

Amazon Web Services Presents

Oracle in the Cloud

A Webinar Featuring:

Mike Culver
Web Services Evangelist
Amazon Web Services

Bill Hodak
Senior Product Manager
Oracle Corporation



Amazon



Retail Business

**Tens of millions of
active customer
accounts**

**Seven countries:
US, UK, Germany,
Japan, France,
Canada, China**



Seller Business

**Sell on Amazon
websites**

**Use Amazon
technology for your
own retail website**

**Leverage Amazon's
massive fulfillment
center network**



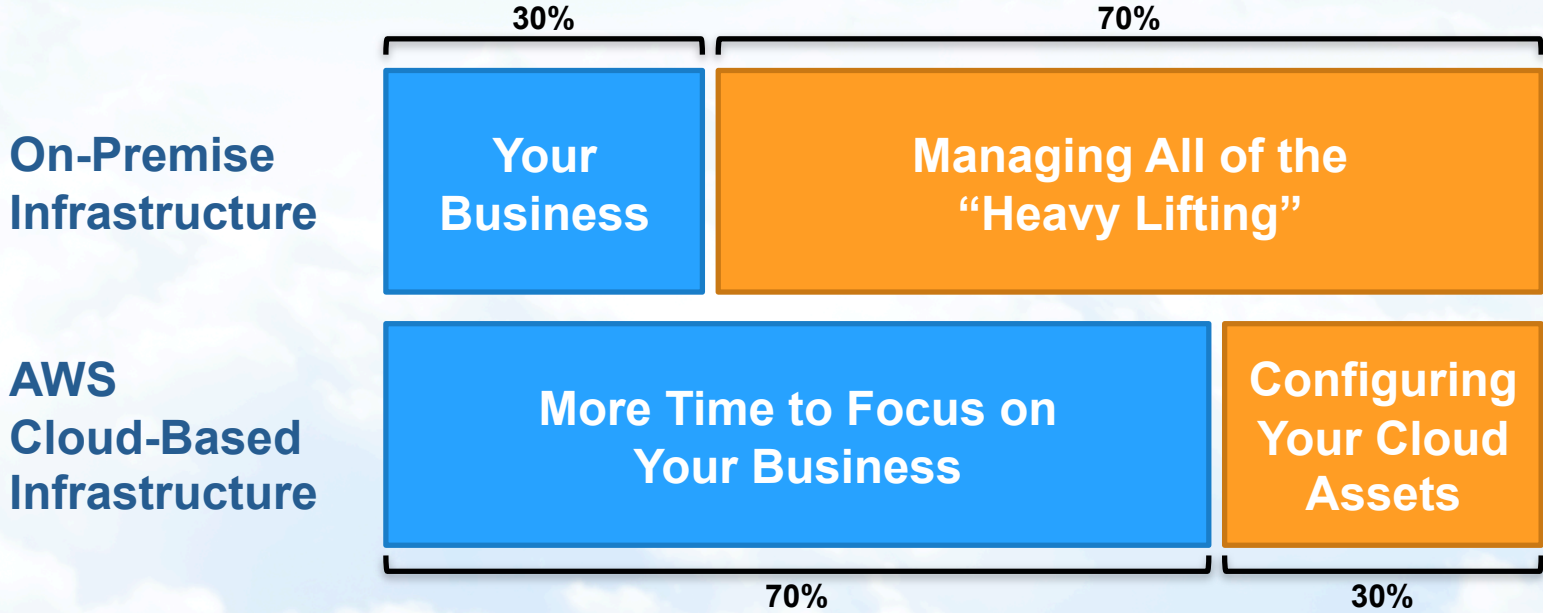
Developers & IT Professionals

**On-demand
compute and
storage
infrastructure for
hosting IT solutions**

**Over 440,000
registered
developers**



The AWS Cloud



The AWS cloud provides reliable and dependable on-demand infrastructure that frees time and expense for you to focus on innovating for your business.



Advantages of the AWS Cloud

Offloads Heavy Lifting

Gives you access to massive data centers
Maintain the flexibility your business demands
Use only the capacity you need, when you need it

Lowers Costs

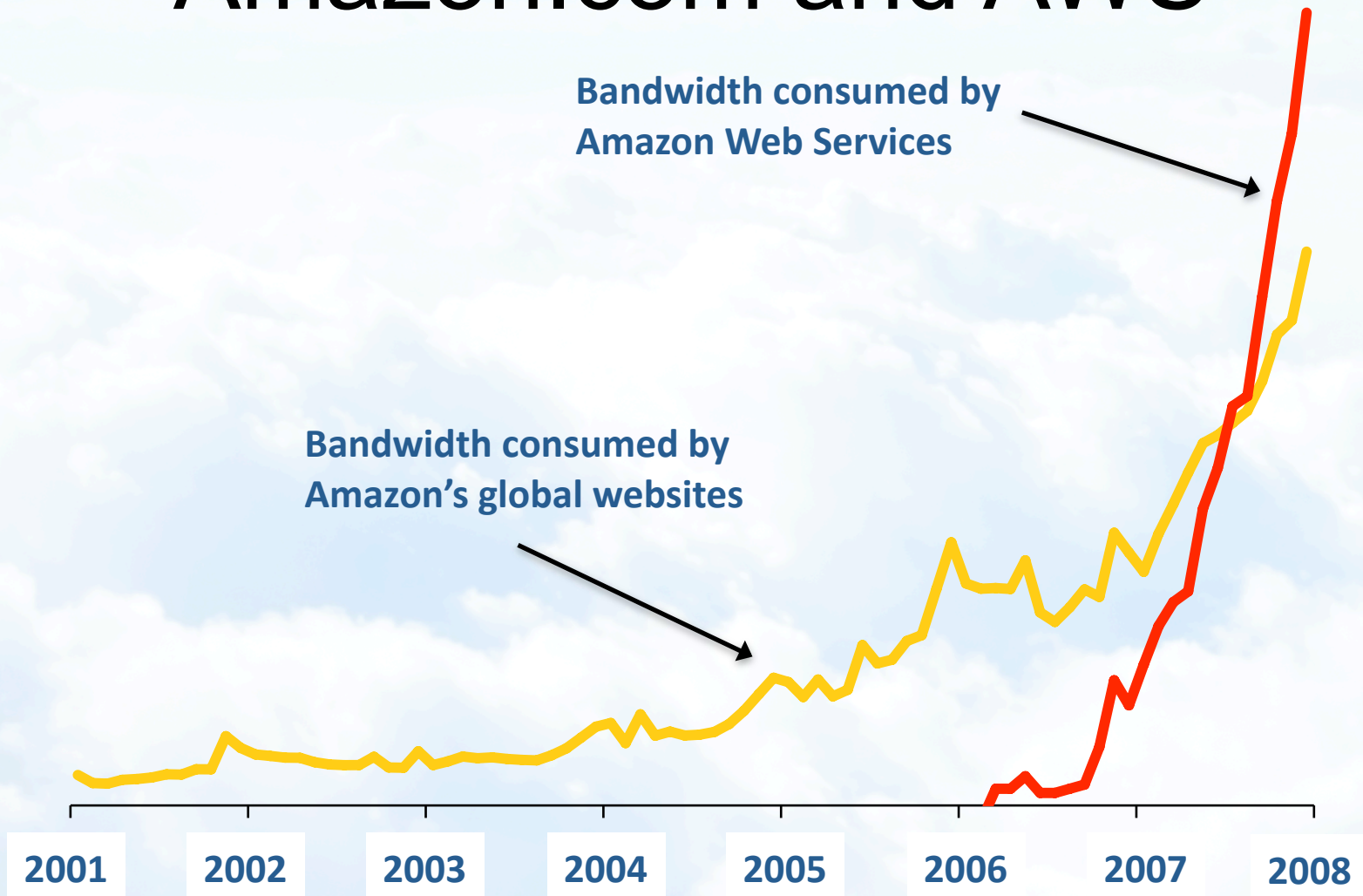
Eliminates up-front capital expenditures
Significantly reduces ongoing operational expenses
Offers a pay-as-you-go utility computing model

