

Network Attached Storage Solution

RFP P9/9682

Date: 9/14/09

Answers to Vendor Questions – Questions are in black, answers are in red.

1. Can you provide a current SAN Network diagram? (Section 2, pages 4 & 5)
 - a. Attached
2. Can you provide a current NAS Network diagram? (Section 2, pages 4 & 5)
 - a. Attached
3. Does Microsoft SQL need to connect via Fiber Channel only? Will ISCSI suffice, especially at 10GB? (Section 7.2.4, page 17)
 - a. iSCSI will suffice provided the system has the is able to provide mpzio capabilities for high availability and increased throughput. Please reference the attached NAS diagram regarding connectivity speeds.
4. What is roadmap for storage connectivity? Current SAN is 2 GB, any plans on upgrading to 4/8 GB or change to ISCSI 10GB? Is PIMA investigating Fiber Channel Over Ethernet (FCOE)? (Section 7.2.4, page 17)
 - a. There currently no plans to move to FCOE. The current 2 GB connections will no longer be used when the SAN is retired. The system should provide the capability to move to 10GB iSCSI if it is deemed necessary for future workloads.
5. What is impact of data loss for new storage? For example, if storage device were down, what is the cost to the business or how critical is information-very, not critical, etc. (Section 7.3, page 18)
 - a. The NAS will be hosting our ERP and student learning systems so the information is business critical.
6. What is reasoning for running Oracle on NFS? Better performance than fiber channel, etc? (Section 7.2.4, page 17)
 - a. Simplification of storage management cost of hardware support, easy sharing of storage in support of clustering.
7. How do we classify data for new storage device as it relates to business, Tier1/Tier2, Business Critical, Infrastructure, etc? (Section 2, pages 4 & 5)
 - a. The NAS will be hosting our ERP and student learning systems so the information is business critical.
8. What kind of application response time does the current infrastructure have today, 5 Ms, 10Ms, fast, slow, good, bad, are users experiencing slow response time/fast, etc? (Section 2, pages 4 & 5)
 - a. Users are not experiencing slow response times. Specific metrics for each application have not been captured.

9. What is the expected increase in future I/O load? (Section 2, pages 4 & 5)
 - a. Current management tools are unable to provide historic I/O load which makes anticipating future growth difficult. A minimum database growth of 3-5TB is expected over the next 2-3 years.
10. What is the throughput of your current applications measured in? - MB/sec, 50MB/sec, 100MB/sec, 200MB/sec. For example: since we are running 2 GB Fiber Channel today, are we having throughput issues? (Section 2, pages 4 & 5)
 - a. We have not measured this but we are not having any throughput issues at 2GB.
11. On a scale of 1-5, please rate the following in level of importance (Section 2, pages 4 & 5):
 4. Hardware Performance
 4. Software features & functionality
 5. Enterprise storage solutions
 1. Midrange storage solutions
 4. Software functionality ease of use

1=Low, 5=High
12. How critical is minimal downtime for the data migration? Is there a current migration plan and time frame? Are you looking for data migration to be included in the RFP? (Section 2, pages 4 & 5)
 - a. Out of hours downtime will be schedule to perform the migration. The current time frame is to have all data migrated by the end of April 2010.
13. How important is downtime for microcode upgrades (eg. No downtime, downtime window, 4, 6, 8 hours downtime, etc.?) (Section 7.3, page 18)
 - a. Microcode updates should be able to be applied during downtime windows and take no more than 6 hours.
14. What is the configuration of the E20K (how many domains, how many CPUs, speed, memory, and what apps are running on it, specifics on the HBA's and NIC on each domain? How long will the E20K remain in service? What are the operating costs associated with running the E20K. (Section 2, pages 4 & 5)
 - a. The E20K's are running Oracle 10gR2 and numerous Cobol and C programs applications from SungardHE. There are three domains will need to be connected to the NAS solution. Each domain contains two hsPCI+ I/O boards. The I/O boards each contain a SCSI HBA, single-port fiber HBA, a 1GB Ethernet HBA and an empty 3.3V 33/66MHz slot. Operating costs and service lifetime of the E20K's are irrelevant for this RFP.

15: Page 1, paragraphs 2 and 4, Deadline for receipt of sealed proposals.

We respectfully request an extension to allow two weeks from the date answers are posted on the web site.

Currently questions and answers are scheduled for posting by September 25; therefore we request an extension to October 9, 2009. Because our configuration is highly dependent on the responses to the questions this time is needed to ensure the best configuration and pricing is presented to Pima Community College.

