

#	Question	Answer
1	<p>1. Should the 5yr Support term include either of the following to replace a failed hardware component:</p> <ul style="list-style-type: none"> A. 4hr parts delivery (customer installs part) B. 4hr parts delivery onsite (manufacturer installs part) C. next business day part delivery and install by customer D. Spares kit onsite to immediate replace failed hardware <p>2. How much actual “real” data does the college have today?</p> <p>3. How many usable TB does the college have today</p> <p>4. Should we include new SAN switches to replace the existing ones?</p> <p>5. How much real data is being backup today?</p> <p>6. Does the existing backup environment have enough capacity for the next 5yrs?</p> <p>7. What is the college’s backup schedule? Daily fulls, hourly backups etc..</p>	<ul style="list-style-type: none"> 1. 4 hour parts delivery onsite – manufacturer installs part 2. See answer to question 2B. 3. 456 TB 4. Replace existing switches with new switches 5. Not sure how to answer without a definition of “real data”. 6. Not relevant. The existing backup environment is part of the total SAN and will be replaced as part of this implementation. 7. The College uses Dell Appassure backup software which is a disk-based backup system. More information is available on the Dell Appassure website. Appassure is performing hourly incremental backups with tiered rollups.
2a	<p>Clarifying questions for ITN 15/16-03 - What is the breakdown of your File and Block storage?</p> <p>Question: Please provide list of RAID groups, respective sizes (RAW) and purpose (SQL, exchange, etc).</p>	<p>IBM:</p> <p>DS5100 –</p> <p>Arrays</p> <p>FC10_D01-D08 – RAID5 – 3,908.881GB</p> <p>FC10_D09-D15 – RAID5 – 3,350.469GB</p> <p>FC11_D01-D08 – RAID5 – 3,908.881GB</p> <p>FC11_D09-D15 – RAID5 – 3,350.469GB</p> <p>FC20_D01-D08 – RAID5 – 3,9078.881GB</p> <p>FC20_D09-D15 – RAID5 – 3,350.469GB</p> <p>FC60_D01-D08 – RAID5 – 5,865.039GB</p> <p>FC60_D09-D15 – RAID5 – 5,027.176GB</p> <p>FC70_D01-D08 – RAID5 – 3,908.881GB</p> <p>FC70_D09-D15 – RAID5 – 3,350.469GB</p> <p>SA30_D01-D08 – RAID5 – 6,517.092GB</p> <p>SA30_D09-D15 – RAID5 – 5,586.079GB</p> <p>SA31_D01-D08 – RAID5 – 6,517.092GB</p> <p>SA31_D09-D15 - RAID5 – 5,586.079GB</p> <p>SA40_D01-D08 – RAID5 – 6,516.092GB</p> <p>SA40_D09-D15 – RAID5 – 5,586.079GB</p> <p>SA50_D01-D08 – RAID5 – 6,517.092GB</p> <p>SA50_D09-D15 – RAID5 – 5,586.079GB</p> <p>SVC Pools</p> <p>DS5100A_10K_900_1 – 5.60TB Used of 10.64TB – Exchange 2007</p>

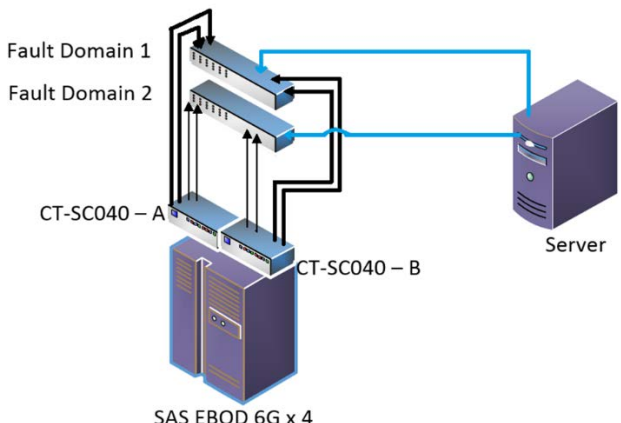
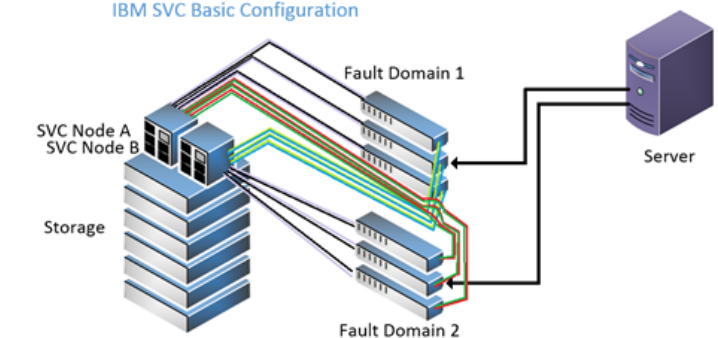
# Question	Answer
	FC60_D01-D08 – RAID5 – 5,865.039GB FC60_D09-D15 – RAID5 – 5,027.176GB DS5100A_15k_600 – 21.TB Used of 28.36TB – SQL Servers FC10_D01-D08 – RAID5 – 3,908.881GB FC10_D09-D15 – RAID5 – 3,350.469GB FC11_D01-D08 – RAID5 – 3,908.881GB FC11_D09-D15 – RAID5 – 3,350.469GB FC20_D01-D08 – RAID5 – 3,9078.881GB FC20_D09-D15 – RAID5 – 3,350.469GB FC70_D01-D08 – RAID5 – 3,908.881GB FC70_D09-D15 – RAID5 – 3,350.469GB DS5100A_7K-1T_1 – 21.52TB Used of 47.28TB – File Server Cluster / Application Servers SA30_D01-D08 – RAID5 – 6,517.092GB SA30_D09-D15 – RAID5 – 5,586.079GB SA31_D01-D08 – RAID5 – 6,517.092GB SA31_D09-D15 - RAID5 – 5,586.079GB SA40_D01-D08 – RAID5 – 6,516.092GB SA40_D09-D15 – RAID5 – 5,586.079GB SA50_D01-D08 – RAID5 – 6,517.092GB SA50_D09-D15 – RAID5 – 5,586.079GB DS3512A – Arrays DS3512A_DP1_A – RAID6 -20.000TB DS3512A_DP1_B – RAID6 – 20.500TB DS3512A_DP1_C – RAID6 – 21.375TB SVC Pools DS3512A_7K_2T_1 – 29.35TB Used of 61.87TB – ERP Production / SQL DS3512A_DP1_A – RAID6 -20.000TB DS3512A_DP1_B – RAID6 – 20.500TB DS3512A_DP1_C – RAID6 – 21.375TB DS3512B – Arrays DS3512B_DP1 – RAID6 – 59.000TB – Backups DS3524A – Arrays DS3524A_DP1_A – RAID6 – 30.902TB SVC Pools DS3524A_7K_1T_1 – 22.13TB used of 30.90TB – MyDocuments Redirection / SQL DS3524A_DP1_A – RAID6 – 30.902TB