Reduces Time to Market

Eliminates hassle of configuring data centers
Reduces time to pilot and test projects
Enables you to focus on adding value to your business



Amazon.com and AWS



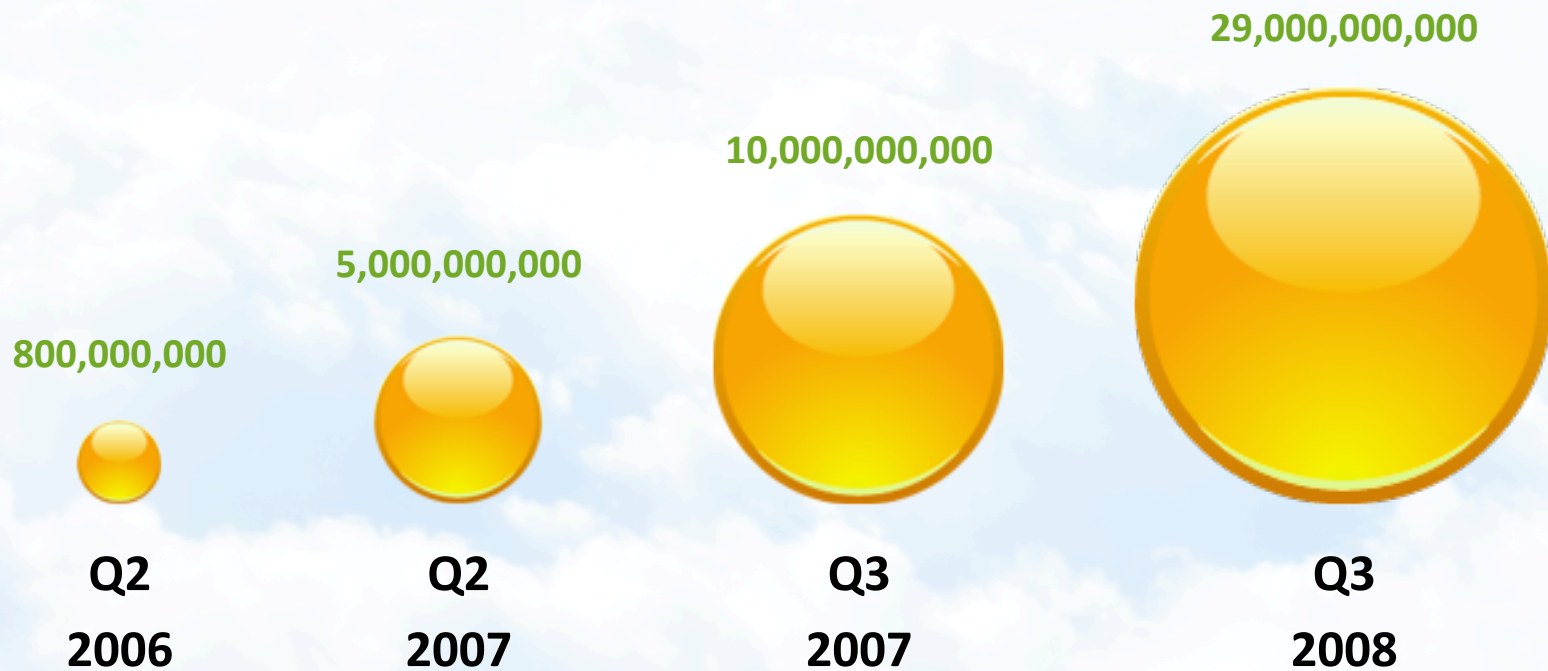
Amazon Web Services (AWS)

- Scalable computing and SOA support
 - Amazon Elastic Compute Cloud (EC2)
 - Amazon Simple Queue Service (SQS)
- Massive storage
 - Amazon Simple Storage Service (S3)
 - Amazon SimpleDB
- Content delivery
 - Amazon CloudFront
- Payments and billing
 - Amazon Flexible Payments Service (FPS)
 - Amazon DevPay
- On-demand workforce
 - Amazon Mechanical Turk

Amazon Simple Storage Service

- Distributed Data Store
- REST/SOAP web services API
- Simple (Buckets, Objects, Keys)
- Service Level Agreement - 99.9%
- ~70K RPS (scalable, durable, available)
- North America and Europe
- Pay-as-you-go:
 - Tiered storage starts at: \$0.15 / GB / month
 - Data Transfer: Tiered \$0.17/ GB to \$0.10/GB
 - Requests: nominal charges

