



Using the Cloud as a Software Testing Solution in an USGCB Environment

How Federal Clients Can Easily Test and Review Desktop Software Applications

Roger Jesrani, Chris Siege, Nathan Sikes
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Presentation Path

- Project Background
- Software Deployment Efforts of Release 1.0 for Client Testing
- Discovery of the Roadblock
- Understanding the USGCB
- Solutions Considered
- Using the Cloud
- Testing in Action
- Results

Project Background

- The Practice Transformation Project is sponsored by:
 - The **Office of the National Coordinator for Health Information Technology (ONC)**;
 - The **Agency for Healthcare Research and Quality (AHRQ)**.

- Ultimate Goals of the Project include:
 - Identify and Develop “best practices” for Electronic Health Record (EHR) implementations;
 - Develop effective tools and robust training programs to assist 100,000 primary healthcare providers to become meaningful users of EHRs.

Computer Task for the Project

- RTI Research Computing Division was tasked with designing and developing a software toolkit that will:
 - **Assess,**
 - **Plan,**
 - **Evaluate** EHR implementation efforts for each medical practice;

Early Software Direction

- Excel Solution (Prototypes)



Pros: Ease of Development, Familiar Interface



Cons: High Level of Difficulty in Managing Data Integration between Modules; High Volume of Manual Intervention

- Web-based Solution



Pros: Allowed ease of support and deployment



Cons: Medical Practices may not trust all practice demographic and financial data being centrally located

Final Software Direction

- Desktop Software



Ease of Development,



Enhanced GUI, and



Comprehensive Data Integration



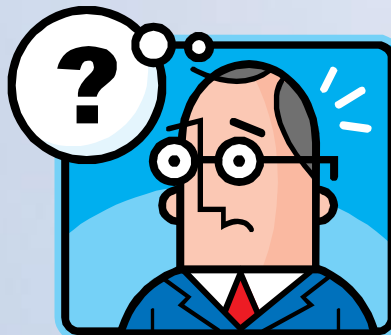
- On Track and
the Future Looked Bright!

Testing Release Version 1.0

- Deployment of Testing Release v1.0
 - Created and Installation Package (.EXE)
 - Posted the package on an FTP share
 - Provided credentials to clients to retrieve the package and install the software

Testing Release Version 1.0

- Testing Feedback
 - Main Client Liaison tested the software and provided feedback
 - Were told (much) later that other clients could not install the package
 - **What was wrong with the installation package?**



Deployment Search and Discovery

- Main Client Liaison installed the software on his personal PC and not his work PC
- Nothing was wrong with the installation package software
- Hit a roadblock called the **USGCB**

What is the USGCB?

- The purpose of the United States Government Configuration Baseline (USGCB) initiative is to create security configuration baselines for Information Technology products widely deployed across the federal agencies.
- The USGCB is a Federal government-wide initiative that provides guidance to agencies on what should be done to improve and maintain an effective configuration settings focusing primarily on security.
- The USGCB is a baseline recommendation of security settings. *Agencies may have stricter settings.*

Benefits of USGCB

- Consistent capability across the Federal Government
 - Common configuration eases testing and compatibility issues
 - apps developed by one agency can run on other agency
- Lower support costs
 - Consistent desktop configuration reduces support requirements
- Improved Agility
 - testing and deployment of applications, updates and patches is dramatically accelerated
- Improved security
 - standard users don't have administrative privileges which are commonly needed to install applications

Testing Conundrum



Would agency IT officials to install the software on all stakeholders' machines for testing?

– No.



Use a personal PC?

– No.



Offer a virtual Windows instance on the RTI network for testing?

– No.



Offer a virtual Windows instance in the Cloud for testing?

– **Yes!**

Uses of the Cloud & the Virtual Desktop



SaaS,
PaaS,
IaaS

The Cloud

EHR Tools Project



SaaS
(Virtual
Desktop)

Service Providers in the Cloud



Enter the Cloud Solution for Testing

- Normally used for web applications, the “cloud” can be used for testing desktop applications as well.
- The project team chose Amazon Web Services (AWS) for our cloud environment set up user roles for all testers, both project members and clients.
- Once in place the team asked our Federal Clients to test the application given the proper links, credentials, and instructions.

AWS Free Usage Tier – 12 Months



Amazon EC2 »

Web service that provides resizable compute capacity in the cloud.



