Virtualizing Research Through a Secure Portal

High Performance Computing
Virtual Laboratory

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Executive Director

uOttawa

L'Université canadienne
Canada's university

Carleton
UNIVERSITY

Queen's
UNIVERSITY

RMC • CMR

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EXIT
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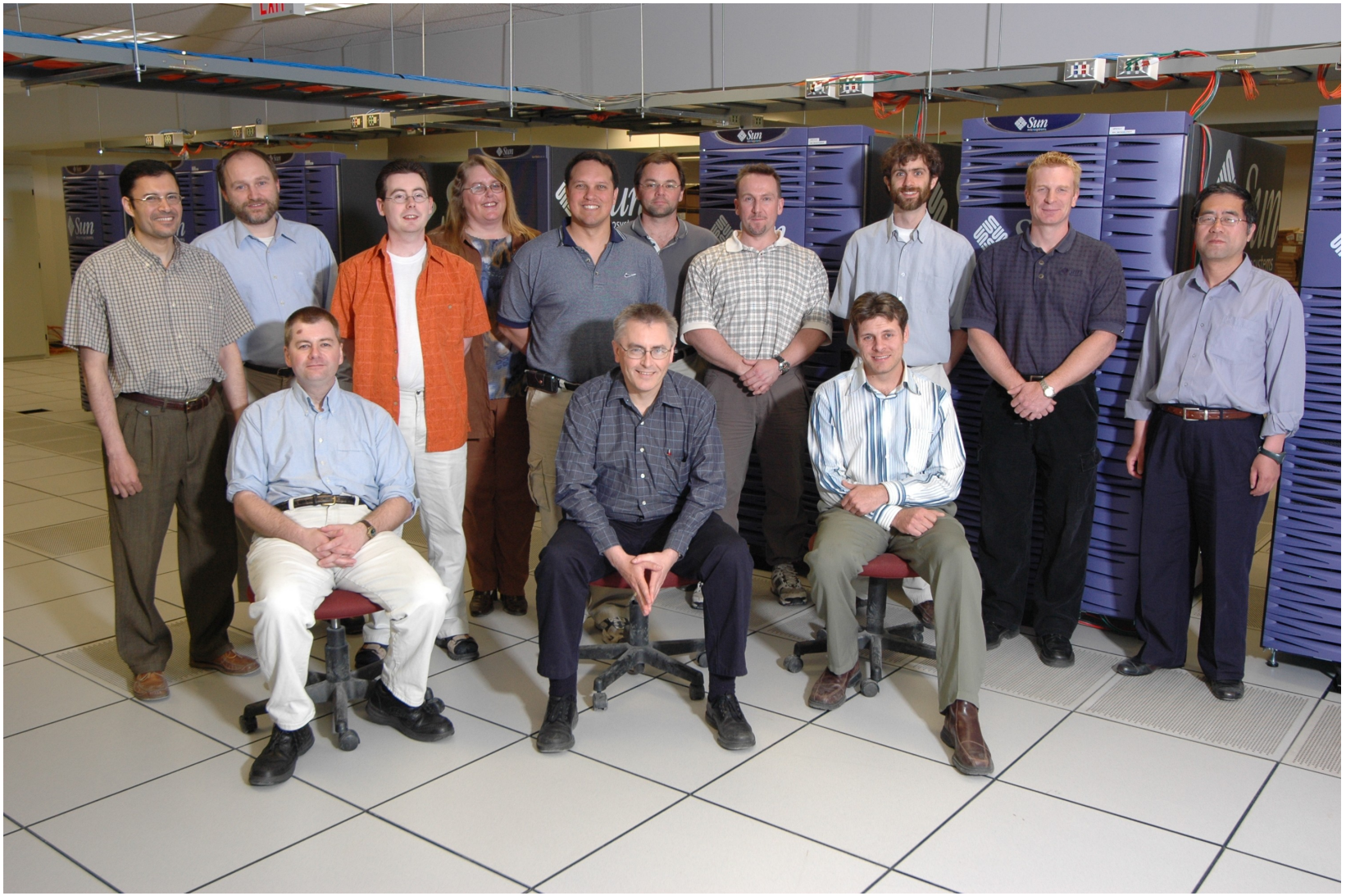

