भारतीय प्रौद्योगिकीसंस्थानमद्रासचेन्नै 600 036
INDIAN INSTITUTE OF TECHNOLOGY MADRAS Chennai 600 036
भंडार एवं क्रय अनुभाग
STORES & PURCHASE SECTION
दूरभाष: (044) 2257 8285 / 8290 / 8287 / 8288 फैक्स: (044) 2257 8292 / 2257 8082
Telephone : (044) 2257 8285/8290/8287/8288 FAX: (044) 2257 8292/2257 8082
email ID- adstores@iitm.ac.in
GST IN : 33AAAAI3615G1Z6

G. Chitrapavai
Deputy Registrar (Stores & Purchase)

Dated : 28.12.2018

Tender No. IITM/SPS /CC/HYPERCONVERGED/007/2018-19

Dear Sirs,

On behalf of the Indian Institute of Technology Madras, Tenders are invited for the purchase of Hardware and software for

"Hyper Converged Infrastructure and Private Cloud"

confirming to the specifications enclosed.

Tender Documents may be downloaded from Central Public Procurement Portal https://etenders.gov.in/eprocure/app Aspiring Bidders who have not enrolled / registered in e-procurement should enroll / register before participating through the website https://etenders.gov.in/eprocure/app. The portal enrolment is free of cost. Bidders are advised to go through instructions provided at **"Help for contractors".** [Special Instructions to the Contractors/Bidders for the e-submission of the bids online through this eProcurement Portal"].

Tenderers can access tender documents on the website (For searching in the NIC site, kindly go to Tender Search option and type 'IIT'. Thereafter, Click on "GO" button to view all IIT Madras tenders). Select the appropriate tender and fill them with all relevant information and submit the completed tender document online on the website https://etenders.gov.in/eprocure/app as per the schedule attached.

No manual bids will be accepted. All quotation both Technical bid and Financial bid should be submitted in the E-procurement portal.

1	**LAST DATE for receipt of Tender**	**:**	**17.01.2019 before 02.00 p.m.**
	Date & Time of opening of Tender	**:**	**18.01.2019 at 03.00 p.m.**
	Pre bid meeting :	**:**	**04.01.2019 @ 03.30 pm** **Venue : Conference Room, 2nd floor, Admin Building** **If you need more clarification on this tender documents or specifications of the equipment, you are invited to attend the pre bid meeting.** All necessary clarifications will be provided as deemed necessary by the special purchase committee to the prospective vendors during the pre-bid meeting. No clarifications will be entertained after the minutes of the pre-bid meeting are posted on the tenders.iitm.ac.in portal. Each solution provider is requested not to have more than two persons to represent their company in the meeting.
			As per the directives of Department of Expenditure, this tender document has been published on the Central Public Procurement Portal URL: https://etenders.gov.in/eprocure/app

A	**Submission of Tender**	**:**	The bidders are required to submit soft copies of their bids electronically on the CPP Portal, using valid Digital Signature Certificates. The instructions given below are meant to assist the bidders in registering on the CPP Portal, prepare their bids in accordance with the requirements and submitting their bids online on the CPP Portal. More information useful for submitting online bids on the CPP Portal may be obtained at: https://etenders.gov.in/eprocure/app Both Technical Bid & Price Bid should be submitted separately in online CPP portal as per the specified format only. Right is reserved to ignore any tender which fails to comply with the above instructions. **No manual bid submission is entertained.**
B	**Instructions for online bid submission**	**:**	**REGISTRATION** i. Bidders are required to enroll on the e-Procurement module of the Central Public Procurement Portal URL:https://etenders.gov.in/eprocure/appby clicking on "Online Bidder Enrollment". Enrolment on the CPP Portal is free of charge. ii. As part of the enrolment process, the bidders will be required to choose a unique username and assign a password for their accounts. iii. Bidders are advised to register their valid email address and mobile numbers as part of the registration process. These would be used for any communication from the CPP Portal. iv. Upon enrolment, the bidders will be required to register their valid Digital Signature Certificate (Class II or Class III Certificates with signing key usage) issued by any Certifying Authority recognized by CCA India (e.g. Sify / TCS / nCode / eMudhra etc.) v. https://etenders.gov.in/eprocure/app?component=%24DirectLink&page=DSCInfo&service=direct&session=Twith their profile. vi. Only one valid DSC should be registered by a bidder. Please note that the bidders are responsible to ensure that they do not lend their DSCs to others which may lead to misuse. vii. Bidder then logs in to the site through the secured log-in by entering their user ID / password and the password of the DSC / eToken.
Guidelines, Terms and Conditions of Tender			
C	**Searching for tender documents**	**:**	i. There are various search options built in the CPP Portal, to facilitate bidders to search active tenders by several parameters. These parameters could include Tender ID, organization name, location, date, value, etc. There is also an option of advanced search for tenders, wherein the bidders may combine a number of search parameters such as organization name, form of contract, location, date, other keywords etc. to search for a tender published on the CPP Portal. ii. Once the bidders have selected the tenders they are interested in, they may download the required documents / tender schedules. These tenders can be moved to the respective **"My Tender"** folder. This would enable the CPP Portal to intimate the bidders

				through SMS / email in case there is any corrigendum issued to the tender document.
			iii.	The bidder should make a note of the **unique Tender ID** assigned to each tender, in case they want to obtain any clarification / help from the Helpdesk.
D	**Preparation of bids**	**:**	i.	Bidder should take into account any corrigendum published on the tender document before submitting their bids.
			ii.	Please go through the tender advertisement and the tender document carefully to understand the documents required to be submitted as part of the bid. Please note the number of covers in which the bid documents have to be submitted, the number of documents including the names and content of each of the document that need to be submitted. Any deviations from these may lead to rejection of the bid.
			iii.	Bidder, in advance, should prepare the bid documents to be submitted as indicated in the tender document / schedule and generally shall be in PDF / XLS formats as the case may be. Bid documents may be scanned with 100 dpi with black and white option.
			iv.	To avoid the time and effort required in uploading the same set of standard documents which are required to be submitted as a part of every bid, a provision of uploading such standard documents (e.g. PAN card copy, GSTIN Details, annual reports, auditor certificates etc.) has been provided to the bidders. Bidders can use **"My Documents"** area available to them to upload such documents. These documents may be directly submitted from the "My Documents" area while submitting a bid, and need not be uploaded again and again. This will lead to a reduction in the time required for bid submission process.
			v.	**All the technical related documents need to be uploaded in Technical bids for evaluation purpose.**
E	**Submission of bids**	**:**	i.	Bidder should log into the site well in advance for bid submission so that he/she upload the bid in time i.e. on or before the bid submission date and time. Bidder will be responsible for any delay due to other issues.
			ii.	The bidder has to digitally sign and upload the required bid documents one by one as indicated in the tender document.
			iii.	Bidder has to select the payment option as "Off-line" to pay the EMD as applicable. The original EMD DD has to reach IIT Madras on or before the closure date and time of the tender. If the DD is not received before the closure date and time the tender will be summarily rejected. **The EMD document submitted physically to IIT Madras and the scanned copies furnished at the time of bid submission online should be the same otherwise the tender will be summarily rejected.**
			iv.	A standard BOQ format has been provided with the tender document to be filled by all the bidders. Bidders are requested to note that they should necessarily submit their financial bids in the format provided and no other format is acceptable. Bidders are required to download the BOQ file, open it and complete the detail with their respective financial quotes and other details (such

				as name of the bidder).If the BOQ file is found to be modified by the bidder, the bid will be rejected. v. The server time (which is displayed on the bidders' dashboard) will be considered as the standard time for referencing the deadlines for submission of the bids by the bidders, opening of bids etc. The bidders should follow this time during bid submission. vi. The **Tender Inviting Authority (TIA)** will not be held responsible for any sort of delay or the difficulties faced during the submission of bids online by the bidders due to local issues. vii. The uploaded tender documents become readable only after the tender opening by the authorized bid openers. viii. Upon the successful and timely submission of bids, the portal will give a successful bid submission message & a bid summary will be displayed with the bid no. and the date & time of submission of the bid with all other relevant details. ix. Kindly add scanned PDF of all relevant documents in a single PDF file of compliance sheet.
F	**Assistance to bidders**	**:**	i. Any queries relating to the tender document and the terms and conditions contained therein should be addressed to the Tender Inviting Authority for a tender or the relevant contact person indicated in the tender. ii. Any queries relating to the process of online bid submission or queries relating to CPP Portal in general may be directed to the 24x7 CPP Portal Helpdesk. The contact number for the helpdesk is [0120-4200462, 0120-4001002, 0120-4001005]	
G	**General Instructions to the Bidders**	**:**	i. The tenders will be received online through portal https://etenders.gov.in/eprocure/app. In the Technical Bids, the bidders are required to upload all the documents in pdf format. ii. Possession of a Valid Class II/III Digital Signature Certificate (DSC) in the form of smart card/e-token in the company's name is a prerequisite for registration and participating in the bid submission activities throughhttps://etenders.gov.in/eprocure/app iii. Digital Signature Certificates can be obtained from the authorized certifying agencies, details of which are available in the web sitehttps://etenders.gov.in/eprocure/appunder the "Information about DSC".	
H	**Opening of the tender**	**:**	The online bid will be opened by a committee duly constituted for this purpose. Online bids (complete in all respect) received along with scanned copy of EMD (if any) will be opened as mentioned at "Annexure: Schedule". Bid received without EMD (if present) will be rejected straight way. The technical bid will be opened online first and it will be examined by a technical committee (as per the eligibility criteria, specification and requirement). The financial offer/bid will be opened only for the offer/bid which technically meets all requirements as per the specification.	
I	**Earnest Money Deposit (EMD)**	**:**	i. **EMD for Rs.3,00,000 /-has to be paid by means of DD only. The scanned copy of DD to be uploaded in the online portal and the**	

			original DD should reach us on or before the due date and time. ii. **The original EMD DD should be sent either by REGISTERED POST ACKNOWLEDGEMENT DUE OR THROUGH MESSENGER**. If the original EMD DD is sent through Messenger, the same has to be dropped in the **TENDER BOX marked Stores & Purchase** kept for this purpose in the **REGISTRAR'S OFFICE (1st Floor of Administrative Building) on or before due date 17.01.2019 before 02.00 p.m.** iii. If it is by post (Registered Post or Speed post only) the same should reach **on or before due date 17.01.2019 before 02.00 p.m.** otherwise it will be summarily rejected even if the scanned copy of the DD is enclosed in e-bid. iv. Demand Draft may be drawn in favour of "**The Registrar, IIT Madras**" payable at Chennai. The original EMD should be sent to: **The Registrar** **INDIAN INSTITUTE OF TECHNOLOGY MADRAS** **CHENNAI-600 036** v. **5% Performance Guarantee** of the order value has to be submitted by way of DD/Bank Guarantee by the successful bidder only. vi. **Non submission of original EMD DD on or before the due date and time will result in rejection of the e-bid even if the proof of the DD attached in the e-bids submitted by the vendor.** vii. The EMD will be returned to all tenderer only after the tenders are finalized. In case of successful tenderer, Performance Guarantee will be retained till the installation and completion of warranty period.
J	**Marking on Technical Bid**	**:**	i. The technical specification for this tender is given in **Annexure A** The tenderer shall go through the specification and submit the technical bid. ii. The Technical bid should be submitted in the proforma given as per **Annexure B in pdf format only through online (e-tender). No manual submission of bid is entertained.** iii. The current set up of the existing system is briefed in the **Annexure D** of the tender document. iv. The technical bid shall include a detailed billof materials (BOM). The BOM shall cover all the items detailed in this document and any other items that are required to complete the solution as deemed by the solution provider. A declaration from the solution provider is required stating that"all minor accessories for completing the commissioning of the solution are included in the BOM and no additional items are necessary". v. All technical bid should have the page-wise **heading as "Technical Bid" and page no.** in all pages with seal and signature of authorized signatory. The total no. of pages should be mentioned at the last page of the documents. vi. The technical bid should consist of all technical details along with catalogue/brochureand other technical, commercial terms and

