An AAA/SWITCH Project

Update on the SMSCG Project www.smscg.ch

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SMSCG
SWISS MULTI-SCIENCE COMPUTING GRID

Project Goal:

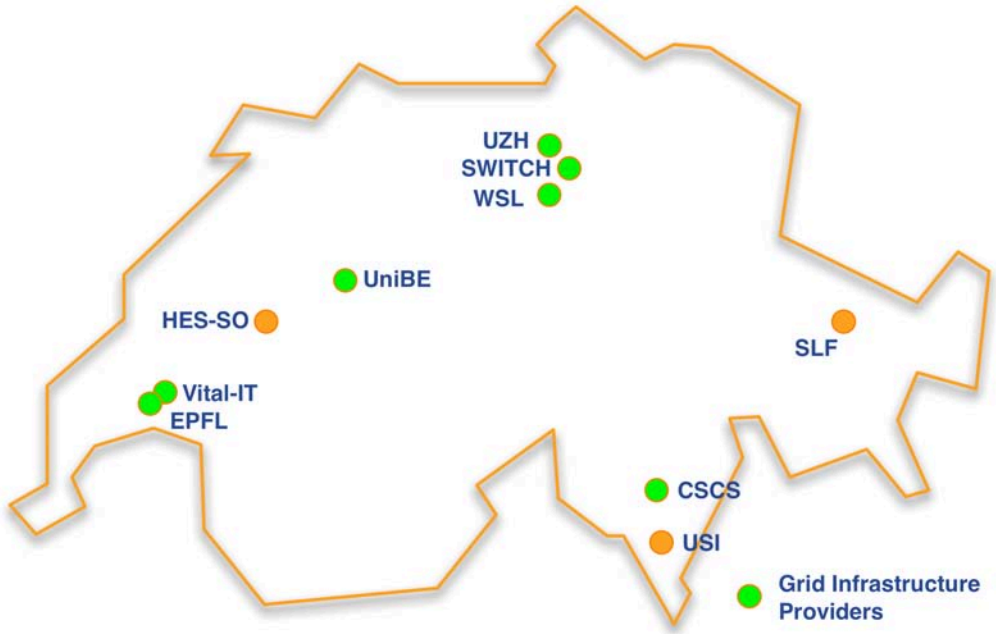
Provide computing resources to solve scientific computational problems

Middleware based (ARC) interconnection of Swiss clusters into a single resource (grid) for eased and multi-disciplinary usage

Project Time Line:

May 2008 – Mar 2010 – Dec 2011 (extension in place)

The SMSCG Project Participants



A relatively large and complex project with a significant knowledge exchange among the participants !

SWISS MULTI-SCIENCE COMPUTING GRID

Project Potential:

In the Swiss higher education sector there are some tens of HPC clusters leveraging Swiss science

Among ~50 thousands computing cores a scientist normally only have access to a small fraction inside her own institution

SMSCG establishes the infrastructure needed to interconnect these resources and in future a scientist may access many clusters in a coherent way

Scientist with uniform access to multiple clusters

Cluster	~Cores
CSCS Monte Rosa	22000
CSCS Buin	900
CSCS Blanc	800
CSCS Rigi	100
CSCS LCG T2 Phoenix	1000
EPFL BlueGene	4100
EPFL Mizar	440
EPFL Callisto	1000
EPFL Greedy	600
EPFL Alcor	100
ETHZ Brutus	2200
PSI Merlin	100
PSI CMS T3	500
SIB Vital IT	600
UniBa Cronos	120
UnBa Athena	80
UniBe LHEP ATLAS T3	200
UniBe UniBe ID	1000
UniGe DPNC ATLAS T3	200
UniGe	
UZH Schroedinger	4600
UZH Matterhorn	800
Sum Cores	**41440**

Numbers taken from web sites. May be wrong !

Status on Interconnected Clusters in SMSCG:

