Proposal to Serve

Servers/Storage Scope of Work

Buyer:

City of Blaine
Attn: Joe Huss
10801 Town Square Drive
Blaine, MN 55449

Proposal Date:

8 February 2016
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February 19, 2016

City of Blaine
ATTN: Joe Huss; Finance Director
10801 Town Square Drive
Blaine, MN 55449

RE: Servers/Storage Capabilities

On January 14th 2016 Technology Management Corporation (TMC) presented a high level Executive Summary detailing areas of technology requiring closer inspection and planning to enhance the delivery of Information Technology services to the City of Blaine staff and citizens. Pursuant to the findings of that report, Technology Management Corporation is pleased to have the opportunity to submit proposals for a deeper dive into three key areas of Blaine's Information Technology (IT) Division. These include:

- Servers/Storage
- Cable Infrastructure
- LAN/WAN

We are providing three separate Scopes of Work so that the City of Blaine can evaluate each separately and prioritize the execution of the work.

This proposal is for the Servers and Storage Scope of Work.

We look forward to your review and approval of this work.

Sincerely,

Cheryl O'Brien
President and Founder

BACKGROUND INFORMATION

Servers/Storage:

Servers are located in the Server Room on the second floor in the City Office Building; with the exception of one server which is in the Public Works Building to serve the Police Department. Available server inventory and the information provided it appears that there is in the range of 20+ physical servers and an additional 10+ virtual servers but due to recent virtualization projects the current server topology would need to be fully reviewed. Per the HP support teams all HP servers are End of Life (EOL) for G7 (Generation 7) and earlier. The inventories we have reviewed show that the City inventory is 100% G4, G5, G6 and G7 therefore 100% End of Life. We did see notes that several servers are scheduled for replacement but only saw one that appeared to be purchased in the 2015 budget. Operation systems for these servers appear to all be at the 2003 and 2008 levels; 2003 was End of Life as of last year - July 2015.

Storage is not known and requires additional investigation to determine the current environment.

Reporting Capability:

The City currently uses a combination of reports and applications to manage inventories, produce reports and trend usage, capacities and deliver to other departments of the City of Blaine. A few of these include:

- Track-It
- Crystal
- Reports off of the routers in place
- Homegrown Report, spreadsheets and databases

SCOPE OF THE WORK

Overview

The City of Blaine IT Department desires consulting assistance to develop a detailed recommendation with supporting documentation for a new server standard to replace (over time) the HP environment that currently supports the existing server systems within City of Blaine's production, development, and test environments. The work will include:

- An evaluation of the existing server environment and support infrastructure (power, HVAC, server racking, etc.) and how these environments will need to be changed, upgraded, or modernized to support the proposed new server standard.
- Work with Paul and Bev to gain a full understanding of the existing application, hardware and network architectures, and future goals and objectives.
- Budget estimates for the proposed new server standard architecture and any support infrastructure (power, HVAC, server racking, storage, etc) that will be required.
- Working with City of Blaine's IT staff in developing the necessary IT specific procurement documents for purchase of the new hardware.

Business Goals & Objectives

The Technology Management Corporation (TMC) team has crafted this Statement of Work (SoW) to support the following City of Blaine business goals and objectives:

- The development of the new server standard to provide City of Blaine with the necessary infrastructure to retire and replace aging and under-performing systems with newer more powerful systems.

- This new standard will provide City of Blaine the system architecture necessary to be able to more easily grow and adapt as future projects demand more and more of City of Blaine's server and compute environments.

- Cost savings through the reduction of the annual support fees.

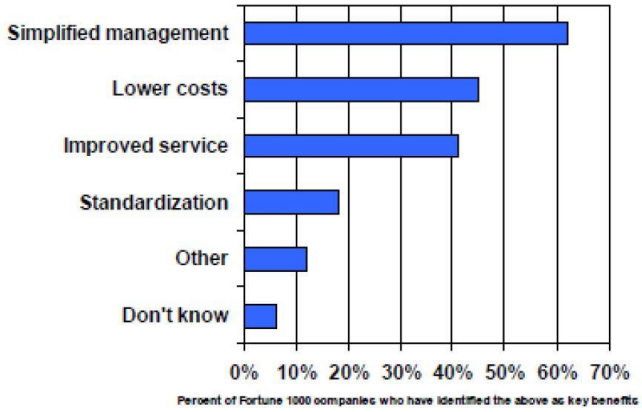
- Creation of a modern, high density and powerful computing and server environment without having to increase the overall size of the existing computer facilities.

