



Identification of the installation/facility :

Country: Germany
 Location (city): Braunschweig
 Name of the facility: C²A²S²E2 Supercomputer
 Date of construction or of acquisition or of main refurbishment: 9/2013
 Owner: DLR / T-Systems SfR
 Contact point: Andreas Ernst (andreas.ernst@dlr.de)
 Internet site:
http://www.dlr.de/as/desktopdefault.aspx/tabid-4083/6455_read-9239/

Technical characteristics:

1 - Type of infrastructure

- Wind tunnel
- Propulsion bench
- Structures facility
- Material facility
- Simulator (ex. Flight simulator, tower, ...)
- Flight test bed (aircraft, embedded facilities, ...)
- Supercomputers
- Other

2 - Main technical characteristics

560 nodes

- SGI ICE X Gemini dual blades with directly warm water cooling
- 2 processor IvyBridge (Intel Xeon CPU E5-2695 v2 @ 2.40GHz) per node, 12 cores per processor, 24 cores per node (48 core with hyper-threading)
- 128 GB main memory per node

4 visualization nodes

- NVIDIA Quadro 6000 graphic adapter per node
- 256 GB main memory per node

2 nodes Intel Xeon Phi™

- 2 Intel Xeon Phi™ 5110 accelerator cards per node, 60 cores per accelerator card
- 64 GB main memory per node

4 login nodes

- 64 GB main memory per node

73 TB main memory in total

13.440 cores

Communication network

- Infiniband FDR, 40 Gbit/s bandwidth
- Fully non blocking

File system

- parallel file system (GPFS)
- 1,1 PB RAID 6

Operating system

- SuSE Enterprise Server

Workload Management

- Son of GridEngine (SGE)

Cluster Management



- SGI Management Center
- Linpack Performance**
- 245 Teraflops
- Rpeak**
- 258 Teraflops
- Energy consumption**
- 236 kWh
- Cooling**
- Directly warm water cooling
- PUE**
- 1,067

3 - *Research domains which can be addressed (refer to ACARE taxonomy <http://www.acare4europe.com/sites/acare4europe.org/files/document/ASD-Annex-final-211004-out-asd.pdf>)*

*Flight Physics
Integrated Design & Validation (methods & tools)*

4 - *Main (or specific) associated measurement techniques*

5 - *Operational status*
- Fully operational 365 day per year, 24 hours per day (8600 hours available in 2015)

6 - *Picture*



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Financial elements:

Replacement cost (M€uros)



- | | |
|---------------|-------------------------------------|
| Less than 10 | <input checked="" type="checkbox"/> |
| 10 to 30 | <input type="checkbox"/> |
| 30 to 60 | <input type="checkbox"/> |
| 60 to 100 | <input type="checkbox"/> |
| More than 100 | <input type="checkbox"/> |

Practices concerning:

Access policy (contract, voucher, free access for research, etc...) contract

Support (regional, national, European, private, ...)

Comments:

Origin of information ('signature'): author and date

Andreas Ernst, DLR
5 September 2016