NACAD:
The High-Performance Computing Center at COPPE/UFRJ

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High-Performance Computing Center
COPPE/Federal University of Rio de Janeiro
www.nacad.ufrj.br

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- The High-Performance Computing Center at COPPE
- COPPE's New Computer: HPE/SGI ICE X Lobo Carneiro
- Timeline: Apps evolving with computers or computers evolving to fit apps?
- What we are doing
- International Collaboration and Partners

NACAD´s Mission

- High-Performance Computing in Engineering and Computational Science – Interdisciplinary area with Major in HPC since 1988
- To provide and operate an advanced HPC infrastructure
- To develop and support relevant multidisciplinary R & D projects, especially in:
  - Energy: Oil and Gas, Electric, alternative sources
  - Civil, Mechanical and Materials Engineering
  - Environment, Meteorology, and Oceanography
  - Computing and Data Science
  - Search Based Software Engineering
  - Biological Sciences

NACAD's Computer Timeline

Computers

Year

1988 | 1990 | 1995 | 1999 | 2005 | 2010

COPPE NCP I

Intel iP

640Mflops, 8 procs

1st Supercomputer built in Brazil

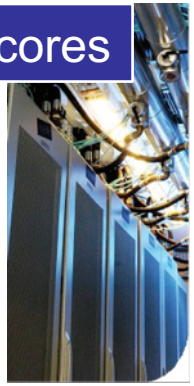
COPPE's new computer:
HPE/SGI ICE X Lobo Carneiro

