

KERALA DEVELOPMENT AND INNOVATION STRATEGIC COUNCIL

TENDER DOCUMENT

Tender No. KDISC/KGDC/2758/2024/02

Version 2.1

INSTRUCTION TO THE TENDERERS/BIDDERS, TERMS AND CONDITIONS OF CONTRACT FOR DESIGN, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF "HIGH-PERFORMANCE COMPUTING (HPC) FACILITY WITH SUSTAINED PERFORMANCE, HIGH-PERFORMANCE MULTI-NODE COMPUTING CLUSTER WITH HYBRID CPU & GPU NODES".

Kerala Development and Innovation Strategic Council

India Heights, Govt. Women's College Road

Vazhuthacaud, Thiruvananthapuram-695014

https://kdisc.kerala.gov.in/

Contact: tenderkgdc@gmail.com; 0471-4117000;



www.kdisc.kerala.gov.in

Tender No.: KDISC/KGDC/2758/2024/02

Date: 03/09/2024

1. NOTICE INVITING TENDER

Kerala Development and Innovation Strategic Council (KDISC) invites E-tenders (Three bid systems) for DESIGN, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF "HIGH PERFORMANCE COMPUTING (HPC) FACILITY WITH SUSTAINED PERFORMANCE, HIGH PERFORMANCE MULTI-NODE COMPUTING CLUSTER WITH HYBRID CPU & GPU NODES" along with accessories and consumables complete as required. Manual/Offline bids shall not be accepted.

Tender documents may be downloaded from Kerala E-tender Website <u>https://etenders.kerala.gov.in</u> as per the schedule given below.

| 1 | Name of Work | DESIGN, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF "HIGH PERFORMANCE COMPUTING (HPC) FACILITY WITH SUSTAINED PERFORMANCE, HIGH PERFORMANCE MULTI-NODE COMPUTING CLUSTER WITH HYBRID CPU & GPU NODES |
|---|---------------------------|--|
| 2 | Tender Type | Open Tender |
| 3 | Currency | Indian Rupees |
| 4 | Estimate Amount (PAC) | 30,00,00,000/- |
| 5 | Tender Fee | Rs. 25,000/- + Tax 18% extra (i.e. Total = INR 29,500/-) |
| 6 | EMD Amount | 30,00,000/- |
| 7 | Completion period | 120 days |
| | *Crit | tical Date Sheet |
| 8 | Date of Tender Publishing | 03.09.2024, 05:00 pm |

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| 9 | Bid Document Download/ Start Date | 03.09.2024, 05:00 pm |
|----|--------------------------------------|----------------------|
| 10 | Seek Clarification Start Date | 04.09.2024 11.00 am |
| 11 | Seek Clarification End Date | 09.09.2024 11.00 am |
| 12 | Pre Bid meeting | 07.09.2024 11.00 am |
| 13 | Bid Submission Start Date | 10.09.2024 10.00 am |
| 14 | Bid Submission End Date | 18.09.2024 03:00 pm |
| 15 | Bid Opening Date | 19.09.2024, 03.00 pm |

Bids shall be submitted online only at Kerala E-tender Website <u>https://etenders.kerala.gov.in</u> using valid Digital Signature Certificate. Tenderer are advised to follow the instructions "Instructions to Bidder for Online Bid Submission" provided in the Annexure for online submission of bids available at Kerala E-tender website: <u>https://etenders.kerala.gov.in</u>

Intending tenderers are advised to visit KDISC website i.e. <u>www.kdisc.kerala.gov.in</u> and Kerala E-tender website: <u>https://etenders.kerala.gov.in</u> regularly till closing date of submission of tender for any 'Corrigendum, Addendum, Amendment'.

Sd/-

Member Secretary

Kerala Development and Innovation Strategic Council, India Heights Building, Govt Women's College Road, Vazhuthacadu, Thycadu P O Thiruvananthapuram Kerala

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SECTION - I

INSTRUCTIONS TO TENDERERS

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SECTION - I INSTRUCTIONS TO TENDERERS

2. INTRODUCTION

Kerala Development and Innovation Strategic Council (K-DISC) is the strategic think-tank advisory body of the Government of Kerala, formulating plans reflecting the latest in technology, product and process innovations for the development of the State. The vision of K-DISC is a competitive and inclusive Kerala through the creation of a healthy, conducive ecosystem for transformative and bold innovations through new directions in technology, product, and process innovations. It seeks to address the challenges of providing holistic health care, employment, social security, infrastructure, and food and nutrition security with a pro-poor bias, gender justice and inclusion of outliers, within severe fiscal constraints.

The Kerala Genome Data Centre (KGDC) is an ambitious initiative of K-DISC as a Special Purpose Vehicle (SPV), aimed at revolutionising the medical, agricultural, and livestock sectors through the power of genomic data. The primary goal is to establish a high-capacity data centre capable of managing and analysing massive quantities of genomic data and generating sufficient genomic data from the various domains of biology. The High Performance Computing Facility will be set up and integrated with the data centre at Digital University, Technopark Phase IV, Pallipuram, Thiruvananthapuram - 695317, Kerala, India.

This genomic data will be collected from diverse sources, including human, animal, plant, microbial and environmental samples, through project grants offered to scientists at the various Life sciences research institutions across the State. Sequencing will be outsourced to empanelled labs in the country. A significant part of our mandate is also the development of standards for data collection, analysis, and sharing, and setting ethical guidelines for responsible

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data use. This will be achieved by developing a Platform as a Service (PaaS) model only through which users can register and access the Data centre.

K-DISC is inviting competitive open tender through the e-tender portal <u>https://etenders.kerala.gov.in</u> of the Government of Kerala. The tender process comprises of three-part such as (i) Pre-qualification criteria, (ii) Technical Bid and (iii) Financial Bid.

3. BROAD SCOPE OF WORK

The scope of work, in general shall include Supply, Installation, Testing and Commissioning of HIGH PERFORMANCE COMPUTING (HPC) FACILITY WITH SUSTAINED PERFORMANCE, HIGH PERFORMANCE MULTI-NODE COMPUTING CLUSTER WITH HYBRID CPU & GPU NODES along with accessories and consumables complete as required for setting up the High Performance Computing Facility and integrating with the data center at Digital University, Technopark Phase IV, Pallipuram, Thiruvananthapuram - 695317, Kerala, India.

The bidders should quote for all the equipment as a bundle procurement (except NVIDIA), hence, consortium is permitted for bidding. Provision for quoting NVIDIA separately has been provided in the BoQ. It is the responsibility of the prime bidder to have a consortium agreement with the bidding partners.

4. COST OF TENDERING

The Tenderer shall bear all costs associated with the preparation and submission of its bid, and KDISC hereinafter referred to as "the Purchaser", will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the E-tender process.

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5. CONTENT OF TENDER DOCUMENTS

- 5.1 The goods/services required, e-tender procedures and contract terms are prescribed in the e-tender Documents. In addition to the e-tender Notice, the e-tender Documents include Instructions to Tenderers, General Conditions of Contract, Special Conditions of Contract, Technical Specifications, and statutory forms to be submitted.
- 5.2 The Tenderer is expected to examine all instructions, forms, terms and specifications in the e-tender documents. Failure to furnish all information required by the e-tender documents or submission of a bid not substantially responsive to the e-tender documents in every respect will be at the Tenderer's risk and may result in the rejection of their bid.

6. CLARIFICATION ON TENDER DOCUMENTS

- 6.1 Queries-related submission of tender should be intimated through email (Email ID: tenderkgdc@gmail.com) within the date specified in the tender notice.
- 6.2 The Tenderers are advised to obtain all necessary information before submitting their bid.
- 6.3 The purchaser shall arrange a pre-bid meeting with the bidders/tenderers to provide clarifications regarding the tender.
- 6.4 The bidder/tenderer shall conduct a site visit (DUK) before submitting the tender, if required.

7. AMENDMENT OF TENDER DOCUMENTS

7.1 At any time prior to the deadline for submission of bids, the Purchaser may, for any reason, whether at its own initiative or in response to the valid queries raised in the pre-bid meeting, modify the tender documents by amendment.

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- 7.2 The amendment will be notified in the e-tender portal as a corrigendum.
- 7.3 In order to offer prospective tenderers reasonable time to take the amendment into account in preparing their bids, the Purchaser may, at their discretion, extend the deadline for the submission of bids.

8. DOCUMENTS COMPRISING THE BID

The bid prepared and uploaded by the Tenderer shall comprise the following components:

- 8.1 Tender cost of INR. 15,000/- + Tax 18% extra (i.e. Total = INR 17,700/-)
- 8.2 Earnest Money Deposit (EMD)- INR 30,00,000/-
- 8.3 The Pre-qualification criteria (Part I) specified in Tender document must be met by the tenderer (Annexure II).
- 8.4 Technical Bid (Part II) with all documentary evidence to establish that the Tenderer meets the technical specifications specified in tender document and all other required forms in (Annexures III).
- 8.5 Form for Price bid completed as per format enclosed (Annexure XI.A and XI.B).

9. TECHNICAL BID

The Tenderer shall submit their technical bid based on the technical specifications (as per clause no 30) along with all attachments (except price bid) specified as per the tender documents.

10. PRICE BID

10.1 The Tenderer shall also complete the Form for Price bid furnished in the Tender Documents to be uploaded to the e-tender site (https://etenders.kerala.gov.in), indicating the goods/services to be supplied/rendered, a brief technical description of the goods/services,

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quantity and prices. Tenderers should prepare their bid strictly according to this format, filling in all the blank spaces.

- 10.2 The Tenderer shall indicate on the Price Schedule the unit prices and total Bid Prices of the goods/services they propose to supply under the Contract. Tenderers must submit the bid for the full quantity specified, failing which such bids are liable for rejection.
- 10.3 The Tenderer's separation of price components in accordance with the enclosed format will be solely for the purpose of facilitating the comparison of bids and will not in any way limit the Purchaser's right to contract on any of the terms offered.
- 10.4 Prices quoted by the Tenderer shall be fixed and firm during the Tenderer's performance of the Contract and shall not be subject to any escalation or variation on any account including that of the foreign exchange variation. A bid submitted with an adjustable price quotation is liable for rejection.

11. DOCUMENTS ESTABLISHING TENDERER'S ELIGIBILITY

The tenderer shall furnish documentary evidence of the Tenderer's technical & financial capability to perform the contract as specified in the pre-qualification criteria as part of the Tender document.

- 11.1 The OEM/Tenderer must have experience in installations of hybrid (GPU and CPU) HPC systems in a single order.
- 11.2 The OEM/Tenderer must have min 3 installations of minimum 100 TFLOPS HPC set up (CPU only) in the last 5-Years as prime contractor/supplier.
- 11.3 The bidder/OEM must have executed at least 3 or more HPC's in the last5 years with at least one cluster of minimum 60 TFLOPS sustainedperformance in a single order. Documentary proof to be attached.

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- 11.4 OEM brand/bidder must have minimum 1 entries in each of the last 2 list of India Top supercomputer (http://topsc.cdacb.in) published on January 2021 or later. (Latest release on July 2024).
- 11.5 Competing OEM brand/bidder must have minimum 10 entries in the list of Worldwide Top 500 Supercomputers (https://www.top500.org) as published on June 2021 or later. (Latest release on June 2024).
- 11.6 The Tenderer should be an OEM/Authorized partner of the OEM and a Letter of Authorization from the OEM, specific to this tender should be enclosed by the bidder if bidder is not the manufacturer.
- 11.7 The Tenderer will be responsible for supply, installation, configuration, testing, integration, commissioning, maintenance and support for both hardware and software during the warranty period.
- 11.8 The OEM and Tenderer should be in the HPC business and should have fully operational office for the last 5 years in India.
- 11.9 OEM must have spares center/warehouse/support office in India for support services. There should be on-site spare part support available directly from OEM or bidder in India for at least five years form the date of acceptance.
- 11.10 The bidder from a country which shares a land border with India will be eligible only if they are registered with the competent authority as per Govt. of India order, issued by Ministry of Finance vide No.F.No.6/18/2019-PPD dated 23/07/2020.
- 11.11 OEM should submit the undertaking stating that the items offered are not nearing end of life or end of support until the end of warranty and AMC. OEMs to provide a product Roadmap for the same.
- 11.12 Tenderer must be a Private or Public Ltd Registered Company.
- 11.13 Average annual financial turnover of the tenderer should be at least 50% of the estimated cost put to tender during the immediate last three consecutive financial years. (Audited balance sheet, profit and loss account of the last 3 financial years shall be submitted). The bidder should have valid Service Tax registration, PAN and, GST.

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- 11.14 Profit/loss: The bidder should not have incurred any loss (profit after tax should be positive) in more than two years during available last five consecutive balance sheet, duly audited and certified by the Chartered Accountant.
- 11.15 Solvency Certificate: Solvency of the amount equal to 40% of the Estimated Cost put to tender (ECPT). Banker's certificate on credit worthiness of the Tenderer and capacity of the tenderer to take up the works

Similar Work:

Similar Work Means Hybrid CPU and GPU based HPC with AI infrastructure (HPC installation/AI infrastructure implementation/ Data Center built-up individually or put- together) installed and supply executed.

a. The Bidder/OEM should have supplied, installed and commissioned one similar work of value not less than 80% of the estimated cost put to tender during the last seven years as prime Contractor ending previous day of last date of submission of tenders. The installed work shall be in satisfactory operation for past one year.

OR

b. The Bidder/OEM should have supplied, installed and commissioned two similar works each of value not less than 60% of the estimated cost put to tender during the last seven years as prime Contractor ending the previous day of the last date of submission of tenders. The installed work shall be in satisfactory operation for the past one year.

OR

c. The Bidder/OEM should have supplied, installed and commissioned three similar works each of value not less than 40% of the estimated cost put to tender during the last seven years as prime Contractor

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ending previous day of last date of submission of tenders. The installed work shall be in satisfactory operation for past one year.

(Copies of Purchase orders, satisfactory completion certificate for the work done, certificate from client showing that the installation is satisfactorily working for past year shall be submitted in English language. Details of current contracts in hand and other commitments as supportive evidence).

- 11.16 Certificate of ISO/ISI, CE or equivalent in terms of quality of product and Manufacturer with proof of document attached,
- 11.17 Copies of original documents defining the constitution or legal status, place of registration and principal place of business of the company or firm or partnership, etc. Copy of PAN and GST Registration No. and Income tax return certificate of the last five years should be attached.
- 11.18 Copy of the power of attorney authorizing the signatory to sign the tender.
- 11.19 If OEM is authorizing an Indian agent, then documents as per clause 31 shall be submitted.
- 11.20 Supplier's Technical offer.
- 11.21 The Bidding entity should not have been black listed for indulging in corrupt practice, fraudulent practice, coercive practice, undesirable practice, breach of contract or restrictive practice by any Central/ State Government/PSU/Semi- Government bodies as on bid submission date.
- 11.22 The bidder must carry out the installation and commissioning of all the supplied hardware components and software components and it must be done by OEM/OEM Certified engineers only.
- 11.23 The bidder/OEM has to quote exactly as per the mentioned technical specifications for the entire solution. Partial offers will not be considered for the commercial bid

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12. DOCUMENTS ESTABLISHING GOODS' ELIGIBILITY AND CONFORMITY TO TENDER DOCUMENTS

- 12.1 The Tenderer shall furnish, as part of their bid, documents establishing the eligibility and conformity to the Tender Documents, of all goods and services which the Tenderer proposes to supply under the Contract.
- 12.2 The documentary evidence of the goods' and services' conformity to the Tender Documents may be in the form of literature, drawing and data, and shall furnish:
 - 12.2.1 A detailed description of the goods' essential technical and performance characteristics including list of equipments offered item wise with capacities.
 - 12.2.2 A list giving full particulars, including available sources and current prices of all spare parts, special tools, etc. necessary for the proper and continuing functioning of the goods for a period of Five years, following successful commissioning of the equipment, and
 - 12.2.3 Deviation statement if any as per Annexure III (Technical Bid PQ).

Pursuant to Para (c) The Tenderer may substitute alternative standards, brand names and/or catalogue numbers in its bid, provided that it demonstrates to the Purchaser's satisfaction that the substitutions are substantially equivalent or superior to those designated in the Technical / Functional Specifications.

13. EARNEST MONEY DEPOSIT (EMD)

- 13.1 The EMD shall be remitted through online payment mechanism for eprocurement system of Govt. of Kerala.
- 13.2 Any bid not secured with EMD will be rejected by the Purchaser as non-responsive.
- 13.3 No interest shall be paid by the Purchaser on the EMD deposited by the Tenderer.

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- 13.4 Unsuccessful Tenderer's EMD will be refunded automatically to their respective account without delay.
- 13.5 The successful Tenderer's EMD will be discharged after the Contract Performance Guarantee is furnished and formal contract duly signed is received by the purchaser.
- 13.6 The Purchaser reserves the right to forfeit the EMD,
 - 13.6.1 If a Tenderer withdraws and/or modifies their bid during the period of bid validity.
 - 13.6.2 In the case of the successful Tenderer, if the Tenderer fails:13.6.2.1 To sign the Contract within the period stipulated or13.6.2.2 To furnish Security Deposit within the period specified.

The decision of the purchaser in this regard shall be final and binding on the tenderer.

13.7 Valid NSIC and MSE Certificates will be accepted for relaxation of EMD and tender fee. Presently EMD/Tender Fee exemptions and price preference are applicable to only Micro and Small Industries. In view of the above, if the vendor will claim for EMD/Tender Fee exemptions, the vendor should meet all the criteria for Micro and Small Industries. The vendor must have to submit the supporting documents like NSIC registration certificate, MSE registration certificate issued by competent government bodies to become eligible for the tender fee/EMD exemptions. (PQ). The certificates of the vendor (NSIC/MSE) shall cover the items tendered to get EMD/Tender Fee exemptions. NSIC certificate shall be valid as on due date/extended due date of the tender. This is not applicable for non NSIC unit.

Note - In case the bid is submitted as an Indian arm of a foreign bidder and the eligibility criteria conditions were met through foreign company, then the EMD exemption cannot be claimed under the MSME status of India arm/subsidiary. Thus a bidder who solely on its own, fulfils each eligibility criteria condition as per the tender terms and conditions and who are having MSE status, can claim EMD exemption/tender fee.

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14. PERIOD OF VALIDITY OF BIDS

- 14.1 Bids shall remain valid for 120 days after the prescribed date of bid opening. A bid valid for a shorter period may be rejected by the Purchaser as non-responsive.
- 14.2 In exceptional circumstances, the Purchaser may solicit the Tenderer's consent to an extension of the period of validity. The request and the responses thereto shall be made in writing or e- mail but followed by a signed confirmation copy. The EMD provided shall also be suitably extended. A tenderer may refuse the request without forfeiting their EMD. A Tenderer granting the extension will not be required nor permitted to modify their bid.

15. FORMAT AND SIGNING OF BID

The Tenderer shall submit the bid in the manner prescribed in the website www.etenders.kerala.gov.in. The tenderer who submits their bids for this tender after digitally signing, using their Digital Signature Certificate (DSC), accepts that they have clearly understood and agreed the terms and conditions in the website including the terms and conditions of this tender.

16. DEADLINE FOR SUBMISSION OF BIDS

- 16.1 Bids must be submitted online through the portal specified not later than the time specified for receipt of the bids as indicated in the e-tender Notice.
- 16.2 The Purchaser may, at their discretion, extend this deadline for the submission of bids by amending the Tender Documents in which case all rights and obligations of the Purchaser and Tenderers previously subject to the deadline will thereafter be subject to the deadline as extended.

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17. MODIFICATION AND WITHDRAWAL OF BIDS

- 17.1 The Tenderer may modify or withdraw their bid prior to the deadline prescribed for submission of bids.
- 17.2 No bid shall be modified subsequent to the deadline for submission of bids.
- 17.3 No bid shall be withdrawn in the interval between the deadline for submission of bids and the expiration of the period of bid validity. Withdrawal of a bid during this interval shall result in the forfeiture of the EMD, submitted by the Tenderer.

18. OPENING OF UNPRICED TECHNICAL BIDS

The Purchaser will open Part- I (Pre-qualification criteria) of the bids online at the time and date specified in the tender. Once the pre-qualification criteria are met then the Part-II technical bid will be opened.

19. PRELIMINARY EXAMINATION

- 19.1 The Purchaser will examine the bids to determine whether they are complete, the required prerequisites or pre-qualification have been met, the documents submitted are complete in all respects and that the bids are generally in order.
- 19.2 Prior to the detailed evaluation, the Purchaser will determine the substantial responsiveness of each bid to the Tender documents. For purposes of these clauses, a substantially responsive bid is one which complied to all the terms and conditions of the Tender Documents without material deviations.

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20. TECHNICAL EVALUATION

- 20.1 The Purchaser will determine to their satisfaction whether the Tenderers who have submitted otherwise substantially responsive bids, are qualified to satisfactorily perform the Contract.
- 20.2 The determination will take into account the Tenderer's technical and financial, capabilities. It will be based upon an examination of the documentary evidence of the Tenderer's qualifications submitted by the Tenderer, as well as such other information as the Purchaser deems necessary and appropriate including details of experience, records of past performance available with the Purchaser and details collected from other sources. The decision of the Purchaser in this regard shall be final and binding on all tenderers.
- 20.3 An affirmative determination will be a pre-requisite (Part-I and Part-II criteria has to be met) for considering the Priced Bid of the Tenderers.

21. OPENING OF PRICED BIDS

Priced bids (Financial Bid) of only those Tenderers whose pre-qualification criteria and unpriced technical bids are acceptable will be opened on the date notified in the tender notice.

22. EVALUATION AND COMPARISON OF PRICED BIDS

The Purchaser will evaluate and compare the priced bids after examining whether the tenders are complete, any computational errors have been made and the bids are generally in order.

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23. CONTACTING THE PURCHASER

- 23.1 No Tenderer shall contact the Purchaser on any matter relating to their bid, from the time of the bid opening to the time the Contract is awarded. Any effort by a Tenderer to influence the Purchaser in the bid evaluation, bid comparison or Contract award decisions may result in the rejection of their bid.
- 23.2 Any effort by a Tenderer to influence the Purchaser in the bid evaluation, bid comparison or contract award decisions may result in the rejection of their bid.

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24. CRITERIA FOR AWARDING CONTRACT

The Purchaser will consider award of Contract for the work to the successful Tenderer based on the Quality Cost Based System (QCBS). We expect products and components from reputable, leading OEMs with high reliability and support, having warranty and maintenance/upgrade commitments.

Weightage for the quality (Q) is 20% and weightage for the price bid (PB) is 80%

The technical bid score and the financial bid score for each vendor shall be normalised and combined evaluation score as indicated below

Normalised Technical Bid Score (NTB) = Marks obtained in technical bid X 100

Highest marks of technical bid

Normalised Financial Bid Score (NFB) = Lowest Quoted Price X 100

Price Quoted by the bidder

Combined Evaluation Score = 0.8 X NFB + 0.2 X NTB

The vendors could be ranked based on the combined evaluation score in descending order and the vendor who secures the highest combined evaluation score would be selected.

The parameters for applying QCBS is given below. Requesting vendor to note down values/comments on these parameters (with reference web links, if any)

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| | Server quality matrix based on key performance indicators | | | | |
|---|---|--|---|----------------|--|
| # | Concern | Parameter | Expectations | Weightage % | |
| 1 | OEM and Make | Top 5 OEMs | Reputed OEMs (Based on the market share as per <u>https://www.idc.com/</u> , <u>https://www.gartner.com/en</u> | 10 | |
| | | Latest product series prefarebly with highest uptime of > 99.99% and least failure of < 0.01% | Uptime > 99.99% and failure < 0.01% | 10 | |
| | | Warranty | 5 years or more | 4 | |
| | | Parts replacement | Next Business Day | 4 | |
| 2 | Support and Warranty | Support availability | 24/7, including all holidays | 4 | |
| | | Response time | < 4 hours 24/7, 15-30 minutes during business hours | 4 | |
| | | Resolution rate | >90% within 24 hours | 4 | |
| 3 | Energy Efficiency | Power consumption | Low energy usage | 2.5 | |
| | | Cooling | Efficient cooling systems | 2.5 | |
| | Performance | IPS (Instructions Per Second) | 1 TIPS (more the better) | 5 | |
| 4 | | FLOPS (Floating point Operations Per second) | 400 GFLOPS (more the better) | 10 | |
| | | CPU Cache | | 5 | |
| | | Data encryption | AES-256 | 4 | |
| 5 | Security | Access control | Multi-factor authentication | 3 | |
| | | Vulnerability management | Regular updates and patches | 3 | |
| 6 | Scalability and | Upgradeability | Easy expansion and upgrade options | 4 | |
| 0 | Manageability | Flexibility | Support for various workloads and applications | 3 | |

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| | | Ease of use | Intuitive management interface | 3 |
|---|--------------------------|--|--|-----|
| | Monitoring and Alerts | Dedicated monitoring and alert system/ports | | 2.5 |
| 7 | | Full system and components should be monitored and alerted | | 2.5 |
| | | Enhanced predictive analysis of components failures and alert system | | 2.5 |
| | | Option to add all machines to single monitoring system | Vendor must have built in solution for the same. | 2.5 |
| | | SMS and email (SMTP) alerts option | | 2.5 |
| | | Mobile apps for monitoring | Built in OEM, not separate solution | 2.5 |

| | Storage quality matrix based on key performance indicators | | | | |
|---|--|--|--|----------------|--|
| # | Concern | Parameter | Expectations | Weightage % | |
| 1 | OEM and Make | Top 5 OEMs | Reputed OEMs (Based on the market share as per <u>https://www.idc.com/,</u> <u>https://www.gartner.com/en</u> | 10 | |
| | | Product series having reputation for performance and reliability | Uptime > 99.99% and failure < 0.01% | 10 | |
| | Support and Warranty | Warranty | 5 years or more | 4 | |
| | | Parts replacement | Next Business Day | 4 | |
| 2 | | Support availability | 24/7, including all holidays | 4 | |
| | | Response time | < 4 hours 24/7, 15-30 minutes during business hours | 4 | |
| | | Resolution rate | >90% within 24 hours | 4 | |

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| 3 | Energy Efficiency | Power consumption | Third Party reports for energy savings | 2.5 |
|---|-------------------------------------|--|--|-----|
| 5 | | Total Rack Space/Power Cooling | Lowest DC foot print | 2.5 |
| | | IOPS and Latency | | 2 |
| | | aggregate throughput in GB/s | Both best case and average for mixed content | 2 |
| 4 | Performance | Number of controllers | | 4 |
| | | Number of Nodes | | 4 |
| | | Number of CPU | | 4 |
| | | System Memory | | 4 |
| | | Data encryption | AES-256 | 2.5 |
| 5 | Security | Ransomware Protection & Mitigation | Anomaly detection Dashboard | 2.5 |
| | | Access control | Multi-factor authentication | 2.5 |
| | | Vulnerability management | Regular updates and patches | 2.5 |
| | Scalability and Manageability | Future Generation Upgrade within same chassis | Easy expansion | 2.5 |
| | | Ability to upgrade newer Modules within same chassis | Easy upgrade options | 2.5 |
| 6 | | Ability to upgrade newer generation Controllers | Easy upgrade options | 2.5 |
| | | All Inclusive Software with future feature updates at no extra cost | Intuitive management interface | 2.5 |
| | Monitoring and Alerts | Dedicated monitoring and alert system/ports | | 2.5 |
| 7 | | Full system and components should be monitored and alerted | | 2.5 |
| | | Enhanced predictive analysis of components failures and alert system | | 2.5 |