Answer: The schedule is able to be extended to October 9th for all parties.

16: Page 4, Section 2, paragraph 2, Hitachi v9980.

This section describes the performance characteristics for the existing Hitachi v9980 in terms of I/O

operations per second. What is the record size for the applications currently running?

Do you have any information on the maximum and typical data throughput (MB/sec) for this device?

Oracle is currently using 8k blocks. Other applications such as Microsoft file shares are using 4k blocks. Current management tools are unable to provide historic statistics. The attached spreadsheet which provides 'vxstat' output of all production Oracle databases.

17. Page 8, Section 3, paragraph 4, Cost Proposal.

Does Pima wish to have an itemized list of software licensing and maintenance costs per software module?

Answer: Yes

18. Page 17, Section 7, paragraph 7.2.1, Capacity and Scalability.

The capacity requirements are described as 20TB for Oracle and

Microsoft with an additional 10TB for file shares and quorum devices. This is assumed to be usable capacity given the

requirement to grow to 72TB of usable capacity. The total raw storage capacity required is dependent upon what RAID classes are used and how much storage is in each class (including spares). Please provide a description of what RAID

types (0,1, 5, etc) are to be used with what capacities and the desired number of spares. Alternatively please provide raw requirements for the storage capacity.

Answer: Raid 5 is preferred provide the performance is adequate for Oracle databases. The number of spares will be dependent on the number of data drives the solution provides.

Generally a ratio of approximately 1 hot spare for every 20 data drives is preferred.

19. Page 17, Section 7, paragraph 7.2.4, Connectivity.

Can Pima describe which switches are currently being used and advise if you planning to replace the current switches?

If so, will they be in place prior to this implementation?

Answer: The switches in place when the NAS is implemented will be Juniper 4200 series for the cabinet switches and Juniper 8400's for the core network. Our existing Brocade's will replace the McData fiber switches so new no additional fiber switches will be required.

20. Page 17, Section 7, paragraph 7.2.4, Connectivity.

HBA's compatible with the Sun Fire E20K domains are mentioned and Oracle connectivity is described as being via NFS.

Is the intent that the E20K's be connected to the NAS solution via fiber channel and via ethernet?

If ethernet, then are 10GigE NIC's required?

Answer: The migration from SAN to NAS will require that the E20K's are connected to both storage devices simultaneously. 10GB nics will not be required.

21. Page 18, Section 7, paragraph 7.2.7, Backup Encryption.

Backup devices described earlier in the document include an L500 tape library and an x4500 for disk backups.

Does Pima employ a disk-to-disk-to-tape scheme currently? Is the DR site backed up or just the main production site?

PCC does not currently perform disk-disk-tape backups. The DR site is backed up using a separate L48 tape library.

22. Page 18, Section 7, paragraph 7.3.1, Replication.

Can Pima describe the minimum available bandwidth or QoS allotted to Pima on the shared 1Gb/s link to the DR site?

Answer: Pima does not have QOS enabled. Approximately 75% of the 1Gb link is available.

23. Page 18, Section 7, paragraph 7.3.1, Replication.

The total size for replicated data bases is described as 5TB. In the capacity section, 20TB is required for Oracle and Microsoft SQL. Does this mean that the size is currently 5TB with expected growth to 20TB? Can Pima please elaborate?

Answer: Pima has multiple stage and development copies of each database. This total of all databases is expected to grow rather quickly to 20TB. Only production databases need to be replicated which should amount to approximately 5TB.

24. Page Section 7, paragraph 7.3.3, RTO and RPO.

Recovery Time Objective (RTO) and Recovery Point Objective (RPO).

Is the requirement on RTO for a single 200GB Oracle database as recovered from tape backup at both primary and DR site or does this requirement also pertain to a complete recovery from a general disaster assuming a startup at the DR site?

Answer: The RTO and RPO is assuming bring a single instance of Oracle at the DR site and the primary datacenter is offline.

25. Page 19, Section 7, paragraph 7.5, Support.

Requires on-site support 24/7. However, you want a detailed description of response times for

standard and extended support. When you refer to "standard" support, are you referring to manufacturer

warranty or the standard 4-hour on-site response time that comes with most service contacts?

Please clarify meaning of "standard" vs "extended" support as used here.

Answer: Some service contracts provide multiple levels of response times 8hr, 4hr, 2hr, etc. If this is the case please explain the differences between support options.

