Department for Transport

CONTRACT REFERENCE PPRO 04/47/100

Provision of Compute and Storage to the Department for Transport

Statement of Requirement

December 2014

Technology Products Framework (RM1054) Lot 1

CONTENTS

1. INTRODUCTION

1.1. The Department for Transport (DfT (c)) is a government department with approximately 2000 staff. The requirement is for additional storage and compute which will supplement and eventually replace our existing system.

2. PURPOSE

2.1. DfT (c) wishes to tender for a mixture of compute and storage that addresses the varied requirements and work profiles of its user base. For ongoing build and support/maintenance purposes DfT (c) wishes to purchase a converged solution to fulfil these needs. We therefore invite suppliers to take part in a competitive quotation exercise between market leading storage and server manufacturers. Following evaluation of the tender responses and prior to final award of the contract, DfT (c) may decide to undertake a further, limited technical evaluation of the preferred proposed hardware which would require the bidder to provide sample units on a try or buy basis for testing purposes.

3. BACKGROUND TO THE AUTHORITY

3.1. DfT(c) has an existing Storage Area Network (SAN) in London and a mirror of this at their disaster recovery (DR) site in Hastings. The two sites are connected via a dedicated 100Mbps link.

3.2. The SAN provides 120TB of usable storage in each location which is presented to a number of HP BL460c blade servers that sit in 5 x HP C7000 enclosures (plus 2 enclosures in Hastings). These take 16 blades each.

3.3. This SAN was purchased and installed when DfT (c) moved from a Novell-based to a Microsoft-based system in late 2007, during the Ethos Technical Refresh project.

3.4. SAN usage is constantly near the limit of 80% (20% needs to be reserved for system processes), despite various attempts to reduce our data holdings. We are currently turning away requests for additional storage where the projected growth is large.

3.5. Performance, although adequate, has been reduced over the years by the attachment of many more servers to the storage system than it was originally designed for. Each additional LUN (piece of storage presented to a server) adds a small performance overhead. As a result, performance suffers at times of peak usage.

4. BACKGROUND TO REQUIREMENT

4.1. The Department for Transport is looking to procure a new infrastructure to run Microsoft Exchange 2013, some small-scale Microsoft SQL and various file-based services on. The current infrastructure is nearing capacity and thus a new compute and storage requirement has arisen. With the move to cloud in the UK Government under the G-Cloud program the Department would like to move to a web-scale type architecture for the internal IT systems. This will allow for a more agile and scalable architecture.

4.2. Due to the nature of the Department's work, moving some systems to the cloud is not feasible from an Information Assurance perspective. By embracing the new converged platforms/systems now available on the market the Department can start small with the compute and storage needed and scale up and out as needed.

4.3. The Department has two data centres geographically separate and the new infrastructure will need to support the replication of data both at the storage layer and the application layer for the current set of applications.

4.4. The current file system usage is about 30TB and the email system (including archived email) is about 10TB. Another 30TB is taken up by boot from SAN and other systems.

5. OVERVIEW OF THE REQUIREMENT

5.1. The summary of the requirement is as follows:

London

Workload	Minimum Useable Capacity Required	Indicative IOPS Required *	Latency	Disk Type
SQL	2TB	30,000	5m/s	SSD
Exchange/File system	120TB	20,000	10m/s	10k 900GB SAS HDD

Number of servers	Minimum processor	Cores per processor	Minimum RAM per server
10	Xeon E5-2600 family, 2.6GHz	12	256GB

Hastings

Workload	Minimum Useable Capacity Required	Indicative IOPS Required *	Latency	Disk Type
Exchange	40TB	8,000	10m/s	10k 900GB SAS HDD
File System	80TB	N/A	10m/s	7.2k 2TB SATA

Number of servers	Minimum processor	Cores per processor	Minimum RAM per server
6	Xeon E5-2600 family, 2.6GHz	12	256GB

*IOPS are calculated as a raw I/O figure, before RAID is taken into account, and assuming a 4KB block size and a 70% read/30% write mix

5.2. We require initial installation of the solution and a period of handover, in addition to Support and Maintenance for all hardware and software for a period of 5 years.

