

Management Framework

Portal, REST, API, command line

Federation Management, Systems Monitoring, Operations

User & Project Services

Experiment Planning and Deployment Services

Provisioning and Execution

Federation Services

Security
Authentication, Authorization, SSO

Experiment **Monitoring** & Execution

**Platform as a Service
Provisioning & Federation**

*Hadoop, HPC Cluster, virtual
Cluster, Customization*

Infrastructure as a Service

*OpenStack, Eucalyptus, Nimbus
OpenNebula, CloudStack, Customization*

**Network
Provisioning**

*OpenFlow,
Neutron,
ViNe, others*

**Compute
Provisioning**

*System, VM,
Hypervisors,
Bare-Metal,
GPU, MIC*

**Storage
Provisioning**

*Partitions,
Disks,
Filespace,
Object Store*

Resources

Federated

Internet

Internet2

Nucleus

Azure AWS

Google Rack-
space
HP ...
Cloud

EGI

XSEDE
Grid
5000

IU

UF

UC

TACC

...