



**PUG CHALLENGE AMERICAS**



**RIVER  
SIDE**  
*software*

# **Leveraging vmware and EC2 APIs**

**Gilles QUERRET**  
**Riverside Software**

# About the speaker

- Based in Lyon, France
- Working with Progress and Java since 10 years
- Started Riverside Software 5 years ago
- Focused on technical expertise and continuous integration in those environments
- Selling WebClient automation solution

# What is this session about ?

- Looking for a way to automate application deployment and testing ?
- Working with vmware ESX and managing many virtual machines ?
- No vmware and a credit card ? Do it in the cloud !
- No vmware, no credit card ? Try it for free with vmware Player !

# And not about...

- Not an introduction to ESX or Amazon EC2. It assumes you have a basic understanding on what they are.
- Not specifically for OpenEdge or any other Progress Software product, but examples will use OpenEdge

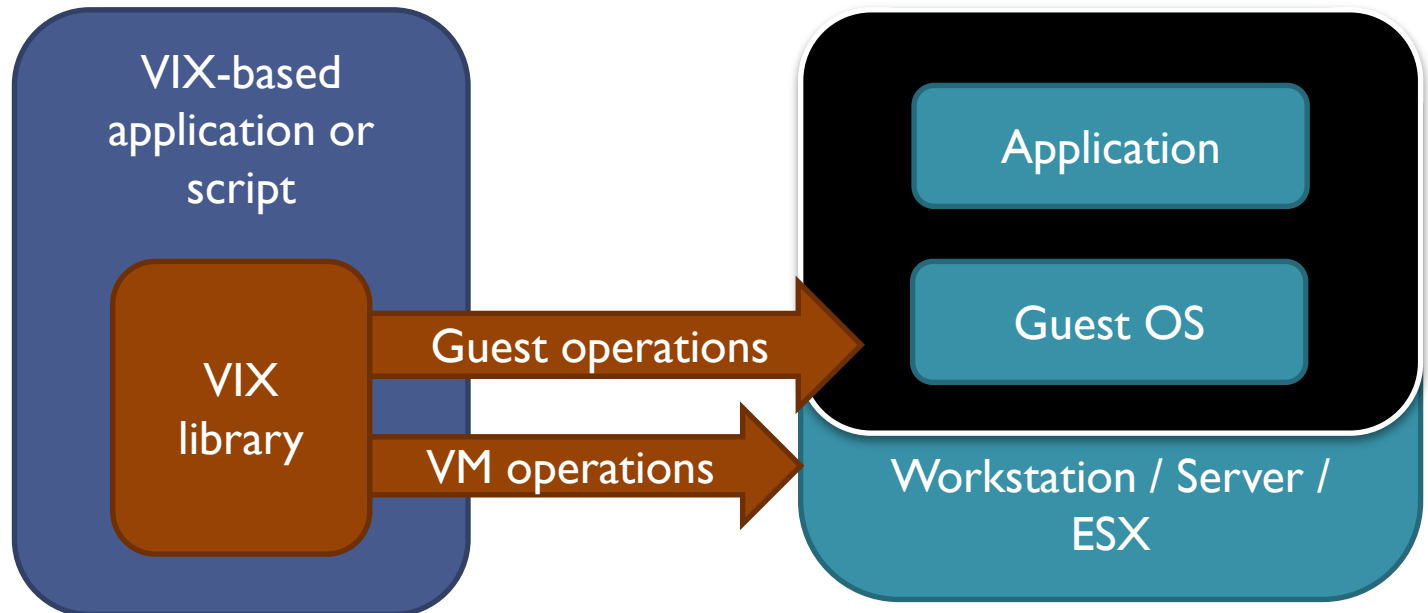
# Agenda

- Automation using VIX API
- Automation using AWS API
- An example use case
- Questions

# vmware®

- VIX API lets you write scripts and programs to automate virtual machine operations
- Bindings in C, Perl and COM
- Works on Windows and Linux
- Download from <http://www.vmware.com/support/developer/vix-api/>

# VIX API overview



# Operations

- VM Operations :
  - Power on, power off, suspend, resume
  - Snapshots, revert
- Guest operations :
  - Manipulate processes (execute, list, kill, ...)
  - File operations (copy, list, delete)
  - Share folders
  - ...