Approach for the IT Consulting Scope

Server upgrade and consolidation provides a solution to reduce capital expenditures (CapEx) and operating expenses (OpEx) associated with running servers. The main reasons that organizations undertake server upgrade and consolidation are to simplify management by reducing complexity and eliminating server sprawl; to reduce costs, such as hardware, software and facilities costs; and to improve service.

Server upgrade and consolidation is not a new phenomenon and has been occurring across all sizes of organizations and industries for many years. But recent trends in the server industry such as virtualization, multicore processors, and advanced power management technologies have rapidly accelerated server upgrade and consolidation because they are delivering exceptional CapEx and OpEx savings to IT departments.

The graph below shows the main reasons cited for undertaking server upgrade and consolidation projects according to a Forrest report on Fortune 100 companies.



As with other parts of business, the success of an information technology upgrade and consolidation effort is often measured by cost reduction. However, it is clear from the Forrester study that other dimensions, such as business agility, improved responsiveness, and lower management overhead, are critical as well.

The past decade has seen exceptional data growth, resulting in larger and increasingly more complex IT environments. IT departments faced with this trend over the years have had to deal with many challenges:

- Increasing TCO: Updating, maintaining, and operating the environment is costly. A major concern is how to lower the TCO and increase ROI effectively and efficiently.
- Server proliferation: With the increasing capabilities, easy deployment, and low cost of servers, server proliferation has occurred in most IT environments. This proliferation has resulted in server sprawl, adding to overall cost and inefficiency.

- Poor server utilization: Older servers are underutilized, resulting in increased costs and affecting support and system, power, and cooling maintenance.
- Licensing and contract issues: Most IT departments are challenged to oversee all the many server and application licenses and contracts, each with its own expiration date. Managing an IT environment is difficult while also ensuring compliance.
- Power and cooling: Due to the significant increase of servers in Communications Rooms, power and cooling costs have increased dramatically. Other associated challenges are server overload, overheating, and loss of redundancy.
- IT environment management: IT environments have become complex, with numerous management points. Most current blade systems have separate power and environmental management modules, adding cost and management complexity. Ethernet network interface cards (NICs) and Fibre Channel host bus adapters (HBAs), whether installed in blade systems or rack-mount servers, require configuration and firmware updates. Blade and rack-mount server firmware must be maintained, and BIOS settings must be managed for consistency. As a result, IT environments have become more difficult and costly to maintain, while security and performance may be less than desired. Scaling out IT infrastructure using these systems is costly in terms of the number of I/O interfaces that each chassis must support, the power and cooling required, the administrative and management overhead of individual blade servers, and the business agility lost due to delayed deployment times.

In order to achieve City of Blaine's business goals and objectives and to solve the challenges outlined above, the following plan approach and sequence is recommended. This presents our multi-phased approach to conducting this Server Refresh & Replace (R&R) project for City of Blaine:

- Phase 1 – Evaluation of Existing Server Environment and Support Infrastructure. The TMC project team will perform a detailed assessment of the existing server environment, support infrastructure, existing application, hardware and network architectures by performing on-site, in-depth reviews and interviews with City of Blaine's Networking, Infrastructure, Systems, Application and DBA staff for the following:
    - Inventories and validation of the current servers.
    - Inventories and validation of the existing applications and databases residing on the servers.
    - Inventories and validation of the current support infrastructure, including:
        - Power loads
        - HVAC
        - Server racking
    - Issues and limitations of the current environment for the above to incorporate findings into future recommended changes, upgrades and modernization for the new high density server environment.

- Phase 2 – Development of Server Environment Requirements. The key deliverable for this phase is the new hardware requirements, which encompasses the capability for efficiently scaling up the solution. During this phase, the TMC project team will develop a consolidation matrix and gather the application profiling information to determine the required performance and capacity of the new server environment.

- Phase 3 – Budget/Migration Planning and Recommendations. The key goal of this phase is to outline a cost-effective, efficient, and minimally labor-intensive migration path for upgrade and consolidation. The outcome of this phase is a detailed upgrade and consolidation framework. Detailed budgets will be developed in conjunction with the Budget/Migration Plan.

- Phase 4 – Solution Procurement Assistance. The key goal of this phase is the creation of the necessary procurement documents for the purchase of the new hardware. The key deliverable will be the new hardware specifications which will be used by the City of Blaine Purchasing Department for bidding.

PLAN OF IT EXECUTION TASKS & DELIVERABLES

This TMC project team has extensive experience in systems and server design, upgrades, replacement and migrations including required infrastructure, power, cooling, and racking requirements. In addition we also have experience in day to day operation of the systems and support facilities including the design and construction of state of the art data centers.