#	Question	Answer
		<p>DS3524B - Arrays DS3524B_POOL1 – RAID6 – 64.000TB - Backups DS3524B-VMCBACKUP-LOGS – 30.000GB – Vmware Logs Free Capacity – 2,132.000GB</p> <p>DS3524C - Arrays DS3524C_DP1 – RAID6 – 15.644TB SVC Pools DS3524C_7K_1TB – 2.37TB used of 15.64TB DS3524C_DP1 – RAID6 – 15.644TB</p> <p>DS4700 - Arrays DS4700A_E2D1-D15 – RAID6 – 19.090TB DS4700A_SA_D1-D15_SA1_D1-D4 – RAID5 – 8,374.711GB DS4700A_SA5_D1-15 – RAID5 – 12.729TB DS4700A_SA85_D1-D15 – RAID5 – 6,513.664GB SA1_D5-D15_SA4_D1-D15 – RAID5 – 17.044TB</p> <p>Dell Compellent: - Active Tiering</p> <p>15K Storage 24 Disk (2 Trays)- 2 Hot Spare – 13.413TB Total, 12.296TB Usable 7K Storage 24 Disk (2 Trays) – 2 Hot Space - 65.52TB Total, 60.06TB Usable</p> <p>Total Active Tiering Storage - 72.35TB</p>
<p>2b (Page 11) Meet or exceed 50K IOPS for all speeds of disk configurations. Question: Does this mean that all disk group types must meet 50K IOPS minimum? If not, please clarify.</p> <p>(Page 11) All controller components are redundant, both internally (dual power supplies, for example) as well as multiple complete controllers Question: Must controllers be physically separated? Please help us understand the underlying use case.</p> <p>(Page 11) Supports NFS, SMB/CIFS, AppleTalk, and AFP</p>	<p>A. 50K is the desired minimum IOPS of the controller(s).</p> <p>A. The chassis housing the disk controllers and other components enabling disk access are to be internally redundant. Then, we desire a mirror of the chassis that is internally redundant. We are trying to achieve multiple fault domains.</p> <p>A. We are looking for block and file access support for the most current version of Macintosh OS/X as well as the</p>	

#	Question	Answer
	<p>Question - What is the underlying use for case or Supporting AppleTalk and AFP?</p> <p>(Page 11) Supports HFS/HFS+ and NTFS</p> <p>Question – What is the underlying use case for HFS/HFS+ support? Are there physical Apple servers that will be accessing the array directly?</p> <p>(iii) Patch installation, including:</p> <p>Question – Can you please provide schematic of existing network layout?</p>	<p>previous two versions. We do not anticipate attaching SAN disk directly to the Macintosh hosts.</p> <p>A. The question is not clear. A SAN network diagram or an Ethernet/Data network diagram? And, at what level of detail? We don't have diagrams for either at the host level. A vendor solution that includes the ability to produce these kinds of diagrams for the SAN/NAS would be a bonus for the response evaluation.</p>
3	<p>(Page 11) Meet or exceed 50K IOPS for all speeds of disk configurations</p> <p>Question clarification- Does this mean that the aggregate of disk must meet 50K IOPS minimum? If not, please clarify</p>	50K is the desired minimum aggregated IOPS of (each of) the controller(s).
4	Can we offer another brand that isn't IBM? But it has the same or better configuration that your need here.	We are looking for a replacement for our existing SAN infrastructure and welcome all manufacturer's responses.
5	I understand you have 456TB of capacity. Of the 456TB, how much is being consumed by actual data?	<p>We do not thin provision storage, so we allocate space for our customers and do not measure how much space they have actually used. The amount of storage not allocated is:</p> <p>IBM: DS 5100 / 3500: 94.852TB Dell: 34.79TB DS4700: 63TB</p>
6	1. If the vendor is responsible for all data backup/replication management, are you seeking a staff aug requirement between 500 and 2000 hours a year?	If referring to Warranty Support and Ongoing Service / Support, section (a)(v), this requirement is only for those times when the vendor is performing maintenance on the system.
7	2. You state that you require 50,000 IOPS for all drive types. Do you mean you need 50,000 IOPS on each disk type or 50,000 IOPS across the system?	Answered previously – see question #3.
8	3. Is the semi-annual healthcheck scope to include software/firmware updates as well as an architectural review of the environment and preventive maintenance?	Yes
9	4. Do you require the semi-annual health checks to be performed by an on-site resource?	On-site, yes.

#	Question	Answer
10	5. Does the storage design uptime requirement 99.99% include scheduled outages?	Yes. The goal is to implement a system with a functioning, active zero-downtime maintenance capability.
11	6. For the redundant mirror, does the college plan on mirroring the production and backups, or just production storage?	Just production.
12	7. What are the current and target RTO and RPO backup/replication objectives?	RTO – 24 hours. RPO – four hours.
13	8. What is your existing usable storage capacity for production workloads?	Answered in question 2A.
14	9. What is your existing usable backup storage capacity?	Answered in question 2A.
15	10. What host attachment protocols are required initially for your production and backup storage? ex. iSCSI, SMB, CIFS, Fibre-Channel, FCOE, FCIP, etc.	Fibre-Channel, iSCSI for block storage. SMB / CIFS , plus native support for MacIntosh OS/X clients for file / share access.
16	11. What is the bandwidth between the primary and backup locations? What is the average inter-site latency?	Primary and backup locations are connected by 10G fiber on a dedicated fiber run.
17	12. What's the budget for the project?	The project has no hard budget. The College did a study in 2014 to determine the range of costs for this project. Based on that study, we were given approval to proceed with the project.
18	13. What are the average and peak IOPS for the existing Dell system?	Peak FE MB/Sec – ~140 Average FE MB/Sec – ~25 Peak BE MB/Sec – ~1,000 Average BE MB/Sec – ~50 Peak FE IO/Sec - ~3,750 Average FE IO/Sec - ~1,250 Peak BE IO/Sec - ~5,500 Average BE IO/Sec - ~2,000
19	14. Do you require a new fibre channel switches? Do you require new 10GbE Switches?	Answered in question #4.
20	4.3 Current Environment 1. Are the DS3512/3524 strictly used for backup data? If not, how much storage on the DS3512/3524 is allocated to backup data and to production/host data? Please specify whether values are in raw or usable storage. 2. Can you provide an inventory list of server hardware models used in the environment? 3. Does the vSphere environment contain any VMs using RDM (Raw Device Mappings), in-guest iSCSI	1) One 3512 is for production data, the other 3512 is for backups. Two 3524 units are for production data and one 3524 is for backups. Data usage is defined in the answer to question 2A. 2) Dell: 2950 Poweredge 1950 Poweredge 2550 Poweredge 2950 Poweredge 410 Poweredge 710

