EURO

EuroCC-Austria

EuroCC

Mission:
Set up 33 National Competence Centres (NCCs)

In the fields:

- High-Performance Computing (HPC)
- High-Performance Data Analytics (HPDA)
- Artificial Intelligence (AI)

Participating countries (33)
Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Montenegro, Netherlands, North Macedonia, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom

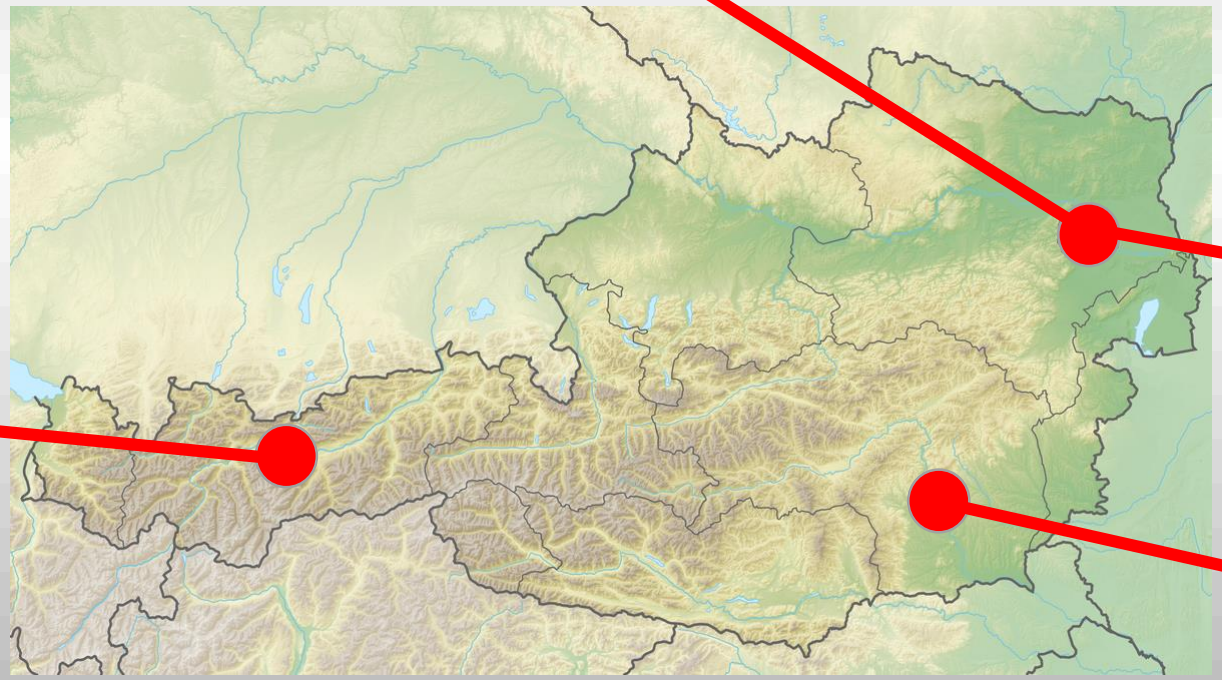
Supported by **CASTIEL** (Coordination and Support Action)

Structure of NCC Austria

EURO

VIENNA SCIENTIFIC CLUSTER

universität wien (lead)