EXIT
Sun

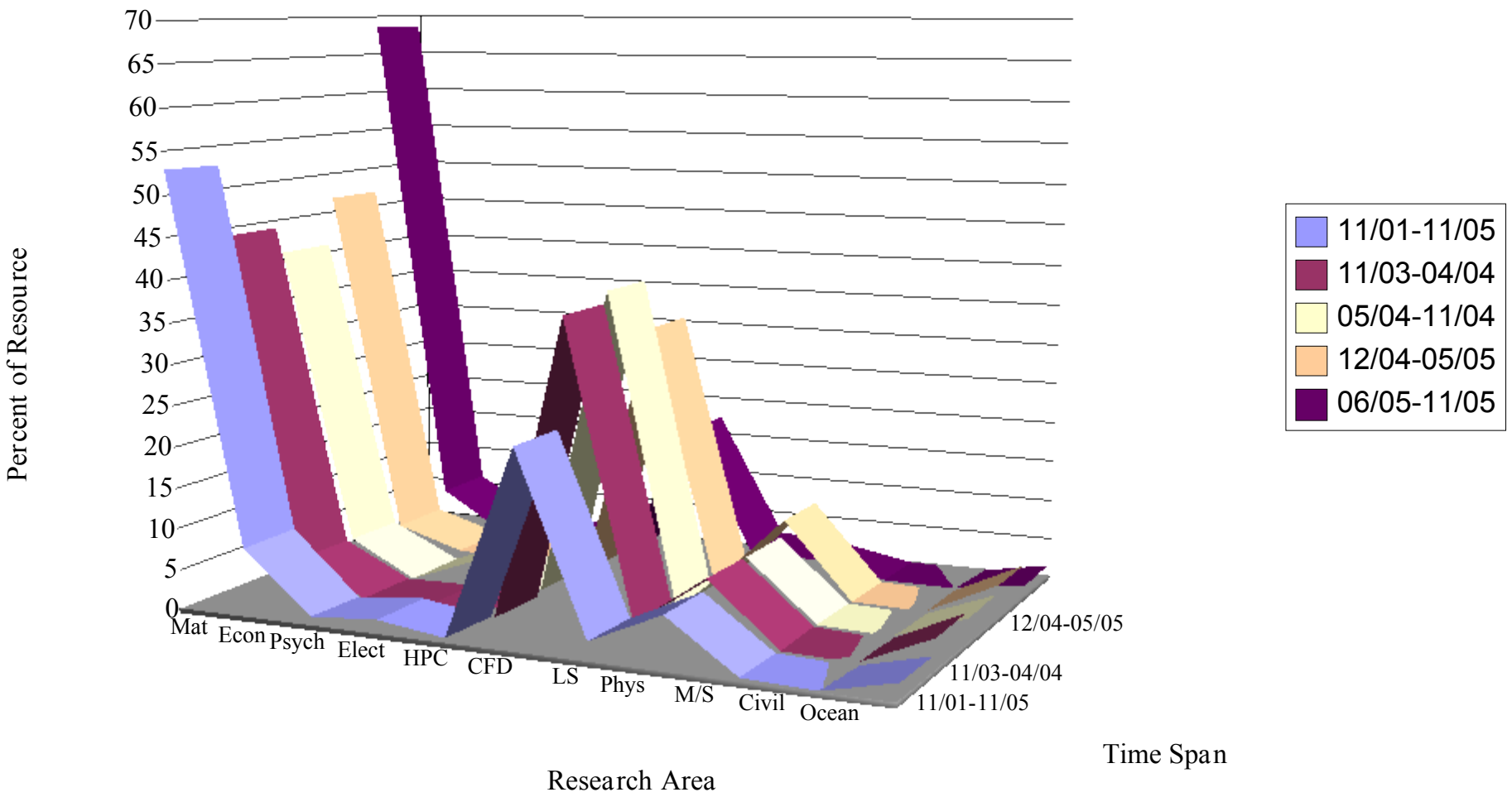
Training/Support

Expert User Support
(new position coming to Toronto)

Workshops
- about 500 participants the past year
- some courses with Sun and NAG
- mainly HPCVL designed
  (OpenMP, MPI, Working Template)
- now pushing multithreading

Tools
e.g. HPCVL Working Template

Research Area Usage



Central Site Resources

7 x Sun Fire 25000s, each with 72 dual core UltraSPARC IV+ chips and 576 GB of RAM plus 2 x SF 2900s for login etc.