#	Question	Answer
	<p>volumes, VM DirectPath HBA or any other directly attached storage? Can you provide a list of the VMs, their functions and storage requirements?</p> <p>4. Please provide a list of the HBA models used in the environment.</p>	<p>Poweredge R210 Poweredge R300 Poweredge R320 Poweredge R410 Poweredge R610 Poweredge R620 Poweredge R630 Poweredge R710 Poweredge R720 Poweredge R720XD</p> <p>IBM: 3837-AC1 X3550 M3 / 7944 X3550 /7978 X3850 X5 / 7145 X3950</p> <p>3) Yes. ERP web portal fronted by IBM Storage 60GB SQL fronted by IBM storage 80GB</p> <p>4) 2/4/8 /10 Gig Fiber Channel HBAs, Qlogic (IBM and Dell side)</p>
<p>21 Page 8 of 24 Proposal Organization and Format</p> <p>Clarification requested: On page 8 of 24 of the Initial RFP response it states Tab 10 should be personnel profile however on Page 15 of 24 it states Tab 10 should be References (Attachment B)</p> <p>Q. Should it be Tab 1 thru 18 with Tab 18 being Financial Proposal removing Personnel profile requirement?</p>	<p>Please use page 8 as the guide for Tab Organization.</p>	
<p>22 The Q&A mentioned a total of 456TB of useable storage today. How is that storage split between the Production and Backup?</p>	<p>Answered in question 2A.</p>	
<p>23 Are the DS3512/3524 arrays the only backup targets and thus only approximately 123TB of storage (of the 456TB total) is available for the Backup today?</p>	<p>Backup targets are 3512 and 3524 units as described in answer 20(1) and the DS4700 unit is also a backup target.</p>	
<p>24 Section 4.3 – Current Environment Current College Configuration Can you provide configuration drawing of how this all is connected today?</p>	<p>What does “this” refer to? Just the SAN components or the host servers as well?</p>	

#	Question	Answer
25	<p>Section 4.3 – Current Environment Dell Components</p> <ol style="list-style-type: none"> How many FC and iscsi ports are being used? What are speeds of each port? Can we get detail for drives which include: raid type, number of drives in raid set, number of spare drives, raw and used capacities? Do you calculate on base 10 or base 2? Drawing to show what is connected to each of the “8024F Ethernet switches w/ 16 ports each populated” switches 	<p>Zero Fiber Channel, 10 iSCSI ports per fault domain (2)</p> <p>10G Full</p> <p>Answered in 2(a) above. Base 2.</p> <p style="text-align: center;">Dell Compellent Basic Configuration</p> 
26	<p>Section 4.3 – Current Environment IBM Components</p> <ol style="list-style-type: none"> Can you provide configuration drawing of how “SAN Volume Controller” is connected today? Configuration details DS5100 SAN – Cache, FC Ports, and how many in use? 64@ 600GB X 15KRPM Drive - Can we get detail for drives which include: raid type, number of drives in raid set, number of spare drives, raw and used capacities. Do you calculate on base 10 or base 2? 	<p style="text-align: center;">IBM SVC Basic Configuration</p>  <p>See the answer to 2(a) above for configuration, 8kb cache, 8 FC ports, all in use.</p> <p>See the answer to 2(a) above, Base2</p>

#	Question	Answer
4.	16@ 900GB X 10KRPM - Can we get detail for drives which include: raid type, number of drives in raid set, number of spare drives, raw and used capacities. Do you calculate on base 10 or base 2?	See the answer to 2(a) above, Base2
5.	64@ 1TB X 7.2KRPM - Can we get detail for drives which include: raid type, number of drives in raid set, number of spare drives, raw and used capacities. Do you calculate on base 10 or base 2?	See the answer to 2(a) above, Base2
6.	3@ DS3524 SAN with 24@ 1TB X 7.2KRPM Drive per unit - Can we get detail for drives which include: raid type, number of drives in raid set, number of spare drives, raw and used capacities. Do you calculate on base 10 or base 2?	See the answer to 2(a) above, Base2
7.	6@ Expansion Drawer with 12@ 2TB X 7.2KRPM Drive per drawer - Can we get detail for drives which include: raid type, number of drives in raid set, number of spare drives, raw and used capacities. Do you calculate on base 10 or base 2?	See the answer to 2(a) above, Base2
8.	What is the usable capacity in Base-2 required for fibre channel connected hosts?	See the answer to 2(a) above, Base2, plus the specification in the ITN Solicitation
9.	What is the usable capacity in Base-2 required for iSCSC connected hosts?	See the answer to 2(a) above, Base2, plus the specification in the ITN Solicitation
10.	Do you have a preferred storage skew (ie- 70% Tier-1, 20% Tier-2, 10% Tier-0)?	Tiered storage is desired but specifics will be determined during negotiations. Make your best recommendation using the information already provided. Not knowing the performance or composition of each Tier, we're unable to answer the question any further.
11.	Do you have a preferred amount of Flash (EFD) capacity?	Tier-0 should be Flash or predominantly Flash.
12.	Do you have a preferred Raid type?	RAID types are dependent on the workload. We use RAID-5 and RAID-6 but would consider other configurations based on industry best-practices and would like other options available as well.
13.	Please list in usable TeraBytes Base-2 the amount of structured data (database, applications) the college will have on the new array?	Information is available in the answer to question 2(a), Base2
14.	Please list in usable TeraBytes Base-2 the amount of UN-structured data (file and filesystem) the college will have on the new array?	Information is available in the answer to question 2(a), Base2