TU WIEN

BOKU

INiTS

universität innsbruck

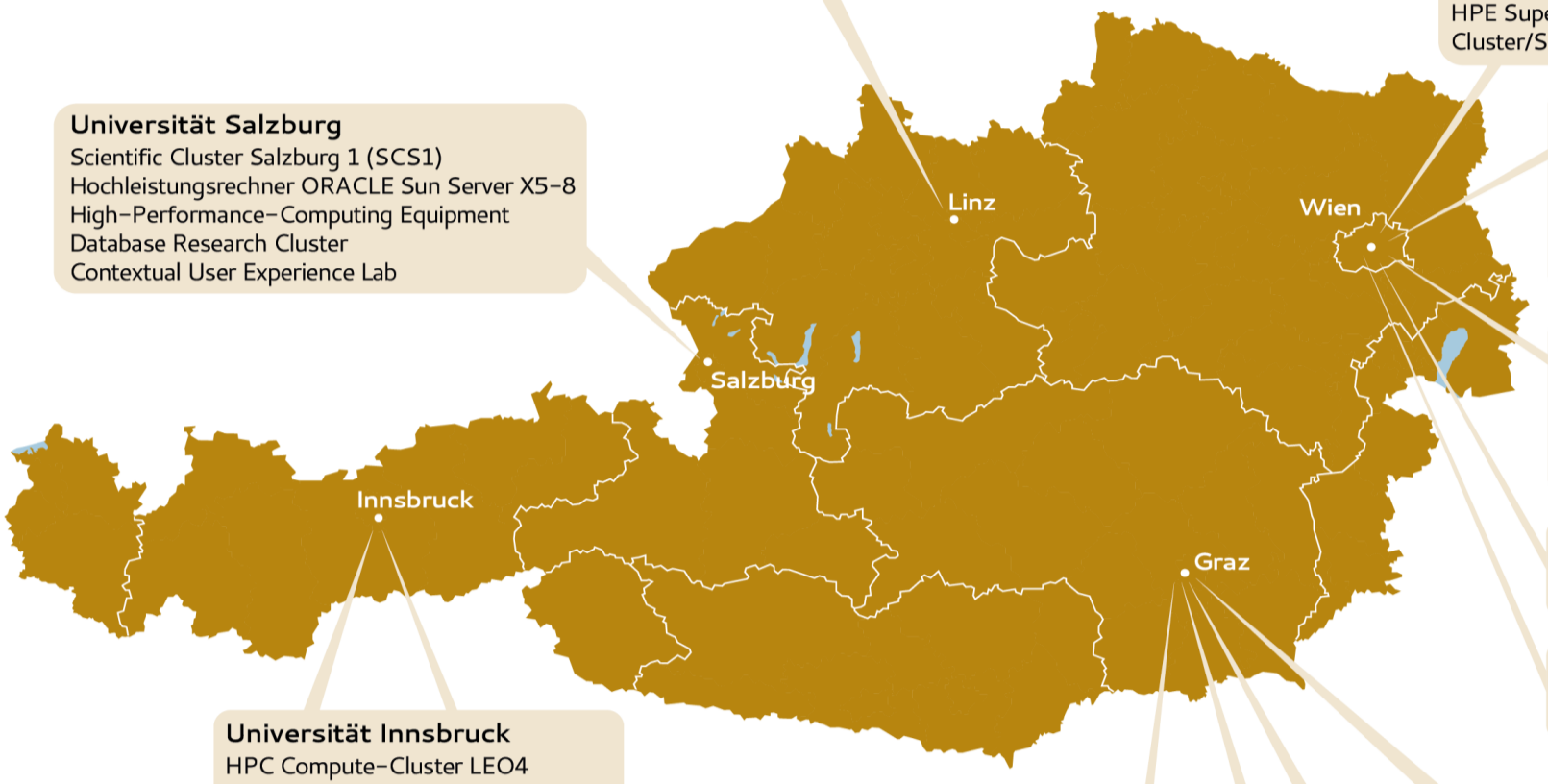
TU Graz

Servicekatalog

EURO

- Vernetzung mit Experten und HPC/Big Data/KI-Anbietern
- Training und Schulungen
- Zugang zu Software und Rechenzeit auf Hochleistungsrechnern
- Begleitung bei der Umsetzung Ihrer Projekte
- Unterstützung bei öffentlichem Förderwesen

Mapping



JKU – Johannes Kepler Universität Linz
Zentraler ACSC Compute Server @ JKU Linz
In-Memory Supercomputer MACH-2 (SGI UV3000)

Universität Wien
Nvidia® DGX-1™ Deep Learning System, FluiDyna
Life Science Compute Cluster, Econocom
HPE Superdome Flex Server
Cluster/SuperServer 2027GR-TRF mit Xeon Phi und Nvidia Tesla

