-Clause 29.2, indemnify and hold harmless the Purchaser and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of any nature, including attorney's fees and expenses, which the Purchaser may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright, or other intellectual property right registered or otherwise existing at the date of the Contract by reason of

(a)   the installation of the IT products by the Supplier or the use of the IT products in the country where the Site is located; and

(b)   the sale in any country of the products produced by the IT products.

Such indemnity shall not cover any use of the IT products or any part thereof other than for the purpose indicated by or to be reasonably inferred from the Contract, neither any infringement resulting from the use of the IT products or any part thereof, or any products produced thereby in association or combination with any other equipment, plant, or materials not supplied by the Supplier, pursuant to the Contract.

29.2   If any proceedings are brought or any claim is made against the Purchaser arising out of the matters referred to in GCC Sub-Clause 29.1, the Purchaser shall promptly give the Supplier a notice thereof, and the Supplier may at its own expense and in the Purchaser's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

29.3 If the Supplier fails to notify the Purchaser within 28 days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Purchaser shall be free to conduct the same on its own behalf.

29.4 The Purchaser shall, at the Supplier's request, afford all available assistance to the Supplier in conducting such proceedings or claim, and shall be reimbursed by the Supplier for all reasonable expenses incurred in so doing.

29.5 The Purchaser shall indemnify and hold harmless the Supplier and its employees, officers, and Subcontractors from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of any nature, including attorney's fees and expenses, which the Supplier may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright, or other intellectual property right registered or otherwise existing at the date of the Contract arising out of or in connection with any design, data, drawing, specification, or other documents or materials provided or designed by or on behalf of the Purchaser.

30. Limitation of Liability

30.1 Except in cases of gross negligence or willful misconduct,

(a) neither party shall be liable to the other party for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Supplier to pay liquidated damages to the Purchaser; and

(b) the aggregate liability of the Supplier to the Purchaser, whether under the Contract, in tort, or otherwise, shall not exceed the amount specified in the SCC, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the Supplier to indemnify the Purchaser with respect to patent infringement.

31. Change in Laws and Regulations

31.1 Unless otherwise specified in the Contract, if after the date of the Invitation for Bids, any law, regulation, ordinance, order or bylaw having the force of law is enacted, promulgated, abrogated, or changed in the place of the Purchaser's country where the Site is located (which shall be deemed to include any change in interpretation or application by the competent authorities) that subsequently affects the Delivery Date and/or the Contract Price, then such Delivery Date and/or Contract Price shall be correspondingly increased or decreased, to the extent that the Supplier has thereby been affected in the performance of any of its obligations under the Contract. Notwithstanding the foregoing, such additional or reduced cost shall not be separately paid or credited if the same has already been accounted for in the price adjustment provisions where applicable, in accordance with 1.1 15.

32. Force Majeure

32.1 The Supplier shall not be liable for forfeiture of its Performance Security, liquidated damages, or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure.

32.2   For purposes of this clause, "Force Majeure" means an event or situation beyond the control of the Supplier that is not foreseeable, is unavoidable, and its origin is not due to negligence or lack of care on the part of the Supplier. Such events may include, but not be limited to, acts of the Purchaser in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.

32.3   If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

33. Change Orders and Contract Amendments

33.1   The Purchaser may at any time order the Supplier through Notice in accordance GCC Clause 8, to make changes within the general scope of the Contract in any one or more of the following:

(a)   drawings, designs, or specifications, where IT products to be furnished under the Contract are to be specifically manufactured for the Purchaser;

(b)   the method of shipment or packing;

(c)   the place of delivery; and

(d)   the services to be provided by the Supplier.

33.2   If any such change causes an increase or decrease in the cost of, or the time required for, the Supplier's performance of any provisions under the Contract, an equitable adjustment shall be made in the Contract Price or in the Delivery and Completion Schedule, or both, and the Contract shall accordingly be amended. Any claims by the Supplier for adjustment under this Clause must be asserted within 28 days from the date of the Supplier's receipt of the Purchaser's change order.

33.3   Prices to be charged by the Supplier for any services that might be needed but which were not included in the Contract shall be agreed upon in advance by the parties and shall not exceed the prevailing rates charged to other parties by the Supplier for similar services.

34. Extensions of Time

34.1   If at any time during performance of the Contract, the Supplier or its Subcontractors should encounter conditions impeding timely delivery of the IT products or completion of services pursuant to GCC Clause 12, the Supplier shall promptly notify the Purchaser in writing of the delay, its likely duration, and its cause. As soon as practicable after receipt of the Supplier's notice, the Purchaser shall evaluate the situation and may at its discretion extend the Supplier's time for performance, in which case the extension shall be ratified by the parties by amendment of the Contract.