			conditions. vii. The technical bid shall include list of all the technical specifications (item number), compliance (yes/no/partial-with-comments) and the details of documentary evidences attached (document, page number/ para for reference). Lack of supporting documentary evidence for compliance of any technical specification will be deemed as non-compliance.
K	**Marking on Price Bid**	**:**	**i.** Price bid should be submitted in the prescribed proforma **Annexure – C as per BOQ in PDF** format through e-tender only. **No manual submission of bid is entertained.** ii. Price bid should indicate item-wise price <u>for all the items</u> mentioned in the price bid. iii. Total value in the price bid should be indicated in figures & words clearly. **iv. Quotes must be for all the options. The choice of the options for the solution rests with IIT Madras**
2	**Preparation of Tender:** a) You should quote your product as per our specification requirements by mentioning our requirements and your offer side by side and the rate should be in total as per our requirements. We will not make any calculation if you have mentioned the rates of items separately. b) The offer/bids should be submitted through online only in two bid system i.e. Technical Bid and Price Bid separately. c) The online technical bid will be first opened and evaluated. In the screening, the Vendor Eligibility Criteria and technical evaluations as per **<u>ANNEXURE – A and B</u>** will be evaluated. The Price bid of only those bidders whosevendoreligibility criteria and technical compliance are found to be adequate by the Committee will be opened.		
3	**Signing of Tender:** The Tender is liable to be rejected if complete information is not given therein or if the particulars and date (if any) asked for in the schedule to the Tender are not fully filled in or not duly signed/authenticated. Specific attention is drawn to the delivery dates and terms and conditions enclosed herewith. **Each page of the technical bid required to be signed and bears the official seal of the tenderers.** If the application is made by a firm in partnership, it shall be signed (with seal)by all the partners of the firm above their full typewritten names and current addresses or alternatively by a partner holding power of attorney for the firm in which case a certified copy of the power of attorney shall accompany the application. A certified copy of the partnership deed along with current addresses of all the partners of the firm shall also accompany the application. If a limited company or a corporation makes the application, it shall be signed by a duly authorized person holding power of attorney for signing the application, in which case a certified copy of the power of attorney shall accompany the application. Such limited company or corporation may be required to furnish satisfactory evidence of its existence. The applicant shall also furnish a copy of the Memorandum of Articles of association duly attested by a Public notary.		
4	**Period for which the offer will remain open:** i. Firms tendering should note the period for which it is desired that their offers should remain open for acceptance. If the firms are unable to keep their offers open for the specified period they shouldspecifically state the period for which their offers are being provided, however, the day up to which theoffer is to remain open being declared closed holiday for the Indian Institute of Technology Madras, theoffer shall remain open for acceptance till the next working day. ii. Quotations qualified by such vague and indefinite expressions such as 'subject to immediate acceptance', 'subject to prior sale' will not be considered. iii. The Tender shall remain open for acceptance/validity till:**120 days from the date of opening of the**		

	tender
5	**Prices:** i. The prices quoted must be nett. per unit as per the technical specification mentioned in **Annexure B** and must include all Shipping, Handling, etc.. **The prices quoted by the Tenderer should be inclusive of GST and other statutory levies** (and should be clearly stated to be so) which will be paid by the Purchaser/if legally leviable at the rate ruling on the date of supply as specified in the Acceptance of Tender. **The percentage of tax etc. included in the price should be indicated in clear terms**. **If the inclusive price is not given, we will treat your offered rate as inclusive rate and comparison be made with others.** If at the time of comparison of your offer without taxes etc. is happen to be lowest, you are bound to supply as per the offered rate, i.e. without taxes etc. ii. All prices in the financial bid should be either in USD or INR or a combination of both. Prices shall be CIF Chennai. If a mix of USD and INR are used in the financial bid, a conversion rate taken from the RBI website will be used to arrive at a total figure in INR for all the bids. Conversion rate will be taken on the date of closing of tender. iii. **Concessional GST :**IIT Madras is eligible for concessional GST @ 5% on IGST and @ 2.5% for CGST and SGST as per Notification No. 45/2017 – Central Tax (Rate) Dated 14th November 2017 & Notification No.47/2017 – Integrated Tax (Rate) Dated 14th November 2017, for procurement of Equipments and Consumables for research purpose. At the time of Invoicing, please state the concessional GST accordingly. During the supply of item, a certificate to this effect will be issued to your firm. iv. "In case of CIF/CIP shipments, kindly provide the shipment information at least 2 days in advance before landing the shipment along with the documents i.e. invoice, packing list, forwarder Name, address, contact No. in India to save penalty/demurrage charges (imposed by Indian Customs) . Otherwise these charges will be recovered from the supplier/Indian Agent." V. Hence you are requested to be careful while quoting for tender. The price should be without customs duty since IIT Madras is eligible for payment of concessional customs duty against submission of Essentiality Certificate. The customs duty will be payable / reimbursable by us at the time of clearance on production of necessary proof. Hence these duties need not be included in the price while quoting. Necessary document will be provided at appropriate time. **No price revision, changes in the specification already given or changes in the terms and conditions etc. during the period is acceptable.** vi. Discount, if any, should be indicated prominently.
6	**Agency Commission:** Agency commission if any will be paid to the Indian agent in Rupees on receipt of the equipment and after satisfactory installation and commissioning. Agency Commission will not be paid in foreign currency under any circumstances. The details should be explicitly shown in Tender even incase of Nil commission. The tenderer should indicate the percentage of agency commission to be paid to the Indian agent. Percentage of agency commission should be clearly mentioned in the price bid.
7	**Payment: No Advance Payment will be made for Indigenous purchase.** Payment will be made only after supply and satisfactory installation and also technical clearance from Computer Centre, IITM.The vendor must supply soft copy & Hardcopy of wiring diagram after completion of the work. **Import Payment:** Normally for more than USD 2001, payment will be made by Letter of Credit only. 90% payment will be made initially by Letter of Credit and balance 10% will be paid only after satisfactory installation and commissioning on the same LC. **Demurrage charges (if any) will be deducted from the balance 10%**. Initial opening of Letter of Credit charges will be borne by us. If any amendment is requested for, the charges for the amendment will be borne by the supplier only. Hence, care should be taken in all respects before opening of Letter of Credit.
8	**Terms and conditions :** Failure to comply with any of the instructions stated in this document or offering unsatisfactory explanations for non compliance will likely to lead to rejection of offers.
9	**Right of Acceptance:** IIT MADRAS reserves the right to reject the whole or any part of the Tender without assigning any reason or to accept them in part or full.The institute reserves the right to choose any one of the options from the specifications given.
10	**Communication of Acceptance:** Acceptance by the Purchaser will be communicated by Post, if required, and the Company's acceptance communicated to us formally in writing.

11	**Warranty and Support:** [1] All the hardware and software should be quoted with 5 years warranty. [2] Bidder shall have back to back agreement with OEM for one day part replacement for 5 years [3] Bidder should also quote for AMC for the 6th year [4] Support shall be for the duration of warranty. [5] Support proposal should include the time frame to resolve the problem by OEM / Solution Provider. [6] Periodic maintenance shall be included. [7] Report shall be submitted every month. [8] Training shall be imparted to the IITM staff, should be briefed
12	**Delivery Period**: Items should be delivered **within 4 to 6 weeks**from the date of P.O/ Award of Contract (AOC). Please indicate the actual delivery period clearly. No further extension of time will be allowed. **Non delivery of items** will lead to cancellation of Purchase Order without any notice. In addition, action may be taken for removing them from our mailing list.
13	In terms of Rule 173 (iv) of General Financial Rules, 2017 the bidder shall be at liberty to question the bidding conditions, bidding process and/or rejection of its bid.
14	**Conditions of Contract and Deviations:** Tenderer should quote as per the terms and conditions referred to in the tender documents. In case, these terms and conditions are not acceptable to the tenderer, he should specifically state the deviation(s) as a separate document.
15	**Transit Insurance:** The Purchaser will not pay separately for Transit Insurance.
16	**Tenderer shall submit along with his Tender:** Name and full address of the Banker and their swift code and PAN No. and GSTIN number.
17	**Guarantee:** The tenderer has to declare that the goods sold to the buyer under this contract shall be of the best quality and workmanship and shall be strictly in accordance with the specifications. Tenderer should indicate the period for which the said goods/articles would continue to confirm to the specifications.
18	**Jurisdiction:** All questions, disputes, or differences arising under, out of or in connection with the contract, if concluded, shall be subject to the exclusive jurisdiction at the place from which the acceptance of Tender is issued.
19	**Force Majeure:** The Supplier shall not be liable for forfeiture of its performance security, liquidated damages or termination for default, if and to the extent that, it's delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force Majeure. • 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 limited to, acts of the Purchaser either in its sovereign or contractual capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions and freight embargoes. • If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such conditions and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by theForce Majeure event.
20	**Risk Purchase Clause:** In event of failure of supply of the item/equipment within the stipulated delivery schedule, the purchaser has all the right to purchase the item/equipment from the other source on the total risk of the supplier under risk purchase clause
21	**Award of Contract:** The order will be awarded to the L1 firm who has fulfilled all vendor eligibility criteria and technical specification mentioned in the Annexure A of the tender document. The total price will be arrived by adding the Table 1 and one selected options among A, B and C mentioned in the Table 2 of the Annexure C. The technical committee will select the one option among the three after opening the price bid.

21	**<u>For Technical Related Queries Contact :</u>** All queries and clarification with regard to technical specification and other terms and conditions should be mailed to sanand@iitm.ac.in prior to the pre-bid meeting and it will be addressed during the pre-bid meeting. **Mr. S. Anandkumar** **Assistant Systems Engineer** **Computer Centre, IIT Madras** **Chennai - 600 036.Phone No: 044- 2257 4987**

Yours Faithfully

-sd/-

Deputy Registrar

(Stores & Purchase Section)

ACKNOWLEDGEMENT

It is hereby acknowledged that I/We have gone through all the points listed under "Specification, Guidelines, Terms and Conditions" of tender document. I/We totally understand the terms and conditions and agree to abide by the same.

SIGNATURE OF TENDERER ALONG WITH
SEAL OF THE COMPANY WITH DATE

DECLARATION

I/We/ M/s. _____ hereby declare that detailed BoM has been included in the technical bid and all minor accessories for completing the commissioning of the solution are included in the BoM and no additional items are necessary.

SIGNATURE OF TENDERER ALONG WITH
SEAL OF THE COMPANY WITH DATE

ANNEXURE – A

I. VENDOR ELIGIBILITY CRITERIA :

S. No	Hyper converged infrastructure and Private Cloud specifications
I.VENDOR ELIGIBILITY CRITERIA: The vendor participating in the bidding process and interacting directly with IIT Madras is referred here as "Solution Provider". Only those solution providers are qualified to participate in the bidding process who satisfy the following criteria. Documentary support for each of these criteria are to beenclosed along with the technical bid.	
1.1	The hardware components that are being procured as part of this tender are to be from the original equipment manufacturers referred here as OEMs.
1.2	The solution provider must be a Premium Solution partner for providing solution to IITM. The partnership must be active during the period of the tender process.
1.3	The solution provider must have minimum 2 certified engineers as part of its technical team for the proposing solution.The capability must be present during the period of the tender process**.**
1.4	The solution provider must have executed minimum of 1 such project for the proposed solution of value greater than 1 Crore in any government/PSU/IIT's
1.5	The solution provider should produce the proof of sign off of the project executed.
1.6	The solution provider should provide a resident engineer for a period of one year, after the date of acceptance.
1.7	The solutionprovider musthaveimplementedcommissioning of thespecifichardwareitemsfromtheOEMpartnersatleast1 timeearlier.
1.8	The solutionprovider musthavebusiness representationofficeinChennai to helpwith thecallcoordination.
1.9	EachOEM should nominate only onesolutionproviderforthistender.
II.Solution Specification	
2.1	The proposed solution should be a Hyper Converged appliance that comes preinstalled with various software including SDS, replication with management and associated hypervisor. It should include all hardware and software necessary to ensure high availability mode of operation. The proposed hyper converged system should have Single Management Console to manage integrated Compute, Storage and Hypervisor. All nodes must be HCI nodes.
2.2	Technology must be software defined and the solution should provide enterprise-class storage services using latest x86 server infrastructures without dependence on a separate Storage Area Network & associated components such as SAN Switches & HBAs
2.3	The proposed Server Nodes, appliance, Hypervisor software & HCI software should be leader in Gartner/Forrester latest Report. Should be in top 5 in the Gartner Quadrant.
2.4	The storage solution with the HCI should either have inbuilt software defined storage capability integrated within the Hypervisor kernel itself or should use a virtual storage controller architecture.
2.5	Hypervisor software shall provide a Hypervisor layer that sits directly on the bare metal server hardware with no dependence on a general purpose OS for greater reliability and security. It should be Industry Standard software and no special purpose software is allowed. Proposed Hypervisor software should be in the latest MQ of Gartner
2.6	The HCI solution should be able to scale by support of adding additional nodesto the cluster at a later point of time to handle compute, Memory & Storage requirements. Solution should support cluster expansion with zero down time.
2.7	Datacompression/deduplication/erasure coding techniques should be available with licenses (if applicable) in the Software Defined Storage (SDS) layer for use without additional cost.

