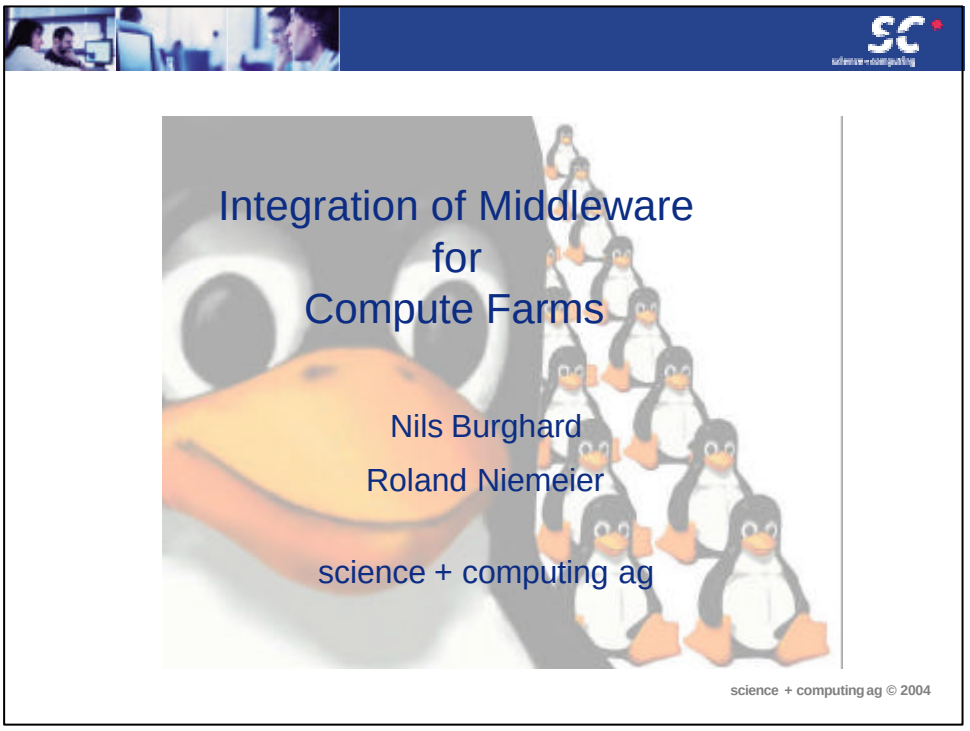


Integration of Middleware for Compute Farms

Nils Burghard

Roland Niemeier

science + computing ag

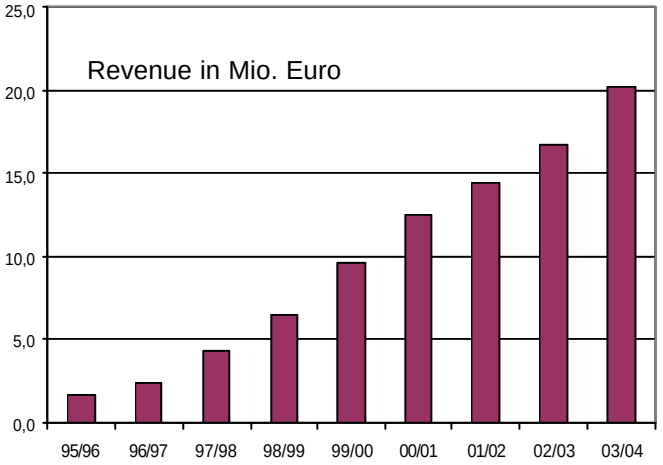
Some Facts und Figures about s+c

- Revenue 2003/04: 20 Mio €
- Employees: 190 (September 2004)
- Locations: Tübingen, München, Berlin, Duisburg
- Company established: September 1989
- Legal Form of Company:
  Privately Owned Stock Corporation