34.2   Except in case of Force Majeure, as provided under GCC Clause 32, a delay by the Supplier in the performance of its Delivery and Completion obligations shall render the Supplier liable to the imposition of liquidated

damages pursuant to GCC Clause 27, unless an extension of time is agreed upon, pursuant to GCC Sub-Clause 34.1.

35. Termination   35.1   Termination for Default

(a) The Purchaser, without prejudice to any other remedy for breach of Contract, by Notice of default sent to the Supplier, may terminate the Contract in whole or in part,

(i) if the Supplier fails to deliver any or all of the IT products within the period specified in the Contract, or within any extension thereof granted by the Purchaser pursuant to GCC Clause 34; or

(ii) if the Supplier fails to perform any other obligation under the Contract.

(iii) if the Supplier, in the judgment of the Purchaser has engaged in integrity violations, as defined in GCC Clause 3, in competing for or in executing the Contract.

(b) In the event the Purchaser terminates the Contract in whole or in part, pursuant to GCC Clause 35.1(a), the Purchaser may procure, upon such terms and in such manner as it deems appropriate, IT Products and Services similar to those undelivered or not performed, and the Supplier shall be liable to the Purchaser for any additional costs for such similar IT Products and Services. However, the Supplier shall continue performance of the Contract to the extent not terminated.

35.2   Termination for Insolvency

The Purchaser may at any time terminate the Contract by giving Notice to the Supplier if the Supplier becomes bankrupt or otherwise insolvent. In such event, termination will be without compensation to the Supplier, provided that such termination will not prejudice or affect any right of action or remedy that has accrued or will accrue thereafter to the Purchaser.

35.3   Termination for Convenience

(a) The Purchaser, by Notice sent to the Supplier, may terminate the Contract, in whole or in part, at any time for its convenience. The Notice of termination shall specify that termination is for the Purchaser's convenience, the extent to which performance of the Supplier under the Contract is terminated, and the date upon which such termination becomes effective.

(b) The IT products that are complete and ready for shipment within 28 days after the Supplier's receipt of the Notice of termination shall be accepted by the Purchaser at the Contract terms and prices. For the remaining IT products, the Purchaser may elect

(i)   to have any portion completed and delivered at the Contract terms and prices; and/or

(ii)   to cancel the remainder and pay to the Supplier an agreed amount for partially completed IT Products and Services and for materials and parts previously procured by the Supplier.

36. Assignment   36.1   Neither the Purchaser nor the Supplier shall assign, in whole or in part, their obligations under this Contract, except with prior written consent of the other party.

37. Respectful Work Environment   37.1   The Contractor shall ensure that its employees and Subcontractors observe the highest ethical standards and refrain from any form of bullying, discrimination, misconduct and harassment, including sexual harassment and shall, at all times, behave in a manner that creates an environment free of unethical behavior, bullying, misconduct and harassment, including sexual harassment. The Contractor shall take appropriate action against any employees or Subcontractors, including suspension or termination of employment or sub-contract, if any form of unethical or inappropriate behavior is identified.

37.2   The Contractor shall conduct training programs for its employees and Subcontractors to raise awareness on and prevent any form of bullying, discrimination, misconduct, and harassment including sexual harassment, and to promote a respectful work environment. The Contractor shall keep an up to date record of its employees and subcontractors who have attended and completed such training programs and provide such records to the Purchaser at their first written request.

Section 8: Special Conditions of Contract

The following Special Conditions of Contract (SCC) shall supplement the General Conditions of Contract (GCC). Whenever there is a conflict, the provisions herein shall prevail over those in the GCC.

GCC 1.1(j)	The Purchaser's country is: <u>Pakistan</u>
GCC 1.1(k)	The Purchaser is: <u>Federal Board of Revenue</u>
GCC 1.1 (q)	The Site is: <u>Karachi PSW Office/PSW Data Center, presently located at Bahria Complex, MT Khan Road, Karachi.</u>
GCC 4.2 (b)	The version of Incoterms shall be: <u>Incoterms 2020</u>
GCC 5.1	The language shall be: <u>English</u> The language for translation of supporting documents and printed literature is: English
GCC 8.1	For **notices**, the Purchaser's address shall be: Attention to: **Mr Ali Raza Hanjra, Project Director CAREC-RIBS (ITTMS), FBR;** Street address: **Kurree Road, Islamabad;** Floor/ Room number: **1st Floor, PMU, Federal Arcade;** City: <u>I</u>**slamabad;** ZIP code: **44000;** Country: **Pakistan;** **92 (51) 934 005 / +92 (51) 920 3917;** Fax: **+92 (51) 934 0009;** E-mail: **ali.raza@carec-ribs.gov.pk**
GCC 9.1	The governing law shall be: **The Laws of Islamic Republic of Pakistan**
GCC 10	The formal mechanism for the resolution of disputes shall be: **For a contract with a Foreign Supplier:** In case of a dispute between the Purchaser and the Supplier, the dispute shall be settled by international arbitration conducted in accordance with the Arbitration Rules of the Singapore International Arbitration Centre. The arbitration procedure shall be administered by the Singapore International Arbitration Center. Place of arbitration: Singapore.