Amazon S3 Momentum

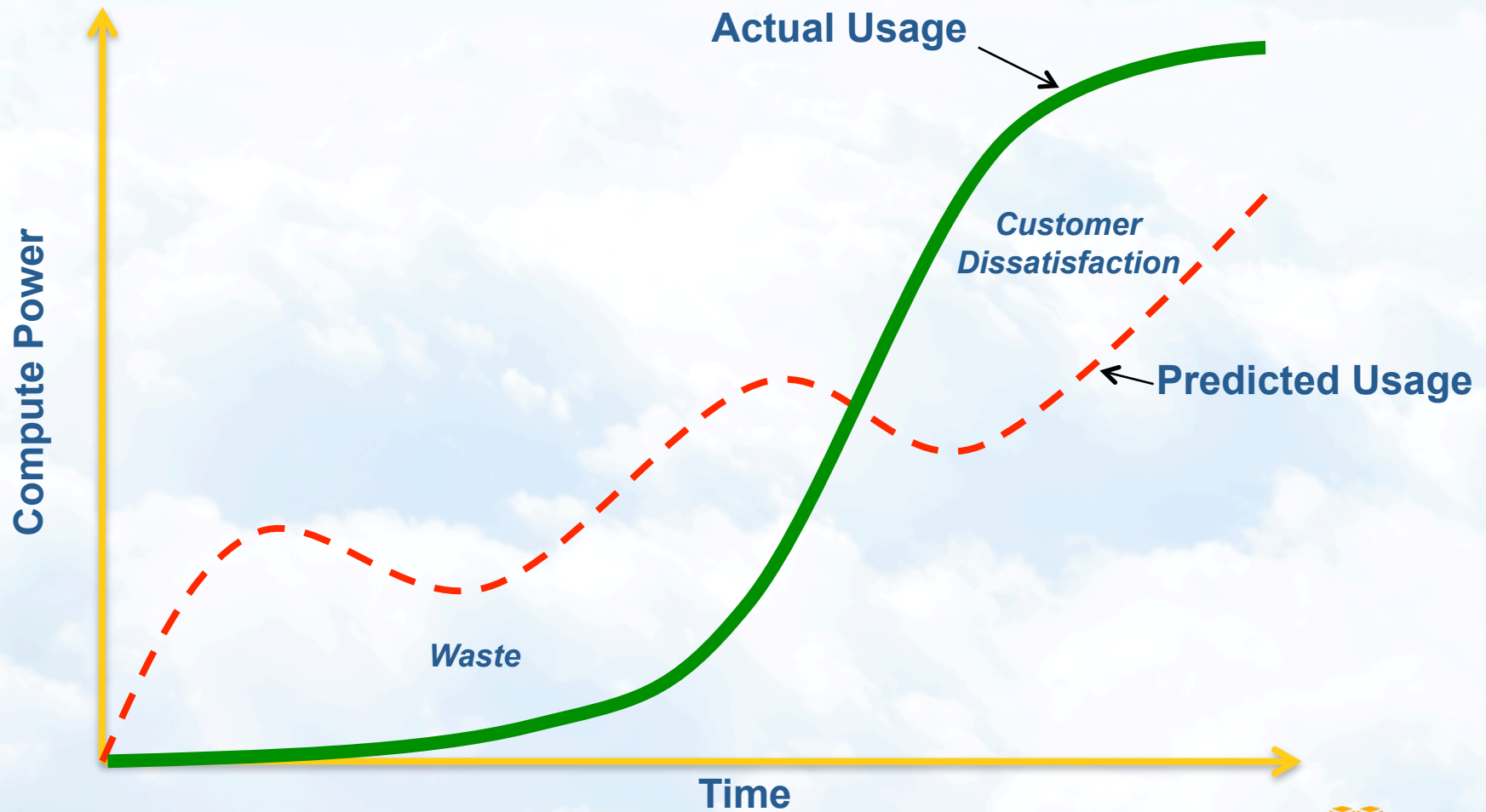


Total Objects Stored in Amazon S3

Amazon Elastic Compute Cloud

- Virtually unlimited computing power
 - Obtain and boot new server instances in minutes
 - Quickly scale capacity up or down
- Full root access to a Linux or Windows virtual computer
 - Basic Linux instances: From \$0.10 / hour
 - Basic Windows Server instances: From \$0.125 / hour
- Recent features
 - Now in both North America & Europe
 - Deploy across Availability Zones for reliability
 - Elastic IPs provide greater flexibility
 - Persistent storage with Elastic Block Store
- Service-Level Agreement – 99.95%

Predicting Infrastructure Needs



Many Uses for AWS

- Elastic computing
- Media distribution
- Scalable Web sites
- Business continuity (backup/recovery)
- Record retention and management
- Financial applications
- High-performance computing
- Software development/testing

AWS In the Enterprise



Development Organizations

- Use development platforms you already know
- Fast access to compute power and storage
- Automatically scale to the needs of your business
- Pay only for what you use, with no commitments



IT Organizations

- Secure, dependable, and fast infrastructure services
- Easily provision resources for one-off projects
- Service the needs of the entire organization without jeopardizing in-progress projects

Many Enterprise AWS Scenarios

Elastic Computing

The New York Times

Scalable Web Sites

ESPN

Backup and Recovery

ORACLE®

Financial Applications

NASDAQ

Large-scale Simulation

Lilly

Cloud Computing and Oracle

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web services™

Cloud Computing and Oracle

- Cloud Computing today
 - Developers are the primary users
 - Enterprises are evaluating infrastructure readiness
 - Non-mission critical systems
- Oracle's goal is to make cloud computing relevant to enterprises by
 - Providing right set of products and services
 - Lead the industry efforts in developing Cloud standards, ensure data security, etc.
- Amazon is #1 Cloud Computing vendor & Oracle's 1st Partner



Deploying Oracle Software in the Cloud

Oracle Database 11g on EC2

- Pre-configured virtual machine images (AMIs) available for EC2
- Consists of Oracle Enterprise Linux + Oracle Database 11g + Application Express
 - No Real Application Clusters (RAC) support currently (EC2 does not support clusters)
- Fully configured hardware and Oracle Database environment in less than 30 minutes
 - For test, dev, QA, POC, and other short-term projects
 - Such projects otherwise often get bottlenecked by IT
 - Can also be used as “sandbox” to try out new releases/options
- More AMIs to be released in the future



ORACLE®

Oracle WebLogic Server on EC2

- Certified Oracle WebLogic Server on EC2
 - Rigorous functional testing
 - Packaged for easy consumption
 - Ready to run
- Use Cases
 - Development & Testing
 - Provides access to machines otherwise out of reach
 - Production
 - Easy to configure and deploy for hosting web apps



Oracle WebLogic Server

- Suitable for Production Deployments
 - 32 & 64 bit AMIs
- Basis for Customization




Component	Description	Version Number
OEL JeOS Operating System	OEL JeOS is a headless version of the Oracle Enterprise Linux 5.2 Operating System.	Oracle Enterprise Linux 5 Update 2 JeOS-1.0.1
WebLogic Server	The WLS components included in a complete WLS installation, with the exception of: <ul style="list-style-type: none">- Server Examples- WebLogic Web Server Plug-ins- Workshop Components	WebLogic Server 10.3.0.0
JRockit JRE	JRockit provides the Java run-time environment for the WLS instances	JRockit JDK 6.0 R27.6 (Java version 1.6.0_05)