Additional Options

5.3. The response must also include the following costed options which may be taken up at the time of purchase, with separate pricing for each option:

Option 1

Site	Additional Data Space
London	30TB - Exchange/File system workload (SAS 10K) in same disk configuration as main requirement

Option 2

Site	Additional Data Space
London	2TB SSD/Flash Tier for SQL in same module configuration as main requirement

Option 3

Site	Additional Compute
London	6 x 12-core Xeon E5-2600 family, 2.6GHz, each with 256GB RAM

5.4. All requirements must be priced using the Pricing Schedule in Annex B

6. REQUIREMENT

In the following specification the requirements which must be provided by the proposed solution are indicated by the presence of **MR - Mandatory Requirement or MIR - Mandatory Information Requirement**.

MR1 - The solution must be a rack-mounted "converged" platform with unified management, encompassing real-time and historical performance and trend monitoring, as well as system-wide analytics. It must conform to a validated architecture with reference design/s detailing versions, specifications and particular hardware/software configuration to ensure the solution performs as intended and is validated end to end. The solution proposed must be based on proven technology that has been shipping to end customers for a minimum of 2 years and be recognised as a converged architecture by a leading analyst firm such as Gartner/IDC etc.

MR2 - The solution must be flexible in design and not bound by particular capacities with fork lift style upgrades required as DfT scales over time. We would like to add storage and compute resources independently and seamlessly, anticipating future workloads that may require differing capacities. Solutions should adopt a predictable linear cost model. Please describe in detail how this system will be scaled in the future as our requirements grow. Include any

detail of scale limitations, outages required, additional hardware and/or software licensing costs, and where the break points are and the cost elements associated with the break point. Please include as much detail as possible/is relevant

MR3 – The solution must be based on unified technology with the following protocols served from a single controller AND operating system:

Fibre Channel

Fibre Channel over Ethernet

CIFS

MR4 - The solution must support Microsoft Hyper-V and Citrix XenServer, and associated management tooling. Please confirm the solution components are on the hardware compatibility list for Microsoft Windows Server.

MR5 - The compute solution must allow our current Microsoft management and monitoring platforms (SCVMM and SCOM) to integrate directly with the compute, storage and network resources, and be managed under a 'single pane of glass'. The solution must have the ability to allocate storage to the compute layer in a flexible manner. It must support Microsoft Data Protection Manager (DPM) as the backup solution. Tenderers must describe the impact of a complete failure and outage of the management environment. For example, how would we receive alerts, perform monitoring, or make changes to the environment? Include how the risk of failure is mitigated, and an expected return to service time.

MR6 - The servers must be able to boot from SAN and must be 'stateless' to allow DfT the ability to repurpose the hardware easily while also having the capability to make upgrades to server firmware in a single template that is replicated across the compute environment. They must have the ability to copy/backup system configurations and reapply these configurations to new hardware to reduce downtime in the event of hardware failure.

MR7 - Although DfT plan to move some applications to application based replication (such as MS Exchange DAG, DFS etc.) the solution should support both synchronous and asynchronous replication technologies for applications and functions that don't have inherent application resilience and replication. Please describe how replication between remote sites operates. Specifically the ability to replicate subset of a number of volumes, throttle their bandwidth requirements, or replicate on a timed schedule. Explain how this would work over a 100Mb/s link between our sites in London and Hastings. Please detail the failover and failback process between sites. Please describe any additional requirements to ensure successful replication between our sites, and any technologies which may be advantageous when performing remote mirroring from the array (for example, line optimisation). Please describe how any storage efficiency technologies used, e.g. de-duplication, integrate fully with data replication technologies. The supplier must detail the specific QoS, VLAN and Policy capabilities that are configurable and how these configurations are applied across the system with little complexity and management overhead.

MR8 - It is our intention to re-purpose our existing EVA device. Does the recommended device/infrastructure hold any capability to enable us to either a) migrate easily with no downtime at a time of our choosing and/or b) manage the entire storage estate as a single

entity? Please outline a typical migration plan with very limited downtime from our existing EVA storage. Does this require additional engineer services or software licensing?

MR9 - Please describe capabilities of the solution in terms of compression/de-duplication/thin provisioning, and quote expected reduction ratios. Is this inline or post-process? If inline, what are the limitations of this design, for example the impact of performing this process during peak periods, or for example if performing other operations outside of normal business hours?

MR10 - The solution must be able to support snapshots without impact to performance. It must also support application-consistent snapshots to allow the restore of application specifics such as Exchange items (mail/tasks etc.) and SQL. Please explain the space requirements of snapshots.