26. Are all questions and responses going to be supplied to all responders?

Answer: Yes.

27. Section 2 – Scope of Work

a. Existing environment – Item 2 Existing Technology Environment

i. Hitachi 9980 performance specifications

1. Total IO Rate/sec is not the sum of Seq IO rate + Rand IO rate.

1. Were these performance numbers documented for the same workload period?

1. These numbers covered the same 1 week sampling of data. The average Total IO rate does equal the Seq IO Rate + Rand IO Rate. The maximum Seq and Rand IO rates did not occur at the same moment so they can not be added determine the maximum Total IO rate.

2. The maximum IO rates are "roughly" 10x the average rates. Is this typically a 1 time maximum (yes it is a definition of maximum), however, is there a

more typical workload performance value? Often averages can be misleading especially if the system is not busy “off-work” hours.

1. Answer: Current management tools are unable to provide historic I/O load which makes anticipating future growth difficult.

28. Section 3 – Proposal Preparation and Submittal

b. Item #3 Response to Scope of Work

i. “...Responses must follow the numbering format used in the Scope of Work Section”

1. This is unclear. The Scope of Work section (page 4-5) describes the existing infrastructure and performance. Do you mean “Section 7 – Technical Specifications” since this is the section which covers the requirements and needs of Pima Community College?

2. Yes, please follow the numbering formation used in Section 7.

c. Item #5 Appendix, sub-item b

i. Our company is a private company, not public. What information do you require from us?

Answer: Please refer to page 9, Appendix, 5b. for requirements.

29. The RFP is a “NAS replacement” of the FC infrastructure. The RFP states FC is required. If PCC does not upgrade/replace the FC switches (as part of the RFP), then are you planning on doing this or keeping “non-supported” switches? Does the RFP (and storage) still require FC connectivity?

Answer: FC connectivity is still required for some systems. The fiber will be re-routed from the unsupported McData switches to our Brocade switches. In the future primary connectivity will be via NAS technologies.

30. Is there a requirement to upgrade the FC switches in the RFP? It is not clearly stated if this is to be upgraded or replaced. If upgrading and replacing is to be added to the RFP, how many ports and performance (4Gb/sec or higher) is required.

1. Answer: any required FC connections will be moved to the Brocade and additional fiber ports are not necessary.

31. Should the solution propose replacing the McData 6064? (Section 2, Page 4)

Answer: No, any required FC connections will be moved to the Brocade.

1.

32. How many ports are available on the Brocade fabric? What are the port speeds?

(Section 2, Page 5)

1. Answer: On each Brocade there are 12 ports unpopulated which contain 4Gb GBIC's. Additionally there are 8 empty ports that require GBIC's.

33. What is the current firmware version on the Brocade fabric? (Section 2, Page 5)

Answer: Fabric OS version v6.0.0b

34. How much iSCSI traffic are you supporting today? Do you anticipate growth or decrease? (Section 7.2.4, Page 17)

We are not using iSCSI today. NFS is primary used. ISCSI will be utilized as new systems are put in place that would normally require FC.

35. How much Fiber Channel traffic are you supporting today? Do you anticipate growth or decrease? (Section 7.2.4, Page 17)

We expect a decrease in FC growth as Oracle databases are moved to NFS and iSCSI replaces FC for direct attached storage.

36. Will the Oracle and SQL databases continue to access Fiber Channel storage or change to iSCSI storage. (Section 7.2.1, Page 17)

Answer: Oracle will move to NFS. MSSQL will initially stay on FC but may move to iSCSI at a later date.

37. Are you replacing the Netapp and Sunfire as part of this solution? (Section 2, Page 5)

1. Answer: No, only the 9980 will be replaced.

38. How much data will be replicated for DR and what is the rate of change of that data? (Section 7.3.1, Page 18) **We do not have the capability to provide rate of change metrics, 5TB**

39. How much bandwidth is available for DR replication? (Section 7.3.1, Page 18)

1. Approximately 75% of the 1Gb link to DR is available for replication.

40. Does encryption at the tape level meet your requirements for encryption? (Section 7.2.7, Page 18)

1. Yes

41. Encryption is at the tape level, not over the wire. (Section 7.2.7, Page 18)

1. Yes

42. What is the firmware and IOS version on the Cisco 6509? (Section 2, Page 5)

The NAS device will be connected to the Juniper 4200 switches, not the Cisco 6509.

