



DIRECTORATE GENERAL OF HYDROCARBONS

(Ministry of Petroleum & Natural Gas, Government of India)

Corrigendum No. 1 to tender no. MM-12018(30)/1/2019-DGH/ENQ-163 for Setting up of private cloud infrastructure at DGH Noida & SDC Bhubaneswar

This corrigendum is issued to amend technical specifications, terms & conditions, extend bid closing/opening date and to provide DGH's response to pre-bid queries.

A: EXTENSION OF BID CLOSING/OPENING DATE

	In lieu of	Revised
Bid Closing Date	12.09.2019	23.09.2019
Bid Opening Date	13.09.2019	24.09.2019

B: Amendment to Technical Specifications and Terms & Conditions

S.N.	Reference	Existing Clause/description	Amended Clause
1	Page 47 Clause 2.2 of detailed scope	Proposed solution should be based on Hyper Converged Infrastructure (HCI) enterprise IT infrastructure solution that integrates Storage, Compute, Networking and Hypervisor with single system management software. The complete HCI solution along with associated Network Attached Storage (NAS) solution as per the technical specifications should be provided with de-duplication, compression with erasure coding OR equivalent with data encryption at rest and motion with no single point of failure (NSPOF) at any stage/ level of the implementation with optimization features along with powerful data management and disaster recovery capabilities at both PDC and SDC.	Proposed solution should be based on Hyper Converged Infrastructure (HCI) enterprise IT infrastructure solution that integrates Storage, Compute, Networking and Hypervisor with single system management software. The complete HCI solution along with associated Network Attached Storage (NAS) as per the technical specifications should be provided with de-duplication, compression with erasure coding OR equivalent with data encryption in motion when sharing data between HCI and NAS with no single point of failure (NSPOF) at any stage/ level of the implementation with optimization features along with powerful data management and disaster recovery capabilities at both PDC and SDC
2	Pages 68 and 86 of Technical specifications (Appendix – A), Page No. 102 and 124 of Technical specifications check list (Appendix B). Also the corresponding items in price bid at Annexure –V item no. 1.03 and 2.02 on page nos. 135 and 136 respectively	Unified Storage System	Storage System
3	clause 2.23 and 5.18 of detailed scope of work	back-to-back support	backup support
4	Page 115, ¶ 1.08(f) : Thin clients with dual monitors for PDC:	I/O - 4 x USB 2.0, 2 x USB 3.0, universal headset jack, 1 x RJ-5, 2 x Display Ports	"I/O - 4 x USB 2.0, 2 x USB 3.0, universal headset jack, 1 x RJ-5, 2 x Display Ports/HDMI"
5	Page 62 clause (g) Page 65 clause (g) Page 83 clause (g)	Storage Cache	Clause deleted
6	Page 62 clause (i)	Total Network throughput from HYPERCONVERGED Chassis should be configured with total 40 Gbps with no single point of failure. i.e (N+1) redundancy	Total Network throughput from HYPERCONVERGED Chassis should be configured with total 40 Gbps per node with no single point of failure. i.e (N+1) redundancy
7	Page 66 clause (i) Page 83 clause (i)	Total Network throughput from HYPERCONVERGED Chassis should be configured with total 20 Gbps with no single point of failure. (N+1) redundancy	Total Network throughput from HYPERCONVERGED Chassis should be configured with total 20 Gbps per node with no single point of failure. (N+1) redundancy

8	Page 62 Clause (k) Page 66 Clause (j) Page 83 Clause (k)	The solution should provide enterprise data services such as de-duplication and compression with erasure coding OR equivalent completely in software without dependence on any proprietary hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	The solution should provide enterprise data services such as de-duplication and compression with erasure coding OR equivalent in software/ hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.
9	Page 63 Clause (s) Page 66 Clause (r)	Proposed solution should have replication software to DR site This replication should be granular in nature with Any Point-In-Time Recovery feature. Licenses for atleast 25 VM replication should be made available with capabilities of WAN bandwidth optimization using features like deduplication, compression. The solution should have capability to protect against data corruption	Proposed solution should have replication software to DR site. The solution should have capability to protect against data corruption
10	Page 84 (s)	Proposed solution should have replication software to DR site This replication should be granular in nature with Any Point-In-Time Recovery feature. Licenses for atleast 20 VM replication should be made available with capabilities of WAN bandwidth optimization using features like deduplication, compression. The solution should have capability to protect against data corruption	Proposed solution should have replication software to DR site. The solution should have capability to protect against data corruption
11	Page 63 Clause (t)Page 67 Clause (s) Page 84 Clause (t)	Storage policies should be enforced directly from hypervisor and managed directly from hypervisor.	Storage policies should be enforced & managed directly from hypervisor/ SDS.
12	Page 63 Clause (u)Page 67 Clause (t)Page 84 clause (u)	All Nodes supplied with the HCI appliance should support following security features. 1) Should have a cyber-resilient architecture for a hardened server design for protection, detection & recovery from cyber-attacks 2) Should protect against hardware firmware attacks which executes before OS boots. 3) Hardware should support Silicon / Hardware Root of Trust.	All Nodes supplied with the HCI appliance should support following security features. 1) Should have a cyber-resilient architecture for a hardened server design for protection, detection & recovery from cyber-attacks 2) Should protect against hardware firmware attacks which executes before OS boots/ secure boots. 3) Hardware should support Silicon / Hardware Root of Trust.
13	Page 71 Clause (r) Page 89 Clause (s)	Proposed storage must offer de-duplication and compression feature.	Proposed storage should be configured with de-duplication and/ or compression feature.
14	Page 74 Clause (e)	Data Link Protocol: Ethernet, Fast Ethernet, Gigabit Ethernet, 10 Gigabit, 40 Gigabit, 25 Gigabit, 50 Gigabit, 100 Gigabit Storage Protocols: Should support Data Center Infra DCB, iSCSI, ETS considering all Licenses.	Data Link Protocol: Ethernet, Fast Ethernet, Gigabit Ethernet, 10 Gigabit, 40 Gigabit, 25 Gigabit, 100 Gigabit Storage Protocols: Should support Data Center Infra DCB, iSCSI/ FCoE, ETS considering all Licenses.
15	Page 74 Clause (f)	Security Features: Should support 802.1x implementation using RADIUS, BFD, Object Tracking	Security Features: Should support 802.1x implementation using RADIUS, BFD
16	Page 75 Clause (g)	RMON, sflow, SNMP v1/v2/v3	RMON, sflow or equivalent, SNMP v1/v2/v3
17	Page 76 Clause (a)	Solution should be an integrated Next Gen Firewall platform which includes firewall, application control, IPS, Anti-Bot, Anti-Spyware, URL Filtering and Advanced Persistent threat Prevention capabilities in a single appliance, configured in High Availability Mode. Firewall should be provided with "Zero" day protection feature.	Solution should be an integrated Next Gen Firewall platform which includes firewall, application control, IPS, Anti-Bot, Anti-Spyware/ Anti-Phishing, URL Filtering and Advanced Persistent threat Prevention capabilities in a single appliance, configured in High Availability Mode. Firewall should be provided with "Zero" day protection feature.
18	Page 77 Clause (ii)	The solution should be able to scan & find for unknown threats in executable, archive files ,documents, JAVA and flash like: 7z ,cab, csv, doc, pdf, ppt, pptx, rar, rtf, scr, swf, tar, docx, , jar, xls, , xlsx, , xlv, zip etc.	The solution should be able to scan & find for unknown threats in executable, archive files, documents, JAVA and flash like: 7z ,cab, doc, pdf, ppt, pptx, rar, rtf, scr, swf, tar, docx, , jar, xls, , xlsx, , xlv, zip etc.

19	Page 79 Clause (a)	DGH wants to implement backup-to-disk solution using disk based backup appliances/ storage to simplify operations and improve overall backup/restore performance. The solution should consist of Enterprise backup software and disk based backup appliances/ storage. The Disk based appliance/ storage and Backup Software supplied must be from Single OEM. The solution should be capable of integration with active directory infrastructure for ease of user rights management along with role based access control to regulate the level of management. The solution must have capability to do trend analysis for capacity planning of backup environment not limiting to Backup Application/Clients, Virtual Environment etc.	DGH wants to implement backup-to-disk solution using disk based backup appliances/ storage to simplify operations and improve overall backup/restore performance. The solution should consist of Enterprise backup software and disk based backup appliances/ storage. OEM best practice to be configured and adopted for local and remote NDMP backup. Necessary documentation to be provided. The solution should be capable of integration with active directory infrastructure for ease of user rights management along with role based access control to regulate the level of management. The solution must have capability to do trend analysis for capacity planning of backup environment not limiting to Backup Application/Clients, Virtual Environment etc.
20	Page 81 Clause (e)	The appliance/ storage should Support Enterprise Applications and Database Backups without integration with Backup Software, for better visibility of Backups to Application and database Owners, thus ensuring faster and direct recovery on application/database level. This integration should be available for Oracle, SAP, SAP HANA, DB2, MS SQL, Hadoop, MongoDB, Cassandra etc.	The appliance/ storage should Support Enterprise Applications and Database Backups with/ without integration with Backup Software, for better visibility of Backups to Application and database Owners, thus ensuring faster and direct recovery on application/database level. This integration should be available for Oracle, SAP, SAP HANA, DB2, MS SQL, Hadoop, MongoDB, Cassandra etc.
21	Page 82 VMware License Clause (e)	VMware vSAN 6 Enterprise for 1 processor	Clause deleted
22	Annexure I Clause 15.4(i)	An account payee Demand Draft in favour of "Directorate General of Hydrocarbons" payable at New Delhi valid for 90 days from its date of issue. In case a bidder submits demand draft in USD as Bid Security, the bidder must agree to the following condition and submits an undertaking as under: "We understand that DGH has rupee account in India. USD receipt value cannot be maintained in foreign currency terms. We confirm to bear the cost/loss on account of different currency conversion rate prevailing at two different occasions i.e. receipt by DGH and refund by DGH. We understand that the interest free refund can be equal to or less than the submitted draft amount in lieu of prescribed USD value for Bid Bond for variation in currency conversion rates"	An account payee Demand Draft in favour of "Directorate General of Hydrocarbons" payable at New Delhi valid for 90 days from its date of issue.
23	Annexure I Clause 31.0	Successful bidder shall submit the performance security, 7.5% of Total contract value with validity 02months beyond the warranty and AMC period, within 21 days of placement of Letter of Award (LoA)/ Notification of Award (NoA).The successful bidder shall furnish to DGH the Performance Security for an amount specified above or the amount mentioned in Letter of Award, issued by DGH to Contractor awarding the contract, as per Appendix-6 in the form of Bank Guarantee(BG).For Indian Bidders: Bank Guarantee is to be issued from any of the Nationalised / scheduled Bank in India on non-judicial stamp paper of requisite value, as per Indian Stamp Act, purchased in the name of the Banker. For Foreign Bidders: Bank Guarantee is to be issued from any of the Indian scheduled Bank situated in their country.	Successful bidder shall submit the performance security, 7.5% of Total contract value with validity 02months beyond the warranty and AMC period, within 21 days of placement of Letter of Award (LoA)/ Notification of Award (NoA).The successful bidder shall furnish to DGH the Performance Security for an amount specified above or the amount mentioned in Letter of Award, issued by DGH to Contractor awarding the contract, as per Appendix-6 in the form of Bank Guarantee(BG). Bank Guarantee is to be issued from any of the Nationalised / scheduled Bank in India on non-judicial stamp paper of requisite value, as per Indian Stamp Act, purchased in the name of the Banker.

24	Clause no. 33 page no.41	The total liability of the supplier arising out of sale or use of the equipment/material/goods supplied by them, if the same is found defective, shall be limited to the contract value of such defective unit(s) and associated tools. In no event shall either party be liable to the other whether in contract, tort or otherwise for any consequential loss or damage, loss of use, loss of production, or loss of profit or interest costs or environmental pollution damage whatsoever arising.	Notwithstanding any other provisions, except only in cases of willful misconduct and / or criminal acts, a) Neither the Contractor nor DGH shall be liable to the other, whether in Contract, tort, or otherwise, for any consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided however that this exclusion shall not apply to any obligation of the Contractor to pay Liquidated Damages to the DGH and b) Notwithstanding any other provisions incorporated elsewhere in the contract, the aggregate liability of the Contractor in respect of this contract, whether under the Contract, in tort or otherwise, shall not exceed Contract Price, provided however that this limitation shall not apply to the cost of repairing or replacing defective equipment by the Contractor, or to any obligation of the Contractor to indemnify the DGH with respect to Intellectual Property Rights. c) DGH shall indemnify and keep indemnified Contractor harmless from and against any and all claims, costs, losses and liabilities in excess of the aggregate liability amount in terms of clause (b) above.
25	Clause no.1, Special Terms and Conditions at page no.133	FOR SUPPLY PORTION: The supply of all the hardware and software items should be completed within 60 days from date of issue of LOA. FOR INSTALLTION & COMMISSIONING: Installation, Configuration, Integration and Commissioning of the complete solution are to be completed within 30 days from date of supply. TRAININGS: To be completed within 60 days of successful installation and commissioning.	FOR SUPPLY PORTION: The supply of all the hardware and software items should be completed within 60 days from date of issue of LOA. FOR INSTALLTION & COMMISSIONING: Installation, Configuration, Integration and Commissioning of the complete solution are to be completed within 45 days from date of supply. TRAININGS: To be completed within 60 days of successful installation and commissioning.
26	Clause No 1.17(VII) of Annexure II at page no 31	Special conditions and deviations, if any, taken by SUPPLIER/CONTRACTOR and not agreed by DGH.	Special conditions and deviations, if any, taken by SUPPLIER/CONTRACTOR and agreed by DGH.
27	Clause no 5.2, Service Level Agreements for HCI based cloud at page 52 and 53		Section 6.3 to be read as Section 5.3
28	Clause no 5.5.2 at page 57	Minimum Qualification:Engineer(BE/Btech) Minimum Experience: 3-year relevant experience in G&G applications management for applications like Landmark, Petrel etc.	Minimum Qualification: Post Graduate in Geology/ Geophysics/ Applied Geology/ Applied Geophysics/ Petroleum Engineering Minimum Experience: 2 years experience in G&G interpretation software from M/s Halliburton/ Schlumberger
29	Clause no 5.4.2 at page 54	Minimum Qualification: Engineer (BE/Btech) Minimum Experience: 3-year relevant experience in HCI infrastructure management with good working knowledge of VMware.	Minimum Qualification: BE/Btech/MCA Minimum Experience: 2 years experience in in system administration and VMware
30	Scope of Work	New Clause	It will be the responsibility of the bidder to provide connectivity thru cables, connectors etc. from the existing UPS system and switches at NDR to the infrastructure provided in this tender

C: DGH's response to Pre Bid Queries

Queries from M/s Suryan Technologies

SL	Clause No. of Bidding Document			Full compliance/ not agreed	Changes/ modifications proposed by the Bidders	DGH's Reply
1	Page No. 133	Item -1.07 of Price Bid Firewall - PDC – 2 Nos	Appendix B: Technical Specifications Check List	Solution should be able to detect & Prevent attack types ie, such as spam sending click fraud or self-distribution, that are associated with Bots.	Request you to remove this clause as this is one OEM proprietary feature. This feature is part of any Email Security solution and can be achieved through the EMAIL security solution already asked in the RFP.	No change.
2	Page No. 133	Item -1.07 of Price Bid Firewall - PDC – 2 Nos	Appendix B: Technical Specifications Check List	No session are asked in rfp	Request you to kindly ask for "Firewall should have 8 Million concurrent sessions and 300,000 new sessions per second"	No change.
3	Page No. 133	Item -1.07 of Price Bid Firewall - PDC – 2 Nos	Appendix B: Technical Specifications Check List	No virtualization asked in RFP	Request you to kindly ask for "The proposed system shall be able to operate on either Transparent (bridge) mode to minimize interruption to existing network infrastructure or NAT/Route mode. Both modes can also be available concurrently using Virtual Contexts."	No change.
4	Page No. 113	Item -1.07 of Price Bid Firewall - PDC – 2 Nos	Appendix B: Technical Specifications Check List	No Threat Prevention throughput asked in RFP	Request you to kindly ask for "The solution should have minimum 4 Gbps of Threat Prevention (FW + IPS + AVC + AV) throughput for Mix / production traffic"	No change.

Queries from M/s Sanvei Overseas Pvt. Ltd.

S.No	Clause No./clause of Bidding Document		Changes/ modifications proposed by the Bidders	Bidder's Remarks	DGH's Reply	
1	Page no. 43, Sr.no. 2, B 1	Technical rejection criteria:-	Bidders have to be "Original Equipment Manufacturer (OEM) of offered Hardware Equipment" OR "Original Equipment Manufacturer (OEM) of G&G Software (DSG or Petrel) used for interpretation of Exploration & Production (E&P) data for Oil & Gas industry" OR "System Integrator (SI)".	Please Allow the bidder with Govt./PSU experience for Server & Storage	To make it open & Generic participation	No change.
2	Page no. 43, Sr. No. 2.1, B 1	Technical rejection criteria:-	In case bidder is OEM of offered hardware or SI, the bidder must submit a certificate from the OEMs of these software i.e Decision Space Geoscience (DSG) of M/s Halliburton and Petrel of M/s Schlumberger that the offered items as per the tender is certified on their latest version of application software.	As tender allow M/s Halliburton and Petrel of M/s Schlumberger as prospect bidder ,so it will restrict other bidder to bid ,kindly remove certificate clause.	To make it open & Generic participation	No change.
3	Page no. 133, Sr. No. 1,	Delivery/ Completion Schedule	FOR SUPPLY PORTION: The supply of all the hardware and software items should be completed within 60 days from date of issue of LOA. FOR INSTALLTION & COMMISSIONING: Installation, Configuration, Integration and Commissioning of the complete solution are to be completed within 30 days from date of supply.	kindly make delivery & installation and commissioning period to 150 days		60 days for supply of all hardware and software items from date of LOA and 45 days for installation and commissioning from date of supply. Refer - B: Amendment to Technical Specification and Terms & Conditions .

Queries from M/s Oasys Cybernetics Pvt. Ltd.

S. No.	RFP Document Reference(s) (Clause)	RFP Document Reference(s) (Page Number(s))	Content of RFP requiring Clarification(s)	Points for clarification	DGH's Reply
1	2.7	48	Implementation of portal for registration of users, authentication and their management, Time Slot Management Tool with Integrated Payment Gateway, MM-12018(30)/1/2019-DGH/ENQ-163 Page 49 of 146 Provisioning of ready to use Virtual Machines hosting G&G software(s) and relevant data as per user requirements.	Are there any other payment gateways other than that of DGH BilDesk ? Will the gateways be provided by DHG?	No, DGH BilDesk gateway only is to be utilized.

2	2.18	49	Training should be provided for configuring and managing day-to-day operations of proposed HCI solution including VMWare software, Firewall, back-up recovery etc. The training should be provided at DGH/OEM premises. Bidder should provide training material. At least one hard copy manual should be provided for the complete training courses to be kept at PDC for reference.	Please specify number of attendees for training?	Please refer to tender document Page No. 91.
3	5.4.7	55	e) Shall carry out Backup and Restoration which includes following activities: i. Creating the scripts for the backup policy defined by DGH. The periodicity of the backup will be provided by DGH and can be increased /decreased at the discretion of DGH.	How many years of data has to be kept inlive system? How many years of data has to be archived?How often backup will have to be taken? - please provide some inputs (provisional)on these as all these have cost implications.	Entire G&G data will be kept in Live condition only. Atleast one complete backup will be required initially and thereafter regular complete/ incremental backups at a frequency as desired by DGH.
4	5.6	59	On successful receipt of payment, Automatic resources provisioning based on approval with a cancellation option in their account with necessary 2/3 level approvals. Cancellation can be done from either side before beginning of Session – 24 Hours with necessary approvals and reasons. Refund Workflow to be defined.	Is email/sms/Whatsapp alert required with regard to payment / refund approvals?how many levels of approval is required for refund (provisional)?	No change. Additional features can be provided at no extra cost to DGH. 2/3 Levels approvals for refund is required. However the process may be modified depending on best practice.
5	5.6	59	Bidder to propose a good packaged industry standard (Non-Open Source) CRM/Incident Management tool which is accessible to the registered users of ndrccloud portal.	Please let us know the minimum features expected in the CRM/Incident Management tool ? Is incident management the only purpose of using CRM?	As per industry best practice which needs to be improved with time.
6			Consortium	Please inform whether consortium bidding is accepted	No

Bidder Name: Dell EMC

Item 1.03 Unified Storage Systems for PDC						
S. No	Page No	Item	Description	Change Requested	Bidder's Remarks	DGH's Reply
1	69	c. Network Ports	Each Storage Controllers/ Storage node should have minimum of 2 x 40GbE for client connections for nodes/controllers serving all flash. Total 8 x 40 GbE. Each Storage Controllers/ Storage node should have minimum 2 x 10GbE for client connections for nodes/controllers serving NL-SAS/SATA. Total 8 x 10 GbE.	Each Storage Controllers/ Storage node should have minimum of 2 x 40GbE QSFP+ for client connections for nodes/controllers serving all flash. Total 8 x 40 GbE SFP+. Each Storage Controllers/ Storage node should have minimum 2 x 10GbE SFP+ for client connections for nodes/controllers serving NL-SAS/SATA. Total 8 x 10 GbE SFP+.	Modern networking uses optical fiber ports for transceivers. Request that for longevity of the solution, optical fiber ports be asked	No change. Bidder has to ensure that storage and switches are compatible in terms of networking ports and connectivity.
2	70	h. Performance/ Throughput Requirements	For cloud portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 8GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size. For NDR portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 1.4GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size. The performance must be demonstrated with data at rest encryption feature switched on along with remote replication.	For cloud portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 17GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size. For NDR portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 3GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size.	(1) The present HCI configuration asked (to which this storage will connect) has the potential of choking the storage unless asked throughput is increased. Reason is as below: HCI aggregated ports speed asked is 40Gbps (page 62, point i). This means the HCI has the capacity of writing data at 5GBps Storage throughput capability asked is 8GBPs at 70:30 read: write ratio. Which means the maximum write throughput capability of storage is 2.4GBps HCI which can write data at 5GBps will choke the storage which cannot write at more than 2.4GBps. Therefore it is requested to increase the performance/ throughput capability of storage to 17GBps at 70:30 read: write ratio. This brings the write capability of storage upto 5.1GBps, which matches the write capability of HCI at 5GBps (2) Request that the need for data at rest be removed	No change. Minimum requirement is specified. Better performance is acceptable. However the offered storage to provide support for a broad range of enterprise workloads.

3	71	q. Data Security	Data must be securely encrypted at rest, in motion and while replication at SDC. Protection from ransomware etc. must be ensured.	Data must be securely encrypted while replication at SDC. Protection from ransomware etc. must be ensured.	Since the storage operates in the trusted environment of a self-hosted data center with no chance of theft, data at rest encryption is not needed. However, since data would be replicated over a third-party hosted network, it is important to encrypt data during replication. If data at rest encryption is mandatory, it should be hardware-based and adhere to the FIPS 140-2 level 2 standard.	No Change.
4	71	r. De-duplication and compression	Proposed storage must offer de-duplication and compression feature	Proposed storage must support de-duplication or compression feature	Different storage vendors support different technologies, either deduplication or compression	Clause may be read as: "Proposed storage should be configured with de-duplication and/or compression features." Refer - B: Amendment to Technical Specification and Terms & Conditions
Item 2.02 Unified Storage Systems for SDC						
S. No	Page No	Item	Description	Change Requested	Bidder's Remarks	DGH's Reply
1	87	c. Network Ports	Each Storage Controller/ Storage node should have minimum of 2 x 40GbE for client connections for nodes/controllers serving all flash. Total 8 x 40 GbE. Each Storage Controller/ Storage node should have minimum 2 x 10GbE for client connections for nodes/controllers serving NL-SAS/SATA. Total 8 x 10 GbE.	Each Storage Controller/ Storage node should have minimum of 2 x 40GbE QSFP+ for client connections for nodes/controllers serving all flash. Total 8 x 40 GbE SFP+. Each Storage Controller/ Storage node should have minimum 2 x 10GbE SFP+ for client connections for nodes/controllers serving NL-SAS/SATA. Total 8 x 10 GbE SFP+.	Modern networking uses optical fiber ports for transceivers. Request that for longevity of the solution, optical fiber ports be asked	No change. Bidder has to ensure that storage and switches are compatible in terms of networking ports and connectivity.
2	88	h. Performance/ Throughput Requirements	For cloud portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 8GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size. For NDR portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 1.4GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size. The performance must be demonstrated with data at rest encryption feature switched on along with remote replication.	For cloud portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 17GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size. For NDR portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 3GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size.	(1) The present HCI configuration asked (to which this storage will connect) has the potential of choking the storage unless asked throughput is increased. Reason is as below: HCI aggregated ports speed asked is 40Gbps (page 62, point i). This means the HCI has the capacity of writing data at 5GBps Storage throughput capability asked is 8GBps at 70:30 read: write ratio. Which means the maximum write throughput capability of storage is 2.4GBps HCI which can write data at 5GBps will choke the storage which cannot write at more than 2.4GBps. Therefore it is requested to increase the performance/ throughput capability of storage to 17GBps at 70:30 read: write ratio. This brings the write capability of storage up to 5.1GBps, which matches the write capability of HCI at 5GBps (2) Request that the need for data at rest be removed	No change. Minimum requirement is specified. Better performance is acceptable. However, the offered storage to provide support for a broad range of enterprise workloads.
3	89	q. Data Security	Data must be securely encrypted at rest, in motion and while replication at SDC. Protection from ransomware etc. must be ensured.	Data must be securely encrypted while replication at SDC. Protection from ransomware etc. must be ensured.	Since the storage operates in the trusted environment of a self-hosted data center with no chance of theft, data at rest encryption is not needed. However, since data would be replicated over a third-party hosted network, it is important to encrypt data during replication. If data at rest encryption is mandatory, it should be hardware-based and adhere to the FIPS 140-2 level 2 standard.	No Change.

4	89	r. De-duplication and compression		Proposed storage must offer de-duplication and compression feature	Proposed storage must support de-duplication or compression feature	Different storage vendors support different technologies, either deduplication or compression	Clause may be read as: "Proposed storage should be configured with de-duplication and/ or compression features." Refer - B: Amendment to Technical Specification and Terms & Conditions
5	87	c. Network Ports	Each Storage Controllers/ Storage node should have minimum of 2 x 40GbE for client connections for nodes/controllers serving all flash. Total 8 x 40 GbE. Each Storage Controllers/ Storage node should have minimum 2 x 10GbE for client connections for nodes/controllers serving NL-SAS/SATA. Total 8 x 10 GbE.	Each Storage Controllers/ Storage node should have minimum of 2 x 40GbE QSFP+ for client connections for nodes/controllers serving all flash. Total 8 x 40 GbE SFP+. Each Storage Controllers/ Storage node should have minimum 2 x 10GbE SFP+ for client connections for nodes/controllers serving NL-SAS/SATA. Total 8 x 10 GbE SFP+.	Each Storage Controllers/ Storage node should have minimum of 2 x 40GbE QSFP+ for client connections for nodes/controllers serving all flash. Total 8 x 40 GbE SFP+. Each Storage Controllers/ Storage node should have minimum 2 x 10GbE SFP+ for client connections for nodes/controllers serving NL-SAS/SATA. Total 8 x 10 GbE SFP+.	Modern networking uses optical fiber ports for transceivers. Request that for longevity of the solution, optical fiber ports be asked	Points appeared to be repeated
6	88	h. Performance/ Throughput Requirements	For cloud portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 8GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size. For NDR portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 1.4GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size. The performance must be demonstrated with data at rest encryption feature switched on along	For cloud portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 17GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size. For NDR portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 3GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size.	For cloud portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 17GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size. For NDR portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 3GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size.	Performance capability of the storages at DC and DR should be the same	
7	89	r. Data Security	Data must be securely encrypted at rest, in motion and while replication at SDC. Protection from ransomware etc. must be ensured.	Data must be securely encrypted while replication at SDC. Protection from ransomware etc. must be ensured.	Data must be securely encrypted while replication at SDC. Protection from ransomware etc. must be ensured.	Since the storage operates in the trusted environment of a self hosted data center with no chance of theft, data at rest encryption is not needed. However since data would be replicated over a third party hosted network, it is important to encrypt data during replication. If data at rest encryption is mandatory, it should be hardware based and adhere to the FIPS 140-2 level 2 standard	
8	89	s. De-duplication and compression	Proposed storage must offer de-duplication and compression feature	Proposed storage must support de-duplication or compression feature	Proposed storage must support de-duplication or compression feature	Different storage vendors support different technologies, either deduplication or compression	
Item 1.03 Unified Storage Systems for PDC							

S. No	Page No	Item	Description	Clarification	DGH's Reply
1	69	b. Onboard Memory	Storage Solution to be configured with minimum 1TB DRAM based usable cache across NAS Storage Controller/ NAS Storage Node configured for read and write operations. If there are any controllers serving the disks separately then equal amount of DRAM based cache must be provided on those controllers to avoid any funnelling effect	Since 1TB DRAM based usable cache is being asked across NAS Storage Controller/ NAS Storage Node configured for read and write operations. It is assumed that it is 1TB cache for the All flash controllers and 1TB cache for the NL-SAS/SATA controllers. Request you to please clarify	No change. 1 TB DRAM based usable cache across all storage controllers.
Item 2.02 Unified Storage Systems for SDC					
S. No	Page No	Item	Description	Clarification	DGH's Reply
1	86	b. Onboard Memory	Storage Solution to be configured with minimum 1TB DRAM based usable cache across NAS Storage Controller/ NAS Storage Node configured for read and write operations. If there are any controllers serving the disks separately then equal amount of DRAM based cache must be provided on those controllers to avoid any funnelling effect.	Since 1TB DRAM based usable cache is being asked across NAS Storage Controller/ NAS Storage Node configured for read and write operations. It is assumed that it is 1TB cache for the All flash controllers and 1TB cache for the NL-SAS/SATA controllers. Request you to please clarify	No change. 1 TB DRAM based usable cache across all storage controllers.

Queries from M/s Hewlett Packard Enterprise India Pvt. Ltd.

