



New HybriLIT cluster module devoted to graphical applications

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Dubna

Content

1. **HybriLIT components: management, computation, services;**
2. **Virtual desktop infrastructure (VDI);**
 - a) **QEMU KVM;**
 - b) **Xen.**

HybriLIT components: management, computation, services

Use of virtual machines for hosting managing services. Development of virtual desktops for work with applied software

Computer component has a heterogeneous structure with support for the newest GPU and processors

CERN VM File System is used for management of own software repository



SLURM
resource management system suitable for usage on large and small Linux clusters.



hybrilit.jinr.ru
Website of heterogeneous cluster HybriLIT.



Virtual desktops
Pool of virtual desktops used by users for rich graphical applied software.



HybriLIT statistics
service providing payload resource monitoring.

Cluster infrastructure

Computation component **HybriLIT**

TOTAL RESOURCES

252 CPU cores;
77184 CUDA cores;
182 MIC cores;
~2,5 Tb RAM;
~57 Tb HDD.

HARDWARE



SuperBlade Chassis including 10 calculation blades for run user tasks.



Virtual Desktops for Rich graphical applications

48 virtual desktops for users who use Rich graphical applications and cluster ready applications.



HARDWARE

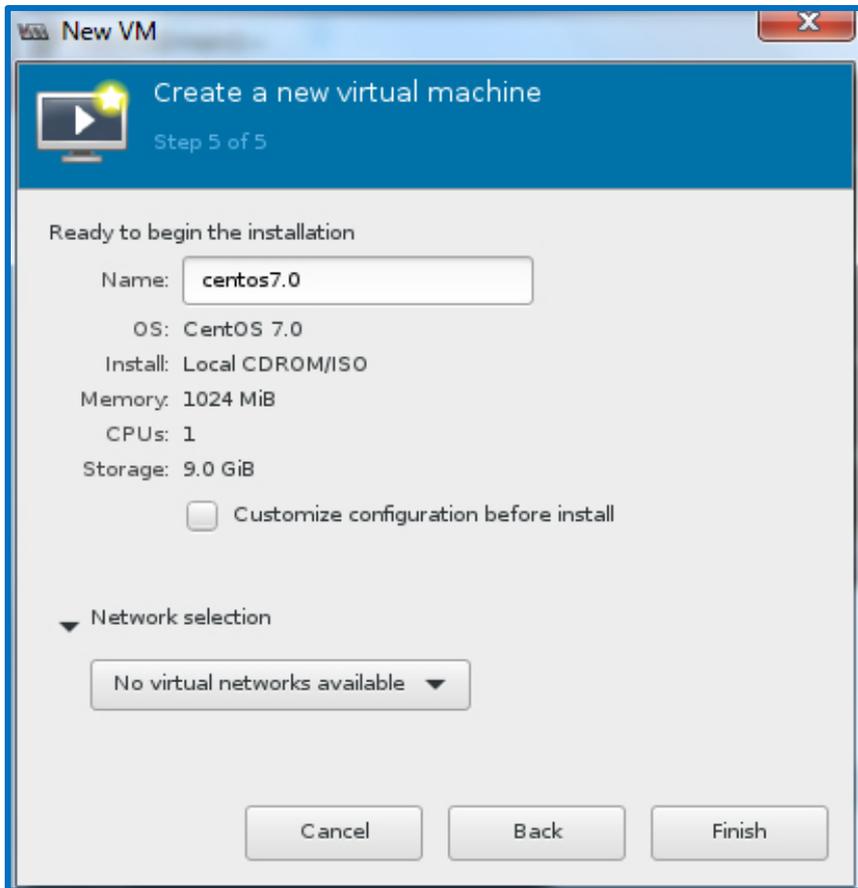


Based on Dell PowerEdge FC430 including 8 server nodes.

