CASC – Industry Trends

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Microsoft Research

Research Data Service Cloud and Marketplace

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

Whitepaper: Green, Gannon, Grossman and Reed

National Science Foundation
WHERE DISCOVERIES BEGIN

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.
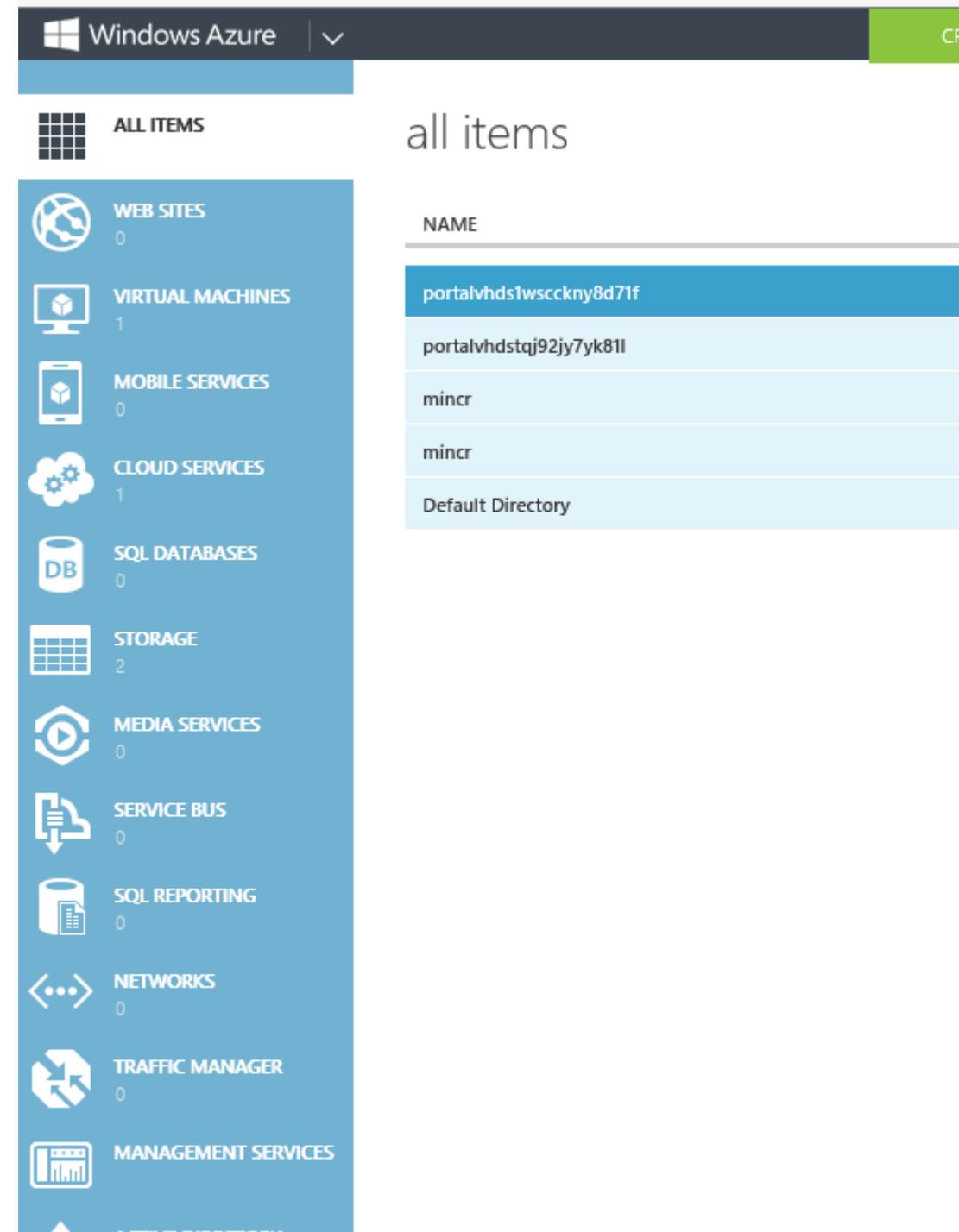
NSF-OCI TASK FORCE on
Data and Visualization

REPORT

Draft Final

March 7, 2011

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

×

ALL

PLATFORM IMAGES

MY IMAGES

MY DISKS

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.