2.8	The HCI solution must be able to survive single node failures and it should in no way affect/degrade the production services & usable resources to the end user application hence HCI solution should be proposed in N+1 configuration, even if one node fails, the remaining nodes should provide user application the specified number of usable physical cores, usable RAM & usable storage capacity as mentioned
2.9	The HCI solution should provide seamless upgrade for Firmware, Hypervisor, Storage OS, SDS software, BIOS and other such functions which are required in the HCI platform. The upgrade should be online and should not mandate any kind of OEM engagement
2.10	The HCI solution should include 3rd party Enterprise Backup Solution (granular). It should be a perpetual / Capacity based license. Backup vendor should be listed as Leader in Gartner/ Forrester latest reports. Solution should be provided with Disk Based Backup target. It should be licensed for minimum of 50 TB backup space.
2.11	The HCISolution should provide a backup catalog to allow any Virtual Server to be recovered to any specific point-in-time; Data recovery process should be simple with an RTO within 5 minutes
2.12	The HCI solution must provide the following Disaster Recovery features and all licenses should be included from day 1. (a) The solution must provide a simple failover operation (b) The solution must allow creation of a Run book to automate recovery of Virtual Servers (c) The solution must allow the option to test DR Failover to separate network with no impact to production workloads
2.13	The HCI solution should have feature to assist in failback process to Primary datacenter.DR should also be proposed which should have all HCI features as in DC.DR proposed would be at 50% of DC.
2.14	The HCI solution should support to connect external storage devices (like NAS, SAN etc.) and should be useable as part of the HCI Solution, for the purpose of Backup.
2.15	HCI solution should provide High Availability & It should support features like snapshots & cloning of individual virtual machines.
2.16	HCI solution should support live migration of running virtual machines from one physical node to another with zero downtime, continuous service availability, and complete transaction integrity transparent to users.
2.17	Dashboard to manage and provision virtual machines, network, storage, monitor performance and manage events & alerts. It should also contain a dashboard for monitoring & generate reports.
2.18	The HCI solution should have a management console for managing compute, Network, Storage and Clustering. The HCI Solution should be able to give insight of underlying infrastructure like compute, storage and network.
2.19	In the event of a node failure, virtual machines should automatically run on another node.
2.20	HCI solution should include Redundant 10G switches providing minimum 32 ports (referred as 'HCI Switch') with minimum 4*10G ports for uplinks per switch.
2.21	All the required cables & modules for connecting all HCI nodes to HCI switch in redundant fashion to be supplied from day one.
2.22	Bidder must quote appropriate license to enable and meet mentioned features in the infrastructure automation architecture.
2.23	HCI Solution should provide additional Server & Management software license for the proposed solution. Management software should be capable enough to manage additional VM inventories too.
2.24	All licenses required for Memory and Storage upgradation with-in the provided solution should be included from Day-1
2.25	HCI solution has to integrate with active directory (AD) /open LDAP to allow importing existing users and groups in addition to creation of local users.
2.26	HCI solution should include an application and infrastructure performance management tool quoted as part of the solution to improve operations and provide deep infrastructure performance insight.
2.27	Migration of existing setup should be done during post office hours with minimal downtime.

2.28	The solution provider may opt to propose to renew/upgrade the existing hypervisor licenses at datacenter to facilitate the requirement
2.29	HCI solution should be capable of increasing the resources such as (RAM,CPU and storage) online.
2.30	HCI solution should have the capability to connect to any public cloud
2.31	HCI solution should support USB dongle based license server.

III.Servers :

Inthisandsubsequentsections,optionsarelistedwithminorvariationinnumbers. Thedecisiononthe option tobepickedwillbemadeduringthefinalcomparisonofbidsandplacing oforder.Allvendorsare requested tobidforall the options in eachof themodules otherwise the bid will be considered as disqualified. The Institute reserves the right to accept or reject any or all of the offers in full/part without assigning any reason whatsoever. The institute reserves all rights to choose any one the options from the specification given.

The details of the options to be quoted in the technical and price bid are given below:

Options	Datacenter Server (Qty in Nos.)	Disaster Recovery Server (Qty in Nos.)
OPTION - A	4	3
OPTION – B	5	3
OPTION - C	6	3

The configuration of each server shall be compliant with the following specifications.

III. (a) TECHNICAL SPECIFICATIONFOR DATA CENTRE SERVER

MINIMUM HARDWARE SPECIFICATION – X86

Sl.No.		TECHNICAL SPECIFICATION
Make & Model		LENOVO/NUTANIX/CISCO/DELL/HPE/FUJITSU The Proposed Server OEM should be in Leaders Quadrant in Latest report of Gartner Modular Servers
1	Chipset	LewisburgPCHIntelC621orhigherconfiguration
2	FormFactor	Max.2Urackmountedwithslidingrails
3	ConfiguredCPU	2*Intel® Xeon® Gold 6130 Processor 16Core, Base frequency 2.1GHz, Turbo Frequency 3.70GHz, 22MB L3
4	Memoryslots	Minimum24TTruDDR4DIMMslotsRDIMMSsupportingspeedsofmin2666 MHz
5	Memoryconfigured	320GBDDR42666 MhzRAMscalableto1TBRAM Minimum
6	DisksSupported	Minimum of12nos. SAS/SATA/SSD
7	RAIDController	HCI Supported Raid Controller
8	DisksRequirement	**The Proposed Solution should support Dedupe and Compression from Day one ALL FLASH Configuration - Useable Storage should be as below after de-dup and compression** **Option – A – 100 TB** **Option – B – 130 TB** **Option – C – 150 TB** Hybrid Configuration - Useable Storage should be as below after de-dup and compression (15% of the storage should be on All Flash) Option – A – 100 TB Option – B – 130 TB Option – C – 150 TB (in both cases quoted per disk capacity should not be more than 4 TB)
9	DVD writer	Internal/External DVD-RW Optical DiskDrive
10	I/Oslots	Minimumof4xPCIeGen3Slots
11	Ethernetports	4x1GbpsBase-Tports(Optional), 4 x 10Gbps Base-T Ports, 1 Dedicated Management port (optional)
12	InterfacePorts	Minimum of1 VGA/Video Port,2xUSB2.0/USB3.0,dedicatedManagementPorts
13	CertificationandCompliances	MicrosoftWindowsServer,Hyper-V,VMWare,RedHatEnterpriseLinux(RHEL)
14	PowerSupply	PlatinumratedredundantPowerSupply
15	ManagementIntegration	SupportforintegrationwithMicrosoftSystemCenter,VMwarevCenter
16	Power& Temperature	Real-timepowermeter,graphing,thresholds,alerts&Temperaturemonitoring&graphing
17	Alert	Shouldprovidepredictivefailuremonitoring&proactivealertsofactualorimpendingcomponentfailureforfan,powersupply,memory,CPU,RAID,NIC,HDD
18	Configuration&Management (optional)	Real-timeout-of-bandhardwareperformancemonitoring&alertingAgent-freemonitoring,driverupdates&configuration,powermonitoring&capping,RAIDmanagement,externalstoragemanagement,monitoringofFC,HBA&CNA & systemhealthOut-of-bandhardware&firmwareinventoryVirtualIO management /statelesscomputingsystem
19	LCD/LEDpanel (Optional)	ShoulddisplaysystemID,statusinformationandsystemerror conditionsindifferentcolorsorstatusLED/LCDavailabletoindicatehealthofthe machine.
20	HTML5support	HTML5supportforvirtual console&virtualmedia withoutusingJavaorActiveXplugins

21	Server Security	Shouldprovideeffectiveprotection,reliabledetection&rapidrecoveryusing: a. SecuredefaultpasswordsPersistenteventloggingincludinguseractivity b. Securealerting c. AutomaticBIOSrecovery d. RapidOS recovery e. Systemerase
22	Warranty	a. 5Years24/7WarrantySupportwith 4HoursResponseTime for both Hardware and Software. b. BiddershouldprovideL1/L2OnsiteSupportforproposedserversincludinghardwareandsoftwarecomponents c. Back-alignssupportwithrespective to OEMmandatorilyduringwarrantyperiodandduringAMCperiod (Biddermustprovidedocumentaryproof)
23	End of Life	Alltheproductsquoted shouldbe ofthelatestgenerationandEndofLife shouldnot beannouncedfortheproductsandcomponentsbeingquoted.
24	Compliance justification	All the compliance should be justified with page numbers highlighted with markers and Book marks.

III (b) TECHNICAL SPECIFICATION FOR DISASTER RECOVERY SERVER

MINIMUM HARDWARE SPECIFICATION – X86

Sl No		TechnicalSpecification
Make&Model		LENOVO/NUTANIX/CISCO/DELL/HPE/FUJITSU The Proposed Server OEM should be in Leaders Quadrant in Latest report of Gartner Modular Servers
1	Chipset	LewisburgPCHIntelC621orhigherconfiguration
2	Form Factor	Max.2Urackmountedwithslidingrails
3	Configured CPU	2*Intel® Xeon® Gold 6130 Processor 16Core, Base frequency 2.1GHz, Turbo Frequency 3.70GHz, 22MB L3
4	Memory slots	Minimum24TTruDDR4DIMMslotsRDIMMSsupportingspeedsofmin2666 MHz
5	Memory configured	320GBDDR42666 MhzRAMscalableto1TBRAM Minimum
6	Disks Supported	Minimum of12nos. SAS/SATA/SSD
7	RAID Controller	HCI Supported Raid Controller
8	Disks Requirement	The Proposed Solution should support Dedupe and Compression from Day one ALL FLASH Configuration - Useable Storage should be as below after de-dup and compression Option – A – 50 TB Option – B – 65 TB Option – C – 85 TB Hybrid Configuration - Useable Storage should be as below after de-dup and compression (15% of the storage should be on All Flash) Option – A – 50 TB Option – B – 65 TB Option – C – 85 TB (in both cases quoted per disk capacity should not be more than 4 TB)
9	DVD writer	Internal / External DVD-RW Optical DiskDrive
10	I/O slots	Minimumof4xPCIeGen3Slots
11	Ethernet ports	4x1GbpsBase-Tports(Optional), 4 x 10Gbps Base-T Ports, 1 Dedicated Management port(optional)

12	Interface Ports	Minimum of1 VGA/Video Port,2xUSB2.0/USB3.0,dedicatedManagementPorts
13	Certification and Compliances	MicrosoftWindowsServer,Hyper-V,VMWare,RedHatEnterpriseLinux(RHEL)
14	Power Supply	Platinum rated redundant Power Supply
15	Management Integration	SupportforintegrationwithMicrosoftSystemCenter,VMwarevCenter
16	Power & Temperature	Real-timepowermeter,graphing,thresholds,alerts&Temperaturemonitoring&graphing
17	Alert	Shouldprovidepredictivefailuremonitoring&proactivealertsofactualorimpendingcomponentfailureforfan,powersupply,memory,CPU,RAID,NIC,HDD
18	Configuration &Management (optional)	Real-timeout-of-bandhardwareperformancemonitoring&alertingAgent-freemonitoring,driverupdates&configuration,powermonitoring&capping,RAIDmanagement,externalstoragemanagement,monitoringofFC,HBA&CNA & systemhealthOut-of-bandhardware&firmwareinventoryVirtualIO management /statelesscomputingsystem
19	LCD/LED panel (Optional)	ShoulddisplaysystemID,statusinformationandsystemerror conditionsindifferentcolorsorstatusLED/LCDavailabletoindicatehealthofthe machine.
20	HTML5 support	HTML5supportforvirtual console&virtualmedia withoutusingJavaorActiveXplugins
21	Server Security	Shouldprovideeffectiveprotection,reliabledetection&rapidrecoveryusing: a) SecuredefaultpasswordsPersistenteventloggingincludinguseractivity b) Securealerting c) AutomaticBIOSrecovery d) RapidOS recovery e) Systemerase
22	Warranty	a) 5Years24/7WarrantySupportwith 4HoursResponseTime for both Hardware and Software. b) BiddershouldprovideL1/L2OnsiteSupportforproposedserversincludinghardwareandsoftwarecomponents c) Back-alignssupportwithrespective to OEMmandatorilyduringwarrantyperiodandduringAMCperiod (Biddermustprovidedocumentaryproof)
23	End of Life	Alltheproductsquoted shouldbe ofthelatestgenerationandEndofLife shouldnot beannouncedfortheproductsandcomponentsbeingquoted.
24	Compliance justification	All the compliance should be justified with page numbers highlighted with markers and Book marks.

