



INDIAN INSTITUTE OF TECHNOLOGY MADRAS Chennai 600 036

STORES & PURCHASE SECTION

Telephone : (044) 2257 8293,8287,8285,8286
email ID- adstores@iitm.ac.in



A. V. Sudarsanam

Dated : 03.12.2012

Deputy Registrar (Stores & Purchase) i/c

Tender No.SPS/CC/SERVERS/001/2012-13

**Due Date: 26.12.2012
before 2.00 p.m**

Dear Sirs,

1. On behalf of the Indian Institute of Technology Madras, I invite you to tender for supply of the following item **under Two bid system from OEM only.**

Item
SERVER CONSOLIDATION AND BACKUP SOLUTION

confirming to the specifications enclosed.

A.	LAST DATE for receipt of Tender	: 26.12.2012 before 2.00 p.m
	Submission of Tender	<p>: Both Technical Bid & Price Bid should be in separate cover with specification on the cover as “Technical Bid” & “Price Bid” as the case may be.</p> <p>Both the independent covers should be placed in one big cover and sealed with the superscription on the left hand side OPEN TENDER FOR SUPPLY OF Server Consolidation and Backup Solution due on 26.12.2012 at 2.00 p.m.</p> <p>The tender cover should be sent to:</p> <p style="text-align: center;">DR. N. SIVA PRASAD REGISTRAR INDIAN INSTITUTE OF TECHNOLOGY MADRAS CHENNAI-600 036</p> <p>Right is reserved to ignore any tender which fails to comply with the above instructions.</p> <p>Tender should be sent either by REGISTERED POST ACKNOWLEDGEMENT DUE OR THROUGH MESSENGER. If the Tender 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) before 2.00 PM on due date (26.12.2012 before 2.00 p.m.).</p> <p>If it is by post (Registered Post or Speed post only) the same should reach before 2.00 p.m. i.e on the last date 26.12.2012 otherwise it will be summarily rejected.</p> <p>THE INSTITUTE SHALL NOT BE RESPONSIBLE FOR THE LATE RECEIPT OF TENDER ON ACCOUNT OF POSTAL OR ANY OTHER DELAY.</p>

	Pre bid meeting:	:	<p>12-12-2012, 03:00 p.m</p> <p>Venue: Conference Room of Computer Centre, GND Floor.</p> <p>If you need more clarifications on this tender documents or specifications of the equipment, you are invited to attend the pre bid meeting.</p>
B.	Earnest Money Deposit (EMD)	:	<ul style="list-style-type: none"> ☞ EMD @ 2% of the equipment value quoted has to be paid along with the tender ☞ To be calculated based on the highest value quoted, among all configurations, by the bidder. ☞ The EMD amount up to 20 Lakhs is to be given in the form of DD from a nationalized bank ☞ Performance guarantee @3% of the equipment value quoted has to be submitted by way of bank guarantee by the successful bidder only. ☞ Demand Draft may be drawn in favour of “The Registrar, IIT Madras” payable at Chennai. ☞ The EMD should be put in a separate cover and should be enclosed in the technical bid cover only, else the bid is likely to be rejected due to non-enclosure of EMD.
C.	Marking on Technical Bid	:	<ul style="list-style-type: none"> ➤ For each item/configuration separate Technical Bid envelope should be used. ➤ The technical bid cover of the various items should clearly be marked with the item name. ➤ The technical bid covers of the various items should be put into one big cover superscribed “Technical Bid”. ➤ 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.
D.	Marking on Price Bid	:	<ul style="list-style-type: none"> ➤ For each item/configuration separate Price Bid envelop should be used. ➤ The price bid cover of the various items should clearly be marked with the item name. ➤ The price bid covers of the various items should be put into one big cover superscribed “Price Bid”. ➤ All financial bid should have the page-wise heading as “Financial 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.
E.	Agency Commission		<ul style="list-style-type: none"> ➤ The financial bid should clearly state (below the total price quoted) if the quoted amount includes agency commission. ➤ If yes, state the percentage of commission. ➤ This will be paid in INR only after satisfactory installation. ➤ The quote value + agency commission, if any, will be taken for comparison purpose.
F.	Tender document fee		<ul style="list-style-type: none"> ➤ The tender document fee of Rs.500/- (Non-refundable) should be drawn in the form of DD (obtained on or after the date of advertisement) in favour of “The Registrar, IIT Madras” payable at Chennai, and the same should be enclosed only in