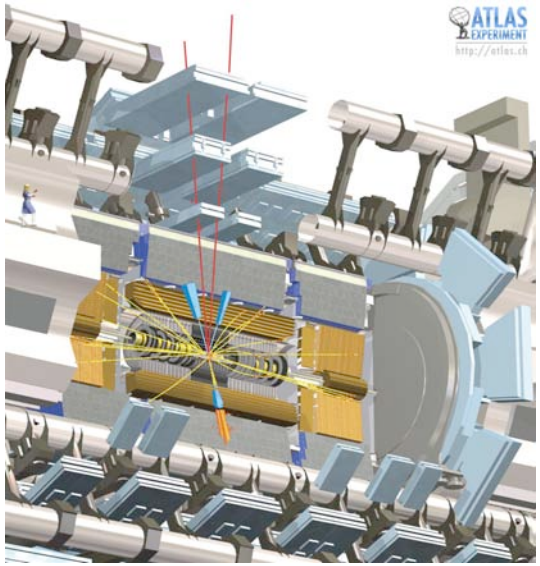
2009-11-17 CET 12:13:19

Processes: Grid Local

Country	Site	CPUs	Load (processes: Grid+local)	Queueing
Switzerland	Bern ATLAS T3	196	165+0	0+0
	Bern UBELIX T3 Cluster	988	109+377	35+95
	OCI Grid Cluster	32	0+0	1+1
	SMSCG - Bern UBELIX	988	0+486	9+108
	SMSCG - SWITCH	1	0+0	0+0
	SMSCG - Vital-IT	640	0+274	0+1992
	SMSCG_CSCS	100	2+10	0+0
	SMSCG_CSCS_test	8	0+0	0+0
	SMSCG_EPFL	1189	0+1184	0+399
TOTAL	*9 sites*	*4142*	*276 + 2331*	*45 + 2595*

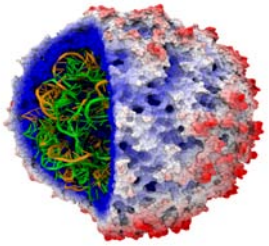
http://giis.smscg.ch

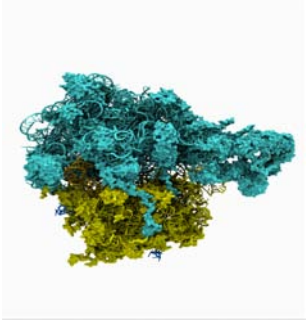
Current Portfolio of Applications

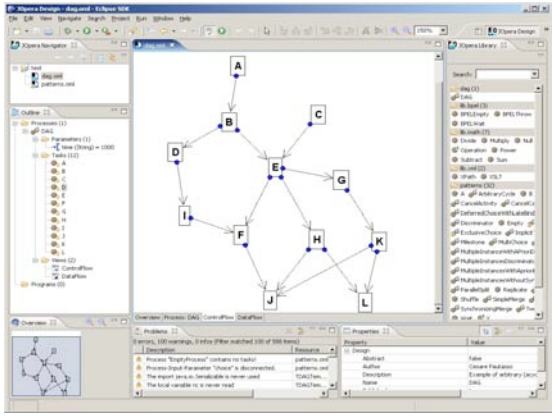


Higgs boson plus a jet in the opposite direction where the Higgs boson decays to two Z bosons with one Z boson decaying to e+ e- and the other to μ+ μ-.

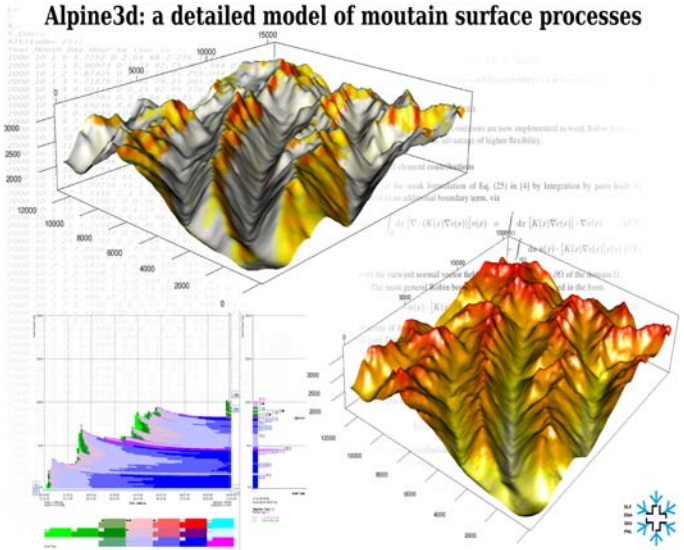
Nanoscale Molecular Dynamics and Ribosome Computed by NAMD
*(*http://www.computerweekly.com)







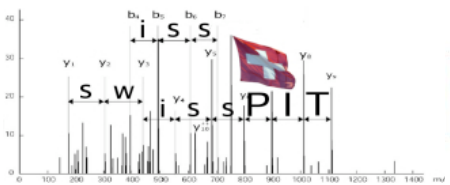
JOpera Design Perspective on a complex DAG Control flow