The primary goal of this project will be to enable City of Blaine to make better use of servers, cut associated costs, achieve greater flexibility, and create a “greener,” more efficient IT environment. Utilizing our combined knowledge and expertise, the TMC project team will help City of Blaine to:

- Provide increased insight into system performance
- Identify opportunities to consolidate and virtualize server resources to decrease cost and improve asset utilization
- Identify ways to reduce maintenance cost, reduce power consumption, and improve flexibility
- Help minimize risk of infrastructure changes
- Help develop cost justification for consolidation
- Identify opportunities to remove technological complexity, freeing up operational resources for higher value-added activities

The following details the tasks and deliverables that are required to achieve the business goals and objectives of this SoW for City of Blaine.

Phase 1 –Evaluation of Existing Server Environment and Support Infrastructure

The TMC project team believes the starting point for coordinating of City of Blaine's new server standard and the purchase and installation of its core server infrastructure is to first define current and future requirements. These requirements will be based on current IT needs and offerings for all users, future project plans and future IT applications which are and will impact the new server platforms and core infrastructure.

1. Kick-Off Meeting to coordinate information gathering, validation and to confirm goals and objectives and team organization.

2. Walk through of existing server room and TRs housing the current servers and core infrastructure. Attention will be given to the server room to document and validate racking, UPS and inventories, changes and utilized/added equipment.

3. Review of and expansion of the server and applications spreadsheet created as part of the Business Impact Analysis (BIA) documentation to ensure there are no additional applications housed on the servers. If this document does not exist then TMC will provide City of Blaine IT staff with the templates to create a BIA.

4. Identify, schedule and conduct interviews with the key City of Blaine stakeholders responsible and accountable for defining future projects and infrastructure needs.

5. Review existing City of Blaine Infrastructure and future IT requirements documentation not yet reviewed by our team under former or current involvement on the initial high level review.

6. Review available City of Blaine created documentation for the current and upcoming IT projects understand current server utilization and future requirements. These reviews will include City of Blaine system logic diagrams, system schematics and component location (as-built) drawings and any existing Master Specifications applicable sections.

7. Identify the servers to be considered for upgrade and consolidation. The first step is to document every Server in the target environment. The server documentation should include the following information for each server:
    - Hardware information
        - Processors (speed, number)
        - Memory (size)
        - Storage, including type (internal, externally attached, SAN), drives (speed, size, type), arrays, and RAID levels
    - Software information

    - Operating system
    - Build, patch, and service-pack levels
    - Applications (and version numbers)
- Network
    - IP addresses
    - Domain membership
- Other organizational information

8. In addition to server, application, and performance-specific information, the TMC project team will consider other categories related to City of Blaine's business needs and organizational structure. These categories, as well as measured server performance characteristics, need to be considered when server groupings are identified. City of Blaine-related categories may include:

    - Sensitivity levels and security classifications
        - Highly confidential
        - Confidential
        - Unrestricted
        - Privacy requirements (e.g., PCI financial data)
        - Multiple (used if Server hosts databases of varying security levels)
    - Business function area
        - Finance
        - Legal
        - Human resources
        - Marketing and communications
        - Police and Fire
        - IT infrastructure
        - Operations
        - Multiple (used if Server hosts databases that belong to different business function areas)
    - Lifecycle
        - Production
        - Staging
        - Testing
        - Development
    - Performance measurements
        - Tier 1—Light load, excellent performance, high consolidation potential
        - Tier 2—Moderate load, performance, and consolidation potential
        - Tier 3—Heavy load, performance near thresholds; consolidation possible once issues are resolved
        - Tier 4—Extreme load, performance that has crossed thresholds; performance analysis required before consolidation

Deliverables:

1. Full updated and expanded inventories of servers including the additional information/fields required.
2. Full updated and expanded inventories of core infrastructure within the server room.
3. Report of findings and recommendations for required upgrades, changes and modernization to required infrastructure.

Phase 2 – Development of Server Environment Requirements

This phase will develop specifications and outline requirements. The following tasks will be performed in this phase:

1. Application profile information will be updated by populating an application profile grid with application-specific information such as application properties, availability and performance needs, and expected growth in application workload. This information will make it easier to identify the applications that will be affected by upgrade and consolidation, their application availability requirements, and their expected application growth.

2. A potential consolidation matrix will be developed showing P2P (Physical to Physical), P2V (Physical to Virtual) and V2V (Virtual to Virtual). This matrix will help the team to place the servers in relatively homogeneous groups and to identify servers that are ideal candidates for upgrade and consolidation. Servers with light workloads and excellent performance can be readily consolidated, while heavily loaded servers should not be consolidated without intervention or upgrades. The consolidation matrix combines groupings of servers, based upon factors such as data sensitivity classification, capability, domain, and other business factors, up time and maintenance window similarities and performance tier assignments for each server.