# VM operations

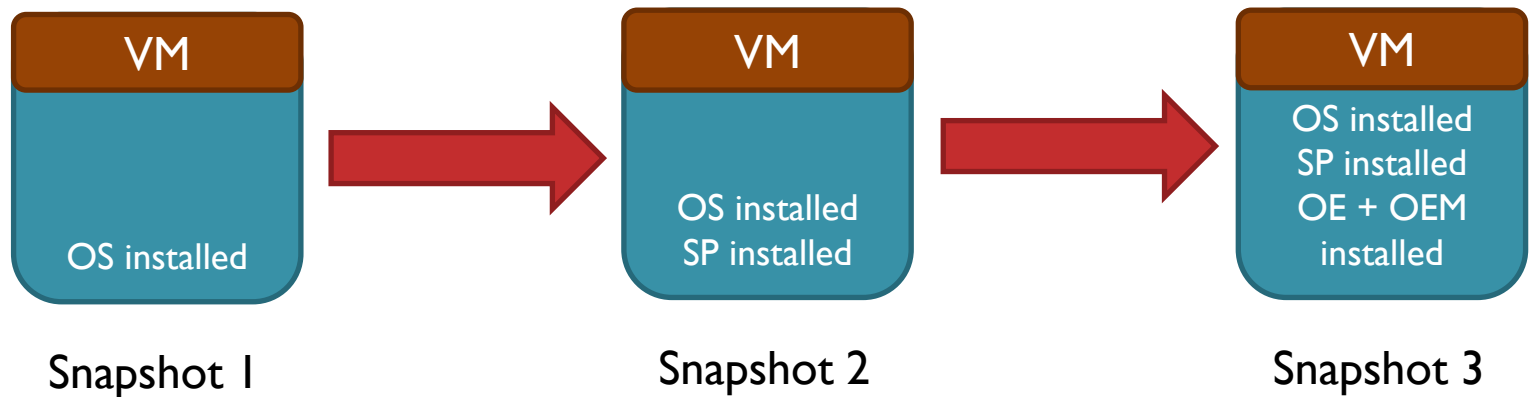
## Standard command line :

```
vmrun -T <player|server|ws|esx>  
      -h https://host-name/sdk  
      -u <host-user> -p <host-password>  
      operation  
      <vm-fullpathname> <operation-parameters>
```

## How to start an existing VM :

```
vmrun -T esx -h https://192.168.4.12/sdk -u root  
      -p "" start "[datastore1] MyVM/MyVM.vmx"
```

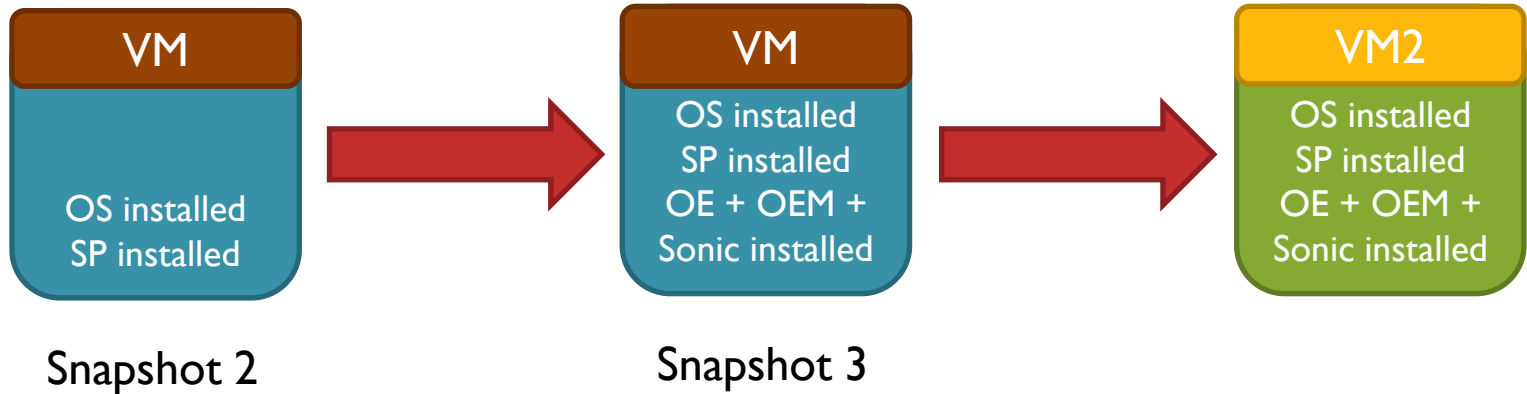
# VM operations • Snapshots



```
vmrun -T esx -h https://192.168.4.12/sdk -u root  
-p "" revertToSnapshot  
"[datastore1] MyVM/MyVM.vmx" Snapshot3
```