# Question	Answer
<p>15. What percentage of the college’s unstructured data is very seldom accessed?</p>	<p>We do not have tools to measure the frequency of access for any given data or data set. We would welcome tools in the new system to provide those measurements and reports for those measurements.</p>
<p>27 Section 4.3 – Current Environment Dell Components - Switch Interconnections</p>	
<p>1. 2@ 2498-B40 FC Switch - how are these connected? I fabric with isl or 2 separate fabrics</p>	<p>No interconnects</p>
<p>2. 4@ 2498-B24 FC Switch - how are these connected? I fabric with isl or 2 separate fabrics</p>	<p>No interconnects</p>
<p>3. Is replacement of the FC switches part of this ITN?</p>	<p>We would like that option. Please price new switches as an optional component of your solution.</p>
<p>4. Are qty-2 new Fibre Channel switches in the production data center acceptable to replace the existing?</p>	<p>Your configuration needs to meet the uptime and maintenance requirements stated in the ITN solicitation and provide for separate fault domains. However you need to configure your solution to accomplish the goals is a function of your offering along with industry and your own best practices.</p>
<p>5. Are qty-2 new Fibre Channel switches in the Backup room acceptable to replace the existing?</p>	<p>Your configuration needs to meet the uptime and maintenance requirements stated in the ITN solicitation and provide for separate fault domains. However you need to configure your solution to accomplish the goals is a function of your offering along with industry and your own best practices.</p>
<p>6. How many ports with growth included are required for the Production room?</p>	<p>Double what we have today. We have 24 and want to go to 48.</p>
<p>7. How many ports with growth included are required for the Backup room?</p>	<p>Double what we have today. We have 24 and want to go to 48.</p>
<p>8. Is the backup target array in the production datacenter only FC connected or is iSCSI needed?</p>	<p>Both iSCSI and FC are needed.</p>
<p>9. Is there a primary backup copy in the Production data center and a replication copy in the DR room, or do all backups go straight to the backup room?</p>	<p>All backups go only to the backup room.</p>
<p>10. Is implementation of new switches part of this ITN? If yes:</p>	<p>Yes</p>
<p>(i) Are professional services to include all zoning of new switches?</p>	<p>Yes</p>
<p>(ii) Is fabric migration of the FC network to be included in the migration effort?</p>	<p>Yes</p>
	<p>No</p>

#	Question	Answer
	<p>(iii) Is there a fibre channel patch panel in the data center?</p> <p>(iv) Please provide the number of new fibre channel cables required and the lengths?</p> <p>(v) Is running new cables expected as part of the professional service implementation?</p> <p>(vi) Are the cable runs overhead or under the floor?</p> <p>(vii) Can cable be run during normal business hours or after hours?</p> <p>(viii) Do you have a preferred vendor for new switches (Brocade or Cisco)?</p>	<p>Not known until the structure and location of components is determined</p> <p>Yes</p> <p>Overhead</p> <p>During Business Hours</p> <p>No preference, but consider compatibility with existing FC hardware in the FC-connected host systems. Proposed switches should interconnect with existing switches to facilitate the migration from the old system to the new system.</p>
	<p>11. Storage units currently consume 18 ports in each switch - Can you provide configuration drawing of how this all is connected?</p>	<p>See diagram provided as answer to the question, "Drawing to show what is connected to each of the "8024F Ethernet switches w/ 16 ports each populated" switches" above. Storage is connected to the controller</p>
	<p>12. Switch Interconnections consume 4 ports in each switch - Can you provide configuration drawing of how this all is connected</p>	<p>See diagram provided as answer to the question, "Drawing to show what is connected to each of the "8024F Ethernet switches w/ 16 ports each populated" switches" above. Storage is connected to the controller</p>
<p>28 Section 4.3 – Current Environment Average IOPS</p>	<p>1. What is the amount of IOPs coming form fibre channel connected hosts vs iSCSI hosts?</p> <p>2. What type of workload is IOPS based on and what are read write percentages, average block size?</p>	<p>~6,000 IOPS/iSCSI (Dell). Previously provided.</p> <p>Workloads are mixed and our current system does not supply metrics we can provide.</p>
<p>29 Section 4.3 – Current Environment Data Backup</p>	<p>1. Can you provide configuration drawing of how this all is connected today? Is this in the separate room location across campus? What does the backup process look like today?</p> <p>2. Is there a primary copy of backup data in the Production data center and a second copy in the backup room, or do all backups go directly to the backup room?</p> <p>3. If there are two copies - is the duplication done at the backup application level or is it done via array based replication?</p> <p>4. Are 4TB drives suitable for all backup data?</p>	<p>Diagrams not available. Backups are performed by Dell AppAssure running on vSphere 5.5 utilizing IBM DS units on the FC SAN, not fronted by the SVC (Direct Connect). Backups are in the production location.</p> <p>All backups are housed today in the production data center. The desire is to have that single backup located in the "backup room" and not in the production data center.</p> <p>There is only one copy</p>

# Question	Answer
<p>5. Is Raid-6 suitable for your backup data?</p> <p>6. We are assuming that migration and integration of the backup application over to the new storage is out of scope?</p> <p>7. Please verify that any changes required to the backup applications to accommodate the new storage and any required changes to backup policies will be the responsibility of the college.</p> <p>8. What is the total number of hosts and the breakdown by OS? Above you mention 42 dual path hosts is that the total number?</p>	<p>Your solution needs to meet the requirements stated in the ITN solicitation and the RTO and RPO as provided in the answer to question #12. Size the storage medium accordingly.</p> <p>Your solution needs to meet the requirements stated in the ITN solicitation and the RTO and RPO as provided in the answer to question #12. Configure the storage medium accordingly.</p> <p>Is this a question or a statement? If a statement, include your assumptions in your formal response. If a question, then migration and integration of the backup application is IN scope.</p> <p>Without guidance as to what changes would be required, we don't know if any changes would be required and if there are changes, if we have the capability to effect those changes. If changes are required, they are the responsibility of the respondent to the ITN solicitation.</p> <p>Mix of Windows Server 2008 R2, Windows Server 2012 R2, VMWare EXSi 5.x and 6, and SuSE Linux Enterprise 10. 42 dual path hosts is the total number.</p>