		<p>the technical bid cover.</p> <p>➤ No separate tender documents will be issued by us. The same can be downloaded from our institute website: http://tenders.iitm.ac.in</p>
G.	For all the imported components	<p>➤ Quote should be in US dollars.</p>
2.	<p>Preparation of Tender:</p> <p>a) The Schedule to the Tender form should be returned intact whether you are quoting for any item or not. Pages should not be detached and when items are not being tendered for, the corresponding space should be defaced by some such words as 'not quoting'.</p> <p>b) In the event of space on the schedule form being insufficient for the required purpose, you have to submit the rates in the letter head of your company clearly mentioning S.No. and other relevant particulars. Each such additional page must be numbered consecutively, bear the Tender Number and be fully signed by you. In such cases reference to the additional pages must be made in the tender form.</p> <p>c) If any modification of the schedule is considered necessary, you should communicate the same by means of a separate letter sent with the Tender within due date.</p> <p>d) 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.</p> <p>e) In case, your product specification does not exactly match our requirements, you may quote for your product, but you must highlight the deviation in specification point by point.</p> <p>f) If you need to add any item to your system in order to meet our specification requirements, you are required to quote for your basic system separately and also to quote the total value of the system including the option required to suit our requirements. Otherwise, your tender will not be considered at all.</p> <p>g) Wherever applicable you are required to clearly indicate the Part No./Model No./Brand Name etc. If such details are not included, it will be presumed that your offer is not for branded item, but for generic only, and compared accordingly.</p> <p>h) The offer/bids should be submitted in two bid system i.e. Technical Bid and Price Bid in a separate cover. The technical bid should consist of all technical details along with catalogue, commercial terms and conditions. Financial bid should indicate item-wise price for all the items mentioned in the technical bid.</p> <p>i) The Technical bid cover will be first opened and evaluated. In the primary screening, technical bid of only those who satisfy the eligibility criteria will be evaluated. The Price bid of only those bidders whose technical bid is found to be technically adequate by the Committee will be opened.</p>	
3.	<p>Signing of Tender:</p> <p>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 important conditions referred to in Annexure enclosed herewith. Each page of the tender documents required to be signed and bears the official seal of the tenderers.</p>	
4.	<p>Period for which the offer will remain open:</p> <p>(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 should specifically state the period for which their offers are being considered provided, however, the day up to which the offer is to remain open being declared closed holiday for the Indian Institute of Technology Madras, the offer shall remain open for acceptance till the next working day.</p> <p>(ii). Quotations qualified by such vague and indefinite expressions such as 'subject to immediate acceptance', 'subject to prior sale' will not be considered.</p>	

5.	Opening of Tenders: You are at liberty to be present or authorize a representative to be present at the opening of the tender at the time and date specified in the Schedule.
6.	Prices: <p>The prices quoted must be net per unit shown in the schedule and must include all packing and delivery charges and other statutory levies. Refund on account of returnable packages (if any) are to be separately specified. Price and refunds must be clearly shown in figures and worked in Indian currency. The prices quoted by the Tenderer should be inclusive of Sales Tax/VAT 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.</p> <p>Hence you are requested to be careful while quoting for tender. The price should be without customs duty and excise duty since IIT Madras is fully exempted from payment of excise duties and also 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.</p> <p>We are eligible for concessional VAT/CST on submission of concessional certificate. The Institute is not authorized to issue C or D forms of Sales tax certificate. Hence VAT/CST should be charged at concessional rates as applicable to educational and research institutions run without profit motives, for which necessary certificate will be issued on demand at the time of retirement of documents/payment, wherever applicable.</p>
7.	Terms of Delivery: Supply, Installation and Commissioning are required by date(s) specified in the Schedule of Tender. If, however, it is not possible for you to effect supply, installation and commissioning by the date(s), you should specify the date(s) by which you can guarantee supply, installation and commissioning in the prescribed schedule to the Tender.
8.	Right of Acceptance: The Indian Institute of Technology Madras, Chennai-600 036 does not pledge itself to accepting the whole or any part of the Tender or portion of the quantity offered.
9.	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. In case where acceptance is communicated by Telegram or letter by Speed Post, the formal Acceptance of Tender will be forwarded to you as soon as possible but the instructions contained in the Telegram or Speed Post letter should be accepted upon immediately.
10.	The Institute shall not be responsible for the late receipt of tender documents due to postal and or any other delay.