Amazon CloudWatch »

Monitoring for AWS cloud resources and applications.



Amazon EBS »

Highly available, highly reliable, predictable storage volumes.



Amazon SNS »

Web service to set up, operate, and send notifications from the cloud.



Amazon SWF »

Workflow service for building scalable, resilient applications.



Amazon S3 »

Highly-scalable, reliable, and low-latency data storage.



AWS Data Pipeline »

Orchestration for data-driven workflows.



Amazon ELB »

Web service that provides scalability and high availability.



Amazon Elastic Transcoder »

Convert your media files easily, at low cost and at scale.



AWS Marketplace »

Partner software pre-configured to run on AWS.



Amazon RDS »

Managed MySQL, Oracle and SQL Server databases.



Amazon DynamoDB »

Fully managed NoSQL database service with seamless scalability.



Amazon ElastiCache »

Managed scale-out caching.



Amazon SQS »

Scalable queue for storing messages as they travel between computers.

Amazon Web Server Options
















Request Instances Wizard


Cancel X

CHOOSE AN AMI INSTANCE DETAILS CREATE KEY PAIR CONFIGURE FIREWALL REVIEW

Choose an Amazon Machine Image (AMI) from one of the tabbed lists below by clicking its **Select** button.

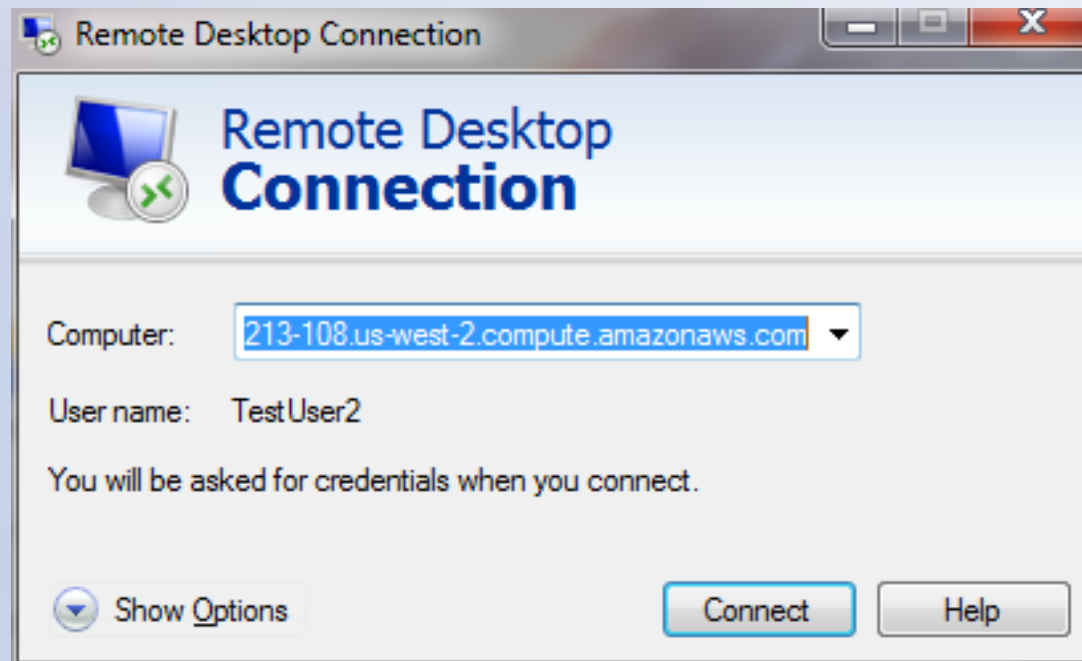
Quick Start My AMIs Community AMIs AWS Marketplace

	Amazon Linux AMI 2013.03.1 The Amazon Linux AMI is an EBS-backed, PV-GRUB image. It includes Linux 3.4, AWS tools, and repository access to multiple versions of MySQL, PostgreSQL, Python, Ruby, and Tomcat. Root Device Size: 8 GB	<input checked="" type="radio"/> 64 bit <input type="radio"/> 32 bit		Select 
	Red Hat Enterprise Linux 6.4 Red Hat Enterprise Linux version 6.4, EBS-boot. Root Device Size: 6 GB	<input checked="" type="radio"/> 64 bit <input type="radio"/> 32 bit		Select 
	SUSE Linux Enterprise Server 11 SUSE Linux Enterprise Server 11 Service Pack 3 basic install, EBS boot with Amazon EC2 AMI Tools preinstalled; Apache 2.2, MySQL 5.5, PHP 5.3, and Ruby 1.8.7 available Root Device Size: 10 GB	<input checked="" type="radio"/> 64 bit <input type="radio"/> 32 bit		Select 
	Ubuntu Server 12.04.2 LTS Ubuntu Server 12.04.2 LTS, with support available from Canonical (http://www.ubuntu.com/cloud/services). Root Device Size: 8 GB	<input checked="" type="radio"/> 64 bit <input type="radio"/> 32 bit		Select 
	Ubuntu Server 13.04 Ubuntu Server 13.04 with support available from Canonical			Select 

