Get More Out of Your Data Center & Cloud Infrastructure
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Disadvantages:

Advantages:

Applications have different hardware/software requirements.
Application running on the hardware not suited to its needs, results in under utilization of the heterogeneous compute farm.

Virtualization allows several guest operating systems to be executed on the same computer computer concurrently.

Cloud Computing

Green Computing

High Performance Computing

Migrate the running instance of applications over the cloud to the best suited hardware with negligible downtime

Isn't that simple?
Allocate compute machines according to requirements of an application
Simple! ... but what if
• The resources are not available when a job is submitted?
  Answer: Wait for an hour, a day or more.
• The scientist does not know the resource requirements?
  Answer: He must know the requirements, In worst case enter approximate requirements.
• The compute job requires a different OS than the one installed on the cloud or a cluster?
  Answer: Sorry, our system only runs 64-bit Linux.
  ... That's hardly good enough!

What can be done?
• Use heterogeneity to our advantage.
• Use virtualization technology to host multiple OS concurrently on a compute node.

Virtualization

Implementation

Virtualize the compute farm using Xen, an open source virtual machine monitor.
Profile the virtualized compute nodes for CPU, network and memory utilization, this is done through a Local resource monitor.
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Advantages:

• Migrate OS from one physical host to another
• Run different types of OS (32/64 bit Linux, Windows) concurrently on the same hardware
• No need to install the OS, just reuse an image

Disadvantages:

• Slower network throughput compared to native.
• High migration times.
• Data-center centric implementation

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