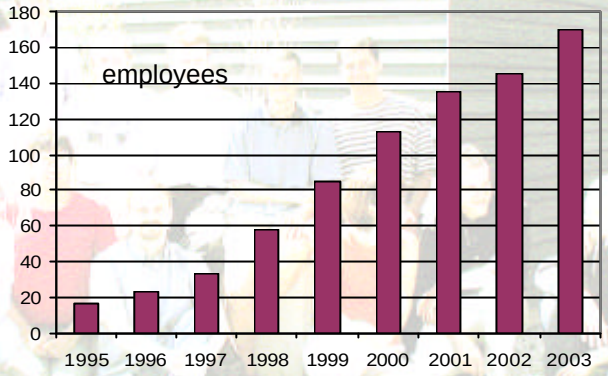
Our Focus

We offer
IT services and solutions
for efficient IT management
in technical computing

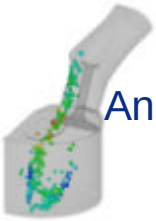
Revenue Growth



Company Growth



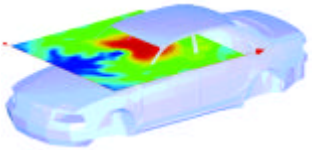
- Today: about 190 employees
- More than 85% hold advanced degrees in sciences, engineering, and computer science

