Indian Institute of Tropical Meteorology

PS/Tender/04/2015 31 July, 2015

Pre-discussion meeting Proceedings for
Tender PS/Tender/04/2015 dated 2nd July, 2015

As per the Pre-discussion meeting proceedings which was scheduled at this Institute on 31st July 2015 at 11:00 hrs, in consultation and discussions with all the participating vendors Institute has agreed and accepted the following amendments to the EOI published vide tender Enquiry No. PS/Tender/04/2015 dated 2nd July, 2015 "Procurement of Additional HPC Storage Solution of 10 Peta byte Storage System for already installed HPC System."

1. *"Point 3(e) of the Pre-Qualification Criterion : The Bidder Storage Solution should be listed in Top 100 of world's top 500 super computing latest list. Should submit details of the ranks for the latest list on the same."*

   The above mentioned prequalification criteria i,e 3.e of EOI document is relaxed.

2. It is clarified that the minimum Storage performance for the Proposed Storage Solution shall be 200 GB/s RW.

3. The New Proposed Storage Solution should not exceed more than 10 Racks.

4. It is clarified that the Present UPS Power available in Prithvi data center is 200KVA X 8 No's (Two banks 3+1), PAC 120 KW X 8 No's (Two banks 3+1) and Chillers 36 Tr X 8 No's (Two banks 3+1).

5. It is clarified that IITM shall make the Prithvi data available for migration purpose on a common protocol like NFS..etc

Apart from clarification and discussed on new queries raised during meeting by all the participating vendors, the replies to all the queries received and discussed in the Meeting are placed at Annexure – 1.

Annexure-I

A	Queries raised by M/s. Wipro	
Sr. No	Queries	Answers
1	Type of Data residing in the Exiting storage which needs to be migrated.	Netcdf Files, binary files, shell scripts, model source code(c, c++, fortran) ..etc
2	Typical size of the files present in the old storage which needs to be migrated to new storage.	In few multiple sizes generally few GB's
	Previous Queries answered	
1	How many NSD's / Luns are configured in the old storage.	NSD 4 / 260 LUNs
	What is the version of the GPFS on old storage	GPFS version: 3.4.0.8
	What is the OS version [kernel version running] on GPFS servers.	OS Version 5300-10-05-1036
	Size of each LUN	online- 300 TB, nearline- 500 TB, archive- 1000, DDN=1000 TB. Specific Details Later.
	What is the interface used to connect storage and Servers [fc 2 or 4 or 8 }.	FC, 4GB
	Are there any free ports available on SAN switch to temporarily connect New storage??	Yes
1	We understand that existing storage is Tired Storage. Also, as per EOI the existing capacity of 3PB need to be migrated to newer solution. Please clarify if the 3PB of capacity is to be migrated only from existing Storage or there is data need to be migrated from Tape to Disk/Tape?	Tape data should be accessible from New Storage
2	We request IITM to clarify on the type of data present on existing storage. Also, please clarify if 3PB of data is the active data or include any passive/archive data?	Netcdf Files, binary files, shell scripts, model source code(c, c++, fortran) ..etc
3	We request IITM to share the performance of existing storage	Prithvi 5GB/s Aaditya 120GB/s
4	We request IITM to clarify on the typical size of the files present in the existing storage.	In few multiple sizes generally few GB's
5	We request IITM to clarify if the Storage has any database kind of data which needs to be migrated.	NO

