**QUESTIONS AND RESPONSES – October 18, 2017**

Q.1 All nodes – IPMI support

What type of IPMI functionality/capability does NETL require?

Does NETL require IP access to the nodes via 1GbE above and beyond the 1GbE IPMI connections? If so, what will this be used for?

**Response** **– The 1GbE interface will be used for command & control and maintenance as well as IPMI. A single PHY layer for both IPMI and 1GbE LAN is preferred.**

Q.2 All nodes – Network connectivity

Where applicable, does NETL require single or dual connections to the compute, access and maintenance networks? Where dual connections are required, would a single adapter with 2-ports suffice?

**Response – Dual-port interface is acceptable.**

Q.3 Node access to 100Gbps Compute Network

A 2:1 blocking ratio was indicated for the Log-in nodes. Please confirm that NETL requires a 2:1 blocking ratio for the compute and maintenance node’s as well.

**Response – 1:1 blocking is required for all storage nodes. All other nodes may use 2:1 blocking or better. See RFP Figure 1.**

Q.4 Section 3.2 – 4 TB RAID 1 local disk storage per node

Is this raw or effective capacity (i.e. 2x 2TB drives provides 4TB of raw capacity or is NETL looking for 2 x 4TB drives)?

**Response – Two 4TB drives in RAID1 for effective capacity of 4TB.**

Q. 5 Section 3.2 – GPU Nodes

Does NETL require the GPU-based nodes be the same server type/form factor as the Large Memory nodes or is the requirement only to have the same processor type?

**Response – Only the same processor type.**

Q.6 Section 3.2 – GPU Nodes

Does NETL have a preference between NVlink and PCIe P100 adapters?

**Response – No preference.**

Q.7 Section 3.2 – Large memory and GPU Nodes

Understanding there is a cost tradeoff, does NETL prefer the memory configuration to optimize performance or price? How will this be scored during the RFP review process?

**Response – All memory should be configured for maximum bandwidth.**

Q.8 Section 3.3 and 3.4 – 4 TB local disk configured in RAID 1 (boot/OS)

Same as above - Is this raw or effective capacity?

**Response – Two 4TB drives in RAID1 for effective capacity of 4TB.**

Q.9 Section 3.3 – One NVIDIA M2000 family GPU Card w/ 4 GB or higher

The NVIDIA M2000 is an old GPU card. Would NETL accept a more current GPU card that has comparable numbers of cores and memory?

**Response – Yes. See RFP Section 3, Note about offering alternatives.**

Q.10 Section 3.3 and 3.5 – SSD RAID 1 for local storage (Preference)

Understanding there is a cost premium for SSD, what SSD drive size is required? How will this be weighted from a proposal evaluation perspective (cost/performance scoring)?

**Response – Two 1TB SSDs in RAID1 is minimum acceptable configuration.**

Q.11 Section 3.5 – The configuration of the firewall systems is the responsibility of the Contractor

Will these systems run a specific firewall software (Check Point, PAN, etc.)?

Could NETL provide additional details on configuration expectations?

**Response – Netfilter using a current Linux Kernel.**

Q.12 Section 3.5 – 1 TB local disk configured in RAID 1 (boot/OS)

Same as above - Is this raw or effective capacity?

**Response – Two 4TB drives in RAID1 for 4TB effective capacity.**

Q.13 Section 3.5 – “Firewall System shall be networked to the Access Network and the external HPC network connection”

The system configuration requirements specify “two 10Gb Ethernet ports”. Does NETL require two separate 10Gb Ethernet adapters or is a single adapter with 2x 10Gb ports sufficient?

**Response – Dual-port interface is acceptable.**

Q.14 Section 3.8 – Management Network

States “Must support both IPMI access and Gigabit IP access to all nodes”. Does this mean all nodes must have an IPMI port AND a separate 1GbE port? If so, what will the non-IPMI 1GbE network be used for?

**Response – Preference is for shared PHY layer for both IPMI and GbE LAN. GbE LAN will be used for command & control and maintenance.**

Q.15 Section 3.9 – HPC Storage Requirements

Does NETL have a parallel file system selected? If Lustre is selected, is NETL open to using openZFS with Lustre or is hardware RAID mandatory?

