



# Wrocław University of Technology

WCNS (WCSS) - CGW  
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Wrocław Centre for Networking and Supercomputing



# Mission

We are a part of Wrocław University of Technology.

WCNS was founded in 1995.

Main tasks:

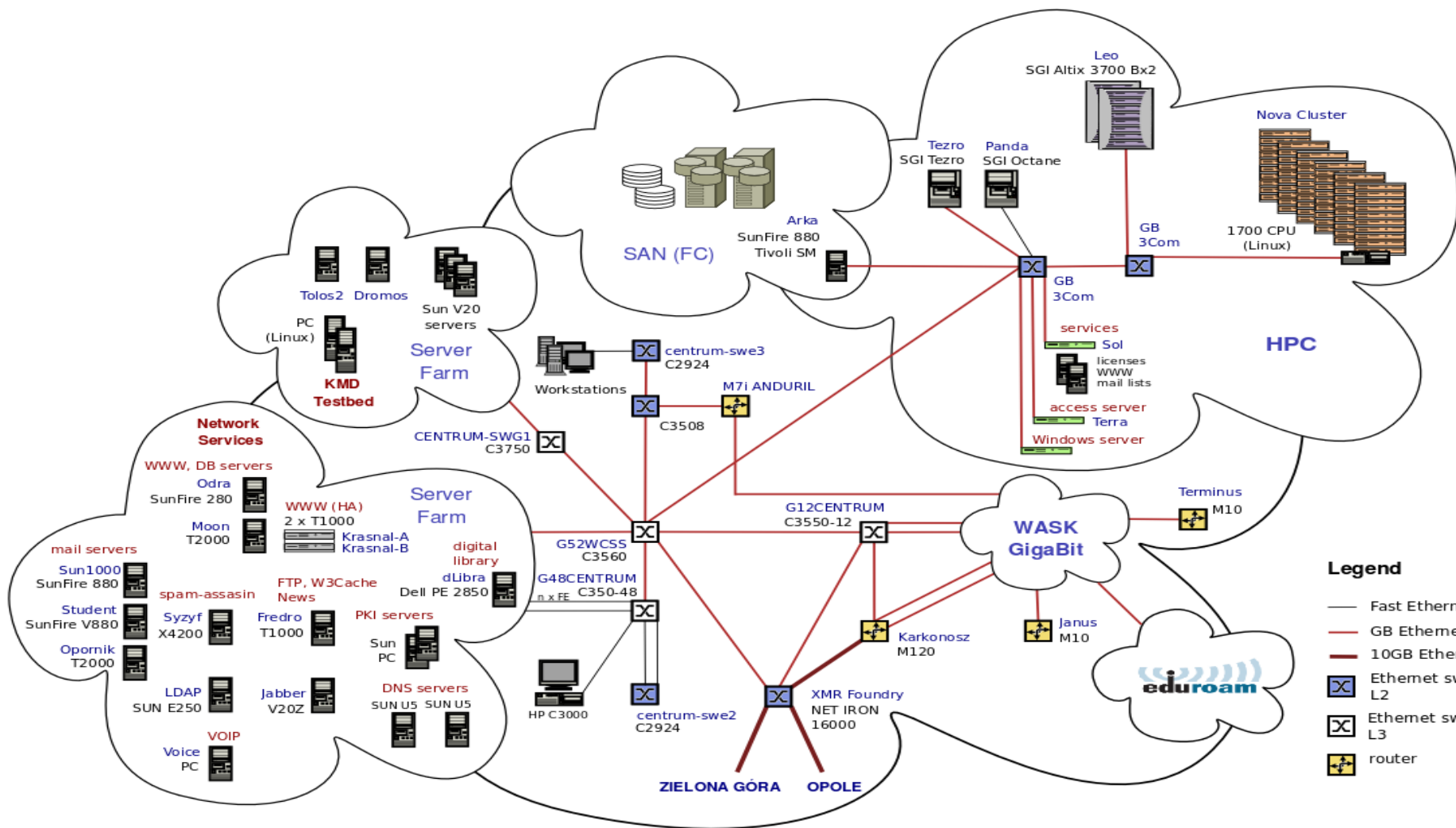
Wrocław Academic Computer Network  
(WASK)