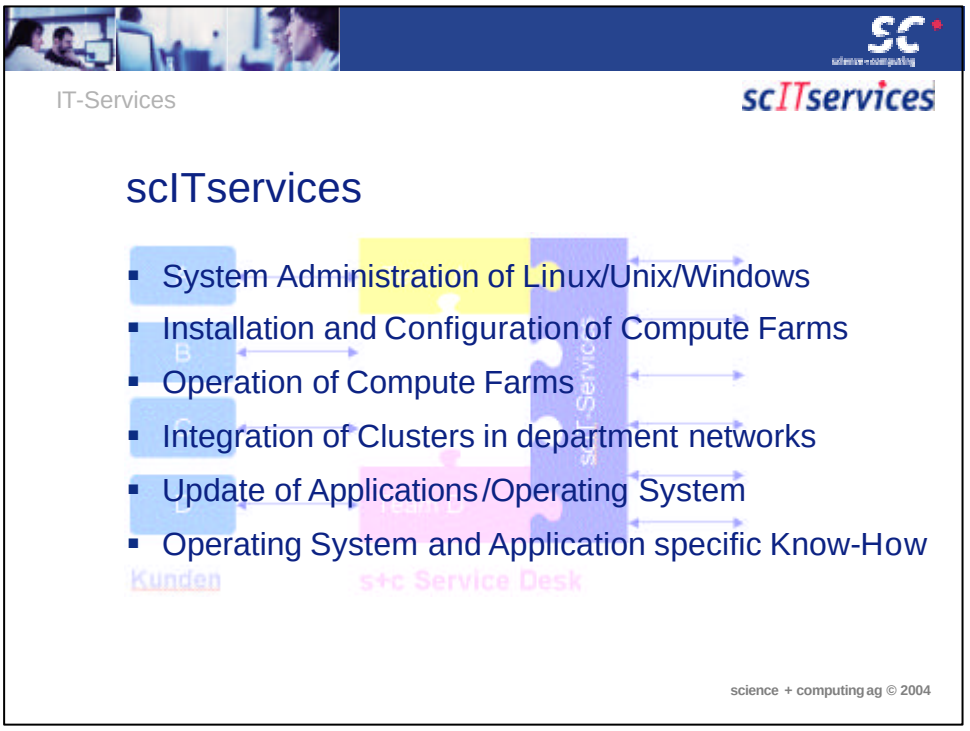


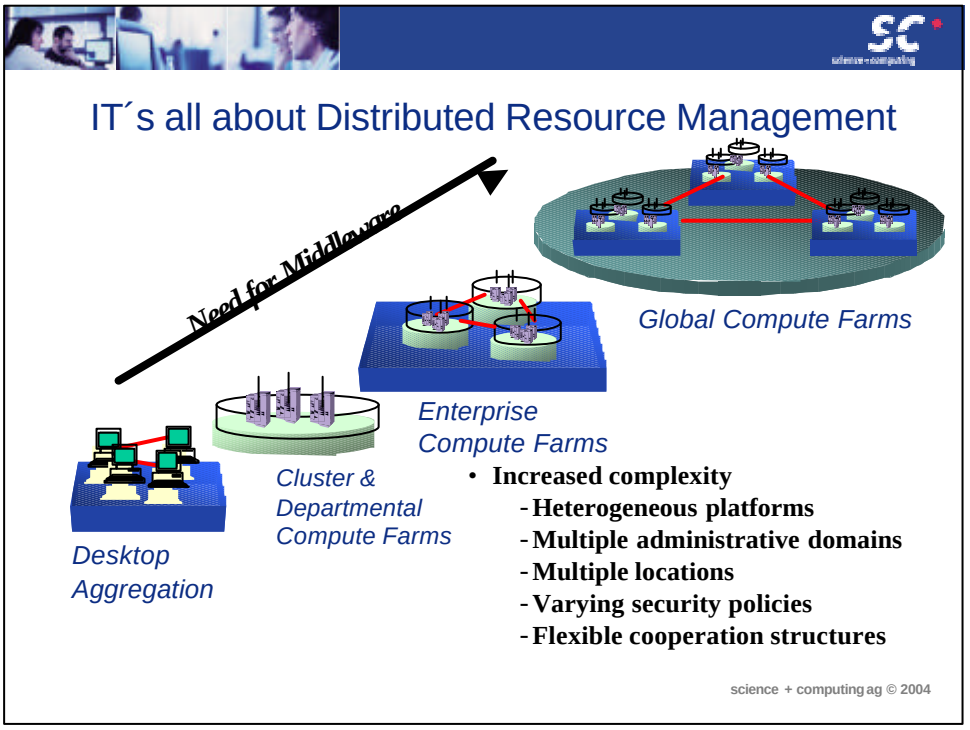
An educated guess

Most of our customers do not want to operate Compute Farms ...

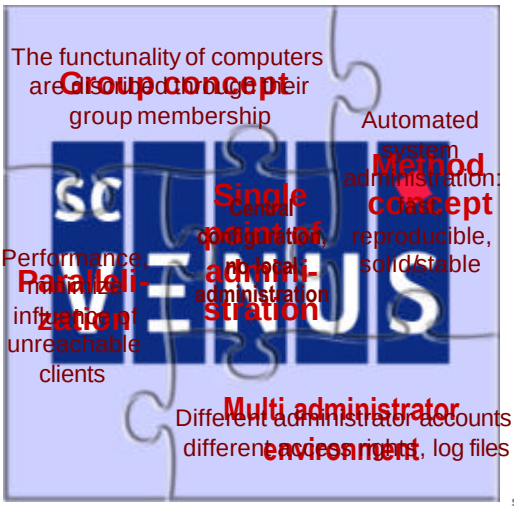
... they want solutions for their simulation problems