1st Brazilian supercomputer vendor

SGI Altix ICE

Sun Galileu

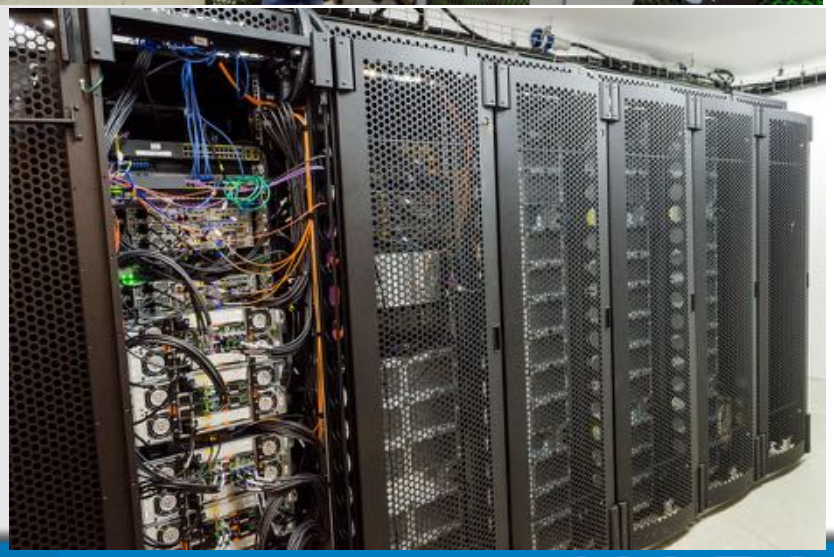
65Tflops, 7K cores



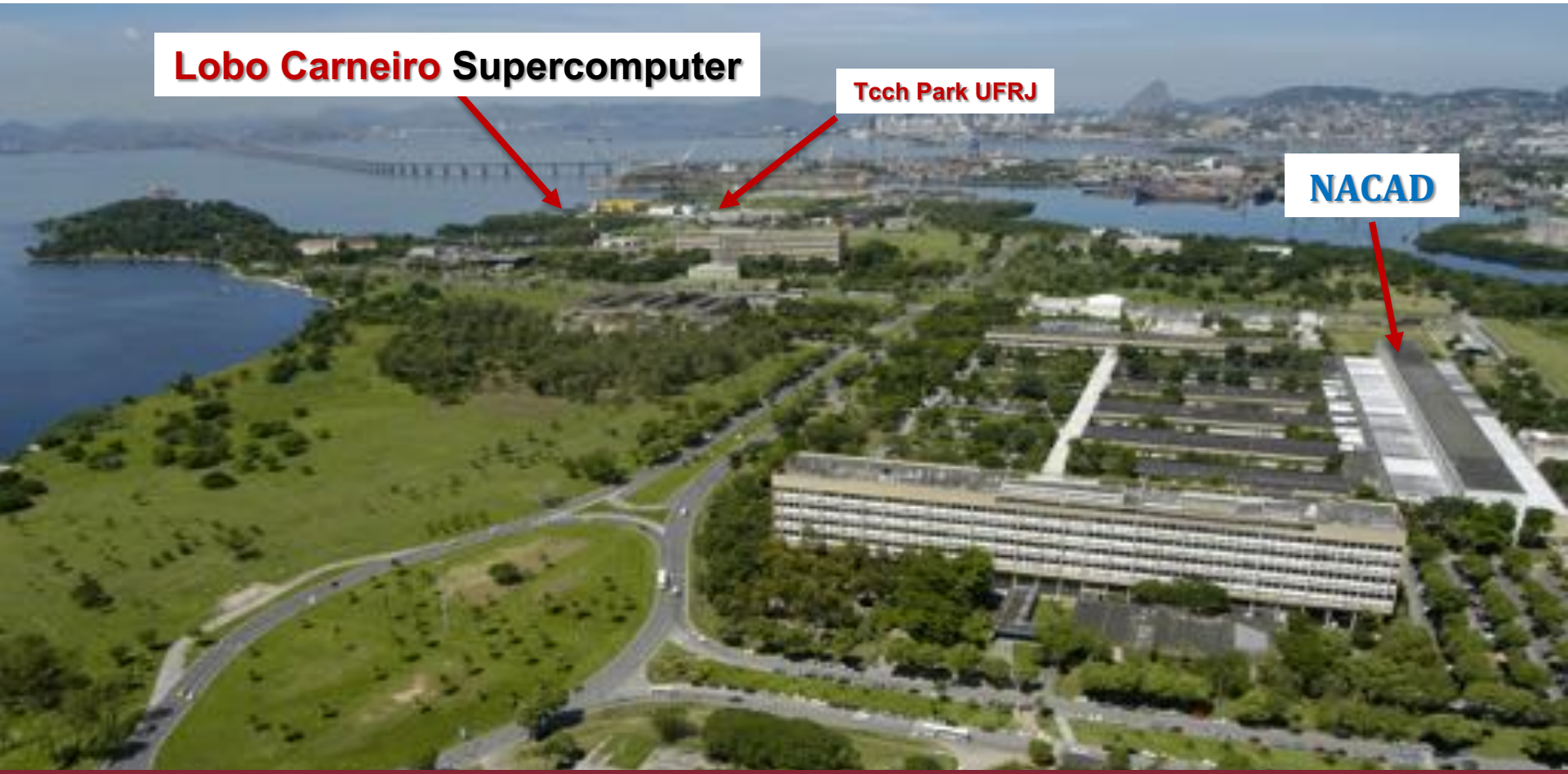
Galileu
Rede Temática em Computação Científica e Visualização

COPPE's New Computer: HPE/SGI ICE X Lobo Carneiro

- Peak performance of 226 TFlops
- Three SGI Infinite Storage IS5600 support 720 Terabytes at 17GB/s in an Intel® Parallel Storage Luster Filesystem. It is the equivalent to 150,000 DVDs or 14,000 Blu-ray Discs.
- The system includes 504 Intel® Xeon® E5-2670 v3 12-Cores 2.3GHz processors with 16 Terabytes of memory across 253 compute nodes.
- An increase up to 2x increase in processing power with an energy reduction 3x

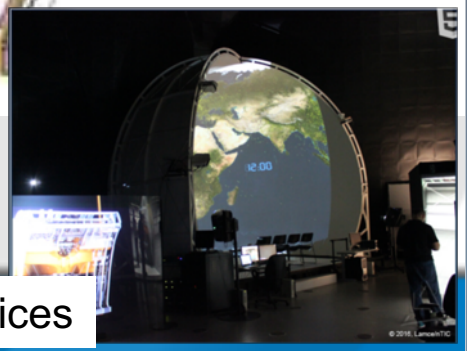


COPPE
Instituto Alberto Luiz Coimbra de Pós-Graduação e Pesquisa de Engenharia
UFRJ