Getting Started: Oracle on Amazon EC2

- Sign up for Amazon Web Services and EC2
 - Can use your regular Amazon account
 - Create your secure X.509 certificate and create key pair for command line access to EC2
 - Using tools like SSH and PuTTY
- Download and install EC2 command line tools

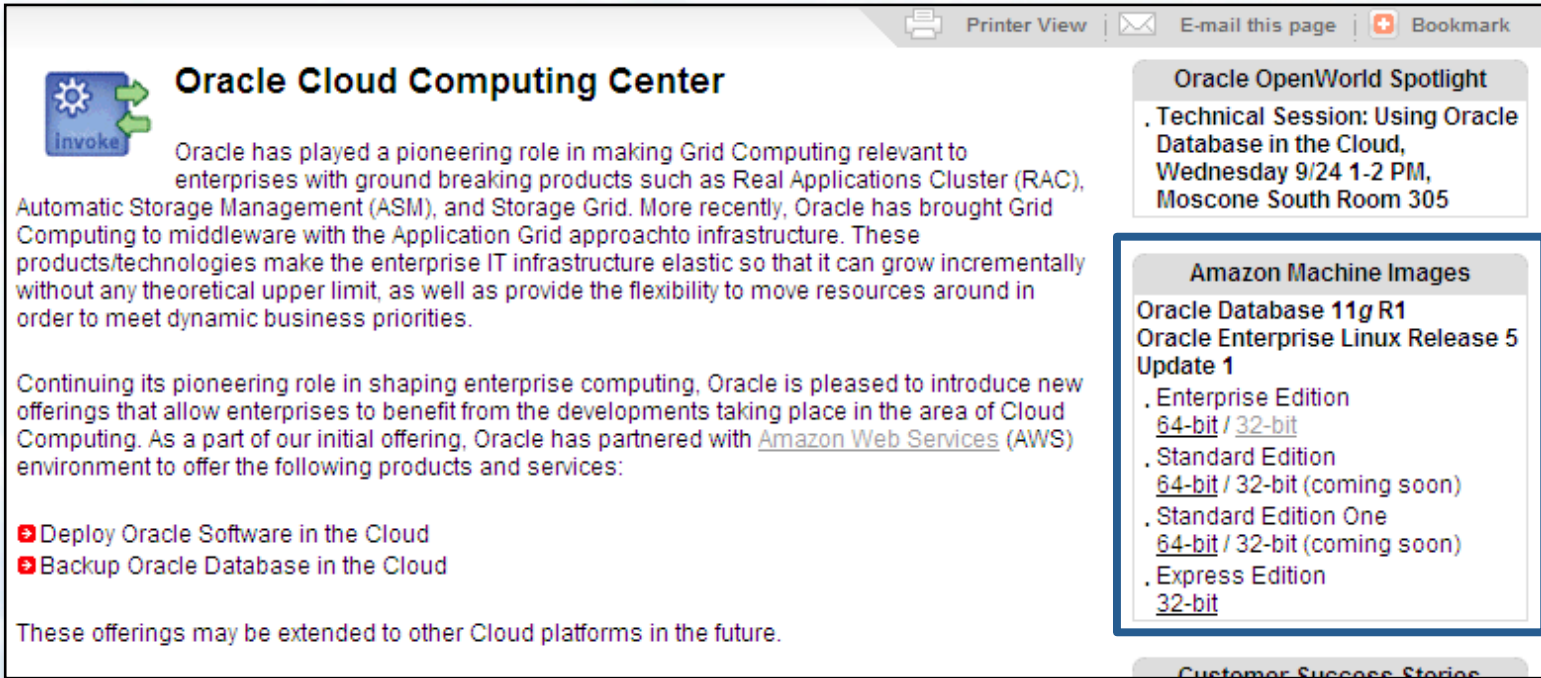
<http://aws.amazon.com>



The screenshot shows the Amazon Web Services website. At the top, there is the Amazon Web Services logo and navigation links for 'About AWS', 'Products', 'Solutions', and 'Resources'. Below the navigation, there is a breadcrumb trail: 'Home > ... > Amazon Elastic Compute Cloud > Developer Tools'. The main heading is 'Sample Code & Libraries'. Underneath, there is a section titled 'Amazon EC2 Command-Line Tools'. This section includes a 'Printer Friendly' link, a 'Save to del.icio.us' button, and an 'Average Review' section with a star rating. The text describes the tools as a client interface to the Amazon EC2 web service. There is a 'Submitted By' field with the name 'Attila@AWS' and buttons for 'Discussion' and 'Reviews'. A 'Download' section follows, with a link to 'Download the Amazon EC2 Command-Line Tools from Amazon S3.' and a note to see related technical documentation.

Getting Started: Oracle on Amazon EC2

Pick an Oracle AMI



The screenshot shows the Oracle Cloud Computing Center website. At the top right, there are navigation links for 'Printer View', 'E-mail this page', and 'Bookmark'. The main content area is titled 'Oracle Cloud Computing Center' and features an 'invoke' button with a gear icon. The text describes Oracle's role in Grid Computing and its partnership with Amazon Web Services (AWS). A sidebar on the right contains an 'Oracle OpenWorld Spotlight' section with a technical session announcement and an 'Amazon Machine Images' section listing Oracle Database 11g R1 and Oracle Enterprise Linux Release 5 Update 1. At the bottom of the sidebar, there is a 'Customer Success Stories' section.

Oracle Cloud Computing Center

Oracle has played a pioneering role in making Grid Computing relevant to enterprises with ground breaking products such as Real Applications Cluster (RAC), Automatic Storage Management (ASM), and Storage Grid. More recently, Oracle has brought Grid Computing to middleware with the Application Grid approach to infrastructure. These products/technologies make the enterprise IT infrastructure elastic so that it can grow incrementally without any theoretical upper limit, as well as provide the flexibility to move resources around in order to meet dynamic business priorities.

Continuing its pioneering role in shaping enterprise computing, Oracle is pleased to introduce new offerings that allow enterprises to benefit from the developments taking place in the area of Cloud Computing. As a part of our initial offering, Oracle has partnered with [Amazon Web Services \(AWS\)](#) environment to offer the following products and services:

- Deploy Oracle Software in the Cloud
- Backup Oracle Database in the Cloud

These offerings may be extended to other Cloud platforms in the future.