Point No's	Clause No. of Bidding Document	Full compliance/ not agreed	Changes/ modifications proposed by the Bidders	Bidder's Remarks	DGH's Reply
		Item -1.03 of Price Bid Unified Storage System- PDC- 1 No		Request DGH to please clarify if unified storage is required or solution based on scale out architecture to deliver NAS is to be offered, these two are different architectures designed for different workloads.	"Unified Storage System" to be read as "Storage System" on Pages 68 and 86 of Technical specifications (Appendix – A), Page No. 102 and 124 of Technical specifications check list (Appendix B). Also the corresponding items in price bid at Annexure –V item no. 1.03 and 2.02 on page nos. 135 and 136 respectively may be read as "Storage System". A dedicated purpose built scale out NAS appliance is required. Refer - B: Amendment to Technical Specification and Terms & Conditions .
Page No 69, a.	Controllers and Architecture	Architecture: Storage should be Fully Symmetric OR Fully Distributed Clustered Architecture written for Scale-Out NAS operations. Hardware and software engineering, and support should be from the same OEM. The Scale-outNAS must be based upon dedicated NAS appliance hardware. System should support linear scalability in Performance and Capacity, without any disruptions to production workflow. The NAS appliance should have specialized Operating System, dedicated and tuned for serving data efficiently and written for scale-out architecture.	Architecture: Storage should be Fully Symmetric OR Fully Distributed Clustered Architecture written for Scale-Out NAS / filesystem operations. The Scale-out solution for NAS must be based/configured upon dedicated NAS appliance / nodes hardware. System should support linear scalability in Performance and Capacity, without any disruptions to production workflow. The NAS appliance /solution /nodes should have specialized filesystem System, dedicated and tuned for serving data efficiently and written for scale-out architecture. General purpose OS / filesystem will not be acceptable for the NAS system/solution . The architecture should have a single namespace. Controllers: Separated controllers are factored for SSD and SAS/NL-SAS/SATA	Since different OEM's has different architectures and nomenclatures, Request DGH to please change the asked clauses for wider participations. Current asked specifications are tending to a particular technology and OEM architecture.	No change. A dedicated purpose built appliance is required. A solution flexibility is not the objective for this requirement, it has to be engineered, purpose built NAS appliance.
a.	Controllers and Architecture	Architecture: Storage should be Fully Symmetric OR Fully Distributed Clustered Architecture written for Scale-Out NAS operations. Hardware and software engineering, and support should be from the same OEM. The Scale-outNAS must be based upon dedicated NAS appliance hardware. System should support linear scalability in Performance and Capacity, without any disruptions to production workflow. The NAS appliance should have specialized Operating System, dedicated and tuned for serving data efficiently and written for scale-out architecture.		Request DGH to please confirm if only asked NAS based solution with specialized Operating System, dedicated and tuned for serving data efficiently and written for scale-out architecture needs to be provided, if the OS support block or other protocols will not be accepted. Please confirm.	The requirement is of scale out NAS, however if additional protocols are provided by OEM with no additional cost to DGH it would be acceptable.
b.	Onboard Memory	Storage Solution to be configured with minimum 1TB DRAM based usable cache across NAS Storage Controller/ NAS Storage Node configured for read and write operations. If there are any controllers serving the disks separately then equal amount of DRAM based cache must be provided on those controllers to avoid any funnelling effect.		As per our understanding the asked DRAM cache needs to be protected as this is being asked for the write operations as well. Please confirm.	The WRITES in the cache/ DRAM must be protected.
e.	Operating System	Scale-Out Storage should have Fully Journalled, fully distributed, specialised Operating System by same OEM (as storage hardware) , dedicated for serving data efficiently and customised for True Scale-Out Storage. General purpose OS will not be acceptable for the NAS Appliance.	Scale-Out Storage should have Fully Journalled, fully distributed, specialised Operating System /filesystem by same OEM (as storage hardware) , dedicated for serving data efficiently and customised for True Scale-Out Storage. General purpose OS /filesystem will not be acceptable for the NAS Appliance / solution .	Since different OEM's has different architectures and nomenclatures, Request DGH to please change the asked clauses for wider participations. Current asked specifications are tending to a particular technology and OEM architecture.	No change. A dedicated purpose built appliance is required. A solution flexibility is not the objective for this requirement, it has to be engineered, purpose built NAS appliance.

f.	Redundancy with No Single Point of Failure (SPOF)	<p>The Scale-Out Storage System should be able to protect the data against simultaneous 2(Two) disk failures or have equivalent technology for data protection.</p> <p>The Scale-Out Storage should be configured to sustain atleast one StorageController/Single Node failure in the storage system without data unavailability and performance drop of not more than 20%.</p> <p>- Data should be striped across all storage controllers/ HA pair in the proposed storage system, so that performance of all controllers/ HA pairs can be utilized for all read and write operations.</p> <p>- The backend internal connectivity between storage controllers/storage nodes should be using high performance Infiniband or 40 GigE network with no single point of failure.</p>	<p>- Data should be striped across all storage controllers in the proposed storage system, so that performance of all controllers can be utilized for all read and write operations.</p> <p>- The backend internal connectivity between storage controllers/storage nodes should be using high performance Infiniband or 40 GigE network or 16Gbps FC with no single point of failure.</p>	<p>Since , value of scale out architecture comes once we use all the hardware installed in the cluster, limiting options for the data / striping of data across HA pairs defeat the complete value of scale out architecture and again tends to a technology from a OEM , we request DGH to change the said clause so DGH gets the best in class storage solution based out on true scale out architecture.</p>	No change
g.	Total Storage Capacity	<p>1 PB(Petabyte) usable capacity with single unified addressable namespace /single filesystem after required protection level on complete storage solution. The NAS Appliance should be scalable upto 60 PB usable as a single filesystem/or a single global namespace. Current Capacity to be configured as - a)250 TiB usable Flash Tier Capacity using SSD of size 7.6TB or less (1 TiB = 1024 x 1024 x 1024 x 1024 bytes) b) 750 TiB usable Tier Capacity using NL-SAS / SATA HDD of size 10TB or less. (1 TiB = 1024 x 1024 x 1024 x 1024 bytes) 10% additional usable space must be provisioned as snapshot space for SSD and NL-SAS/SATA disk tier respectively. License for the same must be provided. 5% additional usable space (in terms of HDD/ SSD must be provisioned for hot sparing apart from usable capacity based on OEM best practice. License for the same must be provided</p>	<p>1 PB(Petabyte) usable capacity with single unified addressable namespace /single filesystem after required protection level on complete storage solution. The NAS Appliance /solution / filesystem should be scalable upto 60 PB usable as a single filesystem/or a single global namespace. Current Capacity to be configured as - a)250 TiB usable Flash Tier Capacity using SSD of size 7.6TB or less (1 TiB = 1024 x 1024 x 1024 x 1024 bytes) b) 750 TiB usable Tier Capacity using NL-SAS / SATA HDD of size 10TB or less. (1 TiB = 1024 x 1024 x 1024 x 1024 bytes) 10% additional usable space must be provisioned as snapshot space for SSD and NL-SAS/SATA disk tier respectively. License for the same must be provided. 5% additional usable space (in terms of HDD/ SSD must be provisioned for hot sparing apart from usable capacity based on OEM best practice. License for the same must be provided</p>	<p>Since different OEM's has different architectures and nomenclatures, Request DGH to please change the asked clauses for wider participations. Current asked specifications are tending to a particular technology and OEM architecture.</p>	<p>No change. A dedicated purpose built appliance is required. A solution flexibility is not the objective for this requirement, it has to be engineered, purpose built NAS appliance.</p>
J.	File Sharing	<p>Should allow simultaneous access to the same file/data via SMB and NFS for data sharing between LINUX and Windows hosts. Data must be encrypted in motion during file sharing operations.</p>	<p>Should allow simultaneous access to the same file/data via SMB and NFS for data sharing between LINUX and Windows hosts. Data must be encrypted.</p>		<p>No Change. Data must be encrypted in motion.</p>
I.	Client Load Balancing	<p>Storage System should have capability to load balance client connectivity across these multiple controllers so that all clients gets distributed across all existing controllers/nodes to avoid any performance hotspot. In case native functionality is not available in the storage, bidder must provide a mechanism such as redundant pair of hardware load balancer for the the same</p>	<p>Storage System should have capability to load balance client connectivity across these multiple controllers so that all clients gets distributed across all existing controllers/nodes to avoid any performance hotspot. In case native functionality is not available in the storage, bidder must provide a mechanism such as redundant pair of hardware load balancer for the the same or using dns round robin feature.</p>		<p>Any additional hardware/ software required to meet this feature has to be provided by the bidder.</p>

p.	Disaster Recovery	The storage system shall be able to support directory and file-level OR volume level asynchronous replication across WAN to another storage system of same type. The replication software shall have a comprehensive Volume/ file and directory selection criteria for replication. The storage system at the remote site shall be at the same protection level as the primary site and be able to sustain 2 disks failure or 1 controller failure after failover. The storage system must preserve bandwidth during replication else must provide redundant WAN optimiser to preserve the bandwidth.	The storage system shall be able to support directory and file-level OR volume level asynchronous replication across WAN to another storage system of same type. The replication software shall have a comprehensive Volume/ file and directory selection criteria for replication. The storage system at the remote site shall be at the same protection level as the primary site and be able to sustain 2 disks failure or 1 controller failure after failover.		No change.
q.	Data Security	Data must be securely encrypted at rest, in motion and while replication at SDC. Protection from ransomware etc. must be ensured.	Request DGH to please remove this clause.	There is no linkage with SDC here. Please remove this clause. This looks to be a typo error.	No Change.
	2.1 Page no 43	In case bidder is OEM of offered hardware or SI, the bidder must submit a certificate from the OEMs of these software i.e Decision Space Geoscience (DSG) of M/s Halliburton and Petrel of M/s Schlumberger that the offered items as per the tender is certified on their latest version of application software.	if the application supports standard NFS / CIFS / SMB it will work with asked applications. Request you to please change the clause as "In case bidder is OEM of offered hardware or SI, the bidder must submit a certificate that software i.e Decision Space Geoscience (DSG) of M/s Halliburton and Petrel of M/s Schlumberger works with the offered stack."		No Change.
	Clause No. of Bidding Document	Full compliance/ not agreed	Changes/ modifications proposed by the Bidders	Bidder's Remarks	DGH's Reply
	Item -1.01 of Price Bid				
	HCI Nodes for VDI - 5 No.s				
Sr.No.	Item	Vendor to specify Brand Make and Model offered.			
Page No 62, a	Hyper Converged Appliance (Essential Features)	Hyper converged appliance, which comes Factory Installed with various software including Software Defined Storage and Hypervisor. SDS should NOT be top-up or add-on software license bundled on generic x86 server. It should be an integral part of appliance.	As VMware vSAN (ST6-EN-C VMware vSAN 6 Enterprise for 1 processor = 10 on Page No. 120) is mentioned with part code in this RFP , please change Hyper Converged Appliance item to vSAN Ready Nodes and remove factory installed. http://www.dghindia.org/assets/tender/5d53bf995850aTender163.pdf	Hyper Converged Appliance with vSAN will be provided by only DELL and rest other vendors can integrate vSAN with their proposed servers.	vSAN License requirement has been dropped / deleted. Requirement is of HCL appliance factory installed SDS and not vSAN ready nodes. Refer - B: Amendment to Technical Specification and Terms & Conditions
g	Storage Cache	2 x 400 GB (SSD) or 1 x 800 GB (SSD) per Node. If SSD cache is not available then additional 10% RAM to be provided in each node.	2 x 400 GB (SSD) or 1 x 800 GB (SSD) per Node. If SSD cache is not available then additional 10% RAM or 800 GB space in SSD tier to be provided in each node.	HPE architecture is engineered with distributed cache from across the SSDs in the node. Hence this change is requested	Clause dropped. Refer - B: Amendment to Technical Specification and Terms & Conditions .
l	Network Throughput	Total Network throughput from HYPERCONVERGED Chassis should be configured with total 40 Gbps with no single point of failure. i.e (N+1) redundancy	Total Network throughput from HYPERCONVERGED node should be configured with total 40 Gbps with no single point of failure. i.e (N+1) redundancy	Each HCI node needs to have 40Gbps in redundancy	To be read as: "Total Network throughput from HYPERCONVERGED Chassis should be configured with total 40 Gbps per node with no single point of failure. i.e (N+1) redundancy" Refer - B: Amendment to Technical Specification and Terms & Conditions .

k	Data Services	The solution should provide enterprise data services such as deduplication and compression with erasure coding OR equivalent completely in software without dependence on any proprietary hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	The solution should provide enterprise data services such as deduplication and compression with erasure coding OR equivalent completely in software. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	In the HCI appliances available in the industry, few vendors use host HCI nodes' CPU for deduplication and compression operations. HPE HCI system offloads the deduplication and compression operations to separate PCI card, this helps in achieving higher storage efficiency without compromising performance. Hence request for changes.	To be read as: "The solution should provide enterprise data services such as deduplication and compression with erasure coding OR equivalent in software/ hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed." Refer - B: Amendment to Technical Specification and Terms & Conditions .
m	Scale Up and Scale out	The solution should support non-disruptive Scale-Up (Upgrade by inserting additional drives in existing empty drive-slots) whenever required without any additional licensing cost and Scale-Out (Upgrade by adding nodes) upgrades to grow capacity and/or performance with no disruption to the workloads already running on the platform.	The solution should support non-disruptive Scale-Out (Upgrade by adding nodes) upgrades to grow capacity and/or performance with no disruption to the workloads already running on the platform.	Our HCI appliances don't support scale up for addition of drives but supports scale out add more nodes in a cluster	No change.
p	Rack Unit	HCI Appliance should support different Rack Units depending upon the workload (2U4N or 1U1N or 2U1N)	HCI Appliance should support different Rack Units depending upon the workload (2U4N or 1U1N or 2U1N). Proposed appliance should have dedicated non shared power supplies and cooling fans in each node	Failure of power supply or system fan should not affect more than single node in the cluster	No change.
t	Storage Feature	Storage policies should be enforced directly from hypervisor and managed directly from hypervisor	Please remove this	this is proprietary to single vendor	Clause may be read as: "Storage policies should be enforced & managed directly from hypervisor/ SDS." Refer - B: Amendment to Technical Specification and Terms & Conditions .
x	Performance IOPS	Minimum 70K IOPS or more with less than 5ms response time when using 8K/16K block size at 70:30 - Read Write Ratio	Minimum 15K IOPS or more with less than 5ms response time when using 8K/16K block size at 70:30 - Read Write Ratio	Considering the GPUs requested, CPU, memory & storage capacity asked, we are requesting to consider this	No change.
	Item -1.02 of Price Bid				
Page No 65 a	Hyper Converged Appliance (Essential Features)	Hyper converged appliance, which comes Factory Installed with various software including Software Defined Storage and Hypervisor. SDS should NOT be top-up or add-on software license bundled on generic x86 server. It should be an integral part of appliance.	As VMware VSAN (ST6-EN-C VMware vSAN 6 Enterprise for 1 processor = 10 on Page No. 120) is mentioned with part code in this RFP , please change Hyper Converged Appliance item to VSAN Ready Nodes and remove factory installed. http://www.dghindia.org/assets/tender/5d53bf995850aTender163.pdf	Hyper Converged Appliance with VSAN will be provided by only DELL. and rest other vendors can integrate VSAN with their proposed servers.	VSAN License requirement has been dropped / deleted. Requirement is of HCL appliance factory installed SDS and not VSAN ready nodes. Refer - B: Amendment to Technical Specification and Terms & Conditions
g	Storage Cache	2 x 400 GB (SSD) or 1 x 800 GB (SSD) per Node. If SSD cache is not available then additional 10% RAM to be provided in each node.	2 x 400 GB (SSD) or 1 x 800 GB (SSD) per Node. If SSD cache is not available then additional 10% RAM or 800 GB space in SSD tier to be provided in each node.	HPE architecture is engineered with distributed cache from across the SSD tier. Hence this change is requested	Clause dropped. Refer - B: Amendment to Technical Specification and Terms & Conditions .
i	Network Throughput	Total Network throughput from HYPERCONVERGED Chassis should be configured with total 20 Gbps with no single point of failure. (N+1) redundancy	Total Network throughput from HYPERCONVERGED node should be configured with total 40 Gbps with no single point of failure. i.e (N+1) redundancy	Each HCI node needs to have 40Gbps in redundancy	To be read as: "Total Network throughput from HYPERCONVERGED Chassis should be configured with total 20 Gbps per node with no single point of failure. i.e (N+1) redundancy" Refer - B: Amendment to Technical Specification and Terms & Conditions .

j	Data Services	The solution should provide enterprise data services such as deduplication and compression with erasure coding OR equivalent completely in software without dependence on any proprietary hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	The solution should provide enterprise data services such as deduplication and compression with erasure coding OR equivalent completely in software. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	In the HCI appliances available in the industry, few vendors use host HCI nodes' CPU for deduplication and compression operations. HPE HCI system off loads the deduplication and compression operations to separate PCI card, this helps in achieving higher storage efficiency without compromising performance. Hence request for changes.	Clause me be read as "The solution should provide enterprise data services such as deduplication and compression with erasure coding OR equivalent in software/ hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed." Refer - B: Amendment to Technical Specification and Terms & Conditions .
l	Scale Up and Scale Out	The solution should support non-disruptive Scale-Up (Upgrade by inserting additional drives in existing empty drive-slots) whenever required without any additional licensing cost and Scale-Out (Upgrade by adding nodes) upgrades to grow capacity and/or performance with no disruption to the workloads already running on the platform.	The solution should support non-disruptive Scale-Out (Upgrade by adding nodes) upgrades to grow capacity and/or performance with no disruption to the workloads already running on the platform.	Our HCI appliances don't support scale up for addition of drives but supports scale out o add more nodes in a cluster	No change.
n	Cluster Scalability	Cluster architecture to be scalable upto 32 nodes wherein all the VM's should be capable to use compute, memory and storage resources from all the nodes in a cluster architecture through a single interface.	Cluster architecture to be scalable upto 16 nodes wherein all the VM's should be capable to use compute, memory and storage resources from all the nodes in a cluster architecture through a single interface.	Our solution supports 16 nodes in a cluster	No Change. In a CLUSTER ARCHITECTURE it should expand upto 32 nodes.
o	Rack Unit	HCI Appliance should support different Rack Units depending upon the workload (2U4N or 1U1N or 2U1N)	HCI Appliance should support different Rack Units depending upon the workload (2U4N or 1U1N or 2U1N). Proposed appliance should have dedicated non shared power supplies and cooling fans in each node	Failure of power supply or system fan should not affect more than single node in the cluster	No change.
s	Storage Feature	Storage policies should be enforced directly from hypervisor and managed directly from hypervisor.	Please remove this	this is proprietary to single vendor	Clause may be read as: "Storage policies should be enforced & managed directly from hypervisor/ SDS." Refer - B: Amendment to Technical Specification and Terms & Conditions .
	Clause No. of Bidding Document	Full compliance/ not agreed	Changes/ modifications proposed by the Bidders	Bidder's Remarks	DGH's Reply
	L3 Switch – PDC- 2 Nos				
Page No 74, e.	Networking Features - Data Link Protocol	Ethernet, Fast Ethernet, Gigabit Ethernet, 10 Gigabit, 40 Gigabit, 25 Gigabit, 50 Gigabit, 100 Gigabit	Please remove 25G & 50 G	The mentioned requirement for this switch is for 48x10G SFP+ with 4x40QSFP+ upgradable to 100G if required in future, but the mentioned data rate support is not standard as per required switch 10G SFP+ ports can work as 1/10G ports and QSFP 28+ ports can works as 40/100G Ports as a standard, Hence request you to please remove other demands, so that leaders can participate.	Clause may be read as: "Ethernet, Fast Ethernet, Gigabit Ethernet, 10 Gigabit, 40 Gigabit, 25 Gigabit, 100 Gigabit" Refer - B: Amendment to Technical Specification and Terms & Conditions .

	Clause No. of Bidding Document	Full compliance/ not agreed	Changes/ modifications proposed by the Bidders	Bidder's Remarks	DGH's Reply
		Item -2.02 of Price Bid Unified Storage System- PDC- 1 No		Request DGH to please clarify if unified storage is required or solution based on scale out architecture to deliver NAS is to be offered, these two are different architectures designed for different workloads.	Item 2.02 of Price Bid is "Storage System" for SDC - 01 No. A dedicated purpose built scale out NAS appliance is required.
Page No 86 a.	Controllers and Architecture	Architecture: Storage should be Fully Symmetric OR Fully Distributed Clustered Architecture written for Scale-Out NAS operations. Hardware and software engineering, and support should be from the same OEM. The Scale-outNAS must be based upon dedicated NAS appliance hardware. System should support linear scalability in Performance and Capacity, without any disruptions to production workflow. The NAS appliance should have specialized Operating System, dedicated and tuned for serving data efficiently and written for scale-out architecture.	Architecture: Storage should be Fully Symmetric OR Fully Distributed Clustered Architecture written for Scale-Out NAS / filesystem operations. The Scale-out solution for NAS must be based/configured upon dedicated NAS appliance / nodes hardware. System should support linear scalability in Performance and Capacity, without any disruptions to production workflow. The NAS appliance /solution /nodes should have specialized filesystem System, dedicated and tuned for serving data efficiently and written for scale-out architecture. General purpose OS / filesystem will not be acceptable for the NAS system/solution . The architecture should have a single namespace. Controllers: Separated controllers are factored for SSD and SAS/NL-SAS/SATA	Since different OEM's has different architectures and nomenclatures, Request DGH to please change the asked clauses for wider participations. Current asked specifications are tending to a particular technology and OEM architecture.	No change. A dedicated purpose built appliance is required. A soluion flexibility is not the objective for this requirement, it has to be engineered, purpose built NAS appliance.
a.	Controllers and Architecture	Architecture: Storage should be Fully Symmetric OR Fully Distributed Clustered Architecture written for Scale-Out NAS operations. Hardware and software engineering, and support should be from the same OEM. The Scale-outNAS must be based upon dedicated NAS appliance hardware. System should support linear scalability in Performance and Capacity, without any disruptions to production workflow. The NAS appliance should have specialized Operating System, dedicated and tuned for serving data efficiently and written for scale-out architecture.		Request DGH to please confirm if only asked NAS based solution with specialized Operating System, dedicated and tuned for serving data efficiently and written for scale-out architecture needs to be provided, if the OS support block or other proctols will not be accepted. Please confirm.	The requirement is of scale out NAS, however if additional protocols are provided by OEM with no additional cost to DGH it would be acceptable.
b.	Onboard Memory	Storage Solution to be configured with minimum 1TB DRAM based usable cache across NAS Storage Controller/ NAS Storage Node configured for read and write operations. If there are any controllers serving the disks seperately then equal amount of DRAM based cache must be provided on those controllers to avoid any funnelling effect.		As per our understanding the asked DRAM cache needs to be protected as this is being asked for the write operations as well. Please confirm.	The WRITES in the cache/ DRAM must be protected.
e.	Operating System	Scale-Out Storage should have Fully Journalled, fully distributed, specialised Operating System by same OEM (as storage hardware) , dedicated for serving data efficiently and customised for True Scale-Out Storage. General purpose OS will not be acceptable for the NAS Appliance.	Scale-Out Storage should have Fully Journalled, fully distributed, specialised Operating System /filesystem by same OEM (as storage hardware) , dedicated for serving data efficiently and customised for True Scale-Out Storage. General purpose OS /filesystem will not be acceptable for the NAS Appliance / solution .	Since different OEM's has different architectures and nomenclatures, Request DGH to please change the asked clauses for wider participations. Current asked specifications are tending to a particular technology and OEM architecture.	No change. A dedicated purpose built appliance is required. A soluion flexibility is not the objective for this requirement, it has to be engineered, purpose built NAS appliance.
f.	Redundancy with No Single Point of Failure (SPOF)	The Scale-Out Storage System should be able to protect the data against simultaneous 2(Two) disk failures or have equivalent technology for data protection. The Scale-Out Storage should be configured to sustain atleast one StorageController/Single Node failure in the storage system without data unavailability and performance drop of not more than 20%. - Data should be striped across all storage controllers/ HA pair in the proposed storage system, so that performance of all controllers/ HA pairs can be utilized for all read and write operations. - The backend internal connectivity between storage controllers/storage nodes should be using high performance Infiniband or 40 GigE network with no single point of failure.	- Data should be striped across all storage controllers in the proposed storage system, so that performance of all controllers can be utilized for all read and write operations. - The backend internal connectivity between storage controllers/storage nodes should be using high performance Infiniband or 40 GigE network or 16Gbps FC with no single point of failure.	Since , value of scale out architecture comes once we use all the hardware installed in the cluster, limiting options for the data / striping of data across HA pairs defeat the complete value of scale out architecture and again tends to a technology from a OEM , we request DGH to change the said clause so DGH gets the best in class storage solution based out on true scale out architecture.	No change

g.	Total Storage Capacity	1 PB(Petabyte) usable capacity with single unified addressable namespace /single filesystem after required protection level on complete storage solution. The NAS Appliance should be scalable upto 60 PB usable as a single filesystem/or a single global namespace. Current Capacity to be configured as - a)250 TiB usable Flash Tier Capacity using SSD of size 7.6TB or less (1 TiB = 1024 x 1024 x 1024 x 1024 bytes) b) 750 TiB usable Tier Capacity using NL-SAS / SATA HDD of size 10TB or less. (1 TiB = 1024 x 1024 x 1024 x 1024 bytes) 10% additional usable space must be provisioned as snapshot space for SSD and NL-SAS/SATA disk tier respectively. License for the same must be provided. 5% additional usable space (in terms of HDD/ SSD must be provisioned for hot sparing apart from usable capacity based on OEM best practice. License for the same must be provided	1 PB(Petabyte) usable capacity with single unified addressable namespace /single filesystem after required protection level on complete storage solution. The NAS Appliance /solution / filesystem should be scalable upto 60 PB usable as a single filesystem/or a single global namespace. Current Capacity to be configured as - a)250 TiB usable Flash Tier Capacity using SSD of size 7.6TB or less (1 TiB = 1024 x 1024 x 1024 x 1024 bytes) b) 750 TiB usable Tier Capacity using NL-SAS / SATA HDD of size 10TB or less. (1 TiB = 1024 x 1024 x 1024 x 1024 bytes) 10% additional usable space must be provisioned as snapshot space for SSD and NL-SAS/SATA disk tier respectively. License for the same must be provided. 5% additional usable space (in terms of HDD/ SSD must be provisioned for hot sparing apart from usable capacity based on OEM best practice. License for the same must be provided	Since different OEM's has different architectures and nomenclatures, Request DGH to please change the asked clauses for wider participations. Current asked specifications are tending to a particular technology and OEM architecture.	No change. Requirement is not for 1 PB in SDC, requirement is 550 TB usable at SDC. Other conditions remains same as storage of PDC item 1.03 of price bid. However a dedicated purpose built appliance is required. A solution flexibility is not the objective for this requirement, it has to be engineered, purpose built NAS appliance.
J.	File Sharing	Should allow simultaneous access to the same file/data via SMB and NFS for data sharing between LINUX and Windows hosts. Data must be encrypted in motion during file sharing operations.	Should allow simultaneous access to the same file/data via SMB and NFS for data sharing between LINUX and Windows hosts. Data must be encrypted.		No Change. Data must be encrypted in motion.
I.	Client Load Balancing	Storage System should have capability to load balance client connectivity across these multiple controllers so that all clients gets distributed across all existing controllers/nodes to avoid any performance hotspot. In case native functionality is not available in the storage, bidder must provide a mechanism such as redundant pair of hardware load balancer for the the same	Storage System should have capability to load balance client connectivity across these multiple controllers so that all clients gets distributed across all existing controllers/nodes to avoid any performance hotspot. In case native functionality is not available in the storage, bidder must provide a mechanism such as redundant pair of hardware load balancer for the the same or using dns round robin feature.		Any additional hardware/ software required to meet this feature has to be provided by the bidder.
p.	Disaster Recovery	The storage system shall be able to support directory and file-level OR volume level asynchronous replication across WAN to another storage system of same type. The replication software shall have a comprehensive Volume/ file and directory selection criteria for replication. The storage system at the remote site shall be at the same protection level as the primary site and be able to sustain 2 disks failure or 1 controller failure after failover. The storage system must preserve bandwidth during replication else must provide redundant WAN optimiser to preserve the bandwidth.	The storage system shall be able to support directory and file-level OR volume level asynchronous replication across WAN to another storage system of same type. The replication software shall have a comprehensive Volume/ file and directory selection criteria for replication. The storage system at the remote site shall be at the same protection level as the primary site and be able to sustain 2 disks failure or 1 controller failure after failover.		No change.
q.	Data Security	Data must be securely encrypted at rest, in motion and while replication at SDC. Protection from ransomware etc. must be ensured.	Request DGH to please remove this clause.	There is no linkage with SDC here. Please remove this clause. This looks to be a typo error.	No Change.
	2.1 Page no 43	In case bidder is OEM of offered hardware or SI, the bidder must submit a certificate from the OEMs of these software i.e Decision Space Geoscience (DSG) of M/s Halliburton and Petrel of M/s Schlumberger that the offered items as per the tender is certified on their latest version of application software.	if the application supports standard NFS / CIFS / SMB it will work with asked applications. Request you to please change the clause as "In case bidder is OEM of offered hardware or SI, the bidder must submit a certificate that software i.e Decision Space Geoscience (DSG) of M/s Halliburton and Petrel of M/s Schlumberger works with the offered stack."		No Change.
	Clause No. of Bidding Document	Full compliance/ not agreed	Changes/ modifications proposed by the Bidders	Bidder's Remarks	DGH's Reply
	Item -2.01 of Price Bid				
	HCL Nodes for VDI - 4 No.s				
Sr.No.	Item	Vendor to specify Brand Make and Model offered.			
Page No 83 a	Hyper Converged Appliance (Essential Features)	Hyper converged appliance, which comes Factory installed with various software including Software Defined Storage and Hypervisor. SDS should NOT be top-up or add-on software license bundled on generic x86 server. It should be an integral part of appliance.	As VMware VSAN (ST6-EN-C VMware vSAN 6 Enterprise for 1 processor = 10 on Page No. 120) is mentioned with part code in this RFP , please change Hyper Converged Appliance item to VSAN Ready Nodes and remove factory installed. http://www.dghindia.org/assets/tender/5d53b995850aTender163.pdf	Hyper Converged Appliance with VSAN will be provided by only DELL. and rest other vendors can integrate VSAN with their proposed servers.	VSAN License requirement has been dropped / deleted. Requirement is of HCL appliance factory installed SDS and not VSAN ready nodes. Refer - B: Amendment to Technical Specification and Terms & Conditions.
g	Storage Cache	2 x 400 GB (SSD) or 1 x 800 GB (SSD) per Node. If SSD cache is not available then additional 10% RAM to be provided in each node.	2 x 400 GB (SSD) or 1 x 800 GB (SSD) per Node. If SSD cache is not available then additional 10% RAM or 800 GB space in SSD tier to be provided in each node.	HPE architecture is engineered with distributed cache from across the SSDs in the node. Hence this change is requested	Clause dropped. Refer - B: Amendment to Technical Specification and Terms & Conditions