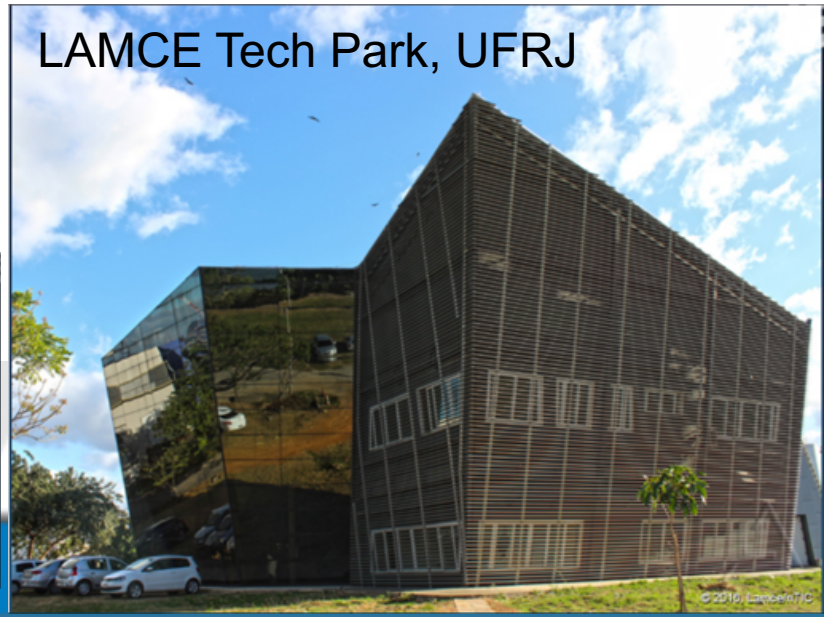


Further information at:
www.nacad.ufrj.br

Floor Plan: Lobo Carneiro at LAMCE

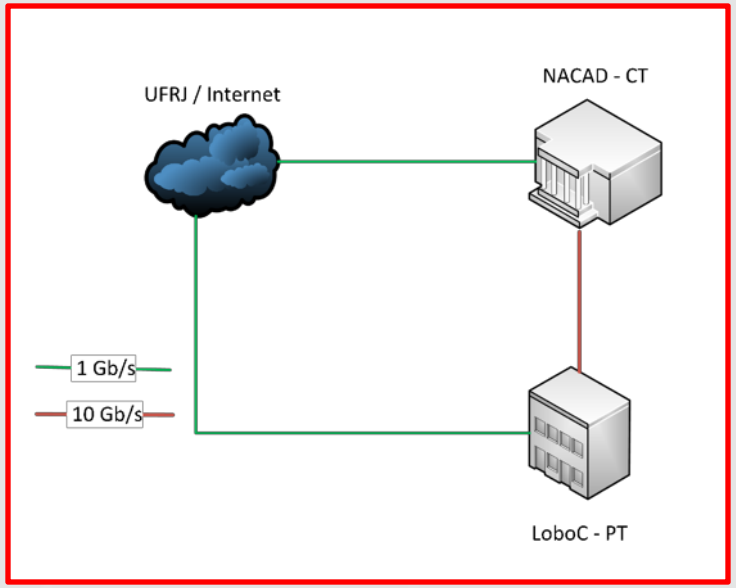


Cave and other 3D viz devices

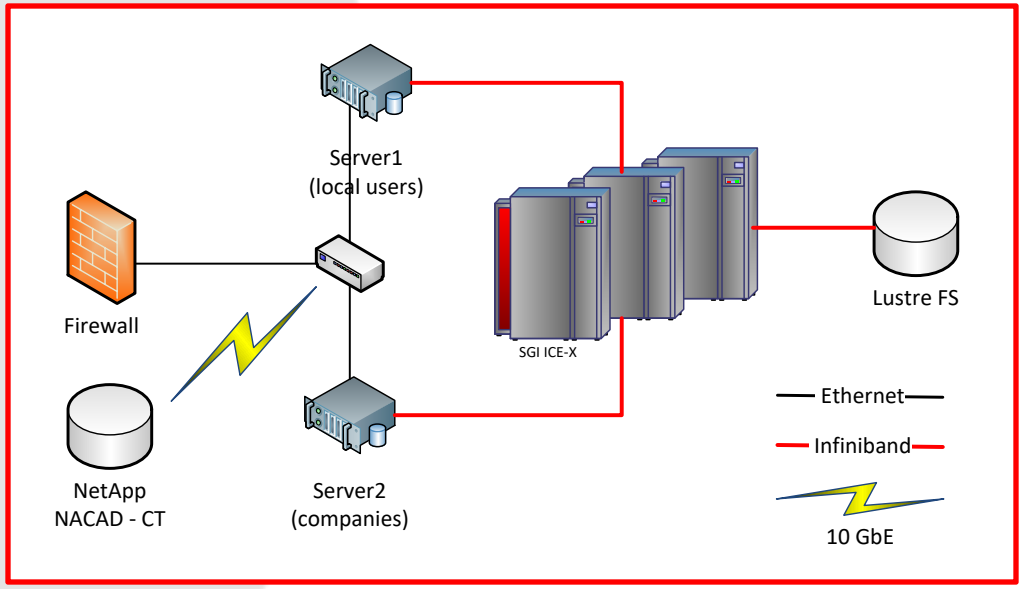


Lobo Carneiro Connectivity

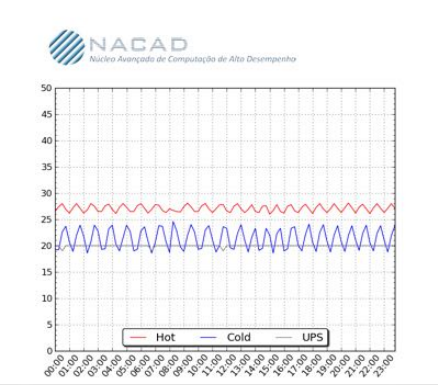
Links

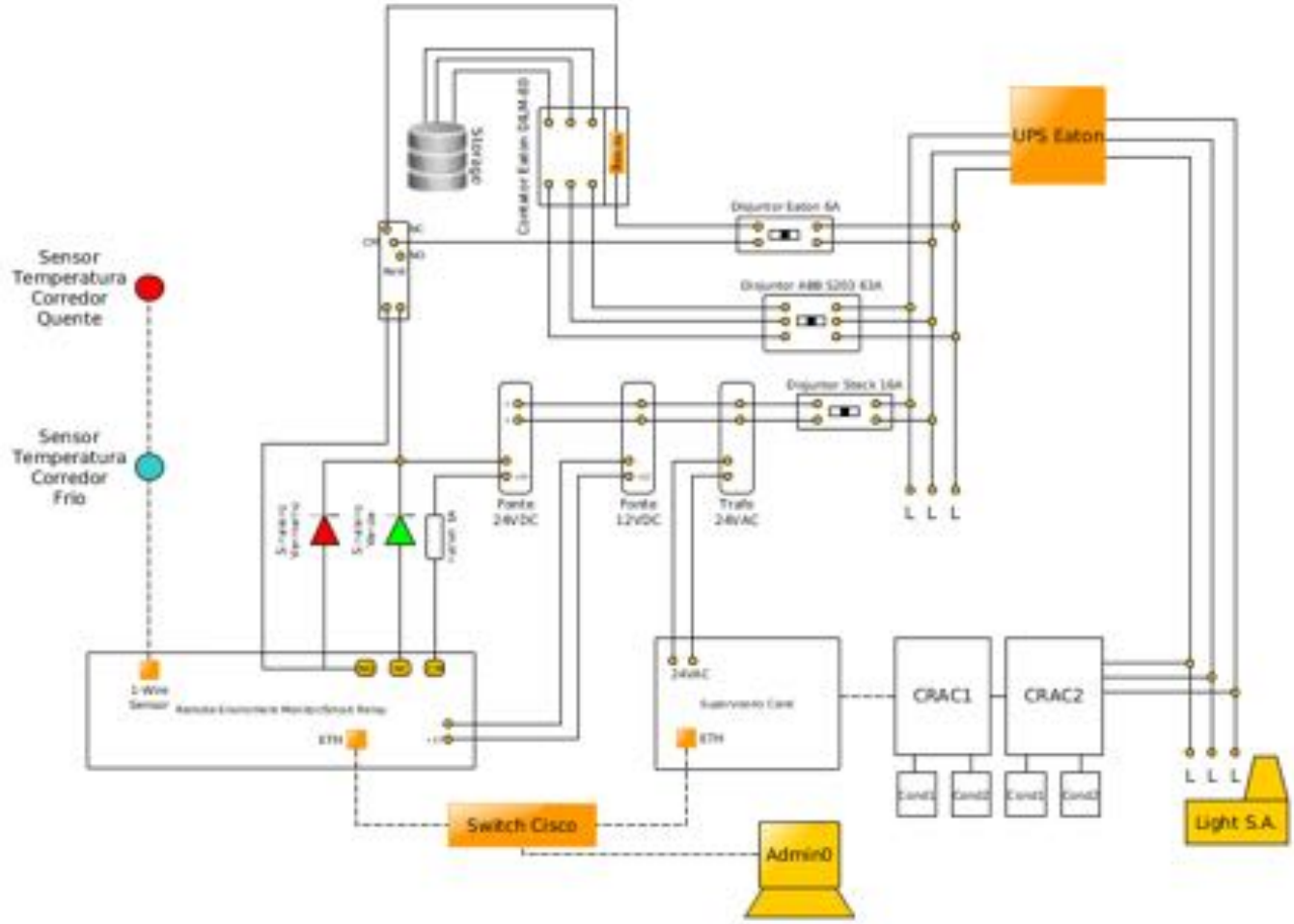


LoboC - PT



Automation Systems

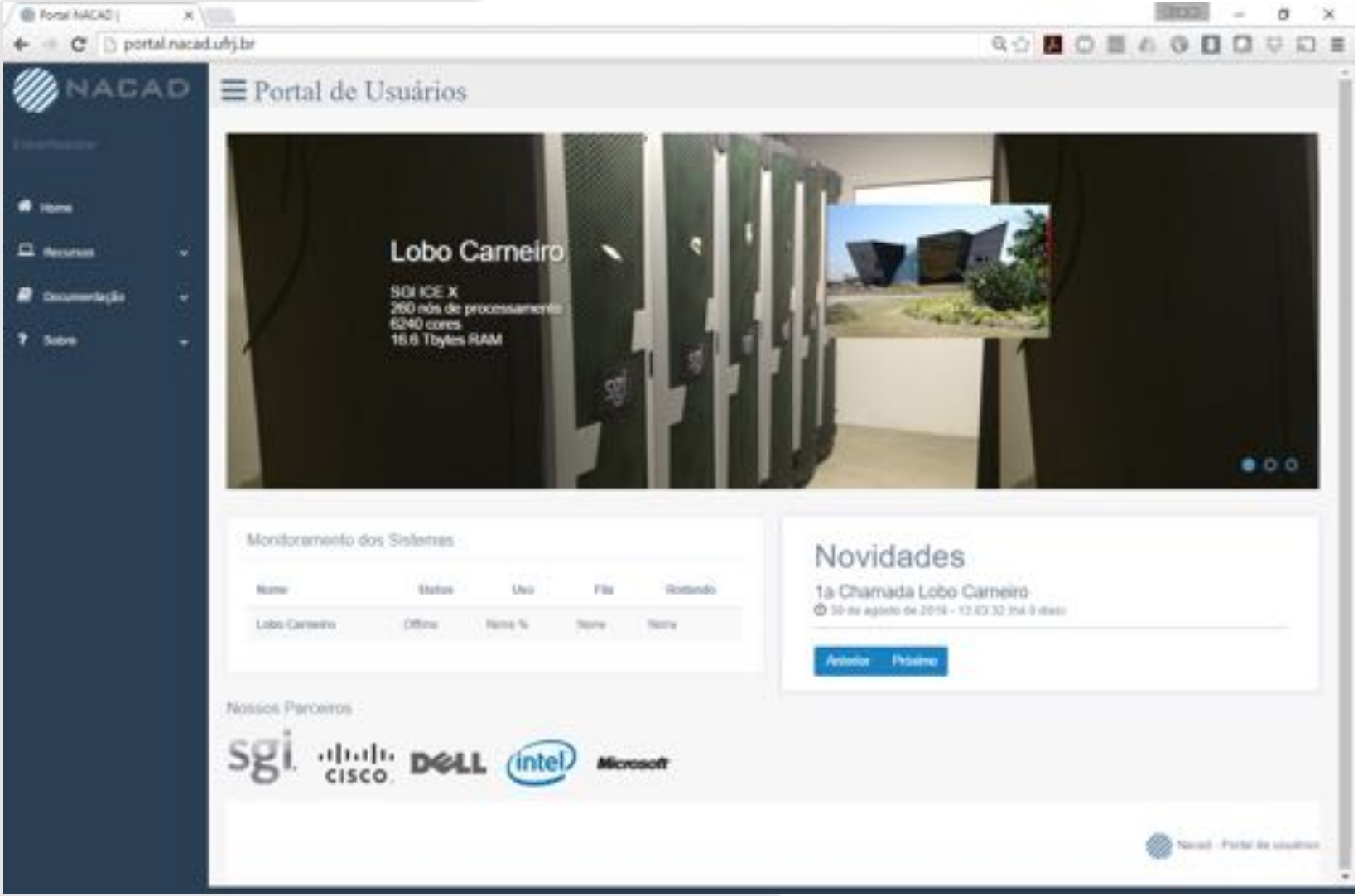




LoboC – Security Basics

- **Firewall**
- **IDS/IPS**
  - Network Intrusion Detection & Prevention System: NYI (Not Yet Implemented)
- **Multi-Factor Authentication (MFA)**
- **Lockout policy**
- **Patches**
- **Logs**