JUNOS Base OS boot [9.6R1.13]

JUNOS Base OS Software Suite [9.6R1.13]

JUNOS Kernel Software Suite [9.6R1.13]

JUNOS Crypto Software Suite [9.6R1.13]

JUNOS Online Documentation [9.6R1.13]

JUNOS Enterprise Software Suite [9.6R1.13]

JUNOS Packet Forwarding Engine Enterprise Software Suite [9.6R1.13]

JUNOS Routing Software Suite [9.6R1.13]

JUNOS Web Management [9.6R1.13]

43. Do the blades in the 6509 support jumbo frames? (Section 2, Page 5)

The NAS device will be connected to the Juniper 4200 switches, not the Cisco 6509.

The Juniper switches do support jumbo frames.

44. Will there be a pre-bid meeting for the NAS Proposal (P10/9682) or is submitting questions by email the only venue for clarification?

Answer: There will not be a pre-bid meeting. Submitting questions by email is the only means of clarification of questions.

Infrastructure (Page-Section)

45. The capacity you mentioned in the RFP (15.61TB) Storage, was this allocated usable capacity or actual data? (4-2)

1. Allocated capacity

46. How much captive (allocated not used) storage do you have in your environment?(4-2)

1. Approximately 1/3 of the allocated space is allocated but not used; approximately 5TB.

47. How much inactive data do you have in your environment?(4-2)

PCC does not currently implement archiving.

48. What has been the pace of storage growth in the past per year? (4-2)

1. Current management tools are unable to provide historic growth information.
 49. Which applications have driven the most growth over the past few years? (4-2)
 1. Sungard Degreeworks, Blackboard Vista
 50. What version of Oracle are you currently running, any short term plans to upgrade versions?(4-2)
 1. Oracle 9 and 10gR2. We hope to upgrade to 11g within the next year.
 51. What file system are you currently running Oracle?(4-2)
 1. Veritas Filesystem 4.1
 52. For high availability do you have (2) switches for iscsi traffic?(17-7)
 1. We will have three Juniper switches in a virtual chassis configuration.
 53. How many ports are available on the Brocade 5K Switches?(17-7)
 1. Answer: On each Brocade there are 12 ports unpopulated which contain 4Gb GBIC's. Additionally there are 8 empty ports that require GBIC's.
 54. What OS are you currently running Oracle, Solaris / Linux? (17-7)
 1. Solaris 9 and 10.
 55. Are you looking to standardize on NFS or are you open to run Oracle on a block based SAN? (17-7)
 1. We are looking to standardize on NFS
 56. Are you looking to consolidate your storage environment into a single solution, or will PCC maintain multiple storage arrays?(4,5-2)
 1. There are no plans to replace the existing Netapp system at this time, only the 9980. Therefore we expect to maintain multiple arrays.
 57. Does PCC currently have any power / footprint limitations within the data center?(18-7)
 1. Any reasonable solution should fit in Pima's data center. We envision a solution that should fit within two racks. Power and space requirements should not exceed a 9980 controller and one disk cabinet..
- Replication / Disaster Recovery -- Page 18 Section 7
58. What is the Bandwidth & Distance between your main office and the DR Site? (18-7)
 1. 1Gb with 75% of bandwidth available for replication. The DR site is approximate 10 miles away.
 59. Is this Bandwidth dedicated for replication or will other business traffic co-exist? If co-exist how much bandwidth will be allocated for replication? (18-7)
 1. 75% of the 1Gb shared link will be available for replication.
 60. Do you currently have a disaster recovery plan with defined recover point objectives? (18-7)

1. No

61. Besides Data Guard do you currently utilize replication? (18-7)

1. No

62. What is it? Do we need to co-exist with it? Can we replace it? (18-7)

1. We are unable to answer this question. Unclear as to the "it" being referred to.

63. What type of replication do you prefer? i.e.: mirroring or point in time? (18-7)

1. Mirroring

ILM/ Retention / Archive – Page 17 Section 7

64. Have tools and processes been implemented towards accomplishing ILM? If so, which ones and describe the process. (17-7)

1. No

65. What are your compliance needs for Archiving? (i.e. retention, SOX, etc) (17-7)

1. None at this time.

66. How are you backing up Oracle today RMAN or through NetBackup? (17-7)

1. We utilize both RMAN, cold backups and Veritas snapshots.

67. Do you plan on backing up to disk then to tape? If so, how long do you plan on keeping backups on disks? (17-7)

1. Only in some situations. Backups to disk are generally offloaded to tape with 5 days.

68. How is archiving accomplished today in terms of retention and storing of archived data, including e-mail? (17-7)

1. Archiving is not done

Snapshot / Cloning – Page 18 Section 7

69. How many DEV/TEST environments do you need? (18-7)

We currently have 12 development/stage databases. This number does fluctuate slightly however depending on business needs.