QEMU/KVM realization remote access to VDI

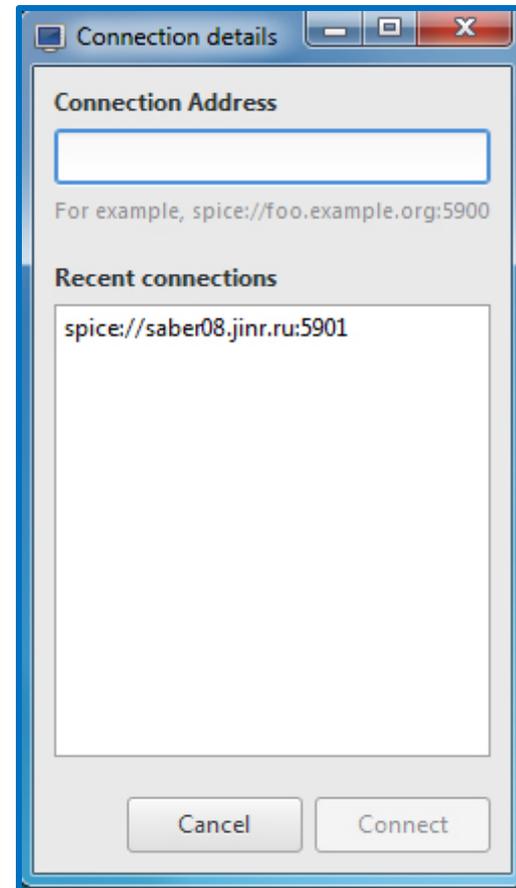
The QEMU/KVM based solution answers the cases when no dedicated GPU resources are requested

Virt-manager for create VDIs.



Server: any machine.

