

City of Culver City, California
City Council Agenda Item Report

Meeting Date: 12/10/2007		Item Number: <u>A-9</u>	
AGENDA ITEM: Approval of an Agreement with Hewlett-Packard Company (Oak Park, CA) for the Purchase of Servers and Related Installation Services to Consolidate Servers and Support Implementation of the Information Technology Department's Green IT Initiative in the City's Data Center.			
Contact Person/Dept.: John Richo		Phone Number: 310-253-5950	
Fiscal Impact: Yes ☒ No ☐		General Fund: Yes ☒ No ☐	
Public Hearing: ☐		Action Item: ☒ Attachments: ☒	
Public Notification: E-Mail Master Notification List on 12/05/07, Hewlett Packard representatives on 12/05/07.			
Department Approval: John Richo (12/05/07)		City Attorney Approval: Carol Schwab (by H. Iker) (12/05/07)	
Fiscal Impact Review: Marlee Chang (12/05/07)		City Manager Approval: Jerry B. Fulwood (12/05/07)	
<u>RECOMMENDATION:</u> Staff recommends the City Council approve an agreement with Hewlett-Packard Company (Oak Park, CA) for the purchase of servers and related installation services to consolidate servers and support implementation of the Information Technology Department's Green IT Initiative in the City's Data Center. <u>BACKGROUND:</u> Over the last ten years the City's use of technology and the supporting technology infrastructure has grown dramatically. Many departments have deployed specialized applications to support business processes and increase productivity. One major effect has been the increase in the number of servers needed to support these client side applications and processes. Approximately seventy physical servers are located in our Data Center, (Attachment 1). The increase in servers has resulted in the second effect of our growth. As currently configured, our Data Center has reached near its physical space limit, and our need for more servers continues to grow (Attachment 2). The third effect, directly linked to the increase in servers, is the continual increase in energy, cooling, and backup power necessary to support the Data Center. Culver City is not unique in this challenge. All organizations of any size have the same experience as we continue to move toward a digital world. In December 2006, the United States Congress passed Public Law 109-431, (Attachment 3), instructing the Environmental Protection Agency to submit the results of a study analyzing the rapid growth and energy consumption of computer data centers.			

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DISCUSSION:

Server Consolidation (Virtualization)

Server consolidation or virtualization is not complicated in its conception, (Attachment 4). Simply put, one physical server is configured with virtualization server software, so that by its sharing physical resources, (hard drive memory, CPU, power supply, footprint, etc.), it can host a number of “virtual” servers, which are isolated from each other. These virtual servers can host any application or process, and perform equal to the performance provided by one physical server. Assuming that we were to consolidate at a conservative ratio of 7:1, (seven virtual serves to one physical server), using consolidation/virtualization we could reduce our current number of servers from seventy physical servers down to ten physical servers.

Consolidation Cost Savings

The replacement cost for the seventy servers listed on Attachment 1 is approximately \$394.5K. The table below is a breakdown of these servers by their processing power, (number of CPUs). Fifty of these servers are currently out of warranty, and have been for some time. Due to budgetary constraints IT has extended the life of these servers beyond “best business practice”. Based on the attached quotes, (Attachment 5), received from Hewlett Packard, by utilizing consolidation we can reduce the server replacement cost to approximately \$155K.

Number of Servers	CPUs*	Cost per Server	Total
39	1	\$4,000	\$156,000
29	2	\$6,500	\$188,500
2	4	\$25,000	\$50,000
Total Cost			\$394,500

*Number of CPUs varies as needed to provide processing power for applications

We will realize a cost saving of approximately \$239.5K by server consolidation. This saving may be reduced by approximately \$25K to pay for additional server software licenses from Microsoft.

Consolidation Space Savings

The photos of our Data Center, (Attachment 2) provide visuals of the floor space limitation that we have reached. Due to the cramped space around server racks we have experienced situations where wires have inadvertently been dislodged,

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resulting in application failures. The department had a preliminary assessment done by a vendor to address our space and wiring issues and were quoted a cost of approximately \$50K. Even if we were to proceed with this configuration, in the end we would not significantly increase our available floor space. With consolidation, we will be able to reduce our current three rack footprint to one rack.

