

CLEVELAND PUBLIC LIBRARY

Finance Committee
February 12, 2012

RESOLUTION TO PURCHASE EQUIPMENT AND SERVICES FOR
VIRTUALIZED DESKTOPS

- WHEREAS, The Cleveland Public Library desires to overcome community deficits and help bridge the Digital Divide; and
- WHEREAS, The ability to provide public users with a robust computing experience has been constrained by the need to serve many people with a limited number of workstations; and
- WHEREAS To insure the usability of the workstation it has been necessary to strictly control the configuration and services offered, and to prevent retaining personalized settings and saved documents; and
- WHEREAS, The technology of virtualizing personal computers has attained a level of sophistication that now makes a different approach possible; and
- WHEREAS, Hewlett-Packard Company and Citrix Systems, Inc., have provided *pro bono* assistance in developing a unique, high capacity system enabling public users to access a configurable, virtualized computer that can support a persistent personalized environment; and
- WHEREAS, The Cleveland Public Library wants to make this technology available to its public; and
- WHEREAS, The cost of necessary server and storage equipment, and the cost of software licensing conform to the lowest possible pricing available through the following governmental and educational schedules: Ohio State and Local Government WSCA, Ohio State and Local Government STS2, HP State and Local Government and Education (SLED) Value Express, HP SLED Big Deal, and Microsoft Academic; therefore
- BE IT RESOLVED, That the Board of Library Trustees authorizes the Director, or his designee, to execute agreements, subject to the approval of the Chief Legal Officer, for the purchase, installation and configuration of a system capable of supporting up to 150 simultaneous users in the amount of \$292,942.53 charged to the Building and Repair Fund Account 40130105-55530.

Business Smarts
2/1/2012

Proposal for
Cleveland Public Library

Virtual Desktop Project

I. Summary

Cleveland Public Library has engaged with Business Smarts and its partners Hewlett Packard, Citrix and Hogan Consulting Group to assist with implementing a production ready Citrix XenDesktop and XenApp environment virtualized on Microsoft Hyper-V. The environment built will include XenDesktop with approximately 150 Windows 7 virtual desktops and a XenApp farm for applications. Utilizing these technologies, along with Citrix Provisioning Server, the environment can easily be expanded at a later time to handle additional users.

II. Implementation Plan

VDI Infrastructure

Business Smarts and HP will be deploying and verifying the infrastructure. The infrastructure proposed includes an HP blade chassis containing two servers for VDI management software, two servers for Citrix Provisioning Services, five servers for Microsoft Hyper-V, and an external HP P4500 ISCSI San connected to the blade chassis via Virtual Connect Flex-10 along with 120 desktop thin clients and 30 mobile thin clients. Also a central management server supporting HP's Insight Control will be installed to provide ongoing monitoring of the VDI Infrastructure. All hardware will be racked, cabled and verified by HP before the start of the project.

Deliverables

The HP Installation and Startup Service for HP BladeSystem c-Class Infrastructure

Provides for the installation of an HP BladeSystem c-Class enclosure, c-Class ProLiant server blades, storage blades and Virtual Connect modules, as well as deployment and basic configuration of HP Insight Control Environment for HP Blade System software.

This service also includes the installation and configuration of HP Service Essentials Remote Support Pack, which is a remote monitoring and analysis tool that provides continuous hardware event monitoring and automated notification designed to identify, diagnose, and prevent potentially critical problems during contract or warranty coverage hours.

HP Enhanced Network Installation and Startup Service for HP BladeSystem

Provides configuration and testing of BladeSystem Ethernet switch modules and HP Virtual Connect modules, including the new HP Virtual Connect Flex-10 technology products. This service is specifically designed to facilitate the proper implementation of network protocols and access to advanced features that can help improve the performance, scalability, and reliability of the Virtual Connect Flex-10 network.

HP Installation and Startup Service for StorageWorks P4000 SAN Solutions



Provides implementation and verification of the HP StorageWorks LeftHand P4000 SAN/IQ Solutions products. This service provides service planning, service deployment, installation verification testing (IVT), and a customer orientation session to help deploy the features and functionality of the StorageWorks LeftHand P4000 SAN/IQ Solutions products.

HP Installation and Startup (I&S) Service for HP Networking (HPN) switching products
Coordinates the installation, configuration, and verification of the Procurve switches providing network connectivity between the P4500 San, Virtual Connect and your existing Cisco environment. With this service, you will also receive a brief orientation session on the product features installed.