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For a contract with a Local Supplier:

In the case of a dispute between the Purchaser and a Supplier who is a national of the Purchaser's country, the dispute shall be referred to adjudication or arbitration in accordance with Pakistan Arbitration Act 1940.

Place of arbitration: Islamabad.
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GCC 11.1
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The Scope of Requirements shall be defined in: **Section 6 (Schedule of Requirements & BOQs) of the Bidding Document.**
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GCC 11.2
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The Scope of Requirements shall also include **Product Upgrades** as mentioned in **Section 6 (Schedule of Requirements & BOQs) of the Bidding Document.**
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GCC 12.1
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Details of shipping and documents to be furnished by the Supplier shall be:

For IT products supplied from abroad as per Incoterms CIP:

a) *Non-negotiable documents i.e., Supplier's invoice showing Goods' description, quantity, unit price and total amount; packing list, bill of lading, and certificate of origin etc. must be sent through courier service or mailed or faxed within 8 working days after shipment.*

b) *In case shipment is not effected up to date (as specified in delivery schedule in Section VII of bidding documents) validity of this letter of credit shall be extended at beneficiary's cost (supplier).*

c) *Copy of the Insurance Certificate showing Pakistan Single Window as the beneficiary.*

d) *Detailed description of material / equipment, item / accessories, no. of boxes, weight, dimension and volume of each box must be shown in the packing list alongwith following details with shipping marks on each Box, crate and on container(s).*

> **Pakistan Single Window**
> PMU CAREC-RIBS (ITTMS) Project, FBR
> Karachi, Pakistan

e) *One Original of the Manufacturer's or Supplier's Warranty Certificate covering all items supplied.*

f) *All cargos shall be accompanied with a copy of packing list and invoice in the following manner:*

   i) *If shipment containerized FCL cargo then the documents shall be placed on the inner side of the door of container. In case of multiple containers in a consignment, each container shall have such documents pertaining to goods inside it.*
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	ii) *If shipment is consolidated cargo and LCL cargo: the documents shall be attached to the goods or package at an obvious place.*
	
	 PMU shall invariably require the following copies of the documents:
	   a) Through bankers in Karachi;
	      4 copies of Invoices
	      4 copies of Bill of Lading including original
	      4 copies of detailed packing list
	      2 copies of Certificate of Origin
	      2 copies of test certificate
	      2 copies of conformity certificate
	
	   b) Immediately after shipment is effected;
	      6 copies of Invoices
	      6 copies of Bill of Lading (Non-negotiable)
	      2 copies of detailed Packing List
	      1 copy of Certificate of Origin
	
	 In case of sea Shipment Non-negotiable documents must be courier/faxed through our fax No +92 (51) 934 0009 or e-mailed to reach us within 8 working days after shipment. In case of any port demurrage charges incurred due to late receipt of documents the same will be recoverable from supplier.
	
	   c) Invoices shall indicate itemized values of the materials concerned.
	   d) Invoices shall include certification that the prices charged are net and that the material concerned are new and unused. Invoices shall further certify that the materials have been supplied strictly in accordance with the order placed by us.
	
	 For IT products from within the Purchaser's country as per Incoterm EXW:
	
	 Upon delivery of the IT products to the transporter, the Supplier shall notify the Purchaser and send the following documents to the Purchaser:
	
	 (a) **03** copies of the Supplier's invoice showing the description of the IT products, quantity, unit price, and total amount;
	
	 (b) Delivery Note, Railway Receipt, or Truck Receipt;
	
	 (c) Manufacturer's or Supplier's Warranty Certificate;
	
	 (d) Inspection Certificate issued by the nominated inspection agency, and the Supplier's Factory Inspection Report; and
	
	 (e) Certificate of Origin.
	
	 The Purchaser shall receive the above documents before the arrival of the IT products and, if not received, the Supplier will be responsible for any consequent expenses.