6	We request IITM to provide architecture of the existing storage and with details on storage controllers and NSD servers are present in the old storage.	online- 300 TB, nearline- 500 TB, archive- 1000, DDN=1000 TB. DS4800 with EXP 810 DS5100 with EXP 5000 DS5100 with EXP 5060 AIX 5.3, AIX 5.3, PowerPC_POWER7 processor PowerPC_POWER6 processor 4 NSD P6 Servers for IBM cluster , 4 NSD P7 servers for DDN cluster
7	We request IITM to provide the details of access mechanism / interfaces available for the old storage.	All standard access are available. Access details will be shared during project execution.
8	Is the old storage in DC1 accessible to DC2 cluster, if yes please explain the access interconnect details.	Data of DC1 is accessible from DC2 over Ethernet. No High speed interconnect is available.
9	If necessary, are we allowed to install additional HBA's on the old storage NSD servers for migration.	Vendor to propose the Solution.
10	We assume there will be no other I/O activities on the storage during the migration process is initiated.	Yes .. No IO activity will be there.
11	We request IITM to provide the details of maximum space available in DC1, and how many 42U racks can be accommodated in the DC1	Entire proposed Solution should be build and installed in not more than 10 racks
12	Any specific time lines IITM is looking for Data migration activity to be completed	Vendor to propose. At the earliest.
13	Keeping in view the exiting Storage solution, are we free to propose other Filesystem solutions and does IITM give any weightage to solutions based on old filesystem solutions.	Vendor to propose the Solution.
14	What is the Storage Performance, IITM is looking for the new requirement	Will be part of tender/RFP.

B.	Locuz Enterprise Solutions Ltd	
Sr. No	Queries	Answers
1	1] Point B mentions that "Migration of existing Prithvi HPC data approximately 3 Petabytes to the New Storage Solution". Can IITM please let us know following information in order to correctly size the data migration efforts ?	
	a] Make and model of Infiniband switch on Prithvi system.	SilverStorm Qlogic 9120
	b] Availability of Infiniband ports (with required licenses) on the Prithvi system to connect data migration nodes.	Availble IB ports : 20 ports.. no license required if more ports required for your solution you can put extra line card
	c] Operating system and CPU architecture of the storage nodes connected to 3PB existing storage.	OS and CPU architecture : AIX 5.3, PowerPC_POWER7 processor, PowerPC_POWER6
	d] Exact capacity of data stored on ONLINE, NEARLINE and ARCHIVE storage	online- 300 TB, nearline- 500 TB, archive- 1000, DDN=1000 TB. Specific Details Later.
	e] GPFS version running on Prithvi system.	GPFS version: 3.4.0.8
	f] Make and model of the disk storage on Prithvi system.	DS4800 with EXP 810 DS5100 with EXP 5000 DS5100 with EXP 5060
	g]Make and model of tape storage on Prithvi system.	3584-L53 (Mother), 3584-D53, 3584-S54, 3584-S54
	h]Connectivity type and bandwidth of the tape storage.	Fc b/w drive and TSM client 4Gb
2	2] Point c mentions that "Integrating of the Storage Solution with the New HPC System Aaditya located at DC2 over very high speed Networks and to be made available as local parallel HPC Storage for Aaditya System". Can IITM please provide us site drawings (civil, electrical and cabling) for both DC1 and DC2 ?	Will be Provided after tender process.
	a] Are there existing cable ducts between DC1 and DC2 ? If yes, can you please provide civil drawings for it ?	Shortest possible route will be arranged by IITM. Detailing will be done mutually after tender process.
	b] If cable ducts does not exist then would IITM be open to getting such ducts constructed as per our suggestion ? Civil work is out of our scope, hence we are asking this question.	same as above
	c] Weight bearing capacity of DC1 floor where 10PB of storage is to be housed.	Building Approx 3K N / meter square DC 10 KN / meter square (Live load)
3	3] Can IITM please provide us detailed information on Aaditya system as follows:	