Yours faithfully,

Deputy Registrar (Stores & Purchase Section) i/c

Indian Institute of Technology Madras, Chennai 600 036 Stores & Purchase Section				
SCHEDULE TO INVITATION OF TENDER NO		:	SPS/CC/SERVERS/001/2012-13	
LAST DATE & TIME FOR RECEIPT OF TENDER		:	26.12-2012 at 2.00 p.m.	
TIME & DATE OF OPENING OF TENDER		:	26.12-2012 at 3.00 p.m.	
In the event of the date of opening of tender being declared a closed holiday for the Indian Institute of Technology Madras the due date for opening will be following working day.				
The Tender shall remain open for acceptance/validity till: 31.03.2013				
S.No.	Description	Quantity	Price	
			US Dollars	In Indian Rupee
The bid shall be submitted in the above format as per the specifications (Page 10 onwards), configuration options on page 19 and additional terms & conditions (page 17 & 18) are attached herewith.				
IMPORTANT TO NOTE: <ol style="list-style-type: none"> 1. All tender documents should be filled in signed and returned. 2. Tenderer must state categorically whether or not his offer is exact to tender specifications and indicate deviations, if any failing which his offer will be ignored. 3. Your offer should be accompanied by catalogue of the equipments. 4. Delivery should be effected within the time frame as given in Important Condition No.7 5. <i>FAX/Email/Telegram quotations will not be accepted.</i> 				
NOTE: ONE AGENT CAN NOT REPRESENT FOR TWO SUPPLIERS OR QUOTE ON THEIR BEHALF AT ONE TIME. In case of import all the particulars required for opening Letter of Credit should be furnished in clear terms. After opening of L/C, based on our tender, no more requests for amendment of L/C will be entertained.				
Total inclusive price to be quoted should be in nearest Rupee (Supply, installation and commissioning at IIT Madras).				
IMPORTANT CONDITIONS:				
The following instructions are to be followed meticulously FAILING WHICH YOUR OFFER WILL NOT BE CONSIDERED:				
1.	Please mention the Part No., Model No. & Make wherever required and also CST/VAT No and Area Code failing which your quotation will be rejected. All of your future correspondences including Invoices should bear the CST/VAT No. and Area Code.			
2.	Withdrawal of a Model quoted is acceptable ONLY IF accompanied by a certificate from the manufacturer to that effect. Correspondence in this connection must be addressed to DR (Stores & Purchase). The offer of higher configuration in lieu of withdrawal model will be accepted only if there is no change in the price offered.			
3.	Quotations should be submitted in Arrack Sealed Cover (Sealing Wax). The quotation should be typed in the space provided in the downloaded format only. No manual entries are accepted and this will be rejected at the opening stage itself. Quotes given by the tenderers in their own format/letter heads will not be considered at all.			
4.	Warranty should be in clear terms. Indicate price change (if any) for extra year warranty.			
5.	In case of Import, the Insurance & Freight Charges should not exceed 6% of FOB Value. You are			

	requested to quote FOB price as well as CIF, CHENNAI mentioning Freight & Insurance charges separately. No Ex-Works pricing is considered.
6.	<p>Quotations will be accepted only from manufacturers for branded items. If they are not in a position to quote, they may authorize only one exclusive Accredited Resellers/Channel Partners/Deluxe Premium Service Partners, who may quote along with proof for authorization.</p> <ol style="list-style-type: none"> Two bid processes (separate sealed envelopes of technical and financial bids in the cover) is open to original equipment manufacturers (OEMs) only. Each OEM can, however, nominate one third party agent (TPA) to represent them during the bidding process. Documentary evidence for the following shall be included along with the covering letter. <ol style="list-style-type: none"> TPA shall produce authorization from the OEM they represent. OEM / TPA shall be an ISO certified company. OEM /TPA shall have a minimum of three installations in the country of similar value and technology. Proof shall be in the form of purchase orders and installation certificates. TPA shall have a partnership with the OEM they represent for at least 3 years. In the possibility of a proposal with a combination of modules from different vendors, OEM is defined as the producer of the modules by the highest value.
7.	<p>Delivery Period for Import & Indigenous Items:</p> <p>For Indigenous Items: Items should be delivered within a week's time. No further extension of time will be allowed.</p> <p>For Import Items: The order acknowledgement should be issued by Fax within 3 days, and the item should be airlifted within 15 days from the date of receipt of the Letter of Credit copy / copy of DD, as the case may be.</p> <p>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 in respect of future enquiry.</p>
8.	IIT Madras is exempted from the Payment of Excise Duty and also eligible for payment of concessional customs duty against submission of Essentiality Certificate. I.I.T. will make necessary arrangements for the clearance of imported goods at Airport. Hence, the price should not include the above charges.
9.	<p>No Advance Payment will be made for Indigenous purchase. 100% Payment against Delivery and installation for local purchase can be agreed to. In respect of Import, Demand Draft can be drawn against Proforma Invoice on an undertaking from the principal that the items will be exported within 10 days. Demand Draft will be drawn, and copy of the same will be given to you as proof, and the actual DD will be handed over to you on satisfactory installation of the systems. Otherwise 90% payment will be made by Letter of Credit and balance 10% will be paid only after satisfactory installation and commissioning. 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.</p>
10.	Item should be commissioned immediately after receipt of item failing which legal action will be taken against the successful bidder.
11.	<p>You must give an undertaking to the effect that “in case of downward price movements during the period, the firm promises to pass on the advantage to IIT Madras”. Your quotation will be summarily rejected, if the undertaking does not accompany the quotation.</p>

**Deputy Registrar
(Stores & Purchase Section) i/c**

ANNEXURE

INSTRUCTIONS & SPECIAL CONDITIONS

(To be returned by Tenderer along with the Tender duly signed)