GCC 15.2	The price adjustment shall be**: Not Applicable**

GCC 16.1	Payment of the Contract Price shall be made in the following manner: As per the Payment Schedule mentioned below:
	For IT Products and Services supplied from outside the Purchaser's country:
	(a) Advance Payment: 10% of the Contract Price within 28 days of signing of the Contract.
	Payment shall be made provided the Supplier presents a request for payment accompanied by an Advance Payment Security in the form of a bank guarantee for an amount equal to the amount of the payment, and that shall be valid until the IT products are delivered. The security shall be in the form as specified in Section 9 (Contract Forms).
	(b) On Shipment: The Purchaser shall pay the Supplier **80%** of the Contract Price of the IT products shipped through irrevocable confirmed letter of credit opened in favor of the Supplier in a bank in its country under the ADB commitment procedure, upon submission of documents specified in SCC Clause 12.1.
	(c) On Acceptance: **10%** of the Contract Price of IT products received shall be paid within 28 days of installation, commissioning, and acceptance of the IT products, issued by the Purchaser, upon submission of a claim supported by receipts on account of payment of import taxes/duties.
	For IT Products and Services supplied from within the Purchaser's country:
	(a) Advance Payment: 10% of the Contract Price within 28 days of signing of the Contract.
	Payment shall be made provided the Supplier presents a request for payment accompanied by an Advance Payment Security in the form of a bank guarantee for an amount equal to the amount of the payment, and that shall be valid until the IT products are delivered. The security shall be in the form as specified in Section 9 (Contract Forms).
	(b) On Delivery: The Purchaser shall pay the Supplier **80%** of the Contract Price of the IT products on receipt of the Goods, upon submission of documents specified in SCC Clause 12.1.
	(c) On Acceptance: 10% of the Contract Price of IT products received shall be paid within 28 days of installation, commissioning, and acceptance of the IT products, issued by the Purchaser, upon submission of a claim supported by receipts on account of payment of import taxes/duties.
GCC 16.4	Payments should be made in the currency or currencies stated in the bid of the successful Bidder
GCC 18.1	The Supplier shall provide a Performance Security of **10%** [which should be consistent with that of Letter of Bid] of the Contract Price within twenty-eight (28) days after the Notification of Award of Contract from a Scheduled Bank.
	The Performance Security shall be denominated in Pak. Rupees.

GCC 18.3	The form of acceptable Performance Security shall be a Form included in Section 9, Contract Forms, issued by a Scheduled Bank.
	If the Supplier's bank is located outside Pakistan, the Performance Security shall be issued by a correspondent financial institution in Pakistan which shall be counter guaranteed and verified by the Supplier's bank.
GCC 18.4	Discharge of the Performance Security shall take place: Pursuant to GCC Sub-Clause 18.4, after delivery, installation, commissioning and acceptance of the Goods, the performance security shall be reduced to five percent (**5%**) of the Contract to cover the Supplier's warranty obligations in accordance with GCC Clause 28.3.
GCC 19	The copyright in all drawings, documents, and other materials containing data and information furnished to the Purchaser by the Supplier directly or through a third party herein shall be owned by the Purchaser/Client. In case the Supplier or any third party supplying the source code of a software gets bankrupt or leaves the market, the source code shall be provided to the Purchaser prior to any such event by notifying the same in advance.

GCC 23.2	The packing, marking, and documentation within and outside the packages shall be:

1) Crates or boxes should have a list of items contained therein, secured to the exterior. A duplicate list should also be included inside with the contents.

2) Shipping Specifications must clearly indicate the contents, gross weight, net weight and measurements of each package.

3) All goods should bear an identification mark of serial number or other marking by which that particular article can be identified in the event of packages being landed damaged. Please show these clearly on your invoice and shipping specifications.

4) In addition to the shipping marks; Purchaser's Name, Goods Purchase Order No., Description of item, gross weight (kg), Measurement (Length x Width x Height in mm), and country or origin must be stenciled on the outside of each package to facilitate identification, as given hereunder.

Purchaser's Name: PMU CAREC-RIBS (ITTMS) Project, FBR, Karachi, Pakistan. Contract Number:	Dimensions --------- x --------- x -------- (Length) x (Width) x (Height) (in Centimeters / Meters as appropriate)
Purchase Order No./ Consignee Code:	Volume: .... Cubic Metres
Box: -------- of ------	Weight: Gross: ------------------------ kgs Tare: ------------------------ kgs Nett: ------------------------ kgs

5) In case of shipping marks becoming illegible all packages, where possible, provide a label inside bearing a clear impression of the external marks.