MR11 - Support for the entire solution, including full hardware and software support, must cover 24/7 365 days a year, with a 4 hour response. The fault must be remedied either by repair or by replacement with an identical item. A spares kit of customer replaceable components (e.g. hard disks) must be maintained on the customer premises. Support must be managed through a single provider. Provide details, including support escalation procedures to third parties where required. Suppliers must provide details of the proposed credit regime if the above SLA is not met. This must be shown in the Pricing Schedule at Annex B.

MIR1 – We may choose to serve CIFS volumes direct from the storage controller. Please explain how your solution achieves this and how we can serve Microsoft Distributed File System (DFS) and use DFS/R from the CIFS share, or how we can replicate the CIFS share data if DFS/R is not possible.

MIR2

Please describe the compute nodes recommended in terms of

- Number of PCI slots, used and free in suggested configuration
- Number of CPU slots, used and free in suggested configuration
- Number of DIMM slots, used and free in suggested configuration
- Number of disk bays, used and free in suggested configuration
- Number of NICs available per host
- Internal connectivity options within suggested node
- Any expansion options to above (for example, additional nodes/trays which may attach to provide additional CPU's, disk, or memory options)
- Other node types which may be intermixed within the chassis (for example, if proposing 2 CPU nodes, can 4 or 8 CPU nodes be added)

Please describe the recommended compute chassis in terms of:

- Rack EIA "U" height
- Number of node bays available per chassis, any use of separate management nodes or any other device (such as expansion devices) which consumes node bays must be highlighted
- Number of switch bays, used and free in suggested configuration
- System networking capabilities (i.e. number of available 1Gb, 10Gb and 40Gb ports).

- How many internal paths to each node are provided for LAN and for SAN? If this number is to be increased, what is the cost implication, and is this disruptive? What additional hardware/software is required?
- Impact of network design on existing infrastructure (i.e. number and types of ports required, additional traffic for messaging etc, and management network requirements, bandwidth requirements, security issues and etc)
- SAN capabilities (i.e. number and type of ports, 8Gbps, 16Gbps
- Number of chassis specific management modules and the individual capability of this module (what monitoring and alerting capabilities does the base management module deliver, before using additional software)
- Host-based remote management
- Power supply configuration (i.e. N+N, N+1 etc)

MIR3 - Cache and SSD are expected to be used to improve the performance of most frequently accessed data. Explain how your solution uses these technologies. Please describe in full the tiering technology, for example, how is tiering delivered, i.e. as a cache extension or sub-LUN capable? How many tiers are supported? Is there the ability to pin certain workloads or volumes to a specific tier if required? What are the requirements in terms of hardware and software? For the storage solution, please describe the:

- RAID levels being proposed, including RAID set size
- Disk drive type, size and speed
- Mean time between failures of disks and expected lifespans of SSDs
- Storage controllers, number, speed, configuration (e.g. active/active), cache size. Is the controller and cache upgradable?
  Pooling technologies

MIR4 – Please describe the internal switch fabric – number of ports per host, speed, protocol, connections to storage, free ports in proposed configuration.

Please describe the network connections required to the DfT's local area network, number of ports required, speed, protocol and presentation. Can the ports be port-channelled? Please confirm that it will be compatible with our Cisco 6509E core switch running VSS, with 10GB fibre on WS-X6708-10GE interface card.

MIR 5 - Please describe at what point a failure would cause loss of service in relation to each key component of the solution. For example, x number of power supplies failing would result in a throttling of node performance, however y number of power supplies failing would result in an outage.

MIR6 - Please detail the launch dates of the recommended device/s, any proposed or announced end dates, including end of support dates for individual elements of the system. Firmware upgrades and maintenance processes must have as little effect on the availability of the system as possible. Please supply details of how this can be mitigated if possible and quote expected uptime, referencing historical data if possible.

MIR7 - Suppliers should describe how they comply with current Government guidelines on Sustainable Development and, in particular, processes in place for the disposal and recycling of products that may be used to deliver the proposed service.

MIR8 – Please supply the power and cooling requirements for the complete solution.

7. SELECTION PROCESS

7.1 Responses to the SOR will be evaluated against pre-defined criteria (see paragraph 9). The Department is not committed to accept any of the submitted proposals, but it is likely that one supplier will be awarded a contract to supply the service.

8. FORMAT OF RESPONSES

8.1 Responses must provide a fully costed proposal for the service and include any equipment and software necessary to meet all of the MRs in paragraph 6.

8.2 Responses should include a breakdown cost per item of equipment and an overall cost (excluding VAT)

8.3 Your response should set out in order how each of the MRs will be met.

8.4 Finally, you should explain any limitations to your ability to supply the service and highlight any anticipated risks to successful implementation of the solution.