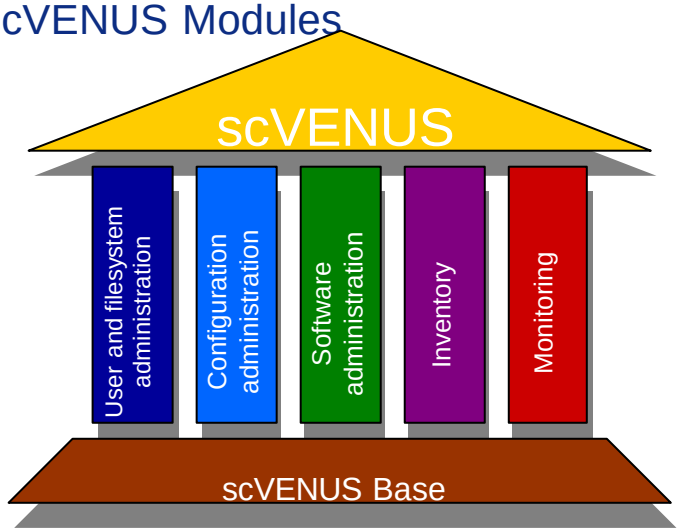




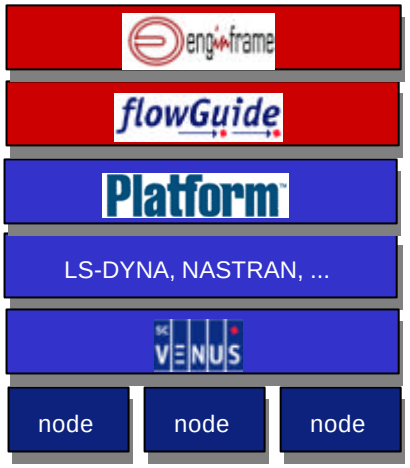
The Administration with scVENUS



scVENUS Modules



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

Integration and Job Flow - I

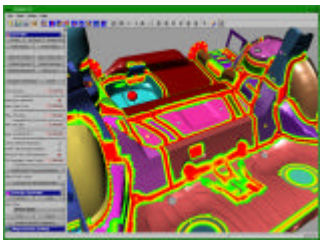
System Environment

Compute Farm

WS ...