6) Packages must be conspicuously marked with "Fragile", "Handle with Care", "Right Side Up", "Keep Dry", etc., in English and with the appropriate international standard symbols, to prevent possible damage.

7) the Supplier must ensure that the centre of gravity and hoisting position/certified lifting points are clearly marked on two sides of each case so as to facilitate loading, unloading and handling.

8) The above-mentioned markings must be indicated on those Goods which would without packing; with metal labels secured to the Goods, or with indelible paint on both sides or both ends of the Goods.

9) All instruments, protection relays or other fragile parts must be removed, placed in sealed plastic bags and packed in expanded polystyrene or similar shock absorbing material in timber boxes. All fragile components must be securely

	supported to prevent damage in transit and must be packed in separate crates and not with heavy items.

10) All material, if scheduled to be shipped via ocean freight must be export packed to withstand the imperils associated with handling at ocean terminals and exposure to the elements during the ocean and inland transportation to the Project site. In addition, the products must be transported under deck.

11) Waterproof case liners should be used protecting goods' damage from moisture.

12) Special attention must be given to fragile items by pre-packing in foam, plastic cushioning or some equally efficient cushioning material. Shredded newsprint, popcorn, straw, or new or used rubber tyres should not be used.

13) All marks, tags and labels shall be in the English language. |
| **GCC 24.1** | The insurance coverage shall be in accordance with: "Pursuant to GCC, Sub-Clause 24.1, the Supplier must insure the IT products in an amount equal to 110% of the CIP or EXW price of the IT products from Warehouse" to "Warehouse" on "All Risks" basis, including War Risks and Strikes. |
| **GCC 25.1** | Obligations for transportation of the IT products shall be in accordance with:

Incoterms 2020 & Section 6 (Schedule of Requirements) of the Bidding Document. |
| **GCC 26.2** | Tests and Inspections specified in Section 6 (Schedule of Requirements), shall be carried out at the following times or milestones, and places: |

Goods	Type of Test	Time or Milestone	Address
Software (Lot-1)	Physical Inspection	At Delivery (120 Days)	PSW Office is in Karachi, presently located at Bahria Complex, MT Khan Road, Karachi.
Hardware (Lot-2)	Physical Inspection	At Delivery (120 Days)	
Software (Lot-1)	Installation & Configuration	After Delivery (60 Days)	
Hardware (Lot-2)	Installation & Configuration	After Delivery (60 Days)	

GCC 27.1	The applicable rate for liquidated damages for delay shall be**: 1 %** of the Contract Price for each week or part thereof.
GCC 27.1	The maximum amount of liquidated damages shall be: **Not exceeding 10% of the Contract Amount.**
GCC 28.3	The period of validity of the Warranty shall be: Lot 1: 1 year Lot 2: 3 Years From the date of issuance of Acceptance Certificate. The place of final destination shall be: **PSW Office / Data Center, Karachi**
GCC 28.5	The Supplier shall correct any defects covered by the Warranty within **24 – 48 Hours** of being notified by the Purchaser of the occurrence of such defects.
GCC 30.1 (b)	The amount of aggregate liability shall be: **Not Exceeding 100% of the total Contract Amount**

Section 9: Contract Forms

Table of Forms

Notice of Intention for Award of Contract

[*on letterhead paper of the Purchaser*]

[*date of notification*]

To: [*name of the Bidder*]
Attention: [*insert name of the Bidder's authorized representative*]
Address: [*insert address of the Bidder's authorized representative*]
Telephone/Fax numbers: [*insert telephone/fax numbers of the Bidder's authorized representative*]
E-mail Address: [*insert e-mail address of the Bidder's authorized representative*]

This is to notify you of our intention to award the contract [*insert name of the contract and identification number, as given in the Bid Data Sheet*]. You have [*insert number of days as specified in ITB 42.1 of the BDS*] days from the date of this notification to (i) request for a debriefing in relation to the evaluation of your Bid; and/or (ii) submit a bidding-related complaint in relation to the intention for award of contract, in accordance with the procedures specified in ITB 48.1.

The summary of the evaluation are as follows:

1.   List of Bidders

Name of Bidder	Bid Price as Read Out at Opening	Evaluated Bid Price

2.   Reason/s Why Your Bid Was Unsuccessful

………………………………………………………………………………………………
………………………………………………………………………………………………
………………………………………………………………………………………………

3.   The Successful Bidder

Name of Bidder:	
Address:	
Contract Price:	
Duration of Contract:	
Scope of the Contract Awarded:	
Amount Performance Security Required:	

Authorized Signature: ………………………………………………………………

Name and Title of Signatory: …………………………………………………….

Name of Agency: ………………………………………………………………….