9. EVALUATION CRITERIA

9.1 Failure to meet any of the MRs will prevent further consideration.

9.2 Your proposal will be marked according to the criteria shown in Annex A.

9.3 The main factor in selecting suppliers will be the marks awarded for MRs/MIRs and other sections of your proposal, but cost will be the deciding factor should two companies have equal scores.

10. PROCUREMENT TIMETABLE

Description	**Date**
Issue ITT	19/12/2014
ITT questions by noon	02/01/2015 11:00
Receipt of bids and clarifications	09/01/2015
Evaluation completion	19/01/2015
Intention to Award (standstill period)	20/01/2015
Award (after standsill)	02/02/2015

11. FURTHER INFORMATION

11.1 Further clarification of requirements should be addressed through the CCS e-Sourcing Suite and additionally through the Business Partner:

[redacted]

For Contractual queries:

[redacted]
Business Partner
Group Procurement Property & Estates
[redacted]

ANNEX A: OUTLINE EVALUATION MATRIX

Technical Specification (carrying 70% of the overall weighting)

Primary Criteria	Sub-criteria		Weighting	Score 0-5
Fitness for Purpose 85%	MR1	Architecture	10	
	MR2	Upgrade/scale flexibilities	10	
	MR3	Protocol support	3	
	MR4	Compatibility with Microsoft technologies	5	
	MR5	Integration with management/monitoring platforms	5	
	MR6	Compute node features and profiles	5	
	MR7	Intra-site replication	4	
	MR8	Legacy equipment and migration	5	
	MR9	Storage reduction technologies	5	
	MR10	Snapshot capabilities	5	
	MIR1	CIFS/DFS/R compatibility	2	
	MIR2	Compute/chassis capabilities and capacities	2	
	MIR3	Storage tiering	9	
	MIR4	Switch fabric and connections to DfT LAN	5	
	MIR5	Resilience	5	
	MIR6	Upgrades and maintenance impact, lifecycles	5	
Delivery 10%	MR11	Support and Maintenance, 24/7, 4 hour response	10	

Environmental 5%	MIR7	Sustainable development.	1	
	MIR8	Power/cooling requirements	4	
Lifecycle costs 0%	Not Applicable		0	

Scoring Scheme

0 – not addressed

1 – Barely meets requirement

2 – Meets some of the requirement

3 – Substantially meets requirement

4 – Fully meets, or is an acceptable mixture of above and below requirements

5 – Fully meets and exceed requirements in ways that will deliver clear benefits

Price (carrying 30% of the overall weighting)

Suppliers should complete the Pricing Schedule at Annexe B.

The price evaluation will take into account the total price including all three options, installation/handover and 5 years maintenance.

The Percentage Scoring Methodology will be used to evaluate all proposals for this requirement. This methodology is based on the following principles:

Firstly, the lowest tendered price will be scored 100, and each subsequent bid will be baselined to this score. So a bid which is 20% more expensive on price than the lowest tendered price will be allocated a score of 80.

ANNEX B: PRICING SCHEDULE

The Total tendered **Fixed Total Price** for all work to be carried out under this contract is as follows:

PRICE = £	**VAT** = £	**TOTAL** = £

Please detail the cost breakdown of the complete solution as outlined in paragraph 5 above. All hardware and software necessary to meet the functionality outlined in the Mandatory Requirements (MR) must be included. Please also include costs for basic initial installation/handover and support hardware and software for 5 years.

Item	**Description**	**Total Cost (£)**
Main Requirement for London & Hastings (para 5.1)	**London:** 2TB SSD, 120TB SAS 10K, 10 x blade servers **Hastings:** 120TB SAS 10K/SATA 7.2K, 6 x blade servers	
Option 1 (para 5.2)	30TB - Exchange/File system workload, including 5 years support and maintenance	
Option 2 (para 5.2)	2TB SSD/Flash Tier for SQL, including 5 years support and maintenance	
Option 3 (para 5.2)	6 x 12-core Xeon E5-2600 family, 2.6GHz, each with 256GB RAM, including 5 years support and maintenance	
Installation/ Handover	Initial installation plus the standard period of handover and skills transfer	
Maintenance & Support – 5 years	Hardware and software maintenance on the Main Requirement for a period of 5 years.	

Other Costs

On-site engineer, additional days during handover period	Daily Rate (£)

Credit regime for failure to meet Service Levels outlined in MR11	(£)