Oracle OpenWorld Spotlight

- . Technical Session: Using Oracle Database in the Cloud, Wednesday 9/24 1-2 PM, Moscone South Room 305

Amazon Machine Images

Oracle Database 11g R1
Oracle Enterprise Linux Release 5 Update 1

- . Enterprise Edition
[64-bit](#) / [32-bit](#)
- . Standard Edition
[64-bit](#) / 32-bit (coming soon)
- . Standard Edition One
[64-bit](#) / 32-bit (coming soon)
- . Express Edition
[32-bit](#)

Customer Success Stories

<http://www.oracle.com/goto/cloud/>




Getting Started: Oracle on Amazon EC2

Pick an Oracle AMI

Amazon Machine Images (AMIs)

Oracle Database 11g Release 1 Enterprise Edition - 32 Bit

 [Printer Friendly](#)  [Save to del.icio.us](#) Average Review: ★★★★★

This is an Oracle Corporation supplied and publicly available AMI that includes Oracle Enterprise Linux Release 5 Update 1 and Oracle Database 11g Release 1 Enterprise Edition - 32 Bit.

[Discussion](#)
[Reviews](#)

Submitted By:	hodakoracle
AMI ID:	ami-cecb2fa7
AMI Manifest:	oracle-corporation/database-ami/32-bit/oracle_11106_EE_32Bit-image.manifest.xml
License:	Public

This AMI comes with Oracle Enterprise Linux Release 5 Update 1 and Oracle Database 11g Release 1 Enterprise Edition software pre-installed and configured on the 32 Bit platform. In a matter of minutes, you can have a fully configured Oracle Database computing environment running on Amazon EC2 that includes the web based management tool Enterprise Manager Database Control and the web based rapid development tool Applications Express (APEX). For further information about Oracle Database in the Cloud or this Amazon Machine Image, please visit <http://www.oracle.com/technology/tech/cloud/index.html>

<http://www.oracle.com/goto/cloud/>



Getting Started: Oracle on Amazon EC2

Start a New EC2 Instance with Oracle AMI

- Configure EC2 firewall settings to open the required network ports (one time operation)
 - 1521 (listener), 8080 (APEX), 1158 (EM), etc.

```
ec2-authorize default -p 1158
```

- Start up an EC2 Instance with Oracle AMI

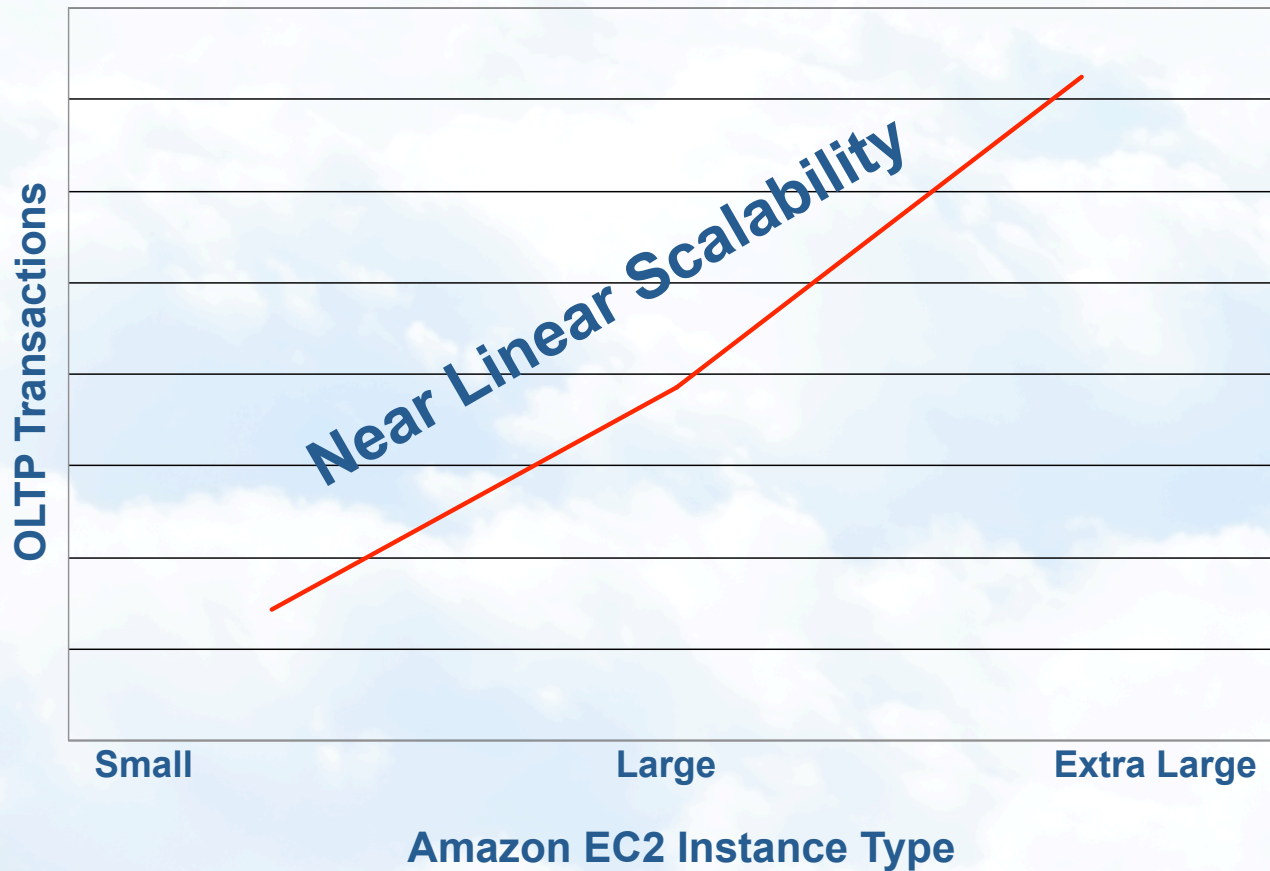
```
ec2-run-instances ami-cecb2fa7 -k <keypair>
```

Key Amazon EC2 Features

- Elastic (Static) IP Addresses
 - Pre-assigned static IP addresses that can be associated with any EC2 instance
- Elastic Block Storage
 - Persistent “NAS” style storage
 - Allows users to create volumes and snapshots
 - Default EC2 storage is ephemeral – you lose everything the moment you shut down an instance
- Availability Zones
 - Spread your instances across multiple locations for business continuity
- Security
 - Private/Public key pair based, SSH-only administrator access
 - Ability to configure firewall and network port settings

Oracle on Amazon EC2

Performance and Scalability



Maximizing Availability and Security

- Oracle Data Guard + Availability Zones = High Availability
 - Scale-out disaster recovery, business continuity, and read scalability
- Transparent Data Encryption
 - Encrypts data on disk without requiring application changes
- Network Encryption
 - Encrypts in-flight data
- Virtual Private Database
 - Users only see the data that they are authorized to see

