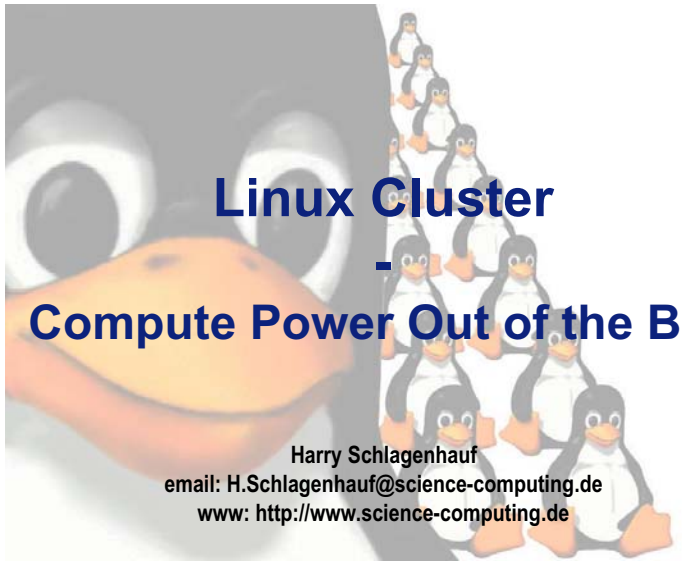

Linux Cluster
-
Compute Power Out of the Box

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email: H.Schlagenhauf@science-computing.de
www: http://www.science-computing.de

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Most of our customers do not want to operate Linux Clusters ...

... they want solutions for their computational problems ...

Compute Power out of the Box!

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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

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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

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How to get Compute Power Out of the Box

2. Step: Tailor

1. Definition of the sytem 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

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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

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Agenda

1. How to get Compute Power Out of the Box
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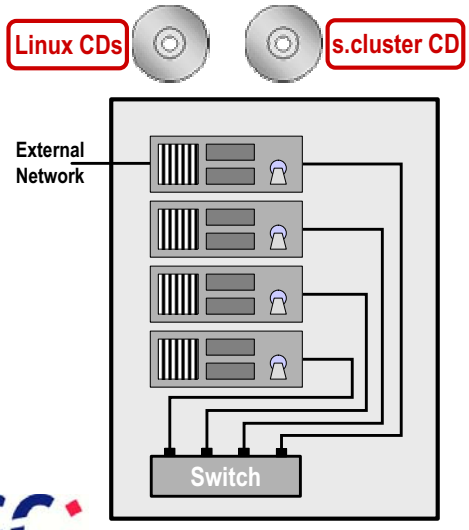
The s.cluster Installation Concept - I



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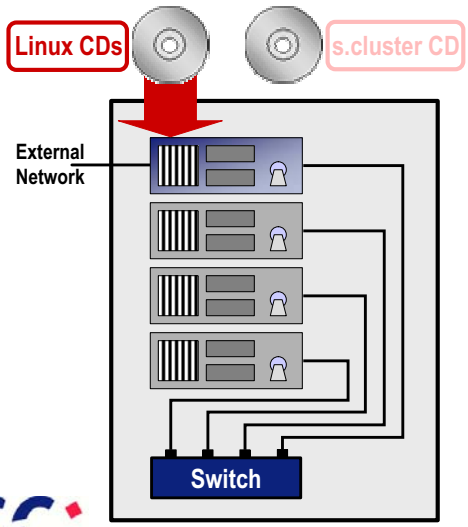
s.cluster

1.1. The s.cluster Installation Concept

The s.cluster Installation Concept - II



Basic installation of the master node using the linux CDs

Master node

Client nodes

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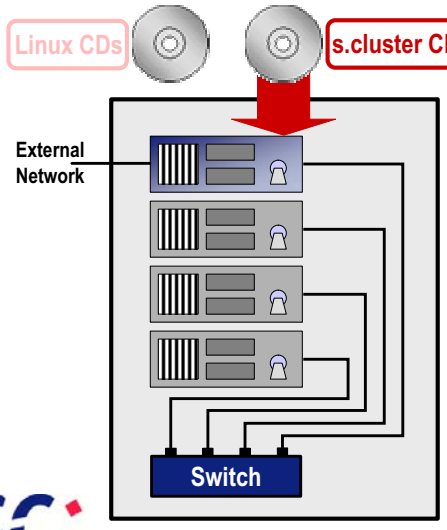
s.cluster