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| Option to add all machines to single monitoring system | Vendor must have built in solution for the same. | 2.5 |
|--|--|-----|
| SMS and email (SMTP) alerts option | | 2.5 |
| Mobile apps for monitoring | Built in OEM, not separate solution | 2.5 |

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| Firewall quality matrix based on key performance indicators | | | | |
|---|---------------|--|--|----------------|
| # | Concern | Parameter | Expectations | Weightage % |
| 1 | OEM and | Top 5 OEMs | Reputed OEMs (Based on the market share as per https://www.idc.com/, https://www.gartner.com/en | 10 |
| | mane | Product series having reputation for performance and reliability | Uptime > 99.99% and failure < 0.01% | 10 |
| | | Warranty | 5 years or more | 4 |
| | | Parts replacement | Next Business Day | 4 |
| 2 | Support and | Support availability | 24/7, including all holidays | 4 |
| | Warranty | Response time | < 4 hours 24/7, 15-30 minutes during business hours | 4 |
| | | Resolution rate | >90% within 24 hours | 4 |
| | Performance | Concurrent connections | | 4 |
| | | New sessions per second | | 3 |
| | | No of network interfaces | | 3 |
| | | Throughput in GB/s | | 4 |
| | | Firewall Policies | >= 20000 | 3 |
| 3 | | Firewall Latency (64 byte, UDP) | <= 4.12 µs / 2.5 µs | 3 |
| | | SSL-VPN Throughput | >= 2-4 Gbps | 3 |
| | | IPsec VPN Throughput (512 byte) | >= 50 Gbps | 3 |
| | | Bandwidth | | 4 |
| | Coqueity | Ransomware Protection & Mitigation | AES-256 | 4 |
| 4 | security | Access control | Anomaly detection Dashboard | 3 |
| | | Vulnerability management | Multi-factor authentication | 3 |
| 5 | Manageability | Patches and upgrades | Easy upgrade options | 10 |

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| 6 | Monitoring and Alerts | monitoring and alert system | 4 |
|---|--------------------------|--|---|
| | | SMS and email (SMTP) alerts option | 3 |
| | | Enhanced predictive analysis of components failures and alert system | 3 |

| Switch quality matrix based on key performance indicators | | | | | |
|---|-------------------------|--|--|----------------|--|
| # | Concern | Parameter | Expectations | Weightage % | |
| 1 | OEM and Make | Top 5 OEMs | Reputed OEMs (Based on the market share as per https://www.idc.com/, https://www.gartner.com/en | 10 | |
| | | Product series having reputation for performance and reliability | Uptime > 99.99% and failure < 0.01% | 10 | |
| | Support and Warranty | Warranty | 5 years or more | 4 | |
| | | Parts replacement | Next Business Day | 4 | |
| 2 | | Support availability | 24/7, including all holidays | 4 | |
| | | Response time | < 4 hours 24/7, 15-30 minutes during business hours | 4 | |
| | | Resolution rate | >90% within 24 hours | 4 | |
| | Performance | Throughput in GB/s | | 8 | |
| | | Bandwidth | | 8 | |
| 3 | | Latency | | 8 | |
| | | Port error rate | | 8 | |
| | | Frame & Link error rates | | 8 | |
| 4 | Manageability | Patches and upgrades | Easy upgrade options | 10 | |
| 5 | | Monitoring and alert system | | 5 | |

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| Monitoring | SMS and email (SMTP) alerts | 5 |
|------------|-----------------------------|---|
| and Alerts | option | J |

| System Integration: Installation, configuration, testing and commissioning of HPC facility. | | | | |
|---|-----------------------|---|---|----------------|
| # | Concern | Parameter | Expectations | Weightage % |
| | | Installation and commissioning of one similar work of value not less than 80% of the estimated cost put to tender during the last seven years | | 60 |
| | System Integration | Installation and commissioning of two similar works each of value not less than 60% of the estimated cost put to tender during the last seven years | Installation, configuration, testing and commissioning of HPC facility. | 40 |
| | | Installation and commissioning of three similar works each of value not less than 40% of the estimated cost put to tender during the last seven years | | 20 |

25. PAYMENT SCHEDULE

The terms of payment for this contract shall be as follows:

25.1 For purchase/supplies

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- 25.1.1 75% (Seventy Five Percent) of the contract value will be released on physical receipt of all items mentioned in the supply order and on receipt of dispatch documents along with signed bill.
- 25.1.2 20% (Twenty Percent) of the contract price will be released after satisfactory installation, testing & commissioning of the item/equipment and on receipt of successful installation report.
- 25.1.3 Balance 5% of the contract price will be released after the expiry of guarantee /warranty period (5 years from the date of commissioning).
- 25.2 All the bills have to be addressed to the Member Secretary, K-DISC for payment process.
- 25.3 Once the bills are approved, the payment shall be made through the online portal of KIIFB to the designated bank account of the prime bidder.

26. PURCHASER'S RIGHT TO VARY QUANTITIES

The Purchaser reserves the right to increase or decrease the quantity of goods and services specified in the Technical Specifications and for which unit rates have been quoted, at the same terms and conditions.

27. PURCHASER'S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL BIDS

The Purchaser reserves the right to accept or reject any bid, in full or part, and to annul the Tendering process and reject all bids at any time prior to award of Contract, without thereby incurring any liability to the affected Tenderer or Tenderers or any obligation to inform them of the grounds for the action. The Purchaser's decision shall be final and binding on the tenderers.

28. NOTIFICATION OF AWARD/LETTER OF INTENT (LOI)

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- 28.1 Prior to expiration of the period of bid validity, the Purchaser will notify the successful Tenderer through a Letter of Intent/Purchase Order by e-mail, to be confirmed in writing, that their bid has been accepted.
- 28.2 The acceptance of the notification of awarding the LOI/purchase order will constitute the formation of the Contract.

29. SECURITY DEPOSIT/PERFORMANCE GUARANTEE BOND

Within 15 days of the receipt of notification of awarding the LOI/purchase order from the Purchaser, the successful Tenderer shall furnish the Security Deposit in accordance with the Conditions of Contract, in the Performance guarantee Form (Annexure IV) provided in the Tender Documents or another form acceptable to the Purchaser. Failure of the successful Bidder to comply with the above requirement shall constitute sufficient grounds for the annulment of the award and forfeiture of the EMD, in which event the Purchaser may make the award to the next eligible and graded Tenderer or call for new bids. The decision of the Purchaser in this regard shall be final and binding on the Tenderers.

30. SIGNING OF CONTRACT

Within 15 days of receipt of the notification of awarding the LOI/purchase order and subject to furnishing the Security deposit as prescribed above, the successful Tenderer shall sign and date the Contract and return it to the Purchaser. Notwithstanding anything contained hereunder, the LOI/Purchase order shall stand as the contract till the agreement is signed.

31. INDIAN AGENT

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- 31.1 If an Original Equipment Manufacturer (OEM) has authorized an agent in India to act on their behalf, then they are required to provide the following information along with the technical bid:
 - 31.1.1 The complete name and address of the Indian Agent(s) and their permanent income tax account number as allotted by the Indian Income Tax Department
 - 31.1.2 Annual turnover for the last 5 years, IT Returns
 - 31.1.3 Association with OEM and authorization letter from OEM as in Annexure VIII.
 - 31.1.4 Power of Attorney shall be submitted by the OEM for authorised partner in India.
 - 31.1.5 Details of business presently carried out in India
 - 31.1.6 The details of the services to be rendered by the agent for the subject requirement and documents to establish the capabilities of agent.
- 31.2 The Indian agent shall act on behalf of the OEM for participation in the tender. The Indian agent shall arrange for remittance of tender document fee, EMD, Security Deposit etc.
- 31.3 The Purchase Order shall be placed directly on the prime bidder and the warranty/guarantee etc. shall be furnished only by the prime bidder.

32. PROPRIETARY ITEM

In case, if a particular instrument is a proprietary item of a particular OEM, a valid Proprietary Article Certificate shall be provided along with the Technical Bid.

Note - The word proprietary is defined as an item which is manufactured by one and only one OEM and/or which is a patent or speciality to which tender system cannot be applied with advantage.

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SECTION - II GENERAL CONDITIONS OF CONTRAC

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SECTION - II

GENERAL CONDITIONS OF CONTRACT

33. **DEFINITIONS**

In this Contract, the following terms shall be interpreted as indicated.

- 33.1 "The Contract" means the agreement entered into between the Purchaser and the successful bidder, as recorded in the Contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein;
- 33.2 "The Contract Price" means the price payable to the successful bidder under the Contract for the full and proper performance of its contractual obligations;
- 33.3 "The Goods"/ "System"/Work(s) means the equipment which the successful bidder is required to supply, install, test and commission at the Purchasers premises under the Contract;
- 33.4 "Services" means services ancillary to the work, supply of the Goods, such as transportation and insurance, and other incidental services, such as installation, commissioning, provision of technical assistance, training and other such obligations of the successful bidder under the Contract;
- 33.5 "The Purchaser" means Kerala Development and Innovation Strategic Council (KDISC), Thiruvananthapuram, Kerala State, the organisation purchasing the Goods and Services for design, supply, installation, testing and commissioning of "High Performance Computing (HPC) facility at DUK in co-location mode.
- 33.6 "The Supplier"/" The Contractor"/" The Tenderer"/" The Bidder" means the firm supplying the Equipment's/Goods/Works and Services under this Contract.
- 33.7 "Site" means Kerala Digital University campus, Technopark Phase IV, Pallippuram, Thiruvananthapuram, the proposed location. Placement is in co-location mode with DUK.

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34. APPLICATION

These general conditions shall apply to the extent that they are not superseded by provisions in other parts of the Contract.

35. STANDARDS

The Goods and Services supplied under this Contract shall conform to the standards mentioned in the Technical Specifications and, when no applicable standard is mentioned, to the International Standards.

36. USE OF CONTRACT DOCUMENTS AND INFORMATION

- 36.1 The Supplier shall not, without the Purchaser's prior written consent, disclose the contract, or any provision thereof, or any specification, plan, drawing, pattern, sample or information furnished by or on behalf of the Purchaser in connection therewith, to any person other than a person employed by the Supplier in the performance of the Contract. Disclosure to any such employed person shall be made in confidence and shall extend only so far as may be necessary for purposes of such performance.
- 36.2 Any document, other than the Contract itself, enumerated in para. 4.1 shall remain the property of the Purchaser and shall be returned (in all copies) to the Purchaser on completion of the Supplier's performance under the Contract if so required by the Purchaser.

37. PATENT RIGHTS

The Supplier shall indemnify the Purchaser against all third-party claims of infringement of patent, trademark or industrial design rights arising from use of the goods or any part thereof in India.

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38. SECURITY DEPOSIT/ PERFORMANCE GUARANTEE

- 38.1 Within 15 days of the Supplier's receipt of notification of award of the Contract, the Supplier shall furnish to the Purchaser, a Security Deposit/Performance guarantee for an amount equal to three percent (3%) of the total contract price.
- 38.2 The proceeds of the Security Deposit/ Performance guarantee shall be payable to the Purchaser as compensation for any loss resulting from the Supplier's failure to complete its obligations under the Contract.
- 38.3 The Security Deposit/ Performance guarantee shall be denominated in Indian Rupees and shall be in the following form:
 - 38.3.1 An irrevocable unconditional BG issued by a nationalised or scheduled Indian Bank in the Security deposit cum Performance guarantee form enclosed. Annexure XIII
 - 38.3.2 Such bank guarantee shall be valid till the expiry of the warranty period with an extra claim period of one month.
- 38.4 The Security Deposit/ Performance guarantee will be discharged by the Purchaser and returned to the Supplier not later than 30 days following the date of satisfactory completion of the Supplier's performance obligations, including any warranty obligations, under the Contract, provided it is not forfeited earlier.

39. INSPECTION AND TESTS

39.1 The Purchaser or their representatives shall have the right to inspect and/or test the Goods to confirm their conformity to the Contract. All inspections shall be carried out jointly by the Purchaser or their representatives as one part and the Supplier or its representative as the other part against an intimation raised by the Supplier stating the completion/supply of services/goods in accordance with the contract.

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- 39.2 The inspections and tests may be conducted at the point of delivery and/or at the Good's final destination. In case of any defects or deficiency notified by the inspection authority, the Supplier will rectify and make good the same without delay.
- 39.3 Should any inspected or tested Goods fail to conform to the specifications, the Purchaser may reject them and the Supplier shall either replace the rejected Goods or make all alterations necessary to meet the specification requirements free of cost to the Purchaser.
- 39.4 The inspection by the Purchaser shall not in any way release the Supplier from any warranty/guarantee or other obligations under this Contract.
- 39.5 Inspection reports should be produced as proof of tests.

40. CONSEQUENCE OF REJECTION

- 40.1 If on the stores being rejected by the Purchaser of consignee at the destination, the contractor fails to make satisfactory supplies within the stipulated period of delivery, the purchaser shall be at liberty to-
 - 40.1.1 Request the contractor to replace the rejected stores forthwith but in any event not later than a period of 21 days from the date of rejection, and the contractor shall bear all the cost of such replacement, including freight, if any, on such replacing and replaced stores but without being entitled to any extra payment on that or on any other account.
 - 40.1.2 Purchase or authorize the purchase of stores rejected or stores of a similar description (when stores exactly complying with the particulars are not, in the opinion of the purchaser which shall be final, readily available) without notice to the contractor, at his risk and cost and without affecting the contractor's liability as regards to the supply of any further instalment due under the contract, or
 - 40.1.3 Cancel the contract and purchase or authorize the purchase of the stores or stores of a similar description (when stores exactly complying with the particulars are not in the opinion of the purchaser which shall Kerala Development and Innovation Strategic Council

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be final readily available) at the risk and cost of the contractor. In the event of action being taken under sub-clause (b) above or this subclause, the provisions of clause-9 of the General Conditions of Contract, shall apply as far as applicable.

41. DEFAULT AND RISK PURCHASE

- 41.1 Should the contractor fail to have the stores ready for delivery by the time or times agreed upon as aforesaid, or should the contractor in any manner otherwise fail to perform the contract, the purchaser shall have power to declare the contract at an end at the risk and cost of the contractor as provided in every way. In such a case, the contractor shall be liable for any expenses, losses or damages which the purchaser may be put to incur or sustain by reason of or in connection with the contractor's default.
- 41.2 In the event of risk purchase being made against the contract the contractor will be liable to pay to the purchaser extra expenditure incurred i.e. in procuring the same or similar stores and/or equipment the difference between the rate quoted by the vendor who secures the highest combined evaluation score in QCBS against the tender and that at which the risk purchase contract is concluded, provided it is done within three (3) months from the date of breach of the contract.
- 41.3 The cancellation of the contract may be either whole or part of the contract at purchaser's option. In the event of the purchaser terminating this contract in whole or in part, he may procure upon such terms and in such manner as he deems appropriate, supplies or services similar to those so terminated, if risk purchase is not rendered possible for any reason in which event the contract shall be liable to the purchaser for any excess costs for such similar supplies/or services. However, the contractor shall continue the performance of this contract to the extent not terminated under the provisions of this clause.

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42. PACKING AND MARKING

- 42.1 The Supplier shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination as indicated in the Contract. The packing shall be sufficient to withstand, without limitation, rough handling during transit and exposure to severe climatic conditions during transit and open storage. Packing case size and weights shall be taken into consideration, where appropriate, the remoteness of the Goods' final destination and the absence of heavy handling facilities at all points in transit.
- 42.2 The packing, marking and documents within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the contract and in any subsequent instruction ordered by the Purchaser.
- 42.3 Each package shall be marked to indicate:
 - 42.3.1 Name of the Supplier
 - 42.3.2 Details of items in the packages
 - 42.3.3 Name of the Consignee
 - 42.3.4 Purchase Order Number
 - 42.3.5 Gross, net and tare weights of the item
 - 42.3.6 Destination
 - 42.3.7 Certificate of Country of Origin

43. DELIVERY AND DOCUMENTS

Delivery of the goods shall be made by the Supplier as specified by the Purchaser in the Special Conditions of Contract. The supply, installation and commissioning of the

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HPC facility mentioned in the contract shall be completed within a timeline of three months from the date of award of the contract.

For purposes of the contract, FOB, C&F, CIF, CIP and other trade items used to describe the obligations of the parties shall have the meanings assigned to them by the current edition of the International Rules for the interpretation of the Trade Terms published by the International Chamber of Commerce, Paris and commonly referred to as INCOTERMS.

44. INSURANCE

- 44.1 The goods supplied under the contract, shall be fully insured in Indian currency against loss or damage incidental to manufacture or acquisition, transportation, storage and delivery in the manner specified in the contract. The insurance may be done for coverage on "all risks" basis including war risks and strike clauses. The amount to be covered under insurance should be sufficient to take care of the overall expenditure to be incurred by the purchaser for receiving the Stores at the destination.
- 44.2 In case of any such loss or damage, the Supplier shall:
 - 44.2.1 Initiate and pursue any claim till its settlement, and
 - 44.2.2 Promptly make arrangements for repair and/or replacement of any damaged item/s irrespective of settlement of claim by the underwriters within a reasonable time.
- 44.3 The supplier shall submit, to the Purchaser documentary evidence that such policy is in effect.

45. INCIDENTAL SERVICES

45.1 As specified in the Special Conditions of Contract, the Supplier is required to provide any or all of the following services:

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- 45.1.1 Furnishing of tools required for assembly and/or maintenance of the supplied Goods;
- 45.1.2 Furnishing of copies of detailed Operation and Maintenance manual for each appropriate unit of the supplied Goods
- 45.1.3 Conduct of training of the Purchaser's personnel, at purchasers site, during installation and start-up operation.
- 45.1.4 Any other service not specifically mentioned but is required for satisfactory performance of the contract.
- 45.2 All charges for the preceding incidental services shall be included in the Contract price.

46. WARRANTY/GUARANTEE

- 46.1 The Supplier shall warrant that the Goods supplied under the Contract are new, unused, of the most recent or current models and incorporate all recent improvements in design and materials unless provided otherwise in the Contract. The Supplier shall further warrant that the Goods and services supplied provided under this Contract shall have no defect arising from design, materials or workmanship or from any act or omission of the Supplier, that may develop under normal use of the supplied Goods in the conditions obtaining in the Digital University, Kerala. The Supplier shall also guarantee that the Goods supplied shall perform satisfactorily as per the designed/rated/installed capacity as provided for in the Contract.
- 46.2 This warranty/guarantee shall remain valid for 60 months from the date of commissioning the equipment as given in the Special Conditions of Contract. Any defect arising out of faulty installation or use of substandard material or workmanship shall be rectified by the Supplier at his own risk and cost and within the time specified by the Purchaser.
- 46.3 The Purchaser shall promptly notify the Supplier in writing of any claims arising under this warranty.

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- 46.4 Upon receipt of such notice, the Supplier shall, with all reasonable speed, repair or replace the defective Goods or parts thereof, without costs to the Purchaser.
- 46.5 If the Supplier, having been notified, fails to remedy the defect(s) within a reasonable period, the Purchaser may proceed to take 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.
- 46.6 This warranty/guarantee shall not cover any damage/s resulting from normal wear and tear or improper handling by the Purchaser.

47. PAYMENT

The method and conditions of payment to be made to the Supplier under the Contract shall be as specified in the Special Conditions of Contract.

48. CHANGE ORDERS

- 48.1 The Purchaser may, at any time, by a written order given to the Supplier make changes within the general scope of the Contract in any one or more of the following:
 - 48.1.1 Drawings, designs or specifications, where Goods to be furnished under the Contract are to be specifically manufactured for the Purchaser;
 - 48.1.2 The method of shipment or packing;
 - 48.1.3 The place of delivery; or
 - 48.1.4 The Services to be provided by the Supplier.
- 48.2 If any such change causes an increase or decrease in the cost of, or the time required for the Supplier's performance of any part of the work under the Contract, an equitable adjustment shall be made in the Contract Price or delivery schedule, or both, and the Contract shall accordingly be amended. <u>Kerala Development and Innovation Strategic Council</u>

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Any claims by the Supplier for adjustment under this clause must be asserted within thirty (30) days from the date of the Supplier's receipt of the Purchaser's change order.

49. CONTRACT AMENDMENTS

No variation in or modification of the terms of the Contract shall be made except by written amendment signed by the parties.

50. LIQUIDATED DAMAGES

- 50.1 If the Supplier fails to deliver any or all of the Goods within the time period(s) specified in the Contract, the Purchaser shall, without prejudice to their other remedies under the Contract, deduct from the Contract Price, as Liquidated Damages and not as penalty, a sum equivalent to:
 - 50.1.1 1% (one percent) of the full Contract price for delay per week or part thereof.
 - 50.1.2 The total amount so deducted shall not exceed 10% of the Contract price. Once the maximum is reached, the Purchaser reserves the right to take necessary steps for the completion of the Goods & Services. The decision of the Purchaser shall be final and binding on the Supplier.

51. TERMINATION FOR DEFAULT

- 51.1 The Purchaser may, without prejudice to any other remedy for breach of Contract, by written notice of default sent to the Supplier, terminate the Contract in whole or in part:
 - 51.1.1 If the Supplier fails to deliver all the Goods/Services and commission the items, under his contract obligations, within the time period(s) specified in the Contract.

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- 51.1.2 If the Supplier fails to perform any other obligation(s) under the Contract.
- 51.2 In the event the Purchaser terminates the Contract in whole or in part, the Purchaser may procure and perform, upon such terms and in such manner as it deems appropriate, Goods and Services similar to those undelivered, and the Supplier shall be liable to pay the Purchaser for any excess costs for such similar Goods and Services. However, the Supplier shall continue performance of the Contract to the extent not terminated. The decision of the Purchaser shall be final and binding on the Supplier.
- 51.3 Consequent to such termination of Contract, the Purchaser shall recover all payments including the advance paid, if any, to the Supplier along with interest @12% per annum, compounded quarterly on the last day of March, June, September and December, for the entire period for which the amounts were retained by the Supplier.

52. FORCE MAJEURE

- 52.1 The Supplier shall not be liable for forfeiture of their Security Deposit, Liquidated damages or Termination for default, if and to the extent that, their delay in performance or other failure to perform their obligations under the Contract is the result of an event of Force Majeure.
- 52.2 For purposes of this clause, "Force Majeure" means an event beyond the control of the Supplier and not involving the Supplier's fault or negligence and not foreseeable. Such events may include, but are not restricted to, acts of the Purchaser either in their sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes.
- 52.3 If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such conditions within 15 days and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform their obligations under the Contract as far as is <u>Kerala Development and Innovation Strategic Council</u>

reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

53. TERMINATION FOR INSOLVENCY

- 53.1 The Purchaser may at any time terminate the Contract by giving written notice to the Supplier, without compensation to the Supplier, if:
 - 53.1.1 The Supplier becomes bankrupt or otherwise insolvent,
 - 53.1.2 The Supplier being a Company is wound up voluntarily by the order of a Court, Receiver, Liquidator or Manager appointed on behalf of the debenture holders, or circumstances shall have arisen which entitle the Court or debenture holders to appoint a Receiver, Liquidator or a Manager, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to the Purchaser.

54. **RESOLUTION OF DISPUTES**

- 54.1 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.
- 54.2 If, after thirty (30) days from the commencement of such informal negotiations, the Purchaser and the Supplier have been unable to resolve amicably a Contract dispute, either party may require that the dispute be referred for resolution to the formal mechanisms specified in the Special Conditions of Contract.

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55. GOVERNING LANGUAGE

The Contract shall be written in English language. The language version of the Contract shall govern its interpretation. All correspondence and other documents pertaining to the contract which are exchanged by the parties shall be written in English.

56. APPLICABLE LAW

The Contract shall be interpreted in accordance with the laws on the Union of India.

57. NOTICES

- 57.1 Any notice given by one party to the other pursuant to the Contract shall be sent in writing or by email and confirmed in writing to the address specified for that purpose in the Special Conditions of Contract.
- 57.2 A notice shall be effective when delivered or on the notice's effective date, whichever is later.

58. RIGHT TO USE DEFECTIVE EQUIPMENT/WORKS

If after delivery, installation and acceptance and within the guarantee and warranty period, the operation or use of any equipment/works proves to be unsatisfactory, the Purchaser shall have the right to continue to operate or use such equipment/works until rectifications of defects, errors or omissions by repair or by partial or complete replacement is made without interfering with the Purchaser's operation.

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59. JURISDICTION

The contract shall be governed by and constructed according to the laws in force in India. For the settlement of any dispute arising out of this Contract, the courts at Thiruvananthapuram District, Kerala shall have jurisdiction.

60. SPARE PARTS

As specified in the technical specification, the Supplier may be required to provide any or all of the following materials and notifications pertaining to spare parts manufactured or distributed by the supplier:

- 60.1 Such spare parts as the Purchaser may elect to purchase from the supplier provided that this selection shall not relieve the Supplier of any warranty obligation and
- 60.2 In the event of termination of production of spare parts:
 - 60.2.1 advance notification to the Purchaser of the pending termination in sufficient time to permit the Purchaser to procure its needed requirements and
 - 60.2.2 Following such termination, furnishing at no cost to the Purchaser, the drawings and specifications of the spare parts, if and when required.

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SECTION - III SPECIAL CONDITIONS OF CONTRACT

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SECTION - III SPECIAL CONDITIONS OF CONTRACT

The following Special Conditions of Contract shall supplement the General Conditions of Contract. Whenever there is a conflict, the provision herein shall prevail over those in the General Conditions of Contract.

61. SUFFICIENCY OF TENDER

The intending tenderers shall be deemed to have studied the tender papers and have taken into account all aspects of the requirements of the Client before submitting the tender.

62. PERFORMANCE OF WORK

The work shall be performed at the place or places specified in the tender or at such other place or places as may be approved by the purchaser.

63. SPECIFICATION

If the contractor shall have any doubt as to the meaning of any portion of the conditions of the specifications, he shall (before submitting the tender) set forth the particulars thereof and submit them to the purchaser in writing in order that such doubts may be removed.

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64. VARIATIONS

- No alterations, amendments, omissions, additions, suspension, or variations 64.1 of the work (hereinafter referred to as "variations") under the contract as shown by the specifications shall be made by the Contractor except as directed in writing by the Purchaser, but the Purchaser shall have full power, subject to the provision hereinafter contained from time to time, during the execution of the contract by notice in writing to instruct the Contractor to make such variation without prejudice to the contract, and the Contractor shall carry out such variations and be bound by the same conditions so far as applicable as though the said variation occurred in the specifications. If any suggested variation, would, in the opinion of the Contractor, if carried out, prevent him from fulfilling any of his obligations or guarantees under the contract, he shall notify the Purchaser thereof in writing and the Purchaser shall decide forthwith, whether or not they shall be carried out. If the Purchaser confirms his instruction, the Contractor's obligations and guarantees shall be modified to such an extent as may in the opinion of the Purchaser, be justified. The difference of cost, if any, occasioned by any such variations shall be added to or deducted from the contract price as the case may require.
- 64.2 The amount of such difference, if any, shall be ascertained as determined in accordance with the rates specified in the schedule of prices, so far as the same may be applicable and where the rates are not contained in the said schedule or not applicable, they shall be settled by the Purchaser and Contractor jointly. But the Purchaser shall not become liable for the payment of any such variations, unless the instructions for the performance of the same have been given in writing by the Inspector.
- 64.3 In the event of the Purchaser requiring any variations, such reasonable and proper notice shall be given to the Contractor, as will enable him to make his arrangements accordingly, and in cases where goods or materials are already prepared or any designs, drawings, or patterns made or work done is required <u>Kerala Development and Innovation Strategic Council</u>

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to be altered a reasonable sum in respect there of shall be allowed by the Purchaser, provided that no such variations shall, except with the consent in writing of the Contractor, be such as will involve an increase or decrease in the total price payable under the contract by more than 10 percent thereof.