Caution : you lose **everything** after the snapshot !

# VM operations • Clones



```
vmrun -T esx -h https://192.168.4.12/sdk -u root  
-p "" clone "[datastore1] MyVM/MyVM.vmx"  
"[datastore1] MyVM2/MyVM2.vmx" full  
Snapshot3
```

Creates a brand new virtual machine with everything pre-installed

# Guest operations

## Standard command line :

```
vmrun -T <player|server|ws|esx>  
-h https://host-name/sdk  
-u <host-user> -p <host-password>  
-gu <guest-user> -gp <guest-password>  
operation  
<vm-fullpathname> <operation-parameters>
```

## How to list processes in existing VM :

```
vmrun -T esx -h https://192.168.4.12/sdk -u root  
-p "" -gu administrator -gp ""  
listProcessesInGuest  
"[datastore1] MyVM/MyVM.vmx"
```

# Guest operations • File copy

- Ability to copy files from host to a virtual machine
- Host can be a physical host or any virtual machine !
- You just don't care about SSH, domain authentications...
- You just need appropriate rights for the guest user

# Guest operations • File copy

## Copy a ZIP file from host to guest :

```
vmrun -T esx -h https://192.168.4.12/sdk -u root -p ""  
-gu root -gp "" copyFileFromHostToGuest  
"[datastore1] MyVM/MyVM.vmx" C:\Temp\MyApp.zip  
/tmp/MyApp.zip
```

- You can easily copy from Windows to Linux and vice-versa (with no setup) !
- To copy a set of files under Windows, use  
`for %%F in (C:\Temp\*.zip) do vmrun ...`

# Guest operations • Running scripts

## Execute a batch file and wait for termination :

```
vmrun -T esx -h https://192.168.4.12/sdk -u root -p ""  
-gu administrator -gp "" runProgramInGuest  
"[datastore1] MyVM/MyVM.vmx"  
C:\Windows\System32\cmd.exe /c  
C:\Temp\MyScript.bat
```

## Unzip a ZIP file :

```
vmrun -T esx -h https://192.168.4.12/sdk -u root -p ""  
-gu administrator -gp "" runProgramInGuest  
"[datastore1] MyVM/MyVM.vmx"  
C:\ProgramFiles\7-zip x C:\Temp\MyApp.zip  
-oC:\MyApp -y
```

# Guest operations • Running scripts

## Execute a bash script under Linux :

```
vmrun -T esx -h https://192.168.4.12/sdk -u root  
-p "" -gu root -gp "" runProgramInGuest  
"[datastore1] MyVM/MyVM.vmx"  
/bin/bash /tmp/myScript
```

## Execute a process in an active window :

```
vmrun -T esx -h https://192.168.4.12/sdk -u root  
-p "" -gu administrator -gp ""  
runProgramInGuest  
"[datastore1] MyVM/MyVM.vmx" -activeWindow  
C:\Windows\notepad.exe
```