Stated “Two 1TB PCIe NAND or 3D X-Point SSDs” – Current 3D X-Point SSDs are 375GB vs 1TB. Are 2 of these 375GB drives sufficient?

Stated “10GB HGST Enterprise-class SAS drives” – Is an equivalent drive permitted or is HGST mandatory?

**Response – Hardware RAID controllers are required. Two 375GB 3D X-Point is sufficient. Enterprise-class SAS drives of other manufacturers are permitted, but HGST are preferred. Ref. RFP Section 3.9 and Section 3.0 Note about offering alternatives.**

Q.16 Section 3.10 and 9.0 – Early Evaluation System

Is the expected delivery of the Early Evaluation System within 10 or 14 working days after the award of the contract?

**Response – See RFP Section 9**

Q.17 Section 3.9 and 4.0 – HPC and Backup Storage System

Stated “Total primary storage of at least 3.5 PB” – Is this raw or usable? If usable, what RAID level should be factored in?

**Response – Usable capacity in RAID6**

Q.18 Section 4.0 – Backup Storage System

The system configuration requirements specify “Dual 10Gb Ethernet ports”. Does NETL require two separate 10Gb Ethernet adapters or is a single adapter with 2x 10Gb ports sufficient?

Will these 10Gb ports be connected to the NETL Access Network switches?

**Response – Single adapter is acceptable. Backup systems will be connected to other 10G termination points in NETL’s primary data center, not to any network in the HPC envelope. See RFP Section 4.0, Required Items**

Q.19 Section 4.0 – Backup Storage System

Would NETL accept a solution that combines all storage into the Server Nodes or are separate JBOD arrays mandatory?

**Response – Both integrated storage nodes and JBOD configurations are acceptable. SGPIO connections must be made to the backplane of integrated storage nodes to provide drive identification. See RFP Section 3.0 Note about offering alternative solutions.**

Q.20 Section 4.0 – Backup Storage System

“IPMI support for all Login nodes with connection to the Gigabit Ethernet Management Network”. Could NETL please explain this reference to Login nodes and how it relates to the Backup Storage System?

**Response – RFP Section 4.0, Required Items, second sub-bullet should read, “IPMI support is required for all backup servers”. Delete “IPMI support for all login nodes with connection to the Gigabit Ethernet management Network”.**

Q.21 Section 4.0 – Backup Storage System - “Backup storage will be located in B39 Datacenter”. Does NETL have existing Maintenance and Access Network switches in B39 or will vendors be required to provide additional 10Gb and 1Gb switch options for B39? If NETL has existing switches, please provide vendor, make/model, number of open ports, port type (QSFP, SFP, RJ45), etc.

**Response – In-rack 10Gb switches must be provided with the Backup Storage System racks. NETL has campus connectivity in place to link the B39 Datacenter to the MDC. SFP connectors are preferred.**

Q.22 Section 5.0 – Warranty/Maintenance

States “…with part replacement provided by the contractor” – Does this mean NETL requires the contractor to come on site and perform parts replacement OR just provide the replacement parts and NETL staff will install?

**Response – NETL requires that the contractor provide the replacement parts. NETL staff will install.**

Q.23 Connectivity to existing NETL Network

Please provide detail on NETL’s existing Core and TOR Compute, Access and Mgmt network switches (vendor, make/model, speed, port type (QSFP, SFP, RJ45), number of open ports, etc.

**Response – All existing switches and network infrastructure in the existing HPC system will be retired and appropriate replacements must be provided as part of this solicitation.**

Q.24 RFP Instructions – L.6.C SF33 Form

Will NETL be posting the SF33 form to the SEWP site?

**Response Yes**

Q.25 Section 6.0 CLIN4- Prefabricated Data Center/Modular Data Center Infrastructure
For both re-use and replacement:

- Expected capacity growth for 3, 5 and 10 years (or next point of IT equipment obsolescence)?

**Response – Not germane to this solicitation**

- Expected life span of the existing PDC/MDC?

**Response – See RFP Section 3.12**

- How will cutover be handled if PDC/MDC is replaced? What is are the allowable downtime window(s)?

**Response – See RFP Section 1.0 and Section 11.1, Transition Plan**

- Who will provide electrical contracting work for on-site improvements for either re-use/replace scenario?  Must electrical work be performed by NETL staff/contractor or should this be included in our proposal?