64.4 In any case, in which the Contractor has received instructions from the Purchaser for carrying out the work which either then or later, will, in the opinion of Contractor involve a claim for additional payment, the Contractor shall as soon as reasonably possible after receipt of the instructions aforesaid, advise the Inspector to that effect.

65. INSPECTION AND TESTS

- 65.1 The inspection of the Goods shall be carried out by the Supplier to check whether the Goods are in conformity with the Technical specifications. The inspection shall be in line with the inspection/test procedures laid down in the Contract conditions.
- 65.2 Reliability of all equipment shall be demonstrated by providing Mean Time between Failures (MTBF) of equipments.
- 65.3 The Purchaser shall have the right at all reasonable times to inspect at the Supplier's premises all Supplier's drawings or any part of the work.
- 65.4 Before the items are taken over by the Purchaser, the Supplier shall supply operation and maintenance manuals together with as-built drawings. These shall have all such details as will enable the Purchaser to operate, maintain, adjust and repair all parts of the work as stated in the specifications.
- 65.5 The manuals and drawings shall be in the ruling language (English) and in such form and numbers as stated in the Contract.
- 65.6 Unless and otherwise agreed, the system shall not be considered to be completed for the purpose of taking over until such manuals and drawings have been supplied to the Purchaser.

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66. INSPECTION OF SITE ETC, BEFORE SUBMISSION OF TENDER

The Supplier shall inspect and examine the site and its surroundings, and shall satisfy himself before submitting his tender, the quantities and nature of work and materials and its availability required for the completion of the works, the means of access to the site, the local labour conditions, the accommodation he may require and in general shall obtain all necessary information as to the risks, contingencies and other circumstances which may influence or affect their tender. The supplier shall assess the site and provide a site feasibility report for the successful installation and commissioning of HPC as per the technical specification.

67. DELIVERY DOCUMENTS

Imported Equipment:

- 67.1 The equipment should be supplied on INCOTERMS Delivered Duty Paid (DDP) basis; that should cover customs clearance/duty charge, demurrage if any, clearing agent charge, documentation charge, labour charge and transportation charge, if applicable.
- 67.2 F.O.R Destination is Kerala Digital University campus, Technopark Phase IV, Pallippuram, Thiruvananthapuram, Kerala, India, the proposed site for the High Performance Computing (HPC) facility.
- 67.3 The seller should take Insurance from warehouse to warehouse (F.O.R destination).
- 67.4 All the shipping documents and invoices should be in the name of "The Member Secretary, Kerala Development and Innovation Strategic Council (KDISC), India Heights, Womens College Road, Vazhuthacadu, Thycadu P O, Thiruvananthapuram, Kerala, India.
- 67.5 The seller should also take care of the unloading of equipment's (at destination) and shifting it to the Installation site/room
- 67.6 The delivery documents shall include:

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- 67.6.1 The Supplier's invoice showing purchase order no., Goods' description, quantity, unit price and total amount;
- 67.6.2 Name of the Carrier
- 67.6.3 Bill
- 67.6.4 Date of Delivery
- 67.6.5 Shipment booking form/Delivery note
- 67.6.6 Packing list
- 67.6.7 Supplier's/Manufacturer's guarantee certificate
- 67.6.8 Calibration Certificates
- 67.6.9 Material Test certificates
- 67.6.10 Inspection certificate issued by the inspection Agency
- 67.6.11 Insurance policy/certificate (warehouse to warehouse (F.O.R Destination))
- 67.6.12 Any other document evidencing payment of statutory levies.
- 67.6.13 Delivery challan (F.O.R Destination)

Note: The nomenclature used for the item description in the invoice/s, packing list/s and delivery note/s etc. should be identical. The dispatch particulars including name of transporter, LR no. and date should also be mentioned in the invoice/s.

68. **RESPONSIBILITY FOR COMPLETENESS**

- 68.1 Any fittings or accessories which may not be specifically mentioned in the specifications, but which are usual or necessary are to be provided by the Contractor without extra charge and the equipment must be complete in all details.
- 68.2 In all cases where the contract provides for tests on site, the Purchaser, except where otherwise specified shall provide free of charge such labour, materials, fuels, stores, apparatus and instruments as may be requisite from time to time and as may reasonably be demanded, efficiently to carry out

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such test of the materials or workmanship etc. in accordance with the contract.

68.3 All items as per the specification should be supplied by the contractor. However, at the time of installation, if it is found that some additional items are required to meet operational requirements of the configuration but not included in the bidder's original list of deliverables, the bidder shall supply items to ensure completeness of the configuration at no extra cost.

69. PAYMENT

Unless agreed otherwise to by the Purchaser, the terms of payment for this contract shall be as follows:

- 69.1 For purchase/supplies
 - 69.1.1 Inland letter of credit will be opened for 100% of the contract value on a deferred payment system. In which 75% (Seventy Five Percent) of the contract value will be released on physical receipt of all items mentioned in the supply order and on receipt of dispatch documents along with signed bill.
 - 69.1.2 20% (Twenty Percent) of the contract price will be released after satisfactory installation, testing & commissioning of the item/equipment and on receipt of successful installation report
 - 69.1.3 Balance 5% of the contract price will be released after the expiry of guarantee /warranty period (5 years from the date of commissioning).

70. RESOLUTION OF DISPUTES

70.1 Subject to the provisions of the relevant clause in General Conditions of Contract, any dispute or differences that could not be resolved be referred to the adjudication of sole Arbitrator. Within thirty days of receipt of notice from the Supplier of his intention to refer the dispute to arbitration, the

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Purchaser shall finalise a panel of three Arbitrators and intimate the same to the Supplier. The Supplier shall within fifteen days of receipt of this list, select and confirm his acceptance to the appointment of one from the panel as Arbitrators. If the Supplier fails to communicate his selection of name within the stipulated period, the Purchaser shall, without delay, select one from the panel and appoint him as the sole Arbitrator. If the Purchaser fails to send such a panel within thirty days as stipulated, the Supplier shall send a similar panel to the Purchaser within fifteen days. The Purchaser shall then select one from the panel and appoint him as the sole Arbitrator within fifteen days. If the Purchaser fails to do so, the Supplier shall communicate to the Purchaser the name of one from the panel who shall then be the sole Arbitrator. The appointment of sole Arbitrator so made shall be final and conclusive. The Arbitration shall be conducted in accordance with the provisions of the Indian Arbitration and Conciliation Act, 1996 and rules there under or any statutory modifications thereof for the time being in force. The Arbitration proceedings shall be held in THIRUVANANTHAPURAM, KERALA ONLY at a time as the sole Arbitrator may decide. The Arbitrator shall give a speaking award and the decision of the sole Arbitrator shall be final and binding upon the parties and the expenses of the Arbitrator shall be paid as may be determined by the Arbitrator.

- 70.2 Performance under the Contract shall, if reasonably possible, continue during the Arbitration proceedings and payments due to the Supplier by the Purchaser shall not be withheld, unless they are the subject of the Arbitration proceedings.
- 70.3 Neither party is entitled to bring a claim to Arbitration if the Arbitrator has not been appointed within thirty days after expiration of the warranty/guarantee period.

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71. EXTENSION OF TIME FOR COMPLETION

Should the amount of extra or additional work of any kind, or any cause of delay referred to in these conditions, or exceptional adverse climatic conditions, or other special circumstances of any kind whatsoever which may occur, other than through a default of the Supplier, be such as fairly to entitle the Supplier to an extension of time for the completion of the works, the Purchaser shall determine the amount of such extension and shall notify the Supplier accordingly. Provided that the Purchaser is not bound to take into account any extra or additional work or other special circumstances unless the Supplier has within twenty eight days after such work has been commenced, or such circumstances have arisen, or as soon thereafter as is practicable, submitted to the Purchaser full and detailed particulars of any extension of time to which he may consider himself entitled, in order that such submission may be investigated at the time. The Supplier shall not be entitled to claim any enhancement in the contract price on account of extension of time granted and the Supplier shall complete the work strictly in terms of the Contract.

72. FINAL TAKING OVER AND GUARANTEE PERIOD

- 72.1 After Commissioning, the guarantee period shall commence from the date of commissioning of equipments and shall be valid for a period of Sixty (60) calendar months.
- 72.2 The Supplier would be required to give performance guarantee for each individual item of equipment supplied, and tested, as is applicable in each case (for due performance, quality of material used, design, throughput, erection, etc.).
- 72.3 In respect of equipment/component renewed under the terms of guarantee, the period of guarantee for such items shall be for six months from the date of renewal or till the end of guarantee period, whichever is later.

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- 72.4 The guarantee period shall be extended in case of extension of the guarantee run period for reasons attributable to the Supplier and this will be communicated by the Purchaser to the Supplier in writing. The duration of extension of guarantee period will be mentioned in the above letter.
- 72.5 Should the Supplier fail to rectify any defects which shall have been notified to him in writing during the period of guarantee, it shall be deemed as a breach of contract and the Purchaser will be entitled to rectify such defects at the Supplier's cost, and charge any further penalty as deemed fit.

73. GST CERTIFICATE

Tenderers must quote their GST details along with quotation otherwise their quotation will not be entertained. GST Number must also be quoted on the bills by the suppliers, failing which their payment may not be released.

74. TRAINING OF PERSONNEL

Suppliers need to provide adequate training at KDISC to the nominated person(s) of KDISC at their cost. KDISC will not bear any training or living expenditure in this regard. The Supplier should arrange for regular visit to the KDISC campus by its technical team and assist in maintenance of the item/equipment within warranty period.

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SECTION - IV TECHNICAL SPECIFICATION

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SECTION - IV TECHNICAL SPECIFICATION

DESIGN, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF HIGH PERFORMANCE COMPUTING (HPC) FACILITY WITH SUSTAINED PERFORMANCE, HIGH PERFORMANCE MULTI-NODE COMPUTING CLUSTER WITH HYBRID CPU & GPU NODES AS PER THE DETAILED SPECIFICATIONS GIVEN BELOW.

Required Quantity: 1 No.

A HPC Cluster along with AI Infrastructure must be supplied, installed and maintained at Kerala Digital University campus, Technopark Phase IV, Pallippuram, Thiruvananthapuram for Kerala Genome Data Centre under K-DISC.

75. LIST OF HARDWARES

| Sl No | ltem | Quantity | Remarks |
|-------|---|----------|---|
| 1. | SERVER (Master Nodes) | 4 | |
| 2. | SERVER (Compute Nodes)* | 20 | Min 100 TFLOPS total |
| 3. | SERVER (Compute Nodes - High Memory) | 8 | |
| 4. | SERVER (Compute Nodes GPU Cluster) | 5 | |
| 5. | SERVER (Compute Nodes For VM) | 4 | |
| 6. | AI / ML COMPUTING - NVIDIA DGX B200 | 1 | Can be quoted as separate item in BoQ2 of the BoQ |
| 7. | Tier1 Storage (500TB capacity) | 1 | |
| 8. | Tier 2 Storage (500TB capacity) | 3 | |
| 9. | Tier 3 Storage (500TB capacity) | 2 | |

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| 10. | Next-generation Firewall | 2 | |
|-----|--------------------------|---|--|
| 11. | 10G/25G Switch | 7 | |
| 12. | 1/10G Switch | 5 | |
| 13. | System Integration | Installation, configuration, testin and commissioning of HPC facility. | |

* The server compute nodes specified is an indicative number, the OEM can offer a computing solution with minimum 100 teraflops.

76. KGDC TECHNICAL SPECIFICATIONS

SERVER TECHNICAL SPECIFICATION (Master Nodes) - 4 nos

| ltem | Туре | Spec | Remark |
|-------------|------------------------|--------------------|--------|
| Processor | Make | Intel/AMD | |
| | Series | Platinum/Gold/EP | |
| | | YC (Latest Series) | |
| | Number of Processors | 2 | |
| | No. of Cores/Processor | 16 | |
| | No of threads/Core | 2 | |
| | Base Frequency | >= 2.9GHz | |
| | Turbo Frequency | >= 3.50 GHz | |
| | Cache | >= 24 MB | |
| | Form Factor | Rack/Blade | |
| | Size | 2U | |
| | Support | AVX/AVX2 | |
| Motherboard | Chip-set Compatible | Intel/AMD | |
| | Max CPU Sockets | 2 | |
| Memory | Туре | DDR4 RDIMM ECC | |

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| | Single Memory module | 16GB | |
|-----------------------|---|--------------------------|----------------|
| | Speed | >=3200 MT/s | |
| | Memory size | 128GB | |
| | Max memory Support | > 512GB (32GB Module) | |
| Co-Processor / GPU | NA | NA | NA |
| Storage | SAS SSD | 2 No's | |
| | SASSSD Size | 800GB | |
| | SAS SSD Req | OS Partition | |
| | SAS SSD RAID Level | RAID 1 | |
| | SATA SSD usable size | 5TB | |
| | Min SATA SSD Drives | >=5 | |
| | SATA SSD RAID Level | RAID 5 | Data Partition |
| RAID Cards | RAID level | 0,1,5,6,10,50,60 | |
| | Ports/Lanes | >= 8 | |
| | Cache | >= 8GB NV | |
| | Interface Support | SAS, SATA,NVMe | |
| Interfaces & Ports | Total network cards | 2 | |
| | Network card1 Type | Ethernet | |
| | Network card1 Speed | 1G and 10G Supported | |
| | Network card1 ports required | 4x1G and 10G supported | |
| | PXE Support | Yes | |
| | Virtual Machine Device Queues (VMDq) | Yes | |
| | PCI-SIG* SR-IOV Capable | Yes | |

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| | Server network ports should support DPDK and it should deliver zero packet loss as per RFC 2544 and deliver 100%-line rate for all the packet sizes over 64 Bytes, Vendor must submit latest DPDK test report for the same | Yes | |
|---------------------|--|---|--|
| | Network card2 Type | SFP28 | |
| | Network card2 Speed | 10G/25G | |
| | Network Transceivers | 25Gb SFP28 SR 100m Transceiver & Cables | |
| | Network card2 ports required | 2 | |
| | PXE Support | Yes | |
| | Virtual Machine Device Queues (VMDq) | Yes | |
| | PCI-SIG* SR-IOV Capable | Yes | |
| | Server network ports should support DPDK and it should deliver zero packet loss as per RFC 2544 and deliver 100%-line rate for all the packet sizes over 64 Bytes, Vendor must submit latest DPDK test report for the same | Yes | |
| Operating system | Certifications/Compliance (OS) | RHEL 7,8+, Ubuntu 20+, Oracle Linux 8,9+, Debian 11,12+, Windows | |
| | Certifications/Compliance (Virtualization/Cloud Platform) | VMware, PROXMOX, KVM, Citrix | |

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| Server Monitor | Separate | Monitoring | Inbuilt Web based | |
|----------------|-----------|------------|-------------------|--|
| (With Advanced | Interface | | secure Server | |
| License) | | | hardware | |
| | | | monitoring | |
| | | | alerting system | |
| | | | | |

SERVER TECHNICAL SPECIFICATION (Compute Nodes) - Minimum 20 nos and minimum of 100 TFLOPS

| ltem | Туре | Spec | Remark |
|-------------|------------------------|---------------------|--------|
| Processor | Make | Intel/AMD | |
| | Series | Platinum/Gold/EPY | |
| | | C (Latest Series) | |
| | Number of Processors | 4 | |
| | No. of Cores/Processor | 18 | |
| | No of threads/Core | 2 | |
| | Base Frequency | >= 2.9GHz | |
| | Turbo Frequency | >= 3.50 GHz | |
| | Cache | >= 24 MB | |
| | Form Factor | Rack/Blade | |
| | Size | 2U/4U | |
| | Support | AVX/AVX2 | |
| Motherboard | Chip-set Compatible | Intel/AMD | |
| | Max CPU Sockets | 4 | |
| Memory | Туре | DDR4 RDIMM ECC | |
| | Single Memory module | 32GB | |
| | Speed | >=3200 MT/s | |
| | Memory size | 512GB | |
| | Max memory Support | > 1TB (32GB Module) | |

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| Co-Processor / GPU | NA | NA | NA |
|-----------------------|--|-------------------------|-------------------|
| Storage | SAS SSD | 2 No's | |
| | SASSSD Size | 800GB | |
| | SAS SSD Req | OS Partition | |
| | SAS SSD RAID Level | RAID 1 | |
| | SATA SSD usable size | 5TB | |
| | Min SATA SSD Drives | >=5 | |
| | SATA SSD RAID Level | RAID 5 | Data Partition |
| RAID Cards | RAID level | 0,1,5,6,10,50,60 | |
| | Ports/Lanes | >= 8 | |
| | Cache | >= 8GB NV | |
| | Interface Support | SAS, SATA,NVMe | |
| Interfaces & Ports | Total network cards | 2 | |
| | Network card1 Type | Ethernet | |
| | Network card1 Speed | 1G and 10G Supported | |
| | Network card1 ports required | 4x1G and 10G supported | |
| | PXE Support | Yes | |
| | Virtual Machine Device Queues (VMDq) | Yes | |
| | PCI-SIG* SR-IOV Capable | Yes | |
| | Server network ports should support DPDK and it should deliver zero packet loss as per RFC 2544 and deliver 100%-line rate for all the packet sizes over 64 Bytes, Vendor must submit latest | Yes | |

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| | DPDK test report for the same | | |
|---|---|---|--|
| | Network card2 Type | SFP28 | |
| | Network card2 Speed | 10G/25G | |
| | Network Transceivers | 25Gb SFP28 SR 100m Transceiver & Cables | |
| | Network card2 ports required | 2 | |
| | PXE Support | Yes | |
| | Virtual Machine Device Queues (VMDq) | Yes | |
| | PCI-SIG* SR-IOV Capable | Yes | |
| | Server network ports should support DPDK, and it should deliver zero packet loss as per RFC 2544 and deliver 100%-line rate for all the packet sizes over 64 Bytes, Vendor must submit latest DPDK test report for the same | Yes | |
| Operating system | Certifications/Compliance (OS) | RHEL 7,8+, Ubuntu 20+, Oracle Linux 8,9+, Debian 11,12+, Windows | |
| | Certifications/Compliance (Virtualization/Cloud Platform) | VM ware, PROXMOX, KVM, Citrix | |
| Server Monitor (With Advanced License) | Separate Monitoring Interface | Inbuilt Web based secure Server hardware monitoring alerting system | |

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SERVER TECHNICAL SPECIFICATION (Compute Nodes - High Memory) - 8 nos

| ltem | Туре | Spec | Remark |
|-----------------------|------------------------|--|--------|
| Processor | Make | Intel/AMD | |
| | Series | Platinum/Gold/EP YC (Latest Series) | |
| | Number of Processors | 4 | |
| | No. of Cores/Processor | 18 | |
| | No of threads/Core | 2 | |
| | Base Frequency | >= 2.9GHz | |
| | Turbo Frequency | >= 3.50 GHz | |
| | Cache | >= 24 MB | |
| | Form Factor | Rack/Blade | |
| | Size | 2U/4U | |
| | Support | AVX/AVX2 | |
| Motherboard | Chip-set Compatible | Intel/AMD | |
| | Max CPU Sockets | 4 | |
| Memory | Туре | DDR4 RDIMM ECC | |
| | Single Memory module | 32GB/64GB | |
| | Speed | >=3200 MT/s | |
| | Memory size | 2TB | |
| | Max memory Support | >2TB (32/64GB Module) | |
| Co-Processor / GPU | NA | NA | NA |
| Storage | SAS SSD | 2 No's | |
| | SASSSD Size | 800GB | |
| | SAS SSD Req | OS Partition | |
| | SAS SSD RAID Level | RAID 1 | |

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| | SATA SSD usable size | 5TB | |
|-----------------------|--|-------------------------|-------------------|
| | Min SATA SSD Drives | >=5 | |
| | SATA SSD RAID Level | RAID 5 | Data Partition |
| RAID Cards | RAID level | 0,1,5,6,10,50,60 | |
| | Ports/Lanes | >= 8 | |
| | Cache | >= 8GB NV | |
| | Interface Support | SAS, SATA,NVMe | |
| Interfaces & Ports | Total network cards | 2 | |
| | Network card1 Type | Ethernet | |
| | Network card1 Speed | 1G and 10G Supported | |
| | Network card1 ports required | 4x1G and 10G supported | |
| | PXE Support | Yes | |
| | Virtual Machine Device Queues (VMDq) | Yes | |
| | PCI-SIG* SR-IOV Capable | Yes | |
| | Server network ports should support DPDK and it should deliver zero packet loss as per RFC 2544 and deliver 100%-line rate for all the packet sizes over 64 Bytes, Vendor must submit latest DPDK test report for the same | Yes | |
| | Network card2 Type | SFP28 | |
| | Network card2 Speed | 10G/25G | |

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| | Network Transceivers | 25Gb SFP28 SR 100m Transceiver & Cables |
|--|--|---|
| | Network card2 ports required | 2 |
| | PXE Support | Yes |
| | Virtual Machine Device Queues (VMDq) | Yes |
| | PCI-SIG* SR-IOV Capable | Yes |
| | Server network ports should support DPDK and it should deliver zero packet loss as per RFC 2544 and deliver 100%-line rate for all the packet sizes over 64 Bytes, Vendor must submit latest DPDK test report for the same | Yes |
| Operating system | Certifications/Compliance (OS) | RHEL 7,8+, Ubuntu 20+, Oracle Linux 8,9+, Debian 11,12+, Windows |
| | Certifications/Compliance (Virtualization/Cloud Platform) | VM ware, PROXMOX, KVM, Citrix |
| Server Monitor (With Advanced License) | Separate Monitoring Interface | Inbuilt Web based secure Server hardware monitoring alerting system |

SERVER TECHNICAL SPECIFICATION (Compute Nodes GPU Cluster) - 5 nos

| Item Type | Spec | Remark |
|-----------|------|--------|
|-----------|------|--------|

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| Processor | Make | Intel/AMD |
|------------------------------------|------------------------|--|
| | Series | Platinum/Gold/EPY C (Latest Series) |
| | Number of Processors | 2 |
| | No. of Cores/Processor | 18 |
| | No of threads/Core | 2 |
| | Base Frequency | >= 2.9GHz |
| | Turbo Frequency | >= 3.50 GHz |
| | Cache | >= 24 MB |
| | Form Factor | Rack/Blade |
| | Size | 2U/4U |
| | Support | AVX/AVX2 |
| Motherboard | Chip-set Compatible | Intel/AMD |
| | Max CPU Sockets | 2 |
| Memory | Туре | DDR4 RDIMM ECC |
| | Single Memory module | 32GB |
| | Speed | >=3200 MT/s |
| | Memory size | 512GB |
| | Max memory Support | > 1TB (32GB Module) |
| GPU/FPGA/Ac celeration Cards | Make | NVIDIA |
| | Series | H100 NVL 94GB |
| | Number of GPU | 1 |
| | Number of CUDA cores | >16,896 |
| | Number Tensor Cores | >528 |
| | Memory | >=48GB |
| Storage | SAS SSD | 2 No's |
| | SASSSD Size | 800GB |

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| | SAS SSD Req | OS Partition | |
|-----------------------|---|-------------------------|-------------------|
| | SAS SSD RAID Level | RAID 1 | |
| | SATA SSD usable size | 5TB | |
| | Min SATA SSD Drives | >=5 | |
| | SATA SSD RAID Level | RAID 5 | Data Partition |
| RAID Cards | RAID level | 0,1,5,6,10,50,60 | |
| | Ports/Lanes | >= 8 | |
| | Cache | >= 8GB NV | |
| | Interface Support | SAS, SATA,NVMe | |
| Interfaces & Ports | Total network cards | 2 | |
| | Network card1 Type | Ethernet | |
| | Network card1 Speed | 1G and 10G Supported | |
| | Network card1 ports required | 4x1G and 10G supported | |
| | PXE Support | Yes | |
| | Virtual Machine Device Queues (VMDq) | Yes | |
| | PCI-SIG* SR-IOV Capable | Yes | |
| | Server network ports should support DPDK and it should deliver zero packet loss as per RFC 2544 and deliver 100%-line rate for all the packet sizes over 64 Bytes, Vendor must submit latest DPDK test report for the same | Yes | |
| | Network card2 Type | SFP28 | |
| | Network card2 Speed | 10G/25G | |

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| | Network Transceivers | 25Gb SFP28 SR 100m Transceiver & Cables | |
|---|--|---|--|
| | Network card2 ports required | 2 | |
| | PXE Support | Yes | |
| | Virtual Machine Device Queues (VMDq) | Yes | |
| | PCI-SIG* SR-IOV Capable | Yes | |
| | Server network ports should support DPDK, and it should deliver zero packet loss as per RFC 2544 and deliver 100%-line rate for all the packet sizes over 64 Bytes, Vendor must submit latest DPDK test report for the same | Yes | |
| Operating system | Certifications/Compliance (OS) | RHEL 7,8+, Ubuntu 20+, Oracle Linux 8,9+, Debian 11,12+, Windows | |
| | Certifications/Compliance (Virtualization/Cloud Platform) | VM ware, PROXMOX, KVM, Citrix | |
| Server Monitor (With Advanced License) | Separate Monitoring Interface | Inbuilt Web based secure Server hardware monitoring alerting system | |

SERVER TECHNICAL SPECIFICATION (Compute Nodes For VM) - 4 nos

| ltem | Туре | Spec | Remark |
|-----------|--------|---------------------------------------|--------|
| Processor | Make | Intel/AMD | |
| | Series | Platinum/Gold/EPYC (Latest Series) | |

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| | Number of Processors | 2 | |
|-----------------------|------------------------|---------------------|----------------|
| | No. of Cores/Processor | 16 | |
| | No of threads/Core | 2 | |
| | Base Frequency | >= 2.9GHz | |
| | Turbo Frequency | >= 3.50 GHz | |
| | Cache | >= 24 MB | |
| | Form Factor | Rack/Blade | |
| | Size | 20 | |
| | Support | AVX/AVX2 | |
| Motherboard | Chip-set Compatible | Intel | |
| | Max CPU Sockets | 2 | |
| Memory | Туре | DDR4 RDIMM ECC | |
| | Single Memory module | 32GB | |
| | Speed | >=3200 MT/s | |
| | Memory size | 256GB | |
| | Max memory Support | > 1TB (32GB Module) | |
| Co-Processor / GPU | NA | NA | NA |
| Storage | NVME SSD | 2 No's | |
| | NVME Size | 800GB | |
| | NVME SSD Req | OS Partition | |
| | NVME SSD RAID Level | RAID 1 | |
| | NVME SSD usable size | 8-10TB | |
| | Min NVME SSD Drives | >=10 | |
| | SATA SSD RAID Level | RAID 5 | Data Partition |
| RAID Cards | RAID level | 0,1,5,6,10,50,60 | |
| | Ports/Lanes | >= 8 | |
| | Cache | >= 8GB NV | |

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| | Interface Support | SAS, SATA, NVMe |
|-----------------------|--|--|
| Interfaces & Ports | Total network cards | 2 |
| | Network card1 Type | Ethernet |
| | Network card1 Speed | 1G and 10G Supported |
| | Network card1 ports required | 4x1G and 10G supported |
| | PXE Support | Yes |
| | Virtual Machine Device Queues (VMDq) | Yes |
| | PCI-SIG* SR-IOV Capable | Yes |
| | Server network ports should support DPDK and it should deliver zero packet loss as per RFC 2544 and deliver 100%- line rate for all the packet sizes over 64 Bytes, Vendor must submit latest DPDK test report for the same | Yes |
| | Network card2 Type | SFP28 |
| | Network card2 Speed | 10G/25G |
| | Network Transceivers | 25Gb SFP28 SR 100m Transceiver & Cables |
| | Network card2 ports required | 2 |
| | PXE Support | Yes |
| | Virtual Machine Device Queues (VMDq) | Yes |
| | PCI-SIG* SR-IOV Capable | Yes |
| | Server network ports should support DPDK and it should deliver zero packet loss as per RFC 2544 and deliver 100%- line rate for all the packet sizes over 64 Bytes, Vendor | Yes |