3. Server design documentation and specifications will be developed. The server design will take into account every aspect of the new environment, including administration and operations (together with monitoring), performance, backup and recovery, chargeback (if necessary), disaster recovery, high availability, connectivity and security.

4. Budget estimates prepared for the proposed new server standard architecture and any supporting infrastructure.

5. The TMC project team will review all developed documentation with City of Blaine IT staff.

Deliverables:

1. Budget estimates for servers along with additional switches, cabling, power, racking and cooling.
2. Consolidation Matrix recommendations
3. Report of findings for Server Environment Requirements.

Phase 3 – Budget/Migration Planning and Recommendations

1. The TMC project team will work with City of Blaine IT staff to determine which applications will be part of each group of consolidated servers.

2. Once the hardware specifications and a capacity study on the new hardware specifications have been finalized, a final migration and consolidation plan will be developed. One of the key goals of this phase is to outline a cost-effective, efficient, and minimally labor-intensive migration path for the consolidation.

3. The outcome of this phase is a detailed upgrade and consolidation plan showing P2P, P2V and V2V that is customized for the applications to be included.

4. This Migration Plan will ensure that the long-term scalability and high-availability needs of each application are not compromised.

5. Create recommended rack and cabinet elevations showing equipment, power, and networking.

6. Detailed budget estimates will be developed for the implementation of the planned upgrades and virtualization/consolidation.

Deliverables:

1. Migration plans from existing hardware to proposed solutions. (P2P, P2V, V2V).
2. Any specialized racking or system housing that will be required.
3. Visio rack layout diagrams.

Phase 4 – Solution Procurement Assistance

1. Work with City of Blaine's System and Purchasing Department staff to determine elements of new hardware to allow for correct and accurate procurement process.

2. Identify requirements for all key elements of servers including:
    - Hardware
    - Processors (speed, number)
    - Memory (size)

- Storage, including type (internal, externally attached, SAN), drives (speed, size, type), arrays, and RAID levels
- Software
- Operating system
- Build, patch, and service-pack levels
- Connectivity – cables
- Power requirements

3. Work with appropriate City of Blaine staff to ensure all CapEx and OpEx costing questions are correctly asked with the result that a total cost of ownership (TCO) can be ascertained during proposal reviews from vendors.
    - Warranties and terms of warranties
    - Coverage of maintenance terms
    - Positioning of hardware in lifecycle of given equipment models
    - Pricing terms for additional equipment purchases, change orders and discounts for multi-year purchases and upgrades
    - Advise of any potential opportunities for in-house short-term performance testing from key vendors.

4. Assist City of Blaine Purchasing Department with vendor questions during procurement process as required.

5. Review proposals with City of Blaine staff.

6. Evaluate the responses for TCO from the perspective of:
    - Maintenance and lifecycle
    - Warranty
    - Initial CapEx
    - OpEx

7. Make recommendations on future manufacturer standard to City of Blaine IT and Finance staff.

Deliverables:

1. A matrix of all reviewed solutions, with pros and cons as they relate to City of Blaine's needs.
2. Detailed evaluations of the solution.
3. Purchase, installation, software, networking hardware costs per solution.
4. Warranty and proposed 3 year maintenance costs.
5. Rack elevations of the proposed solution.

PROPOSAL PRICE

TMC strongly believes in best value to the customer and that includes our fees. We have included our estimate of hours to complete all phases of this project; we only bill the hours used so if we are able to achieve efficiencies during the project City of Blaine only pays for the hours used.

TMC	Sr Project Manager Rate	Principal Rate	Administration Rate	VISIO Rate (Cabinet/Rack Elevations)
Estmated Hours for all Phases	110.00	45.00	6.00	8.00
Total Hours	110.00	45.00	6.00	8.00
Hourly Rate	$ 125.00	$ 150.00	$ 50.00	$ 65.00
Total Fees	$ 13,750.00	$ 6,750.00	$ 300.00	$ 520.00
Total Not to Exceed Fees	**$ 21,320.00**			

ASSUMPTIONS

For this scope we will be including a maximum review, config and pricing for the top three Gartner Group magic Quadrant: HP, Dell and Lenovo (formerly IBM's server division).

We assume that City of Blaine will conduct the purchasing process with TMC providing the specifications for the equipment.

TMC fees do not include physical installation or project management of the implementation of the new server environment, it is assumed that the City of Blaine IT department will handle this portion of the project.