IV. BACKUP STORAGE – 50TB USEABLE CAPACITY WITH NL SAS DRIVES

Sl.No.	Attribute	Specification
1	Form Factor	2U12 LFF controller enclosure 2U rack mount.
2	Controller configuration	Dual active-active controller configuration with automatic load balancing.
3	RAID levels	RAID 0, 1, 3, 5, 6, and 10; Dynamic Disk Pools.
4	Controller cache	16 GB per system (8 GB per controller). Cache mirroring between the controllers. Flash-backed cache protection (includes battery for destaging to flash).
5	Drive bays	Should support Intermix of 2U24 SFF and 2U12 LFF enclosures
6	Drive technology	12 Gb SAS and NL SAS HDDs, 12 Gb SAS SSDs.
		Should support Intermix of HDDs and SSDs within a system
7	Drive expansion	2x 12 Gb SAS x4 (Mini-SAS HD SFF-8644) expansion ports on each of

	connectivity	two controllers in the controllerenclosure for the attachment of the expansion enclosures
		4x 12 Gb SAS x4 (Mini-SAS HD SFF-8644) expansion ports on each of two I/O modules in the expansion enclosure for the attachment to the controller enclosure and daisy chaining of the expansion enclosures.
8	Drives	Should support SSD, SAS, NL SAS Drives
9	Storage capacity	Scalable up to minimum 1PB200 TB
10	Host connectivity	Base ports (per controller enclosure with two controllers):
		4x 10 Gb iSCSI (DAC or SW fibre optics, LC) or 8/16 Gb FC (SW fibre optics, LC) SFP+ host ports (2 ports per controller)
		Optional additional ports on host interface cards (per controller enclosure with two controllers):
		4x 12 Gb SAS host ports (Mini-SAS HD, SFF-8644) (2 ports per controller)
		4x 1/10 Gb iSCSI RJ-45 host ports (2 ports per controller)
11	Host operating systems	Microsoft Windows Server 2012 R2 and 2016; Red Hat Enterprise Linux (RHEL) 7; SUSE Linux Enterprise Server (SLES) 12; VMware vSphere 6.0 and 6.5.
12	Standard software features	Dynamic Disk Pools, SSD read cache, snapshots (up to 128 targets), volume copy, thin provisioning (DDP only), and data assurance.
13	Optional software features	Snapshots (up to 512 targets), asynchronous mirroring.
14	Performance*	Minimum100 000 random read IOPS (4 KB blocks).
		Minimum 35 000 random write IOPS (4 KB blocks).
		Minimum 3 GBps sequential read throughput (64 KB blocks).
		Minimum 0.9 GBps sequential write throughput (64 KB blocks).
15	Cooling	Redundant cooling with the fans that are built into power supplies.
16	Power supply	Two redundant hot-swap 913 W (100 - 240 V) Platinum AC power supplies.
17	Hot-swap parts	Controllers, I/O modules, drives, power supplies, and SFP+ transceivers.
18	Management ports	1x 1 GbE port (UTP, RJ-45) per controller for out-of-band management.
		2x Serial console ports (RJ-45 and Micro-USB) for system configuration.
		In-band management via I/O path.
19	Management interfaces	System Manager web-based GUI; SAN Manager standalone GUI; SSH CLI; Serial console CLI; SMI-S Provider; SNMP, email, and syslog alerts;
20	Security features	Secure Socket Layer (SSL), Secure Shell (SSH), user level security, role-based access control (RBAC), and AD/ LDAP authentication.
21	Hardware warranty	5 years onsite support with 4 hours response time for both hardware and software

V.ToR SWITCH TECHNICAL SPECIFICATION

Sl.No.	Part No.	Description	Qty
1	N9K-C93108TC-FX	Cisco Nexus 9300 with 48p 10G-T, 6p 100G QSFP, MACsec, UP	4
2	NXOS-9.2.2	Nexus 9500, 9300, 3000 Base NX-OS Software Rel 9.2.2	4
3	N3K-C3064-ACC-KIT	Nexus 3K/9K Fixed Accessory Kit	4
4	NXA-FAN-30CFM-B	Nexus 2K/3K/9K Single Fan, port side intake airflow	16
5	NXA-PAC-500W-PI	Nexus NEBs AC 500W PSU - Port Side Intake	8
6	CAB-250V-10A-ID	AC Power Cord - 250V, 10A , India	8
7	N93-LAN1K9	LAN Enterprise License for Nexus 9300 Platform	4
8	QSFP-100G-AOC3M	100GBASE QSFP Active Optical Cable, 3m	4
9	CVR-QSFP-SFP10G=	QSFP to SFP10G adapter	8
10	SFP-10G-LR=	10GBASE-LR SFP Module	16
11	CON-SNT-N93TCFX	SNTC-8X5XNBD Nexus 9300 with 48p	4
12	CON-ECMU-N93LAN	SWSS UPGRADES LAN Enterprise License for Nexus 9300 Pl	4

VI. HYPERVISOR

Sl. No	Technical Specifications
1	The bidder shall propose Support & Subscription services from the direct OEM support 24x7x365 with unlimited incident support and including the unlimited upgrades and updates.
2	The bidder shall propose Hypervisor technology from vendors placed in the leaders quadrant in the Gartner 'Magic Quadrant for x86 Server Hypervisor' report
3	The bidder shall propose to use the existing hypervisor license in the datacentre and renew the subscription for the same, if feasible (or) shall propose a solution with new hypervisor license
4	Hypervisor software shall provide a Hypervisor layer that sits directly on the bare metal server hardware with no dependence on a general purpose OS for greater reliability and security
5	Hypervisor software shall be in Leaders Quadrant of 2017 Gartner Magic Quadrant for x86 Server Hypervisor Infrastructure for continuous last 5 years
6	Hypervisor software shall allow heterogeneous support for guest Operating systems like Windows client, Windows Server, Linux (at least Red Hat, SUSE, Ubuntu, CentOS and Solaris x86)
7	Hypervisor software should be able to boot from iSCSI, FCoE, and Fibre Channel SAN
8	Hypervisor software shall integrate with NAS, FC, FCoE and iSCSI SAN and infrastructure from leading vendors leveraging high performance shared storage to centralize virtual machine file storage for greater manageability, flexibility and availability
9	Capability to create Virtual machines with up to 128 virtual processors, 6 TB virtual RAM and 2GB Video memory in virtual machines for all the guest operating system supported by the hypervisor
10	Hypervisor software shall allow taking point-in-time snapshots of the virtual machines to be able to revert back to an older state if required
11	Hypervisor software should have the ability to thin provision disks to avoid allocating all storage space upfront. Full monitoring capabilities and alerts to prevent from accidentally running out of physical storage space should be there.

12	Hypervisor software should support connecting smart card readers to multiple virtual machines, which can then be used for smart card authentication to virtual Machines.
13	Hypervisor software should support live Virtual Machine migration between different generations of CPUs in the same cluster and without the need for shared storage option.
14	Hypervisor software should have the ability to live migrate VM files from one storage array to another without any VM downtime. Support this migration from one storage protocol to another (ex. FC, NFS, iSCSI, DAS)
15	The solution should provide special integration with Storage API's providing integration with supported third-party data protection, multi-pathing and disk array solutions.
16	Hypervisor software shall have High Availability capabilities for the virtual machines in the sense if in case one server fails all the Virtual machines running on that server shall be able to migrate to another physical server running same Hypervisor software. The feature should be independent of Operating System Clustering and should work with FC/ iSCSI SAN and NAS shared storage.This high availability feature should also be extended to and aware of the applications running inside of the virtual machines.
17	Hypervisor software should have the provision to provide zero downtime, zero data loss and continuous availability for the applications running in virtual machines in the event of physical host failure, without the cost and complexity of traditional hardware or software clustering solutions. This option should be supported for upto 4 virtual CPU per virtual machine.
18	Hypervisor software should provide integration of 3rd party endpoint security to secure the virtual machines with offloaded antivirus, antimalware solutions without the need for agents inside the virtual machines.
19	Hypervisor software should provide secure boot for protection for both the hypervisor and guest operating system by ensuring images have not been tampered with and preventing loading of unauthorized components
20	Hypervisor software should provide software FCoE adaptor that can work with a network adaptor that support partial FCoE offload capabilities.
21	Hypervisor software should allow configuring each virtual machine with one or more virtual NICs. Each of those network interfaces can have its own IP address and even its own MAC address, must support NIC teaming for load sharing and redundancy.
22	Hypervisor software shall allow creating virtual switches that connect virtual Machines
23	Hypervisor software shall support configurations of 802.1q VLANs which are compatible with standard VLAN implementations from other vendors
24	Hypervisor software should allow dynamic adjustment of the teaming algorithm so that the load is always balanced across a team of physical network adapters
25	Hypervisor software shall allow RAM over-commitment that allows configuring virtual machine memory in such a way that safely exceeds physical server memory.
26	Hypervisor software should provide solution to automate and simplify the task of managing hypervisor installation, configuration and upgrade on multiple physical servers.
27	The Hypervisor software should provide Simple and cost effective backup and recovery for virtual machines which should allow admins to back up virtual machine data to disk without the need of agents and this backup solution should have built-in variable length de-duplication capability.
28	The Hypervisor software should provide in-built Replication capability which will enable efficient array-agnostic replication of virtual machine data over the LAN or WAN. This Replication should simplify management enabling replication at the virtual machine level and enabling RPOs as low as 5 minutes.
29	Hypervisor software should support for increasing capacity by adding CPU, Memory or any other devices to virtual machines on an as needed basis without any disruption in working VMs running windows and Linux operating system.
30	It should provide the ability to set constraints that restrict placement of a virtual machine to a subset of hosts in a cluster and to keep virtual machines paired or separated.
31	The solution should support enforcing security for virtual machines at the Ethernet layer. Disallow promiscuous mode, sniffing of network traffic, MAC address changes, and forged source MAC transmits.

32	The solution should provide link aggregation feature in the virtual switch which will provide choice in hashing algorithms on which link aggregation in decided and this should also provide multiple link aggregation groups to be provided in a single host (64 groups per physical host)
33	It should allow dynamic adjustment of the teaming algorithm so that the load is always balanced across a team of physical adapters on a Virtual Switch
34	Hypervisor should have capability similar of Virtual Volumes which enables abstraction for external storage (SAN and NAS) devices making them Hypervisor aware.
35	Hypervisor software shall continuously monitor utilization across virtual machines and should intelligently allocate available resources among virtual machines
36	Hypervisor software should provide enhanced visibility into storage throughput and latency of hosts and virtual machines that can help in troubleshooting storage performance issues.
37	Hypervisor software shall be able to dynamically allocate and balance computing capacity across collections of hardware resources aggregated into one unified resource pool with optional control over movement of virtual machines like restricting VMs to run on selected physical hosts.
38	Hypervisor software should provide dynamic power management such that in case of during off peak hours not all servers are required to be powered on due to less load it should place few servers in G2/S5 (Soft Off) power state as per the Industry Standard Advanced Configuration and Power Interface (ACPI) specifications to save power in an automated or manual or scheduled manner.
39	Hypervisor software should provide proactive High availability capability that utilizes server health information and migrates VMs from degraded hosts before problem occurs
40	Hypervisor software should provide abilities to offload specific storage operations to compliant storage hardware thereby performing these operations faster and consuming less CPU, memory, and storage fabric bandwidth
41	Hypervisor software should provide VM-level encryption protects unauthorized data access both at-rest and in-motion
42	Hypervisor software should allow common management across storage tiers and dynamic storage class of service automation via a policy-driven control plane
43	It should support hardware as well as non-hardware accelerated 3D graphics to run Basic 3D applications in virtual machines.
44	The solution should provide in-built enhanced host-level packet capture tool which will provide functionalities like SPAN, RSPAN, ERSPAN and will capture traffic at uplink, virtual switch port and virtual NIC level. It should also be able to capture dropped packets and trace the path of a packet with time stamp details
45	The solution should provide a “Latency Sensitivity” setting in a VM that can be tuned to help reduce virtual machine latency. When the Latency sensitivity is set to high the hypervisor will try to reduce latency in the virtual machine by reserving memory, dedicating CPU cores and disabling network features that are prone to high latency.
46	The solution should provide an option to easily deploy and manage big data solutions like Hadoop on the Hypervisor platform
47	Hypervisor software shall also natively have feature to enable live migration of virtual machines between servers in a cluster, across clusters as well as as long distances from one site to another (up to 100 milliseconds round trip time) with no disruption to users or loss of services, eliminating the need to schedule application downtime or business downtime.
48	The solution should be able to create a cluster out of multiple storage datastores and automate load balancing by using storage characteristics to determine the best place for a virtual machine’s data to reside, both when it is created and when it is used over time.