i	Network Throughput	Total Network throughput from HYPERCONVERGED Chassis should be configured with total 40 Gbps with no single point of failure. i.e (N+1) redundancy	Total Network throughput from HYPERCONVERGED node should be configured with total 40 Gbps with no single point of failure. i.e (N+1) redundancy	Each HCI node needs to have 40Gbps in redundancy	The Network Throughput for SDC is 20 Gbps per node not 40 Gbps as mentioned by bidder. However clause to be read as: "Total Network throughput from HYPERCONVERGED Chassis should be configured with total 20 Gbps per node with no single point of failure. i.e (N+1) redundancy" Refer - B: Amendment to Technical Specification and Terms & Conditions
k	Data Services	The solution should provide enterprise data services such as deduplication and compression with erasure coding OR equivalent completely in software without dependence on any proprietary hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	The solution should provide enterprise data services such as deduplication and compression with erasure coding OR equivalent completely in software. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	In the HCI appliances available in the industry, few vendors use host HCI nodes' CPU for deduplication and compression operations. HPE HCI system offloads the deduplication and compression operations to separate PCI card, this helps in achieving higher storage efficiency without compromising performance. Hence request for changes.	To be read as: "The solution should provide enterprise data services such as deduplication and compression with erasure coding OR equivalent in software/ hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed." Refer - B: Amendment to Technical Specification and Terms & Conditions
m	Scale Up and Scale out	The solution should support non-disruptive Scale-Up (Upgrade by inserting additional drives in existing empty drive-slots) whenever required without any additional licensing cost and Scale-Out (Upgrade by adding nodes) upgrades to grow capacity and/or performance with nodisruption to the workloads already running on the platform	The solution should support non-disruptive Scale-Out (Upgrade by adding nodes) upgrades to grow capacity and/or performance with nodisruption to the workloads already running on the platform	Our HCI appliances don't support scale up for addition of drives but supports scale out add more nodes in a cluster	No change.
p	Rack Unit	HCI Appliance should support different Rack Units depending upon the workload (2U4N or 1U1N or 2U1N)	HCI Appliance should support different Rack Units depending upon the workload (2U4N or 1U1N or 2U1N). Proposed appliance should have dedicated non shared power supplies and cooling fans in each node	Failure of power supply or system fan should not affect more than single node in the cluster	No change.
t	Storage Feature	Storage policies should be enforced directly from hypervisor and managed directly from hypervisor	Please remove this	this is proprietary to single vendor	Clause may be read as: "Storage policies should be enforced & managed directly from hypervisor/ SDS." Refer - B: Amendment to Technical Specification and Terms & Conditions
x	Performance IOPS	Minimum 70K IOPS or more with less than 5ms response time when using 8K/16K block size at 70:30 - Read Write Ratio	Minimum 15K IOPS or more with less than 5ms response time when using 8K/16K block size at 70:30 - Read Write Ratio	Considering the GPUs requested, CPU, memory & storage capacity asked, we are requesting to consider this	No change.
		Item -2.01 of Price Bid			
		HCI Nodes for AD & DB - 5 No.s			
Page No 93, a	Hyper Converged Appliance (Essential Features)	Hyper converged appliance, which comes Factory Installed with various software including Software Defined Storage and Hypervisor. SDS should NOT be top-up or add-on software license bundled on generic x86 server. It should be an integral part of appliance.	As VMware VSAN (ST6-EN-C VMware vSAN 6 Enterprise for 1 processor = 10 on Page No. 120) is mentioned with part code in this RFP , please change Hyper Converged Appliance item to VSAN Ready Nodes and remove factory installed. http://www.dghindia.org/assets/tender/5d53bf995850aTender163.pdf	Hyper Converged Appliance with VSAN will be provided by only DELL and rest other vendors can integrate VSAN with their proposed servers.	AD & DB nodes are not proposed for SDC. It has been wrongly mentioned by the bidder.
g	Storage Cache	2 x 400 GB (SSD) or 1 x 800 GB (SSD) per Node. If SSD cache is not available then additional 10% RAM to be provided in each node.	2 x 400 GB (SSD) or 1 x 800 GB (SSD) per Node. If SSD cache is not available then additional 10% RAM or 800 GB space in SSD tier to be provided in each node.	HPE architecture is engineered with distributed cache from across the SSD tier. Hence this change is requested	

i	Network Throughput	Total Network throughput from HYPERCONVERGED Chassis should be configured with total 20 Gbps with no single point of failure. (N+1) redundancy	Total Network throughput from HYPERCONVERGED node should be configured with total 40 Gbps with no single point of failure. i.e (N+1) redundancy	Each HCI node needs to have 40Gbps in redundancy
j	Data Services	The solution should provide enterprise data services such as deduplication and compression with erasure coding OR equivalent completely in software without dependence on any proprietary hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	The solution should provide enterprise data services such as deduplication and compression with erasure coding OR equivalent completely in software. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	In the HCI appliances available in the industry, few vendors use host HCI nodes' CPU for deduplication and compression operations. HPE HCI system off loads the deduplication and compression operations to separate PCI card, this helps in achieving higher storage efficiency without compromising performance. Hence request for changes.
l	Scale Up and Scale Out	The solution should support non-disruptive Scale-Up (Upgrade by inserting additional drives in existing empty drive-slots) whenever required without any additional licensing cost and Scale-Out (Upgrade by adding nodes) upgrades to grow capacity and/or performance with no disruption to the workloads already running on the platform.	The solution should support non-disruptive Scale-Out (Upgrade by adding nodes) upgrades to grow capacity and/or performance with no disruption to the workloads already running on the platform.	Our HCI appliances don't support scale up for addition of drives but supports scale out o add more nodes in a cluster
n	Cluster Scalability	Cluster architecture to be scalable upto 32 nodes wherein all the VM's should be capable to use compute, memory and storage resources from all the nodes in a cluster architecture through a single interface.	Cluster architecture to be scalable upto 16 nodes wherein all the VM's should be capable to use compute, memory and storage resources from all the nodes in a cluster architecture through a single interface.	Our solution supports 16 nodes in a cluster
o	Rack Unit	HCI Appliance should support different Rack Units depending upon the workload (2U4N or 1U1N or 2U1N)	HCI Appliance should support different Rack Units depending upon the workload (2U4N or 1U1N or 2U1N). Proposed appliance should have dedicated non shared power supplies and cooling fans in each node	Failure of power supply or system fan should not affect more than single node in the cluster
s	Storage Feature	Storage policies should be enforced directly from hypervisor and managed directly from hypervisor.	Please remove this	this is proprietary to single vendor

Queries from M/s Datagold Software Pvt. Ltd							
Appendix-4							
S.No	Clause No. of Bidding Document			Full compliance/ not agreed	Changes/ modifications proposed by the Bidders	Bidder's remarks	DGH's Reply
	Page	Sr.No.	Heading/Section				
1	43	2	B 1 Technical rejection criteria:-	Bidders have to be "Original Equipment Manufacturer (OEM) of offered Hardware Equipment" OR "Original Equipment Manufacturer (OEM) of G&G Software (DSG or Petrel) used for interpretation of Exploration & Production (E&P) data for Oil & Gas industry" OR "System Integrator (SI)".	Please Allow the bidder with experience for supply & Installation of Server & Storage	To make open participation	No change.
2	43	2.1	B 1 Technical rejection criteria:-	In case bidder is OEM of offered hardware or SI, the bidder must submit a certificate from the OEMs of these software i.e Decision Space Geoscience (DSG) of M/s Halliburton and Petrel of M/s Schlumberger that the offered items as per the tender is certified on their latest version of application software.	As tender allow M/s Halliburton and Petrel of M/s Schlumberger as prospect bidder ,so it will restrict other bidder to bid ,kindly remove certificate caluse	To make open participation	No change.
3	133	1	Delivery/ Completion Schedu	FOR SUPPLY PORTION: The supply of all the hardware and software items should be completed within 60 days from date of issue of LOA. FOR INSTALLTION & COMMISSIONING: Installation, Configuration, Integration and Commissioning of the complete solution are to be completed within 30 days from date of supply.	kindly make delivery & installation and commisioning period to 120 days		60 days for supply of all hardware and software items from date of LOA and 45 days for installation and commissioning from date of supply.Refer - B: Amendment to Technical Specification and Terms & Conditions
7	47	2.2	Detailed Scope:	The complete HCI solution along with associated Network Attached Storage (NAS) solution as per the technical specifications should be provided with de-duplication, compression with erasure coding OR equivalent with data encryption at rest and motion with no single point of failure (NSPOF) at any stage/ level of the implementation with optimization features along with powerful data management and disaster recovery capabilities at both PDC and SDC.	The complete HCI solution along with associated Network Attached Storage (NAS) solution as per the technical specifications should be provided with de-duplication, compression OR equivalent with data encryption at rest/motion with no single point of failure (NSPOF) at any stage/ level of the implementation with optimization features along with powerful data management and disaster recovery capabilities at both PDC and SDC.	Data de-duplication, compression & erasure coding are all different technologies which are not provided by all vendors.	Clause 2.2 of detailed scope should be read as "The complete HCI solution along with associated Network Attached Storage (NAS) solution as per the technical specifications should be provided with de-duplication, compression with erasure coding OR equivalent with data encryption in motion when sharing data between HCI and NAS with no single point of failure (NSPOF) at any stage/ level of the implementation with optimization features along with powerful data management and disaster recovery capabilities at both PDC and SDC." Refer - B: Amendment to Technical Specification and Terms & Conditions
8	82		Item -1.01 of Price Bid HCI Nodes for VDI - 5 No.s Item -1.02 of Price Bid HCI Nodes for AD & DB - 5 No.s	Vmware NSX, vrealise, VSAN	To remove this table.	This will allow only a single vendor to qualify for the bid and removing any competition. All MSI's will definitely provide Vmware vsphere & v-center license since it can be provided by all OEM's but NSX, vrealize & vSAN make it centric one vendor play only.	No change. Only VSAN License requirement has been dropped Refer - B: Amendment to Technical Specification and Terms & Conditions
HCI Nodes for VDI							
	62	a.	Hyper Converged Appliance (Essential Features)	The sizing defined below includes 10% HCI overhead. if any solution requires more than that, then they should factor accordingly.	All HCI overheads shall be factored accordingly. Relevant document to be submitted confirming the overheads each for cores, Memory & Storage.	Since storage mentioned is usable implies not all components includes 10% overheads. Request to mention usable resources and MSI's to factor all overheads accordingly.	Bidder to submit documentary evidence for overheads. If the overheads are above 10% then the bidder needs to factor the actual overheads.
	62	d.	Total Physical Cores	Minimum 180 Cores (Including all the Nodes)	Minimum usable 160 Cores (Including all the Nodes)	Request to ask for usable resources and MSI's to factor the solution along with overheads.	No Change.
	62	g.	Storage Cache	2 x 400 GB (SSD) or 1 x 800 GB (SSD) per Node. If SSD cache is not available then additional 10% RAM to be provided in each node.	2 x 400 GB (SSD) or 1 x 800 GB (SSD) cache capacity per converged Node. Cache capacity to be additional to required usable capacity.	There is no comparison between the cost of SSD and Memory. 10% additional memory would come very cheap compared to SSD cache drive/Module.	Clause dropped. Refer - B: Amendment to Technical Specification and Terms & Conditions
	62	h.	Total Usable Storage	Min. 20 TB Usable capacity with 1.9 TB SSD Disks or higher capacity disk without Deduplication and Compression.	Min. 20 TB Usable capacity post RF2 using SSD Disks. Usable capacity provided should be without using data saving techniques like Deduplication, Compression, erasure coding etc.	Not all vendors has the option to provide 1.9TB SSD drives. Request to leave this to MSI's to quote the optimal Drive to provide the required usable capacity.	No change.

	62	l.	Network Throughput	Total Network throughput from HYPERCONVERGED Chassis should be configured with total 40 Gbps with no single point of failure. i.e (N+1) redundancy	Network throughput from each HYPERCONVERGED Node should be 40 Gbps with no single point of failure. Each HCI Node shall be provided with N+N power supply & Fans.	Current specification refers for MSI to provide total of 40Gbps throughput from a single chassis which might include 4 HCI nodes. This will decrease the overall network throughput. Kindly	To be read as: "Total Network throughput from HYPERCONVERGED Chassis should be configured with total 40 Gbps per node with no single point of failure. i.e (N+1) redundancy" Refer - B: Amendment to Technical Specification and Terms & Conditions
	62	k.	Data Services	The solution should provide enterprise data services such as de-duplication and compression with erasure coding OR equivalent completely in software without dependence on any proprietary hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	The solution should provide enterprise data services such as de-duplication , compression OR equivalent completely in software without dependence on any proprietary hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	Data de-duplication, compression & erasure coding are all different technologies which are not provided by all vendors.	To be read as: Clause me be read as "The solution should provide enterprise data services such as deduplication and compression with erasure coding OR equivalent in software/ hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed." Refer - B: Amendment to Technical Specification and Terms & Conditions
	63	p.	Rack Unit	HCI Appliance should support different Rack Units depending upon the workload (2U4N or 1U1N or 2U1N)	HCI Bodes should be offered in non-shared architecture in terms of power supply and fans (2U1N or 1U1N)	2U 4N is a shared architecture where a single 2U server provides 4 HCI nodes. This architecture increase chances of Node failures due to higher temperature and insufficient air flow. Also, Not all vendors offers this architecture with their HCI	No change.
	63	s.	Redundancy & Business Continuity	Proposed solution should have replication software to DR site This replication should be granular in nature with Any Point-In-Time Recovery feature. Licenses for atleast 25 VM replication should be made available with capabilities of WAN bandwidth optimization using features like deduplication, compression. The solution should have capability to protect against data corruption	Proposed solution should have replication software to DR site .The solution should have capability to protect against data corruption	Current specification is OEM specific and only a single vendor software would comply here. Kindly dilute the specification for higher participation.	Clause may be read as: Proposed solution should have replication software to DR site .The solution should have capability to protect against data corruption
	63	t.	Storage Feature	Storage policies should be enforced directly from hypervisor and managed directly from hypervisor	Storage policies should be enforced & managed directly from hypervisor/ SDS .	Request to allow wider participation.	Clause may be read as: "Storage policies should be enforced & managed directly from hypervisor/ SDS." Refer - B: Amendment to Technical Specification and Terms & Conditions
	64	u	Manageability & Security	The Solution should be able to monitor end to end session of the user including giving the insight of the underlying infrastructure like server and Storage	The Solution should be able to monitor underlying infrastructure like server and Storage	Current specification is OEM Specific. Request to update.	No change. This feature though mentioned under HCI are basically VMWare features. However compliance for these points should be conveyed at their respective places in the technical evaluation matrix.
				All Nodes supplied with the HCI appliance should support following security features. 1) Should have a cyber-resilient architecture for a hardened server design for protection, detection & recovery from cyber-attacks 2) Should protect against hardware firmware attacks which executes before OS boots. 3) Hardware should support Silicon / Hardware Root of Trust.	All Nodes supplied with the HCI appliance should support following security features. 1) Should have a cyber-resilient architecture for a hardened server design for protection, detection & recovery from cyber- attacks 2) Should protect against hardware firmware attacks which executes before OS boots/ Secure Boot . 3) Hardware should support silicon-based Hardware Root of Trust.	Different vendors have different security policies/terminologies. Kindly update.	Should be read as "Should protect against hardware firmware attacks which executes before OS boots/ secure boots" Refer - B: Amendment to Technical Specification and Terms & Conditions
	64	w.	Hypervisor Features	The solution should provide integration of 3rd party endpoint security to secure the virtual machines with offloaded antivirus, anti-malware solutions without the need for agents inside the virtual machines. Shall distribute data intelligently across all nodes and capacity utilization across all nodes has to be uniform at all times . The solution should provide a virtual switch which can span across a virtual datacenter and multiple hosts should be able to connect to it. This in turn will simplify and enhance virtual machine networking in virtualized environments	The solution should provide integration of 3rd party endpoint security to secure the virtual machines with offloaded antivirus, anti-malware solutions Solution shall distribute data intelligently across all converged nodes and has to be uniform at all times. To remove this point.	Current specs are OEM specific. Kindly update. Different vendors can offer better and different architecture to provide overall solution. Request to kindly allow. This is OEM specific. Kindly remove.	These features though mentioned under HCI are basically VMWare features. However compliance for these points should be conveyed at their respective places in the technical evaluation matrix. Separate VMWare licenses are to be provided by the bidder as per price performa.

	64	bb.	Rack, PDU and Accessories	Required number of Industry Standard Rack and PDUs to be provided by bidder alongwith all accessories. Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP, SFP+ etc that are required to make the system fully functional needs to be provided along with the system. Each node should have dedicated non-shared dual-power supplies and should be able to sustain single power supply failure.	Required number of rack and PDUs to be provided by the bidder alongwith all accessories. Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP / SFP+ etc that are required to make the system fully functional needs to be provided along with the system. Solution should also include 48 port 10G Redundant HCI switch. Each Switch shall provide minimum 80Gbps throughput to connect with external LAN Switch. Each HCI node should have dedicated non-shared dual- power supplies and should be able to sustain single power supply failure.	Request to include redundant HCI switch to connect with HCI nodes to manage the hige East West traffic. HCI nodes if connected with LAN switch directly will hamper overall solution efficiency.	No change.
--	----	-----	---------------------------	---	--	--	------------

HCI Nodes for AD & DB							
	65	a.	Hyper Converged Appliance (Features and Requirements)	The sizing defined below includes 10% HCI overhead. If any solution requires more than that, then they should factor accordingly.	All HCI overheads shall be factored accordingly. Relevant document to be submitted confirming the overheads each for cores, Memory & Storage.	Since storage mentioned is usable implies not all components includes 10% overheads. Request to mention usable resources and MSI's to factor all overheads accordingly.	Bidder to submit documentary evidence for overheads. If the overheads are above 10% then the bidder needs to factor the actual overheads.
	65	d.	Total Physical Cores	Minimum 180 Cores (Including all the Nodes)	Minimum usable 160 Cores (Including all the Nodes)	Request to ask for usable resources and MSI's to factor the solution along with overheads.	No Change.
	65	g.	Storage Cache	2 x 400 GB (SSD) or 1 x 800 GB (SSD) per Node. If SSD cache is not available then additional 10% RAM to be provided in each node.	2 x 400 GB (SSD) or 1 x 800 GB (SSD) cache capacity per converged Node. Cache capacity to be additional to required usable capacity.	There is no comparison between the cost of SSD and Memory. 10% additional memory would come very cheap compared to SSD cache drive/Module.	Clause dropped. Refer - B: Amendment to Technical Specification and Terms & Conditions
	66	h.	Total Usable Storage	Min. 50 TB Usable capacity with 1.9 TB SSD Disks or higher capacity without Deduplication and Compression.	Min. 50 TB Usable capacity post RF2 using SSD Disks. Usable capacity provided should be without using data saving techniques like Deduplication, Compression, erasure coding etc.	Not all vendors has the option to provide 1.9TB SSD drives. Request to leave this to MSI's to quote the optimal Drive to provide the required usable capacity.	No change.
	66	i.	Network Throughput	Total Network throughput from HYPERCONVERGED Chassis should be configured with total 20 Gbps with no single point of failure. (N+1) redundancy	Network throughput from each HYPERCONVERGED Node should be 40 Gbps with no single point of failure. Each HCI Node shall be provided with N+N power supply & Fans.	Current specification refers for MSI to provide total of 40Gbps throughput from a single chassis which might include 4 HCI nodes. This will decrease the overall network throughput. Kindly amend	To be read as "Total Network throughput from HYPERCONVERGED Chassis should be configured with total 20 Gbps per node with no single point of failure. i.e (N+1) redundancy" Refer - B: Amendment to Technical Specification and Terms & Conditions
	66	j.	Data Services	The solution should provide enterprise data services such as de-duplication and compression with erasure coding OR equivalent completely in software without dependence on any proprietary hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	The solution should provide enterprise data services such as de-duplication, compression OR equivalent completely in software without dependence on any proprietary hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	Data de-duplication, compression & erasure coding are all different technologies which are not provided by all vendors.	To be read as: Clause me be read as "The solution should provide enterprise data services such as deduplication and compression with erasure coding OR equivalent in software/ hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed." Refer - B: Amendment to Technical Specification and Terms & Conditions
	66	o.	Rack Unit	HCI Appliance should support different Rack Units depending upon the workload (2U4N or 1U1N or 2U1N)	HCI Bodes should be offered in non-shared architecture in terms of power supply and fans (2U1N or 1U1N)	2U 4N is a shared architecture where a single 2U server provides 4 HCI nodes. This architecture increase chances of Node failures due to higher temperature and insufficient air flow. Also, Not all vendors offers this architecture with their HCI solution offerings. Request to kindly update.	No change.
	66	r.	Redundancy & Business Continuity	Proposed solution should have replication software to DR site This replication should be granular in nature with Any Point-In-Time Recovery feature. Licenses for atleast 25 VM replication should be made available with capabilities of WAN bandwidth optimization using features like deduplication, compression. The solution should have capability to protect against data corruption	Proposed solution should have replication software to DR site .The solution should have capability to protect against data corruption	Current specification is OEM specific and only a single vendor software would comply here. Kindly dilute the specification for higher participation.	Clause may be read as: Proposed solution should have replication software to DR site .The solution should have capability to protect against data corruption. Refer - B: Amendment to Technical Specification and Terms & Conditions
	67	s.	Storage Feature	Storage policies should be enforced directly from hypervisor and managed directly from hypervisor.	Storage policies should be enforced & managed directly from hypervisor/ SDS .	Request to allow wider participation.	Clause may be read as: "Storage policies should be enforced & managed directly from hypervisor/ SDS." Refer - B: Amendment to Technical Specification and Terms & Conditions
	67	t.	Manageability & Security	The Solution should be able to monitor end to end session of the user including giving the insight of the underlying infrastructure like server and Storage	The Solution should be able to monitor underlying infrastructure like server and Storage	Current specification is OEM Specific. Request to update.	No change. This feature though mentioned under HCI are basically VMWare features. However compliance for these points should be conveyed at their respective places in the technical evaluation matrix.
	67			All Nodes supplied with the HCI appliance should support following security features. 1) Should have a cyber-resilient architecture for a hardened server design for protection, detection & recovery from cyber-attacks 2) Should protect against hardware firmware attacks which executes before OS boots. 3) Hardware should support Silicon / Hardware Root of Trust.	All Nodes supplied with the HCI appliance should support following security features. 1) Should have a cyber-resilient architecture for a hardened server design for protection, detection & recovery from cyber- attacks 2) Should protect against hardware firmware attacks which executes before OS boots/ Secure Boot . 3) Hardware should support silicon-based Hardware Root of Trust.	Different vendors have different security policies/terminologies. Kindly update.	Should be read as "Should protect against hardware firmware attacks which executes before OS boots/ secure boots" Refer - B: Amendment to Technical Specification and Terms & Conditions

	67	v.	Hypervisor Features	The solution should provide integration of 3rd party endpoint security to secure the virtual machines with offloaded antivirus, anti-malware solutions without the need for agents inside the virtual machines.	The solution should provide integration of 3rd party endpoint security to secure the virtual machines with offloaded antivirus, anti-malware solutions	Current specs are OEM specific. Kindly update.	These features though mentioned under HCI are basically VMWare features. However compliance for these points should be conveyed at their respective places in the technical evaluation matrix. Separate VMWare licenses are to be provided by the bidder as per price performa.
	67			Shall distribute data intelligently across all nodes and capacity utilization across all nodes has to be uniform at all times .	Solution shall distribute data intelligently across all converged nodes and has to be uniform at all times .	Different vendors can offer better and different architecture to provide overall solution. Request to kindly allow.	
	67			The solution should provide a virtual switch which can span across a virtual datacenter and multiple hosts should be able to connect to it. This in turn will simplify and enhance virtual machine networking in virtualized environments	To remove this point.	This is OEM specific. Kindly remove.	
	68	aa.	Rack, PDU and Accessories	Required number of Industry Standard Rack and PDUs to be provided by bidder alongwith all accessories. Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP, SFP+ etc that are required to make the system fully functional needs to be provided along with the system. Each node should have dedicated non-shared dual-power supplies and should be able to sustain single power supply failure.	Required number of rack and PDUs to be provided by the bidder alongwith all accessories. Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP / SFP+ etc that are required to make the system fully functional needs to be provided along with the system. Solution should also include 48 port 10G Redundant HCI switch. Each Switch shall provide minimum 80Gbps throughput to connect with external LAN Switch. Each HCI node should have dedicated non-shared dual- power supplies and should be able to sustain single power supply failure.	Request to include redundant HCI switch to connect with HCI nodes to manage the hige East West traffic. HCI nodes if connected with LAN switch directly will hamper overall solution efficiency.	No change.

HCI Nodes for SDC							
		83 a.	Hyper Converged Appliance (Essential Features)	The sizing defined below includes 10% HCI overhead. If any solution requires more than that, then they should factor accordingly.	All HCI overheads shall be factored accordingly. Relevant document to be submitted confirming the overheads each for cores, Memory & Storage.	Since storage mentioned is usable implies not all components includes 10% overheads. Request to mention usable resources and MSI's to factor all overheads accordingly.	Bidder to submit documentary evidence for overheads. If the overheads are above 10% then the bidder needs to factor the actual overheads.
		83 d.	Total Physical Cores	Minimum 144 Cores (Including all the Nodes)	Minimum usable 128 Cores (Including all the Nodes)	Request to ask for usable resources and MSI's to factor the solution along with overheads.	No Change.
		83 g.	Storage Cache	2 x 400 GB (SSD) or 1 x 800 GB (SSD) per Node. If SSD cache is not available then additional 10% RAM to be provided in each node.	2 x 400 GB (SSD) or 1 x 800 GB (SSD) cache capacity per converged Node. Cache capacity to be additional to required usable capacity.	There is no comparison between the cost of SSD and Memory. 10% additional memory would come very cheap compared to SSD cache drive/Module.	Clause dropped. Refer - B: Amendment to Technical Specification and Terms & Conditions
		83 h.	Total Usable Storage	Min. 20 TB Usable capacity with 1.9 TB SSD Disks or higher capacity without Deduplication and Compression.	Min. 20 TB Usable capacity post RF2 using SSD Disks. Usable capacity provided should be without using data saving techniques like Deduplication, Compression, erasure coding etc.	Not all vendors has the option to provide 1.9TB SSD drives. Request to leave this to MSI's to quote the optimal Drive to provide the required usable capacity.	No change.
		83 i.	Network Throughput	Total Network throughput from HYPERCONVERGED Chassis should be configured with total 20 Gbps with no single point of failure. (N+1) redundancy.	Network throughput from each HYPERCONVERGED Node should be 40 Gbps with no single point of failure. Each HCI Node shall be provided with N+N power supply & Fans.	Current specification refers for MSI to provide total of 40Gbps throughput from a single chassis which might include 4 HCI nodes. This will decrease the overall network throughput. Kindly amend.	To be read as "Total Network throughput from HYPERCONVERGED Chassis should be configured with total 20 Gbps per node with no single point of failure. i.e (N+1) redundancy" Refer - B: Amendment to Technical Specification and Terms & Conditions
		83 k.	Data Services	The solution should provide enterprise data services such as de-duplication and compression with erasure coding OR equivalent completely in software without dependence on any proprietary hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	The solution should provide enterprise data services such as de-duplication, compression OR equivalent completely in software without dependence on any proprietary hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	Data de-duplication, compression & erasure coding are all different technologies which are not provided by all vendors.	To be read as: Clause me be read as "The solution should provide enterprise data services such as deduplication and compression with erasure coding OR equivalent in software/ hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed." Refer - B: Amendment to Technical Specification and Terms & Conditions
		84 p.	Rack Unit	HCI Appliance should support different Rack Units depending upon the workload (2U4N or 1U1N or 2U1N)	HCI Nodes should be offered in non-shared architecture in terms of power supply and fans (2U1N or 1U1N)	2U 4N is a shared architecture where a single 2U server provides 4 HCI nodes. This architecture increase chances of Node failures due to higher temperature and insufficient air flow. Also, Not all vendors offers this architecture with their HCI solution offerings. Request to kindly update.	No change.
		84 s.	Redundancy & Business Continuity	Proposed solution should have replication software to DR site This replication should be granular in nature with Any Point-In-Time Recovery feature. Licenses for atleast 20 VM replication should be made available with capabilities of WAN bandwidth optimization using features like deduplication, compression. The solution should have capability to protect against data corruption	Proposed solution should have replication software to DR site .The solution should have capability to protect against data corruption	Current specification is OEM specific and only a single vendor software would comply here. Kindly dilute the specification for higher participation.	Clause may be read as: Proposed solution should have replication software to DR site .The solution should have capability to protect against data corruption. Refer - B: Amendment to Technical Specification and Terms & Conditions
		84 t.	Storage Feature	Storage policies should be enforced directly from hypervisor and managed directly from hypervisor	Storage policies should be enforced & managed directly from hypervisor/ SDS .	Request to allow wider participation.	Clause may be read as: "Storage policies should be enforced & managed directly from hypervisor/ SDS." Refer - B: Amendment to Technical Specification and Terms & Conditions
		84 u.	Manageability & Security	The Solution should be able to monitor end to end session of the user including giving the insight of the underlying infrastructure like server and Storage	The Solution should be able to monitor underlying infrastructure like server and Storage	Current specification is OEM Specific. Request to update.	No change. This feature though mentioned under HCI are basically VMWare features. However compliance for these points should be conveyed at their respective places in the technical evaluation matrix.

	85			All Nodes supplied with the HCI appliance should support following security features. 1) Should have a cyber-resilient architecture for a hardened server design for protection, detection & recovery from cyber-attacks 2) Should protect against hardware firmware attacks which executes before OS boots. 3) Hardware should support Silicon / Hardware Root of Trust.	All Nodes supplied with the HCI appliance should support following security features. 1) Should have a cyber-resilient architecture for a hardened server design for protection, detection & recovery from cyber- attacks 2) Should protect against hardware firmware attacks which executes before OS boots/ Secure Boot . 3) Hardware should support silicon-based Hardware Root of Trust.	Different vendors have different security policies/terminologies. Kindly update.	Should be read as "Should protect against hardware firmware attacks which executes before OS boots/ secure boots" Refer - B: Amendment to Technical Specification and Terms & Conditions
	85 w.		Hypervisor Features	The solution should provide integration of 3rd party endpoint security to secure the virtual machines with offloaded antivirus, anti-malware solutions without the need for agents inside the virtual machines.	The solution should provide integration of 3rd party endpoint security to secure the virtual machines with offloaded antivirus, anti-malware solutions	Current specs are OEM specific. Kindly update.	These features though mentioned under HCI are basically VMWare features. However compliance for these points should be conveyed at their respective places in the technical evaluation matrix. Separate VMWare licenses are to be provided by the bidder as per price performa.
	85		Shall distribute data intelligently across all nodes and capacity utilization across all nodes has to be uniform at all times .	Solution shall distribute data intelligently across all converged nodes and has to be uniform at all times .	Different vendors can offer better and different architecture to provide overall solution. Request to kindly allow.		
	85		The solution should provide a virtual switch which can span across a virtual datacenter and multiple hosts should be able to connect to it. This in turn will simplify and enhance virtual machine networking in virtualized environments	To remove this point.	This is OEM specific. Kindly remove.		
	86 bb.		Rack, PDU and Accessories	Required number of Industry Standard Rack and PDUs to be provided by bidder alongwith all accessories. Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP, SFP+ etc that are required to make the system fully functional needs to be provided along with the system. Each node should have dedicated non- shared dual-power supplies and should be able to sustain single power supply failure.	Required number of rack and PDUs to be provided by the bidder alongwith all accessories. Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP / SFP+ etc that are required to make the system fully functional needs to be provided along with the system. Solution should also include 48 port 10G Redundant HCI switch. Each Switch shall provide minimum 80Gbps throughput to connect with external LAN Switch. Each HCI node should have dedicated non-shared dual- power supplies and should be able to sustain single power supply failure.	Request to include redundant HCI switch to connect with HCI nodes to manage the hige East West traffic. HCI nodes if connected with LAN switch directly will hamper overall solution efficiency.	No change.

