StratusLab

Enhancing Grid Infrastructures with Virtualization and Cloud Technologies

Models for Integrating Grid and Cloud Technologies

Both cloud and grid technologies have features that make them attractive for technical computing tasks. An improved e-Infrastructure can be provided to European researchers by combining both technologies on a single pan-European platform.

Cloud Features

- Dynamic, instantaneous provisioning of resources.
- Ability to customize execution environment and installed applications.

Grid Features

- Robust security and policy framework permitting global authentication and authorization of users.
- Mechanisms for federating distributed resources to produce a larger, more capable infrastructure for users.

A combined e-Infrastructure:

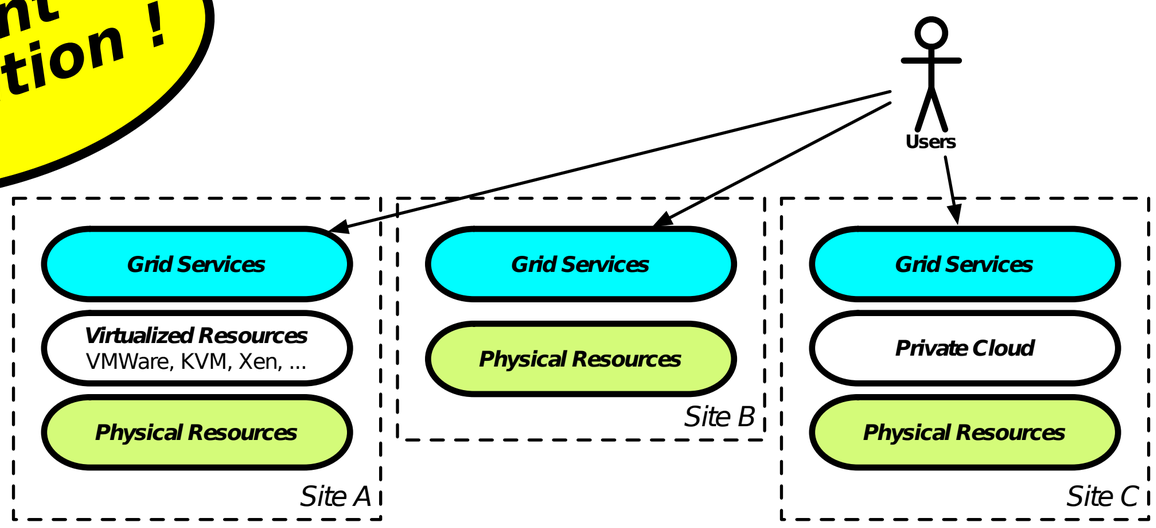
- Appeals to a larger, more diverse scientific community via customized environments and alternate operating systems.
- Allows VO and user-level services permitting the construction of complete scientific platforms and services.
- Allows sharing of same physical resources with different access modes without partitioning of resources.
- Provides more flexible management of services and resources.

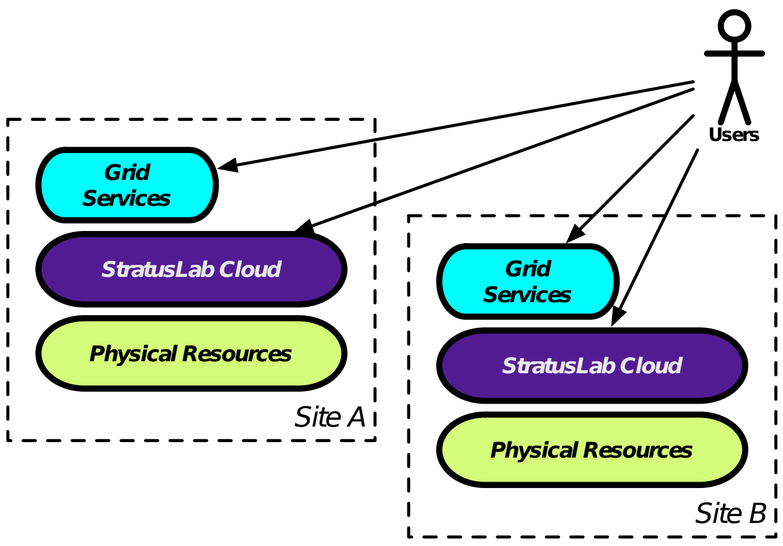
Current Situation !

Model 1: Hidden Virtualization

Site administrators use virtualization and cloud technologies but do not make this visible to grid users.

Site administrators benefit from easier system management; users do not directly benefit.

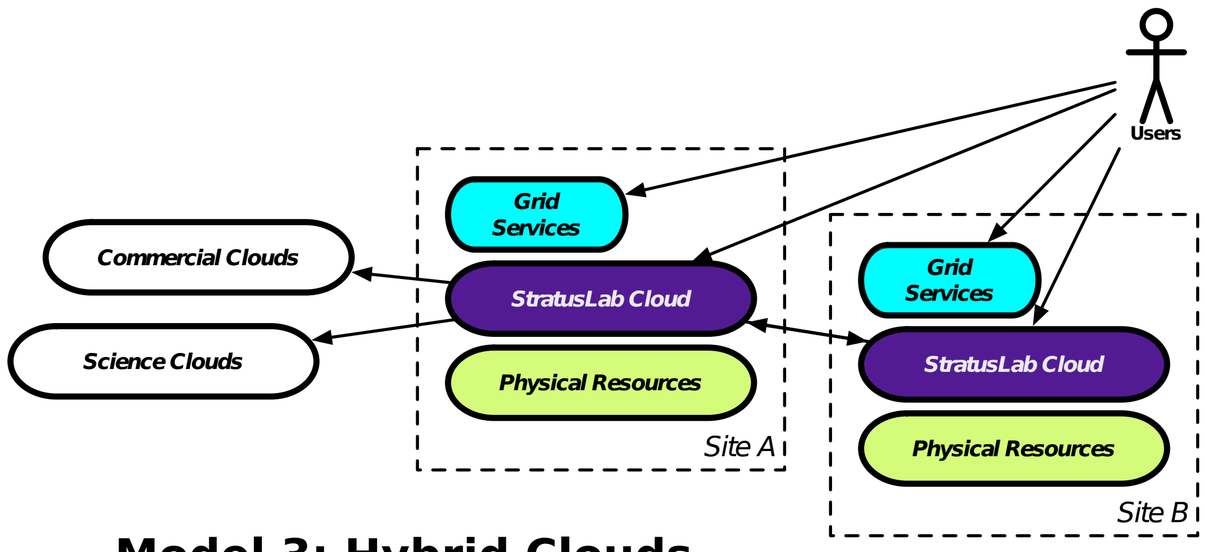




Model 2: Public Cloud and Grid Services

Each site deploys a cloud over its physical resources running the grid services within that cloud with the cloud visible to end-users.

Administrators see the benefits of Model 1 and end-users can take advantage of the customization and dynamic provisioning of clouds.



Model 3: Hybrid Clouds

Like Model 2, but clouds can now transparently use resources from other StratusLab clouds, commercial clouds or science clouds.

All the benefits of Model 2, but more resources can be made available and sharing of resources is permitted between sites, not just between users and VOs.

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