	a] Quantity, make and model of Infiniband switches on Aaditya system	Mellanox 36 Port FDR14 Managed Switch Qty – 139 Model – SX6036 Mellanox 684 Port FDR14 Switch with 24 line cards - Qty 6 Model – SX6536
	b] Infiniband topology details (topology map and drawing) of the Aaditya system	After tender Process
	c] Number of Infiniband ports available on Aaditya system	Mellanox 648 Port FDR14 Switch with 24 line cards 18 ports = 432 ports per chassis switch. Mellanox 36 Port FDR14 Managed Switch - no free ports are available. 15 ports are free per chassis. [i.e 18th port of 15 chassis leaf switch]
	d] Cabling layout and duct drawings of Aaditya system	After tender Process
4	Section 4: Basic Performance & Other Requirements	
	1] Point a of EOI mentions that "The Proposed Storage Solution should deliver a high Performance in line with our existing Aaditya Disk Storage HPC Performance." Same document also mentions that Aaditya system has 6PB of storage offering 100 GB/s performance which results in 16.66 GB/s performance per petabyte. Does IITM expect the new 10PB storage solution to deliver minimum of 166.6 GB/s performance ?	Minimum 200 GB/s or more .. Details in RFP document
	2] Aaditya system was procured in 2013 and 16.6 GB/s performance offered by its storage solution is now outdated. Current leadership storage class systems can offer much higher performance. Would IITM accept higher performance than 16.6 GB/s per petabyte ?	same as above
	3] Point c of EOI mentions that "The Solution should be highly dense (more capacity and performance per rack) and should fit in the existing DC1 Space without any additional space requirements, Vendors can do a Site survey for this purpose". It seems that DC1 has only space to accommodate additional 2 racks and that too is in front of the loading dock gate. If 10PB storage solution requires more rack space, would IITM be open to retiring some of the Prithvi system components to make space ?	Yes

C	Queries raised by M/s. Dell	
Sr. No	Queries	Answers
1	1] Point B mentions that "Migration of existing Prithvi HPC data approximately 3 Petabytes to the New Storage Solution". Can IITM please let us know following information in order to correctly size the data migration efforts ?	
	a]Make and model of Infiniband switch on Prithvi system.	SilverStorm Qlogic 9120
	b]Availability of Infiniband ports (with required licenses) on the Prithvi system to connect data migration nodes.	Availble IB ports : 20 ports no licence required if required more ports you can put extra line card
	c]Operating system and CPU architecture of the storage nodes connected to 3PB existing storage.	OS and CPU architecture : AIX 5.3, PowerPC_POWER7 processor, PowerPC_POWER6
	d]Exact capacity of data stored on ONLINE, NEARLINE and ARCHIVE storage	online- 300 TB, nearline- 500 TB, archive- 1000, DDN=1000 TB. Specific Details Later.
	e] GPFS version running on Prithvi system.	GPFS version: 3.4.0.8
	f]Make and model of the disk storage on Prithvi system.	DS4800 with EXP 810 DS5100 with EXP 5000 DS5100 with EXP 5060
	g]Make and model of tape storage on Prithvi system.	3584-L53 (Mother), 3584-D53, 3584-S54, 3584-S54
	h] Connectivity type and bandwidth of the tape storage.	FC b/w drive and TSM client 4Gb
2	2] Point c mentions that "Integrating of the Storage Solution with the New HPC System Aaditya located at DC2 over very high speed Networks and to be made available as local parallel HPC Storage for Aaditya System". Can IITM please provide us site drawings (civil, electrical and cabling) for both DC1 and DC2 ?	Will be Provided after tender process.
	a] Are there existing cable ducts between DC1 and DC2 ? If yes, can you please provide civil drawings for it ?	Shortest possible route will be arranged by IITM. Detailing will be done mutually after tender process.
	b] If cable ducts does not exist then would IITM be open to getting such ducts constructed as per our suggestion ? Civil work is out of our scope, hence we are asking this question.	same as above
	c] Weight bearing capacity of DC1 floor where 10PB of storage is to be housed.	Building Approx 3K N / meter square DC 10 KN / meter square (Live load)
3	3] Can IITM please provide us detailed information on Aaditya system as follows:	

