

11th European Workshop on HPC Infrastructures

European HPC Infrastructure Workshop Sites



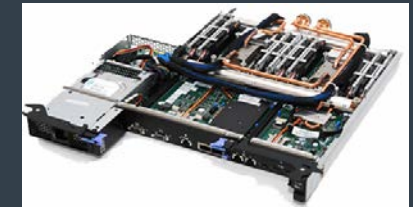
LRZ

A Pioneer of "Direct Warm Water Cooling"



Up to 50°C Hot Water Cooling

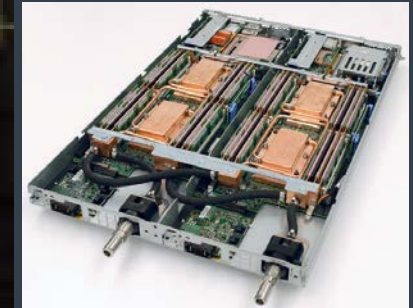
LRZ procurement requirement: 97% Heat Removal Efficiency!



2012



2014



2018



Pioneer in Hot Water Cooling and Reuse of Waste Heat



2011

CoolMUC-1

Megware

178 nodes, 22.7 Tflop/s, 40kW

SorTech ACS08, 6kW

45 - 47 C year round

2015

CoolMUC-2

Lenovo

384 nodes, 466 TFlop/s, 130kW

SorTech eCoo, 60kW

45 - 47 C year round

2017

CoolMUC-3

Megware

148 nodes, 394 TFlop/s, 60kW

40 C summer / 30 C winter



2012

SuperMUC Phase 1

IBM

9,216 nodes, 3.2 PFlop/s, 2.3MW

40 C summer / 30 C winter

2015

SuperMUC Phase 2

Lenovo

3,072 nodes, 3.6 PFlop/s, 1.1MW

40 C summer / 30 C winter

2018

SuperMUC-NG

Intel/Lenovo

6,480 nodes, 26.9 PFlop/s, 2.8MW

Fahrenheit Zeo M, 600kW

47 C w/adsorption chillers

LRZ "SuperMUC-NG"

Top500 (November 2018): #8

Lenovo Intel (2018)

311,040 cores Intel Xeon Skylake

26.9 PetaFlops Peak

19.5 PetaFlops Linpack*

719 TeraByte Main Memory

70 PetaByte Disk