1.1. The s.cluster Installation Concept

The s.cluster Installation Concept - III



Installation of the master node using the s.cluster CD

Master node

Client nodes

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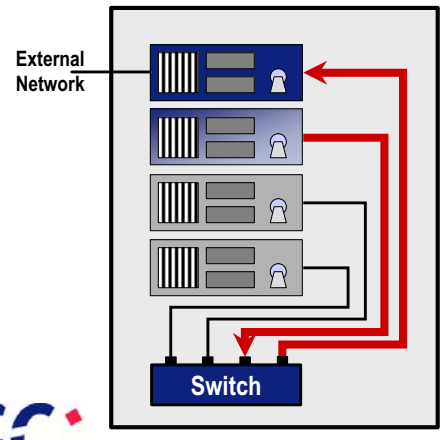
s.cluster

1.1. The s.cluster Installation Concept

The s.cluster Installation Concept - IV



Installation of the first client node via network

➢ Client requests an IP-Address from the master via DHCP

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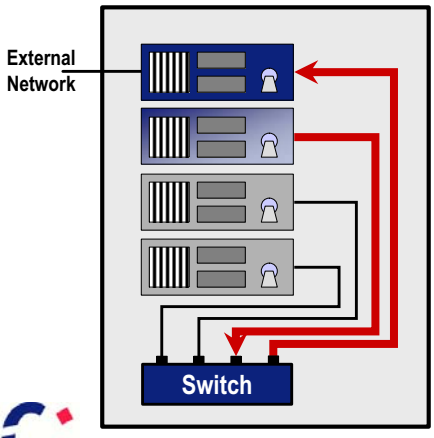
s.cluster

1.1. The s.cluster Installation Concept

The s.cluster Installation Concept - IV



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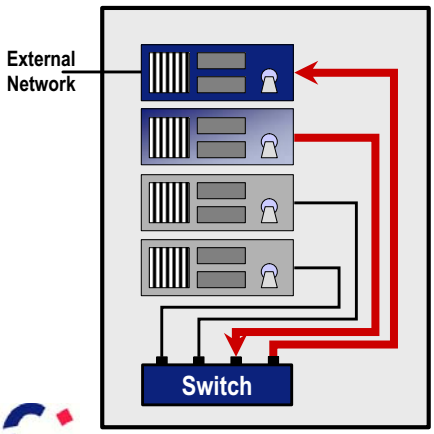
Installation of the first client node via network

- 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

s.cluster

1.1. The s.cluster Installation Concept

The s.cluster Installation Concept - IV



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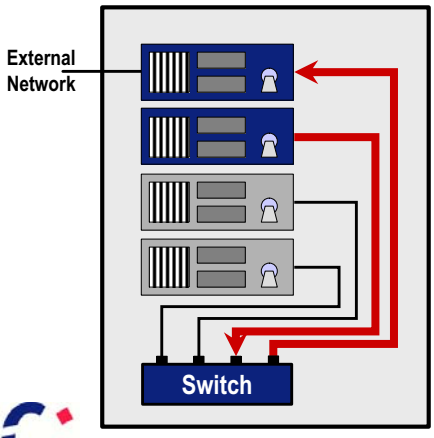
Installation of the first client node via network

- 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

s.cluster

1.1. The s.cluster Installation Concept

The s.cluster Installation Concept - IV



Installation of the first client node via network

- Client requests an IP-Address from the master via DHCP
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- Installation of the node using RedHat kickstart
- Configuration of the node using scVENUS

DONE !