TOR PDC Switch							
		72 a		Switching capacity of 1.4Tbps or more, and throughput of 1070 Mbps or more.	Request to add " Switch should have non-blocking architecture and all the ports should work on line-rate and downlink vs uplink bandwidth ratio should be 2:1."	Since the switch will provide east west communication, all the downlink and uplink bandwidth should be atleast 2:1 ratio other wise bandwidth will be a bottleneck and will add latency.	No change.
				48 nos. of 1/10 Gigabit Ethernet SFP+ ports or FCOE ports and at least 4 nos of the 40 Gigabit Ethernet QSFP +uplink ports	Kindly change the clause as "48 nos of 1/10/25 Gigabit Ethernet SFP+ ports or FCOE ports and at least 6 nos of the 40/100 Gigabit Ethernet QSFP +uplink ports"	This is DC switch and real time low latency communication the downlink vs uplink subscription ratio should be 2:1. In spine-leaf architecture , it is recommended to have spine- leaf connectivity in multiple of 40/100 Gbps.	No change.
	-	-		New addition of important clause	Kindly add "Switch should have min 32MB of buffer memory"	In DC architecture, east west communication between the applications happens through the TOR/L3 switch. Latency in the traffic flow is impacted by the switch buffer capacity. Lower buffer will have higher latency and packet drops. Hence it is recommended to incorporate this clause	Not agreed.
	-	-		New addition of important clause	Kindly add "Switch should support EVPN and IS-IS/BGP for spine-leaf fabric architecture"	In spine-leaf switch architecture, leaf switch connect o spine and spine only connects to leaf over 40/100 Gbps speed and this switch is asked with 10G ports hence will not act as a spine switch.	Not agreed.
	-	-		New addition of important clause	Kindly add "Switch should support minimum 1000K route table capacity for IPv4 & IPv6"	As this TOR switch will be the part of DC architecture hence it is suggested to have this clause in order to support higher route table capacity is suggested.	Not agreed.
	-	-		New addition of important clause	Kindly add "Switch should support 256K MAC address"	MAC address are missing in the switch , kindly add	Not agreed
TOR SDC Switch							
		90 a		Switching capacity of 1.4Tbps or more, and throughput of 1070 Mbps or more.	Request to add " Switch should have non-blocking architecture and all the ports should work on line-rate and downlink vs uplink bandwidth ratio should be 2:1."	Since the switch will provide east west communication, all the downlink and uplink bandwidth should be atleast 2:1 ratio other wise bandwidth will be a bottleneck and will add latency.	No change.
				48 nos. of 1/10 Gigabit Ethernet SFP+ ports or FCOE ports and at least 4 nos of the 40 Gigabit Ethernet QSFP +uplink ports	Kindly change the clause as "48 nos of 1/10/25 Gigabit Ethernet SFP+ ports or FCOE ports and at least 6 nos of the 40/100 Gigabit Ethernet QSFP +uplink ports"	This is DC switch and real time low latency communication the downlink vs uplink subscription ratio should be 2:1. In spine-leaf architecture , it is recommended to have spine- leaf connectivity in multiple of 40/100 Gbps.	No change.
	-	-		New addition of important clause	Kindly add "Switch should have min 32MB of buffer memory"	In DC architecture, east west communication between the applications happens through the TOR/L3 switch. Latency in the traffic flow is impacted by the switch buffer capacity. Lower buffer will have higher latency and packet drops. Hence it is recommended to incorporate this clause	Not agreed.
	-	-		New addition of important clause	Kindly add "Switch should support EVPN and IS-IS/BGP for spine-leaf fabric architecture"	In spine-leaf switch architecture, leaf switch connect o spine and spine only connects to leaf over 40/100 Gbps speed and this switch is asked with 10G ports hence will not act as a spine switch.	Not agreed.

	-	-		New addition of important clause	Kindly add "Switch should support minimum 1000K route table capacity for IPv4 & IPv6"	As this TOR switch will be the part of DC architecture hence it is suggested to have this clause in order to support higher route table capacity is suggested.	Not agreed.
	-	-		New addition of important clause	Kindly add "Switch should support 256K MAC address"	MAC address are missing in the switch , kindly add	Not agreed
L3 Switch							
	74	e.	Networking Features				
				Should support 128K route table capacity for IPv4 & IPv6	Kindly change this to "Should support minimum 768K route table capacity for IPv4 & IPv6"	As the switch will be acting as core switch in the DC architecture hence higher route table capacity is suggested.	No change.
			Storage protocols	Should support Data Center Infra, DCB, iSCSI, ETS considering all License.	Kindly remove this clause	Specific to OEM	To be read as: Should support Data Center Infra, DCB, iSCSI/FCoE, ETS considering all License. Refer - B: Amendment to Technical Specification and Terms & Conditions
			Fabric Features	Should support Spine-Leaf architecture using BGP EVPN from day-1	As per our understanding this L3 switch will be acting as a leaf switch in future. Kindly confirm	In spine-leaf switch architecture, leaf switch connect o spine and spine only connects to leaf over 40/100 Gbps speed and this switch is asked with 10G ports hence will not act as a spine switch.	No change.
	74	f.	Security Features	Should support 802.1x implementation using RADIUS, BFD, Object Tracking	Kindly remove the object tracking from the caluse.	This is not the feature of switch	Should be read as: "Should support 802.1x implementation using RADIUS, BFD " Refer - B: Amendment to Technical Specification and Terms & Conditions
	-	-		New addition of important clause	Kindly add "Switch should have min 32MB of buffer memory"	In DC architecture, east west communication between the applications happens through the TOR/L3 switch. Latency in the traffic flow is impacted by the switch buffer capacity. Lower buffer will have higher latency and packet drops. Hence it is recommended to incorporate this clause	Not agreed.

Mgmt Switch						
	75	b.	Ports Scalability	24x 10/100/1000Mbps half/full duplex RJ45 ports, 4x SFP/SFP+ 1/10GbE ports	As per our understanding uplink ports should support both 1G and 10G. Kindly confirm.	Yes it should support both 1G/10G
	75	e.	Other features:	Time controlled ACLs, 40Gbps stacking, double VLAN tagging	Kindly modify clause as "Time controlled ACLs, 80 Gbps stacking, double VLAN"	Stacking bandwidth is very less when we add more 4 or more switches in a stack No change.
	75/76	g.	Management Function	RMON, sflow, SNMP v1/v2/v3	Kindly modify clause as "RMON, Sflow or equivalent, SNMP v1/v2.v3"	May be read as : "RMON, Sflow or equivalent, SNMP v1/v2.v3" Please treat this as an amendment
Firewall						
	a.			Solution should be an integrated Next Gen Firewall platform which includes firewall, application control, IPS, Anti-Bot, Anti-Spyware, URL Filtering and Advanced Persistent threat Prevention capabilities in a single appliance, configured in High Availability Mode. Firewall should be provided with "Zero" day protection feature.	Kindly modify clause as "Solution should be an integrated Next Gen Firewall platform which includes firewall, application control, IPS, Anti- Bot, Anti-Spyware/Anti-Phising , URL Filtering and Advanced Persistent threat Prevention capabilities in a single appliance, configured in High Availability Mode. Firewall should be provided with "Zero" day protection feature."	May be read as: "Solution should be an integrated Next Gen Firewall platform which includes firewall, application control, IPS, Anti-Bot, Anti-Spyware/Anti-Phising , URL Filtering and Advanced Persistent threat Prevention capabilities in a single appliance, configured in High Availability Mode. Firewall should be provided with "Zero" day protection feature." Refer - B: Amendment to Technical Specification and Terms & Conditions
	w.			Solution must have a URL categorization and URLs filtering database. Should have predefined more than 50+ categories. The solution should have the capabilities to block, permit, allow & log, protocols other than HTTP, HTTPS, FTP	Kindly modify clause as "Should support category-based URL filtering and provide comprehensive alerting and control over web traffic and enforces policies on more than 280 million of URLs in more than 80 categories. The solution should have the capabilities to block, permit, allow & log, protocols other than HTTP, HTTPS, FTP"	Higher number of URLs and categories will help in better detection and filtration of the firewall No change.
	ii.			The solution should be able to scan & find for unknown threats in executable, archive files ,documents, JAVA and flash like: 7z ,cab,doc,docx, pdf, ppt, pptx, rar, rtf, scr, swf, tar, docx, jar, xls, , xlsx, ,xlw, zip etc.	Kindly modify clause as "The solution should be able to scan & find for unknown threats in executable, archive files ,documents, JAVA and flash like: 7z ,cab,doc,docx, pdf, ppt, pptx, rar, rtf, scr, swf, tar, docx, , jar, xls, , xlsx, ,xlw, zip etc."	May be read as: The solution should be able to scan & find for unknown threats in executable, archive files ,documents, JAVA and flash like: 7z ,cab,doc,docx, pdf, ppt, pptx, rar, rtf, scr, swf, tar, docx, jar, xls, , xlsx, ,xlw, zip etc." Refer - B: Amendment to Technical Specification and Terms & Conditions
				New clause	Kindly add "Solution should support RIPv2, OSPF, OSPFv3, BGP4 routing protocol"	Not agreed
				New clause	Kindly add "The IPS system shall have at least 30000 signatures"	Not agreed

Queries from M/s Cygnus Information Solution Pvt. Ltd.

Sr.No.	Item -1.03 of Price Bid Unified Storage System- PDC- 1 No	Clarifications Sought		DGH's Reply
a.	Controllers and Architecture	<p>Architecture: Storage should be Fully Symmetric OR Fully Distributed Clustered Architecture written for Scale-Out NAS operations. Hardware and software engineering, and support should be from the same OEM. The Scale-out- NAS must be based upon dedicated NAS appliance hardware. System should support linear scalability in Performance and Capacity, without any disruptions to production workflow. <u>The NAS appliance should have specialized Operating System, dedicated and tuned for serving data efficiently and written for scale-out architecture. General purpose OS will not be acceptable for the NAS system.</u> The architecture should have a single namespace.</p> <p>Controllers: Separated controllers are factored for SSD and SAS/NL-SAS/SATA a) Minimum 4 Active-Active Storage Controllers/ Nodes must be provided, serving all flash storage for cloud and b) Minimum 4 Active-Active Storage Controllers/ Nodes should be provided for serving NDR data requirements. Offered architecture should be upgradable to min 12 numbers of NAS Storage Controllers/ Nodes seamlessly, without any disruptions/downtime to production workflow for performance, capacity enhancement, software/firmware upgrades. All storage nodes/controllers must be active-active, contributing in performance and capacity of the system. In Active / Active cluster mode offered model should guarantee not more than 20% system degradation in case of controller failure.</p>	We have a solution that can provide Software defined storage software on commodity hardware. We have another solution with purpose built appliance that is specially engineered for large enterprise high performance environments. Please clarify if DGH will accept the Software Defined Storage Software with Commodity Storage Server Solution.	No Change. Only purpose built appliance is acceptable.
h.	Performance/Throughput Requirement	For cloud portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 8GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size. For NDR portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 1.4GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size. Bidder needs to demonstrate this performance using free third party applications like Iometer /FIO etc as part of User Acceptance test. While testing the cloud and NDR portions of the storage, host connectivity will be allowed only to the controllers serving cloud, or NDR storage dedicatedly. Rest of the controllers should be powered off/ disconnected. Cache of both storage and hosts must be cleared before test run by rebooting the controllers. The performance must be demonstrated with data at rest encryption feature switched on along with remote replication.	1. Please clarify if bidder need to submit performance certificate for stated requirement signed by OEM Authorised Signatory along with the bid? 2. Since the performance benchmark/test has to be delivered with replication switched on, please clarify if the replication need to be enabled between the All Flash Nodes and NL-SAS Nodes for performance test/benchmark demonstration during UAT?	1. Yes. 2. DGH may provide additional storage for demonstration of this feature or it may be demonstrated as proposed in point no. 2.
b.	Onboard Memory	Storage Solution to be configured with minimum 1TB DRAM based usable cache across NAS Storage Controller/ NAS Storage Node configured for read and write operations. If there are any controllers serving the disks separately then equal amount of DRAM based cache must be provided on those controllers to avoid any funneling effect.	1. To avoid funneling effect, please clarify if DGH is looking for equal number of NAS & SAN controllers in NAS header based solution? 2. Please clarify if usable cache is cache memory available after cache mirroring/protection overheads?	1. Only purpose built scale out NAS appliance is acceptable. 2. Yes.
a.	Controllers and Architecture	<p>Architecture: Storage should be Fully Symmetric OR Fully Distributed Clustered Architecture written for Scale-Out NAS operations. Hardware and software engineering, and support should be from the same OEM. The Scale-out- NAS must be based upon dedicated NAS appliance hardware. System should support linear scalability in Performance and Capacity, without any disruptions to production workflow. <u>The NAS appliance should have specialized Operating System, dedicated and tuned for serving data efficiently and written for scale-out architecture. General purpose OS will not be acceptable for the NAS system.</u> The architecture should have a single namespace.</p> <p>Controllers: Separated controllers are factored for SSD and SAS/NL-SAS/SATA a) Minimum 4 Active-Active Storage Controllers/ Nodes must be provided, serving all flash storage for cloud and b) Minimum 4 Active-Active Storage Controllers/ Nodes should be provided for serving NDR data requirements. Offered architecture should be upgradable to min 12 numbers of NAS Storage Controllers/ Nodes seamlessly, without any disruptions/downtime to production workflow for performance, capacity enhancement, software/firmware upgrades. All storage nodes/controllers must be active-active, contributing in performance and capacity of the system. In Active / Active cluster mode offered model should guarantee not more than 20% system degradation in case of controller failure.</p>	1. For all flash storage, please clarify if DGH is looking for storage classified by OEM as All Flash Storage or bidders can propose normal storage with SSD disks? 2. Please clarify if the NL-SAS storage is a production storage or an archival storage requirement? Will DGH accept NL-SAS storage purposefully designed for Archival?	1. No. For All flash requirement, All flash controllers/ nodes are required. 2. It is production storage. We will not accept archival storage for our enterprise file workloads.

g.	<p>Total Storage Capacity</p>	<p>1 PB(Petabyte) usable capacity with single unified addressable namespace /single filesystem after required protection level on complete storage solution. The NAS Appliance should be scalable upto 60 PB usable as a single filesystem/or a single global namespace. Current Capacity to be configured as - a)250 TIB usable Flash Tier Capacity using SSD of size 7.6TB or less (1 TIB = 1024 x 1024 x 1024 bytes) b) 750 TIB usable Tier Capacity using NL-SAS / SATA HDD of size 10TB or less. (1 TIB = 1024 x 1024 x 1024 x 1024 bytes) 10% additional usable space must be provisioned as snapshot space for SSD and NL-SAS/SATA disk tier respectively. License for the same must be provided. 5% additional usable space (in terms of HDD/ SSD must be provisioned for hot sparing apart from usable capacity based on OEM best practice. License for the same must be provided</p>	<p>Not all OEMs provision additional Space for hot sparing. This is an OEM specific specification. Please allow other OEMs to configure Hot Spares as per OEM Sparing best practices.</p>	<p>5% additional disk/ capacity on total usable capacity should be provisioned separately on the appliance which can be used to rebuilt as and when required.</p>
S.No.	Item -1.09 of Price Bid			
a.	<p>Vendor to specify Brand Make and Model offered.</p> <p>D2D Appliance/ storage</p>	<p>DGH wants to implement backup-to-disk solution using disk based backup appliances/ storage to simplify operations and improve overall backup/restore performance. The solution should consist of Enterprise backup software and disk based backup appliances/ storage. The Disk based appliance/ storage and Backup Software supplied must be from Single OEM. The solution should be capable of integration with active directory infrastructure for ease of user rights management along with role based access control to regulate the level of management. The solution must have capability to do trend analysis for capacity planning of backup environment not limiting to Backup Application/Clients, Virtual Environment etc.</p>	<p>In certain architectures local/remote NDMP backups cause huge performance drain on the storage resources and hence the OEM best practices recommend additional infrastructure to accelerate local/remote backup. Please clarify if DGH want the bidder to quote the solution that include local/remote NDMP backup best practices recommended by the OEM?</p>	<p>OEM best practice to be configured and adopted for local and remote NDMP backup. Necessay documentation to be provided.</p>
S.No.	Item -1.08 of Price Bid Thin Client with dual monitors (12 No.s + 24 No.s Monitors) for PDC			
f	Display ports	I/O - 4 x USB 2.0, 2 x USB 3.0, universal headset jack, 1 x RJ-5, 2 x Display Ports.		<p>The caluse may be read as: I/O - 4 x USB 2.0, 2 x USB 3.0, universal headset jack, 1 x RJ-5, 2 x Display Ports/ HDMI ports. Refer - B. Amendment to Technical Specification and Terms & Conditions</p>
Sr.No.	Item -1.02 of Price Bid HCI Nodes for AD & DB - 5 No.s	Change Requested	Justification	DGH's Reply
c.	Processor	Latest Generation Intel® (Skylake/ Cascadelake) Processors product family, ≥ 2.7GHz per Core. Minimum 2 Sockets per Node. Both socket must be populated with 48 16 core or more per socket	Not all OEMs offer required CPUs. The CPU requirement can be relaxed without reducing the IOPS.	No change.
g.	Storage Cache	2 x 400 GB (SSD) or 1 x 800 GB (SSD) per Node. If SSD cache is not available then additional 10% RAM to be provided in each node.	SSD Cache is required in Hybird Solution. In all SSD solution, the SSD cache is of no benefit hence we request that this clause be deleted.	Clause dropped. Refer - B. Amendment to Technical Specification and Terms & Conditions
j.	Data Services	The solution should provide enterprise data services such as de-duplication and compression with erasure coding OR equivalent completely in software without dependence on any proprietary or hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	The deduplication and compression on the HCI software as well as hardware must be enabled for wider participation.	Clause me be read as: "The solution should provide enterprise data services such as deduplication and compression with erasure coding OR equivalent in software/ hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed." Refer - B. Amendment to Technical Specification and Terms & Conditions
w.	Performance IOPS	Minimum 70K IOPS or more with less than 5ms 1ms response time when using 8K/16K block size at 70:30 - Read Write Ratio	5ms response time from the HCI storage is very high. Please reduce it to 1ms.	No Change.
x.	Single Point of Support	Single point of support for HCI solution including virtualization through OEM or the bidder	Not all OEMs will offer end to end support. This has to be done by the bidder.	Bidder

S. No.	RFP Page	Section	Current Specification	Query		Suggested specification	DGH's Reply
a	79	Disk Based Appliance/ storage and Backup Software for PDC 1 No	The Disk based appliance/ storage and Backup Software supplied must be from Single OEM.	Request to open the solution so that software vendors can propose solution with bidders choice of hardware.		The Disk based appliance/ storage and Backup Software supplied must be from Gartner leaders quadrant OEM.	To be read as: "DGH wants to implement backup-to-disk solution using disk based backup appliances/ storage to simplify operations and improve overall backup/restore performance. The solution should consist of Enterprise backup software and disk based backup appliances/ storage. The solution should be capable of integration with active directory infrastructure for ease of user rights management along with role based access control to regulate the level of management. The solution must have capability to do trend analysis for capacity planning of backup environment not limiting to Backup Application/Clients, Virtual Environment etc." Refer - B: Amendment to Technical Specification and Terms & Conditions
b	79	Backup Software	Bidder must provide capacity/socket -20 base licenses.	Each OEMs, host base license has different requirement. Request you to please share the no of VMs, DB instances, RDM VMS to quote appropriately. Else, we request DGH to procure capacity license which has no limitation on number of servers, VMs, DB instance etc. to cover current and future infrastructure as it evolves.		Bidder must provide front-end capacity base licenses of 70 TB.	No change.
e	81	Backup Software	The appliance/ storage should Support Enterprise Applications and Database Backups without integration with Backup Software, for better visibility of Backups to Application and database Owners, thus ensuring faster and direct recovery on application/database level. This integration should be available for Oracle, SAP, SAP HANA, DB2, MS SQL, Hadoop, MongoDB, Cassandra etc.	Database intelligence is provided by backup software. Request to add with/without integration with backup software.		The appliance/ storage should Support Enterprise Applications and Database Backups with/without integration with Backup Software, for better visibility of Backups to Application and database Owners, thus ensuring faster and direct recovery on application/database level. This integration should be available for Oracle, SAP, SAP HANA, DB2, MS SQL, Hadoop, MongoDB, Cassandra etc.	May be read as: The appliance/ storage should Support Enterprise Applications and Database Backups with/without integration with Backup Software, for better visibility of Backups to Application and database Owners, thus ensuring faster and direct recovery on application/database level. This integration should be available for Oracle, SAP, SAP HANA, DB2, MS SQL, Hadoop, MongoDB, Cassandra etc. Refer - B: Amendment to Technical Specification and Terms & Conditions
Page No.	Heading/Section			Current specifications	change specs	Remarks	DGH's Reply
47		Detailed Scope:		The complete HCI solution along with associated Network Attached Storage (NAS) solution as per the technical specifications should be provided with de-duplication, compression with erasure coding OR equivalent with data encryption at rest and motion with no single point of failure (NSPOF) at any stage/ level of the implementation with optimization features along with powerful data management and disaster recovery capabilities at both PDC and SDC.	The complete HCI solution along with associated Network Attached Storage (NAS) solution as per the technical specifications should be provided with de-duplication, compression OR equivalent with data encryption at rest /motion with no single point of failure (NSPOF) at any stage/ level of the implementation with optimization features along with powerful data management and disaster recovery capabilities at both PDC and SDC.	Data de-duplication, compression & erasure coding are all different technologies which are not provided by all vendors.	Clause 2.2 of detailed scope should be read as "The complete HCI solution along with associated Network Attached Storage (NAS) solution as per the technical specifications should be provided with de-duplication, compression with erasure coding OR equivalent with data encryption in motion when sharing data between HCI and NAS with no single point of failure (NSPOF) at any stage/ level of the implementation with optimization features along with powerful data management and disaster recovery capabilities at both PDC and SDC." Refer - B: Amendment to Technical Specification and Terms & Conditions
82		Item -1.01 of Price Bid HCI Nodes for VDI - 5 No.s Item -1.02 of Price Bid HCI Nodes for AD & DB - 5 No.s		Vmware NSX, vrealise, VSAN	To remove this table.	This will allow only a single vendor to qualify for the bid and removing any competition. All MSI's will definitely provide Vmware vsphere & v-center license since it can be provided by all OEM's but NSX, vrealise & vSAN make it centric one vendor play only.	No change. Only VSAN License requirement has been dropped Refer - B: Amendment to Technical Specification and Terms & Conditions

Page	Sr.No.	Item -1.01 of Price Bid -HCI Nodes for VDI - 5 No.s					
		Item		Vendor to specify Brand Make and Model offered.	Pre-bid queries/suggestions	Bidder's remarks/ Clarifications	DGH's Reply
62	a.	Hyper Converged Appliance (Essential Features)		The sizing defined below includes 10% HCI overhead. If any solution requires more than that, then they should factor accordingly.	All HCI overheads shall be factored accordingly. Relevant document to be submitted confirming the overheads each for cores, Memory & Storage.	Since storage mentioned is usable implies not all components includes 10% overheads. Request to mention usable resources and MSI's to factor all overheads accordingly.	Bidder to submit documentary evidence for overheads. If the overheads are above 10% then the bidder needs to factor the actual overheads.
62	d.	Total Physical Cores		Minimum 180 Cores (Including all the Nodes)	Minimum usable 160 Cores (Including all the Nodes)	Request to ask for usable resources and MSI's to factor the solution along with overheads.	No Change.
62	g.	Storage Cache		2 x 400 GB (SSD) or 1 x 800 GB (SSD) per Node. If SSD cache is not available then additional 10% RAM to be provided in each node.	2 x 400 GB (SSD) or 1 x 800 GB (SSD) cache capacity per converged Node. Cache capacity to be additional to required usable capacity.	There is no comparison between the cost of SSD and Memory. 10% additional memory would come very cheap compared to SSD cache drive/Module.	Clause dropped. Refer - B: Amendment to Technical Specification and Terms & Conditions
62	h.	Total Usable Storage		Min. 20 TB Usable capacity with 1.9 TB SSD Disks or higher capacity disk without Deduplication and Compression.	Min. 20 TB Usable capacity post RF2 using SSD Disks. Usable capacity provided should be without using data saving techniques like Deduplication, Compression, erasure coding etc.	Not all vendors has the option to provide 1.9TB SSD drives. Request to leave this to MSI's to quote the optimal Drive to provide the required usable capacity.	No change.
62	i.	Network Throughput		Total Network throughput from HYPERCONVERGED Chassis should be configured with total 40 Gbps with no single point of failure. i.e (N+1) redundancy	Network throughput from each HYPERCONVERGED Node should be 40 Gbps with no single point of failure. Each HCI Node shall be provided with N+N power supply & Fans.	Current specification refers for MSI to provide total of 40Gbps throughput from a single chassis which might include 4 HCI nodes. This will decrease the overall network throughput. Kindly amend.	To be read as: "Total Network throughput from HYPERCONVERGED Chassis should be configured with total 40 Gbps per node with no single point of failure. i.e (N+1) redundancy" Refer - B: Amendment to Technical Specification and Terms & Conditions
62	k.	Data Services		The solution should provide enterprise data services such as de-duplication and compression with erasure coding OR equivalent completely in software without dependence on any proprietary hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	The solution should provide enterprise data services such as de-duplication , compression OR equivalent completely in software without dependence on any proprietary hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	Data de-duplication, compression & erasure coding are all different technologies which are not provided by all vendors.	To be read as: Clause me be read as "The solution should provide enterprise data services such as deduplication and compression with erasure coding OR equivalent in software/ hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed." Refer - B: Amendment to Technical Specification and Terms & Conditions
63	p.	Rack Unit		HCI Appliance should support different Rack Units depending upon the workload (2U4N or 1U1N or 2U1N)	HCI Bodes should be offered in non-shared architecture in terms of power supply and fans (2U1N or 1U1N)	2U 4N is a shared architecture where a single 2U server provides 4 HCI nodes. This architecture increase chances of Node failures due to higher temperature and insufficient air flow. Also, Not all vendors offers this architecture with their HCI solution offerings. Request to kindly update.	No change.
63	s.	Redundancy & Business Continuity		Proposed solution should have replication software to DR site This replication should be granular in nature with Any Point-In-Time Recovery feature. Licenses for atleast 25 VM replication should be made available with capabilities of WAN bandwidth optimization using features like deduplication, compression. The solution should have capability to protect against data corruption	Proposed solution should have replication software to DR site .The solution should have capability to protect against data corruption	Current specification is OEM specific and only a single vendor software would comply here. Kindly dilute the specification for higher participation.	Clause may be read as: Proposed solution should have replication software to DR site .The solution should have capability to protect against data corruption. Refer - B: Amendment to Technical Specification and Terms & Conditions
63	t.	Storage Feature		Storage policies should be enforced directly from hypervisor and managed directly from hypervisor	Storage policies should be enforced & managed directly from hypervisor/ SDS .	Request to allow wider participation.	Clause may be read as: "Storage policies should be enforced & managed directly from hypervisor/ SDS." Refer - B: Amendment to Technical Specification and Terms & Conditions
64	u	Manageability & Security		The Solution should be able to monitor end to end session of the user including giving the insight of the underlying infrastructure like server and Storage	The Solution should be able to monitor underlying infrastructure like server and Storage	Current specification is OEM Specific. Request to update.	No change. This feature though mentioned under HCI are basically VMWare features. However compliance for these points should be conveyed at their respective places in the technical evaluation matrix.

				All Nodes supplied with the HCI appliance should support following security features. 1) Should have a cyber-resilient architecture for a hardened server design for protection, detection & recovery from cyber-attacks 2) Should protect against hardware firmware attacks which executes before OS boots. 3) Hardware should support Silicon / Hardware Root of Trust.	All Nodes supplied with the HCI appliance should support following security features. 1) Should have a cyber-resilient architecture for a hardened server design for protection, detection & recovery from cyber-attacks 2) Should protect against hardware firmware attacks which executes before OS boots/ Secure Boot . 3) Hardware should support silicon-based Hardware Root of Trust.	Different vendors have different security policies/terminologies. Kindly update.	Should be read as "Should protect against hardware firmware attacks which executes before OS boots/ secure boots" Refer - B: Amendment to Technical Specification and Terms & Conditions
64	w.	Hypervisor Features		The solution should provide integration of 3rd party endpoint security to secure the virtual machines with offloaded antivirus, anti-malware solutions without the need for agents inside the virtual machines.	The solution should provide integration of 3rd party endpoint security to secure the virtual machines with offloaded antivirus, anti-malware solutions	Current specs are OEM specific. Kindly update.	These features though mentioned under HCI are basically VMWare features. However compliance for these points should be conveyed at their respective places in the technical evaluation matrix. Separate VMWare licenses are to be provided by the bidder as per price performa.
				Shall distribute data intelligently across all nodes and capacity utilization across all nodes has to be uniform at all times .	Solution shall distribute data intelligently across all converged nodes and has to be uniform at all times.	Different vendors can offer better and different architecture to provide overall solution. Request to kindly allow.	
				The solution should provide a virtual switch which can span across a virtual datacenter and multiple hosts should be able to connect to it. This in turn will simplify and enhance virtual machine networking in virtualized environments	To remove this point.	This is OEM specific. Kindly remove.	
64	bb.	Rack, PDU and Accessories		Required number of Industry Standard Rack and PDUs to be provided by bidder alongwith all accessories. Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP, SFP+ etc that are required to make the system fully functional needs to be provided along with the system. Each node should have dedicated non-shared dual-power supplies and should be able to sustain single power supply failure.	Required number of rack and PDUs to be provided by the bidder alongwith all accessories. Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP / SFP+ etc that are required to make the system fully functional needs to be provided along with the system. Solution should also include 48 port 10G Redundant HCI switch. Each Switch shall provide minimum 80Gbps throughput to connect with external LAN Switch. Each HCI node should have dedicated non-shared dual-power supplies and should be able to sustain single power supply failure.	Request to include redundant HCI switch to connect with HCI nodes to manage the hige East West traffic. HCI nodes if connected with LAN switch directly will hamper overall solution efficiency.	No change.