3 x Sun Fire 15000s, each with 72 US III chips and 288 GB of RAM

160 TB of disk storage
480 TB of tape storage

Sun Grid Rack w/21 nodes each w/2 dual core AMD chips

Approximately 4 TFLOPS

Plus – 2 x Sun Fire T2000 w/8 core Niagara chips for the Secure Grid Portal

Central Site Resources Future

New technology SMP systems based on multi-core and multi threading technology -1000s of CPU cores

160 TB of disk storage + extra
480 TB of tape storage

Sun Grid Rack w/21 nodes each w/2 dual core AMD chips + ...

Approximately ?? TFLOPS

Plus – Future Sun Fire systems with next gen. Niagara chips for various projects

Other sites

Carleton University and the University of Ottawa
-SF 6900 with 24 US IV+ dual core
-2008 multi-core new technology

Carleton – 128 node Beowulf cluster
plus new 256 CPU core (AMD) cluster

RMC – old 12 CPU system
– new system evaluation

Ryerson University – SF 4800 possible upgrade
-2008 multi-core new technology

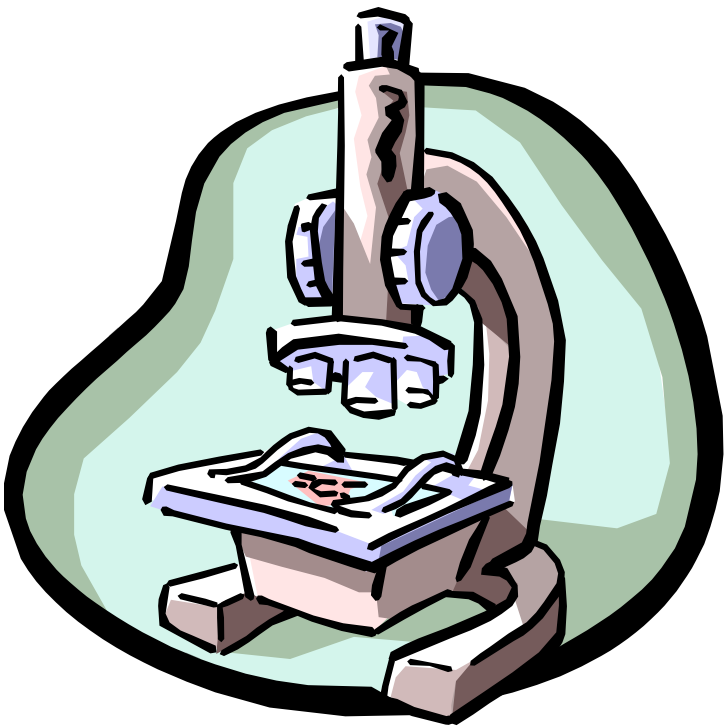
Seneca College – AMD type SMPs
-2008 multi-core new technology