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| | must submit latest DPDK test report for the same | | |
|--|---|--|--|
| HBA Card | FC-HBA Card | Yes | Supported FC- HBA card for Tape Library interface |
| Operating system | Certifications/Compliance (OS) | RHEL 7,8+, Ubuntu 20+, Oracle Linux 8,9+, Debian 11,12+, Windows | |
| | Certifications/Compliance (Virtualization/Cloud Platform) | VM ware, PROXMOX, KVM, Citrix | |
| Server Monitor (With Advanced License) | Separate Monitoring Interface | Inbuilt Web based secure Server hardware monitoring alerting system | |

AI / ML COMPUTING TECHNICAL SPECIFICATION (NVIDIA DGX B200 - 80GB) - 1 no

| ltem | Description | Remark |
|------------------|--|--------|
| CPU | 2 Intel® Xeon® Platinum 8570 Processors 112 Cores total, 2.1 GHz (Base), 4 GHz (Max Boost) | |
| GPU | 8x NVIDIA Blackwell GPUs | |
| Performance | 72 petaFLOPS training and 144 petaFLOPS inference | |
| System Memory | The system should be configured with Minimum 2TB DDR4 RAM with all slots populated. Provision to expand to 4TB | |
| GPU Memory | 1,440GB total, 64TB/s HBM3e bandwidth | |

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| Network | 4x OSFP ports serving 8x single-port NVIDIA ConnectX- 7 VPI Up to 400Gb/s InfiniBand/Ethernet 2x dual-port QSFP112 NVIDIA BlueField-3 DPU | |
|---------------------|---|--|
| | Up to 400Gb/s InfiniBand/Ethernet | |
| Internal Storage | OS: 2x 1.9TB NVMe M.2 Internal storage: 8x 3.84TB NVMe U.2 | |
| OS Support | Latest supported version of RHEL/CentOS/ Ubuntu | |
| Software | NVIDIAAIEnterprise:OptimizedAISoftwareNVIDIABaseCommand™:Orchestration,Scheduling,andClusterManagementDGXOS / RHEL:Operating system | |
| | Installed optimized Al frameworks like Caffe, CNTK, Tensor flow, | |
| Preinstalled Al | Theano, Torch with Docker containers for deploying Deep learning frameworks. | |
| frameworks | Pre-installed Deep learning GPU Training System for to train highly accurate deep neural network (DNNs) for image classification, segmentation, and object detection tasks, Preinstallation & Configuration of Kubernetes/SLUM, Bright Cluster Manger | |
| Scalability & | System should be scalable with multi node cluster. Software | |
| Cluster software | support & cluster tools to be supplied along with product. Full-stack reference designs with all the leading Storage providers | |
| Warranty & AMC | Three-year Enterprise Business-Standard Support for hardwarehardwareandsoftware24/7EnterpriseSupportportalaccessLive agent support during local business hours | |

Tier1 Storage (500TB capacity)- 1 no

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| ltem | Description |
|----------------------------------|--|
| Storage Quality Certification | The Storage OEM should be established in the Gartner or any other equivalent global research firm for the last five years. |
| Storage Controller | The Storage system offered must be a true unified and scale- out system offering NAS (file), SAN (block) and object workloads. The Storage supplied should be an appliance with a Single Microcode offering all protocols and should not be based on server based General Purpose Filesystems or Operating systems such as Linux, Windows etc. Storage system must be offered in a No-Single-Point of Failure offering upto six 9s of availability with minimum 2 Nodes/Controllers and Scale-Out to minimum 12 |
| | Nodes/Controllers. |
| Cache/Memory Support | 1. The system should be offered with minimum 1.2 TB Distributed/Global/Federated DRAM cache across dual controllers. The cache should be scalable to 6 TB in a scale-out architecture with minimum 12 Controllers. System should offer capability to protect the write cache in case of a controller failure. Also, a failure of controller should not lead to write-through mode for cache. |
| Drive Support | The system must support NVMe SSD's each of 100GbE interface speed to meet the capacity and performance requirements for the applications. The system must support a minimum of 240 disks for scalability purpose. |
| Disk Drive Protection | The proposed system should offer minimum raid 6/dual drive failure protection, however for high density drives it should also support triple drive failure protection for better resiliency and performance. |
| Capacity | 1. The system should be configured with 500TB Usable capacity using NVMe SSD Drives with Raid 6/ Dual drive failure protection |
| Performance | The storage should be able to deliver minimum 345,000 IOPS and 10GBps (Gigabyte) with R/W 80/20, Sequential 32K block |

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| Protocols | The storage should be configured natively with NVMe-oF, NVMe/TCP, OEM Certified PFS/ NFS (NFSv3,NFSv4.1 supporting RFC5661), CIFS/SMB protocols for use with different applications. In addition to the above, Object (S3 compatible) storage should be supported. |
|--|---|
| Front-End and Backend connectivity | The proposed storage system should have minimum 4 x100GbE back end ports and 8 x 10GbE iSCSI and 8 x 32 Gb FC front end ports available across dual controllers. |
| Investment Protection | The storage offered should be a true scale-out system that allows intermixing of controllers across generations within the same system , the system should also support intermixing of All flash and Hybrid array is same cluster and scalable to a minimum of 12 controllers for maximum investment protection. The proposed system should offer capability to tion the data to |
| | either On-Prem or Cloud Object Storage. System should be configured with any software capability or license for On-Prem tiering to Object Storage from day-one. |
| | 1. Ability to expand LUNS/Volumes on the storage online and instantly. |
| | 2. Redundant hot swappable components like controllers, disks, power supplies, fans etc. and allow re-usage of Disk Shelves with higher models of the same product line. |
| | 3. The proposed system should offer upto 20PBs capacity scalable within a single namespace. |
| Storage General Features | 4. The proposed storage should enable and integrate with server virtualization technologies such as VMware vSphere. The proposed storage must support VASA 3.0 and above, VMware VVOL feature and feasibility to create more than 1000 VVOLs. The proposed array should be able to present both VVOL storage pool and traditional LUN's. |
| | 5. The storage system should be capable of providing multi- pathing software with failover and load balancing functionality. |
| | 6. The proposed storage should provide both in-line and post process efficiency features such as Compression, De-Duplication and Compaction. |

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| | 7. The proposed storage should be able to provide secure multi tenancy for air gap security and isolation from other workloads |
|----------------------------|---|
| | 1. The proposed system/solution should offer incremental replication capabilities in both fan-out and cascading topologies. The WAN replication should be secured by end-to-end encryption and bandwidth optimization supported natively. All the necessary licenses should be quoted from day 1. |
| Data Protection | 2. The Storage array should be offered with Synchronous, Asynchronous replication feature & Zero Data Loss protection between the DC, DR and Near DR |
| | 3. The offered system should ensure a unified architecture flexibility for replication both on-prem & to the cloud natively without the use of any third party hardware or software solutions. The replication should support end-to-end encryption and bandwidth optimization. |
| | 4. Proposed storage should offer capabilities to create backup copies across sites and also allow replication of data across backup targets. Any license required should be configured. |
| | 1. The proposed storage array must support data at rest encryption for file shares including both CIFS and NFS, managed by On-board Key Manager or External Key Manager offering industry standard certification/compliance by using a cryptographic security module supporting FIPS 140-2 level encryption. For multi-tenant configuration, individual tenant's keys should be managed by the offered storage. |
| Security and Encryption | 2. The storage system should offer high-performance compliance solution in accordance to various industry standards to meet regulations such as Securities and Exchange Commission (SEC) 17a-4, HIPAA, Financial Industry Regulatory Authority (FINRA), Commodity Futures Trading Commission (CFTC), and General Data Protection Regulation (GDPR). |
| | 3. Storage management software should support MFA to ensure secure access of Management Software. The Storage array should support SHA-2 level security for managing user credentials. |
| | 4. The storage should be configured to comply with SEC Rule 17a- 4 for filesystems. Also, the offered storage should ensure that no one including administrator should be able to delete the data post WORM enabled. |

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| | 1. The Proposed Storage system should have native GUI to monitor & perform operations on data protection jobs |
|--|---|
| | 2. The Storage Management Software should offer operational simplicity and rich data management functionalities for Unified Storage. It should provide a single dashboard to monitor health, availability, capacity usage, performance, and data protection status of various platforms along with resource planning. |
| Management | 3. The management tool should display system alerts and notifications for proactive management on the dashboard for users to quickly access them and it should provide information about support cases raised on the cluster. |
| | 4. The offered system should support ransomware and insider threat detection to protect data with early detection and actionable intelligence on ransomware and other malware incursions. It should detect malicious activity and protect the data by automatically taking a snapshot. |
| Rack Mountable | The storage should be supplied with rack mount kit. All the necessary patch cords (Ethernet and Fiber) shall be provided and installed by the vendor. |
| Warranty & AMC | The Hardware and software quoted should have 5 years support along with upgrade and updates. |
| Storage Type | NAS |
| Number of nodes | 4 |
| Drive type | NVMe, QLC |
| End to end NVMe | Yes |
| Total usable capacity (TB) | 500 TiB |
| Systems disk shelfs connectivity (Gbps) | 100GB (Controllers to Disk Shelf) |
| Systems backend | 25GB (Node to Node) |

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| network connectivity | |
|---|--|
| Scalable NAS (upto max) | 9PB |
| System CPU proposed | >=48 cores |
| System CPU per node | 12 cores |
| System memory proposed | >=256 GB |
| System memory per node | >=64 GB |
| NVDIMM/NVRAM | >=8 GB Per Node |
| Total NVDIMM/NVRAM | >=32 GB |
| Network configuration proposed | 8 x 25G SFP28 & 16 x 25G SFP28 |
| Cloud tiering or fabric pool | Yes |
| Compression | Yes |
| Deduplication | Yes |
| Thin provisioning | Yes |
| Data access protocols | FC, iSCSI, NVMe/FC, NVMe/TCP, FCoE, NFS, SMB, Amazon S3 |
| Dual Network Active-Active Switch for Customer Connection | 2x24Port SFP28 switch with Minimum of 4x40G/100G QSFP28 port for Uplink |
| Tiering support | Should support auto tiering and tiering policies. Software's for the tiering management has to be included |

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Tier 2 Storage (500TB capacity) - 3 Nos

| # | Parameter | Description |
|---|-------------------------------------|--|
| 1 | Storage Quality Certification | The Storage OEM should be established in the Gartner or any other equivalent global research firm for the last five years. |
| 2 | Storage Controller | 1. The Storage system offered must be a true unified and scale-out system offering NAS (file), SAN (block) and object workloads. The Storage supplied should be an appliance with a Single Microcode offering all protocols and should not be based on server based General Purpose Filesystems or Operating systems such as Linux, Windows etc. |
| | | 2. Storage system must be offered in a No-Single-Point of Failure offering upto six 9s of availability with minimum 2 Nodes/Controllers and Scale-Out to minimum 12 Nodes/Controllers. |
| 3 | Cache/Memory Support | 1. The system should be offered with minimum 256GB Distributed/Global/Federated DRAM cache across dual controllers. The cache should be scalable to 1536 GB in a scale-out architecture with minimum 12 Controllers. System should offer capability to protect the write cache in case of a controller failure. Also, a failure of controller should not lead to write-through mode for cache. |
| 4 | Drive Support | The system must support NVMe SSD's each of 100GbE interface speed to meet the capacity and performance requirements for the applications. The system must support a minimum of 96 disks for scalability purpose. |
| 5 | Disk Drive Protection | The proposed system should offer minimum dual drive failure protection, however for high density drives it should also support triple drive failure protection for better resiliency and performance. |
| 6 | Capacity | 1. The system should be configured with 500TB capacity using NVMe SSD Drives with Dual drive failure protection |

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| 7 | Performance | The storage should be able to deliver minimum 150,000 IOPS and 4.5 GBps (Gigabyte) with R/W 80/20, Sequential 32K block |
|----|--|---|
| 8 | Protocols | The storage should be configured natively with NVMe-oF, NVMe/TCP, OEM Certified PFS/ NFS (NFSv3,NFSv4.1 supporting RFC5661), CIFS/SMB protocols for use with different applications. In addition to the above, Object (S3 compatible) storage should be supported. |
| 9 | Front-End and Backend connectivity | The proposed storage system should have minimum 4 x100GbE back-end ports and 8 x 10GbE iSCSI and 8 x 32 Gb FC front end ports available across dual controllers. |
| 10 | 10 Investment Protection | 1. The storage offered should be a true scale-out system that allows intermixing of controllers across generations within the same system and scalable to a minimum of 12 controllers for maximum investment protection. |
| 10 | | 2. The proposed system should offer capability to tier the data to either On-Prem or Cloud Object Storage. System should be configured with any software capability or license for On-Prem tiering to Object Storage from day-one. |
| | | 1. Ability to expand LUNS/Volumes on the storage online and instantly. |
| 11 | Storage General Features | 2. Redundant hot swappable components like controllers, disks, power supplies, fans etc. and allow re-usage of Disk Shelves with higher models of the same product line. |
| | | 3. The proposed system should offer upto 20PBs capacity scalable within a single namespace. |
| | | 4. The proposed storage should enable and integrate with server virtualization technologies such as VMware vSphere. The proposed storage must support VASA 3.0 and above, VMware VVOL feature and feasibility to create more than 1000 VVOLs. The proposed array should be able to present both VVOL storage pool and traditional LUN's. |
| | | 5. The storage system should be capable of providing multi- pathing software with failover and load balancing functionality. |

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| | | 6. The proposed storage should provide both in-line and post process efficiency features such as Compression, De-Duplication and Compression. |
|----|----------------------------|---|
| | | 7. The proposed storage should be able to provide secure multi tenancy for air gap security and isolation from other workloads |
| 12 | Data Protection | 1. The proposed system/solution should offer incremental replication capabilities in both fan-out and cascading topologies. The WAN replication should be secured by end-to-end encryption and bandwidth optmization supported natively. All the necessary licenses should be quoted from day 1. |
| | | 2. The Storage array should be offered with Synchronous, Asynchronous replication feature & Zero Data Loss protection between the DC, DR and Near DR |
| | | 3. The offered system should ensure a unified architecture flexibility for replication both on-prem & to the cloud natively without the use of any third-party hardware or software solutions. The replication should support end-to-end encryption and bandwidth optimization. |
| | | 4. Proposed storage should offer capabilities to create backup copies across sites and allow replication of data across backup targets. Any license required should be configured. |
| 13 | Security and Encryption | 1. The proposed storage array must support data at rest encryption for file shares including both CIFS and NFS, managed by On-board Key Manager or External Key Manager offering industry standard certification/compliance by using a cryptographic security module supporting FIPS 140-2 level encryption. For multi-tenant configuration, individual tenant's keys should be managed by the offered storage. |
| 13 | | 2. The storage system should offer high-performance compliance solution in accordance to various industry standards to meet regulations such as Securities and Exchange Commission (SEC) 17a-4, HIPAA, Financial Industry Regulatory Authority (FINRA), Commodity Futures Trading Commission (CFTC), and General Data Protection Regulation (GDPR). |

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| | | 3. Storage management software should support MFA to ensure secure access of Management Software. The Storage array should support SHA-2 level security for managing user credentials. |
|----|--------------------|--|
| | | 4. The storage should be configured to comply with SEC Rule 17a-4 for filesystems. Also, the offered storage should ensure that no one including administrator should be able to delete the data post WORM enabled. |
| | | 1. The Proposed Storage system should have native GUI to monitor & perform operations on data protection jobs |
| 14 | Management | 2. The Storage Management Software should offer operational simplicity and rich data management functionalities for Unified Storage. It should provide a single dashboard to monitor health, availability, capacity usage, performance, and data protection status of various platforms along with resource planning. |
| | | 3. The management tool should display system alerts and notifications for proactive management on the dashboard for users to quickly access them and it should provide information about support cases raised on the cluster. |
| | | 4. The offered system should support ransomware and insider threat detection to protect data with early detection and actionable intelligence on ransomware and other malware incursions. It should detect malicious activity and protect the data by automatically taking a snapshot. |
| 15 | Rack Mountable | The storage should be supplied with rack mount kit. All the necessary patch cords (Ethernet and Fiber) shall be provided and installed by the vendor. |
| 16 | Warranty & AMC | The Hardware and software quoted should have 5 years support along with upgrade and updates. |
| 17 | Tiering support | Should support auto tiering and tiering policies. Software's for the tiering management must be included |

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| # | Feature | Description |
|---|----------------------------------|---|
| 1 | Storage Quality Certification | The Storage OEM should be established in the Gartner Leader Quadrant |
| 2 | Storage Controller | The Storage system should a unified system supporting all Block, File and Object protocols cluster in active-active configuration. Storage system must be offered in a No-Single-Point of Failure offering upto six 9s of availability with minimum 2 Nodes/Controllers and Scale-Out to minimum 12 Nodes/Controllers. |
| 3 | Cache required | The unified system should have minimum 128 GB data cache post protection overheads across supplied controllers with an ability to protect data on cache if there is a controller failure or power outage. Cache should be protected for Writes either through a battery backup or by destaging to flash/disk. The system should be configured with minimum 2TB of SSD/Flash/NVMe in addition to the above and same should be scalable to 12TB. |
| 4 | Drive Support | The unified system must support intermixing of SSD, SAS and SATA drives to meet the capacity and performance requirements of the applications. The system must support a minimum of 140 disks in a dual controller architecture and maximum of 570 disks in a scale-out-architecture. |
| 5 | Protocols | The storage should be configured natively with NVMe-oF, NVMe/TCP, OEM Certified PFS/ NFS (NFSv3,NFSv4.1 supporting RFC5661), CIFS/SMB protocols for use with different applications. In addition to the above, Object (S3 compatible) storage should be supported. |
| 6 | RAID configuration | Should support Raid 6/Dual Parity & Triple Parity. |

Tier 3 Storage (500TB capacity) - 2 nos

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| 7 | High Availability | The unified storage system must be configured to continuously serve data in event of any controller failure. In addition to this, it must also be possible to withstand failure of any 2 or 3 disks per RAID-Group of size not more than 28 disks. In Event, architecture uses a single pool instead of multiple RAID Groups, system should be resilient against failure of three drives for every 28 drives used in the pool |
|----|---|---|
| 9 | Storage Capacity | Storage must supply with 500 TB usable capacity NL-SAS Disk with RAID6/DP/ Triple Parity with Spare Drive at 30 drives one spare drive need to be populated. |
| 10 | Performance | The storage should be able to deliver 700 MBps (Megabyte)/22,000 IOPS with 80/20 R/W Sequential 32K block |
| 11 | Front-End and Backend connectivity | The proposed storage system should have minimum 4x12Gb SAS ports and 4x10GbE Fiber and 4 x 32Gbps FC front end ports available across dual controllers. |
| 12 | Rack Mountable | The unified storage should be supplied with rack mount kit. All the necessary patch cords (Ethernet and Fiber) shall be provided. |
| 13 | Storage Scalability and Upgradability | The unified proposed system should be field upgradeable to a higher model through data-in-place upgrades. The unified Storage should be a true scale-out architecture allowing mixing of Controller/Nodes within same product line with higher configurations. Unified Storage system should allow re-usage of Disk Shelves with higher models of the same product line. |
| | | The unified storage shall have the ability to expand LUNS/Volumes on the storage online and instantly. |
| 14 | Storage functionality | The unified storage shall have the ability to create logical volumes without physical capacity being available or in other words system should allow over-provisioning of the capacity. The license required for the same shall be supplied for the maximum supported capacity of the offered storage model. |
| | | The unified storage should be configured with Quality-of- Service feature for IOPs/Throughput for both Block and File. |

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| | | The unified storage shall support logical partitioning of controllers in future such that each partition appears as a separate Virtual storage in itself for both block and file. |
|----|--------------------------------|--|
| | | The storage should support data tiering with real-time movement of hot data to high performing drives. It should offer the capability to move data between one tier of drives to another tier of drives. |
| | | The proposed unified storage system should be configured to provide data protection against two simultaneous drive failures. |
| | | The required number hard disks for parity & spares, should be provided exclusively of the usable capacity mentioned. |
| | | Unified System should have redundant hot swappable components like controllers, disks, power supplies, fans etc. |
| 15 | Point-in-times images | The unified storage should have the requisite licenses to create point-in-time snapshots. The storage should support minimum 250 snapshots per volume/LUN. The license proposed should be for the complete supported capacity of the unified system for both block and file. |
| | | The unified system should support instant creation of clones of active data, with near zero performance impact for both block and file. |
| 16 | Encryption for Data At Rest | The proposed storage array must support data at rest encryption offering industry standard certification/compliance. The storage array may implement data at rest encryption using self-encrypting drives or controller-based functionality there by not impacting performance. |
| 17 | Management | Single management, easy to use GUI based and web enabled administration interface for configuration, storage management and performance analysis tools for both block and file. |

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| 18 | Remote Support & Diagnostics | Storage management should support "Call home" facility with web-based self-service portal providing an integrated, efficient monitoring and reporting capability and supporting data collection. Management software should provide |
|----|--|--|
| | OS support | Support for industry-leading Operating System platforms including: LINUX, Microsoft Windows, HP-UX, SUN Solaris, IBM-AIX, etc. Any Multipathing software required for the solution must be supplied for unlimited host connectivity |
| 19 | De-Duplication, Compression and Compaction | Proposed unified storage should support Iline as well As Post Process block level data de-duplication, compression and compaction for all kinds of data (structured & unstructured) on both block and file. |
| 20 | VMware Integration | The proposed storage should enable and integrate with server virtualization technologies such as VMware vSphere. The proposed storage must support VASA 3.0 and above, VMware VVOL feature and feasibility to create more than 1000 VVOLs. The proposed array should be able to present both VVOL storage pool and traditional LUN's. |
| 21 | Multi-Pathing | The storage system should be capable of providing multi- pathing software with failover and load balancing functionality. |
| 22 | Certifications | The storage system should offer high-performance compliance solution in accordance to various industry standards to meet regulations such as Securities and Exchange Commission (SEC) 17a-4, HIPAA, Financial Industry Regulatory Authority (FINRA), Commodity Futures Trading Commission (CFTC), and General Data Protection Regulation (GDPR). |
| 23 | Warranty & SLA | The Hardware quoted should have 5 years onsite warranty and support. |
| 24 | Tiering support | Should support auto tiering and tiering policies. Software's for the tiering management must be included |

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Next-generation Firewall Specifications - 2 Nos

| | Next-generation Firewall (NGFW) Specifications |
|----|--|
| # | General Requirements |
| 1 | The Firewall must be appliance based, rack mountable and it should be having internal redundant Power Supply from day one |
| 2 | The Proposed Firewall Vendor should be in the Leaders/ Challenger in Quadrant of Gartner Magic Quadrant for Enterprise Network Firewall. |
| 3 | The proposed NGFW must have build in GUI and CLI to make on the go changes to Firewall policies without any dependency to management and troubleshoot any issue related to network outage. |
| 4 | NGFW must support Secure SD - WAN feature along with advance routing protocols such as BGP |
| 5 | SD-WAN must be able to link and failover between various connections such as Internet, MPLS, leash line and even Routed based VPN interfaces. |
| 6 | Build-in SDWAN must be able to do load balancing of various links based on source address, User group, protocol and/or applications |
| 7 | SLA for SDWAN must be defined based on packet loss or latency or jitter. Even combination of all 3 option must be possible |
| 8 | Central management solution for the next generation Firewall must be able to Manage all the SDWAN link centrally and should give clear dashboard showing which links are down and which are up. This helps the NOC to take action accordingly |
| 9 | NGFW must support multicast routing as well as firewalling |
| 10 | The proposed solution should also support policy routing. Policy routing should work along with SD-WAN and ISP load-balancing. |
| 11 | The proposed solution must also support identity-based routing option allowing traffic to be forced out of specific Internet/MPLS gateway based on authentication rather than IP address |
| 12 | The proposed system should have integrated Traffic Shaping functionality this feature should have option to be configured on same firewall policy along with option to configure it separately if required. |

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| 13 | Build-in GUI on the NGFW should have option to display logical topology of the network the NGFW is protecting. The display should also be able to give security recommendation for the NGFW. |
|----------------------------|---|
| 14 | Device should support Static routing, RIP, OSPF,BGP, IS-IS, RIPng, OSPFv3 and BGP4+ |
| | Performance Parameters |
| 1 | The solution should support a minimum of at least 12 Gbps IPS throughput & Minimum 11 Gbps NGFW throughput on real-world / enterprise mix traffic test condition |
| 2 | The solution should support minimum 10 Gbps threat protection throughput on real-world / enterprise mix traffic test condition |
| 3 | Should support 20 Gbps IPSec VPN throughput and 1500 Tunnels |
| 4 | The Firewall must support at least 6,000,000 concurrent connections and 500,000 new sessions per second |
| 5 | The platform must be having minimum of 10 interfaces with auto sensing 10/100/1000 capability, 6 Gigabit SFP ports and 8 10-GbE SFP+ Interfaces from day one |
| | |
| | Firewall Features |
| 1 | Firewall Features Firewall policy should be single policy where all the features get applied such as IPS, application control, URL filtering, antivirus, SSL inspection, logging and even NAT |
| 1 | Firewall FeaturesFirewall policy should be single policy where all the features get applied such as IPS, application control, URL filtering, antivirus, SSL inspection, logging and even NATFirewall must support Zoning option along with User based authentication. It must have automatic option to group all the same zone policy |
| 1 2 3 | Firewall FeaturesFirewall policy should be single policy where all the features get applied such as IPS, application control, URL filtering, antivirus, SSL inspection, logging and even NATFirewall must support Zoning option along with User based authentication. It must have automatic option to group all the same zone policyThere must be option to configure the said Firewall policy from GUI of the NGFW appliance without requiring any Management solution. This is in the case of emergency where management solution is no available and policy needs to be changed. |
| 1 2 3 4 | Firewall FeaturesFirewall policy should be single policy where all the features get applied such as IPS, application control, URL filtering, antivirus, SSL inspection, logging and even NATFirewall must support Zoning option along with User based authentication. It must have automatic option to group all the same zone policyThere must be option to configure the said Firewall policy from GUI of the NGFW appliance without requiring any Management solution. This is in the case of emergency where management solution is no available and policy needs to be changed.Firewall must support NAT46, NAT66 and NAT64 along with policy for such NAT along with option to configure DNS64. |
| 1 2 3 4 5 | Firewall FeaturesFirewall policy should be single policy where all the features get applied such as IPS, application control, URL filtering, antivirus, SSL inspection, logging and even NATFirewall must support Zoning option along with User based authentication. It must have automatic option to group all the same zone policyThere must be option to configure the said Firewall policy from GUI of the NGFW appliance without requiring any Management solution. This is in the case of emergency where management solution is no available and policy needs to be changed.Firewall must support NAT46, NAT66 and NAT64 along with policy for such NAT along with option to configure DNS64.Firewall must support NAT policy for multicast traffic for both IPv4 and IPv6 |
| 1 2 3 4 5 6 | Firewall FeaturesFirewall policy should be single policy where all the features get applied such as IPS, application control, URL filtering, antivirus, SSL inspection, logging and even NATFirewall must support Zoning option along with User based authentication. It must have automatic option to group all the same zone policyThere must be option to configure the said Firewall policy from GUI of the NGFW appliance without requiring any Management solution. This is in the case of emergency where management solution is no available and policy needs to be changed.Firewall must support NAT46, NAT66 and NAT64 along with policy for such NAT along with option to configure DNS64.Firewall must support NAT policy for multicast traffic for both IPv4 and IPv6Firewall must support option to configure FQDN server rather then IP address in case server have dynamic IP address or site have multiple IP addresses for single domain. |