Notification of Award

[*on letterhead of the Purchaser*]

Letter of Acceptance

[*date*]

To: [*name and address of the supplier*]

Subject: Contract No. [*please specify*]

This is to notify you that your Bid dated [*date*] for execution of the [*name of the contract and identification number, as given in the Bid Data Sheet*] for the Accepted Contract Amount of the equivalent of [*amount in words and figures and name of currency*], as corrected and modified in accordance with the Instructions to Bidders is hereby accepted by our Agency.

You are requested to furnish the Performance Security within 28 days in accordance with the Conditions of Contract and any additional security required as a result of the evaluation of your bid, using for that purpose the Performance Security Form included in Section 9 (Contract Forms) of the Bidding Document.

Authorized Signature: …………………………………………………………………………..

Name and Title of Signatory: …………………………………………………………………..

Name of Agency: …………………………………………………………………………………

Attachment: Contract Agreement

Contract Agreement

THIS AGREEMENT made on the *[insert date]* day of *[insert month]*, *[insert year]*, between *[insert complete name of the purchaser]* of *[insert complete address of the Purchaser]* (hereinafter "the Purchaser"), of the one part, and *[insert complete name of the supplier]* of *[insert complete address of the supplier]* (hereinafter "the Supplier"), of the other part:

WHEREAS the Purchaser invited Bids for certain IT Products and Services, viz., *[insert brief description of the it products and services]* and has accepted a Bid by the Supplier for the supply of those IT Products and Services in the sum of *[insert currency or currencies and amount of contract price in words and figures]* (hereinafter "the Contract Price").

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Contract referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz.:
   (a) Letter of Acceptance;
   (b) Letter of Bid and the Price Schedules submitted by the Supplier;
   (c) Addenda Nos. [*insert addenda numbers if any*][11]
   (d) Special Conditions of Contract;
   (e) List of Eligible Countries that was specified in Section 5 of the Bidding Document;
   (f) General Conditions of Contract;
   (g) Schedule of Requirements; and
   (h) any other documents shall be added here. [12]

   This Contract shall prevail over all other Contract documents. In the event of any discrepancy or inconsistency within the Contract documents, then the documents shall prevail in the order listed above.
3. In consideration of the payments to be made by the Purchaser to the Supplier as indicated in this Agreement, the Supplier hereby covenants with the Purchaser to provide the IT Products and Services and to remedy defects therein in conformity in all respects with the provisions of the Contract.
4. The Purchaser hereby covenants to pay the Supplier in consideration of the provision of the IT Products and Services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.
   IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of *[indicated name of country]* on the day, month, and year indicated above.

Signed by *[insert authorized signature for the Purchaser]* (for the Purchaser)

Signed by *[insert authorized signature for the supplier]* (for the Supplier)

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[11] Information contained in the addenda and or addendum should preferably be included in the contract documents to avoid potential ambiguities during contract implementation. If however, unavoidable priority should be decided depending on the nature of information provided in the addenda/addendum.

[12] Tables of Adjustment Data may be added if the contract provides for price adjustment (see GCC 15).

Performance Security

[*Bank's name, and address of issuing branch or office*]

Beneficiary: …………………….. [*Name and address of the Purchaser*] ………………………
Date: …………………………[*Insert date (as day, month, and year)*] ……………………..
Performance Guarantee No.: …………………………………………………………………..

We have been informed that [*name of the supplier*] (hereinafter called "the Supplier") has entered into Contract No. [*reference number of the contract*] dated [*date*] with you, for the execution of [*name of contract and brief description of it products and services*] (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Supplier, we [*name of the bank*] hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of [*name of the currency and amount in words*][13] [*amount in figures*] such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of your first demand in writing accompanied by a written statement stating that the Supplier is in breach of its obligation(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the [*date*] day of [*month*], [*year*],[14] and any demand for payment under it must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revisions, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.[15]

. . . .
[*Signature(s) and seal of bank (where appropriate)*]

If the bank issuing performance security is located outside the Purchaser's country, it shall be counter-guaranteed or encashable by a bank in the Purchaser's country.

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[13] The guarantor shall insert an amount representing the percentage of the contract price specified in the contract and denominated either in the currency(ies) of the contract or in any freely convertible currency acceptable to the Purchaser.

[14] Insert the date 28 days after the expected completion date. The Purchaser should note that in the event of an extension of the time for completion of the contract, the Purchaser would need to request an extension of this guarantee from the guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Purchaser might consider adding the following text to the form, at the end of the penultimate paragraph: "The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months] [one year], in response to the Purchaser's written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee."