s.cluster

1.1. The s.cluster Installation Concept

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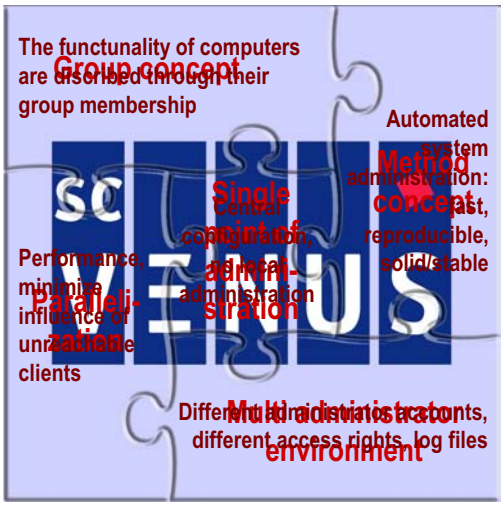
1.2. The s.cluster Administration Concept (scVENUS)

The s.cluster Administration Concept (scVENUS)



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1.2. The s.cluster Administration Concept (scVENUS)

Agenda

1. How to get Compute Power Out of the Box
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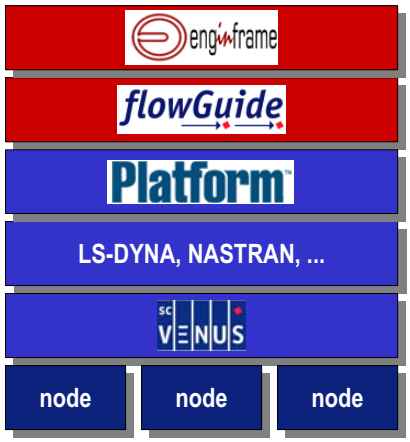
1.3. Integration and Job Flow

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

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1.3. Integration and Job Flow

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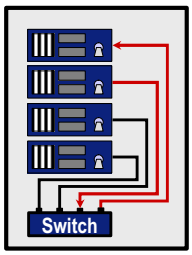
2. Example

Integration and Job Flow - I

System Environment

Linux Cluster



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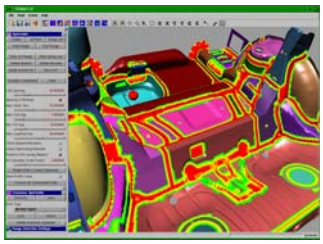
In a pre processing process the CAE engineers are building the input decks on their workstations

scFEMod

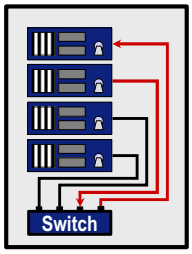


2. Example

Integration and Job Flow - II

System Environment

Linux Cluster



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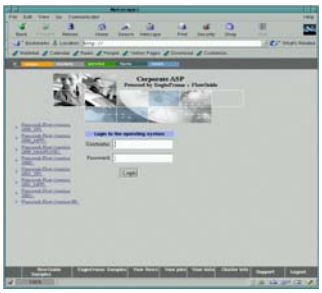
The CAE engineers submits batch jobs over a WEB interface, generated from EnginFrame

enginframe

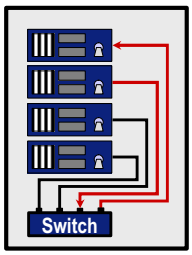


2. Example

Integration and Job Flow - III

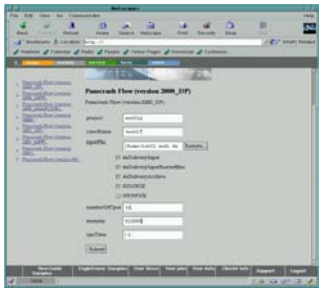
System Environment

Linux Cluster



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

engineframe



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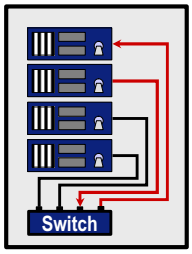
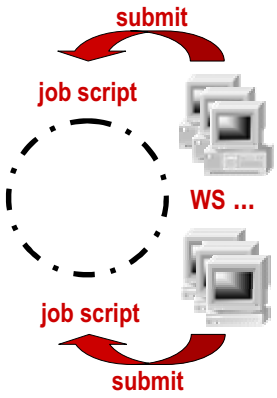
2. Example