Item -1.02 of Price Bid -HCI Nodes for AD & DB - 5 No.s							
Page	Sr.No.	Item	Vendor to specify Brand Make and Model offered.	Pre-bid queries/suggestions	Bidder's remarks/ Clarifications	DGH's Reply	
65	a.	Hyper Converged Appliance (Features and Requirements)		The sizing defined below includes 10% HCI overhead. If any solution requires more than that, then they should factor accordingly.	All HCI overheads shall be factored accordingly. Relevant document to be submitted confirming the overheads each for cores, Memory & Storage.	Since storage mentioned is usable implies not all components includes 10% overheads. Request to mention usable resources and MSI's to factor all overheads accordingly.	Bidder to submit documentary evidence for overheads. If the overheads are above 10% then the bidder needs to factor the actual overheads.
65	d.	Total Physical Cores		Minimum 180 Cores (Including all the Nodes)	Minimum usable 160 Cores (Including all the Nodes)	Request to ask for usable resources and MSI's to factor the solution along with overheads.	No Change.
65	g.	Storage Cache		2 x 400 GB (SSD) or 1 x 800 GB (SSD) per Node. If SSD cache is not available then additional 10% RAM to be provided in each node.	2 x 400 GB (SSD) or 1 x 800 GB (SSD) cache capacity per converged Node. Cache capacity to be additional to required usable capacity.	There is no comparison between the cost of SSD and Memory. 10% additional memory would come very cheap compared to SSD cache drive/Module.	Clause dropped.Refer - B: Amendment to Technical Specification and Terms & Conditions
66	h.	Total Usable Storage		Min. 50 TB Usable capacity with 1.9 TB SSD Disks of higher capacity without Deduplication and Compression.	Min. 50 TB Usable capacity post RF2 using SSD Disks. Usable capacity provided should be without using data saving techniques like Deduplication, Compression, erasure coding etc.	Not all vendors has the option to provide 1.9TB SSD drives. Request to leave this to MSI's to quote the optimal Drive to provide the required usable capacity.	No change.
66	i.	Network Throughput		Total Network throughput from HYPERCONVERGED Chassis should be configured with total 20 Gbps with no single point of failure. (N+1) redundancy	Network throughput from each HYPERCONVERGED Node should be 40 Gbps with no single point of failure. Each HCI Node shall be provided with N+N power supply & Fans.	Current specification refers for MSI to provide total of 40Gbps throughput from a single chassis which might include 4 HCI nodes. This will decrease the overall network throughput. Kindly amend.	To be read as "Total Network throughput from HYPERCONVERGED Chassis should be configured with total 20 Gbps per node with no single point of failure. i.e (N+1) redundancy" Refer - B: Amendment to Technical Specification and Terms & Conditions
66	j.	Data Services		The solution should provide enterprise data services such as de-duplication and compression with erasure coding OR equivalent completely in software without dependence on any proprietary hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	The solution should provide enterprise data services such as de-duplication , compression OR equivalent completely in software without dependence on any proprietary hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	Data de-duplication, compression & erasure coding are all different technologies which are not provided by all vendors.	To be read as: Clause me be read as "The solution should provide enterprise data services such as deduplication and compression with erasure coding OR equivalent in software/ hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed." Refer - B: Amendment to Technical Specification and Terms & Conditions
66	o.	Rack Unit		HCI Appliance should support different Rack Units depending upon the workload (2U4N or 1U1N or 2U1N)	HCI Bodes should be offered in non-shared architecture in terms of power supply and fans (2U1N or 1U1N)	2U 4N is a shared architecture where a single 2U server provides 4 HCI nodes. This architecture increase chances of Node failures due to higher temperature and insufficient air flow. Also, Not all vendors offers this architecture with their HCI solution offerings. Request to kindly update.	No change.
66	r.	Redundancy & Business Continuity		Proposed solution should have replication software to DR site This replication should be granular in nature with Any Point-In-Time Recovery feature. Licenses for atleast 25 VM replication should be made available with capabilities of WAN bandwidth optimization using features like deduplication, compression. The solution should have capability to protect against data corruption	Proposed solution should have replication software to DR site .The solution should have capability to protect against data corruption	Current specification is OEM specific and only a single vendor software would comply here. Kindly dilute the specification for higher participation.	Clause may be read as: Proposed solution should have replication software to DR site .The solution should have capability to protect against data corruption Refer - B: Amendment to Technical Specification and Terms & Conditions
67	s.	Storage Feature		Storage policies should be enforced directly from hypervisor and managed directly from hypervisor.	Storage policies should be enforced & managed directly from hypervisor/ SDS .	Request to allow wider participation.	Clause may be read as: "Storage policies should be enforced & managed directly from hypervisor/ SDS."Refer - B: Amendment to Technical Specification and Terms & Conditions

67	t.	Manageability & Security		The Solution should be able to monitor end to end session of the user including giving the insight of the underlying infrastructure like server and Storage	The Solution should be able to monitor underlying infrastructure like server and Storage	Current specification is OEM Specific. Request to update.	No change. This feature though mentioned under HCI are basically VMWare features. However compliance for these points should be conveyed at their respective places in the technical evaluation matrix.
67				All Nodes supplied with the HCI appliance should support following security features. 1) Should have a cyber-resilient architecture for a hardened server design for protection, detection & recovery from cyber-attacks 2) Should protect against hardware firmware attacks which executes before OS boots. 3) Hardware should support Silicon / Hardware Root of Trust.	All Nodes supplied with the HCI appliance should support following security features. 1) Should have a cyber-resilient architecture for a hardened server design for protection, detection & recovery from cyber-attacks 2) Should protect against hardware firmware attacks which executes before OS boots/Secure Boot. 3) Hardware should support silicon-based Hardware Root of Trust.	Different vendors have different security policies/terminologies. Kindly update.	Should be read as "Should protect against hardware firmware attacks which executes before OS boots/ secure boots" Refer - B: Amendment to Technical Specification and Terms & Conditions
67	v.	Hypervisor Features		The solution should provide integration of 3rd party endpoint security to secure the virtual machines with offloaded antivirus, anti-malware solutions without the need for agents inside the virtual machines.	The solution should provide integration of 3rd party endpoint security to secure the virtual machines with offloaded antivirus, anti-malware solutions	Current specs are OEM specific. Kindly update.	These features though mentioned under HCI are basically VMWare features. However compliance for these points should be conveyed at their respective places in the technical evaluation matrix. Separate VMWare licenses are to be provided by the bidder as per price performa.
67			Shall distribute data intelligently across all nodes and capacity utilization across all nodes has to be uniform at all times .	Solution shall distribute data intelligently across all converged nodes and has to be uniform at all times .	Different vendors can offer better and different architecture to provide overall solution. Request to kindly allow.		
67			The solution should provide a virtual switch which can span across a virtual datacenter and multiple hosts should be able to connect to it. This in turn will simplify and enhance virtual machine networking in virtualized environments	To remove this point.	This is OEM specific. Kindly remove.		
68	aa.	Rack, PDU and Accessories		Required number of Industry Standard Rack and PDUs to be provided by bidder alongwith all accessories. Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP, SFP+ etc that are required to make the system fully functional needs to be provided along with the system. Each node should have dedicated non-shared dual-power supplies and should be able to sustain single power supply failure.	Required number of rack and PDUs to be provided by the bidder alongwith all accessories. Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP / SFP+ etc that are required to make the system fully functional needs to be provided along with the system. Solution should also include 48 port 10G Redundant HCI switch. Each Switch shall provide minimum 80Gbps throughput to connect with external LAN Switch. Each HCI node should have dedicated non-shared dual-power supplies and should be able to sustain single power supply failure.	Request to include redundant HCI switch to connect with HCI nodes to manage the high East West traffic. HCI nodes if connected with LAN switch directly will hamper overall solution efficiency.	No change.
Item -2.01 of Price Bid-HCI Nodes for SDC - 4 Nos							
Page	Sr.No	Item		Vendor to specify Brand Make and Model offered.	Pre-bid queries/suggestions	Bidder's Remarks/ Clarifications	DGH's Reply
83	a.	Hyper Converged Appliance (Essential Features)		The sizing defined below includes 10% HCI overhead. If any solution requires more than that, then they should factor accordingly.	All HCI overheads shall be factored accordingly. Relevant document to be submitted confirming the overheads each for cores, Memory & Storage.	Since storage mentioned is usable implies not all components includes 10% overheads. Request to mention usable resources and MSI's to factor all overheads accordingly.	Bidder to submit documentary evidence for overheads. If the overheads are above 10% then the bidder needs to factor the actual overheads.
83	d.	Total Physical Cores		Minimum 144 Cores (Including all the Nodes)	Minimum usable 128 Cores (Including all the Nodes)	Request to ask for usable resources and MSI's to factor the solution along with overheads.	No Change.
83	g.	Storage Cache		2 x 400 GB (SSD) or 1 x 800 GB (SSD) per Node. If SSD cache is not available then additional 10% RAM to be provided in each node.	2 x 400 GB (SSD) or 1 x 800 GB (SSD) cache capacity per converged Node. Cache capacity to be additional to required usable capacity.	There is no comparison between the cost of SSD and Memory. 10% additional memory would come very cheap compared to SSD cache drive/Module.	Clause dropped. Refer - B: Amendment to Technical Specification and Terms & Conditions
83	h.	Total Usable Storage		Min. 20 TB Usable capacity with 1.9 TB SSD Disks or higher capacity without Deduplication and Compression.	Min. 20 TB Usable capacity post RF2 using SSD Disks. Usable capacity provided should be without using data saving techniques like Deduplication, Compression, erasure coding etc.	Not all vendors has the option to provide 1.9TB SSD drives. Request to leave this to MSI's to quote the optimal Drive to provide the required usable capacity.	No change.
83	i.	Network Throughput		Total Network throughput from HYPERCONVERGED Chassis should be configured with total 20 Gbps with no single point of failure. (N+1) redundancy.	Network throughput from each HYPERCONVERGED Node should be 40 Gbps with no single point of failure. Each HCI Node shall be provided with N+N power supply & Fans.	Current specification refers for MSI to provide total of 40Gbps from a single chassis which might include 4 HCI nodes. This will decrease the overall network throughput. Kindly amend.	To be read as "Total Network throughput from HYPERCONVERGED Chassis should be configured with total 20 Gbps per node with no single point of failure. i.e (N+1) redundancy" Refer - B: Amendment to Technical Specification and Terms & Conditions

83	k.	Data Services		The solution should provide enterprise data services such as de-duplication and compression with erasure coding OR equivalent completely in software without dependence on any proprietary hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	The solution should provide enterprise data services such as de-duplication, compression OR equivalent completely in software without dependence on any proprietary hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.	Data de-duplication, compression & erasure coding are all different technologies which are not provided by all vendors.	To be read as: Clause me be read as "The solution should provide enterprise data services such as deduplication and compression with erasure coding OR equivalent in software/ hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed."Refer - B: Amendment to Technical Specification and Terms & Conditions
84	p.	Rack Unit		HCI Appliance should support different Rack Units depending upon the workload (2U4N or 1U1N or 2U1N)	HCI Bodes should be offered in non-shared architecture in terms of power supply and fans (2U1N or 1U1N)	2U 4N is a shared architecture where a single 2U server provides 4 HCI nodes. This architecture increase chances of Node failures due to higher temperature and insufficient air flow. Also, Not all vendors offers this architecture with their HCI solution offerings. Request to kindly update.	No change.
84	s.	Redundancy & Business Continuity		Proposed solution should have replication software to DR site This replication should be granular in nature with Any Point-In-Time Recovery feature. Licenses for atleast 20 VM replication should be made available with capabilities of WAN bandwidth optimization using features like deduplication, compression. The solution should have capability to protect against data corruption	Proposed solution should have replication software to DR site .The solution should have capability to protect against data corruption	Current specification is OEM specific and only a single vendor software would comply here. Kindly dilute the specification for higher participation.	Clause may be read as: Proposed solution should have replication software to DR site .The solution should have capability to protect against data corruption. Refer - B: Amendment to Technical Specification and Terms & Conditions
84	t.	Storage Feature		Storage policies should be enforced directly from hypervisor and managed directly from hypervisor	Storage policies should be enforced & managed directly from hypervisor/ SDS .	Request to allow wider participation.	Clause may be read as: "Storage policies should be enforced & managed directly from hypervisor/ SDS." Refer - B: Amendment to Technical Specification and Terms & Conditions
84	u	Manageability & Security		The Solution should be able to monitor end to end session of the user including giving the insight of the underlying infrastructure like server and Storage	The Solution should be able to monitor underlying infrastructure like server and Storage	Current specification is OEM Specific. Request to update.	No change. This feature though mentioned under HCI are basically VMWare features. However compliance for these points should be conveyed at their respective places in the technical evaluation matrix.
85				All Nodes supplied with the HCI appliance should support following security features. 1) Should have a cyber-resilient architecture for a hardened server design for protection, detection & recovery from cyber-attacks 2) Should protect against hardware firmware attacks which executes before OS boots. 3) Hardware should support Silicon / Hardware Root of Trust.	All Nodes supplied with the HCI appliance should support following security features. 1) Should have a cyber-resilient architecture for a hardened server design for protection, detection & recovery from cyber-attacks 2) Should protect against hardware firmware attacks which executes before OS boots/ Secure Boot . 3) Hardware should support silicon-based Hardware Root of Trust.	Different vendors have different security policies/terminologies. Kindly update.	Should be read as "Should protect against hardware firmware attacks which executes before OS boots/ secure boots" Refer - B: Amendment to Technical Specification and Terms & Conditions
85	w.	Hypervisor Features		The solution should provide integration of 3rd party endpoint security to secure the virtual machines with offloaded antivirus, anti-malware solutions without the need for agents inside the virtual machines.	The solution should provide integration of 3rd party endpoint security to secure the virtual machines with offloaded antivirus, anti-malware solutions	Current specs are OEM specific. Kindly update.	These features though mentioned under HCI are basically VMWare features. However compliance for these points should be conveyed at their respective places in the technical evaluation matrix. Separate VMWare licenses are to be provided by the bidder as per price performa.
85			Shall distribute data intelligently across all nodes and capacity utilization across all nodes has to be uniform at all times .	Solution shall distribute data intelligently across all converged nodes and has to be uniform at all times .	Different vendors can offer better and different architecture to provide overall solution. Request to kindly allow.		
85			The solution should provide a virtual switch which can span across a virtual datacenter and multiple hosts should be able to connect to it. This in turn will simplify and enhance virtual machine networking in virtualized environments	To remove this point.	This is OEM specific. Kindly remove.		

86	bb.	Rack, PDU and Accessories		Required number of Industry Standard Rack and PDUs to be provided by bidder alongwith all accessories. Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP, SFP+ etc that are required to make the system fully functional needs to be provided along with the system. Each node should have dedicated non- shared dual-power supplies and should be able to sustain single power supply failure.	Required number of rack and PDUs to be provided by the bidder alongwith all accessories. Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP / SFP+ etc that are required to make the system fully functional needs to be provided along with the system. Solution should also include 48 port 10G Redundant HCI switch. Each Switch shall provide minimum 80Gbps throughput to connect with external LAN Switch. Each HCI node should have dedicated non-shared dual-power supplies and should be able to sustain single power supply failure.	Request to include redundant HCI switch to connect with HCI nodes to manage the hige East West traffic. HCI nodes if connected with LAN switch directly will hamper overall solution efficiency.	No change.
Page	Sr.No.	Item -1.04 of Price Bid TOR Switch – PDC- 2 Nos			Pre-bid queries/sugestions	Bidder's Remarks	DGH's Reply
72	a	Switching capacity of 1.4Tbps or more, and throughput of 1070 Mbps or more.			Request to add " Switch should have non-blocking architecture and all the ports should work on line-rate and downlink vs uplink bandwidth ratio should be 2:1."	Since the switch will provide east west communciation, all the downlink and uplink badwidth should be atleast 2:1 ratio other wise bandwidth will be a bottleneck and will add latency.	No change.
		48 nos. of 1/10 Gigabit Ethernet SFP+ ports or FCOE ports and at least 4 nos of the 40 Gigabit Ethernet QSFP +uplink ports			Kindly change the clause as "48 nos of 1/10/25 Gigabit Ethernet SFP+ ports or FCOE ports and at least 6 nos of the 40/100 Gigabit Ethernet QSFP +uplink ports"	This is DC switch and real time low latency communciation the downlink vs uplink subscription ratio should be 2:1. In spine-leaf architecture , it is recommended to have spine-leaf connectivity in multiple of 40/100 Gbps.	No change.
-	-	New addition of important clause			Kindly add "Switch should have min 32MB of buffer memory"	In DC architecture, east west communication between the applications happens through the TOR/L3 switch. Latency in the traffic flow is impacted by the switch buffer capacity. Lower buffer will have higher latency and packet drops. Hence it is recommended to incorporate this clause	Not agreed.
-	-	New addition of important clause			Kindly add "Switch should support EVPN and IS-IS/BGP for spine-leaf fabric architecture"	In spine-leaf switch architecture, leaf switch connect o spine and spine only connects to leaf over 40/100 Gbps speed and this switch is asked with 10G ports hence will not act as a spine switch.	Not agreed.
-	-	New addition of important clause			Kindly add "Switch should support minimum 1000K route table capacity for IPv4 & IPv6"	As this TOR switch will be the part of DC architecture hence it is suggested to have this clause in order to support higher route table capacity is suggested.	Not agreed.
-	-	New addition of important clause			Kindly add "Switch should support 256K MAC address"	MAC address are missing in the switch , kindly add	Not agreed.
Page	Sr.No.	Item -2.03 of Price Bid TOR Switch – SDC- 2 Nos			Pre-bid queries/sugestions	Bidder's remarks	DGH's Reply
90	a	Switching capacity of 1.4Tbps or more, and throughput of 1070 Mbps or more.			Request to add " Switch should have non-blocking architecture and all the ports should work on line-rate and downlink vs uplink bandwidth ratio should be 2:1."	Since the switch will provide east west communciation, all the downlink and uplink badwidth should be atleast 2:1 ratio other wise bandwidth will be a bottleneck and will add latency.	No change.
		48 nos. of 1/10 Gigabit Ethernet SFP+ ports or FCOE ports and at least 4 nos of the 40 Gigabit Ethernet QSFP +uplink ports			Kindly change the clause as "48 nos of 1/10/25 Gigabit Ethernet SFP+ ports or FCOE ports and at least 6 nos of the 40/100 Gigabit Ethernet QSFP +uplink ports"	This is DC switch and real time low latency communciation the downlink vs uplink subscription ratio should be 2:1. In spine-leaf architecture , it is recommended to have spine-leaf connectivity in multiple of 40/100 Gbps.	No change.
-	-	New addition of important clause			Kindly add "Switch should have min 32MB of buffer memory"	In DC architecture, east west communication between the applications happens through the TOR/L3 switch. Latency in the traffic flow is impacted by the switch buffer capacity. Lower buffer will have higher latency and packet drops. Hence it is recommended to incorporate this clause	Not agreed.

-	-	New addition of important clause			Kindly add "Switch should support EVPN and IS-IS/BGP for spine-leaf fabric architecture"	In spine-leaf switch architecture, leaf switch connect o spine and spine only connects to leaf over 40/100 Gbps speed and this switch is asked with 10G ports hence will not act as a spine switch.	Not agreed.
-	-	New addition of important clause			Kindly add "Switch should support minimum 1000K route table capacity for IPv4 & IPv6"	As this TOR switch will be the part of DC architecture hence it is suggested to have this clause in order to support higher route table capacity is suggested.	Not agreed.
-	-	New addition of important clause			Kindly add "Switch should support 256K MAC address"	MAC address are missing in the switch , kindly add	Not agreed.
Page	Sr.No.	Item -1.05 of Price Bid	L3 Switch – PDC- 2 Nos				
		Items		Vendor to specify Brand Make and Model offered.	Pre-bid queries/suggestions	Bidder's Remarks	DGH's Reply
74	e.	Networking Features					
				Should support 128K route table capacity for IPv4 & IPv6	Kindly change this to "Should support minimum 768K route table capacity for IPv4 & IPv6"	As the switch will be acting as core switch in the DC architecture hence higher route table capacity is suggested.	No change.
		Storage protocols		Should support Data Center Infra, DCB, iSCSI, ETS considering all License.	Kindly remove this clause	Specific to OEM	To be read as: Should support Data Center Infra, DCB, iSCSI/FCoE, ETS considering all License. Refer - B: Amendment to Technical Specification and Terms & Conditions
		Fabric Features		Should support Spine-Leaf architecture using BGP EVPN from day-1	As per our understanding this L3 switch will be acting as a leaf switch in future. Kindly confirm	In spine-leaf switch architecture, leaf switch connect o spine and spine only connects to leaf over 40/100 Gbps speed and this switch is asked with 10G ports hence will not act as a spine switch.	No change.
74	f.	Security Features		Should support 802.1x implementation using RADIUS, BFD, Object Tracking	Kindly remove the object tracking from the caluse.	This is not the feature of switch	Should be read as: "Should support 802.1x implementation using RADIUS, BFD, "Refer - B: Amendment to Technical Specification and Terms & Conditions
	-	-		New addition of important clause	Kindly add "Switch should have min 32MB of buffer memory"	In DC architecture, east west communication between the applications happens through the TOR/L3 switch. Latency in the traffic flow is impacted by the switch buffer capacity. Lower buffer will have higher latency and packet drops. Hence it is recommended to incorporate this clause	Not agreed.
Page	Sr.No.	Item -1.06 of Price Bid	Management Switch – PDC 1 No				
		Items		Vendor to specify Brand Make and Model offered.	Pre-bid queries/suggestions	Bidder's Remarks	DGH's Reply
75	b.	Ports Scalability		24x 10/100/1000Mbps half/full duplex RJ45 ports, 4x SFP/SFP+ 1/10GbE ports	As per our understanding uplin kports should support both 1G and 10G. Kindly confirm.		Yes it should support both 1G/10G
75	e.	Other features:		Time controlled ACLs, 40Gbps stacking, double VLAN tagging	Kindly modify clause as "Time controlled ACLs, 80 Gbps stacking, double VLAN"	Stacking badnwidth is very less when we add more 4 or more switches in a stack	No change.

75/76	g.	Management Function		RMON, sflow, SNMP v1/v2/v3	Kindly modify clause as "RMON, Sflow or equivalent, SNMP v1/v2.v3"		May be read as : "RMON, Sflow or equivalent, SNMP v1/v2.v3" Refer - B: Amendment to Technical Specification and Terms & Conditions
Item -1.07 of Price Bid: Firewall - PDC 2 nos							
Sr.No.				Pre-Bid Queries/Suggestion	Remarks	DGH's Reply	
a.	Solution should be an integrated Next Gen Firewall platform which includes firewall, application control, IPS, Anti-Bot, Anti-Spyware, URL Filtering and Advanced Persistent threat Prevention capabilities in a single appliance, configured in High Availability Mode. Firewall should be provided with "Zero" day protection feature.			Kindly modify clause as "Solution should be an integrated Next Gen Firewall platform which includes firewall, application control, IPS, Anti-Bot, Anti-Spyware/Anti-Phising , URL Filtering and Advanced Persistent threat Prevention capabilities in a single appliance, configured in High Availability Mode. Firewall should be provided with "Zero" day protection feature."		May be read as : "Solution should be an integrated Next Gen Firewall platform which includes firewall, application control, IPS, Anti-Bot, Anti-Spyware/Anti-Phising , URL Filtering and Advanced Persistent threat Prevention capabilities in a single appliance, configured in High Availability Mode. Firewall should be provided with "Zero" day protection feature." Refer - B: Amendment to Technical Specification and Terms & Conditions	
w.	Solution must have a URL categorization and URLs filtering database. Should have predefined more than 50+ categories. The solution should have the capabilities to block, permit, allow & log, protocols other than HTTP, HTTPS, FTP			Kindly modify clause as "Should support category-based URL filtering and provide comprehensive alerting and control over web traffic and enforces policies on more than 280 million of URLs in more than 80 categories. The solution should have the capabilities to block, permit, allow & log, protocols other than HTTP, HTTPS, FTP"	Higher number of URLs and categories will help in better detection and filtration of the firewall	No change.	
ii.	The solution should be able to scan & find for unknown threats in executable, archive files ,documents, JAVA and flash like: 7z ,cab,doc,docx,ppt, pptx, rar, rtf, scr, swf, tar, docx, , jar, xls, , xlsx, ,xlw, zip etc.			Kindly modify clause as "The solution should be able to scan & find for unknown threats in executable, archive files ,documents, JAVA and flash like: 7z ,cab,doc,docx,ppt, pptx, rar, rtf, scr, swf, tar, docx, , jar, xls, , xlsx, ,xlw, zip etc."		May be read as : The solution should be able to scan & find for unknown threats in executable, archive files ,documents, JAVA and flash like: 7z ,cab,doc,docx,ppt, pptx, rar, rtf, scr, swf, tar, docx, jar, xls, , xlsx, ,xlw, zip etc." Refer - B: Amendment to Technical Specification and Terms & Conditions	
	New clause			Kindly add "Solution should support RIPv2, OSPF, OSPFv3, BGP4 routing protocol"		Not agreed	
	New clause			Kindly add "The IPS system shall have at least 30000 signatures"		Not agreed	
Queries from M/s Schlumberger Solutions Pvt. Ltd.							
Sl. No.	Clause		Full Compliance/ Not Agreed	As in Tender/ Modifications Requested		Bidder's Remarks	DGH's Reply
ANNEXURE II- GENERAL TERMS AND CONDITIONS							
1.	1.17 (vii); Effective Date of Contract/Supply Order			Special conditions and deviations, if any, taken by SUPPLIER/CONTRACTOR but not agreed by DGH		Any deviations agreed by DGH should form part of the Contract	To be read as : Special conditions and deviations, if any, taken by SUPPLIER/CONTRACTOR and agreed by DGH. Refer - B: Amendment to Technical Specification and Terms & Conditions
2.	3.2; Specification, Drawing, Technical Manuals			Request for replacement of clause with following: "Contractor cannot and does not guarantee the accuracy or correctness of any data/drawings/recommendations / opinions made to DGH. DGH shall indemnify the Contractor and shall be liable for all decisions taken by DGH or any third party on the basis of such recommendations / opinions."		This is Standard Industry Practice.	Not agreed
3.	Cl. 8.4; Performance Security / Performance Bond			In the event of non performance of the contract, if the losses suffered by DGH are more than the value of the Performance Security/Performance bond, DGH in addition to forfeiting the performance security/ performance bond, reserves the right to claim the balance amount of damages/losses suffered by DGH <u>as stated in the Contract.</u>		The tender clause is open-ended; DGH can claims only upto the limitation of liability amount stated in the contract	Not agreed
4.	9.2; Warranties and Guarantees			Lines 12-15: "If the SUPPLIER fails to take proper corrective action to repair/replace defects satisfactorily within a reasonable period DGH shall be free to take such corrective action as may be deemed necessary at SUPPLIER's risk and cost after giving notice to the SUPPLIER- provided that Supplier's liability shall be limited to the contract value of the defective goods."		If Company decides to take any corrective action by itself or through any other party, then this will be at Company's own risk. Also, Contractor's liability under this clause should be limited to the contract value of the defective goods.	Not agreed

5.	9.3 (Insert new sub clause)	<p>Supplier's sole responsibility under these warranties will be to provide the Equipment/Materials/Goods, described in the Contract with DGH. Warranties do not apply to:</p> <p>(a) any products other than Equipment/Materials/Goods listed in the Contract; or</p> <p>(b) conditions resulting from improper use or storage of the Equipment/Materials/Goods or operation of the Equipment/Materials/Goods outside the specified environmental conditions; or</p> <p>(c) conditions resulting from causes external to the Equipment/Materials/Goods after delivery; or</p> <p>(d) conditions resulting from modifications to the Equipment/Materials/Goods other than modifications made by Supplier or Supplier's service vendor; or</p> <p>(e) conditions resulting from DGH's movement of the Equipment/Materials/Goods; or</p> <p>(f) Equipment/Materials/Goods from which Supplier's or Supplier's service vendor's serial numbers have been removed.</p> <p>Disclaimer of Warranties. Except as expressly stated herein, CONTRACTOR MAKES NO WARRANTIES, EXPRESS, IMPLIED, OR STATUTORY, WITH RESPECT TO THE EQUIPMENT/MATERIALS/GOODS PROVIDED, INCLUDING,</p> <p>WITHOUT LIMITATION, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.</p>	As per standard industry practice, request DGH to include the standard exclusions from the warranty clause.	No change
6.	11; Rejection	<p>If DGH finds that the goods supplied are not in accordance with the specification and other conditions stated in the order or its sample(s) are received in damaged condition (of which matters DGH will be the sole judge), DGH shall be entitled to reject the whole of the goods or the part, as the case may be, and intimate within 14 days from the date of receipt at site/store house as per terms of Contract to the SUPPLIER the rejection without prejudice to DGH other rights and remedies to recover from the SUPPLIER any loss which the DGH may be put to, provided that</p> <p>Supplier's liability shall be limited to the contract value of the defective goods, also reserving the right to forfeit the performance security/performance Bond if any, made for the due fulfilment of the contract. The goods shall be removed by the SUPPLIER</p> <p>and if not removed within 14 days of the date of communication of the rejection, DGH will be entitled to dispose of the same on account and at the risk of the SUPPLIER and after recovering the storage charges at the rate of 5% of the value of goods for each month or part of a month and the loss and expenses if any caused to DGH, pay balance to the SUPPLIER.</p>	Request DGH to delete as proposed herein.	No Change
7.	15.1; Sub-standard Material / Replacement of Rejected Goods	<p>The clause to be modified as follows:</p> <p>If DGH finds that material supplied are not of the correct quality or not according to specifications required as stated in the Contract</p> <p>or otherwise not satisfactory owing to any reason of which DGH will be the sole judge, DGH shall notify Supplier in accordance with clause 9.2. In case, Supplier fails to rectify/replace/ modify the Equipment/Materials/Goods within the time line stated, DGH will be entitled to reject materials, cancel</p>	Request you to give us reasonable notice to rectify/repair prior to cancellation of the contract.	No Change
		<p>the contract and buy its requirement in the open market at the risk and cost of SUPPLIER, provided that Supplier's liability shall be limited to the contract value of the defective goods, reserving always to itself the right to forfeit the performance security/Performance Bond placed by the SUPPLIER for the due fulfilment of the contract.</p>		
8.	21; Designs, Patents and Royalties	<p>Insert new paragraph:</p> <p>Supplier shall not be liable under clause 21 for any patent or copyright infringement or claim thereof based upon</p> <p>(a) Supplier's compliance with DGH'S specifications, where such specifications require Supplier to modify an Equipment/Materials/Goods or Service;</p> <p>(b) the combination of the Equipment/Materials/Goods or Service with other items or services not furnished or approved in writing by Supplier;</p> <p>(c) any unauthorized addition to or modification of the Equipment/Materials/Goods, or alteration of the Services at the request of DGH; or</p> <p>(d) any use of the Equipment/Materials/Goods in the performance of a method or process (practice of a process), except where such practice is solely completed by or within the Equipment/Materials/Goods.</p> <p>DGH shall defend and hold Supplier harmless against any expense, judgment or loss for alleged infringement of any patent, copyright or other proprietary right which results from a claim based upon (a), (b), (c), or (d).</p> <p>Supplier or its subcontractors (as applicable) retains all intellectual property rights to the Equipment/Materials/Goods</p>	Bidder requests DGH to include the standard clause for exclusions of IP Infringement. This is as per standard industry practice.	No change