	a] Quantity, make and model of Infiniband switches on Aaditya system	Mellanox 36 Port FDR14 Managed Switch Qty – 139 Model – SX6036 Mellanox 684 Port FDR14 Switch with 24 line cards - Qty 6 Model – SX6536
	b] Infiniband topology details (topology map and drawing) of the Aaditya system	Available
	c]Number of Infiniband ports available on Aaditya system	Mellanox 648 Port FDR14 Switch with 24 line cards 18 ports = 432 ports per chassis switch. Mellanox 36 Port FDR14 Managed Switch - no free ports are available. 15 ports are free per chassis. [i.e 18th port of 15 chassis leaf switch]
	d] Cabling layout and duct drawings of Aaditya system	
	Section 4: Basic Performance & Other Requirements	
	1] Point a of EOI mentions that "The Proposed Storage Solution should deliver a high Performance in line with our existing Aaditya Disk Storage HPC Performance." Same document also mentions that Aaditya system has 6PB of storage offering 100 GB/s performance which results in 16.66 GB/s performance per petabyte. Does IITM expect the new 10PB storage solution to deliver minimum of 166.6 GB/s performance ?	Minimum 200 GB/s .. Details in RFP document
	2] Aaditya system was procured in 2013 and 16.6 GB/s performance offered by its storage solution is now outdated. Current leadership storage class systems can offer much higher performance. Would IITM accept higher performance than 16.6 GB/s per petabyte ?	same as above
	3] Point c of EOI mentions that "The Solution should be highly dense (more capacity and performance per rack) and should fit in the existing DC1 Space without any additional space requirements, Vendors can do a Site survey for this purpose". It seems that DC1 has only space to accommodate additional 2 racks and that too is in front of the loading dock gate. If 10PB storage solution requires more rack space, would IITM be open to retiring some of the Prithvi system components to make space ?	Yes

C	Queries raised by Fujitsu	
Sr. No	Queries	Answers
1	1] Point B mentions that "Migration of existing Prithvi HPC data approximately 3 Petabytes to the New Storage Solution". Can IITM please let us know following information in order to correctly size the data migration efforts?	
	a] Operating system and CPU architecture of the storage nodes connected to 3PB existing storage.	AIX 5.3, PowerPC_POWER7 processor, PowerPC_POWER6
	b] Exact capacity of data stored on ONLINE, NEARLINE and ARCHIVE storage.	online- 300 TB, nearline- 500 TB, archive- 1000, DDN=1000 TB. Specific Details Later.
	c.]If HSM is not configured on the two clusters, provide exact capacity of Online data. We understand, the backup data (on the tapes) does not have to migrated.	Approx 3000 LTO Tapes are there and 500 free. New Storage should be able to access the old tape data.
	d] GPFS version running on Prithvi and Aditya system and whether it will remain under active support till the completion of the project.	YES
	e] Make and model of the disk storage on Prithvi system.	DS4800 with EXP 810 DS5100 with EXP 5000 DS5100 with EXP 5060
	f] Make and model of tape library model, number of drives and number of slots on Prithvi and Aditya system.	Prithvi 3584-L53 (Mother), 3584-D53, 3584-S54, 3584-S54 Aditya 3584- L53 (Mother)/ D53 X 6 Expansion
2	2] Mellanox IB connectivity is a common item across vendors submitting EOI response. Hence we request IITM to exclude Interconnect connectivity outside the scope of the EOI and the subsequent tender. We can specify the number of ports required for our solution in our EOI.	No .. Solution should be on turn key.
3	3] During our site visit, we realised that, there are no cable ducts available for connecting the two DCs. Looking at the Aesthetics of the building, we request the institute help with probable path where the duct will be laid – we understand Civil Work is not be part of the scope of this EOI – so we can estimate the length of the cable and suggest parameters such as	Site Preparation will be based on winning Solution after tendering. Hence will be done mutually, IITM will take care of civil side works as per the solution requirements.
	a] bending radius of the cable.	
	b] distance between two bends etc.	
4	4]We will provide with data such as weight of each rack. From our visit we realised that there are elaborate arrangements at the rear gates of the DCs for bringing the equipment up using cranes.	