After Installation and verification of the infrastructure, Hogan consulting will begin deploying the Virtual Desktop Environment

Microsoft Hyper-V/Xendesktop/Xenapp Deployment

The deployment of the software features of this project will be a collaborative effort between Hogan Consulting and library staff. This will streamline the consulting effort and facilitate the knowledge transfer between Hogan and the staff. Hogan Consulting is a Citrix Platinum partner headquartered in Chesterton, Indiana where they also maintain a Citrix Authorized Learning Center. They come highly recommended by HP and Citrix.

Before beginning. Hogan requests Cleveland Public Library have Windows Server 2008 R2 installed on the two management servers and the two Citrix Provisioning Servers. Microsoft Hyper-V will be installed on the five host servers by Hogan Consulting Group and Cleveland Public Library. A Citrix Provisioning Services farm will be configured to stream a XenDesktop vDisk(s) to Hyper-V VMs. A XenApp farm and XenDesktop site will be configured as VMs in the Hyper-V environment. The XenApp farm will be configured to publish Microsoft Office and a resume application to the Windows 7 virtual desktops. Cleveland Public Library will provide a resource for installing and configuring these applications.

Tasks

- Install Microsoft Hyper-V on five host servers.
- Configure and connect storage to HP P4500 ISCSI San. Create storage LUNs appropriately for project.
- Install Citrix Provisioning Server on two servers for PVS farm. **A SQL database will be required.**
- Create a Windows server VM as a management server for the Citrix environment. This will include Citrix License Server and Web Interface.
- Create two Windows server VMs as Citrix XenDesktop controllers. **A SQL database will be required.**
- A "golden" Windows 7 VM will be created and converted to a PVS vDisk. The XenDesktop site will be expanded to include 150 virtual desktops.



- PVS cache drives will be local to the Windows 7 VMs (SAN storage) and be approximately 7GBs each (to be determined). The vDisk will be set as a "difference disk" to allow user application installations, but those changes to the vDisk will be lost whenever the vDisk is updated.
- A Citrix XenApp farm will be created to publish applications to the virtual desktops. This will include a dedicated Zone Data Collector and 2-3 application servers to handle the load. This number will be determined by the Hogan engineer. **A SQL database will be required.**
- Citrix Profile Management will be installed and configured for profile management.
- All components will be tuned to Citrix and HCG best practices and performance standards.
- Configure Active Directory GPOs to Citrix/HCG best practices.
- Applications will be installed and configured according to Cleveland Public Library requirements.

Assumptions

- Cleveland Public Library will supply all necessary licensing for Citrix and Microsoft components.
- An **existing SQL server** will be needed for XenApp, XenDesktop, and PVS datastores. This can be a VM in the Hyper-V environment, if needed.
- A Windows 2008 Server will be needed to supply RDS CALs (previously TS CALs). This can be a VM in the Hyper-V environment, if needed. The Central Management Server could provide role if not already being done by another server onsite
- HP and Business Smarts rack, cable and verify all servers prior to the project start date.
- Cleveland Public Library will have Microsoft Windows Server 2008 R2 installed on management and PVS servers prior to the project start date.
- Access to Active Directory Users and Computers and Group Policy will be required.
- Cleveland Public Library will provide a resource to assist with networking, storage configuration, application installations, etc.

Deliverables

- Microsoft Hyper-V configured to virtualize infrastructure servers and virtual desktops.
- A PVS farm for streaming Windows 7 vDisk(s).
- A XenDesktop site configured for brokering 150 Windows 7 desktops.
- A XenApp farm configured to publish applications to virtual desktops.
- All components tuned to best practices and performance standards.
- Documentation of configuration.
- Side-by-side installation and instruction on how to maintain the environment. This is not formal Citrix Certification training, but functional training.
 - *Formal training is available from Hogan Consulting Group*
- Knowledge Transfer.