 Free tier eligible if used with a micro instance. See [AWS free tier](#) for complete details and terms.

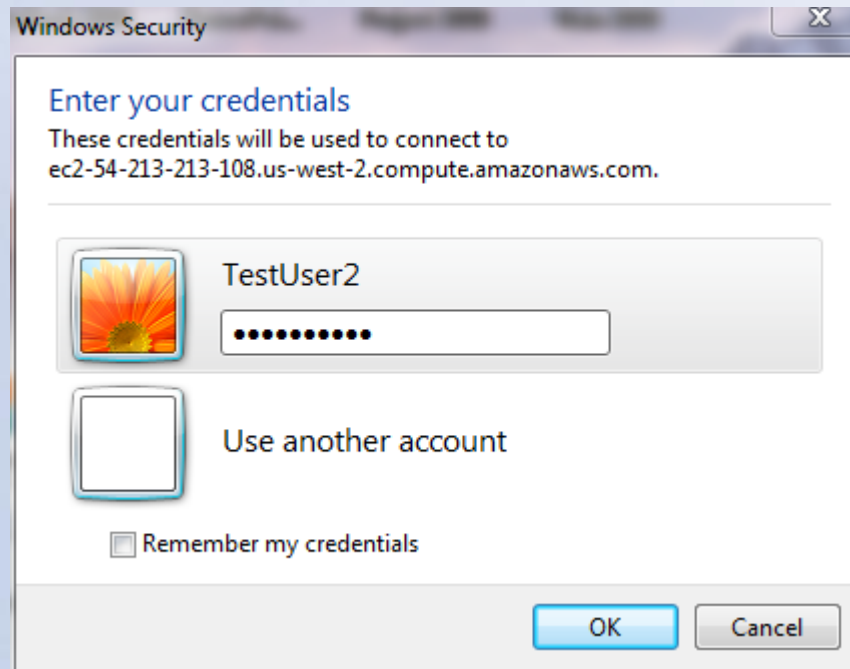
How to test in the Cloud?

- Access the environment using Windows Remote Desktop Connection
- Enter the address. IP Address will work too.



Signing In

- Supply the User Name.
- Enter the Password and click OK.



Voila! A Windows Desktop (Virtual Server)

ec2-54-213-213-108.us-west-2.compute.amazonaws.com

```
Hostname : WIN-RFCCU39NGPG
Instance ID : i-e3dd10d4
Public IP Address : 
Private IP Address : 
Availability Zone : us-west-2b
Instance Size : t1.micro
Architecture : AMD64
Total Memory : 613 MB
Processing Power : up to 2 ECUs
I/O Performance : Low
```

Recycle Bin

Practice Transforma...

What is Cloud Comp... Cisco IP Communica... Outlook Scientific Stature - n... Presentation1 - Micr... ec2-54-213-108...

1:15 PM

Running the Windows Application

ec2-54-213-213-108.us-west-2.compute.amazonaws.com

```

Hostname : WIN-RFCCU39NGPG
Instance ID : i-e3dd10d4
Public IP Address :
Private IP Address :
Architecture :
Platform :
Availability Zone : us-west-2b
CPU Options : t1.micro
Memory : AMD64
Storage : 613 MB
Network : up to 2 ECUs
Security : Low
    
```

Practice Transformation Toolkit

Practice Transformation Starts Here

- Welcome and tutorial
- Help
- About

Assessment

- Practice Readiness Tool
- Change Management Primer
- Provider Incentive Tool
- Practice Profile Tool
- Priorities, Goals and Objectives

Planning

- Practice Plans
- Vendor Selection Tool

Implementation

- Project Management and Implementation Plan
- Vendor Management Tool
- EHR Vendor Reports

Evaluation and Continuous Improvement

- Continuous Quality Improvement Primer
- Continuous Improvement Tool
- Satisfaction
- Sustainability and Enhancement
- PCHM and ACO Roadmap

HealthIT.gov
National Learning Consortium
Advancing American's Health Care

Taskbar: What is Cloud Comp..., Cisco IP Communica..., Outlook, Scientific Stature - n..., Presentation1 - Mic..., ec2-54-213-213-108...

