Most of our customers do not want to operate Linux Clusters ... ... they want solutions for their computational problems ... Compute Power out of the Box!
Agenda

1. How to get Compute Power Out of the Box
   1. The s.cluster Installation Concept
   2. The s.cluster Administration Concept (scVENUS)
   3. Integration and Job Flow

2. Example
How to get Compute Power Out of the Box

1. **Step: Take measure**
   1. Define a list of requirements together with the customer
   2. Realize benchmark tests to identify the ideal hardware components
   3. Configuration of the cluster hardware to be actually ordered

2. **Step: Tailor**
   1. Definition of the system configuration of the cluster
   2. Preparation of the application software
   3. Selection of the Linux components (kernel, modules, rpm-packets, ...)
   4. These activities result in a s.cluster CD
How to get Compute Power Out of the Box

3. Step: Fit
1. Installation of the cluster
2. Test runs to optimize and fine-tune the Cluster configuration
3. Acceptance of the cluster by the customer
4. Regular operation

Agenda

1. How to get Compute Power Out of the Box
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   3. Integration and Job Flow
2. Example
1.1. The s.cluster Installation Concept

- **Basic installation of the master node using the Linux CDs**

- Master node

- Client nodes

Diagram:

- Linux CDs
- s.cluster CD
- External Network
- Master node
- Client nodes
- Switch

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1.1. The s.cluster Installation Concept

Installation of the master node using the s.cluster CD

External Network

Client nodes

Master node

Installation of the first client node via network

- Client requests an IP-Address from the master via DHCP
1.1. The s.cluster Installation Concept - IV

Installation of the first client node via network

- Client requests an IP-Address from the master via DHCP
- Client is recognized as „to be installed“: an installation boot image is transferred to the client

Installation of the node using Redhat kickstart

Configuration of the node using scVENUS
1.1. The s.cluster Installation Concept

Installation of the first client node via network

- Client requests an IP-Address from the master via DHCP
- Client is recognized as „to be installed“: an installation boot image is transferred to the client
- Installation of the node using Red Hat kickstart
- Configuration of the node using scVENUS

DONE!

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2. Example
The s.cluster Administration Concept (scVENUS)

1.2. The s.cluster Administration Concept (scVENUS)

The functionality of computers are described through their group membership.

Automated system administration: fast, reproducible, solid/stable performance.

Different administrator accounts, different access rights, log files.

Central configuration, no local administration.

Multi administrator environment.

Agenda

1. How to get Compute Power Out of the Box
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2. Example
Integration and Job Flow - Software Layers

- Easy access to compute resources over a WEB interface
- Comfortable job flow management with a graphical editor
- Optimal utilization of compute resources, LSF
- Integration of different applications
- Automate and reproduce system administration
- Operating systems

1.3. Integration and Job Flow

Agenda

1. How to get Compute Power Out of the Box
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2. Example
Integration and Job Flow - I

System Environment

In a pre processing process the CAE engineers are building the input decks on their workstations.

Integration and Job Flow - II

System Environment

The CAE engineers submits batch jobs over a WEB interface, generated from EnginFrame.
Integration and Job Flow - III

System Environment

In a submit panel the project, case name, input deck and other job parameters are specified.

2. Example

Integration and Job Flow - IV

System Environment

With flowGuide the batch jobs are prepared to be submitted as job scripts in a load sharing tool, like LSF.

2. Example
Integration and Job Flow - V

System Environment

Linux Cluster

submit

job script

scheduler

batch queues

submit

Optimal distribution of batch jobs depending on system requirements

2. Example

Integration and Job Flow - VI

System Environment

Linux Cluster

submit

job script

scheduler

batch queues

submit

Calculation of the batch job in local working directories on the Linux Cluster

2. Example
Integration and Job Flow - VII

System Environment

For the post processing process the results are automated copied back to the WS or other servers
CAE engineers are informed per email

Summary

1. Simple and comfortable to use solution for CAE engineers (Compute Power out of the Box)
2. Support of heterogenous Environment (Linux Cluster, Compute Servers, Unix-/Linux-WSs, Windows-PCs)
3. Flexible adapt because of modular software layers
4. Easy to administrate, scVENUS
Thank you for your attention