1.	<p>GENERAL:</p> <p>Tenderer should furnish a clear declaration as follows:</p> <p>We declare that I am/we are</p> <ul style="list-style-type: none">i) Accredited Agents of the suppliers aboard;ii) Authorized Agents of the Projects & Equipment Corporation of India Ltd.,iii) Eligible for import of Scientific Equipment from East European Countries;iv) Holders in stock of the stores tendered for <p>(Strike out whichever is not applicable)</p>
2.	<p>CONDITIONS OF CONTRACT:</p> <p>Printed or cyclostyled or such terms and conditions of the tenderer, not appearing in the body of the tender will not be considered as forming part of the tender. Tenderer should quote on the basis of the conditions referred to in Para of the invitation to tender and tender papers. In case these terms and conditions are not acceptable to the tenderer, he should specifically state the deviation(s) there from in the body of the tender.</p>
3.	<p>DEVIATION FROM SPECIFICATIONS:</p> <p>It is in the interest of the tenderer to study the specifications in the tender schedule thoroughly before quoting so that, if any deviations are made by the tenderer, the same are prominently brought out in the body of the tender. If you need to add any optional items to your system in order to meet our specifications, you are requested to quote for the total including the option required to suit our requirements; otherwise, your tender will not be considered at all.</p>
4.	<p>PRICE:</p> <ul style="list-style-type: none">i) Prices must be in Rupees and Paisa if the import is from the East European Countries. For import from General Currency Area, the price may be indicated in foreign Currency (both F.O.B. & C.I.F. CHENNAI by Air/Sea). The price should be without Customs Duty and Excise Duty since IIT Madras is exempted from the payment of Excise Duties and also eligible for concessional Customs Duty against submission of Essentiality Certificate.ii) AGENCY COMMISSION [(Refer page no.2 (E))]iii) The unit prices should be for the same unit as indicated in the Schedule to tender enquiry and not for any other unit.iv) Prices quoted should be for supply, installation and commissioning in I.I.T. Madras.v) Discount, if any, should be indicated prominently.vi) Offers should normally be on firm price basis. If the tenderer cannot quote firm prices, variable prices with a ceiling have to be indicated. If the variation price be lower than the price stated in the quotation, the purchaser should have the benefit of lower price.
5.	<p>TRANSIT INSURANCE: The Purchaser will not pay separately for Transit Insurance.</p>
6.	<p>PAYMENT:</p> <ul style="list-style-type: none">i) Payment will be made only after completion of supply, installation and commissioning of the systems to the entire satisfaction of the Purchaser.ii) If the payment is desired to be made to their Principals directly, the same will be made against Irrevocable Letter of Credit only. For more details, see the accompanying note on "Important Conditions".iii) No Advance Payment will be made either for Indigenous Purchase or Import.iv) Advance dispatch details like Invoice copy, Airway Bill No., Packing List and flight No. should be sent immediately after shipment for early clearance and also make suitable arrangements for sending Cargo Arrival Notice (CAN) in time. Demurrage charges, if any, on account of delay in receipt of above will be debited to supplier's account.

7.	<p>TENDERER SHALL SUBMIT ALONG WITH HIS TENDER:</p> <ol style="list-style-type: none"> I. Submission of Income Tax clearance certificate is not required. However, they have to quote their PAN No. II. Name and full address of the Banker and their swift code. III. Proof of having ISO 9002 or other equivalent certification given by appropriate authorities. IV. Proof of registration with sales tax /VAT authorities like registration number, range etc. in clear terms.
8.	<p>EARNEST MONEY DEPOSIT (EMD): Refer page no.2 (B)</p> <ul style="list-style-type: none"> ➤ This Earnest Money will be returned to the unsuccessful tenderers after the final disposal of the tenders. EMD will not carry any interest. ➤ The EMD will be retained in the case of successful tenderers till the warranty period. ➤ EMD will not be waived under any circumstances. ➤ EMD will be forfeited in the case of non-execution of the order within the due date. ➤ Non submission of EMD will lead to rejection of tender at the opening stage itself.
9.	<p>DISTRIBUTORSHIP CERTIFICATE:</p> <p>Sole selling Agents/Distributors of a particular make should submit a Certificate from their Principals to the effect that they are the authorized Agents of the Manufacturers and that they are authorized to import and supply the equipment to IIT Madras.</p>
10.	<p>GUARANTEE:</p> <p>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.</p>
11.	<p>JURISDICTION:</p> <p>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.</p>

ACKNOWLEDMENT

It is hereby acknowledged that we have gone through all the points listed under "Instructions & Special Conditions" outlined above, and those in the accompanying note on "Important Conditions", and we agree to abide by them under the penalty of permanent disqualification for Tender participation and for related penal actions for non-abidance of the conditions.

**SIGNATURE OF TENDERER ALONG WITH
SEAL OF THE COMPANY WITH DATE**

TERMS & CONDITIONS for Rupee quote

1.	Sales tax	IIT will issue concessional sales Tax certificate for purchase of scientific and research items. IIT is not eligible to issue "C" or "D" form. Percentage of tax if applicable- may be mentioned.
2.	Validity	Should be mentioned clearly
3.	Service charges	Extra, if applicable
4.	Freight charges	Extra, if applicable
5.	Customs duty	IIT is eligible for concessional customs duty. The necessary certificate will be issued for clearance.
6.	Excise duty	IIT is fully exempted from excise duty. The necessary certificate will be issued for clearance.
7.	Discount	Should be stated in clear terms / percentage of discount should be stated.
8.	Warranty	May be stated clearly.
9.	Payment terms	- do -
10.	Delivery period	- do -
11.	AMC	May be stated clearly.
12.	Any other details	Separate sheet may be attached.