- **Scan systems – from inside and out**
- **Staff Development**

NACAD's User Portal



Projects at Lobo Carneiro

- **CFPs**
  - October 2016
  - Joint call with LNCC – 2017
  - On demand since 2017
- **Projects approved**
  - 2016 – 27; 2017 – 28; 2018 - 15
- **Type of projects**
  - Academic: 62
  - Institutional/Commercial: 8
  - 213 active users
  - 195,000 jobs

NACAD
Núcleo Avançado de Computação de Alto Desempenho

COPPE UFRJ
Cidade Universitária - Centro de Tecnologia - Bloco I, Sala I-248
Ilha do Fundão, Rio de Janeiro, RJ

POR FAVOR, NÃO PREENCHER ESTE CAMPO
Proposta Número

ATENÇÃO: antes de preencher este formulário, leia atentamente em http://www.nacad.ufrj.br a Política de Uso dos Sistemas de Computação de Alto Desempenho do NACAD, bem como as características técnicas dos equipamentos, inclusive do supercomputador Lobo Carneiro.

FORMULÁRIO DE PROPOSTA DE USO DO SUPERCOMPUTADOR LOBO CARNEIRO (LOBOC)

DADOS DO PROJETO

Título
Multiscale geophysics: numerical observation of transition from wave propagation to diffusion in realistic topographies

Áreas de Pesquisa: listar de 3 a 6 áreas de pesquisa, em ordem alfabética
Civil Engineering, Elastic wave propagation, Geophysics, Random Media, Seismic Engineering

DADOS DO PROPONENTE (COORDENADOR DO PROJETO)

Nome
Régis COTTEREAU

Instituição
CNRS - CentraleSupélec

Departamento/Programa
Laboratoire de Mécanique des Sols Structures et Matériaux

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Endereço do CV Lattes (formato http://lattes.cnpq.br/xxxxxxxxxxxxxx)
http://lattes.cnpq.br/0925619578751506

Endereço de correspondência

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Número:	grande voie des vignes
Complemento:	F-92295 CHATENAY-MALABRY CEDEX
CEP:	France
Caixa Postal:	
Bairro:	
Cidade:	
UF:	

SELECIONE UM TIPO DE USO

○ ACADÊMICO ○ INDUSTRIAL ○ INSTITUCIONAL

Página 1

Academic Excellence

2018 ACM-IEEE CS George Michael Memorial HPC Fellowships

Linda Gesenhues (Federal University of Rio de Janeiro)