High performance computing services

Network information services for all  
academic institutions in city of Wrocław



# WCNS resources





# The WASK network

1993 - FDDI loop – all main networks of academic institutions in Wrocław

1995 - ATM backbone – OC3/OC12 virtual networks and multimedia broadcasting

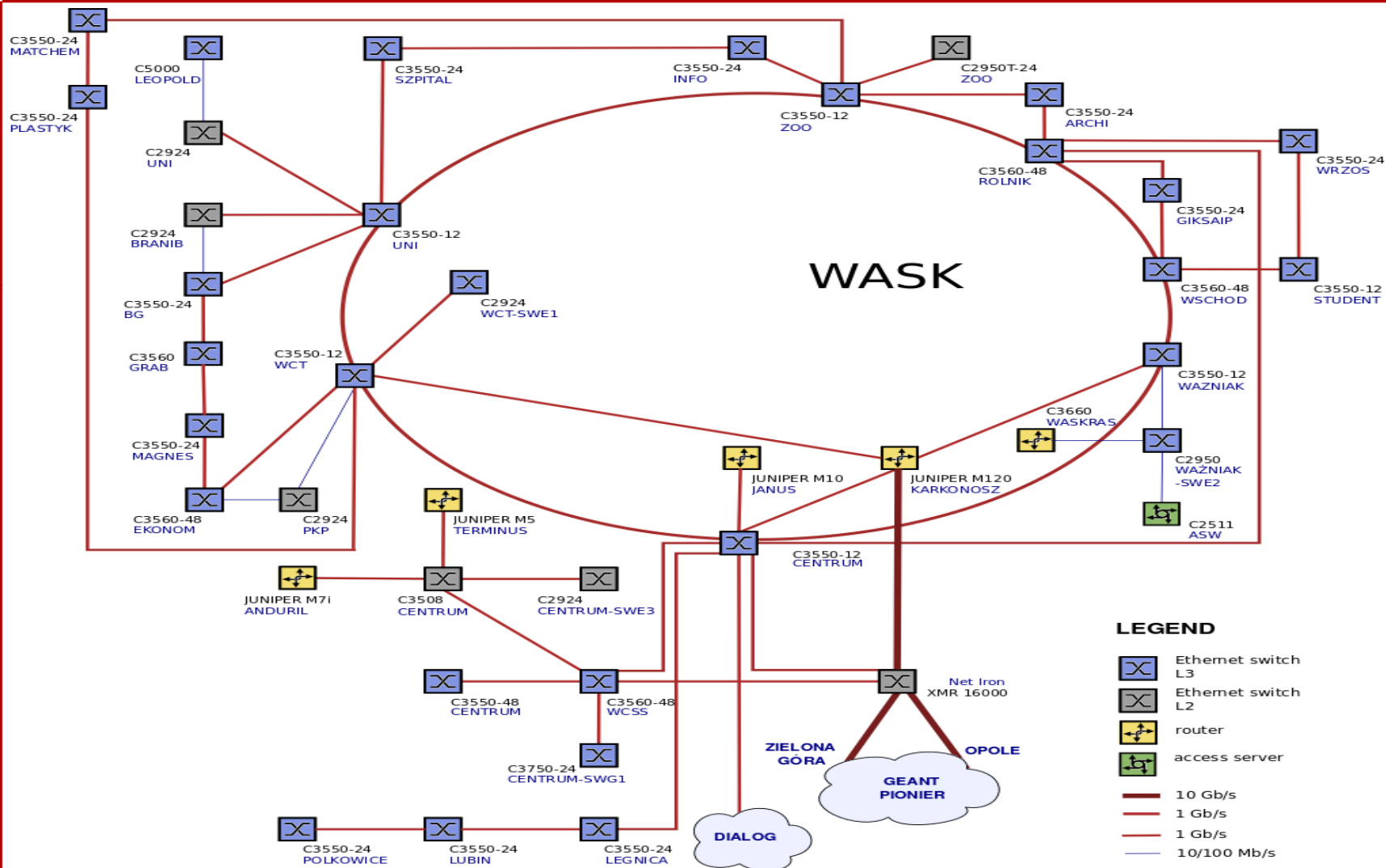
2003 – 6 GbE loops, 1Gb/s uplink to national PIONIER network

2007 - 10GbE to PIONIER backbone









2008-2009 – 10GbE MPLS core net



# The WASK network



**LEGEND**

-  Ethernet switch L3
-  Ethernet switch L2
-  router
-  access server
-  10 Gb/s
-  1 Gb/s
-  1 Gb/s
-  10/100 Mb/s



# Supercomputing services

Multiple independent systems

Heterogeneous env. for different needs

Connected via a high-speed network

Several rare or expensive software packages,  
tools and libraries

Computational chemistry, physics,

Fluid dynamics, finite element modeling,

Mathematics,

Acoustics,

Geophysics and many others

# Supercomputing resources - Leo

## SGI Altix 3700 Bx2 – scalable shared memory

Computing power	<b>768GFlops</b>
Processor	<b>Intel Itanium2</b>
Number of CPUs	<b>128</b>
Clock frequency	<b>1.5GHz</b>
Memory	<b>256GB</b>
Disks	<b>3.2TB + 500GB</b>
Interconnect	<b>NUMalink 4.3 Gbps</b>
Operating system	<b>SUSE Linux</b>



# Supercomputing resources - Nova

Nova – x86\_64/ EM64T cluster for WCNS & EGEE

Nova is ranked 318 on Top500 (2 in Poland) - June 2008

Computing power	<b>16TFlops</b>
Number of nodes	<b>288</b>
Processors per node	<b>1 – 2</b>
Processors	<b>Intel Xeon Quad Core</b>
Number of cores	<b>1700</b>
Clock frequency	<b>2.4 GHz</b>
System memory	<b>3.4 TB</b>
Disc memory	<b>130-300GB per node</b>
Interconnect	<b>Infiniband 20Gb/s</b>
Operating system	<b>Scientific Linux</b>







# HPC services

## The most frequently used software packages:

### Chemical software

Gaussian and GAMESS

Accelrys

ADF

Tripos

MOLCAS and MOLPRO

### CAD/CAE

Abaqus

MSC Software

### Mathematical software

Matlab



# Supercomputing – storage system

Storage Area Network - redundant FC fabric,  
FC and \*ATA disk arrays,  
LTO3 tape library,  
~320TB of raw space,  
Backup/archive system (TSM)



# Recent research projects

CLUSTERIX - national Linux/Itanium grid

NASTEC - network security, PKI

POSITIF - policy based network security

SGIGrid - national SGI grid

PROGRESS - national Sun grid

EGEE-2 - Enabling Grids for E-science  
(phase 2)

ACARM - security alert correlation and



# Current and new projects

FPGA - hardware supported HPC

KMD - national data grid (~1PB in WCNS)

EGEE-3 - Enabling Grids for E-science  
(phase 3)

PRACE – Partnership for Advanced  
Computing in Europe

PL-GRID - national computing grid



# Future

2008 - Nova extended to ~2000 cores

2009 – 2013:

~50 TB Lustre Hi-End SAN system

~100 TFlops in WCNS?



# Thank you