TERMS & CONDITIONS for Foreign quote

1.	Price	Please state whether the price quoted by you is Ex-works / FOB / CIF / CIP / FCA etc. For quote received in Ex-works / FOB / FCA etc. value, for freight, insurance etc. additional 10% of quote value will be added and comparison will be made accordingly for CIF / CIP at the prevailing exchange rate on the date of opening of tender (i.e.) on 26.12.2012
2.	Validity	Should be mentioned clearly
3.	Customs duty	IIT is eligible for concessional customs duty. The necessary certificate will be issued for clearance.
4.	Discount	Should be stated in clear terms / percentage of discount should be stated.
5.	Warranty	May be stated clearly.
6.	Payment terms	- do -
7.	Delivery period	- do -
8.	AMC	May be stated clearly.
9.	Any other details	Separate sheet may be attached.

Technical Specifications for listing in Compliance Certificate

The compliance certificate shall be in a tabular form with the following details:

1. Module number, technical specification number (as per the list below).
2. Compliance (yes / no / partial)
3. Remarks (must, in case of partial compliance)
4. Reference (Name of the document, page number and paragraph number where a documentary evidence of the compliance is available). All the documents so referred shall be part of the technical bid.

1. **Module A. Specifications of Server**

1. Processors:

- a) The server shall consist of 2 processors
- b) Each processor shall be of Intel Xeon E5 series
- c) Each processor to contain minimum of 8 cores each.
- d) Each processor to run 16 threads simultaneously.
- e) Clock speed: 2.2 GHz or more.
- f) Level 3 Cache Memory: 20 MB or more.
- g) Instruction set: 64 bit.
- h) Should support ECC Memory.
- i) Should support Intel technologies such as Turbo Boost, vPro, Hyper-Threading, VT-x, VT-d, Trusted Execution, Flex Memory Access, Execute Disable Bit

2. Form factor shall be in 2U Rack

3. Memory: DDR3 ECC RAM of 8GB per core with a possibility of expansion in future. Memory shall be at 1600 MHz.

4. Network: 1Gb Ethernet Adapter with 4 Ports

5. Storage:

- a) Serial-attached SCSI RAID Controller to support 6 Gb/s SAS drives
- b) Multiple RAID Levels with Hardware RAID support
- c) Storage Controller to have Battery Backed or Flash Backed or Non-volatile Write Cache of 256 MB or more
- d) 8 SFF Drive Bays with the option of expansion in future.
- e) Drive bays to be populated with SAS drives for a total initial usable capacity of 6 TB

6. Power: Dual hot-plug power supplies with auto-switching

7. Hypervisor that supports 64 bit Enterprise Linux (SuSE/RedHat/CentOS/Ubuntu) and Windows 2008 Server shall be preinstalled.

8. All requisite software installations and configurations for clustering to be performed and media kit to be supplied along.

2. Module B. Specifications of SAN Storage

1 Architecture & Processing Power

- a) The storage array should support dual, redundant, hot-pluggable, active-active array controllers for high performance and reliability
- b) Storage Array should be based on a Real Time Embedded Operating System Kernel and shall not be based on general purpose based operating system.
- c) Controllers shall be true active-active so that a single Logical unit can be serviced by both controllers at the same time.

2 Capacity & Scalability

- a) The Storage Array shall be offered with a usable capacity of 30 TB with the option-1 of 100% SAS and option-2 of 50% SAS and 50% NLSAS mix. The usable capacity is in RAID-5 using 10K rpm or above, 2.5" SAS drives @6 Gbps and using 1 TB / 2TB 7.2K RPM NL-SAS Drives. Please note the options as listed in the Options Matrix.
- b) Storage shall be scalable to minimum of 100 number of drives.
- c) The Storage shall support both 3.5" and 2.5" SAS Drives behind the same pair of controllers.

3 No Single point of Failure

- a) Offered Storage Array shall be configurable in a No Single Point of configuration including Array Controller card, back-plane, Cache memory, FAN, Power supply etc.
- b) For high availability and performance, the storage system architecture should have redundant paths to each and every drive shelf through at-least 4 back-end controller paths.

4 Disk Drive Support

Offered Storage Array shall support 6Gbps dual-ported 300GB / 450GB / 600GB 10K hot-pluggable 3.5" Enterprise SAS hard drives, 2 TB 7.2K Near-Line SAS Drives, 146GB-15K and 300GB / 600GB 10K hot-pluggable 2.5" Enterprise SAS Drives and 500GB 7.2K Near-Line SAS Drives. It should also support SSD Drives within the same enclosure.

5 Cache

- a) Offered Storage Array shall be given with a minimum of 4 GB cache per controller and a minimum of 8 GB total cache across both controllers.
- b) Cache shall be used only for Data and Control information exclusively. Any memory overheads for controller OS shall not be allocated out of the 8GB cache.
- c) Cache shall be dynamically managed for Read and Write operations.

6 Raid Support

- a) Offered Storage Subsystem shall support Raid 0, 1, 1+0, 5 and Raid 6.
- b) Offered Storage subsystem controllers shall have capability to create a single volume of up to 32TB.
- c) Offered storage subsystem should have the capability of dynamic expansion of both RAID and volume sizes at controller as well as host level, in an automated fashion and based on policies defined in the Management GUI.