III. Quote



"INTEGRATING KNOWLEDGE & TECHNOLOGY"

6770 West Snowville, Brecksville, OH 44141
 t. (440) 526-2471 f. (240) 358-7179

QUOTE

Number AAAQ4982-01
 Date Feb 1, 2012
 Expires Feb 29, 2012

Sold To
Cleveland Public Library Larry Finnegan 325 Superior Ave Cleveland, OH 44114 Phone (216) 623-2811 Fax (216) 623-7120

Ship To
Cleveland Public Library Larry Finnegan 325 Superior Ave Cleveland, OH 44114 Phone (216) 623-2811 Fax (216) 623-7120

150 Seat VDI Solution

Salesperson	E-Mail	Ship Via	Terms
Jerry Short	jerry.short@busmarts.com		

Line	Qty	Part	Description	Unit Price	Ext. Price
1			Central Management Server		
2	1	74487S	HP ProLiant DL380 G7 Server Quad-Core Intel® Xeon® Processor E5640 HP 16GB PC3-10600R 2x8GB 2Rank Memory HP P410/ZM SAS Array Controller (2) HP 146GB 6G Hot Plug 2.5 SAS 15K RPM HP 512MB P-Series BBWC HP Slim 12.7mm SATA DVD Optical Drive (2) Embedded HP NC382i Dual Port Multifunction Gigabit Adapters (2) HP 460W Common Slot Gold Hot Plug Power Supplies	\$3,443.00	\$3,443.00
3	1	978347	INSTALL H/W DL380 G4 G5 DL385 G1 G2	\$0.00	\$0.00
4	1	2782085	HP TFT7600 KVM CONSOLE US KIT	\$1,359.00	\$1,359.00
5	1	2440099	HP SERVER CONSOLE SWITCH 0X2X8 (TAA COMPLIANT)	\$615.00	\$615.00
6	2	HA113A1 5BW	ProLiant Add On Options Installation SVC	\$0.00	\$0.00
7	2	50767R	AE WIN SVR STD 2008R2 SGL	\$111.64	\$223.28
8			CMS SubTotal		\$5,640.28
9					
10			Blade Infrastructure and Virtual Connect (upgrade to existing)		
11	1	906465	MPDU 24A 220V PDU L6-30P INPUT PLUG CORE ONLY BLD	\$189.00	\$189.00
12	1	52929F	BL C7000 DDR2 ENCL MGMT OPTION OA	\$656.00	\$656.00
13	3	52378F	BL C7000 P/S OPT 2400W SGL HIGH EFFICIENCY	\$269.00	\$807.00
14	4	91063C	BL C7000 C3000 FAN OPT SGL HPL	\$108.00	\$432.00
15	9	2034330	HP INSIGHT CONTROL ENVIRONMENT, NO MEDIA 1-SERVER LICENSE INCLUDING 1 YEAR OF 24	\$400.00	\$3,600.00
16	2	52307F	BL C7000 C3000 INTERCONN VC FLEX-10 ETH MOD	\$8,905.00	\$17,810.00
17	1	98187D	CARE PACK 3YR 13X5 4HR C7000 BLADE ENCL	\$709.00	\$709.00
18			SubTotal		\$24,203.00
19					