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| 8 | Firewall should allow policy based on port or service to protect attack at L3 not just application based policy which might be vulnerable to L3 attacks. |
|----|---|
| 9 | Firewall must support Geo-based IP address blocking option. |
| 10 | DNS translation option must be available in Firewall to change only the specific DNS reply from public to private IP. This is required for allowing user to access local resources using Private IP rather than there public IP address |
| 11 | Build-in GUI/CLI must support option to configure firewall policy which allow packet capture for troubleshooting purposes |
| 12 | The security appliance should be having configurable option to quarantine attack generating source address |
| | Virtualization |
| 1 | The proposed solution should support Virtualization (Virtual Firewall, Security zones and VLAN). Minimum 5 Virtual Firewall license should be provided. |
| 2 | Virtualization must be for every feature which are IPS , Application control, Antivirus/Anti-malware , URL filtering , SSL inspection , SSL VPN , IPSec VPN , Traffic shaping and user authentication. |
| 3 | Enabling Virtualization shouldn't require any kind of downtime or reboot. It must be done seamless even if the NGFW is live in the network. |
| 4 | When creating virtualized NGFW it should give mode option to configure each virtualized system such as first system can work in NAT/route mode and second system can work in transparent mode. |
| 5 | Each virtualized NGFW system must have option to configure various parameter to limit the resources utilization such as number of session, etc. |
| | VPN Features |
| 1 | NGFW must have build in support IPSec VPN and SSL VPN. There shouldn't be any user license restriction |
| 2 | IPSec VPN must include gateway to gateway and gateway to client vpn. In case of gateway to client the administrator must have option to assign private IP address to remote user without requiring any additional license |
| 3 | Route based IPSec VPN must be supported along with SD-WAN in case of two or more ISP's. |
| 4 | IPSec VPN must include gateway to gateway and gateway to client vpn. In case of gateway to client the administrator must have option to assign private IP address to remote user without requiring any additional license |

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| 5 | IPSec VPN must support SHA-1 and SHA-2 (SHA 256, 386 and 512) along with DH group 2,5,14,15,16,17,18,19,20,21,27,28,29,30 and 31. |
|---|--|
| 6 | SSL VPN must support high level algorithm along with TLS v1.2 |
| 7 | SSL VPN must not have any user license and should have option to integrate with local AD or RADIUS server |
| 8 | Both VPN must support 2-factor authentication with option to have locally imported tokens on the NFGW appliance itself, if required. |
| | Intrusion Prevention System |
| 1 | The IPS detection methodologies shall consist of: |
| | a) Signature based detection using real time updated database |
| | b) Anomaly based detection that is based on thresholds |
| 2 | The IPS system shall have at least 7,000 signatures |
| 3 | IPS Signatures can be updated in three different ways: manually, via pull technology or push technology. Administrator can schedule to check for new updates or if the device has a public IP address, updates can be pushed to the device each time an update is available |
| 4 | In event if IPS should cease to function, it will fail open by default and is configurable. This means that crucial network traffic will not be blocked, and the Firewall will continue to operate while the problem is resolved |
| 5 | IPS solution should have capability to protect against Denial of Service (DOS) and DDOS attacks. Should have flexibility to configure IPv4 and IPv6 Rate based DOS protection with threshold settings against TCP Syn flood, TCP/UDP/ port scan, ICMP sweep, TCP/UDP/ SCTP/ICMP session flooding. Threshold settings must be customizable for different sources, destinations & services |
| 6 | IPS signatures should have a configurable action like terminate a TCP session by issuing TCP Reset packets to each end of the connection, or silently drop traffic in addition to sending a alert and logging the incident |
| 7 | Signatures should a severity level defined to it so that it helps the administrator to understand and decide which signatures to enable for what traffic (e.g. for severity level: high medium low) |
| | Antivirus |
| 1 | Firewall should have integrated Antivirus solution |

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| 2 | The proposed system should be able to block, allow or monitor only using AV signatures and file blocking based on per firewall policy based or based on firewall authenticated user groups with configurable selection of the following services: |
|---|---|
| | a) HTTP, HTTPS |
| | b) SMTP, SMTPS |
| | c) POP3, POP3S |
| | d) IMAP, IMAPS |
| | e) FTP, FTPS |
| 3 | The proposed system should be able to block or allow oversize file based on configurable thresholds for each protocol types and per firewall policy. |
| | Web Content Filtering |
| 1 | The proposed system should have integrated Web Content Filtering solution without external solution, devices or hardware modules. |
| 2 | The proposed solution should be able to enable or disable Web Filtering per firewall policy or based on firewall authenticated user groups for both HTTP and HTTPS traffic. |
| 3 | The proposed system shall provide web content filtering features: |
| | a) which blocks web plug-ins such as ActiveX, Java Applet, and Cookies. |
| | b) Shall include Web URL block |
| | c) Shall include score-based web keyword block |
| | d) Shall include Web Exempt List |
| 4 | The proposed system shall be able to queries a real time database of over millions+ rated websites categorized into 75+ unique content categories. |
| 5 | Update of local Database based on malicious category discovered by local Sandboxing solution from same vendor |
| | Application Control |
| 1 | The proposed system shall have the ability to detect, log and take action against network traffic based on over 4000 application signatures |
| 2 | The application signatures shall be manual or automatically updated |

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| 3 | The administrator shall be able to define application control list based on selectable application group and/or list and its corresponding actions |
|---|---|
| 4 | Application control and URL filtering must work independent of each other. |
| | High Availability |
| 1 | The proposed system shall have built-in high availability (HA) features without extra cost/license. |
| 2 | The device shall support stateful session maintenance in the event of a fail- over to a standby unit. |
| 3 | High Availability Configurations should support Active/Active or Active/ Passive |
| | Warranty |
| 1 | Warranty and support for 5 years |
| 2 | Support includes latest patch updates |
| | OEM should be having the following certifications/Ratings |
| 1 | Firewall module should be EAL 4 certified |
| | Centralized Logging & Reporting Solution |
| 1 | The solution should deliver complete security oversight with granular graphical reporting |
| 2 | The solution should provide centralized security event analysis, forensic research, reporting, content archiving, data mining and malicious file quarantining. |
| 3 | The solution should provide detailed data capture for forensic purposes to comply with policies regarding privacy and disclosure of information security breaches. |
| 4 | The solution should analyse user traffic behaviour and identify compromised users/computers |
| 5 | The solution should provide network event correlation to allow administrators to quickly identify and react to network security threats across the network. |
| 6 | The solution should provide streamlined graphical network-wide reporting of events, activities and trends occurring on UTM / NGFW |
| 7 | The solution should provide centralized logging of multiple record types including traffic activity, system events, viruses, attacks, Web filtering events, and messaging activity/data |

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| 8 | The solution be able to provide real-time and historical logs with filtering and search capabilities |
|----|---|
| 9 | The solution should be able to displays a map of the world that shows the top traffic destination country by colour |
| 10 | The solution should provide predefined templates for building / generating reports |
| 11 | The solution should be able to collect logs from multiple devices |
| 12 | The solution should support Out-of-the-box playbook templates for enabling SOC analysts to quickly customize the use case, including playbooks for investigation of infections, compromised hosts, critical incidents, data enrichment for viewing Assets and Identity blocking of malware, C&C IPs |
| 13 | The solution should be able to support threshold values to generate alerts. |
| 14 | The solution should be able to send alert emails |
| 15 | The solution should be able to manually generate the report or schedule the same |
| 16 | The solution should be able to generate report based on user names |
| 17 | The solution should be able to process 50 Gb logs per day |
| 18 | The solution should be having minimum 8 TB log storage capacity after configuring RAID for data protection. |
| 19 | Logging & Reporting architecture shall be hardware or software-based appliance/ VM based solution and the hardware for the solution must be supplied by the bidder. |

10/25G Switch - 7 Nos

Hardware and Architecture

Device should have non-blocking architecture with wire speed L2 and L3 forwarding.

Device should have $48 \times 1/10/25G$ SFP28 ports supporting RS-FEC and FC-FEC as per IEEE 802.3by compliance

Device should have 8 x 40/100G QSFP28 ports with support breakout to provide additional 16 number of 10/25/50G interfaces.

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Device should have total Throughput of 4Tbps and latency packet forwarding less than 850 nanoseconds

Device should support copper Base-T (1G & 10G) connectivity over CAT6 cable and 1G, Dual rate 10G/25G SFP+ fiber connectivity over MM and SM cable

Device should support upto 250K MAC address

Device should support upto 256K IPv4 Prefix routes

Device should support Unified Forwarding Table (UFT) feature to flexibility allocate forwarding table resources to address different type of use cases.

Device should have Max power draw of upto 315W

Shall support active/active layer2/Layer3 multipathing redundancy with Multi-chassis Link Aggregation (MLAG) or equivalent technology while keeping control plane and management plane distributed.

L2 features

Device should support 4K VLANs, 9216 Jumbo frames

Device should support MST, per-vlan, RSTP, BPDU Guard, Loop Guard

Device should support port ACL with l2, L3 and L4 parameters

Device support LLDP and LACP to bundle links and detect miscabling issues.

Device Should support IEEE 802.1D, 802.1Q, Q-in-Q, 802.1w, 802.1s and 802.1x

L3 features

Device should support Routing Protocols: OSPFv2 with multiple instances, OSPFv3, BGP, MP-BGP, IS-IS, and RIPv2

Device Should support graceful restart for BGP, OSPF v2 and v3 and ISIS

Device Should support BFD inclusive of BFD for Lag links, BFD for V4 and V6 VRF, Multi-hop BFD and BFD on IP unnumbered interfaces.

Device Should support Policy Based Routing (PBR) for IPv4 and IPv6, VRRP V4 and V6, Resilient ECMP, Unicast Reverse path forwarding (urpf), and Inter-VRF route leaking

Device Should support Accumulated IGP Metric (AIGP), BGP Monitoring Protocol (BMP) and BGP Prefix Origin Validation with Resource Public Key Infrastructure (RPKI)

Device should support VXLAN+EVPN leaf-spine overlay technology supporting type-1 to type-8 routes

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Device should have support for symmetric and asymmetric IRB with EVPN with distributed gateway functionality.

Device should support IPv4 and IPv6 clients in EVPN based overlay network

Device should support active-active EVPN multi-homing

Device should support Dynamic NAT options like Many-to-Many NAT and Many-to-One NAT (PAT) at line rate with no additional latency.

Device should support IGMP v2/v3,PIM-SM / PIM-SSM, Anycast RP (RFC 4610), VRF Support for IP Multicast, Multicast Source Discovery Protocol (MSDP) and IP Multicast Multipath.

High availability

Device should support Hitless upgrade & reloads in MLAG/Vpc setup and standalone (non-stack) setup, without adversely affecting the forwarding plane with sub second data outage during upgrade.

Device should support maintenance mode/ Graceful insertion and removal (GIR) to isolate device from the network in order to perform debugging or an upgrade while gracefully steering traffic to peer nodes.

Device should 1+1 redundant & hot-swappable Fans with support for both front-torear and rear-to-front airflow options

Device should support 1+1 redundant & hot-swappable power with support for both AC and DC power supply options.

Device should support Low-Memory mode wherein during out of memory condition the device kills non-essential agents until the system recovers the necessary amount of memory.

security

Should support Storm control and Control Plane protection (CoPP)

should support port ACL with l2, L3 and L4 parameters

should support limiting number of mac address on a link

Device should support security-group based segmentation of hosts independent of the network constructs like VLAN, VRF and NVO.

Device should protect against ARP and DHCP spoofing by ensuring that a port will only permit IP and ARP packets with IP source addresses that have been authorized.

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Device should support IEEE 802.1x Authentication framework, MAC authentication, Dynamic VLAN assignment, Dynamic ACL assignment and CoA.

Device should support multicast accounting to AAA servers

Management

Device Should support secure Zero touch provisioning with options to provision Certificates artifacts on the device when it boots.

should support tracking changes in MAC table, ARP, IPv6 neighbor table and IPv4, v6 route table for troubleshooting purpose.

should support real time state streaming for advance monitoring from day 1

Should Support telnet, industry standard hierarchical CLI, SSHv2, HTTPS, SCP, SFTP, CLI task scheduler and configuration session.

should support NTP and IEEE 1588 PTP (Transparent Clock and Boundary Clock)

should support SNMP v1/2/3 and OpenConfig model over gRPC/Netconf

device should support Digital Optical Monitoring (DOM)

Device should support real time data collection with sflow/netflow.

Automation & Visibility

The Device should monitor output queue lengths for all Device interfaces and Log and stream events related to congestion

The Device should automatically mirror traffic queued in event of congestion/latency or micro burst and send mirrored traffic to CPU, directly connected server and remote server as per usecase.

Device should support multi OEM hypervisor environment and should be able to sense movement of VM and configure network automatically

Device should support capturing of information around dropped packet events with associated reasons and details which can be streamed out using a open communication protocol like gRPC or equivalent.

The Device should have OpenStack Neutron for ML2 integration with EVPN VXLAN control plane support.

Device should support advanced mirroring features: Mirror to CPU, ACL filters and truncation on Mirror sessions, and tunnelling of mirror packets to remote servers.

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Should support measure the two-way metrics such as delay, jitter, packet loss rate between two network elements using Two-Way Active Measurement Protocol (TWAMP) as per RFC 5357

should have programmability and automation support with on board python, bash and docker containers.

QOS

should support 8 queues per port

should support priority queue

should support Weighted Fair Queue or Weighted round robin or equivalent

should support WRED and DSCP for CPU generated traffic

should support ACL based classification for QoS

Should support IEEE 802.1Qaz DCBX (Data Centre Bridge Exchange), 802.1Qbb PFC (Priority-based Flow Control) and Explicit Congestion Notification (ECN)

Should support rate limiting function like policing and shaping

Others

should be certified for NDcPP common criteria

should have IPv6 ready logo certification

should be 19" rack mountable with 4-post rail mount kit provided for easy installation

Hardware replacement warranty and TAC support should be directly from the OEM. OEM email-id and India Contact support no. to be provided.

Transceivers should be from Same OEM as of Device.

Warranty

Warranty and support for 5 years

1/10G Switch - 5 Nos

Spec

1/10G 10GBASE-T/Multi-Gigabit Ports Switch

Port Count: 24/48

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Uplink: min 4 x 25Gb SFP28 Uplinks

Efficiency: Support RoCE

Features:

Speed: 100M/1000M/2.5G/5G/10GBase-T

1+1 Hot-swappable Power Supplies and 2+1 Smart Fans

Support QoS, OSPF, DHCP, BGP, VRRP, QinQ

Support ACL, RADIUS, TACACS+, DHCP Snooping, etc. for Security

Warranty

Warranty and support for 5 years

Vendor should design and implement the network and the HPC environment. Vendor also needs to provide all software licenses and support as necessary. This includes the following:

- 1. Submit the network architecture for approval.
- 2. Install and configure following softwares:

| SOFTWARE COMPONENTS & SUPPORT | | | |
|--|--|-------------------|--|
| Cluster Software [FOSS] | Slurm | | |
| Workflow Manager & DataCenter monitoring Tools | Nextflow | | |
| RHEL 8+ | License and support for 5 years (for all the servers) | 47 servers | |
| VMware | * For Fail Safe VM's * Application VM's * Applications and Critical Softwares Hosting | 4 host servers | |

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1. Install and configure following Storage and network components:

| STORAGE & NETWORK COMPONENTS & SUPPORT | | | |
|--|---|--|--|
| Storage | Configuration Fine Turning Performance optimization Tiering configuration Load/Stress testing | | |
| Network Switches | Firmware upgrade Uplink configuration LACP configuration Active-Active Log and Alert configuration Port Optimization SNMP trigger and configuration Routing configuration VLAN/VTP Configuration STP configuration (Domain wide) | | |
| Firewall | Advance configuration Logging and Alert Online portal configuration IPSEC/SSL VPN configuration IDS/IPS Configuration Web filter Antivirus App filter VDOM SDWAN Filter Rules Centralized Auth connection (LDAP/Radius) Reporting Daily usage report Daily vulnerability report Daily Filter reports | | |
| Server | Firmware upgrade BIOS upgrade II O/IDARAC/IPMI Upgrade | | |

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Draft network overview:



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Treat this RFQ as a guideline for the requirement. Vendor needs to:

- Submit specifications, pricing, network architecture and infrastructure designs approved by KGDC. Vendor can improve upon this sketch provided in RFQ and get approval from KGDC.
- Provide components and implement the data centre.
- Verify workings and performance of the system, get signed off by KGDC.

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77. ANNEXURES

Annexure I

PARTICULARS TO BE FILLED BY THE BIDDER

| Sl No. | ltem | Particulars | Remarks |
|--------|--|---|--|
| 1. | Whether the bidder is appearing as a consortium for the tender (If yes, please specify the name of the prime bidder) | | |
| 2. | If the bidder is a part of the consortium, please specify the names of the partners | | |
| 3. | Furnish the complete address of the prime bidder | | |
| 4. | Communication details of the prime b regarding this tender enquiry. [NOTI documents kindly update KDISC] | bidder to whom all refere E: Any changes after sub | nces shall be made omission of Tender |
| | a.) Full Name : | | |
| | b.) Complete Postal Address: | | |
| | c.) Telephone No.: | | |
| | d.) Mobile No.: | | |
| | e.) E-mail: | | |
| | f.) Website URL: | | |
| | g.) PAN No. | | |
| | h.) GST Registration No. | | |
| | i.) IGST? | | |
| 4.1 | Details of Bank | 1 | |
| | Name of the Bank | | |
| | Address of the bank | | |

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| | Account No. | |
|----|------------------------------------|--|
| | IFSC: | |
| 5 | Names of full address of the OEMs* | |
| Э. | | |
| | a.) Full Name : | |
| | b.) Complete Postal Address: | |
| | c.) Telephone No.: | |
| | f.) E-mail: | |
| | g.) Website URL: | |
| | Country of Orgin: | |
| | a.) Import | |
| | b.) Indigenous | |
| | c.) Both | |
| | Any other relevant information: | |

*Insert additional rows to accommodate multiple OEMs

Authorized Signature and Stamp of Bidder

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Annexure II

PRE-QUALIFICATION - GENERAL

PART A

| SI No | PQ Criteria | Yes/No | Supporting Documents to be attached as annexures (1n) |
|-------|---|--------|---|
| 1. | Whether the bidder is appearing as consortium for the tender? | | Consortium Agreement has to be furnished as Annexure 1 |
| 2. | Have you paid Tender Fee & EMD? | | Payment slip has to be furnished as Annexure 2 |
| 3. | Have you submitted a Valid NSIC & MSME Certificate(s) for EMD exemption | | Provide the copies of the certificates as Annexure 3 |
| 4. | Original/Endorsed documents scanned and submitted as indicated in the tender document | | Authorised signatory to sign all copies of all the pages of the tender document and attach as Annexure 4 |
| 5. | a) Name of the bidder (As per Registration Certificate), Correspondence address, telephone number and fax number/E-mail id of the bidder. | | Company registration Certification has to be furnished as attached as Annexure 5 |
| 6. | b) Legal status (Limited Company or Corporation) of the company along with statutory details (Signed and Stamped Certificate of Incorporation/Company Registration), | | Certification of incorporation of the company registration has to be furnished as Annexure 6 |
| 7. | Copy of PAN and GST Registration No. and Income tax return certificate of the last three years (For Indigenous bid) should be attached | | Scanned copy of PAN card and GST Registration Certificate has to be furnished as Annexure 7 |
| 8. | Whether your company ever have been black listed for indulging in corrupt practice, fraudulent practice, coercive practice, undesirable practice, breach of contract or restrictive practice by any Central/ State | | The certificate in respect to the above has to be scanned and submitted as Annexure 8 |

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| | Government/PSU/Semi-Government bodies as on bid submission date.? | |
|-----|--|--|
| 9. | In case of a manufacturer, has the valid registration certificate been enclosed? and self-declaration of manufacturing unit | |
| 10. | In case of sole authorized agent/distributor whether certificate/ authorization letter for the same issued by the OEM is attached? | FORMAT FOR MANUFACTURER'S AUTHORISATION FORM has to be furnished as Annexure 9 |
| 11. | Have you submitted Guarantee/Warranty Declaration? | CERTIFICATE OF GUARANTEE/WARRANTY has to be furnished as Annexure 10 |
| 12. | Have you submitted tender acceptance letter? | TENDER ACCEPTANCE LETTER has to be furnished as Annexure 11 |
| 13. | Whether Bank details has been submitted? | |
| 14. | Whether the split rates of each subunit are quoted for Foreign components in Foreign currency and Indian components in INR | |
| 15. | In case of foreign suppliers quoting directly, Have you indicated the complete name and address of the agents and details of the services to be rendered by the Agents | |
| 16. | Have you submitted a power of attorney with your Indian agent? | Power of attorney has to be furnished as Annexure 12 |
| 17. | Are the agents authorized to deal with this tender as your sole selling agents and confirm that you have not appointed any other sole-selling agents for this tender | Letter of Authorisation (Power of attorney) has to be furnished as Annexure 13 |
| 18. | Have you kept your offer valid for 120 days | |

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| 19. | The Tenderer should be an OEM/Authorized partner of the OEM and a Letter of Authorization from the OEM, specific to this tender should be enclosed by the bidder if the bidder is not the manufacturer. | |
|-----|---|--|
| 20. | The OEM and Tenderer should be in the HPC business and should have fully operational office for the last 5 years in India. | |
| 21. | The bidder from a country which shares a land border with India will be eligible only if they are registered with the competent authority as per Govt. of India order, issued by Ministry of Finance vide No.F.No.6/18/2019-PPD dated 23/07/2020 | |
| 22. | Tenderer must be a Private or Public Ltd Registered Company | |
| 23. | Average annual financial turnover of the tenderer should be at least 50% of the estimated cost put to tender during the immediate last three consecutive financial years. (Audited balance sheet, profit and loss account of the previous 3 financial years shall be submitted). | |
| 24. | Profit/loss: The bidder should not have incurred any loss (profit after tax should be positive) in more than two years during available last three consecutive balance sheet, duly audited and certified by the Chartered Accountant. | |
| 25. | Solvency Certificate: Solvency of the amount equal to 40% of the Estimated Cost put to tender (ECPT). Banker's certificate on credit worthiness of the | |

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| | Tenderer and capacity of the tenderer to take up the works | |
|-----|--|---|
| | Whether the Bidder/OEM has supplied, installed and commissioned one similar work of value not less than 80% of the estimated cost put to tender during the last seven years as prime Contractor ending the previous day of the last date of submission of tenders? The installed work shall be in satisfactory operation for the past one year. | |
| | OR | Copies of Purchase orders, |
| 26. | The Bidder/OEM should have supplied, installed and commissioned two similar works each of value not less than 60% of the estimated cost put to tender during the last seven years as prime Contractor ending the previous day of the last date of submission of tenders. The installed work shall be in satisfactory operation for the past one year. | satisfactory completion certificate for the work done, and certificate from the client showing that the installation has been satisfactorily working for the past year shall be submitted in English language. Details of current contracts in hand and other commitments as supportive evidence. All these should be attached as annexures (13 - 18) |
| | OR | |
| | The Bidder/OEM should have supplied, installed and commissioned three similar works each of value not less than 40% of the estimated cost put to tender during the last seven years as prime Contractor ending previous day of last date of submission of tenders. The installed work shall be in satisfactory operation for past one year. | |
| 27. | Whether Certificate of ISO/IS (BIS), CE or equivalent in terms of quality of product and Manufacturer available? | Certificate of ISO/ISI, CE or equivalent in terms of quality of product and Manufacturer with |

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| | | proof of document has to be furnished as Annexure 19 |
|-----|--|---|
| 28. | Whether the tenderer has the power of attorney authorizing the signatory to sign the tender. | Power of attorney has to be furnished as Annexure 20 |
| 29. | If OEM is authorizing an Indian agent, then documents as per clause 31 shall be submitted. | |
| 30. | Bidder's Technical offer. | |
| 31. | The vendor must have to submit the supporting documents like NSIC registration certificate, MSE registration certificate issued by competent government bodies to become eligible for the tender fee/EMD exemptions. (PQ). | |
| 32. | If an Original Equipment Manufacturer (OEM) has authorized an agent in India to act on their behalf | Authorisation Letter has to be furnished as Annexure 21 |
| 33. | Whether Terms & Conditions of the Service Contract has been complied? | Terms & Conditions of the Service Contract has to be furnished as Annexure 22 |

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| Sl No | PQ Criteria | Yes/No | Supporting Documents to be attached as annexures (1n) |
|-------|---|--------|---|
| 1. | Whether the bidder is appearing as consortium for the tender? | | Consortium Agreement has to be furnished as Annexure 1 |
| 2. | Have you paid Tender Fee & EMD? | | Payment slip has to be furnished as Annexure 2 |
| 3. | Have you submitted a Valid NSIC & MSME Certificate(s) for EMD exemption | | Provide the copies of the certificates as Annexure 3 |
| 4. | Original/Endorsed documents scanned and submitted as indicated in the tender document | | Authorised signatory to sign all copies of all the pages of the tender document and attach as Annexure 4 |
| 5. | a) Name of the bidder (As per Registration Certificate), Correspondence address, telephone number and fax number/E-mail id of the bidder. | | Company registration Certification has to be furnished as attached as Annexure 5 |
| 6. | b) Legal status (Limited Company or Corporation) of the company along with statutory details (Signed and Stamped Certificate of Incorporation/Company Registration), | | Certification of incorporation of the company registration has to be furnished as Annexure 6 |
| 7. | Copy of PAN and GST Registration No. and Income tax return certificate of the last three years (For Indigenous bid) should be attached | | Scanned copy of PAN card and GST Registration Certificate has to be furnished as Annexure 7 |
| 8. | Whether your company ever have been black listed for indulging in corrupt practice, fraudulent practice, coercive practice, undesirable practice, breach of contract or restrictive practice by any Central/ State Government/PSU/Semi-Government bodies as on bid submission date.? | | The certificate in respect to the above has to be scanned and submitted as Annexure 8 |

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| 9. | In case of sole authorized agent/distributor whether certificate/ authorization letter for the same issued by the OEM is attached? | FORMAT FOR MANUFACTURER'S AUTHORISATION FORM has to be furnished as Annexure 9 |
|-----|--|--|
| 10. | Have you submitted Guarantee/Warranty Declaration? | CERTIFICATE OF GUARANTEE/WARRANTY has to be furnished as Annexure 10 |
| 11. | Have you submitted tender acceptance letter? | TENDER ACCEPTANCE LETTER has to be furnished as Annexure 11 |
| 12. | Whether Bank details has been submitted? | |
| 13. | Have you submitted a power of attorney with your Indian agent? | Power of attorney has to be furnished as Annexure 12 |
| 14. | Are the agents authorized to deal with this tender as your sole selling agents and confirm that you have not appointed any other sole-selling agents for this tender | Letter of Authorisation (Power of attorney) has to be furnished as Annexure 13 |
| 15. | Have you kept your offer valid for 120 days | |
| 16. | The Tenderer should be an OEM/Authorized partner of the OEM and a Letter of Authorization from the OEM, specific to this tender should be enclosed by the bidder if the bidder is not the manufacturer. | |
| 17. | The OEM and Tenderer should have fully operational office for the last 5 years in India. | |
| 18. | Tenderer must be a Private or Public Ltd Registered Company | |
| 19. | Average annual financial turnover of the tenderer should be at least 50% of the estimated cost put to tender during the immediate last three consecutive financial years. (Audited balance sheet, profit and loss account | |