[15] Or the purchaser may use "Uniform Rules for Demand Guarantees, ICC Publication No. 458, except that subparagraph (ii) of Sub-article 20(a) is hereby excluded" as appropriate.

Advance Payment Security

[insert complete name and number of contract]

To: [*insert complete name of the Purchaser*]

In accordance with the payment provision included in the Contract, in relation to advance payments, [*insert complete name of the supplier*] (hereinafter called "the Supplier") shall deposit with the Purchaser a security consisting of [*indicate type of security*], to guarantee its proper and faithful performance of the obligations imposed by said Clause of the Contract, in the amount of [*insert currency and amount of guarantee in words and figures*].

We, the undersigned [*insert complete name of the guarantor*], legally domiciled in [*insert full address of the guarantor*] (hereinafter "the Guarantor"), as instructed by the Supplier, agree unconditionally and irrevocably to guarantee as primary obligor and not as surety merely, the payment to the Purchaser on its first demand without whatsoever right of objection on our part and without its first claim to the Supplier, in the amount not exceeding [*insert currency and amount of guarantee in words and figures*].

This security shall remain valid and in full effect from the date of the advance payment being received by the Supplier under the Contract until [*insert date (as day, month, year)*].

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revisions, ICC Publication No. 758, except that the supporting statement under Article 15(a) is hereby excluded.[16]

Name: [*insert complete name of person signing the Security*]
In the capacity of [*insert legal capacity of person signing the Security*]
Signed: [*insert signature of person whose name and capacity are shown above*]
Duly authorized to sign the security for and on behalf of [*insert seal (where appropriate) and complete name of the guarantor*]
Date: [*insert date of signing*]

-- Note to Bidder --
If the bank issuing advance payment security is located outside the Purchaser's country, it shall be counter-guaranteed or encashable by a bank in the Purchaser's country.

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[16] Or the purchaser may use "Uniform Rules for Demand Guarantees (URDG), ICC Publication No. 458, except that subparagraph (ii) of Sub-article 20(a) is hereby excluded" as appropriate.

Section 10: Claims, Disputes and Arbitration

Table of Clauses

1. Supplier's Claims:

If the Supplier considers himself to be entitled to any extension of the Time for Completion and/or any additional payment, under any clause of General Conditions of Contract (GCC) or otherwise in connection with the Contract, the Supplier shall submit a notice to the project manager, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than 28 days after the Supplier became aware, or should have become aware, of the event or circumstance.

If the Supplier fails to give notice of a claim within such period of 28 days, the Time for Completion shall not be extended, the Supplier shall not be entitled to additional payment, and the Purchaser shall be discharged from all liability in connection with the claim. Otherwise, the following provisions of this sub-clause shall apply:

a. The Supplier shall also submit any other notices required by the Contract and supporting articular for the claim, all as relevant to such event or circumstance.

b. The Supplier shall keep such contemporary records as may be necessary to substantiate any claim, either on the site or at another location acceptable to the project manager. Without admitting the Purchaser's liability, the project manager may, after receiving any notice under this sub-clause, monitor the record-keeping and/or instruct the Supplier to keep further contemporary records. The Supplier shall permit the project manager to inspect all these records, and shall (if instructed) submit copies to the project manager.

c. Within 42 days after the Supplier became aware (or should have become aware) of the event or circumstance giving rise to the claim, or within such other period as may be proposed by the Supplier and approved by the project manager, the Supplier shall send to the project manager a fully detailed claim, which includes full supporting particulars of the basis of the claim and of the extension of time and/or additional payment claimed. If the event or circumstance giving rise to the claim has a continuing effect:

    i.   this fully detailed claim shall be considered as interim;

    ii.   the Supplier shall send further interim claims at monthly intervals, giving the accumulated delay and/or amount claimed, and such further particulars as the project manager may reasonably require; and

    iii.   the Supplier shall send a final claim within 28 days after the end of the effects resulting from the event or circumstance, or within such other period as may be proposed by the Supplier and approved by the project manager.

d. Within 42 days after receiving a claim or any further particulars supporting a previous claim, or within such other period as may be proposed by the project manager and approved by the Supplier, the project manager shall respond with approval, or with disapproval and detailed comments. The project manager may also request any necessary further particulars, but shall nevertheless give his/her response on the principles of the claim within such time.

e. Each payment certificate shall include such amounts for any claim as have been reasonably substantiated as due under the relevant provision of the Contract. Unless and until the particulars supplied are sufficient to substantiate the whole of the claim, the Supplier shall only be entitled to payment for such part of the claim as he has been able to substantiate.