70. Are you looking to eliminate tape from your environment? (18-7)

1. No

71. For your SQL, how many hosts / nodes will you want to take snapshots from? (18-7)

1. Two for MS SQL. Minimum of 6, maximum of 8 for Oracle.

Management / Monitoring Tools – Page 19 Section 7)

72. Are there any tools being used today for reporting on storage utilization and growth or trending? If so which ones? (19-7)

No

73. Are any tools being used today to provide performance management, if so which ones? (19-7)

1. No

General

74. What is the anticipated project award date and project start date?

75a. Did the College utilize the services of a consulting firm to assist in developing the RFP and system requirements?

No

b. If so, which firm was used and is that firm eligible to participate in this procurement effort?

- i. N/A

76. Why does Oracle need to be provided over NFS? (Section 7.24)

Simplification of storage management, cost of hardware support, easy sharing of storage in support of clustering.

77. Has block base storage been completely ruled out or can it be submitted as a alternative? (Section 7.24)

It can be submitted as an alternative but our preferred approach is NFS.

78a. Section 3, 5.b. Is this a requirement if the company is privately held?

Answer: Yes.

b. If so how does the College handle this information in context to the RFP being a public record?

Nobody wants a competitor to be able to view their companies financial information.

Answer: Submit financial information in a sealed envelope clearly marked Confidential Financial Statements.

These will be returned to all unsuccessful respondents to the RFP.

NAME	READ OPS	WRITE OPS	READ BLK	WRITE BLK	READ AVG(ms)	WRITE (ms)
pccparchvol	2405616	4946215	2445142791	956683641	16.2	2.2
pccpindexsnapvol	279265	1545354	6876444	35168776	4.9	24.1
pccpindexvol	102074964	23541096	1333053328	593571491	11.1	2.7
pccprbs1snapvol	505975	1377407	31070826	43951446	3.1	6.7
pccprbs1vol	27304247	103144995	4211001710	2442292841	4.6	1.4
pccprbs2snapvol	248419	995814	17249044	27312272	2.8	5.7
pccprbs2vol	9542080	55637722	1017848774	1282378829	9.6	1.4
pccptablesnapvol	375111	511877	6587576	11400864	4	38.9
pccptablevol	364780505	15455231	2511120750	310598150	6.9	2.4
orclvol	3240705	14677354	1492458230	287994830	17.3	2.8
lumpvol	4069356	14709445	1483646183	356769394	11.2	2.1
pdatvol	17551820	7242851	4216850250	362314520	15.1	2
lcmsvol	138558422	10795201	3271319671	238644201	1.6	3.7
pflwvol	5596387	11650786	3020977038	360541415	12.4	1.7
pvisarchsnap	6057747	6428019	730321472	770369262	1.6	3.3
pvisarchvol	8941863	14384785	3437154417	1236747063	5.8	2.2
pvisindexsnap	10322138	16974553	201586648	311043542	4.1	9.9
pvisindexvol	63306672	148300435	2858312468	3253562621	8.5	1.3
pvisrbs1snap	3669812	14176865	436981944	789221730	1.9	1.3
pvisrbs1vol	49839799	111833872	3174106891	1211900202	4.7	2.9
pvisrbs2snap	3922451	6294698	278971282	364611450	2.8	2.8
pvisrbs2vol	12813053	21646491	3187008698	1337984271	9.1	2.4
pvistablesnap	10017406	13838986	301516432	379245282	3.6	16.5
pvistablevol	274503922	89273574	3440678254	3141718520	12.3	1.9

Any volume which contains the word snap is a Veritas snapshot volumes used only during nightly backups.

Meetrics were gathered from the output of the Veritas vxstat command. The vxstat command provides statistics from the last restart. For the PVIS databases this covered 296 days. For all other databases it covered 65 days.

Several production Oracle databases separate indexes, logs, and data into multiple volumes. The key to teh right describes the funtion of each database.

Database Key

PCCP	Sungard Banner ERP
ORCL	UC4 Job Management
LUMP	Sungard Luminis Portal
	Sungard
PFLW	Workflow
LCMS	Sungard Content Management
	Blackboard
PVIS	Vista
PDAT	In-House Applications