VII. HYPERVISOR MANAGEMENT SOFTWARE TECHNICAL SPECIFICATION

Sl.No	Technical Specifications
1	Hypervisor management software console shall provide a single view of all virtual machines, allow monitoring of system availability and performance and automated notifications with email alerts.
2	The Hypervisor management software should provide the core administration interface as a single Web based interface. This interface should be flexible and robust and should simplify the hypervisor control through shortcut navigation, custom tagging, enhanced scalability, and the ability to manage from anywhere with Internet Explorer or Firefox-enabled devices.
3	The management software should provide means to perform quick, as-needed deployment of additional hypervisor hosts. This automatic deployment should be able to push out update images, eliminating patching and the need to schedule patch windows.
4	The Hypervisor should have capability to simplify host deployment and compliance by creating virtual machines from configuration templates.
5	Power, storage related and OS cluster related information has to initiate from the relevant sources and can be integrated through RESTful APIs.
6	Hypervisor management software console shall provide reports for performance and utilization of Virtual Machines. It shall co-exist and integrate with leading systems management vendors.
7	Hypervisor management software console shall provide capability to monitor and analyze virtual machines, and server utilization and availability with detailed performance graphs.
8	Hypervisor management software console shall allow to Move a powered off virtual machine from one physical server to another by dragging and dropping the virtual machine icon. Hypervisor management software console should allow cloning of both powered on and powered off virtual machines.
9	Hypervisor management software console shall maintain a record of significant configuration changes and the administrator who initiated them.
10	Hypervisor management software console shall provide the Manageability of the complete inventory of virtual machines, and physical servers with greater visibility into object relationships.
11	Hypervisor management software should provide a global search function to access the entire inventory of multiple instances of Hypervisor management server, including virtual machines, hosts, data stores and networks, anywhere from within Hypervisor management server.
12	Hypervisor management software should support user role and permission assignment (RBAC).
13	Hypervisor management software should allow you to deploy and export virtual machines, virtual appliances in Open Virtual Machine Format (OVF).
14	Hypervisor management software should allow reliable and non-disruptive migrations for Physical/ Virtual machines running Windows and Linux operating systems to virtual environment.
15	Hypervisor management software should include provision for automated host patch management with no VM downtime.
16	Hypervisor management software should be able to integrate into existing standard EMS systems.
17	The management solution for hypervisor should provide Single-Sign-On capability which should dramatically simplify administration by allowing users to log in once to access all instances or layers of management without the need for further authentication.

VIII. SOFTWARE DEFINED STORAGE

Sl. No.	Technical Specifications
1	The proposed solution shall provide software based enterprise class storage services on commodity x86 servers
2	Shared Storage created by clustering server attached traditional magnetic Disks or Flash Disks (like SSDs, NVMes etc.)
3	Can be configured using either Hybrid or All-Flash Storage
4	Should provide upgrade path from Hybrid to All-Flash with same set of compatible hardware no disruptively.(in case of Hybrid)
5	Should provide high-resilient shared storage capacity for Virtual environment
6	Should be integrated with Hypervisor and No additional VM/Appliance/software should be required to install
7	Should support all Hypervisor benefits like HA, vMotion
8	Should be compatible with Disaster Recovery solutions
9	Should support server side read/write caching to reduce storage latency
10	Should support snapshots and clones in a Virtual environment
11	The software defined storage solution should support Data Locality
12	Should be Hardware independent to provide flexibility of choosing hardware from any server manufacturer
13	Should support non disruptive Scale-Up (Upgrade by inserting drives in existing empty drive-slots) & Scale-Out (Upgrade by adding nodes) upgrades to grow capacity and/or performance whenever required.
14	Should support mixing of different compatible Server brands in same Cluster.
15	Should Support Co-Existence of traditional storage with HCI solution and the existing storage solution should be managed using the same management framework. (3rd party tool can be used) for the purpose of backup)
16	The Solution should be proven in the market. Should have more than 25 customers in India.
17	Direct OEM 24x7x365 days with unlimited incident support and 30mins or less response time including the unlimited upgrades and updates.
18	The solution should provide a single unified management console for the management of the entire environment including virtualized environment as well as software defined storage environment. This would simplify the manageability of the entire solution.
19	Provide granular VM-Centric controls for managing storage service levels
20	Automated self rebalancing capabilities to align with defined Storage service levels
21	The solution should deliver zero data loss capability in case of disk, host, network or rack failure
22	The solution should support Online Analytics on Health and provide predective alerts
23	The solution should be able to use hypervisor/VM based replication to asynchronously replicate VMs across sites based on configurable schedules of up to 5 minutes RPO

IX. RACK TECHNICAL SPECIFICATION –QTY -1NO.

S. No.	Specification
1	All the relevant product brochures and manuals must be submitted
2	RACK should be same make as that of server make i.e. OEM make
3	Standard 42U 800mmW/1000mmD fully perforated front & back door and side panels, holes should be evenly distributed from top to bottom to permit adequate airflow (equivalent to 64 percent open areas for ventilation), preferably black Color.
	Should have 42U of vertical mounting space and the servers, KVM and Monitor Console should fit into the rack and necessary rack mount plates/kits to be provided.
4	Rack doors should having locking arrangements both front panel and rear panel
5	Adequate clearance between the installed rack component and the side panels of the rack
6	One number Earthing Kit, One number Cable Manager Horizontal 1U
7	The bidder should provide 2 (two) nos. Power Distribution Units (PDU) - PDU should have a 32A MCB, a neon Indicator, 16 x IEC C13 Sockets (5 A / 15 A) and at least 3.0 meter cable for connection to the external power source
8	Castors (One set of 4) , One number Stationary Shelf , One number Keyboard tray rotary with slides , two numbers mounting hardware (Each Pack of 10)
9	One number Temperature Indication Unit
10	Two numbers Cat 6 24 port 1 RU Jack Panel for Rack,
11	The bidder should terminate the Jack Panel and its necessary components using Cable Manager
12	The bidder shall have to mount new as well as existing servers in the rack and will have to provide the rack mounting kit accordingly
13	Compliance to EIA-310-D. The bidder has to supply Rack design diagram
14	Appropriate Cables for connecting Keyboard, Monitor, Mouse etc to be provided
15	Supporting 1000 Kgs load. Bottom cover with knock out holes for cable entry to be provided
16	Three pairs of horizontal support shall be fitted on both right and left sides
17	Fans to be mounted on Rear Door / Roof
18	Copper based Electrical Grounding / Earthing Strip
19	Adjustable screw legs – 4 No

X. BACK UP

The solution shall include the following options for the backup.

Sl. No.	Specification
1	Solution should provide a backup catalog to allow any Virtual Server to be recovered to any specific point in time; Data recovery process should be simple with an RTO in minutes
2	Backup Window: Daily incremental, Week Differential and Monthly Full Backup
3	Retention Policy: 90 Days
4	Solution provider should supply 50TB NAS Storage for Backup purpose and should to expandable to 200 TB at any point of time and brand should as server brand

XI. SOFTWARE LICENSES

Sl. No.	Specification
1	Hypervisor & SDS licenses should be perpetual on the supplied appliance.
2	Hypervisor & SDS licenses should keep on working post end of OEM support.
3	Backup software license should be either TB based or processor based perpetual license

XII. INTEGRATION AND COMMISSIONING

S. No.	Specification
1	Integration shall include the hardware installation as well as software installation and configuration of all the modules and requisite dependencies for ready launch of sample virtual machine from templates.
2	All existing virtual machines should be migrated to new setup without any failover and downtime.

ANNEXURE B

TECHNICAL BID SUBMISSION FORMAT

I. VENDOR ELIGIBILITY CRITERIA:

S. No	Specifications	Complied (Yes/No)	Reference (URL address with page No./data.
I.VENDOR ELIGIBILITY CRITERIA:			
The vendor participating in the bidding process and interacting directly with IIT Madras is referred here as "Solution Provider". Only those solution providers are qualified to participate in the bidding process who satisfy the following criteria. Documentary support for each of these criteria are to be enclosed along with the technical bid.			
1.1	The hardware components that are being procured as part of this tender are to be from the original equipment manufacturers referred here as OEMs.		
1.2	The solution provider must be a Premium Solution partner for providing solution to IITM. The partnership must be active during the period of the tender process.		
1.3	The solution provider must have minimum 2 certified engineers as part of its technical team for the proposing solution. The capability must be present during the period of the tender process**.**		
1.4	The solution provider must have executed minimum of 1 such project for the proposed solution of value greater than 1 Crore in any government/PSU/IIT's		
1.5	The solution provider should produce the proof of sign off of the project executed.		
1.6	The solution provider should provide a resident engineer for a period of one year, after the date of acceptance.		
1.7	The solution provider must have implemented commissioning of the specific hardware items from the OEM partners atleast 1 time earlier.		
1.8	The solution provider must have business representation office in Chennai to help with the call coordination.		
1.9	Each OEM should nominate only one solution provider for this tender.		
II. Solution Specification			
2.1	The proposed solution should be a Hyper Converged appliance that comes preinstalled with various software including SDS, replication with management and associated hypervisor. It should include all hardware and software necessary to ensure high availability mode of operation. The proposed hyper converged system should have Single Management Console to manage integrated Compute, Storage and Hypervisor		
2.2	Technology must be software defined and the solution should provide enterprise-class storage services using latest x86 server infrastructures without dependence on a separate Storage Area Network & associated components such as SAN Switches & HBAs		
2.3	The proposed Server Nodes, appliance, Hypervisor software & HCI software should be leader in Gartner/Forrester latest Report. Should be in top 5 in the Gartner Quadrant.		
2.4	The storage solution with the HCI should either have inbuilt software defined storage capability integrated within the Hypervisor kernel itself or should use a virtual storage controller architecture.		

2.5	Hypervisor software shall provide a Hypervisor layer that sits directly on the bare metal server hardware with no dependence on a general purpose OS for greater reliability and security. It should be Industry Standard software and no special purpose software is allowed. Proposed Hypervisor software should be in the latest MQ of Gartner		
2.6	The HCI solution should be able to scale by support of adding additional nodes to the cluster at a later point of time to handle compute, Memory & Storage requirements. Solution should support cluster expansion with zero down time.		
2.7	Data compression/deduplication/erasure coding techniques should be available with licenses (if applicable) in the Software Defined Storage (SDS) layer for use without additional cost.		
2.8	The HCI solution must be able to survive single node failures and it should in no way affect/degrade the production services & usable resources to the end user application hence HCI solution should be proposed in N+1 configuration, even if one node fails, the remaining nodes should provide user application the specified number of usable physical cores, usable RAM & usable storage capacity as mentioned		
2.9	The HCI solution should provide seamless upgrade for Firmware, Hypervisor, Storage OS, SDS software, BIOS and other such functions which are required in the HCI platform. The upgrade should be online and should not mandate any kind of OEM engagement		
2.10	The HCI solution should include 3rd party Enterprise Backup Solution (granular). It should be a perpetual / Capacity based license. Backup vendor should be listed as Leader in Gartner/ Forrester latest reports. Solution should be provided with Disk Based Backup target. It should be licensed for minimum of 50 TB backup space.		
2.11	The HCI Solution should provide a backup catalog to allow any Virtual Server to be recovered to any specific point-in-time; Data recovery process should be simple with an RTO within 5 minutes		
2.12	The HCI solution must provide the following Disaster Recovery features and all licenses should be included from day 1.		
	(a) The solution must provide a simple failover operation		
	(b) The solution must allow creation of a Run book to automate recovery of Virtual Servers		
	(c) The solution must allow the option to test DR Failover to separate network with no impact to production workloads		
2.13	The HCI solution should have feature to assist in failback process to Primary data center. DR should also be proposed which should have all HCI features as in DC. DR proposed would be at 50% of DC.		
2.14	The HCI solution should support to connect external storage devices (like NAS, SAN etc.) and should be useable as part of the HCI Solution, for the purpose of Backup.		
2.15	HCI solution should provide High Availability & It should support features like snapshots & cloning of individual virtual machines.		
2.16	HCI solution should support live migration of running virtual machines from one physical node to another with zero downtime, continuous service availability, and complete transaction integrity transparent to users.		
2.17	Dashboard to manage and provision virtual machines, network, storage, monitor performance and manage events & alerts. It should also contain a dashboard for monitoring & generate reports.		
2.18	The HCI solution should have a management console for managing compute, Network, Storage and Clustering. The HCI Solution should be able to give insight of underlying infrastructure like compute, storage and network.		
2.19	In the event of a node failure, virtual machines should automatically run on another node.		