f. The project manager shall agree with the Supplier or estimate;

    i.   the extension (if any) of the Time for Completion (before or after its expiry) in accordance with any clause of General Conditions of Contract (GCC), and/or

    ii.   the additional payment (if any) to which the Supplier is entitled under the Contract.

g. The requirements of this sub-clause are in addition to those of any other sub-clause which may apply to a claim. If the Supplier fails to comply with this or another sub-clause in relation to any claim, any extension of time and/or additional payment shall take account of the extent (if any) to which the failure has prevented or prejudiced proper investigation of the claim, unless the claim is excluded under the second paragraph of this sub-clause.

h. In the event that the Supplier and the Purchaser cannot agree on any matter relating to a claim, either party may refer the matter to the disputes and arbitration procedures pursuant to GC Clause 10 hereof.

2. Disputes and Arbitration

2.1 Adjudication

a. The parties, within 14 days of the effective date, will agree and appoint an adjudicator.

b. If any dispute of any kind whatsoever shall arise between the Purchaser and the Supplier in connection with or arising out of the Contract, including without prejudice to the generality of the foregoing, any question regarding its existence, validity or termination, or the operation of the IT Products and Services (whether during the progress of implementation or after its achieving operational acceptance and whether before or after the termination, abandonment, or breach of the Contract), the parties shall seek to resolve any such dispute or difference by mutual consultation. If the parties fail to resolve such a dispute or difference by mutual consultation within 14 days after one party has notified the other in writing of the dispute or difference, then, if the Contract in appendix includes and names an adjudicator, the dispute shall be referred in writing by either party to the adjudicator, with a copy to the other party. If there is no adjudicator specified in the Contract, the mutual consultation period stated above shall last 28 days (instead of 14), upon expiry of which either party may move to the notification of arbitration, pursuant to GC Clause 10.

c. The adjudicator shall give his or her decision in writing to both Parties within 28 days of a dispute being referred to the adjudicator. If the adjudicator has done so, and no notice of intention to commence arbitration has been given by either the Purchaser or the Supplier within 56 days of such reference, the decision shall become final and binding upon the Purchaser and the Supplier. Any decision that has become final and binding shall be implemented by the parties forthwith.

d. The adjudicator shall be paid an hourly fee at the rate specified in Appendix 2 (Adjudicator) of the Contract, plus reasonable expenditures incurred in the execution of duties as adjudicator, and these costs shall be divided equally between the Purchaser and the Supplier.

e. Should the adjudicator resign or die, or should the Purchaser and the Supplier agree that the adjudicator is not fulfilling his or her function in accordance with the provision of the Contract, a new adjudicator shall be jointly appointed by the Purchaser and the Supplier. Failing agreement between the parties within 28 days, the new adjudicator shall be appointed at the request of either party by the appointing authority specified in the

Appendix 2 (Adjudicator) of the Contract, or, if no appointing authority is specified in the Contract, shall, from this point onward and until the parties may otherwise agree on an adjudicator or an appointing authority, be implemented as if there is no adjudicator.

2.2 Arbitration

a. If either the Purchaser or the Supplier is dissatisfied with the adjudicator's decision, or if the adjudicator fails to give a decision within 28 days of a dispute being referred to him or her, then the Purchaser or the Supplier may, within 56 days of such reference, give notice to the other party, with a copy of information to the adjudicator, of its intention to commence arbitration, as provided below, as to the matter in dispute, and no arbitration in respect of this matter may be commenced unless such notice is given.

b. Any dispute in respect of which a notice of intention to commence arbitration has been given, in accordance with GC Sub-Clause 52.2(a), shall be finally settled by arbitration. Arbitration may be commenced prior to or after delivery of the IT Products and Services.

c. Arbitration proceedings shall be conducted in accordance with the rules of procedures specified in the Appendix 2 (Adjudicator) of the Contract.

2.3 Notwithstanding any reference to the adjudicator or arbitration in this clause,

a. the parties shall continue to perform their respective obligations under the Contract unless they otherwise agree; and

b. the Purchaser shall pay the Supplier any monies due the Supplier.

Appendix 1. Adjudicator

In accordance with General Conditions of Contract (GCC) Clause 1.2, the agreed-upon adjudicator is:

Name: *[name]*

Title: *[title]*

Address: *[postal address]*

Telephone: *[telephone number]*

As mutually agreed, fees and reimbursable expenses are:

Hourly Fees: *[hourly fees]*

Reimbursable Expenses: *[list reimbursables]*

If at the time of Contract signing, agreement has not been reached between the Purchaser and the Supplier, an adjudicator will be appointed by the appointing authority named in the Special Conditions of Contract.