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

scFEMod

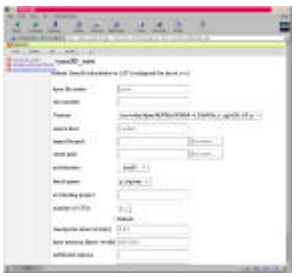


Integration and Job Flow - II

System Environment

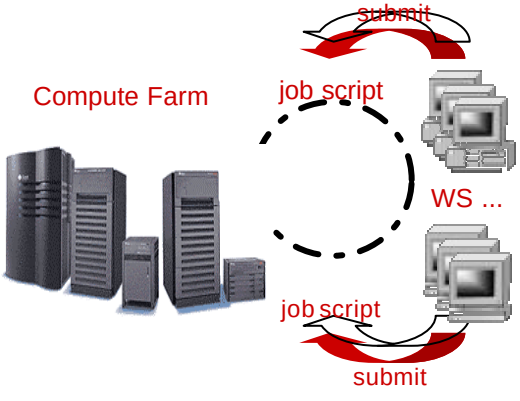
Compute Farm

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



Integration and Job Flow - III

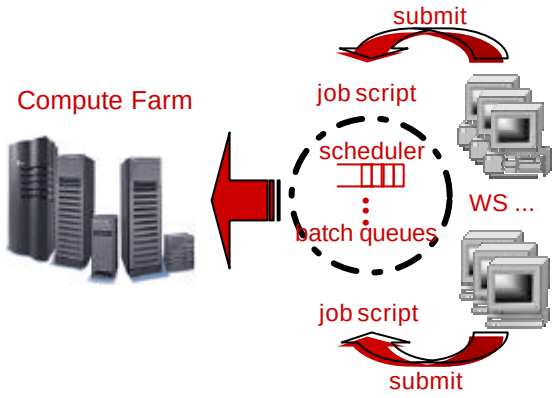
System Environment



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

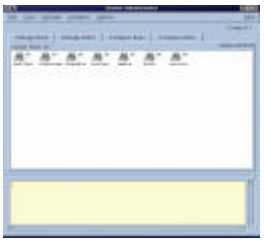
Integration and Job Flow - IV

System Environment



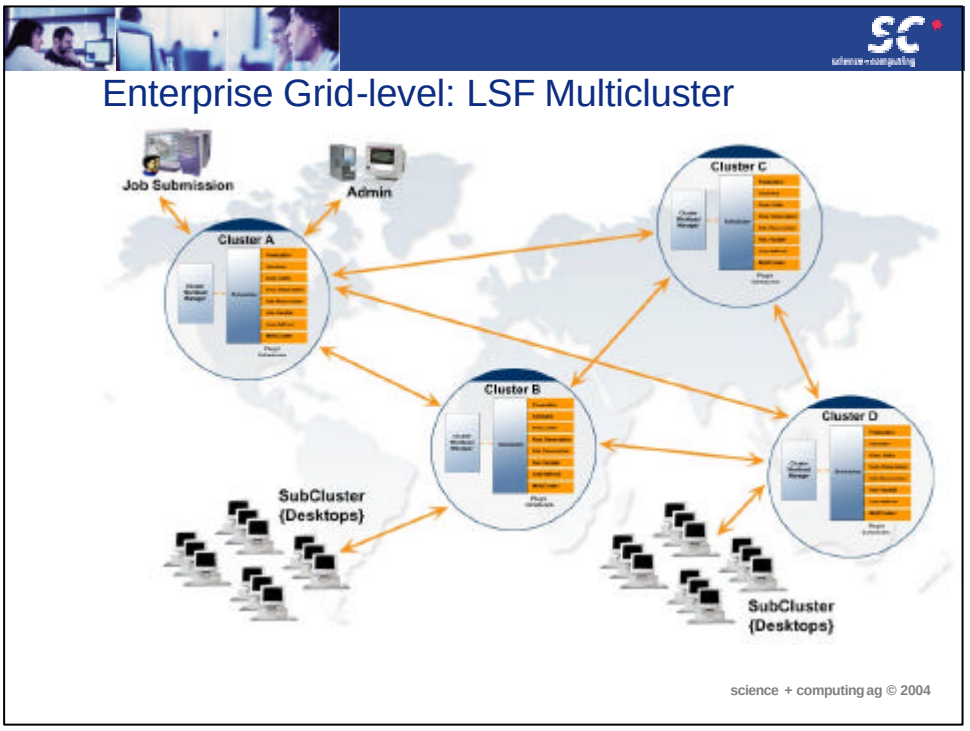
Optimal distribution of batch jobs depending on system requirements