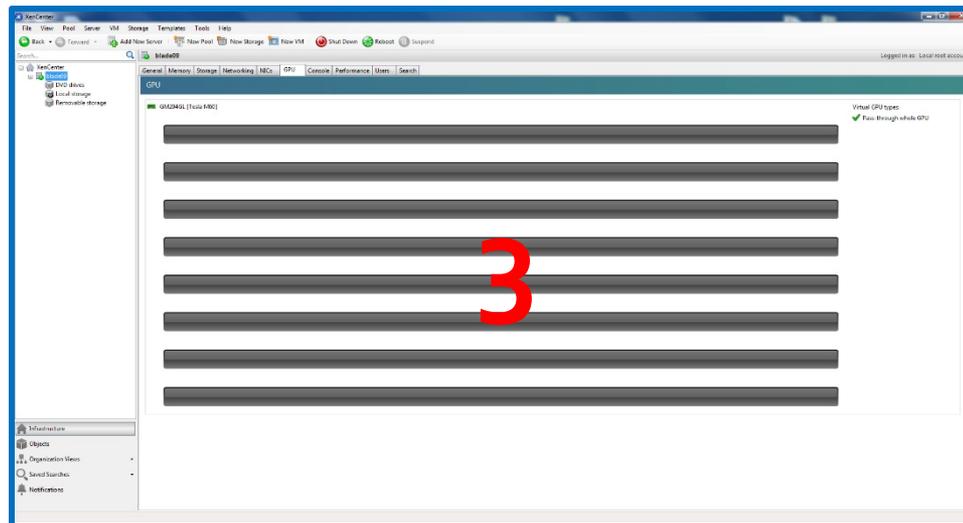
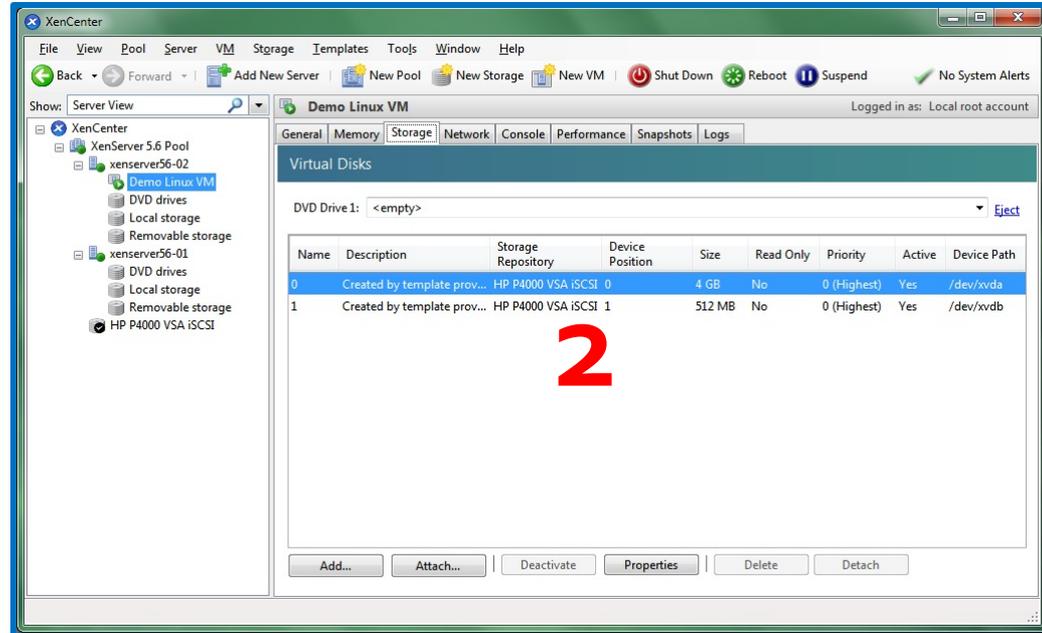
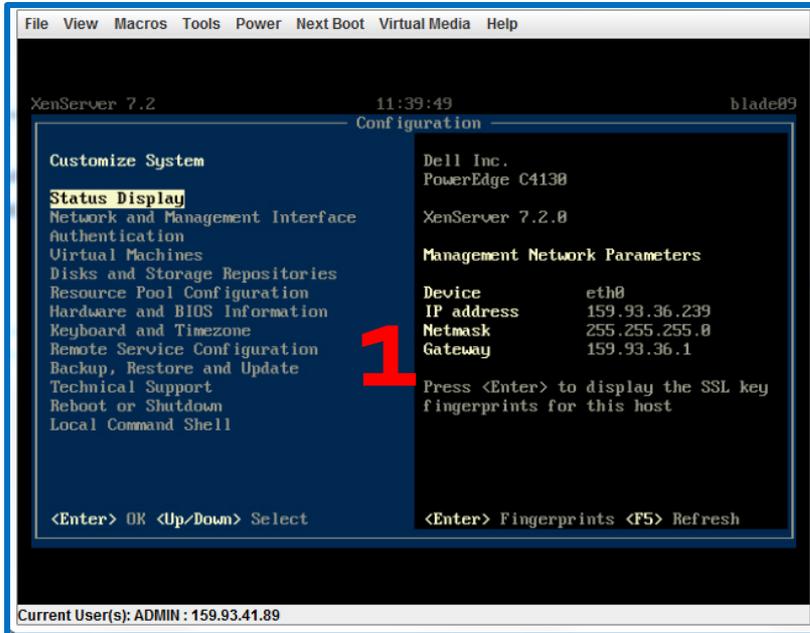
SPICE client for remote access.



Clients: Windows or Linux user desktop.

Xen realization remote access to VDI

The XenServer [1] with Citrix XenCenter [2] software enables the use of high performance GPU [3] resources as well



Virtual desktop infrastructure (VDI)

The virtual desktop infrastructure (VDI), implemented as a new HybriLIT component, brings significantly better support to the users' work with application software. The VDI system provides the users with remote access to a virtual workplace.

Blade chassis:

252 CPU cores;
77184 CUDA cores;
182 MIC cores;
~2,5 TB RAM
~57 TB HDD



NFS / EOS

store1 **24 Tb**, store2 **24 Tb**.



Dell PowerEdge FC430

192 CPU cores;
~2 TB RAM; ~6 Tb SSD



Dell PowerEdge C4130

32 CPU cores; 4xTesla M60
~512 GB RAM; ~800 Gb SSD



Conclusions and plans

HybriLIT has two typical scenarios enabling remote access to the graphic applications. They allow the SaaS (software as a service) use of HPC resources by the end users.

To realize work with Rich graphical applications by GPU we need HDX 3D PRO protocol.

This protocol is provided by connect Citrix XenDesktop 7 with NVIDIA GRID virtual GPU technology.

Thank you for your attention!

