



2015 HPC User Site Census: Applications

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EXECUTIVE SUMMARY

This report is part of our HPC User Site Census series and provides an examination of the primary application software found at a sample of HPC user sites. We surveyed a broad range of users about their current computer system installations, storage systems, networks, middleware, and applications software supporting these computer installations.

Our goal in this analysis of applications is to examine the suppliers, products, and primary usage of the application software packages in use at all HPC sites. Using our primary usage categories, we have created two super segments: High Performance Technical Computing (HPTC) applications and High Performance Business Computing (HPBC) applications. We examine these two super segments in this report.

Key findings of the Site Census surveys include the following:

- 791 unique packages representing 2,044 mentions were listed by all sites: 574 were HPTC applications and 217 were HPBC applications. About three-fourths of HPTC packages and nine-tenths of HPBC packages are mentioned only once in the survey, indicating the diversity of application needs and the experimental nature of the HPC market.
- Chemistry, biosciences, fluid dynamics, structural analysis, and business intelligence were the top five HPC usage categories for application software. Structural analysis returned to the top five after having been displaced by weather/environmental modeling. The broad category of business intelligence was the only HPBC usage category in the top five.
- The leading application software packages in HPTC were Ansys' Fluent, Gaussian, GROMACS, NAMD, and VASP. All are chemistry applications except Ansys' Fluent. The leading application software packages in HPBC were Hadoop and those provided by Oracle and Amazon. All of these top packages were used at multiple sites.
- Commercial sites still prefer ISV-based applications over open-source applications. For HPTC applications, 56% of the applications mentioned were ISV-based applications compared to 20% open-source. For HPBC, 39% of the applications mentioned were ISV-based, compared to 10% open-source.

COMPANIES MENTIONED IN THIS REPORT

AB Sciex	CIG
Abinit.org	Clipster
Acceleware	Cloudera
ACUSIM	CMG Engineering
ADCIRC.org	CMOP
Agilent	Colorado State U
Air Products	COMSOL
Altair Engineering	Convergent Science
Altera	COSMOL
AmberMD.org	CP2K.org
Andor Technology	CPMD.org
Ansoft	Culgi
ANSYS	D.E. Shaw Research
Apache.org	Dassault Systemes
Apple	DEM Solutions
Applied Biosystems	DWD
Arachne	Dynaflow
Autodesk	Eagle Investment Systems
AVL	EDF-R&D
BC Cancer Agency	Elasticsearch.org
BerkeleyGW.org	Emerson Process Management
BigDFT.org	Epic
BitCentral	ESI
BlueSpec	ESRI
Broad Institute	European Bioinformatics Institute
Cadence	EXA
Calit2	Exelis
Calypso	Feko
Cambridge Crystallographic Data Centre	Fiserv
Cardiff University	Flow Science
CCMC	Forming Technologies
CD-adapco	Franz
CEI	Fujitsu
Celera	Fusion Petroleum Technologies, Inc.
CERFACS	Galaxy
CERN	Gaussian
Charles River	GCG
Charmm.org	General Hospital Corp.
Chemical Computing Group	GenoLogics
CHREC	Geophysical Fluid Dynamics Laboratory



COMPANIES MENTIONED IN THIS REPORT (cont.)

GLOBAL SYSTEMS

GNU.org

Google

Gromacs.org

Gurobi

Halliburton/Landmark

HP

IBM

ICMAB

Idaho National Lab

Illumina

Industrial Light & Magic

Infor

Infor Global Solutions

In-house

Intel

Intelligent Light

International Microsystems

Invention Machine

Iowa State University

Jenzabar

Johns Hopkins School of Medicine

JPL

JSI

Kitware

KNMI

LANL

LLNL

LSTC

Lumerical

MateoSwiss

Matrix Science

Max Plank Institute

Mentor Graphics

Mesa Software

Metacomp

Metasonic

Microsoft

Milliman

MITgcm.org

Monash University

MSC Software

myroms.org

NASA

National Energy Technology Lab

National Instruments

NCAR

NCBI

NEC

Newmerical Technologies

NOAA

NOAA GFDL

NOAA NWS

NORSAR Innovations

Nvidia

NYSE Euronext

Open Source

Open Source Drug Discovery

OpenEye

OpenFoam Foundation

Optimum Technology

Oracle

ORNL

Oxford University

Paradigm

Parallel Quantum Solutions

Paraview.org

Pega systems

Pentaho

Pesthomepage.org

Petachem

Pixar

PNNL

Pointwise, Inc.

POSIM

PPPL

PTC

Q-Chem

Qiagen

Quantum-espresso.org



COMPANIES MENTIONED IN THIS REPORT (cont.)



Rome Labs	Thompson Reuters
Rosneft	TimeLogic
Roxar	Tripos
Rsoft	Trizetto
Safe Technology	TURBOMOLE Gmbh
Salesforce	Tyler Technologies
Sandia Nat Lab	U of California, Berkeley
SAP AG	U of California, LA
Scala-lang.org	U of California, San Diego
Schlumberger	U of California, SF
Schrodinger	U of Illinois, UC
Scientific Forming Technologies Company	U of Massachusetts
Scientific Volume Imaging	U of Mo
SCM	U of Oklahoma
Scripps Research Institute	U of Southern California
SICStus	U of Texas, Austin
Siemens	U of Utah
Siemens/LMS	U of Vienna
Silvaco	U of Virginia
Sinauer Associates	U of Washington
SOAP	U Waikato
Software Cradle	UC, Santa Cruz
STFC	UCAR
SugarCRM	UK Met Office
Sungard	Unipro
Sybase	Unity3D
Sybase	University College Cardiff Consultants
Synopsys	USGS
Talend	USQCD.org
TASS	VoltDB
Technical University of Denmark	WebMo
Tech-X	Xilinx
Tecplot, Inc.	Yahoo
Teradata	Yale
Terraspark	YT-project.org
Tesis	Zenotech
Thermo Scientific	

TECHNOLOGIES COVERED IN THIS REPORT

- Software elements
- Application software
 - Independent software vendor (ISV) or third-party (purchased/licensed) applications
 - Open-source applications
 - In-house developed applications
 - Applications by category
 - Computational fluid dynamics
 - Structural analysis
 - Noise, vibration, harshness (NVH) testing
 - Multi-physics applications
- Visualization
- Other technology trends
 - Big Data trends
 - Analytics
 - Data mining
 - MapReduce
 - Hadoop