ENEA-GRID usage, examples and case studies

650 registered users

2 TB stored software/data out of 4 TB available in enea.it AFS cell

Examples and case studies

• Running FLUENT on ENEA GRID

• Support to department experimental research:
  • Biotechnology
  • Electron microscopy
  • Nuclear fusion research
A FLUENT case can be run from a dedicated GUI for submission

**LSF Options**
- `-o filename.%J` - output file
- `-w "done(idjob)"` - start after `idjob`
- `-u e-mail userid` - output by E-mail
- `-b begintime` - job start time

....
Monitoring job status by xlsbatch (LSF)

xlsbatch information
Jobid
Users
Job status
Queues
Submission host
Run host
Submission time
Submission command

Job status:
Monitoring host status by xlsmon (LSF)

Status of sp3-1 host using xlsmon utility

ENEA-GRID, ESA/ESRIN Workshop, Frascati 2/2/2005
3D CFD Simulation on Aircraft Axial Turbin Stage with Wake & Vortex Shedding Analysis on Turbine Blades [FLUENT]

Temperature contours on Stator blades & Cp experimental data comparison

Secondary flow prevision and 3D Path Lines analysis

Large Eddy Simulation (LES) provides high resonable results on wake analysis and turbine stage performance.

Mesh: 1 million cells
CPU Time: 6000 hours
Elapsed Time: 525 hours on 12 IBM SP3 platforms

Temperature & wakes interactions
CFD Analysis of a fluid dumper [FLUENT]

Mesh: 600,000 cells
CPU Time: 960 hours
Elapsed Time: 130 hours on 8 Linux platforms

Pressure losses

Vortex stagnation

Secondary flux

Primary Flux

Pressure jump (Pa)
velocity (m/s)

Caratteristica parabolica dello smorzatore con valvola aperta fino a 3 mm
FLUENT performance on different platforms in ENEA GRID

Scaling with #CPU & platform type

<table>
<thead>
<tr>
<th>Platform</th>
<th>#CPU</th>
<th>GHz</th>
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<tbody>
<tr>
<td>AIX</td>
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</table>

Cpu time normalized to the case: Sp4-1, 2 CPUs
ENEA GRID and experimental facilities

DNA Sequence system
(ABI Prism 3700)
Trisaia

DNA Sequence system
(ABI Prism 3700)
Trisaia

Electronic Microscope
(Brindisi)
300 Kev

Controlled Nuclear Fusion:
FTU
Frascati Tokamak Upgrade
Video Acquisition

WEB
ICA
SSH