CASC – Industry Trends

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Research Data Service Cloud and Marketplace

A vision for Public-Private Partnerships to Enable Data-Intensive Science

Whitepaper: Green, Gannon, Grossman and Reed
Due to the lapse in government funding, National Science Foundation websites and business applications, including NSF.gov, FastLane, and Research.gov will be unavailable until further notice. We sincerely regret this inconvenience.

Updates regarding government operating status and resumption of normal operations can be found at www.opm.gov.

In cases of imminent threat to life or property, please call the Office of the Inspector General at 1-800-428-2189.
Observations from industry

• Cloud increasing business agility - thanks to massive scale and unique COGS

• From concept to running site/application with complex software infrastructure in minutes thanks to...
  • Virtual machines, automated provisioning, intelligent data location, resilience...all reducing barriers/time to deployment
Virtual machine image selection

- Oracle WebLogic Server 11g Standard Edition on WS...
- openSUSE 12.3
- SUSE Linux Enterprise Server 11 SP2
- SUSE Linux Enterprise Server 11 SP3
- Ubuntu Server 12.04 LTS
- Ubuntu Server 12.10
- Ubuntu Server 13.04
- OpenLogic CentOS 6.3
- Oracle Linux 6.4.0.0.0
- Oracle WebLogic Server 12.1.2 on Oracle Linux 6.4.0.0.0

Windows Server 2012...

Windows Server 2012 incorporates Microsoft’s experience building and operating public clouds, resulting in a dynamic, highly available server platform. It offers a scalable, dynamic and multi-tenant-aware infrastructure that helps securely connect across premises.

PUBLISHER: Microsoft Windows Server Group
OS FAMILY: Windows
LOCATION: East Asia; Southeast Asia; North Europe; West Europe; East US; West US

PRICING INFORMATION: Pricing varies based on the subscription you select to provision your virtual machine.
Virtual machine configuration

VERSION RELEASE DATE
9/16/2013

VIRTUAL MACHINE NAME
CASC Example

Extra Small (Shared core, 768 MB memory)
Small (1 core, 1.75 GB memory)
Medium (2 cores, 3.5 GB memory)
Large (4 cores, 7 GB memory)
Extra Large (8 cores, 14 GB memory)
A5 (2 cores, 14 GB memory)
A6 (4 cores, 28 GB memory)
A7 (8 cores, 56 GB memory)

☑ UPLOAD COMPATIBLE SSH KEY FOR AUTHENTICATION

CERTIFICATE

☐ PROVIDE A PASSWORD

Ubuntu Server 12.04...

Ubuntu Server 12.04.3 LTS (amd64 20130916.1) for Windows Azure. Ubuntu Server is the world's most popular Linux for cloud environments. Updates and patches for Ubuntu 12.04.3 LTS will be available until 2017-04-26. Ubuntu Server is the perfect platform for all workloads from web applications to NoSQL databases and Hadoop. More information can be found at: http://www.ubuntu.com/business/server

PUBLISHER
Canonical

OS FAMILY
Linux

LOCATION
East Asia; Southeast Asia; North Europe; West Europe; East US; West US

PRICING INFORMATION
Pricing varies based on the subscription you select to provision your virtual machine.
Example

The research team turned to Windows Azure to help them test the application. They used the Microsoft HPC Pack with FaST-LMM on 27,000 compute cores on Windows Azure to analyze data from the Wellcome Trust study of the British population. They analyzed 63,524,915,020 pairs of genetic markers, looking for interactions among these markers for bipolar disease, coronary artery disease, hypertension, inflammatory bowel disease (Crohn’s disease), rheumatoid arthritis, and type I and type II diabetes.
Implications for research?

Proposal →
Recruitment →
Deploy community or research group VM →
Extend models →

Simultaneously:
• publish paper, publish VM/software stack (open or to community)
• publish data (open or to community).
• Plus optional data market-place for industry (potentially at no extra effort)

...potentially leads to totally new funding sources...
Cloud Service Provider Offering

RaaS
- General research and collaboration tools & research data lifecycle management services

SaaS
- Data management, application services, collaboration tools

PaaS
- Programming abstractions, runtime systems, Database support

IaaS
- Virtual machines, provisioning tools, network bandwidth, reliable storage

Research Community Marketplace Offering

- Expert consulting and analytics services
- Domain specific applications and data access
- Advanced development tools and libraries to SaaS developers
- Specially configured virtual machine templates
Windows Azure for Research
Accelerate the Speed of Scientific Discovery

Windows Azure provides researchers with the power and scalability of cloud computing for collaboration, computation, and data-intensive processing. This open and flexible global cloud platform supports any language, tool, or framework.

The Windows Azure for Research program:

- Free access to Windows Azure cloud computing and storage (submit proposals for Windows Azure Research Awards)
- Windows Azure for Research training classes
- Support and technical resources

Apply the power of cloud computing to your computational and data challenges. Experiment at azure4research.com.