#	Question	Answer
29	<p>Section 4.5 – Proposed Scope</p> <ol style="list-style-type: none"> 1. Will FC and ISCSI be needed from day one? If so how many hosts of each type? 2. Will SAN and NAS be needed from day one? 3. Is all of the storage located in only 1 of the 5 college locations? 4. Are any of the 5500 end users connected and accessing desktops via remote desktops such as VDI? 5. Are there any VDI hosts connected to the SAN? 6. If the college is using VDI what is there any special array specifications for this application the college would like the vendor to consider? 	<p>Yes. Please match existing documented connections</p> <p>Yes</p> <p>Yes</p> <p>Microsoft RDP via Terminal Services is the only remote desktop technology in use</p> <p>The College is not using VDI with the SAN</p> <p>The College is not using VDI with the SAN</p>
30	<p>Section 4.6 – Minimum Requirements Ability to “pin” specific workloads</p> <ol style="list-style-type: none"> 1. Please specify the amount of capacity you would like to pin into a specific pool and the tier of that storage? 2. Please specify the applications, capacities, and number of pools you would like to create and pin data into? 	<p>We want to be able to pin any workloads we want at any available capacity, pool and tier.</p> <p>We are certain about pinning about 55TB of Microsoft SQL and Software AG ADABAS data bases in the fastest tier and want the flexibility to pin other workloads as needs dictate in any tier. SQL is about 45TB and needs pools of 20TB, 20TB and 5TB. ADABAS needs a pool of 10TB.</p>
31	<p>Section 4.6 – Minimum Requirements IOPS levels must be maintained for a minimum utilization of 60%</p> <ol style="list-style-type: none"> 1. Clarification, so 60% of the array’s maximum IOPs should be equal to 50K IOPS? 	<p>The complete requirement was, “IOPS levels must be maintained for a minimum utilization of 60% of the maximum storage that can be configured on the controllers.” We expect to achieve at least 50K IOPS until the controllers are fronting at least 60% of their maximum storage capacity.</p>
32	<p>Section 4.6 – Minimum Requirements Provide for disk-based backup of active data sets, volumes, LUNS, and/or drive pools to a drive pool located in a different facility connected by 10G Fiber</p> <ol style="list-style-type: none"> 1. What is the capacity amount being requested here “disk-based backup of active data sets, volumes, 	<p>See the answer to question 2(a) for the amounts and types of data sets and drive pools. Note the drive pools allocated to backups for</p>

#	Question	Answer
	<p>LUNs, and/or drive pools to a drive pool located in a different facility connected by 10G fiber“?</p> <p>2. Are you asking for just a separate disk storage target? Can it be of lesser scale than primary storage?</p>	<p>guidance and then increase those amounts by 50%, per the specifications in the ITN Solicitation.</p> <p>The backup target has to be capable of holding all of our backups within the parameters specified in the ITN solicitation and the answers provided to questions asked about the ITN solicitation.</p>
33	<p>Section 4.6 – Minimum Requirements</p> <p>Provide for 50% greater storage space than currently available with the existing SAN, and provide for the ability to grow 20% per year for storage and backup for five years without having to invest in additional base controller hardware</p> <p>1. Is requirement for all of storage you defined above? Can your provide totals available for each system above?</p>	<p>Information is provided in the answer to question 2(a). The requirement is for all storage defined in the ITN solicitation and answers to the questions about the ITN solicitation.</p>
34	<p>Section 4.6 – Minimum Requirements</p> <p>Migrating all existing data</p> <p>1. Do you want 100% vendor migration or a train the trainer approach for a subset of migrations and then vendor oversight while you migrate the rest?</p> <p>2. What is the expected time frame for migration?</p> <p>3. How many migration efforts are you predicting?</p> <p>4. Can migrations happen during normal business hours or only after hours or weekends?</p> <p>5. How many servers will be involved in the migration?</p> <p>6. What is the total amount of data to be migrated?</p> <p>7. What are the numbers of clusters being migrated?</p>	<p>100% vendor migration.</p> <p>We have not developed a time frame as we can't predict how quickly any given solution can accomplish the migration. We are looking to move as rapidly as is prudent in order to avoid paying additional maintenance fees on our existing infrastructure.</p> <p>Do not understand the question. Cannot predict without knowing the capabilities of the solution. How many are you predicting?</p> <p>The answer depends on the migration solution provided. If the migration is undetectable to our users and our systems, during business hours is acceptable. Our current solution allows us to migrate between different subsystems with no interruption of services and we typically migrate during business hours.</p> <p>Approximately 120 virtual servers and approximately 50 physical servers.</p> <p>See the storage pools defined in the answer to question 2(a) above. Non-backup sets – approximately 200TB. Approximately 125TB of backup sets.</p> <p>Four Microsoft SQL clusters, two VMWare clusters, two file server clusters.</p>

#	Question	Answer
	<p>8. What type of application and number of applications being migrated?</p> <p>9. What are the maintenance windows to perform the work?</p> <p>10. Will customer require multipathing installation and configuration during the migration? IF so, what multipathing software is used? And what multipathing software will need to be installed?</p> <p>11. What is your maintenance (outage) windows for migration?</p> <p>12. Is there file data to be migrated? If yes then:</p> <p>13. How much (in terms of TBs)</p> <p>14. How many shares</p> <p>15. What is the available transfer rate in MB/s</p> <p>16. CIFS or NFS or Both? And how many TBs for each?</p>	<p>The question is unclear. Servers are attached to LUNs on the SAN, so the LUN contents need to be migrated and attached to the correct servers.</p> <p>8pm Saturday to 8am Sunday, weekly while the College is in session.</p> <p>Multipathing is a function of our switch infrastructure, our storage controllers and performed at our host operating systems. We don't employ special multipathing software. Proposed solution will have to be compatible with existing multipath drivers (Qlogic cards).</p> <p>This is a repeat of your previous question. See the answer to question 34.9.</p> <p>File data is currently fronted by Windows operating system file servers. We do not have a NAS solution in place today. If you are going to migrate our file shares to a NAS solution, then see the answers to YOUR questions 34.13 – 34.16 below:</p> <p>Approximately 30TB</p> <p>Approximately 150</p> <p>Not clear. Data s on our SAN behind Windows file servers. CIFS – 30TB</p>
<p>35 Section 4.6 – Minimum Requirements</p> <p>Include five (5) years maintenance for all hardware and software, including 24X7X365 phone support, for all components .</p> <p>1. Vendor maintenance usually comes in 2hr, 4hr or next business day. Which are you looking for regarding on-site commitment?</p>	<p>Answered in question 1(a) above.</p>	
<p>36 Section 4.6 – Minimum Requirements</p> <p>All controller components are redundant, both internally (dual power supplies, for example) as well as multiple complete controllers</p> <p>1. What does multiple complete controllers mean?</p>	<p>See the answer to question 2(b) above. We want to achieve multiple fault domains.</p>	
<p>37 Section 4.6 – Minimum Requirements</p>		