NACAD's Industrial Partners

NACAD's Main Academic Partners

ICES

TACC

Laboratório Nacional de Computação Científica

informatiques mathématiques Inria

BSC

.inf INSTITUTO DE INFORMÁTICA UFRGS

LAMCE PEC UFRJ COPPE

LASPOT
Programa de Engenharia Eletrica
COPPE / UFRJ

CentraleSupélec

VIRTUS IMPAVIDA UFPE

ntt | Núcleo de Transferência de Tecnologia

ITA

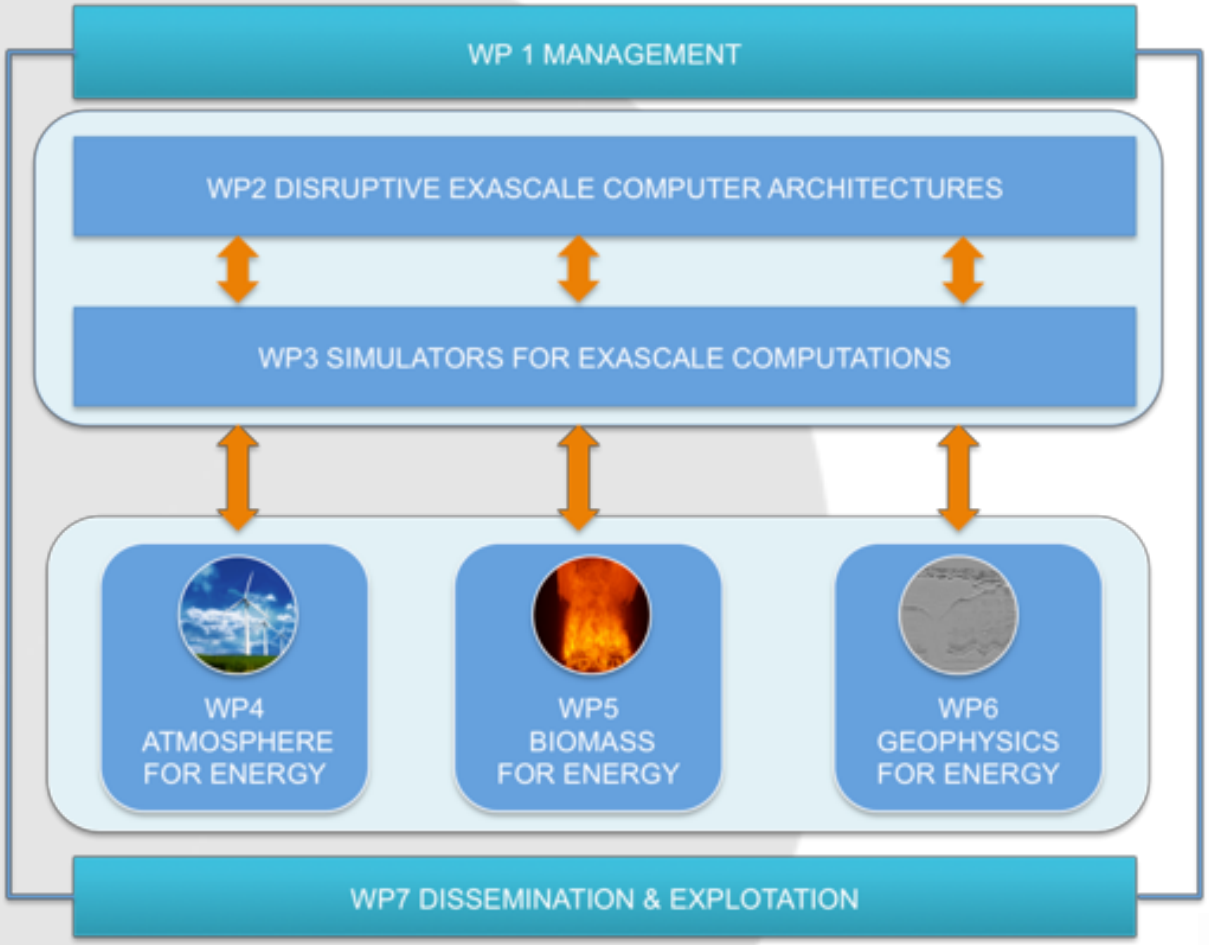
External Projects

PETROBRAS

HPC4e

ESSS ANSYS

RStor

ESSS and NACAD – UFRJ establishes a partnership to make the access to supercomputer available to academia and industry…
https://www.esss.co/blog/esss-e-nacad-ufrj-firmam-parceria-para-disponibilizar-acesso-ao-supercomputador-do-laboratorio/

HPC4E High Performance Computing for Energy 2016-2018