9.	Cl. 33; Liability under the Contract	<p>Replace with: Notwithstanding any other provisions, except only in cases of willful misconduct and / or criminal acts. (a) Neither Supplier nor DGH shall be liable to the other, whether in Contract, tort, or otherwise, for any consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided however that this exclusion shall not apply to any obligation of the Supplier to pay Liquidated Damages to DGH and; (b) Notwithstanding any other provisions incorporated elsewhere in the contract, the aggregate liability of the Supplier in respect of this contract, whether under the Contract, in tort or otherwise, shall not exceed 50% of the annualized Contract Price, provided however that this limitation shall not apply to the cost of repairing or replacing defective equipment by Supplier, or to any obligation of Supplier to indemnify DGH with respect to Intellectual Property Rights. (c) DGH shall indemnify and keep indemnified Supplier harmless from and against any and all claims, costs, losses and liabilities in excess of the aggregate liability amount in terms of clause (b) above. For the purpose of this clause, 'Willful Misconduct' shall mean intentional disregard of good and prudent standards of performance or proper conduct under the Contract with knowledge that it is likely to result in any injury to any person or persons or loss or damage of property.</p>	As the scope involves supply + services, (i.e. deployment of manpower, AMC etc.) request DGH to please include the Limitation of Liability clause.	Clause 33 under page No 41 to be read as under: Notwithstanding any other provisions, except only in cases of willful misconduct and / or criminal acts, a) Neither the Contractor nor DGH shall be liable to the other, whether in Contract, tort, or otherwise, for any consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided however that this exclusion shall not apply to any obligation of the Contractor to pay Liquidated Damages to the DGH and b) Notwithstanding any other provisions incorporated elsewhere in the contract, the aggregate liability of the Contractor in respect of this contract, whether under the Contract, in tort or otherwise, shall not exceed Contract Price, provided however that this limitation shall not apply to the cost of repairing or replacing defective equipment by the Contractor, or to any obligation of the Contractor to indemnify the DGH with respect to Intellectual Property Rights. c) DGH shall indemnify and keep indemnified Contractor harmless from and against any and all claims, costs, losses and liabilities in excess of the aggregate liability amount in terms of clause (b) above. Refer - B: Amendment to Technical Specification and Terms & Conditions
10.	Cl. 28	The terms of payment shall be as stipulated in main body of the purchase order. DGH will initiate payment of each invoice within thirty (30) days after receipt, withholding or deducting any amount required by law. Payment shall be subject to Tax Deduction at source as per Indian Tax Laws.	Request DGH to insert the payment term timeframe (days) for each invoice	30 days
11.	Cl. 28.i (New)	If DGH disputes an item billed, DGH shall, within five (5) days of receiving CONTRACTOR's invoice, notify CONTRACTOR of the item in dispute, specifying complaint by DGH..	Request DGH to insert time frame to resolve disputed invoice for the benefit of both parties.	Not agreed
12.	Cl. 28.j (New)	DGH agrees to pay interest on all amounts due and not paid in accordance with this CONTRACT. Interest will accrue at the higher of 1.5% per month of part thereof of the maximum amount permitted by law. DGH agrees to pay all reasonable and documented costs and attorneys' fees incurred by Vendor if any unpaid amount are collected through legal proceeding or by a collection agent.	Request DGH to kindly add the late payment interest as payment commitment to the agreed credit term.	Not agreed.
ANNEXURE III – BID EVALUATION CRITERIA				
13.	3.1	Experience in E&P Industry	Bidder should be in the business of providing Maintenance & Support (M&S) of G&G application software (Data Interpretation & Visualization software like Petrel and DSG) for minimum 5 years from the date of bid closing. Request DGH to kindly confirm if one (1) PO / Contract is sufficient?	Yes, minimum one should be sufficient. But total contract period should cover a duration of 5 years.
14.	Cl. 5.2.1 to 5.2.5	Penalty clause is wrongly mentioned as "Section 6.3". It needs to be mentioned as "Section 5.3" wherever used throughout the Cl. 5.2	Typo error	Clause 5.1 to 5.2.5 "Section 6.3 may be read as section 5.3" Refer - B: Amendment to Technical Specification and Terms & Conditions
15.	Cl. 5.3	Line 5, replace "1 week" with "30 days"		No change
16.	2. Detailed Scope (page 48) Annexure IV		Implementation of portal for registration of users, authentication and their management, Time Slot Management Tool with Integrated Payment Gateway, MM-12018(30)/1/2019-DGH/ENQ-163 Page 49 of 146 Provisioning of ready to use Virtual Machines hosting G&G software(s) and relevant data as per user requirements – Request DGH to confirm which party shall be responsible for managing the portal?	Bidder shall be responsible for managing the portal.
17.	Clause 2.21	The bidder should manage its support and services in line with industry best practice, aligned with the ITIL service management framework covering Service Design, Transition, Operation and Continuous Improvement	The bidder should manage its support and services in line with industry best practice	No Change

18.	Clause 5.1.9	The bidder along with the respective OEMs shall provide and install patches, updates and upgrades for the entire set of ICT equipment/software as per the recommendations and releases done by the OEM if it is tested and passed by G&G supplier . Software updates/upgrades shall also be done keeping in view advancement in technology, shortcomings of the system, security vulnerabilities or changes required for improving functional efficiency and security level of the system if supplied hardware	Request DGH to consider that the bidder shall take consent from OEM of G&G application and Hardware vendor prior updation/installation of any patches to ensure compatibility.	Clause to be read as: The bidder along with the respective OEMs shall provide and install patches, updates and upgrades for the entire set of ICT equipment/software as per the recommendations and releases done by the OEM <u>if it is tested and passed by G&G supplier</u> . Software updates/upgrades shall also be done keeping in view advancement in technology, shortcomings of the system, security vulnerabilities or changes required for improving functional efficiency and security level of the system. The bidder shall ensure complete rollback to original status in case of problem and shall take necessary system backup before the activity.
19.	Page 79, Item1.09	The Disk based appliance/ storage and Backup Software supplied must be from Single OEM.	Request to open the solution so that software vendors can propose solution with bidders choice of hardware.	To be read as: "DGH wants to implement backup-to-disk solution using disk based backup appliances/ storage to simplify operations and improve overall backup/restore performance. The solution should consist of Enterprise backup software and disk based backup appliances/ storage. The solution should be capable of integration with active directory infrastructure for ease of user rights management along with role based access control to regulate the level of management. The solution must have capability to do trend analysis for capacity planning of backup environment not limiting to Backup Application/Clients, Virtual Environment etc." Refer - B: Amendment to Technical Specification and Terms & Conditions
20.	Page 57 Clause5.5.2	Minimum Qualification for onsite G&G support	Request DGH to consider BSc./Msc. In Geology/Geophysics for minimum qualification.	Post Graduate in Geology/ Geophysics/ Applied Geology/ Applied Geophysics/ Petroleum Engineering plus two years experience in G&G interpretation software from M/s Halliburton/ Schlumberger. Refer - B: Amendment to Technical Specification and Terms & Conditions
21.	Page 57 Clause5.5.2	Minimum Qualification for onsite IT support	Request DGH to consider BCA/MCA for minimum qualification.	B.E/ B.Tech/ MCA plus two years experience in system administration and Vmware. Refer - B: Amendment to Technical Specification and Terms & Conditions
22.	Page 79, Disk Based Appliance/ storage and Backup Software for PDC 1 No		The Disk based appliance/ storage and Backup Software supplied must be from Single OEM. Request to open the solution so that software vendors can propose solution with bidders choice of hardware.	To be read as: "DGH wants to implement backup-to-disk solution using disk based backup appliances/ storage to simplify operations and improve overall backup/restore performance. The solution should consist of Enterprise backup software and disk based backup appliances/ storage. The solution should be capable of integration with active directory infrastructure for ease of user rights management along with role based access control to regulate the level of management. The solution must have capability to do trend analysis for capacity planning of backup environment not limiting to Backup Application/Clients, Virtual Environment etc." Refer - B: Amendment to Technical Specification and Terms & Conditions
23.	Page 64, Point y, Single point of support for HCI solution including virtualization		Please remove the word "Virtualization " from this clause for HCI Hardware product. We request the remote 24x7x365 days L1, L2, L3 Support responsibility for Virtualization to be given to the respective OEM (VmWare) and onsite support responsibility to the bidder/ SI. Instead of the Hardware product OEM.	Bidder is responsible for single point of support.

24.	Page 65, Point aa. Single Number support for all components of appliance (compute, hypervisor, software defined storage) for 5 years		Single Number support for all components of appliance (compute, hypervisor, software defined storage) for 5 years. Please remove the word "Hypervisor" from this clause for HCI Hardware product. We request the 24x7x365 days remote L1, L2, L3 Support responsibility for Virtualization Hypervisor to be given to respective OEM (VmWare) and onsite responsibility to the Bidder/ SI. Instead of the Hardware product OEM.	Bidder is responsible for single point of support.
25.	5.2 (5.2.4) Service Level Agreements for HCI based cloud, page 52	ICT Equipment Failure (Servers, HCI Node, SDN controller, Backup Setup, Switches etc.) / Part Failure (CPU/Memory etc.). In addition to the above, the bidder has to provide an uptime guarantee of 98.0 % on monthly basis for each equipment (including hardware, software & network) maintained by the bidder. If the number of failures of any Equipment exceeds 02 in a month or the duration of failure is more than 7.2 hours in a month, it shall attract penalties as defined in "Equipment MM-12018(30)/1/2019-DGH/ENQ-163 Page 53 of 146 Failure" item of the Section 6.3. Further, in the event of a part failure of equipment i.e. CPU/ memory card/ Supervisor module/ Port module, etc. (which does not lead to failure of Equipment) the part should be installed/ replaced within 48 hours (subject to availability of downtime), beyond which the Equipment shall be considered as down and shall attract penalty as defined in "Part failure" item of the Section 6.3. For the purpose of calculating the penalty, the excess failure time shall be counted but in case number of failures are more than the permissible limit, complete failure period shall be counted for calculation of penalty.		No change
26.			VMware component installation, implementation and training will be provided by bidder or VMware ?	Training is to be provided by respective OEMs
SPECIAL TERMS AND CONDITIONS				
27.	Cl. 1; Delivery / Completion Schedule		FOR SUPPLY PORTION: The supply of all the hardware and software items should be completed within 90 days from date of issue of LOA. FOR INSTALLTION & COMMISSIONING: Installation, Configuration, Integration and Commissioning of the complete solution are to be completed within 45 days from date of supply	60 days for supply of all hardware and software items from date of LOA and 45 days for installation and commissioning from date of supply. Refer - B: Amendment to Technical Specification and Terms & Conditions
28.	Insert new clause for Indemnity	Either party shall be responsible for and shall protect, indemnify and hold harmless the other, its co-venturers, other contractors, sub-contractors, invitees and their owned, controlled, affiliated and subsidiary companies and the stockholders, directors, agents, employees and representatives of each from and against any and all losses, damages, suits litigation, claims etc arising out of loss or injury to their person or property, without regard to the negligence and/or breach of duty (statutory or otherwise), and/ or default of the other.	Request DGH to include the mutual hold harmless / knock for knock clause, where each party will be responsible for its own personnel and property	Not agreed
29.	Insert new clause for Data Liability	DGH shall at all times be responsible for the product(s) provided by DGH and for providing back-up for all software applications and data files. It is clearly understood that Supplier shall have no liability for loss, damage or destruction to any of DGH's data, except in the case of intentional misconduct, in which case the Supplier's sole liability is limited to the costs of recovering and reloading the data from the most recent database back-up. In no event shall the Supplier ever be liable for reacquiring DGH's data.	Request DGH to include the Data Liability clause in the AMC Contract.	Not relevant in the present context
30.	Insert new clause for Intellectual Property	While providing the Services to DGH, Supplier may utilize expertise, know-how and other intellectual capital (including intellectual property) and develop additional expertise, know-how and other intellectual capital (including intellectual property) which are Supplier's exclusive property and which Supplier may freely utilize in providing services for its other customers. Except where expressly and specifically indicated in writing, and in exchange for appropriate agreed payment, Supplier does not develop any intellectual property for ownership by DGH. Supplier retains sole ownership of any such intellectual capital (including intellectual property) created by Supplier during the course of providing the services. Supplier grants no title, license or right to DGH to use Supplier Group's intellectual capital (including intellectual property).		Not agreed
31.	Appendix 5 – Bid Bond Format	Request DGH to please consider the changes proposed in the bid bond format as below: Cl. 1, Line 12 – Delete " unconditional and irrevocable. " Cl. 2: We (name of the bank) _____ registered under the laws of _____ having its head/registered office at _____ (hereinafter referred to as "the Bank" which expression, unless repugnant to the context or meaning thereof, shall mean and include all its successors, administrators, executors and permitted assignees) do hereby guarantee and undertake to pay immediately within 5 (five)		Not agreed

		<p>business days on the first written demand by DGH, the amount of Indian Rs. (in figures) _____ (Indian Rupees (in words) _____ only) in aggregate at any time without any demur and recourse, and without DGH having to substantiate the demand. Any such demand made by DGH shall be accompanied by conclusive and binding on the Bank irrespective of any dispute or difference raised by the Bidder. A. DGH's statement purportedly signed by an officer of DGH, certifying that for reasons other than force majeure, Bidder has failed to fulfill its obligations as contained in the terms and conditions in the Tender document and that DGH is entitled to the payment of [INR/] _____ (in figures & words); and B. A copy of DGH's statement sent by DGH to Bidder and acknowledged by the Bidder, sent and dated at least thirty (30) days prior to such drawing listing each element or default which DGH certifies to be in sufficient detail to enable Bidder to identify and rectify same and communicating DGH's intent to draw under bank guarantee number unless said elements or defaults are corrected within thirty (30) days. Cl. 4: The Bank also agree that this guarantee shall be irrevocable and governed and construed in accordance with Indian Laws and subject to exclusive jurisdiction of Indian Courts of the place from where the Bank Guarantee has been issued. Cl. 5: This guarantee shall be irrevocable and shall remain in force up to _____ which includes forty-five days after the period of bid validity and any demand in respect thereof should reach the Bank not later than the of said date. The Bank guarantee becomes null and void and will be considered cancelled even if not returned to the Bank upon its expiry. Insert new clauses 7 & 8: 7. This Bank Guarantee is non-assignable and non-transferable. 8. This bank guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, International Chamber of Commerce Publication No. 758</p>		
32.	Appendix 6 – PBG Format	<p>Request DGH to please consider the changes proposed in the PBG format as below: Cl. 1.2: We (name of the bank) _____ registered under the laws of _____ having head/registered office at _____ (hereinafter referred to as "the Bank", which expression shall, unless repugnant to the context or meaning thereof, include all its successors, administrators, executors and permitted assignees) do hereby guarantee and undertake to pay immediately within 5 (five) business days on first written demand in writing any/all moneys _____ to the extent of Indian Rs (in figures) _____ (Indian Rupees (in words) _____) without any demur, reservation, contest or protest and/or without any reference to the CONTRACTOR. Any such demand made by DGH on the Bank by serving a written notice shall be accompanied by A. DGH's statement purportedly signed by an officer of DGH, certifying that for reasons other than force majeure, Contractor has failed to fulfill its performance obligations under the Contract and that DGH is entitled to the payment of [INR/] _____ (in figures & words); and B. A copy of DGH's statement sent by DGH to Contractor and acknowledged by the Contractor, sent and dated at least thirty (30) days prior to such drawing listing each element or default which DGH certifies to be in sufficient detail to enable Contractor to identify and rectify same and communicating DGH's intent to draw under bank guarantee number unless said elements or defaults are corrected within thirty (30) days. shall be conclusive and binding, without any proof, on the bank as regards the amount due and payable, notwithstanding any dispute(s) pending before any Court, Tribunal, Arbitrator or any other authority and/or any other matter or thing whatsoever, as liability under these presents being absolute and unequivocal. We agree that the guarantee herein contained shall be irrevocable and shall continue to be enforceable until it is _____ discharged by DGH in writing or till (insert expiry date of PBG), whichever is earlier. This guarantee shall not be determined, discharged or affected by the liquidation, winding up, dissolution or insolvency of the CONTRACTOR and shall remain valid, binding and operative against the bank Cl. 1.3: Delete Cl. 1.5: The Bank further agrees that the Guarantee herein contained shall remain in full force during the period that is taken for the performance of the CONTRACT and all dues of DGH under or by virtue of this CONTRACT have been fully paid and its claim satisfied or discharged or till DGH discharges this guarantee in writing, or till (insert expiry date of PBG), whichever is earlier Cl. 1.9: Notwithstanding anything contained herein above, our liability under this Guarantee is limited to Indian Rs. (in figures) _____ (Indian Rupees (in words) _____) and our guarantee shall remain in force until _____. (indicate the date of expiry of bank guarantee). The Bank guarantee becomes null and void and will be considered cancelled even if not returned to the Bank upon its expiry. Insert new clauses 1.10 & 1.11: 1.10 This Bank Guarantee is non-assignable and non-transferable. _____ 1.11 This bank guarantee is subject to the Uniform Rules for Demand Guarantees (URDG) 2010 Revision, International Chamber of Commerce Publication No. 758</p>		Not agreed

PRE-CONTRACT INTEGRITY PACT			
33.	Annexure-VII		Request DGH to kindly consider the suggested modifications as per attached revised document for pre-contract integrity pact.
Integrity pact can be signed by authorised representative who has signed the bid. EMD and PBG terms shall be applicable as stipulated in tender.			
Queries from M/s Halliburton India Operations Private Limited			
S.No	Clause	Change/ Modification proposed by bidder	DGH's Reply
1	Clause 5.1.13	Inventory of Spares should be defined in the relevant clause of the tender which will help the bidders to accurately factor the cost in the price bid	Bidder to take call on his inventory for critical spares and non critical spares.
2	Clause 5.2.4	In the event of equipment/part failure (not leading to the failure of entire system) & absence of spares, 5 business days should be given for equipment/part replacement. However, we will try our best to rectify the issue in shortest possible time	No change. DGH can provide space for storage of spares at bidders responsibility.
3	1 - Special Terms & Conditions	Consider 60 days for installation, configuration, integration and commissioning of system from the date of supply + 30 days for Onsite Acceptance Tests	60 days for supply of all hardware and software items from date of LOA and 45 days for installation and commissioning from date of supply. Refer - B: Amendment to Technical Specification and Terms & Conditions
4	Clause 5.4	As stipulated in the tender clause, 3 personnel in a day would manage the HCI system in the shifts of 8 hour each. However, in case 1 personnel fails to appear for the shift, will DGH consider 2 personnel to monitor the system in the shifts of 12 hour each for those particular day(s)?	DGH is seeking service contract of manpower under prevailing statutory laws which need to be complied by the bidder. Bidder has to deploy accordingly.
5	Clause 2.12	DGH to confirm the IT security standards followed in their premises	ISMS process will be implemented in near future.
6	Clause 2.12	Third party agency to certify the solution from IT security perspective. Does DGH going to recommend the auditor or it will be on bidder to pick the auditor of their choice?	No change. CERT-IN empanelled IT Security audit agency
7	Clause 1.11	We recommend NVidia Quadro vDWS license instead of NVidia Grid vWS for better performance	No change.
8	Clause 5.2.1	We can only commit 98% SLA for LAN. For WAN connectivity, we would request you to reconsider this percentage	No Change. However the performance within HCI infrastructure, storage and switches etc. supplied by the bidder under this tender should guarantee uptime availability of 99.9% on monthly basis. This excludes the DGH LAN and WAN connectivity of PDC and SDC.
9	Clause 2.4	We recommend less than 100ms latency for our solution. However, DGH needs to provide enough bandwidth to support this number	Enough bandwidths shall be provided by DGH where latency would be less than 100ms.
10	Clause 1.10	We understand that the backups will be stored in disk based storage. We would like to know the utility of Tape Library in the solution	Tape library will be used for creating copy for off site backup. Also may be utilised for NDMP backup of NAS storage.
11	Clause 25.1	CONTRACTOR, unless specified otherwise in the CONTRACT, shall bear all tax liabilities, duties, Govt. levies etc. including GST, Customs Duty, Corporate and Personnel Taxes levied or imposed on the CONTRACTOR however excluding GST and Custom Duty on account of payments received by it from the DGH for the work done under this CONTRACT. It shall be the responsibility of the CONTRACTOR to submit to the concerned Indian authorities, the returns and all other concerned documents required for this purpose and to comply in all respects with the requirements of the laws in this regard, in time	GST to be quoted extra as price format. Any changes shall be governed by clause no 34 of page 41
12	Clause 10.2	Bidder wants to insert the following line in the para "Prices quoted are exclusive of Goods and Service Tax (GST) and shall be charge extra as per prevailing rate"	GST to be quoted extra as price format. Any changes shall be governed by clause no 34 of page 41
13	Clause 29.2	Bidder wants to insert the following line at the end of the clause "..... and DGH shall promptly issue the original official tax certificate for such tax deducted in accordance with the relevant regulations to Contractor evidencing the tax payment, so as to enable Contractor to claim the set-off of such taxes against its tax liability in its tax return."	TDS Certificate shall be issued
14	Clause 29.3	Bidder wants to inserts the following line at the end of clause "If GST Tds is applicable and DGH has deducted the same DGH will issue original TDS certificate in FORM GSTR7A on regular intervals along with invoices details as per GST laws "	TDS Certificate shall be issued
15	Warranty 9.3	Bidder wants to insert a new sub clause (xv): These warranties do not cover any defects or resulting damage caused by installation or use of hardware or software not furnished by Supplier , accident (including damage during shipment), neglect, misuse or abuse, or exposure to conditions beyond the environmental, power and/or operating constraints specified by Supplier . Furthermore, these warranties do not cover defects or failure resulting from modification or installation by any person or entity other than Supplier or its authorized representative Except as expressly provided in this Contract, Supplier makes no warranties and DGH hereby waives any express or implied warranty of any kind with respect to the Work or any part thereof performed hereunder, including, without limitation, the implied warranty of fitness for a particular purpose or merchantability.	Not agreed
16	Designs, Patents and Royalties 21	Bidder wants to replace this clause as " DGH acknowledges that Supplier is the sole and exclusive owner of, or otherwise has the legal right to, the Software and all patents, copyrights, trade secrets, trademarks, and other intellectual properties and proprietary rights therein. No title to or ownership of the Software or the patents, copyrights, trade secrets, trademarks, or other proprietary rights contained therein is transferred to DGH by this Contract.	Not agreed

		Supplier will defend DGH , at Supplier's expense, against any claim or suit alleging that any Software Product infringes upon a patent or copyright granted by the United States of America. Supplier will pay all costs and any damages finally awarded, provided DGH gives Supplier prompt written notice of such claim, reasonable information and assistance, and sole authority to defend or settle the claim. In the defense or settlement, Supplier may obtain for DGH the right to continue using the Software Product, or replace or modify it (without substantially changing its original functions) so that it becomes non-infringing. If such remedies are not reasonably available, and if DGH returns the Software Product, Supplier will give DGH a refund of the price paid for such Software Product net of reasonable depreciation). Supplier is not liable if the alleged infringement is based on modifications to the Software or the use of such Software in combination with products not furnished by Supplier.	
		DGH agrees that the Software is confidential and proprietary information in which Supplier claims trade secret rights and that the Software is disclosed to DGH on a confidential basis. DGH shall keep the Software confidential and prevent the Software from being (a) used except as permitted by the license granted herein, or (b) disclosed to any person or entity other than DGH's employees or agents solely for the purposes of DGH's permitted use of the Software. DGH's obligations of confidentiality under this contract do not apply to any information or material provided to DGH by Supplier hereunder, which (i) is or becomes, through no fault of DGH, part of the public knowledge; (ii) is made or becomes available to DGH from a third party lawfully in possession of same and having no obligation of confidentiality to Supplier with respect thereto; or (iii) is already in DGH's possession in written form prior to disclosure to DGH by Supplier hereunder without obligation of confidentiality. DGH shall protect the Software from theft, misappropriation, and unauthorized reproduction. DGH may not transfer the Software to another party without first obtaining Supplier's express written approval; and in the event that Supplier grants permission to transfer, DGH agrees to assure that the receiving party is bound to like obligations of confidentiality with respect to the Software. It is expressly understood that the obligation of confidentiality will survive any termination or cancellation of this contract	
17	Liability Under the Contract 33	<p>Bidder wants to insert a new sub clause as :</p> <p>(b) In no event will Supplier be liable for any special, indirect, consequential, exemplary or punitive damages to DGH or any Other party as a result of the performance or non-performance by Supplier of any of the services described herein (including, without limitation, loss of data, profits or use of software) whether foreseeable or not, even if Supplier has been advised of the possibility of such damages.</p> <p>(c) Notwithstanding any other provisions incorporated elsewhere in the Contract, the aggregate liability of the Contractor in respect of this contract, whether under Contract, in tort or otherwise, shall not exceed 50% of the annualized Contract price,</p> <p>(d) DGH shall indemnify and keep indemnified Contractor harmless from and against any and all claims, costs, losses and liabilities in excess of the aggregate liability amount in terms of clause (c) above.</p>	<p>Clause 33 under page No 41 to be read as under: Notwithstanding any other provisions, except only in cases of willful misconduct and / or criminal acts, a) Neither the Contractor nor DGH shall be liable to the other, whether in Contract, tort, or otherwise, for any consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided however that this exclusion shall not apply to any obligation of the Contractor to pay Liquidated Damages to the DGH and b) Notwithstanding any other provisions incorporated elsewhere in the contract, the aggregate liability of the Contractor in respect of this contract, whether under the Contract, in tort or otherwise, shall not exceed Contract Price, provided however that this limitation shall not apply to the cost of repairing or replacing defective equipment by the Contractor, or to any obligation of the Contractor to indemnify the DGH with respect to Intellectual Property Rights. c) DGH shall indemnify and keep indemnified Contractor harmless from and against any and all claims, costs, losses and liabilities in excess of the aggregate liability amount in terms of clause (b) above. Refer - B. Amendment to Technical Specification and Terms & Conditions</p>
18	New Clauses	Data Interpretation: Bidder wants to insert new clause :	
		DGH accepts full responsibility for any investment made based on results from the Work. Any interpretations or analyses of geophysical or other DGH data, and any recommendation or reservoir description based upon such interpretations or analyses are opinions based upon inferences from measurements and empirical relationships and assumptions, which inferences and assumptions are not infallible, and with respect to which professional geoscientists may differ. Accordingly, Supplier cannot and does not warrant the accuracy, correctness or completeness of any such interpretation, recommendation or reservoir description, and DGH hereby releases and indemnifies Supplier for any claims relating to investment or operational decisions made by the DGH and arising from the Scope of Work of the Contract.	Not relevant on the present context
		Export Control : DGH may not export nor re-export any item of Hardware or Software Product without first obtaining authorization from the United States Department of Commerce and/or the United States Department of Treasury, as applicable.	Not relevant on the present context
		Knock For Knock Provision : Each Party agrees to be responsible for and to release, defend and indemnify the other and its respective Group from and against any and all claims, judgments, liabilities, costs and expenses (including attorneys' fees) for injury to or death of its respective Group personnel and for losses and damages of its respective Group property (whether owned, operated or hired), regardless of the cause and even if due in whole or in part to the fault, breach of contract or statute, or negligence of the indemnified Party.	Not agreed
19	Storage at PDC: Page 70 h. Performance/ Throughput Requirements	For cloud portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 17GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size. For NDR portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 3GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size.	No change. Minimum requirement is specified. Better performance is acceptable. However the offered storage to provide support for a broad range of enterprise workloads.