7 Data Protection

- a) In case of Power failure, Storage array shall be able to hold data in the cache till destaging to disk drives safely. Redundant standby power supplies are to be configured to enable this feature.
- b) For optimal data protection, storage shall support distribution of metadata on more than one drive shelf.

8 Host Ports & Back-end Ports

Offered Storage shall have minimum of 4 x 8Gbps FC and 4 x 10Gbps iSCSI/FCoE host ports for connectivity to servers & minimum of 8 SAS Lanes for Disk shelf connectivity.

9 Ports Bandwidth

Offered storage shall offer 8Gbps bandwidth per FC and 10Gbps per iSCSI/FCoE Host Port and 6Gbps bandwidth per back-end SAS Lane. SAN Switch is to be included as part of the proposal.

10 Global Hot Spare

- a) Offered Storage Array shall support distributed Global hot Spare for offered Disk drives.

b) Atleast 2 Global hot spare drive shall be configured for every 40 drives.

11 Performance

Shall have capability to use more than 30 drives per RAID-5 array group or raid group for better performance.

12 Load Balancing & Multi-path

Multi-path and load balancing software shall be provided, if vendor does not support MPIO functionality of Operating system.

13 Maintenance

Offered storage shall support online non-disruptive firmware upgrade for both Controller and disk drives.

14 Point-time-copies

- a) Shall support Snapshot, Capacity free snapshot without locking the disk space, Full physical copy (Clone).
- b) Shall support incremental re-synchronization of clone copy with Primary volume.
- c) Shall support more than 16 Snapshots of a given production volume.
- d) Shall be able to create Snapshots on different RAID levels as compared to Production volume.
- e) Shall be able to create Clone copy on high capacity SATA/FATA/NLSAS Drives.

15 Storage Array Configuration & Management Software

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

16 Performance Management

Vendor shall also offer the performance management software for Storage Array. It should provide online and historical performance details. The historical performance details should be available within the system for atleast 6 months.

17 Thin Provisioning & Capacity Management

The array should have Thin Provisioning capability and should also have the capability for dynamic management of capacity - policy based LUN expansion and shrinking. Licenses if any, should be provided for the entire capacity of the array.

18 Remote Replication

- a) Storage shall support both Synchronous and Asynchronous replication at controller level.
- b) Shall support continuous asynchronous replication to Remote Array without locking up cache for buffering by preferably using a disk based journal so as to optimize bandwidth usage.
- c) Shall support replication across all models of the offered family.

19 Operating System & Clustering Support

- a) The storage array should support industry-leading Operating System platforms including: Windows Server 2003, Windows Server 2008, Vmware, and multiple popular variants of Linux.
- b) Offered storage shall also support clustered servers of all above operating systems.

3. **Module C. Specification of Backup Storage**

- 1. The D2D Appliance should be offered with a capacity Minimum of **30TB** of usable space and scalable to **60TB** usable space using 2TB or higher SAS/NLSAS midline drives. The option matrix shows the combination of SAS and NLSAS drives desired.
- 2. The Disk based backup system (D2D) shall be Modular in design to allow addition of incremental capacity / increase performance.
- 3. Offered device shall support emulation of either VTL or NAS target (CIFS / NFS access) for a given storage box. The choice must be available for the proposed storage system.

4. Offered device shall have the ability to configure at-least combination of 12 or more tape Libraries & NAS targets and significantly larger Virtual Cartridge slots in the single appliance.
5. The NAS Targets should be accessible over CIFS and NFS protocols for deployment in all OS environments if the storage is configured with a NAS appliance.
6. Offered Disk shall be hardware RAID protected preferably in RAID 6.
7. The proposed solution should be compatible with all leading backup applications/vendors including Symantec Netbackup, Backup Exec, Tivoli Storage Manager, Data Protector, Comm Vault, etc.
8. The D2D System should have integral capability to de-dupe backup data (inline de-dupe) for efficient and reduced capacity utilization and facilitate keeping more backups online. Licenses, if any, should be provided for the entire capacity of the appliance.
9. De-duplication shall be inline and shall not have any dependency on the backup software.
10. The Inline De-dupe should be efficient to support high de-dupe ratios of at least 10:1 or greater depending on data types and backup routines and retention policies.
11. The D2D Appliance should also support low bandwidth replication to replicate data to another D2D appliance over LAN or WAN.
12. The Appliance shall flexibly emulate tape drive/ tape formats at least LTO-Gen2 and LTO-Gen3.
13. Offered device shall have Minimum of 2 x 8Gbps Fibre Channel connections and 2 x 1Gbps iSCSI connection.
14. The appliance shall support backup throughput of at least 1 TB/hr and should be scalable internally to support throughput of approximately 2TB/hour.
15. The Appliance should have a graphical utility to provide backup performance, capacity utilization and de-dupe ratios.

4. *Module D. OEM Rack, KVM Switch and related accessories*

1. 12 port Digital KVM Switch.
2. A network switch (of CISCO make – for compatibility with existing network, 1 Gbps, dual power source) shall be included along.
3. Console with one set of LCD monitor, keyboard and mouse/touchpad to slide in and out of 1U rack space.
4. KVM switch and Console shall be compatible for USB passthrough.
5. KVM Switch to be preferably in the same U space.
6. Cabling to the servers.