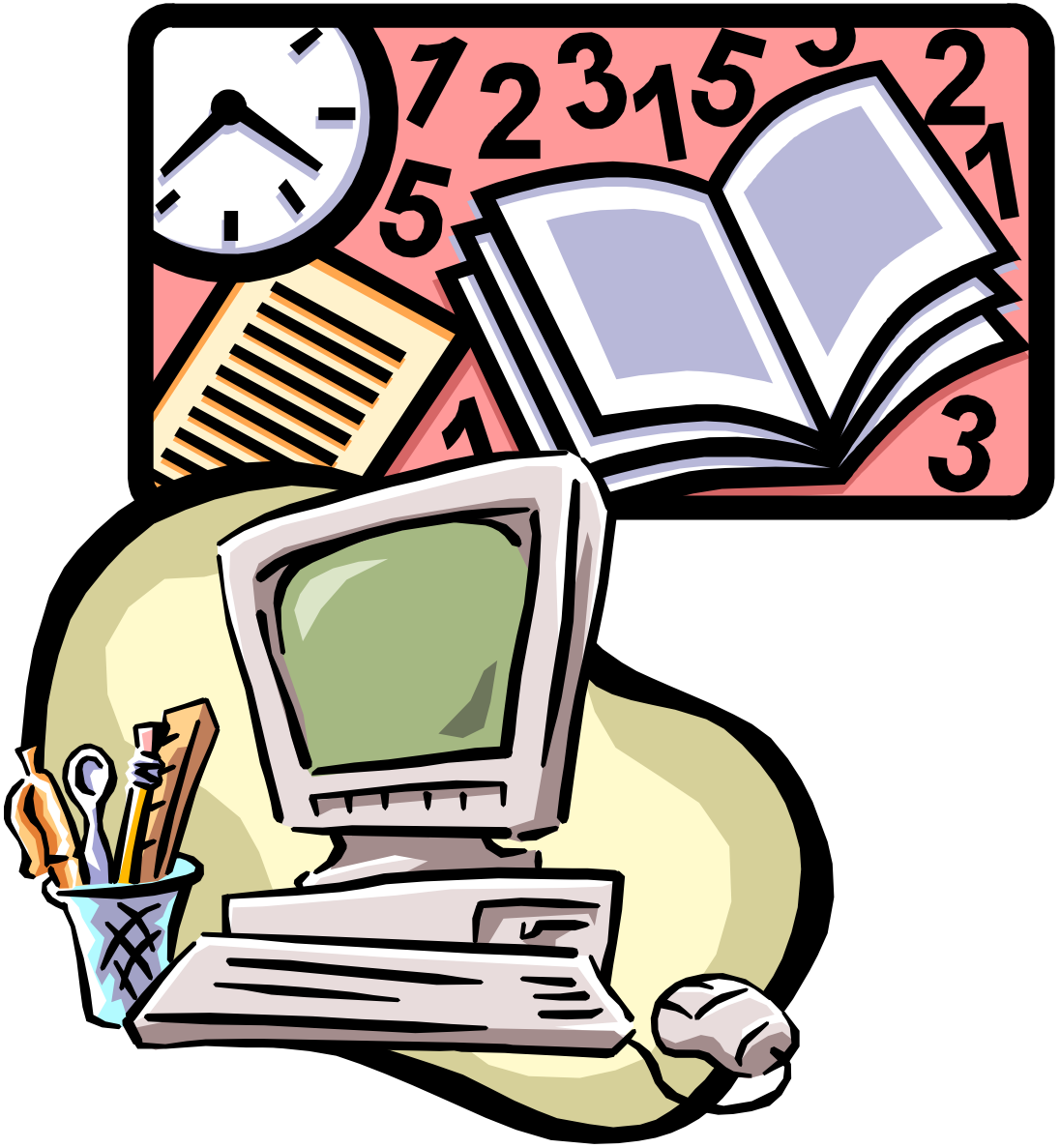
Loyalist College – possible system in 2008

Application provisioning

- “freeware”
  e.g. GAMESS,

- wide variety of commercially available software
  e.g. GAUSSIAN 03
  FLUENT
  NAG libraries
  -plus Iris Explorer
  PowerFlow





Why security and authentication?

Data Integrity in a networked and ”gridded” world

Protection of intellectual property

Compliance
eg. USA FDA Title 21 CFR Part 11
-digital signatures, audit trails
also, PIPEDA, FIPPA, etc.

Security – identified as biggest obstacle to grid adoption (MCNC workshop, Oct./04)

In an academic environment:

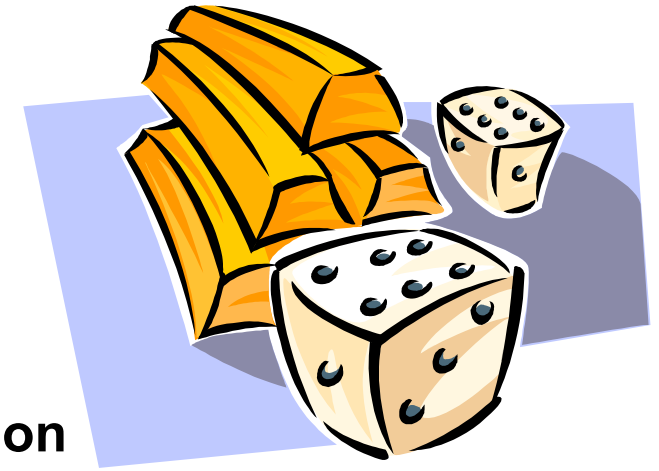
- How do you integrate security?
- Who will take responsibility?
- Why do it?

How do you make it worthwhile for your community?

What is the reward?