2.20	HCI solution should include Redundant 10G switches providing minimum 32 ports (referred as 'HCI Switch') with minimum 4*10G ports for uplinks per switch.		
2.21	All the required cables & modules for connecting all HCI nodes to HCI switch in redundant fashion to be supplied from day one.		
2.22	Bidder must quote appropriate license to enable and meet mentioned features in the infrastructure automation architecture.		
2.23	HCI Solution should provide additional Server & Management software license for the proposed solution. Management software should be capable enough to manage additional VM inventories too.		
2.24	All licenses required for Memory and Storage upgradation with-in the provided solution should be included from Day-1		
2.25	HCI solution has to integrate with active directory (AD) /open LDAP to allow importing existing users and groups in addition to creation of local users.		
2.26	HCI solution should include an application and infrastructure performance management tool quoted as part of the solution to improve operations and provide deep infrastructure performance insight.		
2.27	Migration of existing setup should be done during post office hours with minimal downtime.		
2.28	The solution provider may opt to propose to renew/upgrade the existing hypervisor licenses at datacenter to facilitate the requirement		
2.29	HCI solution should be capable of increasing the resources such as (RAM, CPU and storage) online.		
2.30	HCI solution should have the capability to connect to any public cloud		
2.31	HCI solution should support USB dongle based license server.		
III. Servers :			
In this and subsequent sections, options are listed with minor variation in numbers. The decision on the option to be picked will be made during the final comparison of bids and placing of order. All vendors are requested to bid for all the options in each of the modules otherwise the bid will be considered as disqualified. The Institute reserves the right to accept or reject any or all of the offers in full/part without assigning any reason whatsoever. The institute reserves all rights to choose any one the options from the specification given.			

III. (a) TECHNICAL SPECIFICATIONFOR DATA CENTRE SERVER :

1.(a) MINIMUM HARDWARE SPECIFICATION – X86

Sl.No.		Technical Specification	Complied (Yes/No)	Reference (URL address with page No./data.
Make & Model		LENOVO/NUTANIX/CISCO/DELL/HPE/FUJITSU		
		The Proposed Server OEM should be in Leaders Quadrant in Latest report of Gartner Modular Servers		
1	Chipset	Lewisburg PCH IntelC621 or higher configuration		
2	Form Factor	Max.2U rack mounted with sliding rails		
3	Configured CPU	2*Intel® Xeon® Gold 6130 Processor 16Core, Base frequency 2.1GHz, Turbo Frequency 3.70GHz, 22MB L3		
4	Memory slots	Minimum 24 TTruDDR4 DIMM slots RDIMMS supporting speeds of min 2666 MHz		
5	Memory configured	320 GB DDR4 2666 Mhz RAM scalable to 1 TB RAM Minimum		
6	Disks Supported	Minimum of 12nos. SAS/SATA/SSD		
7	RAID Controller	HCI Supported Raid Controller		
8	Disks Requirement	**The Proposed Solution should support Dedupe and Compression from Day one**		
		ALL FLASH Configuration - Useable Storage should be as below after de-dup and compression		
		Option – A – 100 TB		
		Option – B – 130 TB		
		Option – C – 150 TB		
		Hybrid Configuration - Useable Storage should be as below after de-dup and compression (15% of the storage should be on All Flash)		
		Option – A – 100 TB		
		Option – B – 130 TB		
		Option – C – 150 TB		
		(in both cases quoted per disk capacity should not be more than 4 TB)		
9	DVD writer	Internal/External DVD-RW Optical Disk Drive		
10	I/O slots	Minimum of 4xPCIe Gen3 Slots		
11	Ethernet ports	4x1GbpsBase-T ports(Optional), 4 x 10Gbps Base-T Ports, 1 Dedicated Management port (optional)		
12	Interface Ports	Minimum of 1 VGA/Video Port,2xUSB2.0/USB3.0,dedicated Management Ports		
13	Certification and Compliances	Microsoft Windows Server, Hyper-V, VMWare, Red Hat Enterprise Linux (RHEL)		
14	Power Supply	Platinum rated redundant Power Supply		

15	Management Integration	Support for integration with Microsoft System Center, VMware vCenter		
16	Power& Temperature	Real- time power meter, graphing, thresholds, alerts & Temperature monitoring & graphing		
17	Alert	Should provide predictive failure monitoring & proactive alerts of actual or impending component failure forfan, powersupply, memory, CPU, RAID, NIC, HDD		
18	Configuration & Management (optional)	Real-time out-of-band hardware performance monitoring & alerting Agent-free monitoring, driver updates & configuration, power monitoring & capping, RAID management, external storage management, monitoring of FC,HBA & CNA & system health Out-of-band hardware & firmware inventory Virtual IO management /stateless computing system		
19	LCD/LED panel (Optional)	Should display system ID, status information and system error conditions in different colors or status LED/LCD available to indicate health of the machine.		
20	HTML5 support	HTML5 support for virtual console & virtual media without using Java or ActiveX plugins		
21	Server Security	Should provide effective protection, reliable detection & rapid recovery using:		
		a. Secure default passwords Persistent event logging including user activity		
		b. Secure alerting		
		c. Automatic BIOS recovery		
		d. Rapid OS recovery		
		e. System erase		
22	Warranty	a. 5 Years 24/7 Warranty Support with 4 Hours Response Time for both Hardware and Software.		
		b. Bidder should provide L1/L2 Onsite Support for proposed servers including hardware and software components		
		c. Back-aligns support with respective to OEM mandatorily during warranty period and during AMC period (Bidder must provide documentary proof)		
23	End of Life	All the products quoted should be of the latest generation and End of Life should not be announced for the products and components being quoted.		
24	Compliance justification	All the compliance should be justified with page numbers highlighted with markers and Book marks.		

III (b) TECHNICAL SPECIFICATION FOR DISASTER RECOVERY SERVER

MINIMUM HARDWARE SPECIFICATION – X86

Sl No		Technical Specification	Complied (Yes/No)	Reference (URL address with page No./data sheet with page No.)
Make & Model		LENOVO/NUTANIX/CISCO/DELL/HPE/FUJITSU		
		The Proposed Server OEM should be in Leaders Quadrant in Latest report of Gartner Modular Servers		
1	Chipset	Lewisburg PCH IntelC621 or higher configuration		
2	Form Factor	Max.2U rack mounted with sliding rails		
3	Configured CPU	2*Intel® Xeon® Gold 6130 Processor 16 Core, Base frequency 2.1GHz, Turbo Frequency 3.70GHz, 22MB L3		
4	Memory slots	Minimum 24 TTruDDR4 DIMM slots RDIMMS supporting speeds of min 2666 MHz		
5	Memory configured	320 GB DDR4 2666 Mhz RAM scalable to 1 TB RAM Minimum		
6	Disks Supported	Minimum of12 nos. SAS/SATA/SSD		
7	RAID Controller	HCI Supported Raid Controller		
8	Disks Requirement	The Proposed Solution should support Dedupe and Compression from Day one		
		ALL FLASH Configuration - Useable Storage should be as below after de-dup and compression		
		Option – A – 50 TB		
		Option – B – 65 TB		
		Option – C – 85 TB		
		Hybrid Configuration - Useable Storage should be as below after de-dup and compression (15% of the storage should be on All Flash)		
		Option – A – 50 TB		
		Option – B – 65 TB		
		Option – C – 85 TB		
		(in both cases quoted per disk capacity should not be more than 4 TB)		
9	DVD writer	Internal / External DVD-RW Optical Disk Drive		
10	I/O slots	Minimum of 4xPCIe Gen3 Slots		
11	Ethernet ports	4x1Gbps Base-Tports(Optional), 4 x 10Gbps Base-T Ports, 1 Dedicated Management port(optional)		
12	Interface Ports	Minimum of 1 VGA/Video Port, 2xUSB2.0/USB3.0, dedicated Management Ports		
13	Certification and Compliances	Microsoft Windows Server, Hyper-V, VMWare, Red Hat Enterprise Linux (RHEL)		
14	Power Supply	Platinum rated redundant Power Supply		
15	Management Integration	Support for integration with Microsoft System Center, VMware vCenter		
16	Power & Temperature	Real- time power meter, graphing, thresholds, alerts & Temperature monitoring & graphing		

17	Alert	Should provide predictive failure monitoring & proactive alerts of actual or impending component failure forfan, powersupply, memory, CPU, RAID, NIC, HDD		
18	Configuration & Management (optional)	Real-time out-of-band hardware performance monitoring & alerting Agent-free monitoring, driver updates & configuration, power monitoring & capping, RAID management, external storage management, monitoring of FC,HBA & CNA & system health Out-of-band hardware & firmware inventory Virtual IO management /stateless computing system		
19	LCD/LED panel (Optional)	Should display system ID, status information and system error conditions in different colors or status LED/LCD available to indicate health of the machine.		
20	HTML5 support	HTML5 support for virtual console & virtual media without using Java or ActiveX plugins		
21	Server Security	Should provide effective protection, reliable detection & rapid recovery using:		
		a) Secure default passwords Persistent event logging including user activity		
		b) Secure alerting		
		c) Automatic BIOS recovery		
		d) Rapid OS recovery		
		e) System erase		
22	Warranty	a) 5 Years 24/7 Warranty Support with 4 Hours Response Time for both Hardware and Software.		
		b) Bidder should provide L1/L2 Onsite Support for proposed servers including hardware and software components		
		c) Back-aligns support with respective to OEM mandatorily during warranty period and during AMC period (Bidder must provide documentary proof)		
23	End of Life	All the products quoted should be of the latest generation and End of Life should not be announced for the products and components being quoted.		
24	Compliance justification	All the compliance should be justified with page numbers highlighted with markers and Book marks.		

IV. BACKUP STORAGE – 50TB USEABLE CAPACITY WITH NL SAS DRIVES

Sl.No.	Attribute	Specification	Compliance (Yes/No)	Reference (URL address with page No./ data sheet with page No.
1	Form Factor	2U12 LFF controller enclosure 2U rack mount.		
2	Controller configuration	Dual active-active controller configuration with automatic load balancing.		
3	RAID levels	RAID 0, 1, 3, 5, 6, and 10; Dynamic Disk Pools.		
4	Controller cache	16 GB per system (8 GB per controller). Cache mirroring between the controllers. Flash-backed cache protection (includes battery for destaging to flash).		
5	Drive bays	Should support Intermix of 2U24 SFF and 2U12 LFF enclosures		
6	Drive technology	12 Gb SAS and NL SAS HDDs, 12 Gb SAS SSDs.		
		Should support Intermix of HDDs and SSDs within a system		
7	Drive expansion connectivity	2x 12 Gb SAS x4 (Mini-SAS HD SFF-8644) expansion ports on each of two controllers in the controller enclosure for the attachment of the expansion enclosures		
		4x 12 Gb SAS x4 (Mini-SAS HD SFF-8644) expansion ports on each of two I/O modules in the expansion enclosure for the attachment to the controller enclosure and daisy chaining of the expansion enclosures.		
8	Drives	Should support SSD, SAS, NL SAS Drives		
9	Storage capacity	Scalable up to minimum 200 TB		
10	Host connectivity	Base ports (per controller enclosure with two controllers):		
		4x 10 Gb iSCSI (DAC or SW fibre optics, LC) or 8/16 Gb FC (SW fibre optics, LC) SFP+ host ports (2 ports per controller)		
		Optional additional ports on host interface cards (per controller enclosure with two controllers):		
		4x 12 Gb SAS host ports (Mini-SAS HD, SFF-8644) (2 ports per controller)		
		4x 1/10 Gb iSCSI RJ-45 host ports (2 ports per controller)		
11	Host operating systems	Microsoft Windows Server 2012 R2 and 2016; Red Hat Enterprise Linux (RHEL) 7; SUSE Linux Enterprise Server (SLES) 12; VMware vSphere 6.0 and 6.5.		