#	Question	Answer
	<p>VMWare 5.x, VSphere 6, Microsoft Windows Server 2008R2, Microsoft Windows Server 2012R2 and SuSE Linux 10 certified across all components</p> <p>1. Please define number of each host and as much information possible regarding these hosts.</p>	<p>Irrelevant to the requirement. Is the proposed solution certified to work with those operating systems?</p>
<p>38</p> <p>Section 4.6 – Minimum Requirements</p> <p>Supports NFS, SMB/CIFS, AppleTalk, and AFP</p> <p>1. PBC is asking for NAS capabilities (CIFS and NFS), the understanding from the bidders conference is that there is no NAS functionality being used today. Only iSCSI and Fibre Channel are used, is this correct?</p> <p>2. Is AFP needed from day one for implementation?</p>		<p>Yes</p> <p>This requirement was modified in the response to question #15 to “native support for MacIntosh OS/X clients for file / share access.”</p>
<p>39</p> <p>Section 4.6 – Minimum Requirements</p> <p>Supports HFS/HFS+ and NTFS</p> <p>1. Is this being used today or just be supported if used in future?</p>		<p>NTFS is used today. HFS/HFS+ is a future possibility.</p>
<p>40</p> <p>Section 4.6 – Minimum Requirements</p> <p>Include training for three operators on system operations and maintenance</p> <p>1. How many days training would you like for each operator?</p>		<p>Provide training that is adequate for operators to be independently able to perform day-to-day maintenance and typical operations without the need for reseller or vendor augmentation. We do not know how many days that training would take for any given solution.</p>
<p>41</p> <p>Section 4.6 – Minimum Requirements</p> <p>Provide detailed reports showing disk and channel utilization trends, performance, and alerts for the current year and three prior years, as part of the solution acquired by the College.</p> <p>1. Please confirm that it is not for prior three years as stated at the bidder’s conference.</p>		<p>Confirmed. The ability to show the new solution’s three prior years of history at the start of the fourth year of operation, and only three year’s prior history for every year thereafter, is what we require.</p>
<p>42</p> <p>Section 4.6 – Minimum Requirements</p> <p>Pricing option for live mirrored environment</p>		

#	Question	Answer
	<p>1. In the option to provide a live mirrored copy are you referring to a complete active-active completely in sync mirror where you can split clusters across data centers?</p> <p>2. How much of your production data will be mirrored to that location?</p> <p>3. Just to clarify, no replication is being done in the current environment, outside of a copy of backup data to the backup room?</p> <p>4. This is to be used for BC/DR scenario? If so where would second location be in regards to primary location?</p>	<p>Yes</p> <p>100%</p> <p>Confirmed</p> <p>Not for BC/DR. For complete fault tolerance at the primary site.</p>
<p>43</p> <p>Section 4.6 – Minimum Requirements</p> <p>Installation Services</p> <p>b) Proposer should recognize in their pricing for labor and other professional services the requirement that, during Installation Services, all systems will be hardened, and any system fixes consisting of software patches or hardware replacement will be included.</p> <p>1. Can you please clarify and expand on “Hardened”?</p> <p>2. Can you please identify the most critical applications that can tolerate zero downtime?</p>		<p>Protected from malware and from tampering by unauthorized personnel.</p> <p>All applications would enjoy zero downtime, no matter how critical.</p>
<p>44</p> <p>Section 4.6 – Minimum Requirements</p> <p>Installation Services</p> <p>c) (ii)The Proposer is to provide and install a minimum of Category 6 patch cables to connect its network devices to patch panels. The Proposer is to provide all cables and connectors necessary, including fiber optic patch cables, to complete the installation.</p> <p>1. Can you please provide IP cable lengths?</p> <p>2. The college will provide all patch panels needed, correct? Vendor is only supplying cables?</p>		<p>Unable to determine without knowing the physical layout of the proposed solution.</p> <p>Yes</p>
<p>45</p> <p>Section 4.6 – Minimum Requirements</p>		

#	Question	Answer
	<p>Installation Services</p> <p>c) (iv) The Proposer will be required to complete the following items within the first thirty days following the cutover of each system:</p> <p>1. What is meant by the “cutover of each system”?</p> <p>2. Is this question referring to showing the IOPS at the array level?</p>	<p>Each data set migrated has an associated system using that data set. When the data set is migrated and the associated system is using the data set in the new location, that system is considered cut over.</p> <p>See ITN Solicitation section Installation Services, C(iv), all bullet points, for measurements we expect for this QA process.</p>
<p>46</p> <p>Section 4.6 – Minimum Requirements</p> <p>Warranty Support and Ongoing Service/Support</p> <p>a)(iii) Semi-annual health checks and code updates to bring the system to currently-supported, stable code and remediate any problems uncovered by the health check</p> <p>1. Above all relates to the management software provided with the solution correct?</p>	<p>Refers to all system hardware, software, firmware and microcode that is able to be remediated and updated.</p>	
<p>47</p> <p>Section 4.6 – Minimum Requirements</p> <p>Warranty Support and Ongoing Service/Support</p> <p>a)(v) management of data, application, operating system, and database management system backups as required to provide for full recovery in the event of a disaster or hardware failure.</p> <p>1. Please provide clarification that the items listed in section-A items 1-5 are strictly referring to the management servers needed for operation of the storage array and any associated monitoring software, etc, and that none of these items pertain to the college’s servers, databases, applications, etc.</p>	<p>What we’re asking for is that the vendor take the responsibility to get positive verification from us that we have valid, recoverable backups before commencing any maintenance work. We expect the vendor to verify that the management servers for the arrays and associated software and databases are backed up, or perform those backups if unsure, so any updates that fail can be backed out gracefully with a minimum of downtime and/or disruption. This should not be a concern with a zero-downtime maintenance solution, but is an extra precaution.</p>	
<p>48</p> <p>Warranty Support and Ongoing Service/Support</p> <p>b) Required Service Levels</p>		