- for the researchers

Virtualization and ease of use leading to increased productivity and innovation



Virtualization

Transportability

-resources available from anywhere with a connection and a browser

Access

-user support

-application availability, including graphics

-data (files)

Ease of Use

-no complex or time consuming process

Secure Grid Portal

Sun Java System Portal Server
Sun Grid Engine
Sun Secure Global Desktop Software
Sun Java System Identity Manager

PKI based Electronic Security, Encryption, Data Integrity

Entrust TruePass
Entrust Authority Security Manager
Entrust Authority Roaming Server
Entrust Self Administration Server
– **Manage and issue user Certificates**

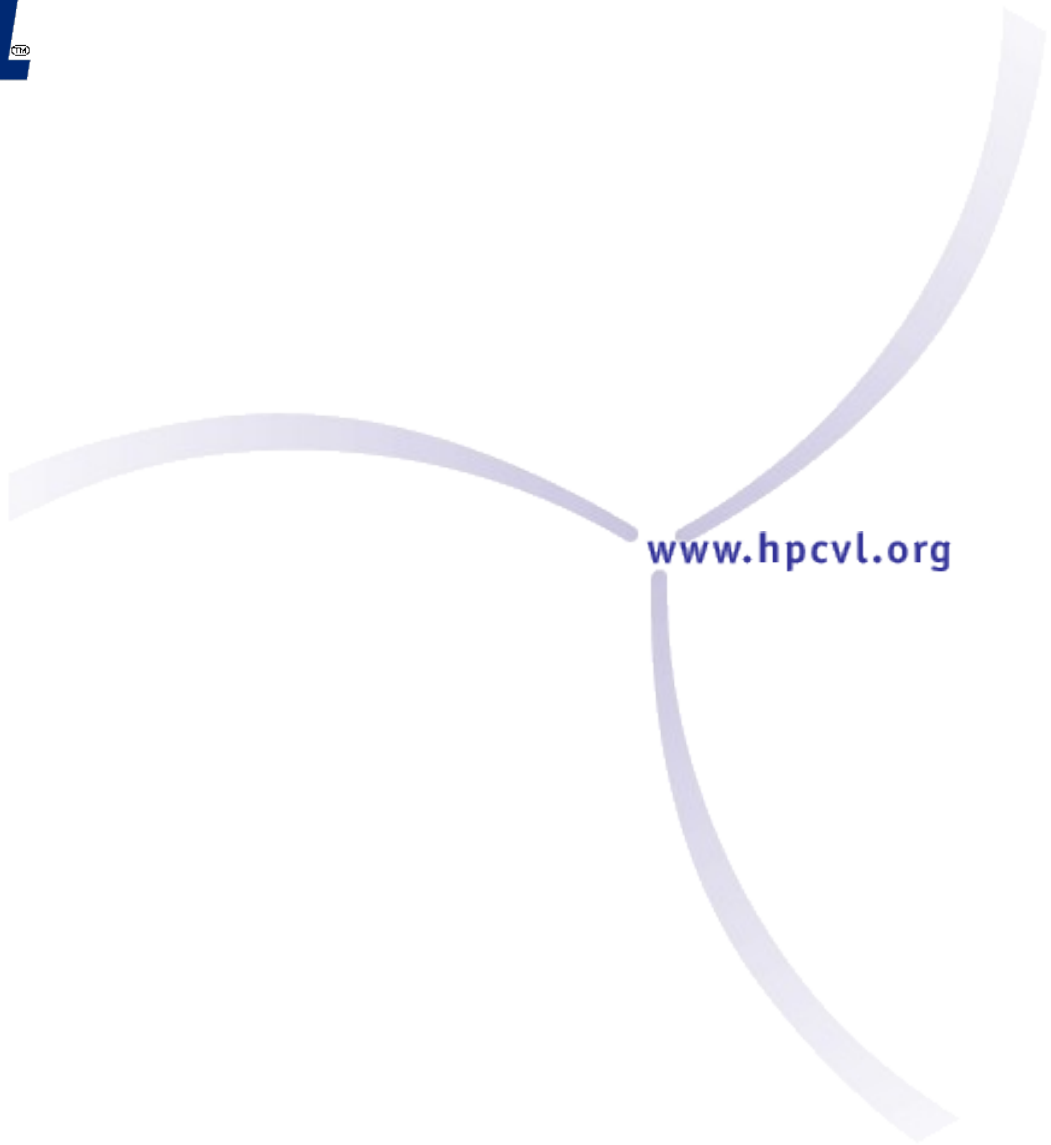
LDAP – Administration of user identity and privileges

Demos

Portal Overview

Iris Explorer Demo

SGE Data Analysis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