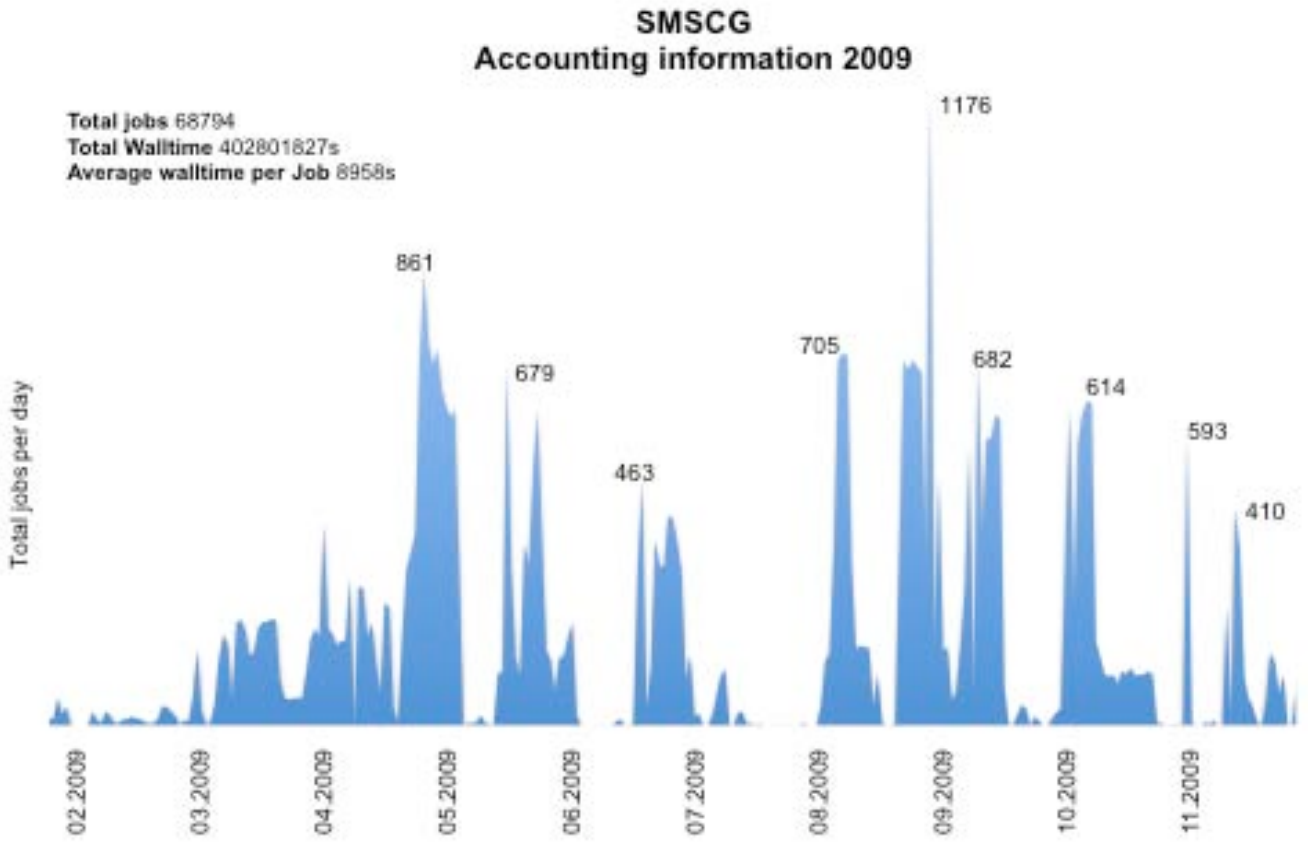
APPLICATIONS

On the SMSCG Grid the following applications are supported:

- ***ATLAS***: high energy physics application developed for the LHC experiment at CERN
- ***NAMD*** and ***GROMACS*****:** biochemistry applications
- ***Alpine 3D*****:** an application for the high resolution simulation of alpine surface processes
- ***swissPIT*****:** Swiss Protein Identification Toolbox
- ***POP-C++:*** Parallel Object Programming framework
- ***JOpera***: open grid workflow management system based on the Eclipse platform
- ***RSA768***: cryptographic application
- ***GAMESS***: biochemistry application (work in progress)



Some initial accounting of first usage:



From paper in progress: The Swiss National Grid Association and its experience on a national grid infrastructure

Services in Place (enjoy):

http://www.smscg.ch (entry point for users and admins)
http://rt.smscg.ch (AAI protected ticket system)
http://giis.smscg.ch (nordugrid style monitor)
http://monitor.smscg.ch (AAI protected monitor system)
http://voms.smscg.ch (virtual organisations)
http://vash.smscg.ch (VO registrations)
http://repo.smscg.ch (software repository)

SMSCG in the Swiss Landscape:

At institutional level to CERT, IT services and user communities

At national level to other AAA/SWITCH projects (*Condor Infrastructure (Project ref. EPFL.1), GridUNIL (Project ref. UNIL.1). Swiss Grid Portal (Project ref. USI.3), Chemistry - Grid integration (Project ref. UZH.7)) and SwiNG (HPC-CH)*)

At international level to NorduGrid and Nordic DataGrid Facility (contributed in certification of ARC 0.8,use cases, testing etc)

Summary and Outlook:

SMSCG has established a complete infrastructure for a national multi-science computing grid. Initial usage has driven the project into a production mode.

The project extension will focus on user migration from local to grid submission and hopefully the integration of more clusters.

It is expected that SwiNG will sustain the operation of this national infrastructure beyond the extension

SWISS MULTI-SCIENCE COMPUTING GRID

Do you want to join SMSCG ?

We welcome new users and applications from the Swiss higher education sector

We welcome more clusters

You may even get AAA money for joining

Contact: smscg-wg@swing-grid.ch