Integration and Job Flow - IV

System Environment

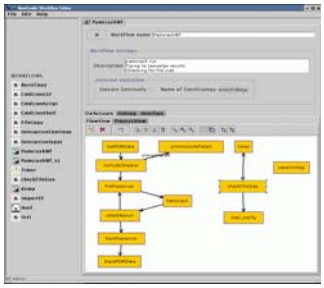
Linux Cluster





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

flowGuide



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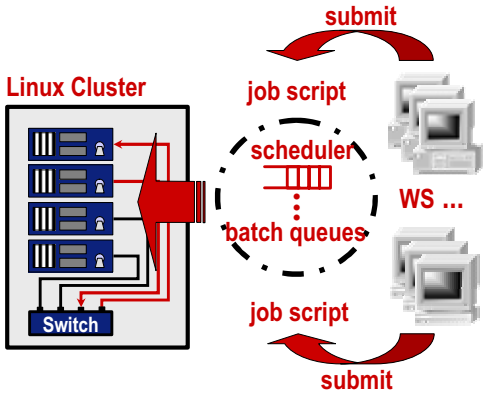
2. Example

Integration and Job Flow - V

System Environment



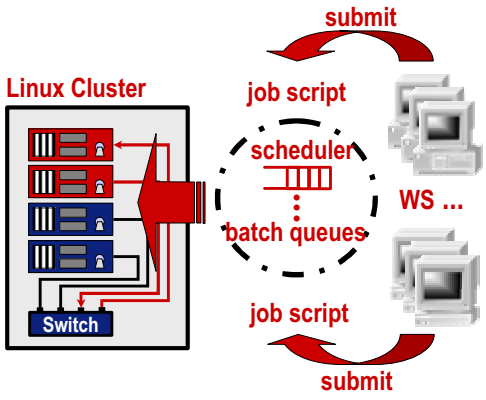
Optimal distribution of batch jobs depending on system requirements

Platform

2. Example

Integration and Job Flow - VI

System Environment

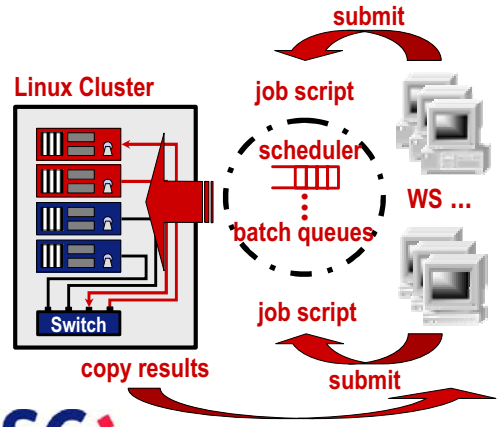


Calculation of the batch job in local working directories on the Linux Cluster

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

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2. Example

Summary

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

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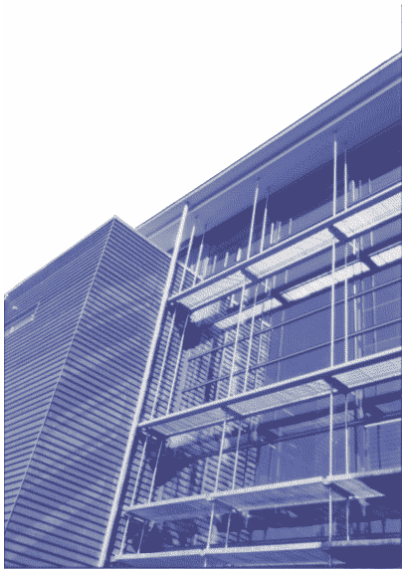
Thank you for your attention



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