LOS MEDANOS COLLEGE

Pittsburg VDI Server Systems Project Scope Statement

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Summary

LMC as part of future technical planning, accelerated by the worldwide Covid-19 pandemic, identified the need and utility of providing remote computer resource access for students to virtualized computer systems traditionally hosted on our physical campus sites. Many specialized applications and computer resources required for instructional needs are traditionally accessible in computer labs and classrooms on our campuses.

Virtual Desktop Infrastructure (VDI) is a platform whereby LMC can provide access to fully loaded PC systems similar to resources for students and staff on campus, hosted on server-based systems in datacenters or 3rd party cloud resources. VDI is an Infrastructure-as-a-Service (IAAS) system giving students from heterogeneous endpoints such as home computers, tablets, laptops, and Chromebooks remote internet access to applications they need with powerful processing and graphics abilities (CPU and GPU) on servers. A student only need a lower cost commodity device and a simple internet connection, to go online in a virtual LMC PC session with the processing and applications hosted they need for their instructional courses.

Proposed is the following:

- Acquire the necessary redundant server hardware platform to augment the conditional needs of various instructional computer labs at LMC. This hardware will accommodate a beginning set of 150 concurrent sessions licensed to use the system, with existing margin to expand use. This includes necessary CPU, memory, networking capacity, and fast storage necessary to host various "images" of a variety of instructional computer software profiles actively in use. This VDI host system will additionally accommodate intensive graphical applications by having substantial GPU co-processing power available. The entire platform should be able to scale in capacity for modular growth in all those components should LMC wish to increasing hosting more concurrent sessions or intensive applications.

- LMC will also implement with a similar lead CCCCD has recently taken in adopting VMware Horizon as the software basis of hosting this VDI platform. This way LMC and other colleges in our district will not obtain fragmented VDI systems. An engagement with professional implementation services for VMware Horizon, to be performed bringing this VDI server service system online at LMC and hosting virtualized PC systems and software. This engagement will include a formal statement of work and install documentation.

- Support service agreements on hardware and software licensing to be made for 5 years of service.

Estimated Support Renewal Costs for annual (discounts given for multi-year renewals):

EMC\Dell support service (HW/SW): $32k/annual

VMware Horizon 7 Enterprise, 150 user seat licenses: $21k/annual

NVidia VDWS and Grid VPC Subscription license (SW): $20k/annual

Project Background Description

1.1 Expansion of LMC compute abilities and remote access

VDI is a new fork in IT services and technical abilities for LMC. Primarily such a platform will give LMC the additional capability to host most any PC or application service provided traditionally with hardware desktops and laptops into a cloud service, virtually. While the system will start with a capital expense into on premises cluster server hardware, an essential requirement of the VDI server-side software system is it is diverse, allowing LMC to expand the system into cloud compute providers leveraging their multi-site connectivity should LMC choose so, at more utility based operating expenses.

In light of the sudden technical demand pivot from Covid19, the rational of providing remote access to such systems becomes essential to LMC operations. VDI as a platform is flexible allowing on premises access, but importantly worldwide access via the internet with light bandwidth demands and use of low cost devices. LMC will be able to present an entire array of instructional software access traditionally hosted throughout physical sites in one logical space for a student to choose from anywhere they have an internet connection.

1.2 Additional benefits that can be utilized

This infrastructure if expanded in software licensing and modular server hosts, can reduce the need for purchasing high powered PCs throughout many computer labs. When traditional physical computer labs are considered for refreshing, if those seats are chosen to move to a virtual VDI session, they can be replaced with low cost access devices. If more computer lab seats do move virtually, student demand for those campus physical computers lab seats may decrease.

VDI use is not limited to just student computer lab access, as other profiles could be virtualized. Many physical areas on campus are provided robust PC hardware from classroom podiums, front line staff, kiosk, and others. A VDI system could also expand to accommodate those areas, thus also seeing replacements in the field be with lower cost access devices.

A high performance cluster server system such as this also includes state of the art compute abilities with fast CPU, and especially server based GPU high co-processing ability. New instructional programs could be brought online, even as provisional concepts to test out, against existing VDI HPC resources for computer science or engineering courses with high processing machine learning needs.

Justification

2.1 Infrastructure for remote access for LMC instructional courses

A VDI system will augment existing computer labs with virtualizing them for remote access anywhere on the internet by our students. Students not able to come on to campus will have all the same necessary software and system performance to complete their instructional work. Covid19 restrictions brought to bear an issue of equity access to infrastructure. Some students now face the expense of buying a PC and multiple software licenses for instructional needs that once were accessible on campus. Many of these expenses are not immediately available for them to absorb and have dropped pursuing their educational goals. Some software applications are not available on "thin" devices like Google Chromebooks, and thus a VDI solution provides for access to intensive applications, or Windows OS only requirements, we instructionally use that a "thin" device can then connect to.

2.2 Enable fast infrastructure turnaround for new software availability and updating existing deployments.

A VDI system takes an image profile of a whole PC system, or a set of applications, and hosts this as one connectable resource identity. Then as requests are made for that resource, clones of that identity are made for each session connecting for it. This means there is simply one image or application to maintain. New image profiles and applications are exponentially quicker to create and deploy to thousands because of it is only one source to maintain, instead of how LMC currently is taking once image source and having to deploy it to thousands of PCs.

In that same concept, updating software for the entire PC and application environment for new versions is also about maintaining one profile source. Importantly as well, maintenance or critical security updates needing fast deployment will radically improve in time to deployment.

Key Deliverables

LMC IT will engage with vendors and integrators for a VDI hardware solution and IT engineering services that best matches the current and future demands required. The solution will fulfill for:

- A new redundant systems server hardware architecture for VMware Horizon. This will be in a clustered or hyper-converged cluster system hosting the VDI platform.
- The system will be able to host at start a minimum of 150 concurrent virtual sessions in good performance metrics, with the GPU power to host high graphical rendering application ability.
- VMware 6.7 environment and VSphere services to produce like-to-like or better systems management.
- Technical implementation service with high skill support to bring VMware Horizon online and hosting a PC image for remote access.
- Implementation services will include run documentation and recording of environment parameters
- Vendors will support the system at time of purchase for a 5-year term.
- Training credit for LMC IT staff on VMware Horizon.

5.1 Timelines

LMC is in need to initiate this project as soon as reasonably possible, as the need for remote access of instructional applications is in high demand in a Covid19 pandemic.

6.1 Key team members

LMC Administration leadership, LMC IT Manager, vendor representatives, IT solutions service implementer, LMC IT Specialists, District IP networking IT staff.

7.1 Assumptions

It is assumed that LMC can properly obtain the means, hardware, and service to conventionally obtain this technology environment.

8.1 Constraints

Funding is the major constraint of this project. A key requirement of this project is implementation, in partnership of LMC Buildings and Grounds, to complete the electrical updating of the LMC core data room to properly host this VDI system.

9.1 Exclusions

This project augments additional backend server capabilities of LMC technical resources to host existing applications and PC operating systems to students. We are not moving students to a significantly different state of technology or architecture at this time.