5	5] We could see the location where new racks can be fitted in Prithvi DC (near the rear door). Also the cooling arrangement is bottoms-up. We will provide the following details so the institute can make due arrangement in the Prithvi DC in terms of shifting some racks or taking off the racks which are decomissioned.	
	a] rack dimensions.	
	b] Space needed in the front and rear of the rack for adequate serviceablility.	
	c] rack weight	
	d] Power and cooling	
6	6] Can IITM please provide us detailed information on Aaditya system as follows:	
	a] Quantity, make and model of Infiniband switches on Prithvi and Aaditya system.	Prithvi SilverStorm Qlogic 9120 , Aaditya Mellanox 36 Port FDR14 Managed Switch Qty – 139 Model – SX6036 Mellanox 684 Port FDR14 Switch with 24 line cards - Qty 6 Model – SX6536
	b] Infiniband topology details (topology map and drawing) of the Aaditya system.	Will be provided while execution.
	c] Number of Infiniband ports available on Prithvi and Aaditya system and how these spare ports are distributed on each of the switches.	Prithvi 20 ports. Aaditya Mellanox 648 Port FDR14 Switch with 24 line cards 18 ports = 432 ports per chassis switch. Mellanox 36 Port FDR14 Managed Switch - no free ports are available. 15 ports are free per chassis. [i.e 18th port of 15 chassis leaf switch]
	Section 4: Basic Performance & Other Requirements	
1	1] Point a of EOI mentions that "The Proposed Storage Solution should deliver a high Performance in line with our existing Aaditya Disk Storage HPC Performance." Same document also mentions that Aaditya system has 6PB of storage offering 100 GB/s performance which results in 16.66 GB/s performance per petabyte. Does IITM expect the new 10PB storage solution to deliver minimum of 166.6 GB/s performance? Can you elaborate if this is read performance – write performance or a mix of read+write. If read+write, please mention the ratio of read v/s write.	Details in RFP
2	2] Otherwise, can IITM specify the performance expectation from the new system.	Details in RFP

3	3] Is IITM looking at features like HSM and Tape based automated backup for the new storage system. If yes,	Details in RFP
	a] Is it mandatory to use the same HSM application as the current application.	Details in RFP
	b] Should HSM on new storage use the existing tape infrastructure or it will be new tape infrastructure.	Existing
	c] Please elaborate the tape backup details desired.	Details in RFP
	d] Please provide details of the backup servers currently deployed.	10 TSM servers IBM
	e] Please provide details of the ports available on FC switches.	12 Ports Free.

D	Queries raised by M/s. HP	
Sr. No	Queries	Answers
1	1] Point B mentions that "Migration of existing Prithvi HPC data approximately 3 Petabytes to the New Storage Solution". Can IITM please let us know following information in order to correctly size the data migration efforts ?	
	a] Make and model of Infiniband switch on Prithvi system.	SilverStorm Qlogic 9120
	b] Availability of Infiniband ports (with required licenses) on the Prithvi system to connect data migration nodes.	20 ports.. Details while execution.
	c] Operating system and CPU architecture of the storage nodes connected to 3PB existing storage.	AIX 5.3, PowerPC_POWER7 processor, PowerPC_POWER6
	d] Exact capacity of data stored on ONLINE, NEARLINE and ARCHIVE storage	online- 300 TB, nearline- 500 TB, archive- 1000, DDN=1000 TB. Specific Details Later.
	e] GPFS version running on Prithvi system.	GPFS version: 3.4.0.8
	f] Make and model of the disk storage on Prithvi system.	DS4800 with EXP 810 DS5100 with EXP 5000 DS5100 with EXP 5060
	g] Make and model of tape storage on Prithvi system.	3584-L53 (Mother), 3584-D53, 3584-S54, 3584-S54
	h] Connectivity type and bandwidth of the tape storage	FC 4GB
2	2] Point c mentions that "Integrating of the Storage Solution with the New HPC System Aaditya located at DC2 over very high speed Networks and to be made available as local parallel HPC Storage for Aaditya System". Can IITM please provide us site drawings (civil, electrical and cabling) for both DC1 and DC2 ?	Yes while execution
	a] Are there existing cable ducts between DC1 and DC2 ? If yes, can you please provide civil drawings for it ?	Shortest possible route will be arranged by IITM. Detailing will be done mutually after tender process.
	b] If cable ducts does not exist then would IITM be open to getting such ducts constructed as per our suggestion ? Civil work is out of our scope, hence we are asking this question.	same as above
	c] Weight bearing capacity of DC1 floor where 10PB of storage is to be housed.	Building Approx 3K N / meter square DC 10 KN / meter square(Live load)