→

2 3 4

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

📁	BROWSE FOR FILE...

☐ 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
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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?
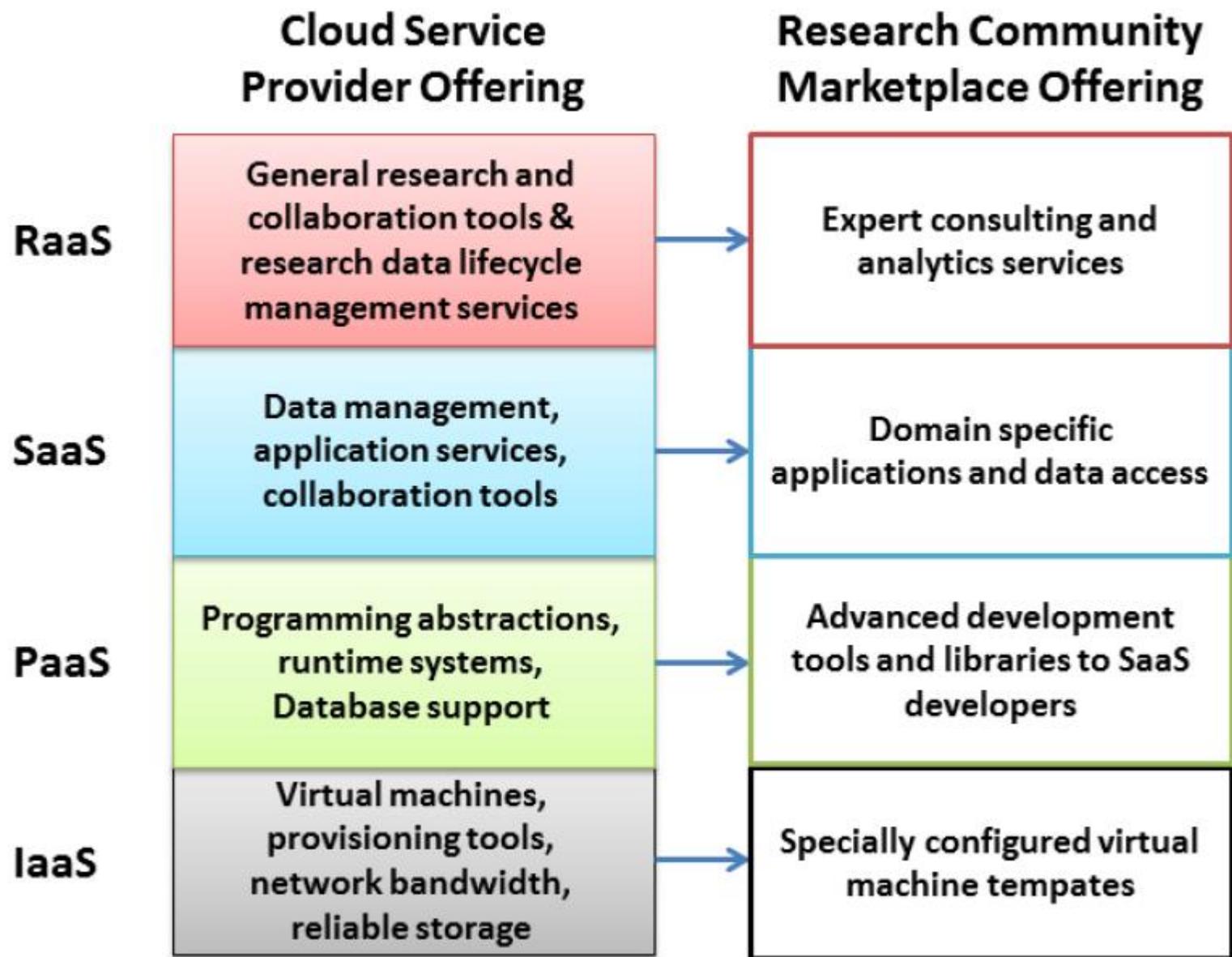
Proposal →

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…

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.**