**Response – Contractor is responsible for electrical contracting work and should be included in the proposal**

- For electrical and mechanical re-use- what components will be reused?  Replaced?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Existing space allocated for power, cooling and IT enclosures – During the walk-through, we noticed there were approximately 8 empty racks. Will these racks be available for this refresh project or can they be removed to make room during the installation/migration? How much additional open floor space can be used for this project? If they can be repurposed for this project, please provide the vendor, make/model, PDU type, etc.

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Does NETL require monitoring/work/control environment, air lock between exterior/interior of CIM?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Are there other empty racks enclosures available for this project?  Please provide vendor, make/model, size, dimensions, U space?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Does NETL wish to stay with 415Y/230V 3P power?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- How much total power required currently?  Future state?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Back up runtime required?  Currently?  Future state?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Battery type required?  VRLA?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Redundancy?  Current and future state? A/B power distribution, N, 2N, N+1 needed?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- How much power, phases, voltage, amperage is available per rack?  Current/Future state?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- How will power be distributed within the rack?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- ePDU's and ratings required, number and type of plug/receptacles?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Single or double corded power supplies?  Rack mounted EATS required?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Cooling and environmental considerations required?  Type?  Specification.

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Ambient and high/low temperature

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Computing environment operating temperature

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Cooling BTU/KW currently being used?  Under or over sized?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Security and access control required inside and outside?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Lighting, inside/outside?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Convenience receptacles and other power availability?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Door and other critical component dimensions

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- How is/will power distribution be handled?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Upstream of the UPS- input switchgear type drawout/fixed mount, panel or switchboard

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Downstream of the UPS- PDU/RPP, panel board

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Under or overhead power distribution cabling, whips flex conduit

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Continue to use busway overhead?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Current generator specifications, new required?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- ATS required?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- IT Integration SOW required?  Power, power distribution, IT equipment etc. Are there certain tasks an NETL staff member or contractor MUST perform?

**Response – Ref. RFP Section 3.10, 8.0, 9.0, and 10.0 for IT integration and startup information. Power, power distribution, IT equipment, etc. is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Monitoring and metering required at what points of the power chain?  Which devices?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Down time schedule/window?

**Response – See Section 1.0 and Section 11.1, Transition Plan**

- Softcopy site planning drawings available?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

- Certifications required? UL, ISO, Union, etc.

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

Q. 26 Section 11.1 – Transition Plan

Would NETL please indicate which installation and migration tasks MUST be handled by NETL staff (i.e. post-installation customization of HPC software, migration of data from the old HPC storage environment to the new HPC storage environment, connectivity of new access switches to NETL existing core network, etc.)?

**Response – The referenced items will be performed by NETL**

Q. 27 Considering the scale and scope of this solicitation, we would like to request a 2 week extension to the RFP due date (from 10/31/17 to 11/14/17)

**Response RFP due date remains 10/31/2017**

Q.28 “Whereas, LESSEE operates a U.S Department of Energy Laboratory (the “U.S. Government End User”) under a contract (the “Government Contract”) as might be amended from time to time; and Whereas, LESSEE desires to lease certain equipment from LESSOR for use at U.S Government End User; and Whereas, LESSEE and LESSOR are entering into this Agreement as a financing transaction between Lessee and Lessor for the sale of the equipment described on one or more Lease Schedules to be issued hereunder.”

Could you please clarify exactly what entity will be the Lessee? Is it the Department of Energy or another legal entity that operates the Lab?

**Response National Energy Technology Laboratory**

Q.29 Finance Question: Does NETL intends to finance the property taxes and so those should be included as part of the debt service as well?

**No Federal Government does not pay property taxes and we are tax exempt**

Q.30 Storage Question: What type of data is being stored? Structured data (structured data is organized in a highly mechanized and manageable way. Structured data is ready for seamless integration into a database or well-structured file format such as XML.), unstructured data (Unstructured data, by contrast, is raw and unorganized. Examples of unstructured data include email, books, documents, medical records, satellite images, pictures, video and social media posts.) or both? How quickly does the data need to be retrieved?

**Response – Data will primarily be stored as large files in user-organized directories. Most data will NOT be stored in databases. Read and write file access speed is critical for HPC performance.**

Q.31 We would like to support CPU that would not meet 2.6GHz frequency however it will be more cost effective and better performing than alternate which supports 2.6GHz. Proposed CPU will be 2.4Ghz with more than 16 cores. Would that be acceptable?