Oracle Software Cloud Licensing

- Oracle software can now be licensed for the Cloud
 - Amazon EC2 supported today
- All editions of Database, Middleware, Grid Control
 - EE: Each virtual core counted as a physical x86 core (EE)
 - SE/SE1 license based on the EC2 instance size
 - 0-4 virtual cores = 1 processor (socket)
 - >4 virtual cores = each 4 virtual core counted as a processor (socket)
- Oracle Enterprise Linux
 - Each EC2 instance is counted as a “System”
- Can buy new licenses or use existing ones
- Customers with ULAs can use EC2 without any additional license

Oracle on EC2 First Reactions

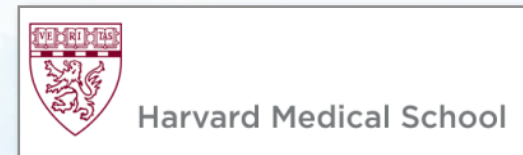
From the AWS Website Forums

“First class Database + linux available in 8 minutes!!. Don't you believe? Try this AMI and enjoy with APEX and its GUI for the administration. Specially amazing with EBS.”

Oracle in the Cloud

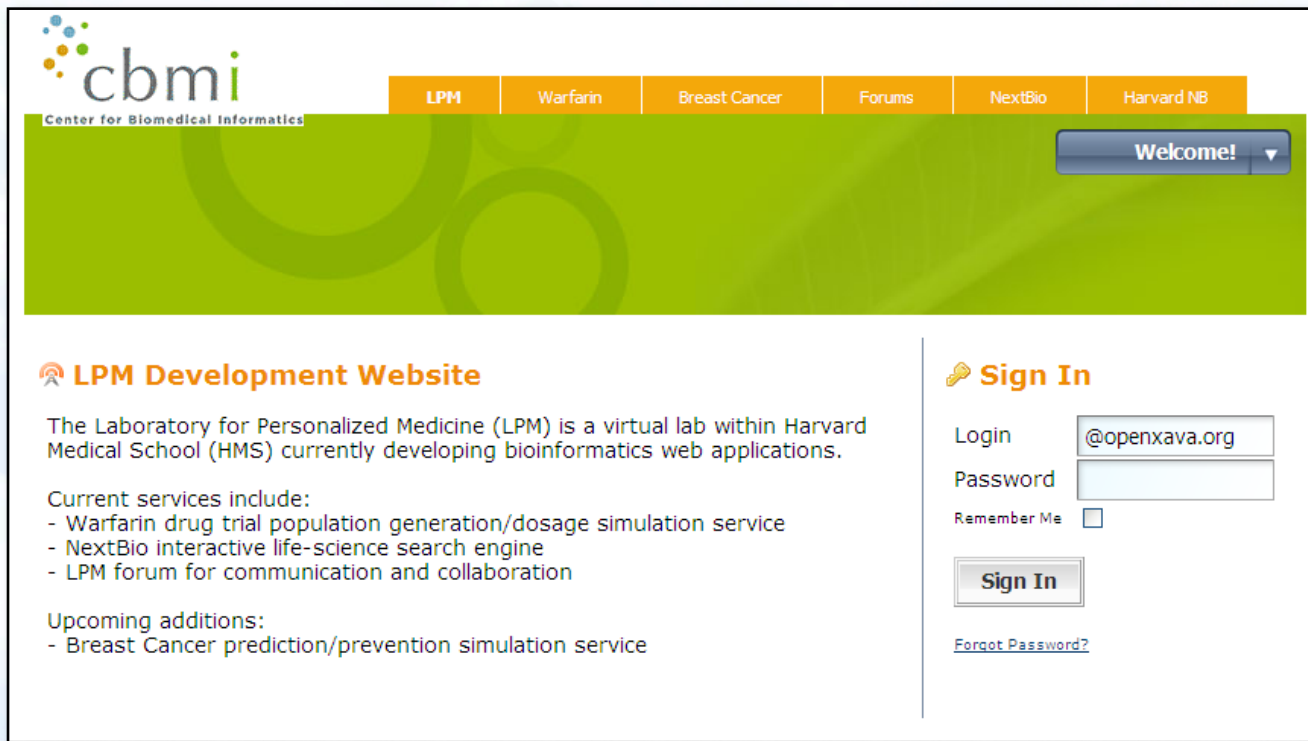
Customer Success Story — Harvard Medical School

- Clinical and drug simulation application
- Technical challenges
 - Short development time
 - Unpredictable peaks and troughs
 - Limited capital budget
 - Minimal technical and administrative complexity
- Solution
 - Oracle Database 11g on Amazon EC2
 - Participated in Oracle on EC2 beta program
 - Developed the entire application in 4 weeks



Oracle in the Cloud

Customer Success Story — Harvard Medical School



The screenshot shows the homepage of the Center for Biomedical Informatics (cbmi) LPM Development Website. The header features the cbmi logo and a navigation menu with links for LPM, Warfarin, Breast Cancer, Forums, NextBio, and Harvard NB. A green banner with a 'Welcome!' button is positioned below the navigation. The main content area is divided into two columns. The left column, titled 'LPM Development Website', provides an overview of the Laboratory for Personalized Medicine (LPM) and lists current services and upcoming additions. The right column, titled 'Sign In', contains a login form with fields for 'Login' (containing '@openxava.org') and 'Password', a 'Remember Me' checkbox, a 'Sign In' button, and a 'Forgot Password?' link.

cbmi
Center for Biomedical Informatics

LPM Warfarin Breast Cancer Forums NextBio Harvard NB

Welcome!

LPM Development Website

The Laboratory for Personalized Medicine (LPM) is a virtual lab within Harvard Medical School (HMS) currently developing bioinformatics web applications.