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| | of the previous 3 financial years shall be submitted). | |
|-----|---|--|
| 20. | Profit/loss: The bidder should not have incurred any loss (profit after tax should be positive) in more than two years during available last three consecutive balance sheet, duly audited and certified by the Chartered Accountant. | |
| 21. | Solvency Certificate: Solvency of the amount equal to 40% of the Estimated Cost put to tender (ECPT). Banker's certificate on credit worthiness of the Tenderer and capacity of the tenderer to take up the works | |
| 22. | List of recent installations within India for the last 3 years | Purchase orders and completion certificate has to be furnished as Annexure 14 |
| 23. | Whether Certificate of ISO/IS (BIS), CE or equivalent in terms of quality of product and Manufacturer available? | Certificate of ISO/ISI, CE or equivalent in terms of quality of product and Manufacturer with proof of document has to be furnished as Annexure 15 |
| 24. | Whether the tenderer has the power of attorney authorizing the signatory to sign the tender. | Power of attorney has to be furnished as Annexure 16 |
| 25. | Bidder's Technical offer. | |
| 26. | Whether Terms & Conditions of the Service Contract has been complied? | Terms & Conditions of the Service Contract has to be furnished as Annexure 17 |

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Annexure III

PREQUALIFICATION - TECHNICAL

PART A

| SI No | PQ Criteria | Yes/No | Supporting Documents to be attached as annexures (1n) |
|----------|---|--------|---|
| 1. | Whether Technical specifications of the equipment attached? | | |
| 2. | Relevant literature pertaining to the items quoted with full specifications (and drawing, if any) shall be signed, scan and submit with the technical offer, wherever applicable. | | Attachment as per Annexure XII (Data Sheet) has to be furnished as Annexure 1 |
| 3. | Whether duly filled and signed Technical compliance sheet of the quoted item/equipment as per Annexure V attached? | | Technical compliance sheet has to be furnished as Annexure 2 |
| 4. | List of institutions/organizations along with contact details of the users, where the quoted model of equipment/instrument has been supplied in the prescribed format given in Annexure V | | Purchase order details has to be furnished as Annexure 3 |
| 5. | The Suppliers should scan and submit copies of suitable documents in support of their reputation, credentials and past performance about the product/equipment which they have supplied to premier Institution(s) in India along with technical offer. Without these documents the tender may be rejected by KDISC | | Purchase order details has to be furnished as Annexure 4 |
| 6. | Whether TECHNICAL COMPLIANCE SHEET for HPC SYSTEM has been submitted? | | TECHNICAL COMPLIANCE SHEET as per annexure has to be furnished as Annexure 5 |
| 7. | PROFORMA FOR USER LIST OF QUOTED MODEL | | |
| 8. | Whether data sheet is submitted ot not? | | |
| 9. | Whether list of spares required for smooth functioning of the equipment attached? | | |

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| 10. | Whether catalogue of the equipment highlighting the desired specifications attached? | Certification has to be furnished as Annexure 6 |
|-----|--|---|
| 11. | Whether the OEM/Tenderer has experience installing hybrid (GPU and CPU) HPC systems in a single order? | Certification has to be furnished as Annexure 7 |
| 12. | The OEM/Tenderer must have min 3 installations of minimum 100TF HPC set up (CPU only) in the last 5-Years as prime contractor/supplier. | |
| 13. | The bidder must have executed at least 3 or more HPC's in the last 5 years with at least one cluster of minimum 60 TFLOPS sustained performance in a single order. Documentary proof to be attached. | |
| 14. | OEM brand/bidder must have minimum 1 entries in each of the last 2 list of India Top supercomputer (http://topsc.cdacb.in) published on January 2021 or later. (Latest release on July 2024) | |
| 15. | Competing OEM brand/bidder must have minimum 10 entries in the list of Worldwide Top 500 Supercomputers (Ref: https://www.top500.org) as published on June 2021 or later. (Latest release on June 2024) | |
| 16. | The Tenderer will be responsible for supply, installation, configuration, testing, integration, commissioning, maintenance and support for both hardware and software during the warranty period. | |
| 17. | OEM must have spares center/warehouse/support office in India for support services. There should be on-site spare part support available directly from OEM or bidder in India for at least five years form the date of acceptance. | |
| 18. | OEM should submit the undertaking stating that the items offered are not nearing end of life or end of support until the end of warranty and AMC. OEMs to provide a product Roadmap for the same. | |
| 19. | The bidder must carry out the installation and commissioning of all the supplied hardware components and software components and it must be done by OEM/OEM Certified engineers only. | |

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| 20. | The bidder/OEM has to quote exactly as per the mentioned technical specifications for the entire solution. Partial offers will not be considered for the commercial bid. | |
|-----|--|--|
| 21. | In case, if a particular instrument is a proprietary item of a particular manufacturer, a valid Proprietary Article Certificate shall be provided along with the Technical Bid. | |

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| SI No | PQ Criteria | Yes/No | Supporting Documents to be attached as annexures (1n) |
|----------|--|--------|--|
| 1. | Whether Technical specifications of the equipment attached? | | |
| 2. | Relevant literature pertaining to the items quoted with full specifications (and drawing, if any) shall be signed, scan and submit with the technical offer, wherever applicable. | | Attachment as per Annexure XII (Data Sheet) has to be furnished as Annexure 1 |
| 3. | Whether duly filled and signed Technical compliance sheet of the quoted item/equipment as per Annexure V attached? | | Technical compliance sheet has to be furnished as Annexure 2 |
| 4. | List of institutions/organizations along with contact details of the users, where the quoted model of equipment/instrument has been supplied in the prescribed format given in Annexure V | | Purchase order details has to be furnished as Annexure 3 |
| 5. | The Suppliers should scan and submit copies of suitable documents in support of their reputation, credentials and past performance about the product/equipment which they have supplied to premier Institution(s) in India along with technical offer. Without these documents the tender may be rejected by KDISC | | Purchase order details has to be furnished as Annexure 4 |
| 6. | Whether TECHNICAL COMPLIANCE SHEET for NVIDIA has been submitted? (Only applicable compliance related to NVIDIA must be filled, rest should be written as not applicable) | | TECHNICAL COMPLIANCE SHEET as per annexure V has to be furnished as Annexure 5 |
| 7. | PROFORMA FOR USER LIST OF QUOTED MODEL | | |
| 8. | Whether data sheet is submitted ot not? | | |
| 9. | Whether list of spares required for smooth functioning of the equipment attached? | | |
| 10. | Whether catalogue of the equipment highlighting the desired specifications attached? | | Certification has to be furnished as Annexure 6 |

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| 11. | Whether the OEM/Tenderer has experience installing and integration with hybrid (GPU and CPU) HPC systems in a single order? | Certification has to be furnished as Annexure 7 |
|-----|--|---|
| 12. | The OEM/Tenderer must have min 3 installation and integration with minimum 100TF HPC set up (CPU only) in the last 5-Years as prime contractor/supplier. | |
| 13. | OEM brand/bidder must have minimum 1 entries in each of the last 2 list of India Top supercomputer (http://topsc.cdacb.in) published on January 2021 or later. (Latest release on July 2024) | |
| 14. | Competing OEM brand/bidder must have minimum 10 entries in the list of Worldwide Top 500 Supercomputers (Ref: https://www.top500.org) as published on June 2021 or later. (Latest release on June 2024) | |
| 15. | The Tenderer will be responsible for supply, installation, configuration, testing, integration, commissioning, maintenance and support for both hardware and software during the warranty period. | |
| 16. | The Tenderer will be responsible for Integration of proprietary item (NVIDIA) with the proposed HPC system as per tender document. | |
| 17. | OEM must have spares center/warehouse/support office in India for support services. There should be on-site spare part support available directly from OEM or bidder in India for at least five years form the date of acceptance. | |
| 18. | OEM should submit the undertaking stating that the items offered are not nearing end of life or end of support until the end of warranty and AMC. OEMs to provide a product Roadmap for the same. | |
| 19. | The bidder must carry out the installation and commissioning of all the supplied hardware components and software components and it must be done by OEM/OEM Certified engineers only. | |
| 20. | The bidder/OEM has to quote exactly as per the mentioned technical specifications for the entire solution. Partial offers will not be considered for the commercial bid. | |

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Signature of Authorized Signatory

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Annexure IV

PROFORMA FOR PERFORMANCE GUARANTEE BOND

(To be typed on Non-judicial stamp paper of the value of Indian Rupees of Two Hundred) (TO BE ESTABLISHED THROUGH ANY OF THE NATIONALISED BANKS (WHETHER SITUATED AT THIRUVANANTHAPURAM OR OUTSTATION) WITH A CLAUSE TO ENFORCE THE SAME ON THEIR LOCAL BRANCH AT THIRUVANANTHAPURAM. BONDS ISSUED BY CO-OPERATIVE BANKS ARE NOT ACCEPTED.)

То

The Member Secretary, Kerala Development and Innovation Strategic Council India Heights, Womens College Road Vazhuthacadu, Thiruvananthapuram Kerala, India

LETTER OF GUARANTEE

WHEREAS Kerala Development and Innovation Strategic Council (KDISC) (Purchaser) have invited Tenders vide

Tender No......for purchase

of..... AND

Kerala Development and Innovation Strategic Council

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(three percent) of the purchase value] which will be valid for entire warranty period (up to date) from the date of installation, the said Performance Guarantee Bond is to be submitted within 30 (Thirty) days from the date of successful installation. On receiving the clear Performance Guarantee Bond, payment will be processed.

This Bank further agrees that the decision of Kerala Development of Innovation and Strategic Council, (KDISC) (Buyer) as to whether the said supplier/firm (Seller) has committed a breach of any of the conditions referred in tender document / purchase order shall be final and binding.

We, (name of the Bank & branch) hereby further agree that the Guarantee herein contained shall not be affected by any change in the constitution of the supplier/firm (Seller) and/ or Kerala Development and Innovation Strategic Council, (KDISC) (Buyer).

Notwithstanding anything contained herein:

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 c. We are liable to pay the guaranteed amount or any part thereof under this bank guarantee only and only if Kerala Development and Innovation Strategic Council (KDISC) serve upon us a written claim or demand on or before (date).

This Bank further agrees that the claims if any, against this Bank Guarantee shall be enforceable at our branch office at situated at.....

| | (Address | of | local |
|------------------------------|----------|----|-------|
| branch). | | | |
| Yours truly, | | | |
| Signature and seal of the | | | |
| guarantor: Name of the Bank: | | | |
| Complete Postal Address: | | | |
| Date: | | | |

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Annexure V

TECHNICAL COMPLIANCE SHEET HIGH PERFORMANCE COMPUTING SYSTEM

| Sl No | Specifications (Refer KGDC Technical | Compliance | Deviation (if any) |
|-------|--|------------|--------------------|
| | Specifications table) | (Yes/No) | |
| 1. | SERVER (Master Nodes) | | |
| 2. | SERVER (Compute Nodes)* | | |
| 3. | SERVER (Compute Nodes - High Memory) | | |
| 4. | SERVER (Compute Nodes GPU Cluster) | | |
| 5. | SERVER (Compute Nodes For VM) | | |
| 6. | AI / ML COMPUTING (NVIDIA DGX A100 - 80GB) | | |
| 7. | Tier1 Storage (500TB capacity) | | |
| 8. | Tier 2 Storage (1 PB capacity) | | |
| 9. | Tier 3 Storage (1PB capacity) | | |
| 10. | Next-generation Firewall Specifications | | |
| 11. | 10G/25G Switch | | |
| 12. | 1/10G Switch | | |
| 13. | System Integration - Installation, configuration, testing and commissioning of HPC facility. | | |

Place:

Date:

Signature and seal of the Manufacturer/Bidder

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NOTE:

- 1. Compliance statement should be supported with the printed catalogue mentioning page number and clearly highlighting the required tender specifications in the catalogue.
- 2. Where there is no deviation, the statement should be returned duly signed with an endorsement indicating "No Deviations"

Furnishing of wrong statement may lead to debar from the future purchases of KDISC

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Annexure VI

TERMS AND CONDITIONS OF THE SERVICE CONTRACT

- i. During the service contract period, the firm shall provide at least 3 preventive maintenance visits per year and attended to all emergent and break-down calls.
- ii. In each block of 365 days during the entire service contract period the firm will be responsible to maintain the equipment in good working condition for a period 328 days (i.e 90% uptime). All the complaints will be attended by the firm within 2 days of the dispatch of the complaint to their office. In case there is delay of more than 2 days in attending to a complaint then the number of days in excess of the permissible response time shall be counted in the downtime. In case total downtime exceeds the permissible downtime a fine equivalent to double the service contract charges shall be recovered from the firm on per day basis.
- iii. The right to accept the reason(s) for delay and consider reduction or waive off the penalty for the same shall be at the sole discretion of The Member Secretary, Kerala Development and Innovation Strategic Council KDISC, Thiruvananthapuram.
- iv. We undertake to carry out annual calibration of the equipment.
- v. We undertake to perform Quality check after every major repair/breakdown/taking the equipment for repair out of Kerala Digital University, Technopark Phase IV, Pallipuram, Thiruvananthapuram **premises**.
- vi. The replaced parts shall remain the property of the KDISC, Thiruvananthapuram.
- vii. The firm shall try to repair the equipment at **Kerala Digital University**, **Thiruvananthapuram** itself. However, the equipment may be taken to their site, on their own expenses if in case it is not possible to repair the same at **Kerala Digital University**, **Thiruvananthapuram**. The firm shall take the

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entire responsibility for the safe custody and transportation of the equipment taken out for repairs till this is handed over the purchaser after repair. Any loss of equipment or its accessories on account of theft, fire or any such reasons shall be the sole risk and responsibility of the firm who will compensate the **KDISC**, **Thiruvananthapuram**, for such losses at order value of the damaged/lost equipment/part including accessories.

- viii. During the service contract period the parts/components that may be needing replacement shall be made available by the **bidder** at their own expenses
- ix. We undertake to provide PM kit and calibration kit as per requirement to meet uptime condition of the tender.

Authorized Signature and Stamp of Bidder

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Annexure VII

PROFORMA FOR USER LIST OF QUOTED MODEL

No. of similar item/equipment installed and supply executed by the bidder in any PSU/Autonomous bodies/Educational Institutions during the last five years as prime Contractor ending previous day of last date of submission of tenders.

| SI. No. | Name & full address of purchaser | Purchas e Order No. & Date | No. of Units (Qty.) | Purchase Order Value (Rs.) | Date of Installation | Contact person name, phone No. and email id of Purchaser | Supporting documents have to be attached as annexures (1n) |
|------------|---|-------------------------------------|---------------------------|-------------------------------------|-------------------------|--|--|
| | | | | | | | |

(Copies of Purchase orders, satisfactory completion certificate for the work done, certificate from client showing that the installation is satisfactorily working for past year shall be submitted in English language. Details of current contracts in hand and other commitments as supportive evidence).

Place:

Date:

Signature & Seal of the bidder

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Annexure VIII

FORMAT FOR MANUFACTURER'S AUTHORISATION FORM

(To be given on Manufacturer Letter Head)

[NOTE: The Bidder shall require the Manufacturer (OEM) to fill in this Form in accordance with the instructions indicated. This letter of authorization should be on the letterhead of the OEM and should be signed by a person with the proper authority to sign documents that are binding on the OEM. The power of attorney has to be submitted to validate the signatory authority. It should be included by the Bidder in its bid.

No. Dated

Date: [insert date (as day, month and year) of Bid Submission]

Tender No.: [insert number from Invitation for Bids]

То

The Member Secretary,

Kerala Development and Innovation Strategic Council

India Heights, Womens College Road

Vazhuthacadu, Thiruvananthapuram

Kerala, India

WHEREAS

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We [insert complete name of Manufacturer], who are official manufacturers of [insert type of goods manufactured], having factories at [insert full address of Manufacturers factories], do hereby authorize [insert complete name of Bidder] to submit a bid the purpose of which is to provide the following Goods, 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 the General Conditions of Contract, 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/Designation**: [insert title]

Duly authorized to sign this Authorization on behalf of: [insert complete name of Bidder] Dated on __day of _____, ____[insert date of signing]

Yours faithfully,

(Name of manufacturer)

OR

SELF DECLARATION OF MANUFACTURING UNIT

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Annexure IX

CERTIFICATE OF GUARANTEE/WARRANTY

(To be given on Manufacturer Letter Head)

- a. I/We certify that the standard guarantee/warranty shall be for a period of 60 months starting from the date of satisfactory installation, commissioning and handing over of the equipment and of the works conducted therewith covered under the Supply order in working order. During the guarantee/warranty period. I/we shall provide free "after sale service" and the replacement of any part(s) of the equipment or rectification of defects of work of the equipment will be free of cost. The replacement of the parts shall be arranged by us, at our own cost and responsibility. We undertake that the above guarantee/warranty shall begin only from the date of satisfactory and faultless functioning of the equipment at KDISC, Kerala Digital University, Thiruvananthapuram premises. The benefit of change in dates of the guarantee/warranty period shall be in the interest of the user/your organization.
- b. During the warranty period, we shall provide at least 3 preventive maintenance visits per year.
- c. Uptime Guarantee: During the guarantee/warranty period, we will be responsible to maintain the equipment in good working conditions for a period 328 days (i.e. 90% uptime) in a block of 365 days.
- d. All the complaints will be attended by us within 2 working days of receipt of the complaint in our office.
- e. In case there is delay of more than 2 days in attending to a complaint from our side then you can count the number of days in excess of the permissible response time in the downtime. The above said response time of 2 days for attending to a complaint by us will not be counted in the downtime.
- f. Penalty: We shall pay a penalty equivalent to 0.5 % of the order value of the equipment for every week or part thereof delay in rectifying the defect. <u>Kerala Development and Innovation Strategic Council</u>

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- Note: The right to accept the reason (s) for delay and consider reduction or waive a. off the penalty for the Member Secretary, Kerala Development and Innovation Strategic Council, Thiruvananthapuram. We undertake that all the equipment & spares/consumables related to exclusively supplied by manufacturer/supplier of the equipment shall be covered under warranty/extended warranty. Nothing shall be payable on account of these items during warranty/extended warranty by KDISC, Thiruvananthapuram.
- b. We certify that the equipment being/quoted is the latest model and that spares for the equipment will be available for a period of at least 10 years and we also guarantee that we will keep the organization informed of any update of the equipment over a period of seven (07) years.
- c. We guarantee that in case we fail to carry out the maintenance within the stipulated period, KDISC, Thiruvananthapuram reserves the right to get the maintenance work carried out at our risk, cost and responsibility. All the expenses including excess payment for repairs/maintenance shall be adjusted against the Performance Bank Guarantee. In case the expenses exceed the amount of Performance Bank Guarantee, the same shall be recoverable from us with/without interest in accordance with the circumstances.
- d. We shall try to repair the equipment at KDISC, Thiruvananthapuram premises itself. However, the equipment will be taken to our site on our own expenses in case it is not possible to repair the same at KDISC, Thiruvananthapuram. We shall take the entire responsibility for the safe custody and transportation of the equipment taken out for repairs till the equipment is rehabilitated to the KDISC, Thiruvananthapuram after repairs. Any loss of equipment or its accessories under its charge on account of theft, fire or any other reasons shall be at our sole risk and responsibility which will be compensated to KDISC, Thiruvananthapuram for such losses at the order value for the damaged/lost equipment/part, including accessories.
- We undertake to perform Quality check after major every e. repair/breakdown/taking equipment KDISC, the for repair out of Thiruvananthapuram premises.

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- f. In case of extended guarantee/warrantee, we undertake to carry out annual calibration/IPV of the equipment.
- g. We guarantee that we will supply spare parts if and when required on agreed basis for an agreed price. The agreed basis could be an agreed discount on the published catalogue price.
- h. We guarantee to the effect that before going out of production of spare parts, we will give adequate advance notice to you so that you may undertake to procure the balance of the life time requirements of spare parts.
- i. We guarantee the entire unit against defects of manufacture, workmanship and poor quality of components.
- j. We undertake to provide PM kit as per requirement to meet uptime guarantee condition.

Place:

Date:

1. Authorized signatory

(with seal)

2. Authorized signatory

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Annexure X

TENDER ACCEPTANCE LETTER

(Submitted on Letterhead of bidder/supplier)

Date:

То

The Member Secretary,

Kerala Development and Innovation Strategic Council

India Heights, Womens College Road

Vazhuthacadu, Thiruvananthapuram

Kerala, India

Sub: Acceptance of Terms & Conditions of Tender.

Tender Reference No: Name of Tender / Work: -

Dear Sir,

 I/ We have downloaded / obtained the tender document(s) for the above mentioned 'Tender/Work' from the web site(s) namely:

as per your advertisement, given in the above mentioned website(s).

 I / We hereby certify that I / we have read the entire terms and conditions of the tender documents (including all documents like annexure(s), schedule(s), etc.), which form part of

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the contract agreement and I / we shall abide hereby by the terms / conditions / clauses contained therein.

- 3. The corrigendum(s) issued from time to time by your department/ organizations too have also been taken into consideration, while submitting this acceptance letter.
- 4. I / We hereby unconditionally accept the tender conditions of above mentioned tender document(s) / corrigendum(s) in its totality / entirety.
- 5. I / We do hereby declare that our Firm has not been blacklisted/ debarred by any Govt. Department/Public sector undertaking/Govt. Autonomous organisations.
- 6. I / We certify that all information furnished by the our Firm is true & correct and in the event that the information is found to be incorrect/untrue or found violated, then your department/ organisation shall without giving any notice or reason therefore can summarily reject the bid or terminate the contract, without prejudice to any other rights or remedy including the forfeiture of the full said earnest money deposit absolutely.

Yours faithfully,

(Signature of the Bidder, with Official Sea

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Annexure XI

FORMAT FOR QUOTING THE RATES (Price bid)

(To be submitted on the letterhead of the company/ firm. This annexure need not be submitted along with the Technical bid. If any bidder submitted the same along with Technical bid the bid may not be considered for evaluation. If required, K-DISC will demand it from the bidders)

| SI No | ltem | Qty | Rate Unit | per | Total Price |
|----------|--|-----|--------------|-----|----------------|
| 1. | SERVER (Master Nodes) - Processor: Make: Intel/AMD, Series: Platinum/Gold/EPYC (Latest Series), Number of Processors: 2, No. of Cores/Processor: 16, No of threads/Core: 2, Base Frequency: >= 2.9GHz, Turbo Frequency: >= 3.50 GHz, Cache: >= 24 MB, Form Factor: Rack/Blade, Size: 2U, Support: AVX/AVX2; Motherboard, Chip-set Compatible: Intel/AMD, Max CPU Sockets: 2; Memory: Type: DDR4 RDIMM ECC, Single Memory module: 16GB, Speed: >=3200 MT/s, Memory size: 128GB, Max memory Support: > 512GB (32GB Module); Storage: SAS SSD: 2 No's, SASSSD Size: 800GB, SAS SSD Req: OS Partition, SAS SSD RAID Level: RAID 1, SATA SSD usable size: 5TB, Min SATA SSD Drives: >=5, SATA SSD RAID Level: RAID 5; RAID Cards: RAID level: 0,1,5,6,10,50,60, Ports/Lanes: >= 8, Cache: >= 8GB NV, Interface Support: SAS, SATA, NVMe; Interfaces & Ports: Total network cards: 2, Network card1 Type: Ethernet, Network card1 Speed: 1G and 10G Supported, Network card1 ports required: 4x1G and 10G supported, PXE Support, Virtual Machine Device Queues (VMDq), PCI-SIG* SR-IOV Capable, Server network ports should support DPDK and it should deliver zero packet loss as per RFC 2544 and deliver 100%-line rate for all the packet sizes over 64 Bytes, Vendor must submit latest DPDK test report for the same, Network card2 Type: SFP28, Network card2 Speed: 10G/25G, Network Transceivers: 25Gb SFP28 SR 100m Transceiver & Cables, Network card2 ports required: 2, PXE | 4 | | | |

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| | Support, Virtual Machine Device Queues (VMDq), PCI-SIG* SR-IOV Capable, Server network ports should support DPDK and it should deliver zero packet loss as per RFC 2544 and deliver 100%-line rate for all the packet sizes over 64 Bytes, Vendor must submit latest DPDK test report for the same; Operating system, Certifications/Compliance (OS): RHEL 7,8+, Ubuntu 20+, Oracle Linux 8,9+, Debian 11,12+, Windows, Certifications/Compliance (Virtualization/Cloud Platform): VMware, PROXMOX, KVM, Citrix, Server Monitor (With Advanced License): Separate Monitoring Interface: Inbuilt Web-based secure Server hardware monitoring alerting system. | | |
|----|--|----|--|
| 2. | SERVER (Compute Nodes)* - Processor, Make: Intel/AMD ,, , Series: Platinum/Gold/EPYC (Latest Series), , Number of Processors: 4, , No. of Cores/Processor: 18, , No of threads/Core: 2, , Base Frequency: >= 2.9GHz, , Turbo Frequency: >= 3.50 GHz, , Cache: >= 24 MB, , Form Factor: Rack/Blade, , Size: 2U/4U, , Support: AVX/AVX2, Motherboard, Chip-set Compatible: Intel/AMD, , Max CPU Sockets: 4, Memory, Type: DDR4 RDIMM ECC, , Single Memory module : 32GB, , Speed: >=3200 MT/s, , Memory size: 512GB, , Max memory Support: > 1TB (32GB Module), Co-Processor / GPU, NA: NA, Storage, SAS SSD: 2 No's, , SASSSD Size: 800GB, , SAS SSD Req: OS Partition, , SAS SSD RAID Level: RAID 1, , SATA SSD usable size: 5TB, , Min SATA SSD Drives: >=5, , SATA SSD RAID Level: RAID 5, RAID Cards, RAID level: 0,1,5,6,10,50,60, , Ports/Lanes: >= 8, , Cache: >= 8GB NV, , Interface Support: SAS, SATA,NVMe, Interfaces & Ports, Total network cards: 2, , Network card1 Type: Ethernet, , Network card1 Speed: 1G and 10G Supported, , Network card1 ports required: 4x1G and 10G supported, , PXE Support: Yes, , Virtual Machine Device Queues (VMDq): Yes, , PCI-SIG* SR-IOV Capable: Yes, , Server network ports should support DPDK and it should deliver zero packet loss as per RFC 2544 and deliver 100%-line rate for all the packet sizes over 64 Bytes, Vendor must submit latest DPDK test report for the same: Yes, , Network card2 Type: SFP28, , Network card2 Speed: 10G/25G, , Network Transceivers: 25Gb SFP28 SR 100m Transceiver & Cables, , Network card2 ports required: 2, , PXE Support: Yes, , Virtual Machine Device Queues (VMDq): Yes, , PCI-SIG* SR-IOV Capable: Yes, , Server network ports should support DPDK, and it should deliver zero packet loss as per RFC 2544 and deliver 100%-line rate for all the packet sizes over 64 Bytes, Vendor must submit latest DPDK test report for the same: | 20 | |