Vendor Selection

We compared server products from Hewlett Packard, IBM, and Dell. These are the three industry leaders, and the three vendors with whom we have had considerable positive experience with over the last ten years. All three visited us and discussed their products that would fit in our consolidation project. All three submitted quotes, (Attachments 5, 6, 7).

Dell	\$132,091
Hewlett Packard	\$154,570
IBM	\$234,398

The quotes are not exact apples to apples comparisons, as they involve slightly different technology approaches. We also did not look at the quotes based on cost, since we would not make our choice based on lowest bid. Our selection criteria were:

- Manageability and administration features that fit best with the skills composition of IT staff.
- Product reliability.
- Product lifecycle... i.e. when was the product release to market. A key factor relative to how long the vendor would be supporting the product under warranty.
- Our experience with the vendor's products and support.
- References from cities that implemented consolidation.
- Environmental impact.

Referring back to Attachment 1, (Data Center Servers), you will note that Hewlett Packard servers currently run our most mission critical application, JDE. When that choice was made we replaced IBM servers that were previously used. That decision was based on manageability and administration, and we have been pleased with that choice. Additionally, the reliability of those servers has been outstanding. The server products that Hewlett Packard is recommending were released to market within the last year, with a projected lifecycle of five years. Our neighboring city, Santa Monica, has implemented their server consolidation project on Hewlett

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Packard servers, and is very satisfied with their performance. The environmental impact is similar among the three choices. All have implemented power saving, and energy efficient components.

Based on the above, staff recommends the purchase of servers from Hewlett Packard.

Green Information Technology Initiative

Southern California Edison offers a financial incentive to its business customers who implement a variety of energy saving measures. Within their Standard Performance Contract program, (Attachment 8), implementing server virtualization qualifies. We have already begun discussions with Edison staff that provided us with the necessary steps that we must take to qualify for the Incentive (rebate). To move forward we will need an onsite assessment done of our Data Center by Edison engineers so that a baseline of usage can be established before our implementation.

Preliminary estimates indicate that on an annual basis, our Data Center uses 18.5% of the electricity in City Hall.

Our incentive will be based on the direct savings from virtualization. Preliminary estimates indicate that our current servers use 251,464 kilowatt hours of electricity annually. After virtualization, our usage should be 171,029 kilowatt hours annually. We will also have indirect savings principally due to the reduced need for air conditioning. We estimate that currently we use 92,261 kilowatt hours annually for air conditioning. After virtualization that usage would drop to 62,750 kilowatt hours. After the onsite visit by Edison the department will report back to the Council the actual baseline usage, with translation into dollar savings, (direct and indirect), as well as our rebate.

This staff report relates to servers in our Data Center. It is one of several interdependent actions that are part of our comprehensive Green Information Technology Initiative, (Attachment 9).

FISCAL ANALYSIS:

Adequate funding is available in the Computer Replacement Fund, account number 30724100, to cover this purchase. However, under funding of the Computer Replacement Fund is one of the issues that has been identified as being part of the city's structural deficit. This expenditure will reduce the Computer Replacement Fund to a level that will negatively impact our ability to replace old desktop computers.

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Additionally, funding is also needed to upgrade and increase our data storage capability, which is approaching a critical need.

ATTACHMENTS:

1. Data Center Servers
2. Data Center Photos
3. US Congress PL 109-431
4. Virtualization Diagram
5. HP Server Quote
6. Dell Server Quote
7. IBM Server Quote
8. SoCal Edison Standard Performance Contract
9. Green Information Technology Initiative

MOTION:

That the City Council:

1. Approve an agreement with Hewlett Packard Company for the purchase of servers and related installation services to support virtualization in the City's Data Center, for an amount not to exceed \$154,570;
2. Authorize the City Attorney to review/prepare the necessary documents and authorize the City Manager to execute said documents on behalf of the City.