Current services include:

- Warfarin drug trial population generation/dosage simulation service
- NextBio interactive life-science search engine
- LPM forum for communication and collaboration

Upcoming additions:

- Breast Cancer prediction/prevention simulation service

Sign In

Login

Password

Remember Me

[Forgot Password?](#)

<http://ec2-75-101-221-79.compute-1.amazonaws.com:8080/web/guest/home>



Oracle in the Cloud

Customer Success Story — Harvard Medical School



“The combination of Oracle and AWS allowed us to focus our time and energy on simulation development, rather than technology, to get results quickly”

— Dr. Peter Tonellato

Current services include:

- Warfarin drug trial population generation/dosage simulation service
- NextBio interactive life-science search engine
- LPM forum for communication and collaboration

Upcoming additions:

- Breast Cancer prediction/prevention simulation service

Password

Remember Me

[Forgot Password?](#)

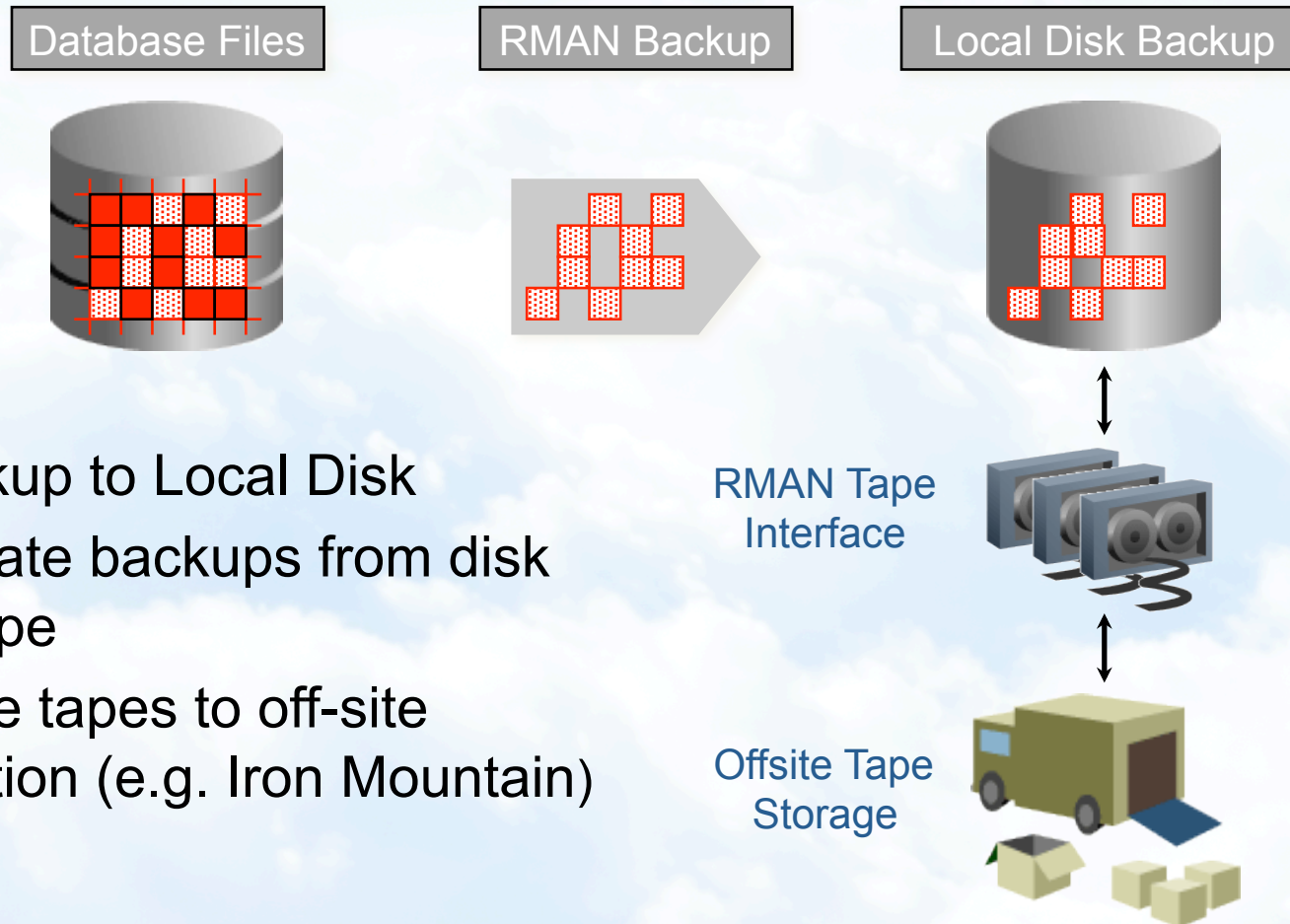
<http://ec2-75-101-221-79.compute-1.amazonaws.com:8080/web/guest/home>