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Line	Qty	Part	Description	Unit Price	Ext. Price
20			Servers		
21			VDI Management Blades		
22	2	59783V	HP ProLiant BL460c G7 Server Blade (2) Quad-Core Intel® Xeon® Processor E5640 HP 96GB PC3-10600R 12x8GB 2Rank Memory Embedded P410i (SAS Array Controller) HP 512MB Flash Backed Write Cache (For P410i) (2) HP 146GB 6G Hot Plug 2.5 SAS 15K rpm Hard Drive 2 HP Embedded 1Gb/10Gb Multi-function Network Adapters NC553i Integrated Lights Out 3 (iLO 3) Standard Blade Edition	\$5,280.00	\$10,560.00
23	2	50767R	AE WIN SVR STD 2008R2 SGL	\$111.64	\$223.28
24	2	51387F	CARE PACK 3YR 13X5 4HR BL460C BL465C BL480C G5	\$324.32	\$648.64
25					
26			Provisioning Servers (upgrade to existing blades)		
27	2	59773V	PROC X5670 X/2.93 BL460C G7 ONLY	\$1,459.00	\$2,918.00
28	24	53373F	8GB 2RX4 PC3-10600R-9 KIT	\$145.00	\$3,480.00
29	2	51387F	CARE PACK 3YR 13X5 4HR BL460C BL465C BL480C G5	\$324.32	\$648.64
30					
31			Xendesktop Host Blades		
32	5	59783V	HP ProLiant BL460c G7 Server Blade (2) Six-Core Intel® Xeon® Processor X5675 HP 192GB PC3-8500R 12x16GB 4Rank Memory 2 HP Embedded 1Gb/10Gb Multi-function Network Adapters NC553i Integrated Lights Out 3 (iLO 3) Standard Blade Edition (2) 146 GB SAS 15k HDD	\$8,871.00	\$44,355.00
33	5	50767R	AE WIN SVR STD 2008R2 SGL	\$111.64	\$558.20
34	5	51387F	CARE PACK 3YR 13X5 4HR BL460C BL465C BL480C G5	\$324.32	\$1,621.60
35			Blade Server SubTotal		\$65,013.36
36					
37			Storage - 14.2 TB raw (6 TB usable with NetRAID 10)		
38	1	40377R	HP P4500 G2 14.2TB SAS Virt SAN (2 nodes)	\$28,421.18	\$28,421.18
39	1	34332R	CARE PACK 3YR SUP PLUS 24 P4500 G2 SAN SOLN SVC	\$2,408.80	\$2,408.80
40			Storage SubTotal		\$30,829.98
41					
42			ISCSI Storage Network		
43	2	24484P	2910AL-24G SWCH 24PT LAN DEVICE ETH	\$1,622.00	\$3,244.00
44	2	2952578	HP X410 E-SERIES 1U UNIV 4-POST RACK	\$85.00	\$170.00
45	2	2398909	PROCURVE MODULE AL 2-PORT CX4 10-GBE	\$617.21	\$1,234.42
46	2	1924739	HP BLC 3M 10-GBE CX4 CABLE OPT	\$94.71	\$189.42
47	4	01863Z	50FT CBL CAT6 SNAGLESS PATCH CBL ORNG	\$14.39	\$57.56
48	2	C29618	CARE PACK 3YR 13X5 4HR PROCURVE STACKABLE 24PT	\$616.00	\$1,232.00
49			SubTotal		\$6,127.40
50			Connection to Cisco		
51	2	52308F	BL C7000 C3000 INTERCONN 10GB SR SFP+ OPT	\$583.00	\$1,166.00
52	2	444984	CBL FC LC-LC 15M M/M	\$131.23	\$262.46
53					
54			Thin clients		
55	20	04703X	T5740E ATM/1.66 2GR 4GF WES 7 SBY	\$353.26	\$7,065.20

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Line	Qty	Part	Description	Unit Price	Ext. Price
56	20	63800P	LE1901W 19IN WIDE LCD MON SBY	\$135.87	\$2,717.40
57	30	54417Z	IWC4 INTEGRATED WORK CENTER ALL	\$68.24	\$2,047.20
58	120	2986756	6360t B210/2GB/4GBSSD/W7e	\$564.13	\$67,695.60
59			SubTotal		\$80,953.86
60					
61			Citrix License		
62	150	MW2Z0000094	EASY XENDESKTOP ENTERPRISE NAMED LICENSE W/ 1 YR SA	\$169.12	\$25,368.00
63			SubTotal		\$25,368.00
64			Microsoft Licenses 12 month subscription		
65	150	42424V	OV VDA SUB VL 12MO AP PER DEV	\$104.44	\$15,666.00
66	150	42431V	OV VDI STD STE MDOP SUB VL 12MO AP PER DEV PROMO	\$6.55	\$982.50
67			SubTotal		\$16,648.50
68					
69			INFRASTRUCTURE SUBTOTAL		\$254,784.38
70					
71			DEPLOYMENT SERVICES		
72			Infrastructure Implementation		
73	1	K37033	INSTALL/STARTUP C7000 ENCL & INFR	\$3,130.00	\$3,130.00
74	1	L09868	INSTALL/STARTUP C7000 ENH NTWK SVC	\$2,034.44	\$2,034.44
75	1	DQ4136	TECH STARTUP LEFTHAND P4K INT LTU	\$3,346.65	\$3,346.65
76	1	774035	INSTALL/STARTUP STACKABLE SWCH	\$1,147.06	\$1,147.06
77					
78			Microsoft Hyper-V/Xendesktop/Xenapp Deployment		
79	120	BS-IMPL-04	Vdi Implementation/Hour	\$205.00	\$24,600.00
80	20	BS-IMPL-TE	Travel Expenses/Day	\$180.00	\$3,600.00
81					
82			DEPLOYMENT SUBTOTAL		\$37,858.15
Pricing conforms to the following schedules where applicable Ohio State S&L Gov WSCA Ohio State S&L Gov STS2 HP SLED Value Express HP SLED Big Deal Microsoft Academic				SubTotal	\$292,642.53
				Tax	\$0.00
				Shipping	\$300.00
				Total	\$292,942.53