5. *Module E. Virtualization Software and requisite licenses*

Part 1. Virtualization Software:

1. Virtualization software shall provide a Virtualization layer that sits directly on the bare metal server hardware with no dependence on a general purpose OS for greater reliability and security.
2. Virtualization software should be able to boot from iSCSI, FCoE, and Fibre Channel SAN
3. Virtualization software shall have the capability to create Virtual servers with upto 32 processors and upto 1TB Memory in virtual machines for all the guest operating system supported by the hypervisor.
4. Virtualization software shall integrate with NAS, FC, FCoE, and iSCSI SAN and infrastructure from leading vendors Leverage high performance shared storage to centralize virtual machine file storage for greater manageability, flexibility and availability.
5. Virtualization software shall allow heterogeneous support for guest Operating systems like Windows client, Windows Server, Linux (at least Red Hat, SUSE, Ubuntu and CentOS), Solaris x86 and Novell Netware.
6. Virtualization software shall have the capability for creating virtual machine templates to

provision new servers

7. Virtualization software shall allow taking snapshots of the virtual machines to be able to revert back to an older state if required.
8. Virtualization software should have the ability to thin provisions disks to avoid allocating all storage space upfront. Full monitoring capabilities and alerts to prevent from accidentally running out of physical storage space.
9. Virtualization software should support connecting smart card readers to multiple virtual machines, which can then be used for smart card authentication to virtual machines.
10. Virtualization software should have provision for profile-driven storage, which will enable rapid and intelligent deployment & placement of virtual machines based on SLA, availability, performance or other requirements and provided storage capabilities.
11. Virtualization software should Support live Virtual Machine migration with enhanced CPU compatibility.
12. Virtualization 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, iSCSI, NFS, DAS).
13. Virtualization 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.
14. Virtualization software should provide smart virtual machine disk placement and load balancing mechanisms based on I/O and space capacity which will help decrease operational effort associated with the provisioning of virtual machines and the monitoring of the storage environment.
15. Virtualization software should provide dynamic power management such that incase 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.
16. Virtualization 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 virtualization software. The feature should be independent of Operating System Clustering and should work with FC/ iSCSI SAN and NAS shared storage.
17. Virtualization 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.
18. Virtualization software should have the ability to manage virtual switches at a cluster level by creating a distributed switch that can span an entire cluster and is VM mobility aware. It should support features NetFlow and Port mirror and protocols Link Layer Discovery Protocol (LLDP) and Cisco Discovery Protocol (CDP)
19. Virtualization software should provide an integrated network firewall solution for virtual network with centralized management, suitable for all virtualized applications which should provide below features:-
 - i. It should be hypervisor-based application-aware firewall solution for virtual datacenters.
 - ii. It should have the ability to control Inbound/outbound connection by enforcing at the virtual NIC level through hypervisor inspection, supporting multihomed virtual machines.
 - iii. It should provide IP-based stateful firewall and application layer gateway for a broad

range of protocols including Oracle, Sun Remote Procedure Call (RPC), Microsoft RPC, LDAP and SMTP.

- iv. It should provide policy enforcement based on 5 tuple (source IP, destination IP, source port, destination port, protocol).
- v. It should have the ability of Inbound and outbound connection control with rules based on IP address (source/destination IP address), Ports (source/destination port), Protocol type (TCP or UDP).
- vi. It should provide masquerading of virtual datacenter IP addresses to untrusted locations.
- vii. It should be based on industry-standard syslog format.

- 20. Virtualization software should provide a service-oriented and stateless firewall to address security of the management interface and helps manage firewall rules through a familiar, service-oriented GUI. It should also support additional capability to restrict access to services based on IP address and subnet mask.
- 21. Virtualization software must support built-in storage multi-pathing.
- 22. Virtualization 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
- 23. Virtualization software should provide enhanced visibility into storage throughput and latency of hosts and virtual machines that can help in troubleshooting storage performance issues.
- 24. Virtualization software should provide quality-of-service capabilities for storage I/O so as to ensure that the most important virtual machines get adequate I/O resources even in times of congestion. The feature should be available for FC, iSCSI and NFS storage datastores.
- 25. Virtualization software should provide software FCoE adaptor that can work with a network adaptor that support partial FCoE offload capabilities.
- 26. Virtualization 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
- 27. Virtualization software must support NIC teaming for load sharing and redundancy.
- 28. Virtualization software shall allow creating virtual switches that connect virtual machines
- 29. Virtualization software shall support configurations of 802.1q VLANs which are compatible with standard VLAN implementations from other vendors
- 30. Virtualization software should allow dynamic adjustment of the teaming algorithm so that the load is always balanced across a team of physical network adapters
- 31. Virtualization software should provide network traffic-management controls to allow flexible partitioning of physical NIC bandwidth between different network-traffic types and allow user-defined network resource pools, enabling multi-tenancy deployment, and to bridge virtual and physical infrastructure QoS with per resource pool 802.1 tagging.
- 32. Virtualization software shall continuously monitor utilization across virtual machines and should intelligently allocate available resources among virtual machines
- 33. Virtualization software should allow redirection of virtual machine serial ports over a standard network link thereby enabling solutions such as third-party virtual serial port concentrators for virtual machine serial console management or monitoring
- 34. Virtualization software shall allow RAM over-commitment that allows to configure virtual machine memory in such a way that safely exceeds the physical server memory.
- 35. Virtualization software shall allow usage of Remote devices which allow Installation of software in a virtual machine running on a server from the CD-ROM of a desktop