#	Question	Answer																																																																																																												
	1. As stated earlier support is 7X24X365 but response time is either 2hr, 4hr or next business day. Which level would be sufficient for the College?	Phone support is 7 X 24 X 365, per the statement in the ITN solicitation. Response time is four hours.																																																																																																												
49	Is data at rest encryption a requirement for the new storage array?	No																																																																																																												
50	Can you please provide a technical drawing of your environment?	See the answers to 25.4 and 26.1 above. You have asked this question already.																																																																																																												
51	What are the primary application hosted on the capacity mentioned?	Answered in question 2(a) above.																																																																																																												
52	Please break down the capacities allocated per application?	Answered in question 2(a) above.																																																																																																												
53	Please provide a list of servers and associated applications?	<p>Hardware Servers:</p> <table border="1"> <thead> <tr> <th>ServerName</th> <th>Mftr.</th> <th>Model</th> <th>Application</th> </tr> </thead> <tbody> <tr> <td>APCMGMT1</td> <td>APC</td> <td>AP 9470</td> <td>Management server for APC infrastructure</td> </tr> <tr> <td>BYME1</td> <td>Dell</td> <td>PE R620</td> <td>Firewall management</td> </tr> <tr> <td>DC5</td> <td>Dell</td> <td>PE R610</td> <td>Windows Domain Controller</td> </tr> <tr> <td>DC6</td> <td>Dell</td> <td>PE R610</td> <td>Windows Domain Controller</td> </tr> <tr> <td>DC7</td> <td>Dell</td> <td>PE R610</td> <td>Windows Domain Controller</td> </tr> <tr> <td>DC8</td> <td>Dell</td> <td>PE R610</td> <td>Windows Domain Controller</td> </tr> <tr> <td>DCAD1</td> <td>Dell</td> <td>PE R620</td> <td>Windows Domain Controller</td> </tr> <tr> <td>DCAD2</td> <td>Dell</td> <td>PE R620</td> <td>Windows Domain Controller</td> </tr> <tr> <td>DCMY3</td> <td>Dell</td> <td>PE R610</td> <td>Windows Domain Controller</td> </tr> <tr> <td>DCMY5</td> <td>Dell</td> <td>PE R610</td> <td>Windows Domain Controller</td> </tr> <tr> <td>DCROOT1</td> <td>Dell</td> <td>PE R620</td> <td>Windows Domain Controller</td> </tr> <tr> <td>DCROOT2</td> <td>Dell</td> <td>PE R620</td> <td>Windows Domain Controller</td> </tr> <tr> <td>DCSERVERS1</td> <td>Dell</td> <td>PE R620</td> <td>Windows Domain Controller</td> </tr> <tr> <td>DCSERVERS2</td> <td>Dell</td> <td>PE R620</td> <td>Windows Domain Controller</td> </tr> <tr> <td>DCSTUDENTS1</td> <td>Dell</td> <td>PE R620</td> <td>Windows Domain Controller</td> </tr> <tr> <td>DCSTUDENTS2</td> <td>Dell</td> <td>PE R620</td> <td>Windows Domain Controller</td> </tr> <tr> <td>DPM1</td> <td>Dell</td> <td>PE R710</td> <td>Microsoft Data Protection Manager</td> </tr> <tr> <td>DPM2</td> <td>Dell</td> <td>PE R710</td> <td>Microsoft Data Protection Manager</td> </tr> <tr> <td>EX13MBA1</td> <td>Dell</td> <td>PE R720</td> <td>Exchange 2013</td> </tr> <tr> <td>EX13MBA2</td> <td>Dell</td> <td>PE R720</td> <td>Exchange 2013</td> </tr> <tr> <td>EX13MBP1</td> <td>Dell</td> <td>PE R720xd</td> <td>Exchange 2013</td> </tr> <tr> <td>EX13MBP2</td> <td>Dell</td> <td>PE R720xd</td> <td>Exchange 2013</td> </tr> <tr> <td>FSCLUST1N1</td> <td>IBM</td> <td>X3550 M3 MT: 7944-AC1</td> <td>Windows File Server Cluster Node</td> </tr> <tr> <td>FSCLUST1N2</td> <td>IBM</td> <td>X3550 M3 MT: 7944-AC1</td> <td>Windows File Server Cluster Node</td> </tr> <tr> <td>Google</td> <td>Dell</td> <td>PE R720xd</td> <td>Google Search Appliance</td> </tr> <tr> <td>HIT-ECS1</td> <td>HP</td> <td>ProLiant ML350p</td> <td>Nuance</td> </tr> </tbody> </table>	ServerName	Mftr.	Model	Application	APCMGMT1	APC	AP 9470	Management server for APC infrastructure	BYME1	Dell	PE R620	Firewall management	DC5	Dell	PE R610	Windows Domain Controller	DC6	Dell	PE R610	Windows Domain Controller	DC7	Dell	PE R610	Windows Domain Controller	DC8	Dell	PE R610	Windows Domain Controller	DCAD1	Dell	PE R620	Windows Domain Controller	DCAD2	Dell	PE R620	Windows Domain Controller	DCMY3	Dell	PE R610	Windows Domain Controller	DCMY5	Dell	PE R610	Windows Domain Controller	DCROOT1	Dell	PE R620	Windows Domain Controller	DCROOT2	Dell	PE R620	Windows Domain Controller	DCSERVERS1	Dell	PE R620	Windows Domain Controller	DCSERVERS2	Dell	PE R620	Windows Domain Controller	DCSTUDENTS1	Dell	PE R620	Windows Domain Controller	DCSTUDENTS2	Dell	PE R620	Windows Domain Controller	DPM1	Dell	PE R710	Microsoft Data Protection Manager	DPM2	Dell	PE R710	Microsoft Data Protection Manager	EX13MBA1	Dell	PE R720	Exchange 2013	EX13MBA2	Dell	PE R720	Exchange 2013	EX13MBP1	Dell	PE R720xd	Exchange 2013	EX13MBP2	Dell	PE R720xd	Exchange 2013	FSCLUST1N1	IBM	X3550 M3 MT: 7944-AC1	Windows File Server Cluster Node	FSCLUST1N2	IBM	X3550 M3 MT: 7944-AC1	Windows File Server Cluster Node	Google	Dell	PE R720xd	Google Search Appliance	HIT-ECS1	HP	ProLiant ML350p	Nuance
ServerName	Mftr.	Model	Application																																																																																																											
APCMGMT1	APC	AP 9470	Management server for APC infrastructure																																																																																																											
BYME1	Dell	PE R620	Firewall management																																																																																																											
DC5	Dell	PE R610	Windows Domain Controller																																																																																																											
DC6	Dell	PE R610	Windows Domain Controller																																																																																																											
DC7	Dell	PE R610	Windows Domain Controller																																																																																																											
DC8	Dell	PE R610	Windows Domain Controller																																																																																																											
DCAD1	Dell	PE R620	Windows Domain Controller																																																																																																											
DCAD2	Dell	PE R620	Windows Domain Controller																																																																																																											
DCMY3	Dell	PE R610	Windows Domain Controller																																																																																																											
DCMY5	Dell	PE R610	Windows Domain Controller																																																																																																											
DCROOT1	Dell	PE R620	Windows Domain Controller																																																																																																											
DCROOT2	Dell	PE R620	Windows Domain Controller																																																																																																											
DCSERVERS1	Dell	PE R620	Windows Domain Controller																																																																																																											
DCSERVERS2	Dell	PE R620	Windows Domain Controller																																																																																																											
DCSTUDENTS1	Dell	PE R620	Windows Domain Controller																																																																																																											
DCSTUDENTS2	Dell	PE R620	Windows Domain Controller																																																																																																											
DPM1	Dell	PE R710	Microsoft Data Protection Manager																																																																																																											
DPM2	Dell	PE R710	Microsoft Data Protection Manager																																																																																																											
EX13MBA1	Dell	PE R720	Exchange 2013																																																																																																											
EX13MBA2	Dell	PE R720	Exchange 2013																																																																																																											
EX13MBP1	Dell	PE R720xd	Exchange 2013																																																																																																											
EX13MBP2	Dell	PE R720xd	Exchange 2013																																																																																																											
FSCLUST1N1	IBM	X3550 M3 MT: 7944-AC1	Windows File Server Cluster Node																																																																																																											
FSCLUST1N2	IBM	X3550 M3 MT: 7944-AC1	Windows File Server Cluster Node																																																																																																											
Google	Dell	PE R720xd	Google Search Appliance																																																																																																											
HIT-ECS1	HP	ProLiant ML350p	Nuance																																																																																																											

