An Use case for VM’s Power-hungry Compute Clusters

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DAS-3 Cluster Tender
http://www.clustervision.com/pr_das3_uk.html

10 Gbit/s Ethernet lanphy

To local University

UvA-node

1 Gbit/s Ethernet

Local interconnect

85 compute nodes

Fast interconnect

10 Gbit/s Ethernet lanphy

To SURFnet

head node (2)
Power is a big issue

- UvA cluster uses 30 kWh
- 1 kWh ~ 0.1 €
- per year -> 26 k€/y
- cooling -> 39 k€/y
- Emergency power system -> 60 k€/y
- per rack 10 kWh is now normal
Power outages are a big problem

• on average about one outage per year
  – once the generator not starting/taking over
  – recently explosion of cable -> generator fine!
• battery power for 5 minutes, generator to take over
• priorities for emergency power/cooling
VM opportunity

Head node

Memory rich VM holder

switchable power strip

CPU nodes

network
The VMs that are live-migrated run an iterative search-refine-search workflow against data stored in different databases at the various locations. A user in San Diego gets hitless rendering of search progress as VMs spin around
Other VM opportunity

• run grid in a grid
• every project its own favorite suite on favorite Linux version
  – Glite in EGEE
  – Teragrid
  – Rock-Roll in OptIPuter
• Solution -> run entire system+app in VM as stupid app on other grid
Questions?