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| | Yes, Operating system, Certifications/Compliance (OS): RHEL 7,8+, Ubuntu 20+, Oracle Linux 8,9+, Debian 11,12+, Windows , , Certifications/Compliance (Virtualization/Cloud Platform): VM ware, PROXMOX, KVM, Citrix, Server Monitor (With Advanced License), Separate Monitoring Interface: Inbuilt Web based secure Server hardware monitoring alerting system | | |
|----|--|---|--|
| 3. | SERVER (Compute Nodes - High Memory) - Processor: Make: Intel/AMD, Series: Platinum/Gold/EPYC (Latest Series), Number of Processors: 4, No. of Cores/Processor: 18, No of threads/Core: 2, Base Frequency: >= 2.9GHz, Turbo Frequency: >= 3.50 GHz, Cache: >= 24 MB, Form Factor: Rack/Blade, Size: 2U/4U, Support: AVX/AVX2; Motherboard: Chip-set Compatible: Intel/AMD, Max CPU Sockets: 4; Memory: Type: DDR4 RDIMM ECC, Single Memory module: 32GB/64GB, Speed: >=3200 MT/s, Memory size: 2TB, Max memory Support: >2TB (32/64GB Module); Storage: SAS SSD: 2 No's, SASSSD Size: 800GB, SAS SSD Req: OS Partition, SAS SSD RAID Level: RAID 1, SATA SSD usable size: 5TB, Min SATA SSD Drives: >=5, SATA SSD RAID Level: RAID 5; RAID Cards: RAID level: 0,1,5,6,10,50,60, Ports/Lanes: >= 8, Cache: >= 8GB NV, Interface Support: SAS, SATA, NVMe; Interfaces & Ports: Total network cards: 2, Network card1 Type: Ethernet, Network card1 Speed: 1G and 10G Supported, Network card1 ports required: 4x1G and 10G supported, Network card1 ports required: 4x1G and 10G supported, Network card1 ports should support DPDK and it should deliver zero packet loss as per RFC 2544 and deliver 100%-line rate for all the packet sizes over 64 Bytes, Vendor must submit latest DPDK test report for the same, Network card2 Type: SFP28, Network card2 Speed: 10G/25G, Network Transceivers: 25Gb SFP28 SR 100m Transceiver & Cables, Network card2 ports required: 2, PXE Support, Virtual Machine Device Queues (VMDq), PCI-SIG* SR-IOV Capable, Server network ports should support DPDK and it should deliver zero packet loss as per RFC 2544 and deliver 100%-line rate for all the packet sizes over 64 Bytes, Vendor must submit latest DPDK test report for the same; Operating system, Certifications/Compliance (OS): RHEL 7,8+, Ubuntu 20+, Oracle Linux 8,9+, Debian 11,12+, Windows, Certifications/Compliance (Virtualization/Cloud Platform): VM ware, PROXMOX, KVM, Citrix; Server Monitor (With Advanced License): Separate Monitoring Interface: Inbuilt Web-based secure Server hardware monitoring | 8 | |

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| Δ | SERVER (Compute Nodes GPU Cluster) - Processor: Make: | 5 | |
|----|--|---|--|
| т. | Intel (AMD Series: Distinum (Cold (EDVC (Latest Series) Number | 5 | |
| | of Drassessery 2 No. of Corres (Drassessery 19 No. of | | |
| | of Processors: 2, No. of Cores/Processor: 18, No of | | |
| | threads/Core: 2, Base Frequency: >= 2.9GHz, Turbo Frequency: | | |
| | >= 3.50 GHz, Cache: >= 24 MB, Form Factor: Rack/Blade, Size: | | |
| | 2U/4U, Support: AVX/AVX2; Motherboard: Chip-set Compatible: | | |
| | Intel/AMD, Max CPU Sockets: 2; Memory: Type: DDR4 RDIMM | | |
| | ECC. Single Memory module: 32GB. Speed: >=3200 MT/s. | | |
| | Memory size: 512GB Max memory Support: > 1TB (32GB | | |
| | Module): GPU/EPGA/Acceleration Cards: Make: NVIDIA Series: | | |
| | H100 NVI 04CP Number of CDU: 1 Number of CUDA cores: | | |
| | 1/ 20/ Nershar Targer Carrier 529 Marsare 42CD Stars | | |
| | >16,896, Number Tensor Cores: >528, Memory: >=48GB; Storage, | | |
| | SAS SSD: 2 No's, SASSSD Size: 800GB, SAS SSD Req: OS Partition, | | |
| | SAS SSD RAID Level: RAID 1, SATA SSD usable size: 5TB, Min SATA | | |
| | SSD Drives: >=5, SATA SSD RAID Level: RAID 5; RAID Cards: RAID | | |
| | level: 0,1,5,6,10,50,60, Ports/Lanes: >= 8, Cache: >= 8GB NV, | | |
| | Interface Support: SAS, SATA, NVMe; Interfaces & Ports: Total | | |
| | network cards: 2. Network card1 Type: Ethernet. Network card1 | | |
| | Speed: 1G and 10G Supported Network card1 ports required: | | |
| | Ax1G and 10G supported, PYE Support Virtual Machine Device | | |
| | Akito and too supported, FAE support, virtual machine bevice | | |
| | Queues (VMDq), PCI-SIG [®] SR-IOV Capable, Server network ports | | |
| | should support DPDK and it should deliver zero packet loss as | | |
| | per RFC 2544 and deliver 100%-line rate for all the packet sizes | | |
| | over 64 Bytes, Vendor must submit latest DPDK test report for | | |
| | the same, Network card2 Type: SFP28, Network card2 Speed: | | |
| | 10G/25G, Network Transceivers: 25Gb SFP28 SR 100m | | |
| | Transceiver & Cables, Network card2 ports required: 2, PXE | | |
| | Support, Virtual Machine Device Queues (VMDg), PCI-SIG* SR-IOV | | |
| | Capable Server network ports should support DPDK and it | | |
| | should doliver zero packet loss as per PEC 2544 and doliver 100% | | |
| | Should deliver zero packet loss as per Ni C 2044 and deliver 100%- | | |
| | the rate for all the packet sizes over 64 Bytes, vendor must | | |
| | submit latest DPDK test report for the same; Operating system: | | |
| | Certifications/Compliance (OS): RHEL 7,8+, Ubuntu 20+, Oracle | | |
| | Linux 8,9+, Debian 11,12+, Windows, Certifications/Compliance | | |
| | (Virtualization/Cloud Platform): VM ware, PROXMOX, KVM, | | |
| | Citrix; Server Monitor (With Advanced License): Separate | | |
| | Monitoring Interface: Inbuilt Web-based secure Server hardware | | |
| | monitoring alerting system. | | |
| | | | |
| 5. | SERVER (Compute Nodes For VM) - Processor, Make: Intel/AMD, | 4 | |
| | Series: Platinum/Gold/EPYC (Latest Series), Number of | | |
| | Processors: 2, No. of Cores/Processor: 16, No of threads/Core: | | |
| | 2, Base Frequency: >= 2.9GHz, Turbo Frequency: >= 3.50 GHz, | | |
| | 2, Base Frequency: >= 2.9GHz, Turbo Frequency: >= 3.50 GHz, | | |

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| | | - | |
|----|--|---|------|
| | Cache: >= 24 MB, Form Factor: Rack/Blade, Size: 2U, Support: AVX/AVX2; Motherboard: Chip-set Compatible: Intel, Max CPU Sockets: 2; Memory, Type: DDR4 RDIMM ECC, Single Memory module: 32GB, Speed: >=3200 MT/s, Memory size: 256GB, Max memory Support: > 1TB (32GB Module); Storage: NVME SSD: 2 No's, NVME Size: 800GB, NVME SSD Req: OS Partition, NVME SSD RAID Level: RAID 1, NVME SSD usable size: 8-10TB, Min NVME SSD Drives: >=10, SATA SSD RAID Level: RAID 5; RAID Cards: RAID level: 0,1,5,6,10,50,60, Ports/Lanes: >= 8, Cache: >= 8GB NV, Interface Support: SAS, SATA, NVMe; Interfaces & Ports: Total network cards: 2, Network card1 Type: Ethernet, Network card1 Speed: 1G and 10G Supported, Network card1 ports required: 4x1G and 10G supported, Network card1 ports required: 4x1G and 10G supported, PXE Support, Virtual Machine Device Queues (VMDq), PCI-SIG* SR-IOV Capable, Server network ports should support DPDK and it should deliver zero packet loss as per RFC 2544 and deliver 100%-line rate for all the packet sizes over 64 Bytes, Vendor must submit latest DPDK test report for the same, Network card2 Type: SFP28, Network card2 Speed: 10G/25G, Network Transceivers: 25Gb SFP28 SR 100m Transceiver & Cables, Network card2 ports required: 2, PXE Support, Virtual Machine Device Queues (VMDq), PCI-SIG* SR-IOV Capable, Server network ports should support DPDK and it should deliver zero packet loss as per RFC 2544 and deliver 100%-line rate for all the packet sizes over 64 Bytes, Vendor must submit latest DPDK test report for the same; HBA Card: FC-HBA Card; Supported FC-HBA card for Tape Library interface; Operating system: Certifications/Compliance (OS): RHEL 7,8+, Ubuntu 20+, Oracle Linux 8,9+, Debian 11,12+, Windows, Certifications/Compliance (Virtualization/Cloud Platform): VM ware, PROXMOX, KVM, Citrix; Server Monitor (With Advanced License): Separate Monitoring Interface: Inbuilt Web-based | | |
| | License): Separate Monitoring Interface: Inbuilt Web-based secure Server hardware monitoring alerting system. | | |
| 6. | AI / ML COMPUTING - NVIDIA DGX B200 - CPU: 2 Intel® Xeon® Platinum 8570 Processors: 112 Cores total, 2.1 GHz (Base), 4 GHz (Max Boost); GPU: 8x NVIDIA Blackwell GPUs; Performance, 72 petaFLOPS training and 144 petaFLOPS inference; System Memory, The system should be configured with a Minimum 2TB DDR4 RAM with all slots populated. Provision to expand to 4TB; GPU Memory, 1,440GB total, 64TB/s HBM3e bandwidth; Network, 4x OSFP ports serving 8x single-port NVIDIA ConnectX- 7 VPI: Up to 400Gb/s InfiniBand/Ethernet:2x dual-port QSFP112 NVIDIA BlueField-3 DPU: Up to 400Gb/s InfiniBand/Ethernet: | 1 | |

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| | Internal Storage, OS: 2x 1.9TB NVMe M.2:, , Internal storage: 8x 3.84TB NVMe U.2: OS Support, Latest supported version of RHEL/CentOS/ Ubuntu: Software, NVIDIA AI Enterprise: Optimized AI Software: , NVIDIA Base Command™: Orchestration, Scheduling, and Cluster Management: , DGX OS / RHEL: Operating system: Preinstalled Al, Installed optimized Al frameworks like Caffe, CNTK, Tensor flow,:, frameworks, Theano, Torch with Docker containers for deploying Deep learning frameworks.: , Pre-installed Deep learning GPU Training System for to train a highly accurate deep neural network (DNNs) for image classification, segmentation, and object detection tasks, Preinstallation & Configuration of Kubernetes/SLUM, Bright Cluster Manger: Scalability & Cluster, System should be scalable with multi-node cluster. Software: software, support & cluster tools to be supplied along with the product. Full-stack reference designs with all the leading Storage providers: Warranty & AMC, Five-year Enterprise Business-Standard Support for hardware and software: 24/7 Enterprise Support portal access, Live agent support during local business hours | | |
|----|---|---|--|
| 7. | Tier1 Storage (500TB capacity) - Storage Quality Certification: The Storage OEM should be established in the Gartner or any other equivalent global research firm for the last five years; Storage Controller: 1. The Storage system offered must be a true unified and scale-out system offering NAS (file), SAN (block) and object workloads. The Storage supplied should be an appliance with a Single Microcode offering all protocols and should not be based on server-based General Purpose File systems or Operating systems such as Linux, Windows etc., 2. Storage system must be offered in a No-Single-Point of Failure offering up to six 9s of availability with a minimum of 2 Nodes/Controllers; Cache/Memory Support: 1. The system should be offered with a minimum 1.2 TB Distributed/Global/Federated DRAM cache across dual controllers. The cache should be scalable to 6 TB in a scale-out architecture with a minimum 12 Controllers. The system should offer the capability to protect the write cache in case of a controller failure. Also, a failure of a controller should not lead to write-through mode for cache; Drive Support: The system must support NVMe SSDs each of 100GbE interface speed to meet the capacity and performance requirements for the | 1 | |

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| | 1 | 1 |
|--|-------|---|
| applications. The system must support a minimum of 240 disks | | |
| for scalability purposes; Disk Drive Protection: The proposed | | |
| system should offer minimum raid 6/dual drive failure | | |
| protection, however for high-density drives it should also | | |
| support triple drive failure protection for better resiliency and | | |
| performance: Capacity: 1. The system should be configured with | | |
| 500TB Usable capacity using NVMe SSD Drives with Raid 6/ Dual | | |
| drive failure protection: Performance: The storage should be | | |
| able to deliver a minimum of 345,000 IOPS and 10GBps | | |
| (Gigabyte) with R/W 80/20 Sequential 32K block: Protocols: | | |
| The storage should be configured natively with EC NVMe-oF | | |
| NVM_{Θ}/TCP is CSI NFS (NFSv2 NFSv2 NFSv2 1 supporting | | |
| PEC5661) CIEC/SMB protocols for use with different | | |
| appliestions in addition to the above Object (C2 compatible) | | |
| applications. In addition to the above, Object (55 compatible) | | |
| protocol should also be supported either natively or through any | | |
| additional appliance; Front-End and Backend connectivity, The | | |
| proposed storage system should have a minimum 4 x100GbE | | |
| back-end ports and 8 x 10GbE iSCSI and 8 x 32 Gb FC front-end | | |
| ports available across dual controllers; Investment Protection: | | |
| 1. The storage offered should be a true scale-out system that | | |
| allows the intermixing of controllers across generations within | | |
| the same system, the system should also support the intermixing | | |
| of All-flash and Hybrid arrays is the same cluster and be scalable | | |
| to a minimum of 12 controllers for maximum investment | | |
| protection, 2. The proposed system should offer the capability | | |
| to tier the data to either On-Prem or Cloud Object Storage. The | | |
| system should be configured with any software capability or | | |
| license for On-Prem tiering to Object Storage from day one; | | |
| Storage General Features: 1. Ability to expand LUNS/Volumes | | |
| on the storage online and instantly, 2. Redundant hot-swappable | | |
| components like controllers, disks, power supplies, fans etc. and | | |
| allow re-usage of Disk Shelves with higher models of the same | | |
| product line, 3. The proposed system should offer up to 20PBs | | |
| capacity scalable within a single namespace, 4. The proposed | | |
| storage should enable and integrate with server virtualization | | |
| technologies such as VMware vSphere. The proposed storage | | |
| must support VASA 3.0 and above, VMware VVOL feature and the | | |
| feasibility of creating more than 1000 VVOLs. The proposed | | |
| array should be able to present both the VVOL storage pool and | | |
| traditional LUN's, 5. The storage system should be capable of | | |
| providing multi-pathing software with failover and load- | | |
| balancing functionality, 6. The proposed storage should provide | | |
| | 1 | |

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| both in-line and post-process efficiency features such as | | |
|--|--|--|
| Compression, De-Duplication and Compactation, 7. The | | |
| proposed storage should be able to provide secure multi-tenancy | | |
| for air gap security and isolation from other workloads: Data | | |
| Protection: 1. The proposed system/solution should offer | | |
| incremental replication capabilities in both fan-out and | | |
| cascading topologies. The WAN replication should be secured by | | |
| end-to-end encryption and bandwidth optimization supported | | |
| natively. All the necessary licenses should be guoted from day | | |
| 1: 2. The Storage array should be offered with Synchronous. | | |
| Asynchronous replication features & Zero Data Loss protection | | |
| between the DC. DR and Near DR. 3. The offered system should | | |
| ensure a unified architecture flexibility for replication both on- | | |
| prem & to the cloud natively without the use of any third-party | | |
| hardware or software solutions. The replication should support | | |
| end-to-end encryption and bandwidth optimization. 4. Proposed | | |
| storage should offer capabilities to create backup copies across | | |
| sites and also allow replication of data across backup targets | | |
| Any license required should be configured: Security and | | |
| Encryption, 1. The proposed storage array must support data at | | |
| rest encryption for file shares including both CIFS and NFS. | | |
| managed by an On-board Key Manager or External Key Manager | | |
| offering industry-standard certification/compliance by using a | | |
| cryptographic security module supporting FIPS 140-2 level | | |
| encryption. For multi-tenant configuration, individual tenant's | | |
| keys should be managed by the offered storage. 2. The storage | | |
| system should offer high-performance compliance solutions in | | |
| accordance with various industry standards to meet regulations | | |
| such as Securities and Exchange Commission (SEC) 17a-4, HIPAA. | | |
| Financial Industry Regulatory Authority (FINRA). Commodity | | |
| Futures Trading Commission (CFTC), and General Data | | |
| Protection Regulation (GDPR), 3. Storage management software | | |
| should support MFA to ensure secure access to Management | | |
| Software. The Storage array should support SHA-2 level security | | |
| for managing user credentials, 4. The storage should be | | |
| configured to comply with SEC Rule 17a-4 for file systems. Also, | | |
| the offered storage should ensure that no one including the | | |
| administrator should can delete the data post WORM enabled; | | |
| Management, 1. The Proposed Storage system should have | | |
| native GUI to monitor & perform operations on data protection | | |
| jobs, 2. The Storage Management Software should offer | | |
| operational simplicity and rich data management functionalities | | |

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| | for Unified Storage. It should provide a single dashboard to monitor the health, availability, capacity usage, performance, and data protection status of various platforms along with resource planning, 3. The management tool should display system alerts and notifications for proactive management on the dashboard for users to quickly access them and it should provide information about support cases raised on the cluster, 4. The offered system should support ransomware and insider threat detection to protect data with early detection and actionable intelligence on ransomware and other malware incursions. It should detect malicious activity and protect the data by automatically taking a snapshot; Rack Mountable: The storage should be supplied with a rack mount kit. All the necessary patch cords (Ethernet and Fiber) shall be provided and installed by the vendor; Warranty & AMC: The Hardware and software quoted should have 5 years of support along with upgrades and updates; Storage Type: NAS; Number of nodes: 4; Drive type: NVMe, QLC; End-to-end NVMe; Total usable capacity (TB): 500 TiB; Systems disk shelfs connectivity (Gbps): 100GB (Controllers to Disk Shelf); Systems backend network connectivity: 25GB (Node to Node); Scalable NAS (up to max), 9PB; System CPU proposed: >=48 cores; System CPU per node, 12 cores; System memory proposed, >=256 GB; System memory per node, >=64 GB; NVDIMW/NVRAM, >=8 GB Per Node; Total NVDIMW/NVRAM, >=32 GB; Network configuration proposed, 8 x 25G SFP28 & 16 x 25G SFP28; Cloud tiering or fabric pool, ; Compression, ; Deduplication, ; Thin provisioning, ; Data access protocols, FC, iSCSI, NVMe/FC, NVMe/TCP, FCoE, NFS, SMB, Amazon S3; Dual Network Active-Active Switch for Customer Connection, 2x24Port SFP28 switch with Minimum of 4x40G/100G QSFP28 port for Uplink; Tiering support, Should support auto tiering and tiering policies. Software's for the tiering management has to be included. | | |
|----|--|---|--|
| 8. | Tier 2 Storage (500 TB capacity) - Storage Quality Certification: The Storage OEM should be established in the Gartner or any other equivalent global research firm for the last five years. , 2, Storage Controller: 1. The Storage system offered must be a true unified and scale-out system offering NAS (file), SAN (block) and object workloads. The Storage supplied should be an appliance with a Single Microcode offering all protocols and should not be based on server based General Purpose Filesystems or Operating systems such as Linux, Windows etc, : 2. Storage system must | 3 | |

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| be offered in a No-Single-Point of Failure offering upto six 9s of | | |
|--|--|--|
| availability with minimum 2 Nodes/Controllers and Scale-Out to | | |
| minimum 12 Nodes/Controllers. 1. The system should be | | |
| offered with minimum 256GB Distributed/Global/Federated | | |
| DRAM cache across dual controllers. The cache should be | | |
| scalable to 1536 GB in a scale-out architecture with minimum | | |
| 12 Controllors System should offer capability to protect the | | |
| write cache in case of a controller failure. Also, a failure of | | |
| while cache in case of a controller failure. Also, a failure of | | |
| Drive Support. The system must support NVMe SSD's each of | | |
| Drive Support: The system must support invine SSD's each of | | |
| The subscription of the subscription. The subscription of the subs | | |
| requirements for the applications. The system must support a | | |
| minimum of 96 disks for scalability purpose, 5, Disk Drive | | |
| Protection: The proposed system should offer minimum dual | | |
| drive failure protection, however for high density drives it | | |
| should also support triple drive failure protection for better | | |
| resiliency and performance, 6, Capacity: 1. The system should | | |
| be configured with 500TB capacity using NVMe SSD Drives with | | |
| Dual drive failure protection, 7, Performance: The storage | | |
| should be able to deliver minimum 150,000 IOPS and 4.5 GBps | | |
| (Gigabyte) with R/W 80/20, Sequential 32K block, 8, Protocols: | | |
| The storage should be configured natively with FC, NVMe-oF, | | |
| NVMe/TCP, iSCSI, NFS (NFSv3, NFSv4, NFSv4.1 supporting | | |
| RFC5661), CIFS/SMB protocols for use with different | | |
| applications. In addition to the above, Object (S3 compatible) | | |
| protocol should also be supported either natively or through any | | |
| additional appliance, 9, Front-End and Backend connectivity: | | |
| The proposed storage system should have minimum 4 x100GbE | | |
| back-end ports and 8 x 10GbE iSCSI and 8 x 32 Gb FC front end | | |
| ports available across dual controllers, 10, Investment | | |
| Protection: 1. The storage offered should be a true scale-out | | |
| system that allows intermixing of controllers across generations | | |
| within the same system and scalable to a minimum of 12 | | |
| controllers for maximum investment protection. \cdot : 2. The | | |
| proposed system should offer capability to tier the data to either | | |
| On-Prem or Cloud Object Storage. System should be configured | | |
| with any software capability or license for On-Prem tiering to | | |
| Object Storage from day-one, 11. Storage General Features: 1 | | |
| Ability to expand LUNS/Volumes on the storage online and | | |
| instantly, : 2. Redundant hot swappable components like | | |
| controllers, disks, power supplies fans etc. and allow re-usage | | |
| of Disk Shelves with higher models of the same product line | | |
| or bisk sherees with higher models of the same product time, . | | |

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3. The proposed system should offer upto 20PBs capacity scalable within a single namespace, : 4. The proposed storage should enable and integrate with server virtualization technologies such as VMware vSphere. The proposed storage must support VASA 3.0 and above, VMware VVOL feature and feasibility to create more than 1000 VVOLs. The proposed array should be able to present both VVOL storage pool and traditional LUN's, : 5. The storage system should be capable of providing multi-pathing software with failover and load balancing functionality, : 6. The proposed storage should provide both inline and post process efficiency features such as Compression, De-Duplication and Compression, : 7. The proposed storage should be able to provide secure multi tenancy for air gap security and isolation from other workloads, 12, Data Protection: 1.The proposed system/solution should offer incremental replication capabilities in both fan-out and cascading topologies. The WAN replication should be secured by end-to-end encryption and bandwidth optmization supported natively. All the necessary licenses should be guoted from day 1, : 2. The Storage array should be offered with Synchronous, Asynchronous replication feature & Zero Data Loss protection between the DC, DR and Near DR, : 3. The offered system should ensure a unified architecture flexibility for replication both onprem & to the cloud natively without the use of any third-party hardware or software solutions. The replication should support end-to-end encryption and bandwidth optimization, : 4. Proposed storage should offer capabilities to create backup copies across sites and allow replication of data across backup targets. Any license required should be configured, 13, Security and Encryption: 1. The proposed storage array must support data at rest encryption for file shares including both CIFS and NFS, managed by On-board Key Manager or External Key Manager offering industry standard certification/compliance by using a cryptographic security module supporting FIPS 140-2 level encryption. For multi-tenant configuration, individual tenant's keys should be managed by the offered storage, : 2. The storage system should offer high-performance compliance solution in accordance to various industry standards to meet regulations such as Securities and Exchange Commission (SEC) 17a-4, HIPAA, Financial Industry Regulatory Authority (FINRA), Commodity Futures Trading Commission (CFTC), and General Data Protection Regulation (GDPR), : 3. Storage management

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| | software should support MFA to ensure secure access of Management Software. The Storage array should support SHA-2 level security for managing user credentials, : 4. The storage should be configured to comply with SEC Rule 17a-4 for filesystems. Also, the offered storage should ensure that no one including administrator should be able to delete the data post WORM enabled, 14, Management: 1. The Proposed Storage system should have native GUI to monitor & perform operations on data protection jobs, : 2. The Storage Management Software should offer operational simplicity and rich data management functionalities for Unified Storage. It should provide a single dashboard to monitor health, availability, capacity usage, performance, and data protection status of various platforms along with resource planning, : 3. The management tool should display system alerts and notifications for proactive management on the dashboard for users to quickly access them and it should provide information about support cases raised on the cluster, : 4. The offered system should support ransomware and insider threat detection to protect data with early detection and actionable intelligence on ransomware and other malware incursions. It should detect malicious activity and protect the data by automatically taking a snapshot, 15, Rack Mountable: The storage should be supplied with rack mount kit. All the necessary patch cords (Ethernet and Fiber) shall be provided and installed by the vendor, 16, Warranty & AMC: The Hardware and software quoted should have 5 years support along with upgrade and updates, 17, Tiering support: Should support auto tiering and tiering policies. Software's for the tiering management must be included | | |
|----|---|---|--|
| 9. | Tier 3 Storage (500 TB capacity) - 1, Storage Quality Certification: The Storage OEM should be established in the Gartner Leader Quadrant , 2, Storage Controller: 1.The Storage system should a unified system supporting all Block, File and Object protocols cluster in active-active configuration, : 2. Storage system must be offered in a No-Single-Point of Failure offering upto six 9s of availability with minimum 2 Nodes/Controllers and Scale-Out to minimum 12 Nodes/Controllers, 3, Cache required: 1. The unified system should have minimum 128 GB data cache post protection overheads across supplied controllers with an ability to protect data on cache if there is a controller failure or power outage. Cache should be protected for Writes either through a battery | 2 | |

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| backup or by destaging to flash/disk, : 2. The system should be | | |
|--|--|--|
| configured with minimum 2TB of SSD/Flash/NVMe in addition to | | |
| the above and same should be scalable to 12TB, 4, Drive | | |
| Support: The unified system must support intermixing of SSD, | | |
| SAS and SATA drives to meet the capacity and performance | | |
| requirements of the applications. The system must support a | | |
| minimum of 140 disks in a dual controller architecture and | | |
| maximum of 570 disks in a scale-out-architecture, 5, Protocols: | | |
| The storage should a true unified storage configured with iSCSI, | | |
| FC, FCOE, NFS (NFSv3,NFSv4, NFSv4.1) SMB(,SMB2 & SMB3),S3 | | |
| and pNFS protocols for use with different applications and | | |
| should support the maximum capacity offered by the storage | | |
| system. Any hardware/software required for this functionality | | |
| shall be supplied along with it in No Single Point Of Failure | | |
| mode, 6, RAID configuration: Should support Raid 6/Dual Parity | | |
| & Triple Parity, 7, High Availability: The unified storage system | | |
| must be configured to continuously serve data in event of any | | |
| controller failure. In addition to this, it must also be possible to | | |
| withstand failure of any 2 or 3 disks per RAID-Group of size not | | |
| more than 28 disks. In Event, architecture uses a single pool | | |
| instead of multiple RAID Groups, system should be resilient | | |
| against failure of three drives for every 28 drives used in the | | |
| pool, 9, Storage Capacity: Storage must supply with 500 TB | | |
| usable capacity NL-SAS Disk with RAID6/DP/ Triple Parity with | | |
| Spare Drive at 30 drives one spare drive need to be populated, | | |
| 10, Performance: The storage should be able to deliver 700 MBps | | |
| (Megabyte)/22,000 IOPS with 80/20 R/W Sequential 32K block, | | |
| 11, Front-End and Backend connectivity: The proposed storage | | |
| system should have minimum 4x12Gb SAS ports and 4x10GbE | | |
| Fiber and 4 x 32Gbps FC front end ports available across dual | | |
| controllers, 12, Rack Mountable: The unified storage should be | | |
| supplied with rack mount kit. All the necessary patch cords | | |
| (Ethernet and Fiber) shall be provided, 13, Storage Scalability | | |
| and Upgradability: 1. The unified proposed system should be | | |
| field upgradeable to a higher model through data-in-place | | |
| upgrades, : 2. The unified Storage should be a true scale-out | | |
| architecture allowing mixing of Controller/Nodes within same | | |
| product line with higher configurations, : 3. Unified Storage | | |
| system should allow re-usage of Disk Shelves with higher models | | |
| of the same product line, 14, Storage functionality : The unified | | |
| storage shall have the ability to expand LUNS/Volumes on the | | |
| storage online and instantly, : The unified storage shall have the | | |