3	3] Point c of EOI mentions that "The Solution should be highly dense (more capacity and performance per rack) and should fit in the existing DC1 Space without any additional space requirements, Vendors can do a Site survey for this purpose". It seems that DC1 has only space to accommodate additional 2 racks and that too is in front of the loading dock gate. If 10PB storage solution requires more rack space, would IITM be open to retiring some of the Prithvi system components to make space ?	Yes.
	Section 6: Instruction to the bidder	
	1] Pre Contract Integrity Pact: In point I under this section, it says that the vendor must sign and stamp the duly filled Pre Contract integrity Pact as part of the qualification criterion. The Pre Contact Integrity pact also refers to the Earnest Money Deposit under point 5. However there is no EMD asked for in this EOI. Therefore should this be submitted now along with the EOI or later while submitting the RFP.	Explained in Pre discussion Meeting

E	Queries raised by M/s. Lenovo	
Sr. No	**Queries**	**Answers**
1	1) We wish to know the amount of data (in TB) which are in online, nearline & archival storage in the Prithvi DC1 which requires migration to new storage system	online- 300 TB, nearline- 500 TB, archive- 1000, DDN=1000 TB. Specific Details Later.
2	2) The new storage system will be used as local parallel HPC storage for Aaditya & Prithvi or as archival for Aaditya & Prithvi or both?	Please refer EOI..
	a. If it is for archival what is the performance expectation between Aaditya & new storage system	Performance details in RFP
	b. If it is for local parallel HPC storage & archival then what is the performance expectation between Aaditya & new storage	same as above
3	3) If the new storage system is also to be used as local parallel HPC storage for Aaditya Cluster then how IITM plans to use the existing 6PB in Aaditya?	Both the storage should be available as PFS.
	a. Does IITM plan to have the existing Aaditya storage & new storage as local parallel HPC for the compute nodes?	Yes
4	4) What are the timelines for this project i.e. delivery time line of the system, Go Live schedule, training schedule & others?	Vendor to propose the time schedule for deployment. ASAP
5	5) Please help know the Rack space availability in DC1 for new 10PB Storage and also the load bearing capability of DC1 false floor.	Building Approx 3K N / meter square DC 10 KN / meter square(Live load)

F	Queries raised by M/s. Hitachi	
Sr. No	Queries	Answers
1	Considering GPFS being the Parallel File System running on the current IBM Server, what is its role when only the underlying SAN storage undergoes a tech refresh?	As explained in Pre-discussion Meeting the solution should compose of Storage, PFS, Interconnect and HPC Storage Software echo system.
2	Even if the consideration is for host based data migration for any reason, there are better solutions available now for storage level data migration (using advanced storage virtualization capabilities) which is compatible with existing setup. So again what is the role of Parallel File System here?	As explained in Pre-discussion Meeting the solution should compose of Storage, PFS, Interconnect and HPC Storage Software echo system.
3	Is IITM / IMD considering storage consolidation approach in future which can avoid such data migration activities if advanced storage virtualization is deployed?	Not applicable in HPC Storage deployments.
4	In view of the aforementioned, why is it mandatory for the System Integrator to have experience of Parallel File System when the current scope is only the tech refresh of underlying SAN Storage?	Yes. Parallel file system is mandatory.