Universität Salzburg
Scientific Cluster Salzburg 1 (SCS1)
Hochleistungsrechner ORACLE Sun Server X5-8
High-Performance-Computing Equipment
Database Research Cluster
Contextual User Experience Lab

Technische Universität Wien
Vienna Scientific Cluster 4 (VSC-4)
Vienna Scientific Cluster 3 (VSC-3)
Klinischer micro CT (Scanco XCT)
HPC-Rechencluster
GEOCLIM Server
EODC Infrastruktur

ZAMG Zentralanstalt für Meteorologie und Geodynamik
Supercomputer (HPC ICE-XA)
NEC HPC AURORA
IT Großrechner HPC ICE-X
CRAY HPC

CCCA – Climate Change Centre Austria – Datenzentrum
CCCA Datenzentrum

ACR – Austrian Cooperative Research
IBS – Simulationsrechner für die Entwicklung virtueller Prototypen

Universität Innsbruck
HPC Compute-Cluster LEO4
HPC Compute-Cluster Leo3 + Leo3e
Hochleistungs-GPU-Server

Medizinische Universität Innsbruck
Serverausstattung Bioinformatik
HPC Apollo 6000 System

Universität Graz
Server-Infrastruktur für Integriertes Datenmanagement

Medizinische Universität Graz
MedBioNode

Technische Universität Graz
Visualisierung von 3D Daten
HPC in progress

Fraunhofer Austria Research GmbH
Fraunhofer Austria – Visual Computing

Forschungs*infrastruktur*
Datenbank

https://forschungsinfrastruktur.bmbwf.gv.at

https://forschungsinfrastruktur.bmbwf.gv.at/de/institution/austrian-centre-of-industrial-biotechnology-acib_79?reset=1

EURO AUSTRIA

DIGITAL TWINS merge the real and the digital world unlocking various value streams