12	Standard software features	Dynamic Disk Pools, SSD read cache, snapshots (up to 128 targets), volume copy, thin provisioning (DDP only), and data assurance.		
13	Optional software features	Snapshots (up to 512 targets), asynchronous mirroring.		
14	Performance*	Minimum100 000 random read IOPS (4 KB blocks).		
		Minimum 35 000 random write IOPS (4 KB blocks).		
		Minimum 3 GBps sequential read throughput (64 KB blocks).		
		Minimum 0.9 GBps sequential write throughput (64 KB blocks).		
15	Cooling	Redundant cooling with the fans that are built into power supplies.		
16	Power supply	Two redundant hot-swap 913 W (100 - 240 V) Platinum AC power supplies.		
17	Hot-swap parts	Controllers, I/O modules, drives, power supplies, and SFP+ transceivers.		
18	Management ports	1x 1 GbE port (UTP, RJ-45) per controller for out-of-band management.		
		2x Serial console ports (RJ-45 and Micro-USB) for system configuration.		
		In-band management via I/O path.		
19	Management interfaces	System Manager web-based GUI; SAN Manager standalone GUI; SSH CLI; Serial console CLI; SMI-S Provider; SNMP, email, and syslog alerts;		
20	Security features	Secure Socket Layer (SSL), Secure Shell (SSH), user level security, role-based access control (RBAC), and AD/ LDAP authentication.		
21	Hardware warranty	5 years onsite support with 4 hours response time for both hardware and software		

V. ToR SWITCH

Sl.NO	Part No.	Description	Compliance (Yes/No)	Reference (URL address with page No./ data sheet with page No.
1	N9K-C93108TC-FX	Cisco Nexus 9300 with 48p 10G-T, 6p 100G QSFP, MACsec, UP		
2	NXOS-9.2.2	Nexus 9500, 9300, 3000 Base NX-OS Software Rel 9.2.2		
3	N3K-C3064-ACC-KIT	Nexus 3K/9K Fixed Accessory Kit		
4	NXA-FAN-30CFM-B	Nexus 2K/3K/9K Single Fan, port side intake airflow		
5	NXA-PAC-500W-PI	Nexus NEBs AC 500W PSU - Port Side Intake		
6	CAB-250V-10A-ID	AC Power Cord - 250V, 10A , India		
7	N93-LAN1K9	LAN Enterprise License for Nexus 9300 Platform		
8	QSFP-100G-AOC3M	100GBASE QSFP Active Optical Cable, 3m		
9	CVR-QSFP-SFP10G=	QSFP to SFP10G adapter		
10	SFP-10G-LR=	10GBASE-LR SFP Module		
11	CON-SNT-N93TCFX	SNTC-8X5XNBD Nexus 9300 with 48p		
12	CON-ECMU-N93LAN	SWSS UPGRADES LAN Enterprise License for Nexus 9300 Pl		

VI. HYPERVISOR

Sl. No	Technical Specifications	Compliance (Yes/ No)	Reference (URL address with page No./data sheet with page No.)
1	The bidder shall propose Support & Subscription services from the direct OEM support 24x7x365 with unlimited incident support and including the unlimited upgrades and updates.		
2	The bidder shall propose Hypervisor technology from vendors placed in the leaders quadrant in the Gartner 'Magic Quadrant for x86 Server Hypervisor' report		
3	The bidder shall propose to use the existing hypervisor license in the datacentre and renew the subscription for the same, if feasible (or) shall propose a solution with new hypervisor license		
4	Hypervisor software shall provide a Hypervisor layer that sits directly on the bare metal server hardware with no dependence on a general purpose OS for greater reliability and security		

5	Hypervisor software shall be in Leaders Quadrant of 2017 Gartner Magic Quadrant for x86 Server Hypervisor Infrastructure for continuous last 5 years		
6	Hypervisor software shall allow heterogeneous support for guest Operating systems like Windows client, Windows Server, Linux (at least Red Hat, SUSE, Ubuntu, CentOS and Solaris x86)		
7	Hypervisor software should be able to boot from iSCSI, FCoE, and Fibre Channel SAN		
8	Hypervisor software shall integrate with NAS, FC, FCoE and iSCSI SAN and infrastructure from leading vendors leveraging high performance shared storage to centralize virtual machine file storage for greater manageability, flexibility and availability		
9	Capability to create Virtual machines with up to 128 virtual processors, 6 TB virtual RAM and 2GB Video memory in virtual machines for all the guest operating system supported by the hypervisor		
10	Hypervisor software shall allow taking point-in-time snapshots of the virtual machines to be able to revert back to an older state if required		
11	Hypervisor software should have the ability to thin provision disks to avoid allocating all storage space upfront. Full monitoring capabilities and alerts to prevent from accidentally running out of physical storage space should be there.		
12	Hypervisor software should support connecting smart card readers to multiple virtual machines, which can then be used for smart card authentication to virtual Machines.		
13	Hypervisor software should support live Virtual Machine migration between different generations of CPUs in the same cluster and without the need for shared storage option.		
14	Hypervisor software should have the ability to live migrate VM files from one storage array to another without any VM downtime. Support this migration from one storage protocol to another (ex. FC, NFS, iSCSI, DAS)		
15	The solution should provide special integration with Storage API's providing integration with supported third-party data protection, multi-pathing and disk array solutions.		
16	Hypervisor software shall have High Availability capabilities for the virtual machines in the sense if in case one server fails all the Virtual machines running on that server shall be able to migrate to another physical server running same Hypervisor software. The feature should be independent of Operating System Clustering and should work with FC/ iSCSI SAN and NAS shared storage.This high availability feature should also be extended to and aware of the applications running inside of the virtual machines.		

17	Hypervisor software should have the provision to provide zero downtime, zero data loss and continuous availability for the applications running in virtual machines in the event of physical host failure, without the cost and complexity of traditional hardware or software clustering solutions. This option should be supported for upto 4 virtual CPU per virtual machine.		
18	Hypervisor software should provide integration of 3rd party endpoint security to secure the virtual machines with offloaded antivirus, antimalware solutions without the need for agents inside the virtual machines.		
19	Hypervisor software should provide secure boot for protection for both the hypervisor and guest operating system by ensuring images have not been tampered with and preventing loading of unauthorized components		
20	Hypervisor software should provide software FCoE adaptor that can work with a network adaptor that support partial FCoE offload capabilities.		
21	Hypervisor software should allow configuring each virtual machine with one or more virtual NICs. Each of those network interfaces can have its own IP address and even its own MAC address, must support NIC teaming for load sharing and redundancy.		
22	Hypervisor software shall allow creating virtual switches that connect virtual Machines		
23	Hypervisor software shall support configurations of 802.1q VLANs which are compatible with standard VLAN implementations from other vendors		
24	Hypervisor software should allow dynamic adjustment of the teaming algorithm so that the load is always balanced across a team of physical network adapters		
25	Hypervisor software shall allow RAM over-commitment that allows configuring virtual machine memory in such a way that safely exceeds physical server memory.		
26	Hypervisor software should provide solution to automate and simplify the task of managing hypervisor installation, configuration and upgrade on multiple physical servers.		
27	The Hypervisor software should provide Simple and cost effective backup and recovery for virtual machines which should allow admins to back up virtual machine data to disk without the need of agents and this backup solution should have built-in variable length de-duplication capability.		
28	The Hypervisor software should provide in-built Replication capability which will enable efficient array-agnostic replication of virtual machine data over the LAN or WAN. This Replication should simplify management enabling replication at the virtual machine level and enabling RPOs as low as 5 minutes.		
29	Hypervisor software should support for increasing capacity by adding CPU, Memory or any other devices to virtual machines on an as needed basis without any disruption in working VMs running windows and Linux operating system.		

30	It should provide the ability to set constraints that restrict placement of a virtual machine to a subset of hosts in a cluster and to keep virtual machines paired or separated.		
31	The solution should support enforcing security for virtual machines at the Ethernet layer. Disallow promiscuous mode, sniffing of network traffic, MAC address changes, and forged source MAC transmits.		
32	The solution should provide link aggregation feature in the virtual switch which will provide choice in hashing algorithms on which link aggregation in decided and this should also provide multiple link aggregation groups to be provided in a single host (64 groups per physical host)		
33	It should allow dynamic adjustment of the teaming algorithm so that the load is always balanced across a team of physical adapters on a Virtual Switch		
34	Hypervisor should have capability similar of Virtual Volumes which enables abstraction for external storage (SAN and NAS) devices making them Hypervisor aware.		
35	Hypervisor software shall continuously monitor utilization across virtual machines and should intelligently allocate available resources among virtual machines		
36	Hypervisor software should provide enhanced visibility into storage throughput and latency of hosts and virtual machines that can help in troubleshooting storage performance issues.		
37	Hypervisor software shall be able to dynamically allocate and balance computing capacity across collections of hardware resources aggregated into one unified resource pool with optional control over movement of virtual machines like restricting VMs to run on selected physical hosts.		
38	Hypervisor software should provide dynamic power management such that in case of during off peak hours not all servers are required to be powered on due to less load it should place few servers in G2/S5 (Soft Off) power state as per the Industry Standard Advanced Configuration and Power Interface (ACPI) specifications to save power in an automated or manual or scheduled manner.		
39	Hypervisor software should provide proactive High availability capability that utilizes server health information and migrates VMs from degraded hosts before problem occurs		
40	Hypervisor software should provide abilities to offload specific storage operations to compliant storage hardware thereby performing these operations faster and consuming less CPU, memory, and storage fabric bandwidth		
41	Hypervisor software should provide VM-level encryption protects unauthorized data access both at-rest and in-motion		
42	Hypervisor software should allow common management across storage tiers and dynamic storage class of service automation via a policy-driven control plane		

43	It should support hardware as well as non-hardware accelerated 3D graphics to run Basic 3D applications in virtual machines.		
44	The solution should provide in-built enhanced host-level packet capture tool which will provide functionalities like SPAN, RSPAN, ERSPAN and will capture traffic at uplink, virtual switch port and virtual NIC level. It should also be able to capture dropped packets and trace the path of a packet with time stamp details		
45	The solution should provide a "Latency Sensitivity" setting in a VM that can be tuned to help reduce virtual machine latency. When the Latency sensitivity is set to high the hypervisor will try to reduce latency in the virtual machine by reserving memory, dedicating CPU cores and disabling network features that are prone to high latency.		
46	The solution should provide an option to easily deploy and manage big data solutions like Hadoop on the Hypervisor platform		
47	Hypervisor software shall also natively have feature to enable live migration of virtual machines between servers in a cluster, across clusters as well as as long distances from one site to another (up to 100 milliseconds round trip time) with no disruption to users or loss of services, eliminating the need to schedule application downtime or business downtime.		
48	The solution should be able to create a cluster out of multiple storage datastores and automate load balancing by using storage characteristics to determine the best place for a virtual machine's data to reside, both when it is created and when it is used over time.		

VII. HYPERVISOR MANAGEMENT SOFTWARE

Sl.No	Technical Specifications	Compliance (Yes/ No)	Reference (URL address with page No./data sheet with page No.)
1	Hypervisor management software console shall provide a single view of all virtual machines, allow monitoring of system availability and performance and automated notifications with email alerts.		
2	The Hypervisor management software should provide the core administration interface as a single Web based interface. This interface should be flexible and robust and should simplify the hypervisor control through shortcut navigation, custom tagging, enhanced scalability, and the ability to manage from anywhere with Internet Explorer or Firefox-enabled devices.		
3	The management software should provide means to perform quick, as-needed deployment of additional hypervisor hosts. This automatic deployment should be able to push out update images, eliminating patching and the need to schedule patch windows.		