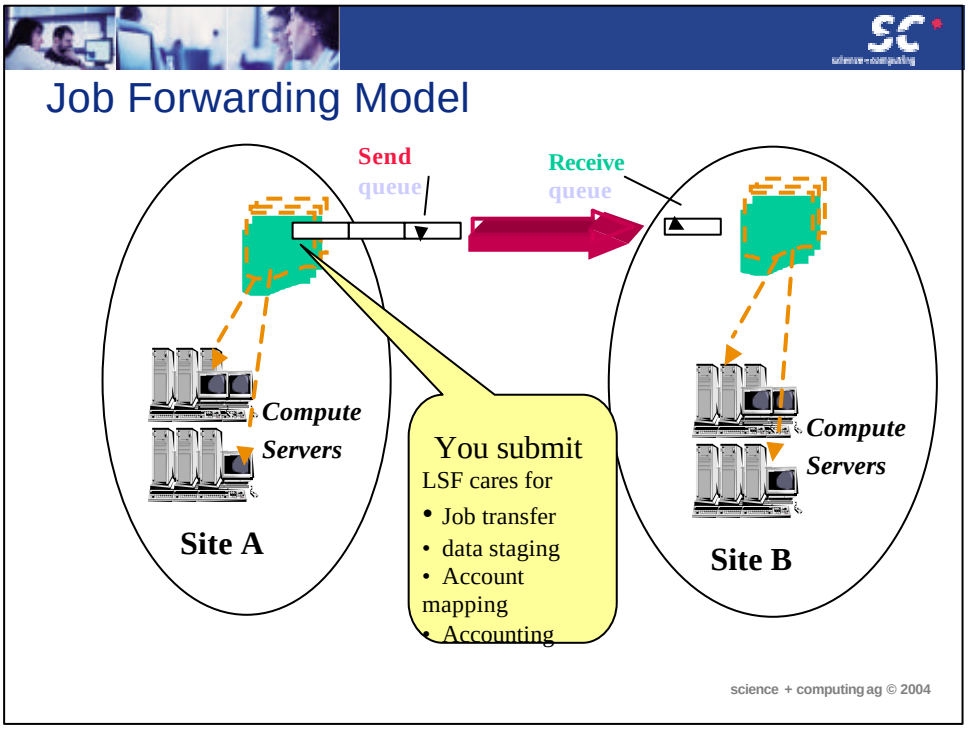
Platform



LSF Parallel:
- Control for MPP Jobs
- Proper Accounting

The Platform LSF Family of Products

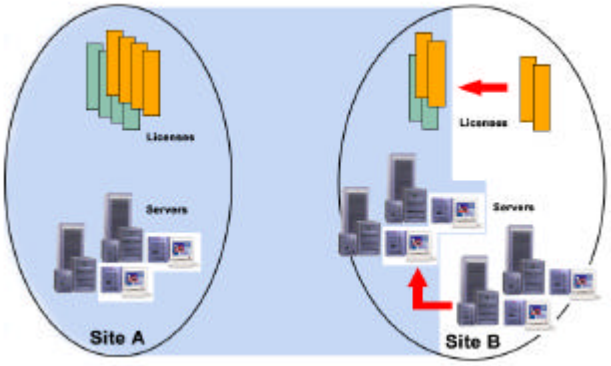




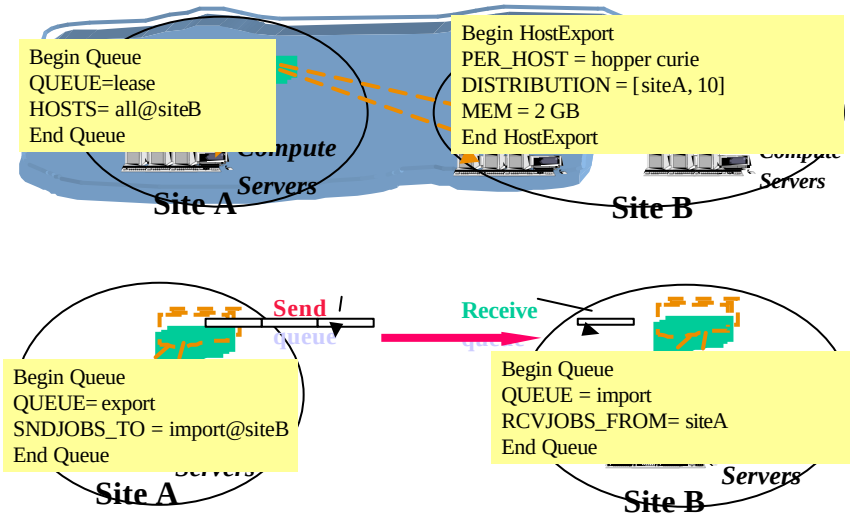
Resource Leasing Model

Single system image, ease of admin, scalability

Enable fairshare, preemption, pending reason support, chunk jobs, advance reservation, interactive jobs, parallel jobs, … across clusters

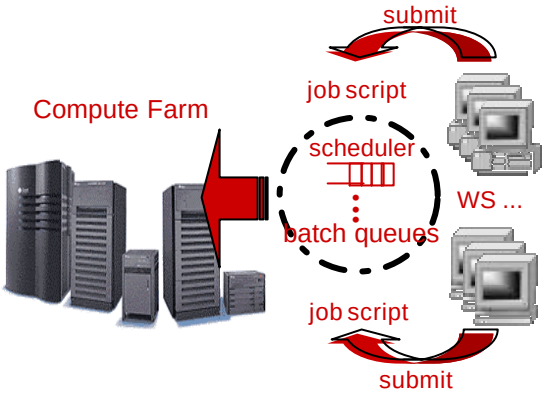


Easy to Configure



Integration and Job Flow - V

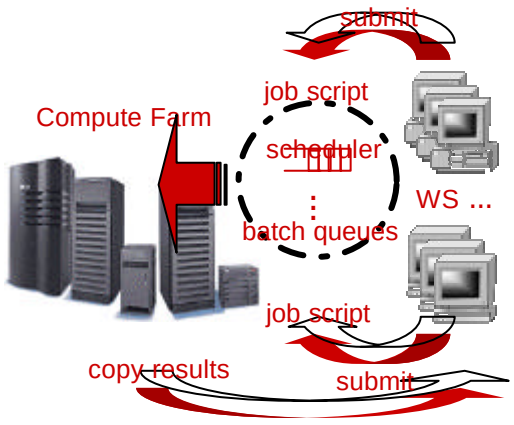
System Environment



Calculation of the batch job in local working directories on the Compute Farm

Integration and Job Flow - VI

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

- Simple and comfortable to use solution for CAE engineers (Compute Power out of the Box)
- Support of heterogeneous environment (Linux, Unix, Windows)
- Flexible configuration due to modular software layers: Easy to administrate with scVENUS
- Efficient distributed resource management with Platform LSF
- Comfortable user oriented workflows with flowGuide
- Portal Solutions with EnginFrame