OFFLINE DIGITAL TWIN
model-based systems engineering

- scales with engineers/experts

VIRTUAL ◀▶ REAL

ONLINE DIGITAL TWIN
realtime performance twin

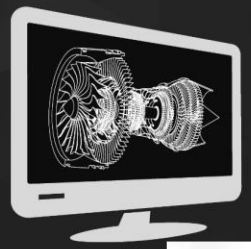
- scales with usage and products

MODEL / DESIGN IMPROVEMENT

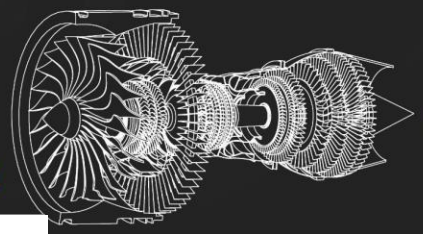
validate

improve & control

Intelligence-in-the-loop



SIMULAT
OPTIMIZ
TOOLS

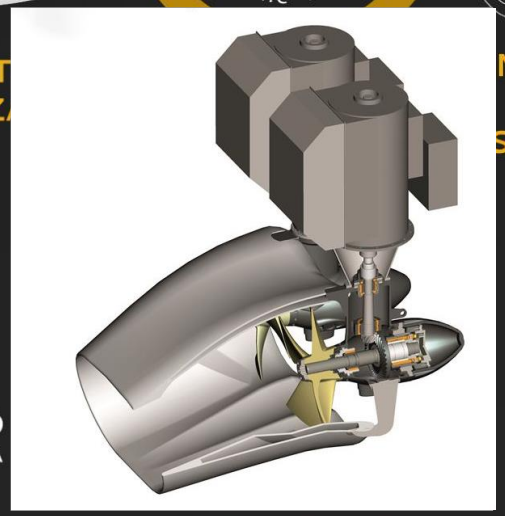


MODEL OF ASSET & SOFTWARE

RE
AS

Intelligence-in-the-loop

CONTROL & SOFTWARE



MODEL ACCELERATION

Desktop & HPC | EDGE & Cloud

Real time performance monitoring in complex machine parks

Time series analysis in the energy sector

…

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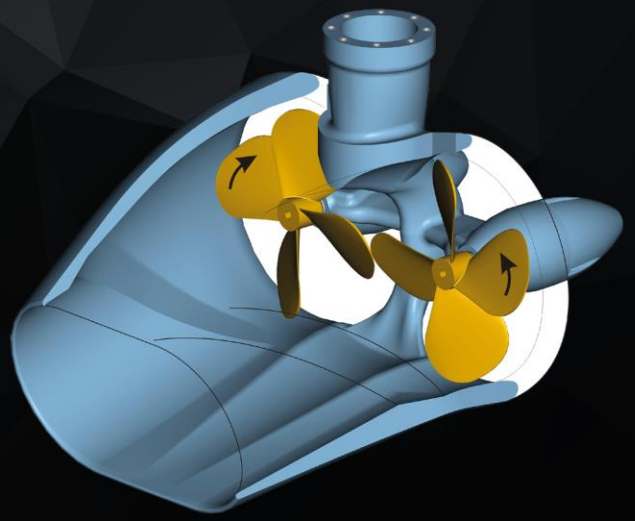
Reintrieb

Innovative marine propulsion system developed by Austrian cleantech company goes into next phase of development



- Efficient inland waterway propulsion that enables ships to navigate at lower water levels caused by climate change
- At least the same amount of thrust while reducing the ship's draught by 25% due to the innovative design based on two propellers
- No loss of loading capacity and less downtime due to low water levels thanks to the optimised side-by-side propulsion system

Support by SHAPE, Vienna Scientific Cluster (VSC) and EuroCC Austria

- Funding to model and optimise the side-by-side prototype by SHAPE
- Complex Computational Fluid Dynamics (CFD) simulations will be done at the Vienna Scientific Cluster (VSC)
- Reintrieb gets access to the supercomputer VSC-4 and help from HPC and CFD experts of the VSC Research Center at TU Wien

REINTRIEB
AMBIENT WATER TRANSMISSIONS

PRACE SHAPE
SME HPC Adoption Programme in Europe

VIENNA SCIENTIFIC CLUSTER

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SUCCESS STORY

TAILSIT – tailored simulation tools

TAILSIT

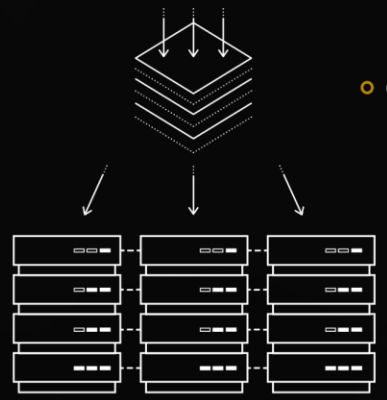
- developer of simulation software for problems in electromagnetics, acoustics, structural analysis and heat conduction

- single CPU, shared memory

EuroCC@Austria

with the SHAPE program

- allocation of exclusive computing time within the high performance computing (HPC) infrastructure of the Vienna Scientific Cluster
- parallelization of the code via message passing interface (MPI)
- transition from shared memory to distributed memory



- distributed memory – parallelization

ADVANTAGES

- reduction of computing time
- increase in software efficiency
- improved competitive advantages by reduced time to market
- adaption of software to costumers' needs

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PRACE

VSC VIENNA SCIENTIFIC CLUSTER

TAILSIT tailored simulation tools

This project has received funding from the European High-Performance Computing Joint Undertaking (JU) under grant agreement No 951732. The JU receives support from the European Union's Horizon 2020 research and innovation programme and Germany, Bulgaria, Austria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Ireland, Italy, Lithuania, Latvia, Poland, Portugal, Romania, Slovenia, Spain, Sweden, United Kingdom, France, Netherlands, Belgium, Luxembourg, Slovakia, Norway, Switzerland, Turkey, Republic of North Macedonia, Iceland, Montenegro