System Tray: 1:18 PM

The Results?

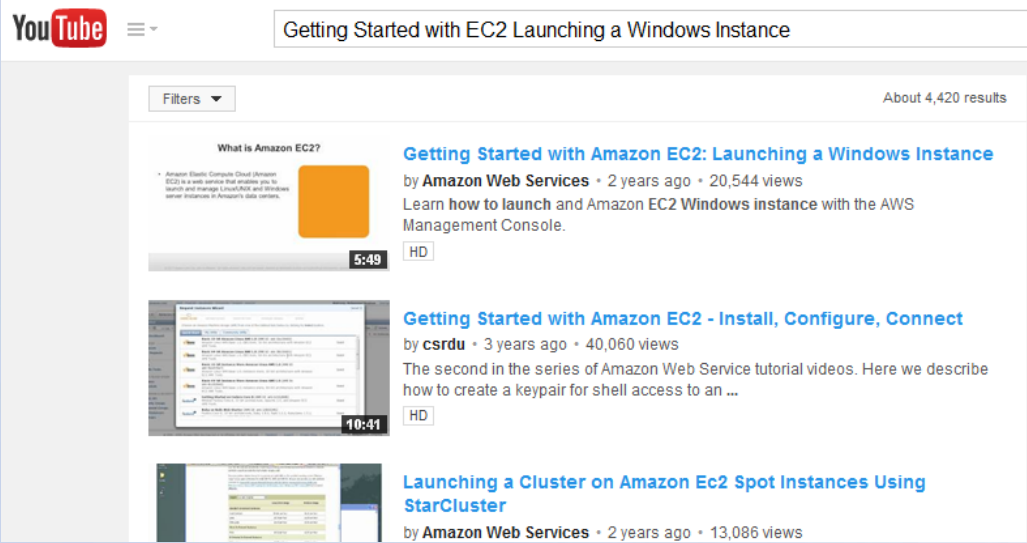
- Everybody celebrated our success!

A photograph of Barack and Michelle Obama. Barack is on the right, wearing a white polo shirt, and is kissing Michelle on the cheek. Michelle is on the left, wearing a dark blue top, and is smiling broadly. A blue speech bubble is overlaid on the left side of the image, containing the text 'They got it to work!'.

**They
got it to
work!**

Getting Started with AWS EC2

- YouTube Instructional Videos are Highly Recommended!
- Go to YouTube and enter the following search keywords:
 - “Getting Started with EC2 Launching a Windows Instance”



The screenshot shows a YouTube search results page. The search bar contains the text "Getting Started with EC2 Launching a Windows Instance". The page displays three video results:

- Getting Started with Amazon EC2: Launching a Windows Instance**
by Amazon Web Services • 2 years ago • 20,544 views
Learn how to launch and Amazon EC2 Windows instance with the AWS Management Console.
5:49 HD
- Getting Started with Amazon EC2 - Install, Configure, Connect**
by csrdu • 3 years ago • 40,060 views
The second in the series of Amazon Web Service tutorial videos. Here we describe how to create a keypair for shell access to an ...
10:41 HD
- Launching a Cluster on Amazon Ec2 Spot Instances Using StarCluster**
by Amazon Web Services • 2 years ago • 13,086 views

The Good News

- 12 Months Free use in AWS!
- You are in Total Control!
- You can also deploy Web Applications in the Cloud for review and testing

The Not So Good News

- The AWS Free trial only lasts 12 months
 - **Pay as you go!**
 - Starting at 9.1 cents per hour (\$2.18/day; \$65.52/month) for a small Windows Server Instance
- You are in Total Control and you are responsible for:
 - Security
 - Backing up your work
 - Anything else you usually expect your IT infrastructure to provide

Questions?



Contact Us:

Roger Jesrani

rjesrani@rti.org

919-541-6132

Christopher Siege

csiege@rti.org

919-485-5605

Nathan Sikes

sikes@rti.org

919-316-3320

www.rti.org