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# Amazon EC2

- See Paul Koufalis session for an introduction to EC2
- Amazon offers WebServices to control your account (S3, instances, ...)
- SDK available in Java, download from <http://aws.amazon.com/sdkforjava/>
- Command line wrapper, download from <http://aws.amazon.com/developertools/351>

# EC2 API Tools • Setup

- JDK 1.5 must be installed, you can use JDK provided by OpenEdge :
  - `set JAVA_HOME=%DLC%\jdk`
- Unzip EC2 API Tools ZIP file, and set EC2\_HOME variable :
  - `set EC2_HOME=<drive:\path\to\ec2-tools>`
- Add programs to your PATH variable :
  - `set PATH=%PATH%;%EC2_HOME%\bin`
- Try basic command :
  - `ec2-version`  
1.4.4.2 2011-07-15

# EC2 API Tools • Setup

- Go to your AWS account, and create a X.509 certificate
- Be sure to keep your private key in a safe place ! You can only download it once.
- Download certificate locally
- Set variables for certificate and private key :
  - `set EC2_CERT=<drive:\path\to\certificate.pem>`
  - `set EC2_PRIVATE_KEY=<drive:\path\to\priv_key.pem>`
- Display available regions :
  - `ec2-describe-regions`  
REGION eu-west-1 ec2.eu-west-1.amazonaws.com  
REGION us-east-1 ec2.us-east-1.amazonaws.com  
REGION ap-northeast-1 ec2.ap-northeast-1.amazonaws.com  
REGION us-west-1 ec2.us-west-1.amazonaws.com  
REGION ap-southeast-1 ec2.ap-southeast-1.amazonaws.com
- Set specific region :
  - `set EC2_URL=https://ec2.eu-west-1.amazonaws.com`
- Describe key pairs :
  - `ec2-describe-keypairs`  
KEYPAIR RSSW XX:XX:XX:XX:XX:XX  
KEYPAIR Test XX:XX:XX:XX:XX:XX

# Instances • Find images

- Ec2-describe-images will list **lots** of available images. Let's add some filters :

- `ec2-describe-images -o amazon --filter="platform=windows"`

```
IMAGE    ami-4853783c    ec2-public-windows-image-
eu/IT-SqlSvrExp2003r2-x86_64-Win-v1.03.manifest.xml
amazon  available      public          x86_64
machine                windows instance-store  hvm
xen
IMAGE    ami-34537840    ec2-public-windows-image-
eu/IT-SqlSvrStd2003r2-x86_64-Win-v1.03.manifest.xml
amazon  available      public          x86_64
machine                windows instance-store  hvm
xen
```

# Instances • Start and stop

- `Ec2-run-instances ami-2853785c -k RSSW -g Security I`
- Starting windows instances can be long (up to 10 minutes) !
- Don't forget a security group with RDP for Windows, and SSH for Linux
- `Ec2-get-password i-XXXXXXX -k RSSW.pem`
- Getting password can be long too !

# Instances • Snapshots

- First, create a snapshot :
  - `Ec2-create-snapshot`
- Wait for snapshot creation :
  - `Ec2-describe-snapshot`
- Then register it :
  - `Ec2-register --snapshot XXX --description  
Desc --name XXX`

# Instances • Copy files

- Unfortunately, no way to copy files on EC2 instances
- On Linux, you can use SSH and scp
- One way is to push to Amazon S3, and then download from your instance



# Instances • Remote execution

- Unfortunately, no way to execute remote command lines on EC2
- On Linux, you can use SSH
- On Windows, you can use psexec from SysInternals
  - Psexec.exe \\full-name -u administrator -p password command line