Queries from M/s Esconet Technologies Pvt. Ltd

S.No	Clause No. of Bidding Document	Description	Changes/ modifications proposed by the Bidders	DGH's Reply
------	--------------------------------	-------------	--	-------------

1	2.1 of Annexure III	In case bidder is OEM of offered hardware or SI, the bidder must submit a certificate from the OEMs of these software i.e Decision Space Geoscience (DSG) of M/s Halliburton and Petrel of M/s Schlumberger that the offered items as per the tender is certified on their latest version of application software. This is important because DGH is currently using the latest versions of DSG Suite of software from M/s Halliburton and Petrel Suite of software from M/s Schlumberger. Offers without certification from G&G software OEM(s) shall not be considered. Proforma for authorization to be submitted by OEM of Hardware/ SI attached as appendix C	To be deleted - as this supports single software OEM	No change
2	2.2 of Annexure III	In case bidder is "Original Equipment Manufacturer (OEM) of G&G Software used for interpretation of Exploration & Production (E&P) data for Oil & Gas industry", the bidder must provide tender specific relevant authorization letter from OEM(s) of their quoted products/ offering against this specific tender. Offers without authorization letter from OEM(s) shall not be considered.	To be deleted - as this supports single software OEM	No change
3	3.1 of Annexure III	Experience in E&P Industry Bidder should be in the business of providing Maintenance & Support (M&S) of G&G application software (Data Interpretation & Visualization software like Petrel and DSG) for minimum 5 years from the date of bid closing. Documentary evidence such as orders and contracts in support of the above requirements must have been issued to the bidder by their clients 5 years before the bid closing date. Documentary evidence in respect of the above must be submitted along with the techno-commercial bids in the form of copies of relevant Purchase Orders/contracts issued on or before the bid closing date along with copies of any of the documents in respect of satisfactory execution of each of those Purchase Orders/contracts, such as-(i) Satisfactory supply, completion/Installation report (OR) (ii) any other documentary evidence that can substantiate the satisfactory execution of the purchase orders/contracts cited above.	To be deleted - as this supports single software OEM	No change
	3.2 of Annexure III	Bidder should have minimum Two (02) implementations of G&G software running in a virtualized environment anywhere in India or globally during the last 5 years. Documentary evidence in respect of the above must be submitted in the form of a certificate from a client where their software is implemented/running in such a virtualized	To be deleted as this supports single software OEM OR one implementation during last three years.	No change

*Cells highlighted in green may please be treated as amendment to tender terms and conditions

D: Revised Technical Specifications Check List after Pre-Bid modifications

(Appendix – B)

Sr.No.	Item -1.01 of Price Bid HCI Nodes for VDI - 5 No.s		Brand/Model offered Yes/ No	Reference in Bid Document of Bidder
	Item	Vendor to specify Brand Make and Model offered.		
a.	Hyper Converged Appliance (Essential Features)	Hyper converged appliance, which comes Factory Installed with various software including Software Defined Storage and Hypervisor. SDS should NOT be top-up or add-on software license bundled on generic x86 server. It should be an integral part of appliance.		
		Offered Model to be Fully Software Defined Infrastructure (Compute, Storage and Management)		
		The sizing defined below includes 10% HCI over head. if any solution requires more than that, then they should factor accordingly.		
		Should also have capability to use Network Virtualization (SDN).		
b.	Nodes Required	Min. 5 Nodes		
c.	Processor	Latest Generation Intel® (Skylake/Cascadelake) Processors product family, ≥3.0 GHz per Core. Minimum 2 Sockets per Node. Both socket must be populated with 18 core or more per socket.		
d.	Total Physical Cores	Minimum 180 Cores (Including all the Nodes)		
e.	Processor Cache	Min. 22 MB L3 Cache per processor		
f.	Total Physical RAM	Min. 1.5 TB DDR4 per node.		
g.	Storage Cache	2 x 400 GB (SSD) or 1 x 800 GB (SSD) per Node. If SSD cache is not available then additional 10% RAM to be provided in each node.	Deleted	Deleted

h.	Total Usable Storage	Min. 20 TB Usable capacity with 1.9 TB SSD Disks or higher capacity disk without Deduplication and Compression.		
i.	Network Throughput	Total Network throughput from HYPERCONVERGED Chassis should be configured with total 40 Gbps per node with no single point of failure. i.e (N+1) redundancy		
j.	GPU	2 x Nvidia Tesla P40 Cards or Higher per Node		
k.	Data Services	The solution should provide enterprise data services such as <u>de-duplication and compression with erasure coding</u> OR <u>equivalent</u> in software/ hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.		
l.	Hypervisor	VMWare ESX Hypervisor needs to be proposed with the HCI Appliance for this requirement.		
m.	Scale Up and Scale Out	The solution should support non-disruptive Scale-Up (Upgrade by inserting additional drives in existing empty drive-slots) whenever required without any additional licensing cost and Scale-Out (Upgrade by adding nodes) upgrades to grow capacity and/or performance with no disruption to the workloads already running on the platform.		
n.	Hybrid and Flash Support	HCI solution should support SSD disks.		
o.	Cluster Scalability	Cluster architecture to be scalable upto 32 nodes wherein all the VM's should be capable to use compute, memory and storage resources from all the nodes in cluster architecture through a single interface .		
p.	Rack Unit	HCI Appliance should support different Rack Units depending upon the workload (2U4N or 1U1N or 2U1N)		
q.	Data Integrity Check	The solution should support checksum of data to ensure data integrity & to enable automatic detection and resolution of		

		silent disk errors.		
r.	Encryption	Solution should provide Data at Rest Encryption		
s.	Redundancy & Business Continuity	No Single Point of Failure with complete redundancy at all levels. Nodes should be configured to have atleast one copy of data available in cluster, in order to support data & cluster availability in event of One Node Failure		
		Proposed solution should have replication software to DR site. The solution should have capability to protect against data corruption		
		Replication should be possible locally (same datacenter) and/or remote site; and, on any x86 platform with requisite number of resources, as long as the hypervisor is same.		
		Replication software to be provided and should integrate with the hypervisor.		
t.	Storage Feature	Storage policies should be enforced & managed directly from hypervisor/ SDS		
u.	Manageability & Security	Single Web Interface Central Management for Compute, Network, Storage and Clustering.		
		Single Click Feature should be available for upgrade/update for all components of compute (including network adapter, BIOS), hypervisor and SDS.		
		The Solution should be able to monitor end to end session of the user including giving the insight of the underlying infrastructure like server and Storage Note: This feature though mentioned under HCI is basically VMware feature factored in the VMware licenses (VMware Horizon session recording). Feature compliance to be provided against this clause.		

		All Nodes supplied with the HCI appliance should support following security features. 1) Should have a cyber-resilient architecture for a hardened server design for protection, detection & recovery from cyber-attacks 2) Should protect against hardware firmware attacks which executes before OS boots/ secure boots. 3) Hardware should support Silicon / Hardware Root of Trust.		
v.	Scalability	Proposed solution should be based on modular scalable architecture having the ability to add auto-discoverable Nodes. Node addition should be non-disruptive & seamless; and should allow simple ONE node scaling.		
		Proposed solution must support automated cluster deployment, configuration and non-disruptive updates and migration		
w.	Hypervisor Features Note: These features though mentioned under HCI are basically VMware feature factored in the VMware licenses at item 1.11 of this Appendix -B. Feature compliance to be provided against these clauses.	The solution should be able to support different generation of Intel processors in the same cluster for investment protection over the life of the proposed solution.		
		The solution should provide integration of 3rd party endpoint security to secure the virtual machines with offloaded antivirus, anti-malware solutions without the need for agents inside the virtual machines.		
		Shall distribute data intelligently across all nodes and capacity utilization across all nodes has to be uniform at all times .		
		The solution should provide a virtual switch which can span across a virtual datacenter and multiple hosts should be able to connect to it. This in turn will simplify and enhance virtual machine networking in virtualized environments		
		Should have all Virtualization benefits like High Availability, automated distribution of resources and automated live migration of Virtual Machines from one physical server to another in case of		

		any failure.		
x.	Performance IOPS	Minimum 70K IOPS or more with less than 5ms response time when using 8K/16K block size at 70:30 - Read Write Ratio		
y.	Single Point of Support	Single point of support for HCI solution including virtualization		
z.	OS Support	Windows 2012 and 2016 Standard/Data Center, SUSE Enterprise Linux, RHEL 6.x, (All latest flavors of Linux and Windows) in the Virtual Machines		
aa.	Warranty	24 X 7 X 365 onsite for five years fulfilled directly by bidder. Single number support for all components of appliance (compute, hypervisor, software defined storage) for 5 years All SSD supplied must be covered and replacement must be provided during this 5 year period even if SSD have reached its wear level or usage limits.		
bb.	Rack, PDU and Accessories	Required number of Industry Standard Rack and PDUs to be provided by bidder alongwith all accessories. Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP, SFP+ etc that are required to make the system fully functional needs to be provided along with the system. Each node should have dedicated non-shared dual-power supplies and should be able to sustain single power supply failure.		

Sr.No.	Item -1.02 of Price Bid HCI Nodes for AD & DB - 5 No.s		Brand/Make/Model offered Yes/ No	Reference in Bid Document of Bidder
	Item	Vendor to specify Brand Make and Model offered.		
a.	Hyper Converged Appliance (Features and Requirements)	Hyper converged appliance, which comes Factory Installed with various software including Software Defined Storage and Hypervisor. SDS should NOT be top-up or add-on software license bundled on generic x86 server. It should be an integral part of appliance.		
		Offered Model to be Fully Software Defined Infrastructure (Compute, Storage and Management)		
		The sizing defined below includes 10% HCI over head. if any solution requires more than that, then they should factor accordingly.		
		Should also have capability to use Network Virtualization (SDN).		
b.	Nodes Required	Min. 5 Nodes		
c.	Processor	Latest Generation Intel® (Skylake/Cascadelake) Processors product family, ≥ 2.7 GHz per Core. Minimum 2 Sockets per Node. Both socket must be populated with 18 core or more per socket.		
d.	Total Physical Cores	Minimum 180 Cores (Including all the Nodes)		
e.	Processor Cache	Min. 22 MB L3 Cache per processor		
f.	Total Physical RAM	Min. 1024 GB DDR4 per Node.		
g.	Storage Cache	2 x 400 GB (SSD) or 1 x 800 GB (SSD) per Node. If SSD cache is not available then additional 10% RAM	Deleted	Deleted

		to be provided in each node.		
h.	Total Usable Storage	Min. 50 TB Usable capacity with 1.9 TB SSD Disks or higher capacity without Deduplication and Compression.		
i.	Network Throughput	Total Network throughput from HYPERCONVERGED Chassis should be configured with total 20 Gbps per node with no single point of failure. (N+1) redundancy		
j.	Data Services	The solution should provide enterprise data services such as <u>de-duplication and compression with erasure coding</u> OR <u>equivalent</u> in software/ hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and licensed.		
k.	Hypervisor	VMWare ESX Hypervisor needs to be proposed with the HCI Appliance for this requirement		
l.	Scale Up and Scale Out	The solution should support non-disruptive Scale-Up (Upgrade by inserting additional drives in existing empty drive-slots) whenever required without any additional licensing cost and Scale-Out (Upgrade by adding nodes) upgrades to grow capacity and/or performance with no disruption to the workloads already running on the platform.		
m.	Hybrid and Flash Support	HCI solution should support SSD disks		
n.	Cluster Scalability	Cluster architecture to be scalable upto 32 nodes wherein all the VM's should be capable to use compute, memory and storage resources from all the nodes in a cluster architecture through a single interface.		

o.	Rack Unit	HCI Appliance should support different Rack Units depending upon the workload (2U4N or 1U1N or 2U1N)		
p.	Data Integrity Check	The solution should support checksum of data to ensure data integrity & to enable automatic detection and resolution of silent disk errors.		
q.	Encryption	Solution should provide Data at Rest Encryption		
r.	Redundancy & Business Continuity	No Single Point of Failure with complete redundancy at all levels. Nodes should be configured to have atleast one copy of data available in cluster, in order to support data & cluster availability in event of One Node Failure		
		Proposed solution should have replication software to DR site. The solution should have capability to protect against data corruption.		
		Replication should be possible locally (same datacenter) and/or remote site; and, on any x86 platform with requisite number of resources, as long as the hypervisor is same.		
		Replication software to be provided and should integrate with the hypervisor.		
s.	Storage Feature	Storage policies should be enforced & managed directly from hypervisor/ SDS		
t.	Manageability & Security	Single Web Interface Central Management for Compute, Network, Storage and Clustering.		
		Single Click Feature should be available for upgrade/update for all components of compute (including		

		network adapter, BIOS), hypervisor and SDS.		
		The Solution should be able to monitor end to end session of the user including giving the insight of the underlying infrastructure like server and Storage Note: This feature though mentioned under HCI is basically VMware feature factored in the VMware licenses (VMware Horizon session recording). Feature compliance to be provided against this clause.		
		All Nodes supplied with the HCI appliance should support following security features. 1) Should have a cyber-resilient architecture for a hardened server design for protection, detection & recovery from cyber-attacks 2) Should protect against hardware firmware attacks which executes before OS boots/ secure boots. 3) Hardware should support Silicon / Hardware Root of Trust.		
u.	Scalability	Proposed solution should be based on modular scalable architecture having the ability to add auto-discoverable Nodes. Node addition should be non-disruptive & seamless; and should allow simple ONE node scaling.		
		Proposed solution must support automated cluster deployment, configuration and non-disruptive updates and migration		
v.	Hypervisor Features Note: These features though	The solution should be able to support different generation of Intel processors in the same cluster for investment protection over the life of the proposed solution.		

	<p>mentioned under HCI are basically VMware feature factored in the VMware licenses at item 1.11 of this Appendix -B. Feature compliance to be provided against these clauses.</p>	<p>The solution should provide integration of 3rd party endpoint security to secure the virtual machines with offloaded antivirus, anti-malware solutions without the need for agents inside the virtual machines.</p>		
		<p>Shall distribute data intelligently across all nodes and capacity utilization across all nodes has to be uniform at all times .</p>		
		<p>The solution should provide a virtual switch which can span across a virtual datacenter and multiple hosts should be able to connect to it. This in turn will simplify and enhance virtual machine networking in virtualized environments</p>		
		<p>Should have all Virtualization benefits like High Availability, automated distribution of resources and automated live migration of Virtual Machines from one physical server to another in case of any failure</p>		
w.	Performance IOPS	<p>Minimum 70K IOPS or more with less than 5ms response time when using 8K/16K block size at 70:30 - Read Write Ratio</p>		
x.	Single Point of Support	<p>Single point of support for HCI solution including virtualization</p>		
y.	OS Support	<p>Windows 2012 and 2016 Standard/Data Center, SUSE Enterprise Linux, RHEL 6.x, (All latest flavors of Linux and Windows) in the Virtual Machines</p>		
z.	Warranty	<p>24X7X365 onsite for five years fulfilled directly by bidder. Single</p>		

		<p>number support for all components of appliance (compute, hypervisor, software defined storage) for 5 years</p> <p>All SSD supplied must be covered and replacement must be provided during this 5 year period even if SSD have reached its wear level or usage limits.</p>		
aa.	Rack, PDU and Accessories	<p>Required number of Industry Standard Rack and PDUs to be provided by bidder alongwith all accessories. Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP, SFP+ etc that are required to make the system fully functional needs to be provided along with the system. Each node should have dedicated non-shared dual-power supplies and should be able to sustain single power supply failure.</p>		

Sr. No.	Item -1.03 of Price Bid Storage System- PDC – 01 No.		Brand/Model offered Yes/ No	Reference in Bid Document of Bidder
	Item	Vendor to specify Brand Make and Model offered.		
	a. Controllers and Architecture	<p>Architecture: Storage should be Fully Symmetric OR Fully Distributed Clustered Architecture written for Scale-Out NAS operations. Hardware and software engineering, and support should be from the same OEM. The Scale-out-NAS must be based upon dedicated NAS appliance hardware. System should support linear scalability in Performance and Capacity, without any disruptions to production workflow. <u>The NAS appliance should have specialized Operating System, dedicated and tuned for serving data efficiently and written for scale-out architecture.</u> General purpose OS will not be acceptable for the NAS system. The architecture should have a single namespace.</p> <p>Controllers: Separated controllers are factored for SSD and SAS/NL-SAS/SATA a) Minimum 4 Active-Active Storage Controllers/ Nodes must be provided, serving all flash storage for cloud and b) Minimum 4 Active-Active Storage Controllers/ Nodes should be provided for serving NDR data requirements. Offered architecture should be upgradable to min 12 numbers of NAS Storage Controllers/ Nodes seamlessly, without any disruptions/downtime to production workflow for performance, capacity enhancement, software/firmware upgrades. All storage nodes/controllers must be active-active, contributing in</p>		

		<p>performance and capacity of the system.</p> <p>In Active / Active cluster mode offered model should guarantee not more than 20% system degradation in case of controller failure.</p>		
b.	Onboard Memory	<p>Storage Solution to be configured with minimum 1TB DRAM based usable cache across NAS Storage Controller/ NAS Storage Node configured for read and write operations. If there are any controllers serving the disks separately then equal amount of DRAM based cache must be provided on those controllers to avoid any funnelling effect.</p>		
c.	Network Ports	<p>Each Storage Controllers/ Storage node should have minimum of 2 x 40GbE for client connections for nodes/controllers serving all flash. Total 8 x 40 GbE. Each Storage Controllers/ Storage node should have minimum 2 x 10GbE for client connections for nodes/controllers serving NL-SAS/SATA. Total 8 x 10 GbE.</p>		
d.	Disk Type	<p>Storage solution should have capability to support different kinds of disks types</p>		

		likes SSD and NL-SAS/SATA drives pools in same filesystem/ namespace in same storage Cluster.		
e.	Operating System	Scale-Out Storage should have Fully Journalled, fully distributed, specialised Operating System by same OEM (as storage hardware) , dedicated for serving data efficiently and customised for True Scale-Out Storage. General purpose OS will not be acceptable for the NAS Appliance.		
f.	Redundancy with No Single Point of Failure (SPOF)	<p>The Scale-Out Storage System should be able to protect the data against simultaneous 2(Two) disk failures or have equivalent technology for data protection.</p> <p>The Scale-Out Storage should be configured to sustain atleast one Storage Controller/Single Node failure in the storage system without data unavailability and performance drop of not more than 20%.</p> <ul style="list-style-type: none"> - Data should be striped across all storage controllers/ HA pair in the proposed storage system, so that performance of all controllers/ HA pairs can be utilized for all read and write operations. - The backend internal connectivity between storage controllers/storage nodes should be using high performance Infiniband or 40 GigE network with no single point of failure. - Redundant and Hot replaceble modules: Controllers, Hard Disk Drive and power supplies (230V AC, 50 Hz.) - The Complete multi-controller Storage System Solution should be fully redundant, configured in High Availability mode and should NOT have any Single Point of Failure (SPOF). 		

	<p>g. Total Storage Capacity</p>	<p>1 PB(Petabyte) usable capacity with single unified addressable namespace /single filesystem after required protection level on complete storage solution. The NAS Appliance should be scalable upto 60 PB usable as a single filesystem/or a single global namespace. Current Capacity to be configured as - a) 250 TiB usable Flash Tier Capacity using SSD of size 7.6TB or less (1 TiB = 1024 x 1024 x 1024 x 1024 bytes)b) 750 TiB usable Tier Capacity using NL-SAS / SATA HDD of size 10TB or less. (1 TiB = 1024 x 1024 x 1024 x 1024 bytes)10% additional usable space must be provisioned as snapshot space for SSD and NL-SAS/SATA disk tier respectively. License for the same must be provided5% additional usable space (in terms of HDD/ SSD must be provisioned for hot sparing apart from usable capacity based on OEM best practice. License for the same must be provided</p>		
	<p>h. Performance/ Throughput Requirement</p>	<p>For cloud portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 8GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size.</p> <p>For NDR portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 1.4GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size.</p> <p>Bidder needs to demonstrate this performance using free third party applications like IOmeter /FIO etc as part of User Acceptance test.</p> <p>While testing the cloud and NDR portions of the storage, host connectivity will be allowed only to the</p>		

		<p>controllers serving cloud, or NDR storage dedicatedly. Rest of the controllers should be powered off/disconnected. Cache of both storage and hosts must be cleared before test run by rebooting the controllers. The performance must be demonstrated with data at rest encryption feature switched on along with remote replication.</p>		
	<p>Capacity/performance Expansion</p>	<p>There should not be any downtime or migration activity required in the event it is needed to add additional capacity or additional performance to the storage system. Storage solution should enable independent and linear scalability of performance and capacity. The system must be able to support policy based tiering to different storage tiers with internal/external storage sub-system.</p>		
	<p>i. Protocol Support</p>	<p>Must provide access for a variety of operating systems (Mac, Linux, Windows) using all standard protocols: NFS, SMB(CIFS) etc. All protocols supported by the storage must be licensed and provided from day one. All licenses must be perpetual in nature. Should support user security mechanisms like AD,LDAP and NIS.</p>		
	<p>j. File Sharing</p>	<p>Should allow simultaneous access to the same file/data via SMB and NFS for data sharing between LINUX and Windows hosts. Data must be encrypted in motion during file sharing operations.</p>		

k.	File Locking & Filtering	File Locking for Data protection from corruption while sharing files between Linux (RHEL) and Windows users.		
l.	Client Load Balancing	Storage System should have capability to load balance client connectivity across these multiple controllers so that all clients gets distributed across all existing controllers/nodes to avoid any performance hotspot. In case native functionality is not available in the storage, bidder must provide a mechanism such as redundant pair of hardware load balancer for the the same		
m.	Heterogenous support for end user systems	Operating system support RedHat Linux, Suse Linux, Windows Servers 2003/2008 or later , Windows XP/7 or later.		
n.	Management Interface software	Support the management, administration and configuration of the whole storage platform through a single management interface along with CLI		
o.	Spare Disks:	Vendor will maintain at DGH-NDR site THREE (03) spare SSD disks and TEN (10) spare NL-SAS / SATA disks of same type and capacity (Cold spares) which may be required to meet immediate replacement for breakdown disks.		
p.	Disaster Recovery	The storage system shall be able to support directory and file-level OR volume level asynchronous replication across WAN to another storage system of same type. The replication software shall have a comprehensive Volume/ file and directory selection criteria for replication. The storage system at the remote site shall be at the same protection level as the primary site and be able to sustain 2 disks failure or 1 controller failure after failover. The storage system must preserve bandwidth during replication else must		

		provide redundant WAN optimiser to preserve the bandwidth.		
q.	Data Security	Data must be securely encrypted at rest, in motion and while replication at SDC. Protection from ransomware etc. must be ensured.		
r.	De-duplication and compression	Proposed storage should be configured with de-duplication and/ or compression feature.		
s.	Warranty	5 years comprehensive OEM onsite warranty		
t.	Rack, PDU and Accessories	Required number of rack and PDUs to be provided by the Storage OEM alongwith all accessories. Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP, SFP+ etc that are required to make the system fully functional needs to be provided along with the system.		

Sr. No.	Item -1.04 of Price Bid TOR Switch – PDC – 02 Nos.	Brand/Make/Model offered Yes/ No	Reference in Bid Document of Bidder
	Vendor to specify Brand Make and Model offered.		
a.	The offered switch should be datacenter class switch with redundant power supply & fan trays.		
	Switching capacity of 1.4Tbps or more, and throughput of 1070 Mbps or more.		
	48 nos. of 1/10 Gigabit Ethernet SFP+ ports or FCOE ports and at least 4 nos of the 40 Gigabit Ethernet QSFP+uplink ports		
	Following items shall be included in the supply (for each switch):		
b.	i. 2 nos. of 40 Gigabit Ethernet QSFP+ optical transceivers with required fibre patch cables for connectivity to TOR switches		
	ii. 8 nos. of 10GBASE-SR SFP+ transceivers		
	iii. 36 nos. of 1GBASE-T SFP transceivers		
c.	All required licenses and other optics/ accessories including jack panel, patch cords etc., shall be supplied for above ports		
	Layer 2 features		
d.	i. IEEE 802.1Q VLAN encapsulation		
	ii. Support for minimum 1000 VLANs		
	iii. Support for minimum 1000 access control list (ACL) entries		
	iv. Rapid Per-VLAN Spanning Tree Plus (PVRST+) (IEEE 802.1w compatible)		
	v. Multiple Spanning Tree Protocol (MSTP) (IEEE 802.1s): 64 instances		
	vi. Spanning Tree PortFast		
	vii. Spanning Tree root guard		
	viii. Spanning Tree Bridge Assurance/ loop guard		
	ix. Link Aggregation Control Protocol (LACP): IEEE 802.3ad		
	x. Advanced port-channel / LACP with load balancing		
	xi. Jumbo frames on all ports		
	xii. Pause frames (IEEE 802.3x)		

	xiii.	Storm control (unicast, multicast, and broadcast)		
	xiv.	Private VLANs		
	xv.	Private VLAN over trunks (isolated and promiscuous)		
	xvi.	VLAN remapping		
e.	Layer 3 features:			
	i.	Support for 1024 VLANs		
	ii.	1000 ACL entries		
	iii.	Routing protocols: Static, Routing Information Protocol Version 2 (RIPv2), Open Shortest Path First Version 2 (OSPFv2), Border Gateway Protocol (BGP), and Intermediate System-to-Intermediate System (IS-IS)		
	iv.	IPv6 routing protocols: Static, OPFv3, BGPv6		
	v.	Virtual Router Redundancy Protocol (VRRP)		
f.	Management Features:			
	i.	Switch management using 10/100/1000-Mbps management or console ports		
	ii.	CLI-based console to provide detailed out-of-band management		
	iii.	In-band switch management		
	iv.	Secure Shell Version 2 (SSHv2)		
	v.	Telnet		
g.	Authentication, authorization, and accounting (AAA)			
	i.	RADIUS		
	ii.	TACACS+		
	iii.	Syslog		
	iv.	SNMPv1, v2, and v3 (IPv4 and IPv6)		
	v.	Remote monitoring (RMON)		
	vi.	RBAC		
	vii.	SPAN		
	viii.	Network Time Protocol (NTP)		
h.	Warranty: 5 years comprehensive OEM onsite			
i.	Accessories			
	Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP, SFP+ etc that are required to make the system fully functional needs to be provided along with the system.			

Sr.No.	Item -1.05 of Price Bid L3 Switch – PDC – 02 Nos.		Brand/Make/ Model offered Yes/ No	Reference in Bid Document of Bidder
	Item	Vendor to specify Brand Make and Model offered.		
a.	Device Type:	Switch supporting Full Enterprise Layer 3 image supporting IPv6 and BGP with the latest Firmware as available with Line rate non-blocking performance.		
b.	Ports Scalability	The switch should support 48x10GbE SFP+ ports and 6x40GbE QSFP+ ports for uplink from day-1. It should have option to upgrade to min. 4x100G ports without changing entire switch.		
c.	High Availability	The switch should support HA options in Active - Active or Active Backup configuration as required, all supporting features and licenses to be provided to support the same.		
d.	Performance			
	Switching Capacity	Minimum 1.76Tbps backplane or more for wire rate performance with 800 nano second latency or better		
	Switching Throughput	Minimum 1320 million pps or better		
	MAC Address Table Size	Minimum 256K MAC addresses		
	802.1Q Vlans	4K 802.1Q vlans with 4K vlan ID support		
e.	Networking Features			
	Data Link Protocol:	Ethernet, Fast Ethernet, Gigabit Ethernet, 10 Gigabit, 40 Gigabit, 25 Gigabit, 100 Gigabit		
		Should support 128K route table capacity for IPv4 & IPv6		

	Routing Protocol:	Should have Static Route, OSPF, BGP, PBR from Day one for both IPv4 and IPv6 considering all License, software, hardware upgrades required if any.		
	Storage protocols	Should support Data Center Infra DCB, iSCSI/ FCoE, ETS considering all Licenses.		
	Fabric Features	Should support Spine-Leaf architecture using BGP EVPN from day-1		
f.	Security Features			
		Should support all AAA functions with RADIUS and TACACS integration.		
		Should support various strom control functions.		
		Should support Intrusion Protection like functionality against various TCP/UDP attacks.		
		Should support Control Plane / CPU protection using ACL and Qos.		
		Should support 802.1x implementation using RADIUS, BFD		
		Should support 128 Lag groups & min 32 ports per group		
g.	Management Function			
	Configurati on	CLI automation, zero touch deployment. Should support encrypted communication between the user accessing the device namely using all access methods CLI or NMS via features like SSHv2, SSL, and SNMPv3 and Secure FTP/TFTP, SCP		
		Control Plane Service APIs, Scripting Tools , streaming Telemetry, Ansible, pupper/chef/saltstack, OpenFlow 1.3, IEEE 1588v2		
h.	Physical parameter of switch			

	Redundancy	The proposed switch should be offered with redundant FAN tray and Power supply Redundancy.		
	operating specifications	Operating temperature: 41° to 104°F (5° to 40°C)		
	Console/Management Port	1 RJ45 console port or 1 micro-USB-B console port, 1 RJ45 10/100/1000Base-T Out Of Band management port		
i.	Compliant Standards:			
		Should be ROHS Compliant		
	Immunity	EN 300 386, EN 55024, EN 61000-3-2, EN 61000-3-3, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6		
		EN 60825-2 Safety of Laser Products Part 2: Safety of Optical Fibre Communication Systems		
j.	Warranty and Support	OEM warranty for 5 year 24x7x365 support		

Sr.No.	Item -1.06 of Price Bid Management Switch – PDC – 01No.		Brand/Make / Model offered Yes/ No	Reference in Bid Document of Bidder
	Item	Vendor to specify Brand Make and Model offered.		
a.	Device Type:	Full managed gigabit ethernet 1RU layer 2 switch		
b.	Ports Scalability	24x 10/100/1000Mbps half/full duplex RJ45 ports, 4x SFP/SFP+ 1/10GbE ports		
c.	High Availability	The switch should support stacking from day-1		
d.	Performance			
	Switching Capacity	Minimum 128Gbps backplane or more for wire rate		

		performance		
	Switching Throughput	Minimum 96 million pps or better		
	MAC Address Table Size	Minimum 16K MAC addresses		
	802.1Q Vlans	Minimum 500 VLANs, private VLAN		
	Networking Features			
e.	Data Link Protocol:	802.1X Network Access Control, Auto VLAN, 802.2 Logical Link Control 802.3 10BASE-T, 802.3ab Gigabit Ethernet (1000BASE-T) 802.3ac Frame Extensions for VLAN Tagging 802.3ad Link Aggregation with LACP 802.3ae 10Gigabit Ethernet (10GBASE-X)		
		802.3az Energy Efficient Ethernet, IGMP v1/v2/v3 snooping & querier		
	Other features:	Time controlled ACLs, 40Gbps stacking, double VLAN tagging		
	Security Features			
f.		Should support all AAA functions with RADIUS and TACACS integration.		
		Should have broadcast storm control		
		view based control model, user-based security model		
		RSPAN, custom login banner		
		Should support 802.1x monitor mode, dynamic arp inspection		
		Should support 64 Lag groups & min 8 ports per group		
	Management Function			
g.		CLI, Telnet, web GUI, SSH		
		RMON, sflow or equivalent, SNMP v1/v2/v3		
	Physical parameter of switch			
h.	Redundancy	Should have redundant variable speed fans		
	operating specifications	Operating temperature: 0° to 45°C		

	Console/Management Port	1 RJ45 console port or 1 micro-USB-B console port		
i.	Compliant Standards:			
		Should be ROHS Compliant		
	Immunity	EN 61000-4-5: Surge		
		USA: FCC Class A, EU WEEE		
j.	Warranty and Support SLA	OEM warranty for 5 year 24x7x365 support		