36. Virtualization software should provide support for Microsoft Cluster Services between virtual machines
37. Virtualization software should provides an integrated back-up solution in addition to support for a centralized backup proxy to offload backup from virtualization host.
38. Virtualization software should provide solution to automate and simplify the task of managing hypervisor installation, configuration and upgrade on multiple physical servers.

Part 2. Virtual Machines Management Software Suite

39. Virtualization 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.
40. Virtualization management software should have intergrated Physical Host and Virtual Machine performance monitoring including CPU, Memory,Disk, Network, Power, Storage Adapter, Storage Path, Cluster services, Virtual machine datastores.
41. Virtualization management software console shall provide reports for performance and utilization of Virtual Machines. It shall co-exist and integrate with leading systems management vendors
42. Virtualization management software console shall provide capability to monitor and analyze virtual machines, and server utilization and availability with detailed performance graphs.
43. Virtualization 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.
44. Virtualization management software console should allow cloning of both powered on and powered off virtual machines.
45. Virtualization management software console shall provide Interactive topology maps to visualize the relationships between physical servers, virtual machines, networks and storage.
46. Virtualization management software console shall maintain a record of significant configuration changes and the administrator who initiated them.
47. Virtualization management software console shall provide the Manageability of the complete inventory of virtual machines, and physical servers with greater visibility into object relationships.
48. Virtualization management software should provide a global search function to access the entire inventory of multiple instances of virtualization management server, including virtual machines, hosts, datastores and networks, anywhere from within Virtualization management server.
49. Virtualization management software should support user role and permission assignment (RBAC)
50. Virtualization management software should allow you to deploy and export virtual machines, virtual appliances in Open Virtual Machine Format (OVF).
51. Virtualization management software should allow reliable and non-disruptive migrations for Physical/ Virtual machines running Windows and Linux operating systems to virtual environment.
52. Virtualization management software should include provision for automated host patch mgmt with no VM downtime
53. Virtualization management software should generate automated notifications and alerts, and can trigger automated workflows to remedy and pre-empt problems.
54. Virtualization management software should include have provision to capture the blueprint of a known, validated configuration - including networking, storage and security settings - and

deploy it to many hosts, simplifying setup for automated host configuration and compliance monitoring.

55. Virtualization management software should be able to integrate into existing standard EMS systems.

56. Virtualization management software should be able to do performance analytics, pro-active alerting, capacity trending, capacity planning and optimization

Part 3. Support

57. The Virtualisation software vendor should provide direct telephonic/email/chat/remote support.

6. *Module F: Integration and Commissioning*

1. Integration shall include hardware installation as well as software installation and configuration of all the modules and requisite dependencies for ready launch of a sample virtual machine from one enterprise linux template and one windows 2008 server template.
2. Integration includes installation of requisite tools on existing desktop machines (upto **20** in number) to create images that will be copied on to the virtual host and be launched to essentially replace the physical desktop.

7. *Module G: Support and Warranty*

1. Comprehensive warranty is desired for a period of 4 years for servers and 5 years for storage.
2. Support shall be for the duration of warranty.
3. The option of extended warranty or AMC price commitment shall be committed as part of the financial bid.
4. Support proposal shall include details of the levels of queries and the time frame to resolve the same (call response time) by the OEM. Modes of support (telephone / email / on site etc.) shall also be indicated.
5. Periodic maintenance (one visit every three months) shall be included.
6. Training for two personnel on the routine administration of the solution shall be included.

Configuration Options Matrix

Note:

1. Technical bid shall include compliance certificate to cover **all** the possible options that the vendor wishes to offer.
2. Financial bid shall include unit price and total price for **all** combinations of options that the vendor wishes to offer.
3. IIT Madras is free to pick **any** option for a given module to arrive at the desired total solution.
4. The options matrix is given below.

Module	Options	Remarks
A. Server	Option-1: Set of 3 servers Option-2: Set of 5 servers	Please indicate the discount per server if more than 3 are ordered.
B. SAN Storage	Option-1: 100% SAS drives, 30 TB total usable capacity Option-2: 50% SAS drives + 50% NLSAS drives, 30 TB total usable capacity	Please indicate the discount if two storage systems are ordered.
C. Backup Storage	Option-1: 100% SAS drives, 30 TB total usable capacity Option-2: 50% SAS drives + 50% NLSAS drives, 30 TB total usable capacity Option-3: 100% SAS drives, 60 TB total usable capacity Option-4: 50% SAS drives, + 50% NLSAS drives, 60 TB total usable capacity	Please indicate the discount if two storage systems are ordered.