**Response – CPU speed and core count may be proposed so as to deliver optimal performance for the price. See RFP Section 3.0 Note about offering alternative solutions.**

Q.32 For compute nodes do you require 4TB usable which is in raid-1?

**Response – Two 4TB drives in RAID1 with 4TB effective capacity.**

Q.33 For any 10G connections, do you prefer SFP+ or BaseT?

**Response – No preference for 10G runs within the HPC envelope. SFP is preferred for the backup servers.**

Q.34 How do we need to configure backup storage server and JBOD arrays?

**Response – Reference RFP Section 4.0. The backup servers will be deployed in NETL’s primary data center and will not connect directly to any networks in the HPC envelope.**

Q.35 Software List - The requested software pricing will vary depending on whether these are for new licenses or subscription renewals. If it is a subscription renewal, we will need the license number to provide the requested pricing. Could NETL please provide this information for each software product/feature listed? Also, we are assuming the number listed in the Features column are the quantity required for that specific feature, correct?

**Response – New licenses**

Q.36 What is the full legal name of the entity that will be the lessee?   What is that entity’s relationship to NETL?   If that entity is not a US Government entity, who can provide details regarding the entity’s relationship to NETL and current and historical financial statements for the entity?

**Response National Energy Technology Laboratory**

Q.37 Is the $5M/year lease budget inclusive of expected property taxes?  If property taxes are to be included in the $5M/year budget, do you want the monthly payments to include all property tax amounts?

**Response No property taxes Federal Government does not pay property taxes and we are tax exempt**

Q.38 Can a wholly-owned subsidiary of the prime contractor, or a subcontractor of the prime contractor, sign the lease as “lessor”, or do you require that the prime contractor sign and assign the lease as per Section 22 of the master lease agreement?

**Response Prime Contractor**

Q.39 Are there full design specifications and as-built drawings for the existing MDC, including site, floor plan, mechanical, electrical and IT data?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

Q.40 Also above specs including technical data on the existing transformer, power distribution switchgear, UPS, UPS batteries, UPS maintenance bypass, power distribution switchboards, rack PDUs, thermal PLC controls & EC plug fans?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

Q.41 What is powered by the Siemens busway installed in the ceiling in the air blending chamber?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

Q.42 Is there technical information for the busway?

**Response – This question is answered in the RFP. Reference RFP Sections 3.12, 3.13, 6.0, 6.1, 6.2, and reference drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

Q.43 If not mentioned in the design specifications are there acceptable parameters for hot aisle and cold aisle temperatures?

**Response – Acceptable temperatures are a function of the computational and storage hardware being provided by the contractor. For current PDC/MDC system cooling capability refer to drawings and manuals found at** <http://netl.doe.gov/business/site-support/de-sol-0011826>**.**

Q.44 What are the parameters of the city water supply being provided to the modular data center?

**Response – Water is provided at approximately 80 psi (small variations with system load) and 50 GPM. See attached for chemical composition.**

Q.45 How do the compute nodes plan to access the storage nodes? What storage protocol and would there be any software used to aggregate the storage nodes together?

**Response – Storage nodes will be accessed via the compute network.**

**QUESTIONS AND RESPONSES – October 10, 2017**

Q.1 Can alternative processors be proposed?

**RESPONSE:**

**Yes.**

Q.2 If we have more details of the performance, power, and cooling requirements this will allowing the responders to determine the best processors to use to meet those requirements?

**RESPONSE:**

**Performance, power and cooling requirements have been provided. Information is also available at http://netl.doe.gov/business/site-support/de-sol-0011826**

Q.3 Will systems proposed using processors with slower clock speeds and a higher number of cores per processor that still meet your requirements be considered?

**RESPONSE:**

**Potentially, all alternative approaches will be examined and could still be viable in meeting the NETL needs.**

Q.4 Likewise, will systems with higher watts per processor that meet your requirements and reduce the overall wattage required be considered?

**RESPONSE:**

**Yes.**

Q.5 Would it be possible to advise on specific time we should expect the site-visit to occur?

**RESPONSE:**

**1-3 EST on Thursday October 12,2017.**