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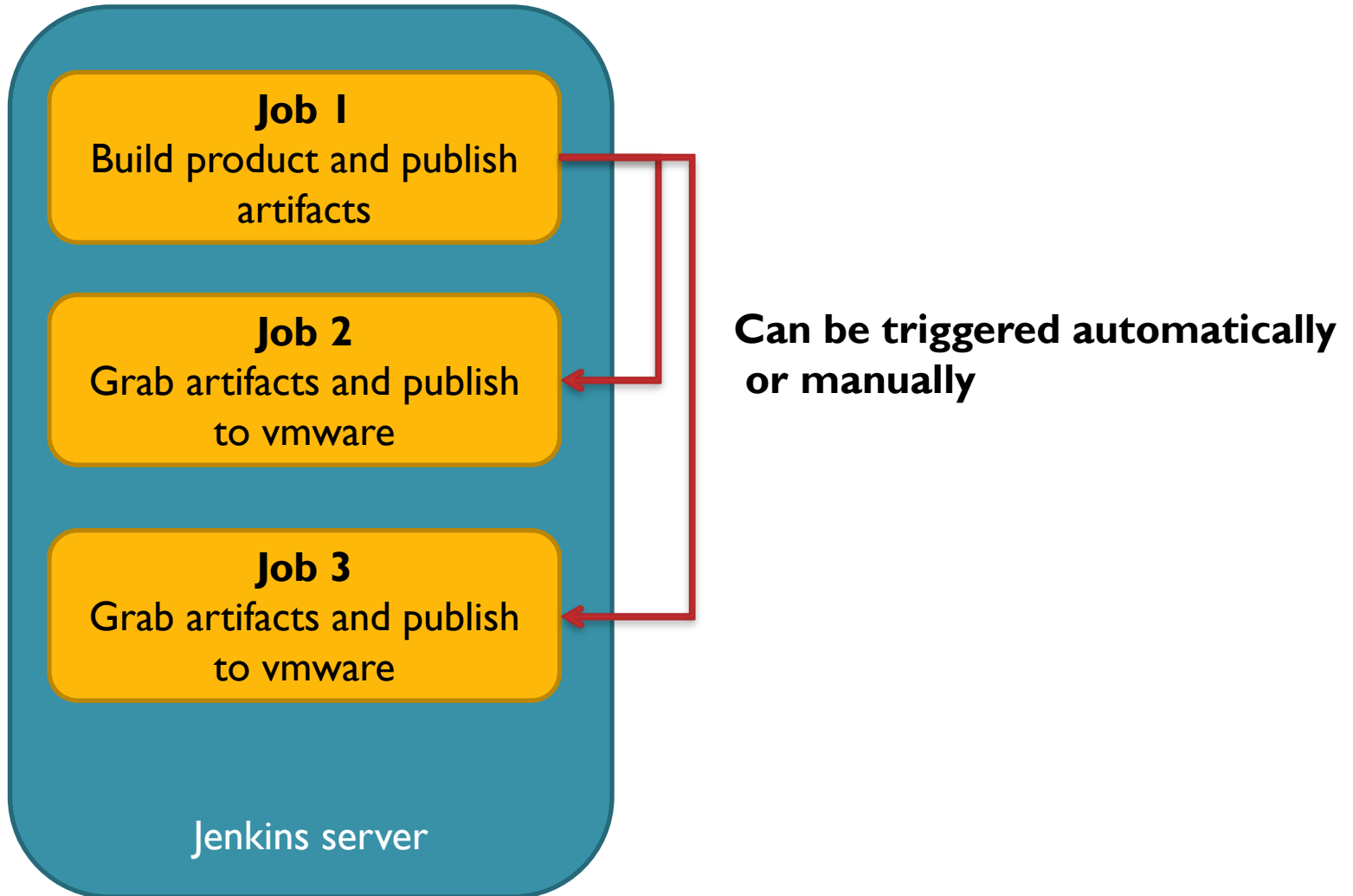
# Use case

- Follow-up of my continuous integration session
- Use build automation in Jenkins to build a full product
- Use vmware API to deploy it automatically to a new virtual machine

# Jenkins plugins

- Amazon S3 : push artifacts to S3 webservice
- Copy artifacts : move them from build job to deployment job
- Promotion : execute tasks after build job (beware of workspace)

# Jenkins overview



# Deployment job overview

## **Step 1**

Revert VM to snapshot and restart it

## **Step 2**

Copy artifacts to VM and installation script

## **Step 3**

Run install script on VM

## **Step 4**

Execute tests

Deployment job

Questions ?