4	The Hypervisor should have capability to simplify host deployment and compliance by creating virtual machines from configuration templates.		
5	Power, storage related and OS cluster related information has to initiate from the relevant sources and can be integrated through RESTful APIs.		
6	Hypervisor management software console shall provide reports for performance and utilization of Virtual Machines. It shall co-exist and integrate with leading systems management vendors.		
7	Hypervisor management software console shall provide capability to monitor and analyze virtual machines, and server utilization and availability with detailed performance graphs.		
8	Hypervisor management software console shall allow to Move a powered off virtual machine from one physical server to another by dragging and dropping the virtual machine icon. Hypervisor management software console should allow cloning of both powered on and powered off virtual machines.		
9	Hypervisor management software console shall maintain a record of significant configuration changes and the administrator who initiated them.		
10	Hypervisor management software console shall provide the Manageability of the complete inventory of virtual machines, and physical servers with greater visibility into object relationships.		
11	Hypervisor management software should provide a global search function to access the entire inventory of multiple instances of Hypervisor management server, including virtual machines, hosts, data stores and networks, anywhere from within Hypervisor management server.		
12	Hypervisor management software should support user role and permission assignment (RBAC).		
13	Hypervisor management software should allow you to deploy and export virtual machines, virtual appliances in Open Virtual Machine Format (OVF).		
14	Hypervisor management software should allow reliable and non-disruptive migrations for Physical/ Virtual machines running Windows and Linux operating systems to virtual environment.		
15	Hypervisor management software should include provision for automated host patch management with no VM downtime.		
16	Hypervisor management software should be able to integrate into existing standard EMS systems.		
17	The management solution for hypervisor should provide Single-Sign-On capability which should dramatically simplify administration by allowing users to log in once to access all instances or layers of management without the need for further authentication.		

VIII. SOFTWARE DEFINED STORAGE

Sl. No.	Technical Specifications	Compliance (Yes/ No)	Reference (URL address with page No./data sheet with page No.)
1	The proposed solution shall provide software based enterprise class storage services on commodity x86 servers		
2	Shared Storage created by clustering server attached traditional magnetic Disks or Flash Disks (like SSDs, NVMes etc.)		
3	Can be configured using either Hybrid or All-Flash Storage		
4	Should provide upgrade path from Hybrid to All-Flash with same set of compatible hardware no disruptively.(in case of Hybrid)		
5	Should provide high-resilient shared storage capacity for Virtual environment		
6	Should be integrated with Hypervisor and No additional VM/Appliance/software should be required to install		
7	Should support all Hypervisor benefits like HA, vMotion		
8	Should be compatible with Disaster Recovery solutions		
9	Should support server side read/write caching to reduce storage latency		
10	Should support snapshots and clones in a Virtual environment		
11	The software defined storage solution should support Data Locality		
12	Should be Hardware independent to provide flexibility of choosing hardware from any server manufacturer		
13	Should support nondisruptive Scale-Up (Upgrade by inserting drives in existing empty drive-slots) & Scale-Out (Upgrade by adding nodes) upgrades to grow capacity and/or performance whenever required.		
14	Should support mixing of different compatible Server brands in same Cluster.		
15	Should Support Co-Existence of traditional storage with HCI solution and the existing storage solution should be managed using the same management framework. (3rd party tool can be used) for the purpose of backup)		
16	The Solution should be proven in the market. Should have more than 25 customers in India.		
17	Direct OEM 24x7x365 days with unlimited incident support and 30mins or less response time including the unlimited upgrades and updates.		
18	The solution should provide a single unified management console for the management of the entire environment including virtualized environment as well as software defined storage environment. This would simplify the manageability of the entire solution.		
19	Provide granular VM-Centric controls for managing storage service levels		
20	Automated self rebalancing capabilities to align with defined Storage service levels		
21	The solution should deliver zero data loss capability in case of disk, host, network or rack failure		

22	The solution should support Online Analytics on Health and provide predective alerts		
23	The solution should be able to use hypervisor/VM based replication to asynchronously replicate VMs across sites based on configurable schedules of up to 5 minutes RPO		

IX. RACK

S. No.	Specification	Compliance (YES/NO)	Reference (URL address with page No./data sheet with page No.)
1	All the relevant product brochures and manuals must be submitted		
2	RACK should be same make as that of server make i.e. OEM make		
3	Standard 42U 800mmW/1000mmD fully perforated front & back door and side panels, holes should be evenly distributed from top to bottom to permit adequate airflow (equivalent to 64 percent open areas for ventilation), preferably black Color.		
	Should have 42U of vertical mounting space and the servers, KVM and Monitor Console should fit into the rack and necessary rack mount plates/kits to be provided.		
4	Rack doors should having locking arrangements both front panel and rear panel		
5	Adequate clearance between the installed rack component and the side panels of the rack		
6	One number Earthing Kit, One number Cable Manager Horizontal 1U		
7	The bidder should provide 2 (two) nos. Power Distribution Units (PDU) - PDU should have a 32A MCB, a neon Indicator, 16 x IEC C13 Sockets (5 A / 15 A) and at least 3.0 meter cable for connection to the external power source		
8	Castors (One set of 4) , One number Stationary Shelf , One number Keyboard tray rotary with slides , two numbers mounting hardware (Each Pack of 10)		
9	One number Temperature Indication Unit		
10	Two numbers Cat 6 24 port 1 RU Jack Panel for Rack,		
11	The bidder should terminate the Jack Panel and its necessary components using Cable Manager		
12	The bidder shall have to mount new as well as existing servers in the rack and will have to provide the rack mounting kit accordingly		
13	Compliance to EIA-310-D. The bidder has to supply Rack design diagram		
14	Appropriate Cables for connecting Keyboard, Monitor, Mouse etc to be provided		

15	Supporting 1000 Kgs load. Bottom cover with knock out holes for cable entry to be provided		
16	Three pairs of horizontal support shall be fitted on both right and left sides		
17	Fans to be mounted on Rear Door / Roof		
18	Copper based Electrical Grounding / Earthing Strip		
19	Adjustable screw legs – 4 No		

X. BACK UP

The solution shall include the following options for the backup.

Sl. No.	Specification	Compliance (Yes/No)	Reference (URL address with page No./data sheet with page No.)
1	Solution should provide a backup catalog to allow any Virtual Server to be recovered to any specific point in time; Data recovery process should be simple with an RTO in minutes		
2	Backup Window: Daily incremental, Week Differential and Monthly Full Backup		
3	Retention Policy: 90 Days		
4	Solution provider should supply 50TB NAS Storage for Backup purpose and should to expandable to 200 TB at any point of time and brand should as server brand		

XI. SOFTWARE LICENSES

Sl. No.	Specification	Compliance Yes/NO	Reference (URL address with page No./data sheet with page No.)
1	Hypervisor & SDS licenses should be perpetual on the supplied appliance.		
2	Hypervisor & SDS licenses should keep on working post end of OEM support.		
3	Backup software license should be either TB based or processor based perpetual license		

XII. INTEGRATION AND COMMISSIONING

S. No.	Specification	Compliance Yes/NO	Reference (URL address with page No./data sheet with page No.)
1	Integration shall include the hardware installation as well as software installation and configuration of all the modules and requisite dependencies for ready launch of sample virtual machine from templates.		
2	All existing virtual machines should be migrated to new setup without any failover and downtime.		

ANNEXURE –C

BOQ – PRICE BID FORMAT

TABLE 1:

Sl. No.	Description	Qty in Nos.	Unit Cost in USD	Total cost in USD
1	Backup Storage			
2	Top of the Rack Switch			
3	Rack			
4	Hyper Converged Infrastructure license			
5	Backup Software and Licenses			
6	Implementation and Support Services			
Shipping, Handling and Other Charges whichever applicable including option items.				
	Total Amount			
Total in words:				
Agency commission % (if any)_____				

TABLE 2:

Sl. No.	Description of Server Options		Qty (in Nos.)	Unit Cost in USD	Total Cost in USD
1	Option A	Data Centre Server	4		
		Disaster Recovery Server	3		
2	Option B	Data Centre Server	5		
		Disaster Recovery Server	3		
3	Option C	Data Centre Server	6		
		Disaster Recovery Server	3		

AMC charges from 6th year (to quote as annual charge) in INR:_____

*** Servers need to be included (should quote for all options)**

SIGNATURE OF TENDERER ALONG WITH SEAL OF THE COMPANY WITH DATE

ANNEXURE – D

DETAILS OF EXISTING SETUP

Hardware Details

Production Server Details					
Make/Model	**Processor**	**Memory**	**Disk**	**Ethernet Adapter**	**Qty**
HPE DL380p GEN8	Intel Xeon 2.2Ghz, 8Core x 2	128 GB	900GB SAS x 2	4	5

Storage Details						
Make/Model	**Storage Controller**	**Hard Disk**	**Ethernet/FC**	**No of HBA Port**	**Total Disk**	**Useable Space**
HP P6350 EVA Storage	2	600 GB SAS 10.2k	FC/10GB E/1GB	4	74 Disk In each EVA Storage	30 TB

SAN Switch Details			
Make/Model	**Description**	**Ethernet Adapter**	**Qty**
HPE Storage Work, SAN Switch	HPE B-Series 8/8 and 8/24 Switch Support	2	4

Backup Server Details					
Make/Model	**Processor**	**Memory**	**Disk**	**Ethernet Adapter**	**Qty**
HPE DL160 GEN7	Intel Xeon 3.10Ghz, 2Core	8 GB	250 GB SAS 7.2K	2	1

Backup Storage Details				
Make/Model	**No of HBA Ports**	**Ethernet Adapter**	**Total No of Disk**	**Useable Space**
HPE StoreOnce 4430	4	4	2TB NL-SAS 7.2K – 24 Nos	10TB

Software License Details

Vmware License Details			
Sl.No	**Part Code**	**Product Description**	**Qty**
1	VS5-ENT-PL-C	VMware vSphere 5 Enterprise Plus for 1 processor	10
2	VS5-ENT-PL-P-SSS-C	Production Support / Subscription for VMware vSphere 5 Enterprise Plus for 1 processor for 4 years	10
3	VCS5-STD-C	VMware vCenter Server 5 Standard for vSphere 5 (Per Instance	1
4	VCS5-STD-P-SSS-C	Production Support / Subscription for vCenter Server 5 Standard for vSphere 5 for 4 Years	1

Backup Software Details			
Sl.No	**Part Code**	**Product Description**	**Qty**
1	CAUDPPVS50W00G4	Arcserve UDP v5 Premium Edition (formerly RPO) – Socket - Product plus 1 Year Enterprise Maintenance	10

SCHEDULE

Name of Organization	Indian Institute of Technology Madras
Tender Type (Open/Limited/EOI/Auction/Single)	OPEN
Tender Category (Services/Goods/works)	Goods/Services
Type/Form of Contract (Work/Supply/ Auction/ Service/ Buy/ Empanelment/ Sell)	Supply
Product Category (Civil Works/Electrical Works/Fleet Management/ Computer Systems)	**Hyper Converged Infrastructure and Private Cloud**
Source of Fund (Institute/Project)	IIT Madras
Is Multi Currency Allowed	No
Date of Issue/Publishing	28.12.2018
Pre- bid Meeting Date and time	04.01.2019 @ 03.30 pm
Document Download/Sale Start Date	28.12.2018
Document Download/Sale End Date	28.12.2018
Last Date and Time for Uploading of Bids	17.01.2019 before 02.00 p.m.
Date and Time of Opening of Technical Bid	18.01.2019 at 03.00 p.m.
EMD	Rs. 3,00,000/-
No. of Covers (1/2/3/4)	2
Bid Validity days (180/120/90/60/30)	120 Days
Address for Communication	**The Deputy Registrar** **Stores & Purchase Section** **IIT Madras** **Chennai – 600 036**
Contact No.	**Technical Related Queries:** **Mr. S. Anandkumar** **Assistant Systems Engineer** **Computer Centre** **IIT Madras** **Chennai - 600 036.** **Phone No: 044- 2257 4987** **E-mail id : sanand@iitm.ac.in**
Email Address	adstores@iitm.ac.in