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| ability to create logical volumes without physical capacity being | | |
|--|--|--|
| available or in other words system should allow over- | | |
| provisioning of the capacity. The license required for the same | | |
| shall be supplied for the maximum supported capacity of the | | |
| offered storage model · The unified storage should be | | |
| configured with Quality of Service feature for IOPs/Throughout | | |
| for both Block and File . The unified storage shall support | | |
| logical partitioning of controllors in future such that each | | |
| logical partitioning of controllers in future such that each | | |
| partition appears as a separate virtual storage in itself for both | | |
| block and file, : The storage should support data tiering with | | |
| real-time movement of hot data to high performing drives. It | | |
| should offer the capability to move data between one tier of | | |
| drives to another tier of drives, : The proposed unified storage | | |
| system should be configured to provide data protection against | | |
| two simultaneous drive failures, : The required number hard | | |
| disks for parity & spares, should be provided exclusively of the | | |
| usable capacity mentioned. , : Unified System should have | | |
| redundant hot swappable components like controllers, disks, | | |
| power supplies, fans etc, 15, Point-in-times images: The unified | | |
| storage should have the requisite licenses to create point-in- | | |
| time snapshots. The storage should support minimum 250 | | |
| snapshots per volume/LUN. The license proposed should be for | | |
| the complete supported capacity of the unified system for both | | |
| block and file. : The unified system should support instant | | |
| creation of clones of active data, with near zero performance | | |
| impact for both block and file, 16. Encryption for Data At Rest: | | |
| The proposed storage array must support data at rest encryption | | |
| offering industry standard certification/compliance The | | |
| storage array may implement data at rest encryption using self- | | |
| encrypting drives or controller-based functionality there by not | | |
| impacting performance 17 Management: Single management | | |
| and web enabled administration interface | | |
| for configuration storage management and performance | | |
| analysis tools for both block and file 19 Demote Support 6 | | |
| Diagnostice: Storage management should support d | | |
| facility with web based calf consists neutral providing on | | |
| integrated officient monitoring and accurating events integrated | | |
| integrated, efficient monitoring and reporting capability and | | |
| supporting data collection. Management software should | | |
| provide features like; : 1. Automated call home feature, : 2. | | |
| Nonintrusive alerting, : 3. Performance and Capacity reports, : | | |
| 4. Ungoing health check analysis, OS support: Support for | | |
| industry-leading Operating System platforms including: LINUX, | | |
| | | |

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| | Microsoft Windows, HP-UX, SUN Solaris, IBM-AIX, etc, : Any Multipathing software required for the solution must be supplied for unlimited host connectivity, 19, De-Duplication, Compression and Compaction: Proposed unified storage should support Iline as well As Post Process block level data de- duplication, compression and compaction for all kinds of data (structured & unstructured) on both block and file, 20, VMware Integration: The proposed storage should enable and integrate with server virtualization technologies such as VMware vSphere. The proposed storage must support VASA 3.0 and above, VMware VVOL feature and feasibility to create more than 1000 VVOLs. The proposed array should be able to present both VVOL storage pool and traditional LUN's, 21, Multi-Pathing: The storage system should be capable of providing multi-pathing software with failover and load balancing functionality, 22, Certifications: The storage system should offer high- performance compliance solution in accordance to various industry standards to meet regulations such as Securities and Exchange Commission (SEC) 17a-4, HIPAA, Financial Industry Regulatory Authority (FINRA), Commodity Futures Trading Commission (CFTC), and General Data Protection Regulation (GDPR), 23, Warranty & SLA: The Hardware quoted should have 5 years onsite warranty and support, 24, Tiering support: Should support auto tiering and tiering policies. Software's for the tiering management must be included | | |
|----|--|---|--|
| 10 | Next-generation Firewall Specifications - 1, The Firewall must be appliance based, rack mountable and it should be having internal redundant Power Supply from day one: , 2, The Proposed Firewall Vendor should be in the Leaders/ Challenger in Quadrant of Gartner Magic Quadrant for Enterprise Network Firewall.; 3, The proposed NGFW must have build in GUI and CLI to make on the go changes to Firewall policies without any dependency to management and troubleshoot any issue related to network outage.; 4, NGFW must support Secure SD - WAN feature along with advance routing protocols such as BGP ; 5, SD-WAN must be able to link and failover between various connections such as Internet, MPLS, leash line and even Routed based VPN interfaces.; 6, Build-in SDWAN must be able to do load balancing of various links based on source address, User group, protocol and/or applications ; 7, SLA for SDWAN must be defined based on packet loss or latency or jitter. Even combination of all 3 option must be possible ; 8, Central | 2 | |

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| management solution for the next generation Firewall must be | | |
|--|--|--|
| able to Manage all the SDWAN link centrally and should give | | |
| clear dashboard showing which links are down and which are up. | | |
| This helps the NOC to take action accordingly: 9, NGFW must | | |
| support multicast routing as well as firewalling ; 10, The | | |
| proposed solution should also support policy routing. Policy | | |
| routing should work along with SD-WAN and ISP load-balancing.; | | |
| 11, The proposed solution must also support identity-based | | |
| routing option allowing traffic to be forced out of specific | | |
| Internet/MPLS gateway based on authentication rather than IP | | |
| address; 12, The proposed system should have integrated Traffic | | |
| Shaping functionality this feature should have option to be | | |
| configured on same firewall policy along with option to | | |
| configure it separately if required.; 13, Build-in GUI on the | | |
| NGFW should have option to display logical topology of the | | |
| network the NGFW is protecting. The display should also be able | | |
| to give security recommendation for the NGFW.; 14, Device | | |
| should support Static routing, RIP, OSPF, BGP, IS-IS, RIPng, | | |
| OSPFv3 and BGP4+, Performance Parameters; 1, The solution | | |
| should support a minimum of at least 12 Gbps IPS throughput & | | |
| Minimum 11 Gbps NGFW throughput on real-world / enterprise | | |
| mix traffic test condition; 2, The solution should support | | |
| minimum 10 Gbps threat protection throughput on real-world / | | |
| enterprise mix traffic test condition; 3, Should support 20 Gbps | | |
| IPSec VPN throughput and 1500 Tunnels; 4, The Firewall must | | |
| support at least 6,000,000 concurrent connections and 500,000 | | |
| new sessions per second; 5, The platform must be having | | |
| minimum of 10 interfaces with auto sensing 10/100/1000 | | |
| capability, 6 Gigabit SFP ports and 8 10-GbE SFP+ Interfaces | | |
| from day one, Firewall Features; 1, Firewall policy should be | | |
| single policy where all the features get applied such as IPS, | | |
| application control, URL filtering, antivirus, SSL inspection, | | |
| logging and even NAT; 2, Firewall must support Zoning option | | |
| along with User based authentication. It must have automatic | | |
| option to group all the same zone policy ; 3, There must be | | |
| option to configure the said Firewall policy from GUI of the | | |
| NGFW appliance without requiring any Management solution. | | |
| inis is in the case of emergency where management solution is | | |
| no available and policy needs to be changed.; 4, FireWall Must | | |
| support NAT40, NAT00 and NAT04 along with policy for such NAT | | |
| along with option to configure DNS64.; 5, Firewall must support | | |
| INAL POLICY FOR MULTICASE TRATTIC FOR DOED IPV4 and IPV6; 6, | | |

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| Firew | all must support option to configure FQDN server rather | | |
|---------|--|--|--|
| then | P address in case server have dynamic IP address or site | | |
| have | multiple IP addresses for single domain.; 7, There must be | | |
| optio | n to even configure wildcard FQDN; 8, Firewall should allow | | |
| policy | based on port or service to protect attack at L3 not just | | |
| applic | ation based policy which might be vulnerable to L3 | | |
| attac | ks.; 9, Firewall must support Geo-based IP address blocking | | |
| optio | n.; 10, DNS translation option must be available in Firewall | | |
| to cha | ange only the specific DNS reply from public to private IP. | | |
| This is | s required for allowing user to access local resources using | | |
| Privat | e IP rather than there public IP address; 11, Build-in | | |
| GUI/C | LI must support option to configure firewall policy which | | |
| allow | packet capture for troubleshooting purposes; 12, The | | |
| secur | ty appliance should be having configurable option to | | |
| guara | ntine attack generating source address, Virtualization; 1, | | |
| The r | proposed solution should support Virtualization (Virtual | | |
| Firew | all, Security zones and VLAN). Minimum 5 Virtual Firewall | | |
| licens | e should be provided.; 2, Virtualization must be for every | | |
| featu | e which are IPS, Application control, Antivirus/Anti- | | |
| malw | are, URL filtering, SSL inspection, SSL VPN, IPSec VPN, | | |
| Traffi | c shaping and user authentication.; 3, Enabling | | |
| Virtua | lization shouldn't require any kind of downtime or reboot. | | |
| lt mu | st be done seamless even if the NGFW is live in the | | |
| netwo | ork.; 4, When creating virtualized NGFW it should give | | |
| mode | option to configure each virtualized system such as first | | |
| syster | n can work in NAT/route mode and second system can | | |
| work | in transparent mode.; 5, Each virtualized NGFW system | | |
| must | have option to configure various parameter to limit the | | |
| resou | rces utilization such as number of session, etc, VPN | | |
| Featu | res; 1, NGFW must have build in support IPSec VPN and SSL | | |
| VPN. | There shouldn't be any user license restriction; 2, IPSec | | |
| VPN r | nust include gateway to gateway and gateway to client | | |
| vpn. | n case of gateway to client the administrator must have | | |
| optio | n to assign private IP address to remote user without | | |
| requi | ing any additional license; 3, Route based IPSec VPN must | | |
| be su | oported along with SD-WAN in case of two or more ISP's.; | | |
| 4, IPS | ec VPN must include gateway to gateway and gateway to | | |
| client | vpn. In case of gateway to client the administrator must | | |
| have | option to assign private IP address to remote user without | | |
| requi | ing any additional license; 5, IPSec VPN must support SHA- | | |
| 1 and | SHA-2 (SHA 256, 386 and 512) along with DH group | | |
| 2,5,14 | 4,15,16,17,18,19,20,21,27,28,29,30 and 31.; 6, SSL VPN | | |

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| | must support high level algorithm along with TLS v1.2; 7, SSL | | |
|---|--|--|--|
| | VPN must not have any user license and should have option to | | |
| | integrate with local AD or RADIUS server ; 8, Both VPN must | | |
| | support 2-factor authentication with option to have locally | | |
| | imported tokens on the NFGW appliance itself, if required, | | |
| | Intrusion Prevention System; 1, The IPS detection methodologies | | |
| | shall consist of:, a) Signature based detection using real time | | |
| | updated database, b) Anomaly based detection that is based on | | |
| | thresholds; 2, The IPS system shall have at least 7,000 | | |
| | signatures; 3, IPS Signatures can be updated in three different | | |
| , | ways: manually, via pull technology or push technology. | | |
| | Administrator can schedule to check for new updates or if the | | |
| | device has a public IP address, updates can be pushed to the | | |
| | device each time an update is available; 4, In event if IPS should | | |
| | cease to function, it will fail open by default and is configurable. | | |
| • | This means that crucial network traffic will not be blocked, and | | |
| | the Firewall will continue to operate while the problem is | | |
| | resolved; 5, IPS solution should have capability to protect | | |
| | against Denial of Service (DOS) and DDOS attacks. Should have | | |
| | flexibility to configure IPv4 and IPv6 Rate based DOS protection | | |
| , | with threshold settings against TCP Syn flood, TCP/UDP/ port | | |
| | scan, ICMP sweep, TCP/UDP/ SCTP/ICMP session flooding. | | |
| | Threshold settings must be customizable for different sources, | | |
| | destinations & services; 6, IPS signatures should have a | | |
| | configurable action like terminate a TCP session by issuing TCP | | |
| | Reset packets to each end of the connection, or silently drop | | |
| | traffic in addition to sending a alert and logging the incident; 7, | | |
| | Signatures should a severity level defined to it so that it helps | | |
| | the administrator to understand and decide which signatures to | | |
| | enable for what traffic (e.g. for severity level: high medium | | |
| | low), Antivirus; 1, Firewall should have integrated Antivirus | | |
| | solution; 2, The proposed system should be able to block, allow | | |
| | or monitor only using AV signatures and file blocking based on | | |
| | per firewall policy based or based on firewall authenticated user | | |
| | groups with configurable selection of the following services:, a) | | |
| | HI IP, HI IPS, b) SMTP, SMTPS, c) POP3, POP3S, d) IMAP, IMAPS, | | |
| | e) FIP, FIPS; 3, The proposed system should be able to block or | | |
| | allow oversize file based on configurable thresholds for each | | |
| | protocol types and per firewall policy, web Content Filtering; 1, | | |
| | The proposed system should have integrated web Content | | |
| | Filtering solution without external solution, devices or hardware | | |
| | modules.; 2, The proposed solution should be able to enable or | | |

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| disable Web Filtering per firewall policy or based on firewall | | |
|--|--|--|
| authenticated user groups for both HTTP and HTTPS traffic.; 3, | | |
| The proposed system shall provide web content filtering | | |
| features:, a) which blocks web plug-ins such as ActiveX, Java | | |
| Applet, and Cookies, b) Shall include Web URL block, c) Shall | | |
| include score-based web keyword block, d) Shall include Web | | |
| Exempt List: 4. The proposed system shall be able to gueries a | | |
| real time database of over millions+ rated websites categorized | | |
| into 75+ unique content categories.: 5. Update of local Database | | |
| based on malicious category discovered by local Sandboxing | | |
| solution from same vendor, Application Control ; 1, The | | |
| proposed system shall have the ability to detect, log and take | | |
| action against network traffic based on over 4000 application | | |
| signatures: 2. The application signatures shall be manual or | | |
| automatically updated: 3. The administrator shall be able to | | |
| define application control list based on selectable application | | |
| group and/or list and its corresponding actions; 4, Application | | |
| control and URL filtering must work independent of each other, | | |
| High Availability; 1, The proposed system shall have built-in high | | |
| availability (HA) features without extra cost/license.; 2, The | | |
| device shall support stateful session maintenance in the event | | |
| of a fail-over to a standby unit.; 3, High Availability | | |
| Configurations should support Active/Active or Active/ Passive, | | |
| Warranty; 1, Warranty and support for 5 years; 2, Support | | |
| includes latest patch updates, OEM should be having the | | |
| following certifications/Ratings; 1, Firewall module should be | | |
| EAL 4 certified, Centralized Logging & Reporting Solution; 1, The | | |
| solution should deliver complete security oversight with | | |
| granular graphical reporting; 2, The solution should provide | | |
| centralized security event analysis, forensic research, reporting, | | |
| content archiving, data mining and malicious file quarantining.; | | |
| 3, The solution should provide detailed data capture for forensic | | |
| purposes to comply with policies regarding privacy and | | |
| disclosure of information security breaches.; 4, The solution | | |
| should analyze user traffic behaviour and identify compromised | | |
| users/computers; 5, The solution should provide network event | | |
| correlation to allow administrators to quickly identify and react | | |
| to network security threats across the network.; 6, The solution | | |
| should provide streamlined graphical network-wide reporting of | | |
| events, activities and trends occurring on UTM / NGFW; 7, The | | |
| solution should provide centralized logging of multiple record | | |
| types including traffic activity, system events, viruses, attacks, | | |

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| | Web filtering events, and messaging activity/data; 8, The solution be able to provide real-time and historical logs with filtering and search capabilities; 9, The solution should be able to displays a map of the world that shows the top traffic destination country by colour; 10, The solution should provide predefined templates for building / generating reports; 11, The solution should be able to collect logs from multiple devices; 12, The solution should support Out-of-the-box playbook templates for enabling SOC analysts to quickly customize the use case, including playbooks for investigation of infections, compromised hosts, critical incidents, data enrichment for viewing Assets and Identity blocking of malware, C&C IPs; 13, The solution should be able to send alert emails; 15, The solution should be able to send alert emails; 15, The solution should be able to manually generate the report or schedule the same; 16, The solution should be able to generate report based on user names; 17, The solution should be able to process 50 Gb logs per day; 18, The solution should be having minimum 8 TB log storage capacity after configuring RAID for data protection.; 19, Logging & Reporting architecture shall be hardware or software-based appliance/ VM based solution and the hardware for the solution must be supplied by the bidder. | | |
|----|---|---|--|
| 11 | 10G/25G Switch - Device should have non-blocking architecture with wire speed L2 and L3 forwarding, : , Device should have 48 x 1/10/25G SFP28 ports supporting RS-FEC and FC-FEC as per IEEE 802.3by compliance, ; Device should have 8 x 40/100G QSFP28 ports with support breakout to provide additional 16 number of 10/25/50G interfaces, ; Device should have total Throughput of 4Tbps and latency packet forwarding less than 850 nanoseconds, ; Device should support copper Base-T (1G & 10G) connectivity over CAT6 cable and 1G, Dual rate 10G/25G SFP+ fiber connectivity over MM and SM cable, ; Device should support upto 250K MAC address, ; Device should support upto 256K IPv4 Prefix routes, ; Device should support Unified Forwarding Table (UFT) feature to flexibility allocate forwarding table resources to address different type of use cases, ; Device should have Max power draw of upto 315W, ; Shall support active/active layer2/Layer3 multipathing redundancy with Multi-chassis Link Aggregation (MLAG) or equivalent technology while keeping control plane and management plane distributed, ; L2 features, ; Device should support 4K VLANs, 9216 Jumbo frames, ; Device should support MST, per-vlan, RSTP, BPDU | 7 | |

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| Guard, Loop Guard, ; Device should support port ACL with 12, L3 | | |
|--|--|--|
| and L4 parameters, ; Device support LLDP and LACP to bundle | | |
| links and detect miscabling issues, ; Device Should support IEEE | | |
| 802.1D, 802.1Q, Q-in-Q, 802.1w, 802.1s and 802.1x, ; L3 | | |
| features, ; Device should support Routing Protocols: OSPFv2 | | |
| with multiple instances, OSPFv3, BGP, MP-BGP, IS-IS, and RIPv2, | | |
| ; Device Should support graceful restart for BGP, OSPF v2 and v3 | | |
| and ISIS, ; Device Should support BFD inclusive of BFD for Lag | | |
| links, BFD for V4 and V6 VRF, Multi-hop BFD and BFD on IP | | |
| unnumbered interfaces, ; Device Should support Policy Based | | |
| Routing (PBR) for IPv4 and IPv6, VRRP V4 and V6, Resilient ECMP, | | |
| Unicast Reverse path forwarding (urpf), and Inter-VRF route | | |
| leaking, ; Device Should support Accumulated IGP Metric (AIGP), | | |
| BGP Monitoring Protocol (BMP) and BGP Prefix Origin Validation | | |
| with Resource Public Key Infrastructure (RPKI), ; Device should | | |
| support VXLAN+EVPN leaf-spine overlay technology supporting | | |
| type-1 to type-8 routes, ; Device should have support for | | |
| symmetric and asymmetric IRB with EVPN with distributed | | |
| gateway functionality, ; Device should support IPv4 and IPv6 | | |
| clients in EVPN based overlay network, ; Device should support | | |
| active-active EVPN multi-homing, ; Device should support | | |
| Dynamic NAT options like Many-to-Many NAT and Many-to-One | | |
| NAT (PAT) at line rate with no additional latency, ; Device | | |
| should support IGMP v2/v3,PIM-SM / PIM-SSM, Anycast RP (RFC | | |
| 4610), VRF Support for IP Multicast, Multicast Source Discovery | | |
| Protocol (MSDP) and IP Multicast Multipath, ; High availability, ; | | |
| Device should support Hitless upgrade & reloads in MLAG/Vpc | | |
| setup and standalone (non-stack) setup, without adversely | | |
| affecting the forwarding plane with sub second data outage | | |
| during upgrade, ; Device should support maintenance mode/ | | |
| Graceful insertion and removal (GIR) to isolate device from the | | |
| network in order to perform debugging or an upgrade while | | |
| gracefully steering traffic to peer nodes, ; Device should 1+1 | | |
| redundant & hot-swappable Fans with support for both front-to- | | |
| rear and rear-to-front airflow options, ; Device should support | | |
| 1+1 redundant & hot-swappable power with support for both AC | | |
| and DC power supply options, ; Device should support Low- | | |
| Memory mode wherein during out of memory condition the | | |
| device kills non-essential agents until the system recovers the | | |
| necessary amount of memory, ; security, ; Should support Storm | | |
| control and Control Plane protection (CoPP), ; should support | | |
| port ACL with 12, L3 and L4 parameters, ; should support limiting | | |

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| number of mac address on a link, ; Device should support | | |
|---|--|--|
| security-group based segmentation of hosts independent of the | | |
| network constructs like VLAN, VRF and NVO, ; Device should | | |
| protect against ARP and DHCP spoofing by ensuring that a port | | |
| will only permit IP and ARP packets with IP source addresses that | | |
| have been authorized, ; Device should support IEEE 802.1x | | |
| Authentication framework, MAC authentication, Dynamic VLAN | | |
| assignment, Dynamic ACL assignment and CoA, ; Device should | | |
| support multicast accounting to AAA servers, ; Management, ; | | |
| Device Should support secure Zero touch provisioning with | | |
| options to provision Certificates artifacts on the device when it | | |
| boots, ; should support tracking changes in MAC table, ARP, IPv6 | | |
| neighbor table and IPv4, v6 route table for troubleshooting | | |
| purpose, ; should support real time state streaming for advance | | |
| monitoring from day 1, ; Should Support telnet, industry | | |
| standard hierarchical CLI, SSHv2, HTTPS, SCP, SFTP, CLI task | | |
| scheduler and configuration session, ; should support NTP and | | |
| IEEE 1588 PTP (Transparent Clock and Boundary Clock), ; should | | |
| support SNMP v1/2/3 and OpenConfig model over | | |
| gRPC/Netconf, ; device should support Digital Optical | | |
| Monitoring (DOM), ; Device should support real time data | | |
| collection with sflow/netflow, ; Automation & Visibility, ; The | | |
| Device should monitor output queue lengths for all Device | | |
| interfaces and Log and stream events related to congestion, ; | | |
| The Device should automatically mirror traffic queued in event | | |
| of congestion/latency or micro burst and send mirrored traffic | | |
| to CPU, directly connected server and remote server as per | | |
| usecase, ; Device should support multi OEM hypervisor | | |
| environment and should be able to sense movement of VM and | | |
| configure network automatically, ; Device should support | | |
| capturing of information around dropped packet events with | | |
| associated reasons and details which can be streamed out using | | |
| a open communication protocol like gRPC or equivalent, ; The | | |
| Device should have OpenStack Neutron for ML2 integration with | | |
| EVPN VXLAN control plane support, ; Device should support | | |
| advanced mirroring features: Mirror to CPU, ACL filters and | | |
| truncation on Mirror sessions, and tunneling of mirror packets to | | |
| remote servers, ; Should support measure the two-way metrics | | |
| such as delay, jitter, packet loss rate between two network | | |
| elements using I wo-way Active measurement Protocol (I WAMP) | | |
| as per KFC 5357, ; should have programmability and automation | | |
| support with on board python, bash and docker containers, ; | | |

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| | QOS, ; should support 8 queues per port, ; should support priority queue, ; should support Weighted Fair Queue or Weighted round robin or equivalent, ; should support WRED and DSCP for CPU generated traffic, ; should support ACL based classification for QoS, ; Should support IEEE 802.1Qaz DCBX (Data Center Bridge Exchange), 802.1Qbb PFC (Priority-based Flow Control) and Explicit Congestion Notification (ECN), ; Should support rate limiting function like policing and shaping, ; Others, ; should be certified for NDcPP common criteria, ; should have IPv6 ready logo certification, ; should be 19" rack mountable with 4-post rail mount kit provided for easy installtion, ; Hardware replacement warranty and TAC support should be directly from the OEM. OEM email-id and India Contact support no. to be provided, ; Transceivers should be from Same OEM as of Device, ; Warranty, ; Warranty and support for 5 years | | |
|----|--|---|--|
| 12 | 1/10G Switch - 1/10G 10GBASE-T/Multi-Gigabit Ports Switch, : , Port Count: 24/48, ; Uplink: min 4 x 25Gb SFP28 Uplinks, ; Efficiency: Support RoCE, ; Features; ; Speed: 100M/1000M/2.5G/5G/10GBase-T, ; 1+1 Hot-swappable Power Supplies and 2+1 Smart Fans, ; Support QoS, OSPF, DHCP, BGP, VRRP, QinQ, ; Support ACL, RADIUS, TACACS+, DHCP Snooping, etc. for Security, ; Warranty, ; Warranty and support for 5 years. | 5 | |
| 13 | System Integration - Installation, configuration, testing and commissioning of HPC facility. | | |

Sign of bidder:_____

Date:

_____ Name of the bidder:-_____ Firm's Name:-_____

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*** The above annexure is only for reference purpose. Any discrepancy in the quoted rate between the BOQ in excel format and Annexure XI, the rate quoted in the excel format will prevail for finalizing the contract.

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Annexure XII

DATA SHEET TO BE SUBMITTED BY THE BIDDER

| SI No. | Name of the equipment and Model | Detailed data sheet to be attached as annexures (1n) | Remarks |
|-----------|------------------------------------|--|---------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| Sign of bidder: | | |
|---------------------|--|--|
| Date: | | |
| Name of the bidder: | | |
| Firm's Name: | | |
| | | |

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Annexure XIII

FORMAT FOR BANK GUARANTEE

(ON NON-JUDICIAL STAMP PAPER OF Rs.200/-)

To: (Name and address of Owner)

••••••

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as (Retention amount / Security deposit as applicable) for compliance with the Contractor's contractual obligations in accordance with the Contract.

AND WHEREAS we (Name of Banker) have agreed to give the Contractor a Guarantee:

THEREFORE WE hereby affirm that we are Guarantors and responsible to you, on behalf of the Contractor, up to a total of (Amount of the Guarantee in Words and Figures) such

sum being payable in the types and proportions of currencies in which the Contract Price is payable, and we undertake to pay you, upon your first written demand declaring the Contractor

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to be in default under the Contract and without cavil or argument, any sum or sums within the limit of

...... (Amount of Guarantee) as aforesaid, without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

This guarantee is valid until the day of 20...

Signature and Seal of Guarantors

..... 20...

Name of Bank:

Address:

.....

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