#	Question	Answer
	HIT-ECSVS1	HP ProLiant DL380p Nuance
	HIT-HVCLUST1N1	Dell PE R720 Microsoft VDI
	HIT-HVCLUST1N2	Dell PE R720 Microsoft VDI
	HIT-HVCLUST1N3	Dell PE R720 Microsoft VDI
	HOMECLUST1N1	Dell PE R710 Windows File Server Cluster Node
	HOMECLUST1N2	Dell PE R710 Windows File Server Cluster Node
	ILM3	Dell PE R410 Microsoft Forefront Identity Manager
	LMS2	IBM x3550 M3 CiscoWorks MT:7944-AC1
	MACSERVBACK	Apple Mac Pro MacIntosh Server Backup
	MACSERVMAIN	Apple Mac Pro MacIntosh File Server
	NETADMIN1	IBM x3550 M3 Network Management Tools MT:7944-AC1
	NS1	Dell PE R320 DNS
	NS3	Dell PE R630 DNS
	OSI1	Dell PE R610 PI Database Server
	OTM1	Dell PE 2550 PBX Control
	PACS2	PE T420 Fuji PACS Application
	PRINTADMIN2	Dell PE R210 Print Server
	ProceraReportServer	Dell PE 2950 Reporting Server for Traffic Shaper
	PVMC1N1	IBM X3850 X5 MT: 7145-AC1 VMWare
	PVMC1N2	IBM X3850 x5 MT: 7145-AC1 VMWare
	PVMC1N3	IBM X3850 X5 MT: 7145-AC1 VMWare
	PVMC1N4	IBM MT: 3837-AC1 VMWare
	REMOTETS4	Dell PE R710 Terminal Services
	REMOTETS5	Dell PE R710 Terminal Services
	Sandbox	IBM X3950 MT:8878 Software AG Development
	SCCM-ETC1	Dell PE R710 System Center Configuration Manager
	SCSQLCLUST1N1	Dell PE 710 Microsoft SQL
	SCSQLCLUST1N2	Dell PE 710 Microsoft SQL
	SCSQLCLUST1N3	Dell PE 710 Microsoft SQL
	SQLAPP1	Dell PE R710 Microsoft SQL
	SQLCLUST1N1	Dell PE 2950 Microsoft SQL
	SQLCLUST1N2	Dell PE 2950 Microsoft SQL
	SQLCLUST1N5	Dell 2950 Microsoft SQL
	SQLCLUST1N5	Dell PE R720 Microsoft SQL

#	Question	Answer
		SQLCLUST1N6 Dell PE R720 Microsoft SQL
		SQLCLUST1N7 Dell PE R720 Microsoft SQL
		SQLCLUST1N8 Dell PE R720 Microsoft SQL
		SQLCLUSTTEST1N1 Dell 2950 Microsoft SQL
		SQLCLUSTTEST1N2 Dell 2950 Microsoft SQL
		SQLDB1 Dell PE R710 Microsoft SQL
		SQLDBTEST1 Dell PE R710 Microsoft SQL
		SQLGateway1 Dell PE 2950 Microsoft SQL
		SQLGateway2 Dell PE R720 Microsoft SQL
		STUDAPPS1 Dell PE 2950 Classroom Applications
		STUDAPPS2 Dell PE 2950 Classroom Applications
		SUBCA1 Dell R300 Certificate Authority
		VC5 IBM x3550 VMWare M3 MT:7944 -AC1
		VMC55N1 Dell PE R620 VMWare
		VMC55N2 Dell PE R620 VMWare
		VMC55N3 Dell PE R620 VMWare
		VMC55N4 Dell PE R620 VMWare
		VMC55N5 Dell PE R620 VMWare
		VMC55N6 Dell PE R620 VMWare
		VMCBAC2N1 Dell PE R720 VMWare
		VMCBAC2N2 Dell PE R720 VMWare
		VMCBAC2N3 Dell PE R720 VMWare
		VMCPRINT1N1 Dell PE R710 VMWare
		VMCPRINT1N2 Dell PE R710 VMWare
		VMM1 Dell PE 710 VMWare
		VMSRV1 Dell PE R720 VMWare
		VMSRV2 Dell PE R720 VMWare
		WEB5-STAGING Dell PE 2950 Web Server
		WEB6 Dell PE 410 Web Server
54	Please provide a list of servers and associated capacities allocated?	SAN capacities and applications on the SAN noted in the answer to question 2(a) above. Not all servers are connected to the SAN. Backup space on SAN today is inadequate for our backup needs.
55	Please provide a list of servers and associated Operating Systems and versions?	Answered in question 20.2 and ITN Solicitation section 4.6.
56	Please provide details on any clustered environments, the clustering software, versions, and applications running under the cluster.	Microsoft SQL clusters, two VMWare ESX 5.5 clusters, Windows File Server Clusters on Server 2008 R2 and Server 2012 R2, all clustered using native operating system/hypervisor clustering tools
57	What is the total number of LUNs allocated to all Fibre Channel hosts?	162 as of 07/22/2015
58	What is the total number of LUNs allocated to all iSCSI hosts?	25 as of 07/22/2015

#	Question	Answer
59	Did the due date for the surveys change to match the new due date for proposal responses? The amendment only addresses our responses thus we need clarification	We will not be changing any dates other than those listed in Amendment 2.