Oracle Cloud Backup and Amazon S3

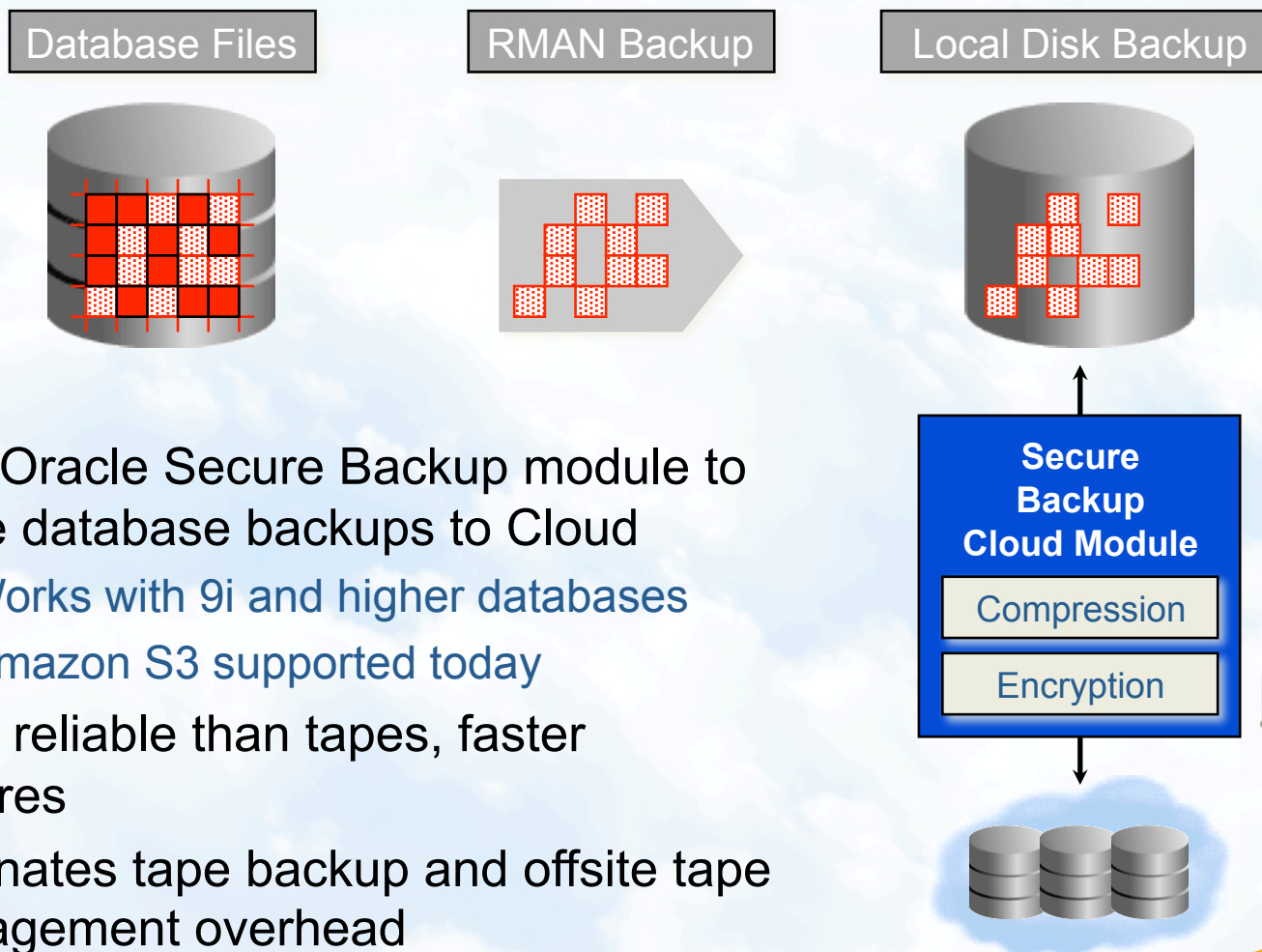


Current Database Backup Best Practice



- Backup to Local Disk
- Migrate backups from disk to tape
- Move tapes to off-site location (e.g. Iron Mountain)

Offsite Backups in the Cloud



- New Oracle Secure Backup module to move database backups to Cloud
 - Works with 9i and higher databases
 - Amazon S3 supported today
- More reliable than tapes, faster restores
- Eliminates tape backup and offsite tape management overhead

Oracle Secure Backup Cloud Module

- A new library that interfaces with RMAN and Amazon S3
 - Using RMAN's SBT (Tape) Interface
 - Part of Oracle Secure Backup product family
 - Licensed based on number of concurrent parallel streams (RMAN channels)
 - Includes encryption and compression capability
- Currently available on Linux 32, Linux 64, Windows 32
 - Cloud Backup Installer included in Oracle AMIs
 - Download available on OTN!
- Fully compatible with existing backup scripts and EM

See Cloud Backup TWP on OTN for details

Database Backups to Cloud

Benefits

- Always accessible, Faster restore
 - No need to call any one, ship tapes
 - Cloud backups can be used to quickly create test, dev DBs
- Better reliability
 - Disks are more reliable than tapes
 - S3 makes several redundant copies for data
- Cost effective
 - No capital expense
 - Compelling S3 storage costs
 - Can reduce tape backup software licensing and support costs
 - Eliminates need for additional offsite storage

Database Backups to Cloud

Performance — Viable Even for Large Databases

DB Size (GB)	Full DB Backup Time	Incremental Backup Time	Monthly Amazon S3 Cost
500	4 Hours	30 Minutes	\$200
300	2 Hours	15 Minutes	\$125
100	40 Minutes	5 Minutes	\$50

On-premises DB; Compressed Parallel Backups

Oracle on Amazon EC2

Best Practices

- Data Persistence with Elastic Block Storage (EBS)
- Migrating to EC2
 - Backup on-premise database to S3 using Cloud Module
 - Restore database on EC2
- Security
 - EC2 Firewall
 - Only open necessary ports (to necessary networks)
 - Encryption
 - Oracle Transparent Data Encryption
 - Network Encryption
- High Availability
 - Oracle Data Guard + AWS Availability Zones
 - Primary Database in Availability Zone “A”
 - Standby Database in Availability Zone “B”
 - Oracle Secure Backup Cloud Module

Q&A

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Useful Links

- Amazon Web Services website:
<http://aws.amazon.com/>
- Amazon Web Services blog:
<http://aws.typepad.com/>
- Oracle Database page:
<http://www.oracle.com/database/>
- Oracle Cloud Computing Center:
<http://www.oracle.com/goto/cloud/>

Thank You

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Appendix A

Service-by-Service Slides

Amazon Public Datasets

- Free, centralized data repository enables low-cost collaboration for AWS cloud-based applications
- Pre-built data repositories for immediate use:
 - Ensembl Annotated Human Genome
 - 3-D PubChem Library
 - UGI Virtual Conformer Library
 - 1980, 1990, and 2000 U.S. Census Bureau data
 - U.S. Department of Labor statistical data
 - Much more coming soon...
- Share your own datasets with the AWS community

Amazon CloudFront

- Powerful and efficient
 - Serves content via worldwide edge locations
 - Low latency, high throughput, elastic, reliable
- Easy to get started and use
 - Simple, easy to learn API
 - Seamless use with other AWS services
 - Works great with content stored in Amazon S3
- Cost-effective
 - No contracts or commitments
 - Pay as you go
 - Transparent pricing

Amazon SimpleDB

- Core database functionality without the operational complexity of RDBMS
 - Query semi-structured data
 - No index maintenance or performance tuning
 - Availability equivalent to 3-way cluster
 - No schemas
- Simple Query/SOAP API (Domains, Items and Attributes)
- Pay as you go
 - Pay per GB, Pay per Query (machine utilization)
 - Free usage tier for a limited time

Amazon Simple Queue Service

- Reliable, highly scalable, hosted queue for messaging
- SendMessage, ReceiveMessage, DeleteMessage
- Easy to build automated workflows for all applications, including those hosted within Amazon EC2
- Pay as you go
 - Pay per message sent

Other Amazon Web Services

Amazon DevPay

Billing and Account Management Service

Enables you to sell applications built on Amazon S3 and Amazon EC2 and hand the billing off to Amazon

Amazon Flexible Payments Service

Payments service built from ground up for developers

Supports multiple payment methods, including credit cards, bank transfers, or Amazon accounts

Support for micro-payments

Easiest way to charge Amazon customers

Can leverage the same account and payment information already on file with the Amazon.com retail site

Amazon Mechanical Turk

Cost-effective access to a diverse, on-demand workforce








Elastically scale up or down

Perfect for high-volume micro tasks

Programmatic access through web service API



AWS Premium Support

Activity	Free	Silver	Gold
Variety of online support options <ul style="list-style-type: none">•Resource Center•Service Health Dashboard•Developer Forums			
Personalized assistance from an AWS Developer Support Engineer with deep technical expertise <ul style="list-style-type: none">•Assistance with all technical problems, including guidance on getting started with AWS•As-needed escalation to AWS engineers•Fast, predictable response times			
Unlimited number of support cases			
Web-based support during normal business hours			
Phone-based support around the clock			

Starting at \$0.10 per dollar of total monthly AWS usage