Sr.No.	Item -1.07 of Price Bid Firewall - PDC - 02 Nos.	Brand/Make / Model offered Yes/ No	Reference in Bid Document of Bidder
	Vendor to specify Brand Make and Model offered.		
a.	Solution should be an integrated Next Gen Firewall platform which includes firewall, application control, IPS, Anti-Bot, Anti-Spyware/ Anti-Phishing, URL Filtering and Advanced Persistent threat Prevention capabilities in a single appliance, configured in High Availability Mode. Firewall should be provided with "Zero" day protection feature.		
b.	The appliance should support at least 6 nos 10/100/1000 Gigabit ports		
c.	Proposed appliance should have inbuilt redundant power supply.		
d.	Firewall should have local in-built storage of minimum 100GB SSD		
e.	Firewall should have minimum 8GB memory.		
f.	Firewall must have minimum 1Gbps of real world multiprotocol throughput including firewall, IPS and application visibility		
g.	Firewall should support 3DES/AES IPsec VPN throughput of at least 300 Mbps		
h.	Proposed solution must include SSL VPN license for minimum 50 users		
i.	Network Security Firewall should support "Stateful" policy inspection technology. It should also have application intelligence for commonly used TCP/IP protocols like telnet, ftp etc.		
j.	It should support the Firewall and IPSEC VPN as integrated security functions		

k.	Appliance should have granular visibility with respect to user and group policy.		
l.	The Firewall should support authentication protocols like Active Directory, LDAP and have support for Firewall passwords token-based products and X.509 digital certificates or equivalent.		
m.	The IPS should be constantly updated with new defences against emerging threats.		
n.	IPS Engine should support Vulnerability and Exploit signatures, Protocol validation, Anomaly detection, Behaviour-based detection, Multi-element correlation.		
o.	IPS should have the functionality of Geo Protection to Block the traffic country wise incoming as well as outgoing.		
p.	IPS should be able to detect and prevent embedded threats with in SSL traffic.		
q.	Application control must identify applications, its different categories, URLs, HTTPS inspection, Malware content sites, IP and/or user based policies.		
r.	The proposed solution must be able to support DoS protection		
s.	The proposed solution shall support DNS proxy or DNS security and DNS sinkhole which can block the DNS black listed domains and URLs.		
t.	Inspect content to protect networks. Protect the network against known and unknown threats including vulnerability exploits and malware embedded in all types of traffic.		
u.	Application control database should contain more than 3000 known web 2.0 applications and social network widgets. Bidder to confirm the current application database and social network widgets.		
v.	Proposed solution support Multi Link Management and should support more than two ISPs.		
w.	Solution must have a URL categorization and URLs filtering database. Should have predefined more than 50+ categories. The solution should have the capabilities to block, permit, allow & log, protocols other than HTTP, HTTPS, FTP		

x.	The solution should also have the scalability to scan & secure SSL encrypted traffic passing through gateway. Should perform inspection to detect & block malicious content downloaded through SSL.		
y.	Should scan outbound URL requests and ensure users do not visit websites that are known to distribute malware.		
z.	Granularly define exceptions for SSL inspection to protect user privacy and comply with corporate policy.		
aa.	Solution should be able to detect & Prevent bot outbreaks and APT attacks		
bb.	Solution should be able to detect & Prevent the Bot infected machine		
cc.	Solution should be able to detect & Prevent Unique communication patterns used by BOTs i.e. Information about Botnet family		
dd.	Solution should be able to detect & Prevent attack types i.e., such as spam sending click fraud or self-distribution, that are associated with Bots		
ee.	Solution should be able to block traffic between infected Host and Remote Operator and not to legitimate destination		
ff.	The solution should provide the protection from zero day attacks, known & un-known attacks.		
gg.	It should be able to scan SSL & TLS traffic.		
hh.	The solution should support detection & prevention of Cryptors & ransomware and variants (Cryptlocker , CryptoWall etc) through use of static and/or dynamic analysis		
ii.	The solution should be able to scan & find for unknown threats in executable, archive files ,documents, JAVA and flash like: 7z ,cab, doc,pdf, ppt, pptx, rar, rtf, scr, swf, tar, docx, , jar, xls, , xlsx, ,xlw, zip etc.		
jj.	The solution should eliminate threats and detect and block exploitable content, including active content and embedded objects		
kk.	Upon malicious files detection, a detailed report should be generated for each one of the malicious files.		
ll.	Firewall central management reporting, logging and analyzer solution has to be in dedicated appliance foot print		

mm	Centralized Firewall management should be able to manage all functions specified in Firewall, NIPS, AntiBot specification from central console		
nn	Firewall should be able to provide central logging, Analysis and granular reporting		
oo	Management (Management , reporting, analysis) System Support for role based administration of firewall		
pp	Solution should support analysis of traffic pattern using graphs and charts		
qq	Should provide clear indications that highlight regulations with serious indications of potential breaches with respect to Access Policies, Intrusion, Malwares, BOT, URL, Applications etc.		
rr	Required software license for providing above features shall be included in the solution.		
ss	Above hardware items shall be installed in OEM supplied industry standard rack with required PDU for dual power supply, other accessories.		
Sr.No.	Item -1.08 of Price Bid Thin Clients with Dual Monitors (12 Nos + 24 Nos Monitors) for PDC	Brand/Make / Model offered Yes/ No	Reference in Bid Document of Bidder
	Vendor to specify Brand Make and Model offered.	Qty	
a.	30/32 inch Monitor with 3840 x 2160 resolution	24	
b.	OS - Windows Embedded Standard 7 (64bit) or higher	12	
c.	CPU - Intel/AMD 2.0 GHz quad core or higher	12	
d.	Memory - 32 GB or higher Flash / 4GB RAM DDR3	12	
e.	Graphics - Built-in Graphics controller		
f.	I/O - 4 x USB 2.0, 2 x USB 3.0, universal headset jack, 1 x RJ-5, 2 x Display Ports/ HDMI ports.	12	
g.	Networking -10/100/1000Mbps Ethernet (RJ45).	12	
h.	OEM USB Keyboard and Mouse	12	
i.	All Accessories required to make the system functional needs to be provided		

j.	Five years comprehensive OEM warranty			
----	---------------------------------------	--	--	--

S.No	Item -1.09 of Price Bid Disk Based Appliance/ storage and Backup Software for PDC -01 No.		Brand/Make/ Model offered Yes/ No	Reference in Bid Document of Bidder
	Vendor to specify Brand Make and Model offered.			
a.	D2D Appliance/ storage	<p>DGH wants to implement backup-to-disk solution using disk based backup appliances/ storage to simplify operations and improve overall backup/restore performance. The solution should consist of Enterprise backup software and disk based backup appliances/ storage.</p> <p>OEM best practice to be configured and adopted for local and remote NDMP backup. Necessary documentation to be provided.</p> <p>The solution should be capable of integration with active directory infrastructure for ease of user rights management along with role based access control to regulate the level of management.</p> <p>The solution must have capability to do trend analysis for capacity planning of backup environment not limiting to Backup Application/Clients, Virtual Environment etc.</p>		

<p>b.</p>	<p>Backup Software</p>	<p>Bidder must provide capacity/socket -20 base licenses.</p> <p>The Software must be able to provide VMWARE VM machines image based backups and restore a single VM, single file from a VM, a VMDK restore from the same management console for ease of use.</p> <p>Backup software should have the capability for Block based backups with granular recovery capability for Windows, Linux, Hyper-V, VMWARE</p> <p>The backup software should be available on various OS platforms like Windows, Linux, etc</p> <p>The backup solution should also support online LAN Free SAN based backups of databases through appropriate agents for Oracle, MS SQL Server, Exchange, SharePoint, IBM DB2 , Informix, MySQL, SAP HANA & Sybase etc.</p> <p>The software must support integration with VMWare vRealize Automation for complete orchestration and bidder has to intergrate with VRA.</p> <p>Must support NAS and storage array based snapshot backup for off host zero downtime and zero load on the primary backup client with wizard based configuration.</p> <p>The offered software should support disk-to-disk backup and</p>		
------------------	-------------------------------	--	--	--

		disk-to-tape backup.		
--	--	----------------------	--	--

c.	<p>Capacity</p>	<p>The disk based backup appliance/ storage must be sized appropriately for backup of 70TB of (FileSystem,Database & VM Data) as per below backup policies</p> <ul style="list-style-type: none"> a. Daily Incremental Backup – retained for 4 weeks in disk based appliance/ storage b. Weekly Full Backup for all data types – retained for 3 month in disk based appliance/ storage c. Monthly Full Backups – Retained for 12 Months in the same appliance/ storage <p>The solution should be quoted with a minimum usable capacity of 110 TB and should be scalable upto 240 TB or higher for long term retention. Any additional capacity required as per above mentioned retention policy sizing needs to be provided by the bidder/OEM for an entire warranty period of the disk appliance/ storage without adding any new shelf and controller.</p>		
d.	<p>RAID Level and storage</p>	<p>The appliance/ storage should be offered RAID-6 with SATA/NL-SAS disk drives along with hot-spare disks in the ratio of 15:1 or better.</p>		
e.	<p>Features</p>	<p>The appliance/ storage should provide global and inline data duplication using automated variable block length deduplication technology.</p> <p>Appliance/ storage must be able to provisioned as target device via LAN/SAN and as VTL/ disk volume simultaneously</p>		

	<p>Use of Source and Target Based De-duplication for Backups. In order to improve the backup performance and reduce the disk footprint for storing backup data, the disk-appliance solution proposed by the Bidder must provide inline global de-duplication and must integrate with the backup software to facilitate client direct backups to the backup disk with source based de-duplication to reduce data transfer over IP and FC Networks.</p>		
	<p>The appliance/ storage should be offered with protocols like VTL/ disk volume. All of the protocols should be available to use concurrently with global deduplication for data ingested across all of them.</p>		
	<p>The appliance/ storage should support industry leading backup software like Symantec Netbackup/ Commvault/ DELLEMC Networker/ Microsfocus Data Protector etc and should provide deduplication at host / application level so that only changed blocks travel through network to backup device.</p>		
	<p>The appliance/ storage should Support Enterprise Applications and Database Backups with/ without integration with Backup Software, for better visibility of Backups to Application and database Owners, thus ensuring faster and direct recovery on application/database level. This integration should be available for Oracle, SAP, SAP HANA, DB2, MS SQL, Hadoop, MongoDB, Cassandra etc.</p>		

		<p>The appliance/ storage should support 256 bit AES encryption for data at rest and data-in-flight during replication. It should offer internal and external key management for encryption.</p>		
		<p>The appliance/ storage should support different retentions for Backup at primary and DR and must support for transmitting only deduplicated unique data in encrypted format to remote sites.</p>		
f.	Ports	<p>The appliance/ storage should have the ability to perform different backup, restore, replication jobs simultaneously and Must supports communications and data transfers through 8/16 GB SAN, 10 Gb & 1 Gb ethernet LAN over copper and SFP+.</p> <p>The backup appliance/ storage should be offered with min. 2 x 1Gbps NIC, 4 x 10Gbps NIC and 4 x 16Gbps FC ports.</p>		
g.	Performance	<p>The appliance/ storage must support minimum backup throughput of 30 TB/hr RAID 6 and without using hot spare disk.</p> <p>The solution must ensure that the Backup of entire data (70TB) should be complete within 8 hours of backup window. In case any hardware/software along license is required to deliver this must be supplied by bidder.</p>		
h.	Scalability	<p>The appliance/ storage must be proposed with No Single Point Of Failure (NSPOF) like controller, fans, power system etc.</p>		

		The appliance/ storage must support High Availability by adding additional controller to meet future needs.		
		The appliance/ storage must support Data In Place upgrade to higher model for increasing backup capacities and performance.		
i.	Warranty	The appliance/ storage and Backup Software should offered with 24x7- 5 years onsite warranty support.		
j.	License	Requisite licenses as per specifications		

S.No	Item -1.10 of Price Bid Tape Library for PDC -01No.		Brand/Make/ Model offered Yes/ No	Reference in Bid Document of Bidder
	Vendor to specify Brand Make and Model offered.	Qty		
a.	Rack mountable 24 slot Tape Library with four LTO-7 SAS Tape Drive	1		
b.	LTO 7 Media	100		
c.	SAS Card to connect with backup server	1		
d.	LTO -7 Cleaning cartridges	5		
e.	5 Years comprehensive OEM Warranty			
f.	Licenses	As required		

S.No	Item -1.11 of Price Bid VMware Licenses			Brand/Make/ Model offered Yes/ No	Reference in Bid Document of Bidder
	Vendor to specify Brand Make and Model offered.				
	Part No.	Description	Qty		
a.	H7NX-ED-C10-C	VMware Horizon 7 Enterprise & NSX Data Center Enterprise Plus for Desktop: 10 Pack (CCU)	3		
b.	VR18-ADV-C	VMware vRealize Suite 2018 Advanced (Per PLU)	10		
c.	VCS6-STD-C	VMware vCenter Server 6 Standard for vSphere 6 (Per Instance)	1		
d.	VS6-EPL-C	VMware vSphere 6 Enterprise Plus for 1 processor	10		
e.	ST6-EN-C	VMware vSAN 6	10	Deleted	Deleted

		Enterprise for 1 processor			
--	--	-----------------------------------	--	--	--

Item No.	Software License Feature	No. of Licenses	Brand/Make/Model offered Yes/ No	Reference in Bid Document of Bidder
1.12	NVidia Grid vWS	24		
1.13	Windows Server Operating System (Data Center Edition 16 core license) 2012 or later (64 Bit)	24		
1.14	Windows VDA Lic	24		
1.15	Windows Server Cal	24		
1.16	Redhat Enterprise Linux	20		
1.17	Antivirus software (TrendMicro or equivalent)	40		
1.18	SSL Certificate - 256 bit encryption	1		
Note: Software subscription for items 1.12 to 1.18 wherever required must be provided for five years from date of acceptance.				

Sr.No.	Item -2.01 of Price Bid HCI Nodes for SDC - 4 No.s		Brand/Make/Model offered Yes/ No	Reference in Bid Document of Bidder
	Item	Vendor to specify Brand Make and Model offered.		
a.	Hyper Converged Appliance (Essential Features)	Hyper converged appliance, which comes Factory Installed with various software including Software Defined Storage and Hypervisor. SDS should NOT be top-up or add-on software license bundled on generic x86 server. It should be an integral part of appliance.		
		Offered Model to be Fully Software Defined Infrastructure (Compute, Storage and Management)		

		The sizing defined below includes 10% HCI over head. if any solution requires more than that, then they should factor accordingly.		
		Should also have capability to use Network Virtualization (SDN).		
b.	Nodes Required	Min. 4 Nodes		
c.	Processor	Latest Generation Intel® (Skylake/ Cascadelake) Processors product family,min. 2.7 GHz per Core. Minimum 2 Sockets per Node. Both socket must be populated with 18 core or more per socket.		
d.	Total Physical Cores	Minimum 144 Cores (Including all the Nodes)		
e.	Processor Cache	Min. 22 MB L3 Cache per processor		
f.	Total Physical RAM	Min. 1.5 TB DDR4 per node.		
g.	Storage Cache	2 x 400 GB (SSD) or 1 x 800 GB (SSD) per Node. If SSD cache is not available then additional 10% RAM to be provided in each node.	Deleted	Deleted
h.	Total Usable Storage	Min. 20 TB Usable capacity with 1.9 TB SSD Disks or higher capacity without Deduplication and Compression.		
i.	Network Throughput	Total Network throughput from HYPERCONVERGED Chassis should be configured with total 20 Gbps per node with no single point of failure. (N+1) redundancy.		
j.	GPU	2 x Nvidia Tesla P40 Cards or Higher per Node		
k.	Data Services	The solution should provide enterprise data services such as <u>de-duplication and compression with erasure coding</u> OR <u>equivalent</u> in software/ hardware. These should be delivered in all flash appliances. These functionalities should be part of the proposed solution and		

		licensed.		
l.	Hypervisor	VMWare ESX Hypervisor needs to be proposed with the HCI Appliance for this requirement.		
m.	Scale Up and Scale Out	The solution should support non-disruptive Scale-Up (Upgrade by inserting additional drives in existing empty drive-slots) whenever required without any additional licensing cost and Scale-Out (Upgrade by adding nodes) upgrades to grow capacity and/or performance with no disruption to the workloads already running on the platform.		
n.	Hybrid and Flash Support	HCI solution should support SSD disks.		
o.	Cluster Scalability	Cluster architecture to be scalable upto 32 nodes wherein all the VM's should be capable to use compute, memory and storage resources from all the nodes in a cluster architecture through a single interface.		
p.	Rack Unit	HCI Appliance should support different Rack Units depending upon the workload (2U4N or 1U1N or 2U1N)		
q.	Data Integrity Check	The solution should support checksum of data to ensure data integrity & to enable automatic detection and resolution of silent disk errors.		
r.	Encryption	Solution should provide Data at Rest Encryption		
s.	Redundancy & Business Continuity	No Single Point of Failure with complete redundancy at all levels. Nodes should be configured to have atleast one copy of data		

		available in cluster, in order to support data & cluster availability in event of One Node Failure		
		Proposed solution should have replication software to DR site. The solution should have capability to protect against data corruption.		
		Replication should be possible locally (same datacenter) and/or remote site; and, on any x86 platform with requisite number of resources, as long as the hypervisor is same.		
		Replication software to be provided and should integrate with the hypervisor.		
t.	Storage Feature	Storage policies should be enforced & managed directly from hypervisor/ SDS		
u.	Manageability & Security	Single Web Interface Central Management for Compute, Network, Storage and Clustering.		
		Single Click Feature should be available for upgrade/update for all components of compute (including network adapter, BIOS), hypervisor and SDS.		
		The Solution should be able to monitor end to end session of the user including giving the insight of the underlying infrastructure like server and Storage Note: This feature though mentioned under HCI is basically VMware feature factored in the VMware licenses (VMware Horizon session recording). Feature compliance to be provided against this clause.		

		All Nodes supplied with the HCI appliance should support following security features. 1) Should have a cyber-resilient architecture for a hardened server design for protection, detection & recovery from cyber-attacks 2) Should protect against hardware firmware attacks which executes before OS boots/ secure boots.. 3) Hardware should support Silicon / Hardware Root of Trust.		
v.	Scalability	Proposed solution should be based on modular scalable architecture having the ability to add auto-discoverable Nodes. Node addition should be non-disruptive & seamless; and should allow simple ONE node scaling.		
		Proposed solution must support automated cluster deployment, configuration and non-disruptive updates and migration		
w.	<p>Hypervisor Features</p> <p>Note: These features though mentioned under HCI are basically VMware feature factored in the VMware licenses at item 1.11 of this Appendix -B. Feature compliance to be provided against these clauses.</p>	The solution should be able to support different generation of Intel processors in the same cluster for investment protection over the life of the proposed solution.		
		The solution should provide integration of 3rd party endpoint security to secure the virtual machines with offloaded antivirus, anti-malware solutions without the need for agents inside the virtual machines.		
		Shall distribute data intelligently across all nodes and capacity utilization across all nodes has to be uniform at all times .		
		The solution should provide a virtual switch which can span across a virtual datacenter and multiple hosts should be able to connect to it. This in turn will simplify and enhance virtual		

		machine networking in virtualized environments		
		Should have all Virtualization benefits like High Availability, automated distribution of resources and automated live migration of Virtual Machines from one physical server to another in case of any failure		
x.	Performance IOPS	Minimum 70K IOPS or more with less than 5ms response time when using 8K/16K block size at 70:30 - Read Write Ratio		
y.	Single Point of Support	Single point of support for HCI solution including virtualization		
z.	OS Support	Windows 2012 and 2016 Standard/Data Center, SUSE Enterprise Linux, RHEL 6.x, (All latest flavors of Linux and Windows) in the Virtual Machines		
aa	Warranty	24X7X365 onsite for five years fulfilled directly by bidder. Single number support for all components of appliance (compute, hypervisor, software defined storage) for 5 years All SSD supplied must be covered and replacement must be provided during this 5 year period even if SSD have reached its wear level or usage limits.		
bb	Rack, PDU and Accessories	Required number of Industry Standard Rack and PDUs to be provided by bidder alongwith all accessories. Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP, SFP+ etc that are required to make the system fully functional needs to be provided along with the system. Each node should have dedicated non-shared dual-power supplies and should be able to		

		sustain single power supply failure.		
--	--	---	--	--

Sr.No.	Item -2.02 of Price Bid Storage System for SDC – 01No.		Brand/Make/ Model offered Yes/ No	Reference in Bid Document of Bidder
	Item	Vendor to specify Brand Make and Model offered.		
a.	Controllers and Architecture	<p>Architecture: Storage should be Fully Symmetric OR Fully Distributed Clustered Architecture written for Scale-Out NAS operations. Hardware and software engineering, and support should be from the same OEM. The Scale-out-NAS must be based upon dedicated NAS appliance hardware. System should support linear scalability in Performance and Capacity, without any disruptions to production workflow.</p> <p><u>The NAS appliance should have specialized Operating System, dedicated and tuned for serving data efficiently and written for scale-out architecture.</u> General purpose OS will not be acceptable for the NAS system. The architecture should have a single namespace.</p> <p>Controllers: Separated controllers are factored for SSD and SAS/NL-SAS/SATA</p> <p>a) Minimum 4 Active-Active Storage Controllers/ Nodes must be provided, serving all flash storage for cloud and</p> <p>b) Minimum 4 Active-Active Storage Controllers/ Nodes should be provided for serving NDR data requirements. Offered architecture should be upgradable to min 12 numbers of NAS Storage Controllers/ Nodes seamlessly, without any</p>		

		<p>disruptions/downtime to production workflow for performance, capacity enhancement, software/firmware upgrades.</p> <p>All storage nodes/controllers must be active-active, contributing in performance and capacity of the system.</p> <p>In Active / Active cluster mode offered model should guarantee not more than 20% system degradation in case of controller failure.</p>		
b.	Onboard Memory	<p>Storage Solution to be configured with minimum 1TB DRAM based usable cache across NAS Storage Controller/ NAS Storage Node configured for read and write operations.</p> <p>If there are any controllers serving the disks separately then equal amount of DRAM based cache must be provided on those controllers to avoid any funnelling effect.</p>		
c.	Network Ports	<p>Each Storage Controllers/ Storage node should have minimum of 2 x 40GbE for client connections for nodes/controllers serving all flash. Total 8 x 40 GbE.</p> <p>Each Storage Controllers/ Storage node should have minimum 2 x 10GbE for client connections for nodes/controllers serving NL-SAS/SATA. Total 8 x 10 GbE.</p>		
d.	Disk Type	<p>Storage solution should have capability to support different kinds of disks types likes SSD and NL-SAS/SATA drives pools in same filesystem/ namespace in same storage Cluster.</p>		
e.	Operating System	<p>Scale-Out Storage should have Fully Journalled, fully distributed, specialised Operating System by same OEM (as storage hardware) , dedicated for serving data</p>		

		<p>efficiently and customised for True Scale-Out Storage. General purpose OS will not be acceptable for the NAS Appliance.</p>		
<p>f.</p>	<p>Redundancy with No Single Point of Failure (SPOF)</p>	<p>The Scale-Out Storage System should be able to protect the data against simultaneous 2(Two) disk failures or have equivalent technology for data protection.</p> <p>The Scale-Out Storage should be configured to sustain at least one Storage Controller/Single Node failure in the storage system without data unavailability and performance drop of not more than 20%.</p> <ul style="list-style-type: none"> - Data should be striped across all storage controllers/ HA pair in the proposed storage system, so that performance of all controllers/ HA pairs can be utilized for all read and write operations. - The backend internal connectivity between storage controllers/storage nodes should be using high performance Infiniband or 40 GigE network with no single point of failure. - Redundant and Hot replaceable modules: Controllers, Hard Disk Drive and power supplies (230V AC, 50 Hz.) - The Complete multi-controller Storage System Solution should be fully redundant, configured in High Availability mode and should NOT have any Single Point of Failure (SPOF). 		

g.	<p>Total Storage Capacity</p>	<p>550 TB usable capacity with single unified addressable namespace /single filesystem after required protection level on complete storage solution.</p> <p>The NAS Appliance should be scalable upto 60 PB usable as a single filesystem/or a single global namespace.</p> <p>Current Capacity to be configured as -</p> <p>a) 100 TiB usable Flash Tier Capacity using SSD of size 7.6TB or less (1 TiB = 1024 x 1024 x 1024 x 1024 bytes)</p> <p>b) 450 TiB usable Tier Capacity using NL-SAS / SATA HDD of size 10TB or less. (1 TiB = 1024 x 1024 x 1024 x 1024 bytes)</p> <p>10% additional usable space must be provisioned as snapshot space for SSD and NL-SAS/SATA disk tier respectively. License for the same must be provided</p> <p>5% additional usable space (in terms of HDD/ SSD must be provisioned for hot sparing apart from usable capacity based on OEM best practice. License for the same must be provided</p>		
h.	<p>Performance/Throughput Requirement</p>	<p>For cloud portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 8GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size.For NDR portion of the storage, Throughput requirement should be of sustained Aggregate Performance of 1.4GB/sec on NFS, 70% read and 30% write in sequential file IO of 1 MB block size.Bidder needs to demonstrate</p>		

		<p>this performance using free third party applications like IOmeter /FIO etc as part of User Acceptance test. While testing the cloud and NDR portions of the storage, host connectivity will be allowed only to the controllers serving cloud, or NDR storage dedicatedly. Rest of the controllers should be powered off/ disconnected. Cache of both storage and hosts must be cleared before test run by rebooting the controllers.The performance must be demonstrated with data at rest encryption feature switched on along with remote replication.</p>		
i.	Capacity/p erformance Expansion	<p>There should not be any downtime or migration activity required in the event it is needed to add additional capacity or additional performance to the storage system.Storage solution should enable independent and linear scalability of performance and capacity.The system must be able to support policy based tiering to different storage tiers with internal/external storage sub-system.</p>		
j.	Protocol Support	<p>Must provide access for a variety of operating systems (Mac, Linux, Windows) using all standard protocols: NFS, SMB(CIFS) etc. All protocols supported by the storage must be licensed and provided from day one. All licenses must be perpetual in nature. Should support user security mechnisms like AD,LDAP and NIS.</p>		
k.	File Sharing	<p>Should allow simultaneous access to the same file/data via SMB and NFS for data sharing between LINUX and Windows hosts. Data must be encrypted in motion during file sharing operations.</p>		

l.	File Locking & Filtering	File Locking for Data protection from corruption while sharing files between Linux (RHEL) and Windows users.		
m.	Client Load Balancing	Storage System should have capability to load balance client connectivity across these multiple controllers so that all clients gets distributed across all existing controllers/nodes to avoid any performance hotspot. In case native functionality is not available in the storage, bidder must provide a mechanism such as redundant pair of hardware load balancer for the the same		
n.	Heterogenous support for end user systems	Operating system support RedHat Linux, Suse Linux, Windows Servers 2003/2008 or later , Windows XP/7 or later.		
o.	Management Interface software	Support the management, administration and configuration of the whole storage platform through a single management interface along with CLI		
p.	Spare Disks:	Vendor will maintain at DGH-NDR site TWO (02) spare SSD disks and FIVE (05) spare NL-SAS / SATA disks of same type and capacity (Cold spares) which may be required to meet immediate replacement for breakdown disks.		
q.	Disaster Recovery	The storage system shall be able to support directory and file-level OR volume level asynchronous replication across WAN to another storage system of same type. The replication software shall have a comprehensive Volume/ file and directory selection criteria for replication. The storage system at the remote site shall be at the same protection level as the primary site and be able to sustain 2 disks failure or 1		

		controller failure after failover. The storage system must preserve bandwidth during replication else must provide redundant WAN optimiser to preserve the bandwidth.		
r.	Data Security	Data must be securely encrypted at rest, in motion and while replication at SDC. Protection from ransomware etc. must be ensured.		
s.	De-duplication and compression	Proposed storage should be configured with de-duplication and/ or compression feature.		
t.	Warranty	5 years comprehensive OEM onsite warranty		
u.	Rack, PDU and Accessories	Required number of rack and PDUs to be provided by the Storage OEM alongwith all accessories. Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP, SFP+ etc that are required to make the system fully functional needs to be provided along with the system.		

Sr. No.	Item -2.03 of Price Bid TOR Switch – SDC – 02No.	Brand/Make/Model offered Yes/ No	Reference in Bid Document of Bidder
a.	Vendor to specify Brand Make and Model offered.		
	The offered switch should be datacenter class switch with redundant power supply & fan trays.		

	Switching capacity of 1.4Tbps or more, and throughput of 1070 Mbps or more.		
	48 nos. of 1/10 Gigabit Ethernet SFP+ ports or FCOE ports and at least 4 nos of the 40 Gigabit Ethernet QSFP +uplink ports		
	Following items shall be included in the supply (for each switch):		
b.	i. 2 nos. of 40 Gigabit Ethernet QSFP+ optical transceivers with required fibre patch cables for connectivity to TOR switches		
	ii. 8 nos. of 10GBASE-SR SFP+ transceivers		
	iii. 36 nos. of 1GBASE-T SFP transceivers		
c.	All required licenses and other optics/ accessories including jack panel, patch cords etc., shall be supplied for above ports		
	Layer 2 features		
d.	xvii. IEEE 802.1Q VLAN encapsulation		
	xviii. Support for minimum 1000 VLANs		
	xix. Support for minimum 1000 access control list (ACL) entries		
	xx. Rapid Per-VLAN Spanning Tree Plus (PVRST+) (IEEE 802.1w compatible)		
	xxi. Multiple Spanning Tree Protocol (MSTP) (IEEE 802.1s): 64 instances		
	xxii. Spanning Tree PortFast		
	xxiii. Spanning Tree root guard		
	xxiv. Spanning Tree Bridge Assurance/ loop guard		
	xxv. Link Aggregation Control Protocol (LACP): IEEE 802.3ad		
	xxvi. Advanced port-channel / LACP with load balancing		
	xxvii. Jumbo frames on all ports		
	xxviii. Pause frames (IEEE 802.3x)		
	xxix. Storm control (unicast, multicast, and broadcast)		
	xxx. Private VLANs		
xxxi. Private VLAN over trunks (isolated and promiscuous)			
xxxii. VLAN remapping			
e.	Layer 3 features:		
	vi. Support for 1024 VLANs		
	vii. 1000 ACL entries		

	viii.	Routing protocols: Static, Routing Information Protocol Version 2 (RIPv2), Open Shortest Path First Version 2 (OSPFv2), Border Gateway Protocol (BGP), and Intermediate System-to-Intermediate System (IS-IS)		
	ix.	IPv6 routing protocols: Static, OPFv3, BGPv6		
	x.	Virtual Router Redundancy Protocol (VRRP)		
	Management Features:			
	vi.	Switch management using 10/100/1000-Mbps management or console ports		
f.	vii.	CLI-based console to provide detailed out-of-band management		
	viii.	In-band switch management		
	ix.	Secure Shell Version 2 (SSHv2)		
	x.	Telnet		
	Authentication, authorization, and accounting (AAA)			
	ix.	RADIUS		
g.	x.	TACACS+		
	xi.	Syslog		
	xii.	SNMPv1, v2, and v3 (IPv4 and IPv6)		
	xiii.	Remote monitoring (RMON)		
	xiv.	RBAC		
	xv.	SPAN		
	xvi.	Network Time Protocol (NTP)		
h.	Warranty: 5 years comprehensive OEM onsite			
	Accessories			
i.	Bidder will be responsible to integrate all the hardware on the rack. All cables, connectors, network cards, SFP, SFP+ etc that are required to make the system fully functional needs to be provided along with the system.			

Sr.No.	Item -4 of Price Bid Training		Yes/ No	Training Details
a.	Module-1	5 Days		
	No. of participants	5		
	Coverage			
	Basics of VMware			

	Site specific configuration & Operation of the Vmware implementation at DGH			
	Troubleshooting			
b.	Module -2	5 Days		
	No. of participants	5		
	Coverage			
	Fundamentals of HCI			
	System administration of HCI			
	Backup and Restoration Troubleshooting			
c.	Module - 3	3 Days		
	No. of participants	5		
	Coverage			
	Introduction to G&G applications and implementation on HCI			
	Operations on HCI with G&G modules			
	Troubleshooting			