RHEL in Azure

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Agenda

- History and overview of Red Hat and Azure offerings
- General requirements (subscription and process requirements)
- RHEL build specifics
- Azure CLI installation and configuration
- Cloud deployment
What is Azure?

- Microsoft’s cloud platform
  - Build infrastructure
  - Develop applications
  - Managed SQL / NoSQL
  - Manage identity and access
Joint November 2015 Announcement

- Customers can use Red Hat Cloud Access to bring the following subscriptions to Azure
  - Red Hat Enterprise Linux
  - Red Hat Enterprise Linux Atomic Host
  - Red Hat Enterprise Application Server
  - Red Hat JBoss Enterprise Web Server
  - Red Hat Gluster Storage
  - Red Hat OpenShift Enterprise

- Red Hat and Microsoft engineering are collaborating on the following
  - .NET support for both Red Hat Enterprise Linux and OpenShift
  - Cloud Forms integration of both Azure and Microsoft System Center

- Joint support
  - Co-located engineers
  - Coordinated escalations and resolution
February 17, 2016 Announcement

• As of Feb 17\textsuperscript{th}, 2016, RHEL is available from the Azure Marketplace!
• RHEL 6.7 and RHEL 7.2 are currently available
• Newer versions of RHEL will be available as they are released
• Existing RHEL subscription not consumed, pay-per-hour instead
Steps needed to migrate existing RHEL to Azure

1. Have an Azure subscription
2. Have a RHEL subscription
3. Cloud Access enabled on RHEL subscription tying it to Azure subscription (glue!)
4. Your RHEL build (currently Azure Gallery doesn't offer a RHEL image)
5. Upload RHEL 6.x or RHEL 7.x image with Azure CLI
6. Create a VM with Azure CLI
Log into Azure: https://portal.azure.com
Find your Azure Subscription ID
Register your Subscriptions for Cloud Access
https://access.redhat.com/cloud/manager/image_imports/new

Register Image

Please complete all fields in order to register your image to a public cloud.

Red Hat Login: marc@skinnerlabs.com
Email Address: marc@skinnerlabs.com
Name: marc skinner
Company Name: No company listed
Cloud Provider: Microsoft Azure
Microsoft Subscription Number: 75c72cd5-c1dc-4d8c-bb2c-7a81a4bf4465
Product Name: RH00065 - 30 Day Red Hat Enterprise Linux Server Self-Supported
Quantity: 1
Cloud Access Registration Confirmation

Image Import was successfully created.

Image Registration Confirmation

You have successfully registered your image for import.
You may now move your image to your selected cloud provider.
Please access the provider's website for instructions on using their import tools.

Rechat Login: marc@skinnerlebs.com
Email Address: marc@skinnerlebs.com
Name: marc skinner
Company Name: No company listed
Cloud Provider: Microsoft Azure
Microsoft Account Number: 75c72cd5-c1dc-4d8c-bb2c-7a61a4bf4465
Product: RH00065 - 30 Day RHEL Server
Self-Supported Evaluation
Quantity: 1
RHEL on Azure image requirements

- NO LVM currently supported – only formatted partitions for primary OS disk
- LVM / DM-RAID may be used for data disks
- SSH must be enabled for remote access (key or password auth)
- IPv4 only
- Primary virtual network adapter should be configured for dhcp
- Swap space configured on Azure resource disk (either in image or later)
- Hyper-V device drivers
  - RHEL 6 installer will auto install them
    - `# lsinitrd | grep hv`
  - RHEL 7
    - Manual steps to follow (dracut)
    - `# lsinitrd | grep hv`
Image requirements

- Build/clone a RHEL 6.x or 7.x image on your hypervisor of choice:
  - KVM / virt-manager
  - VMware vSphere
  - Microsoft Hyper-V
  - Probably others (VirtualBox, Fusion could work)

- We used KVM and virt-manager to build and manipulate images
Create RHEL 6 image

- Virt-manager
  - Create new image – PXE boot, Satellite or ISO installation
  - Selected 4Gb RAM, 2VCPU
  - Selected 4Gb disk size using raw format
  - Installed “Basic Server”
RHEL6 :: Networking Configuration

- Modify /etc/sysconfig/network-scripts/ifcfg-eth0

  TYPE=Ethernet
  BOOTPROTO=dhcp
  PEERDNS=yes
  USERCTL=no
  IPV6INIT=no
  DEVICE=eth0
  ONBOOT=yes
RHEL6 :: Kernel / SSH Tweaks

- # vi /boot/grub.cfg
- Add the following parameters to the kernel line
  - earlyprintk=ttyS0 console=ttyS0 rootdelay=300 numa=off
- Remove the following parameters from the kernel line
  - rhgb quiet crashkernel=auto

- # vi /etc/ssh/sshd_config
- Update the following lines
  - PasswordAuthentication yes
  - ClientAliveInterval 180
RHEL 6 :: Package Requirements

- Assumption :: registered to RHN/Satellite for subscription
- # yum install -y wget yum-utils
- # subscription-manager repos --enable rhel-6-server-extras-rpms
- # yum -y install WALinuxAgent
- # chkconfig waagent on
- Edit /etc/waagent.conf
  - ResourceDisk.FileSystem=ext4
  - ResourceDisk.EnableSwap=y
  - ResourceDisk.SwapSizeMB=2048
  - Provisioning.DeleteRootPassword=y
- # rm -rf /etc/udev/rules.d/7*-persistent-net.rules
- # subscription-manager unregister
- # waagent --force --deprovision
- # export HISTSIZE=0
- # poweroff
Create RHEL 7 image

- virt-manager
  - Create new image – PXE boot, Satellite or ISO installation
  - Selected 4Gb RAM, 2VCPU
  - Selected 4Gb disk size using raw format
  - Installed “Minimal” and disabled kdump on the main install screen
RHEL7 :: Networking Configuration

- Modify /etc/sysconfig/network-scripts/ifcfg-eth0

  TYPE=Ethernet
  BOOTPROTO= dhcp
  PEERDNS=yes
  USERCTL=no
  IPV6INIT=no
  DEVICE=eth0
  ONBOOT=yes
RHEL7 :: Hyper-V Drivers

- Hyper-V drivers
  - Add following line to /etc/dracut.conf
  - `add_drivers+="hv_vmbus hv_netvsc hv_storvsc"
  - `# dracut -f -v`
  - `# lsinitrd | grep hv`
RHEL7 :: Kernel / SSH Tweaks

- # vi /etc/default/grub
- Add the following parameters to the end of GRUB_CMDLINE_LINUX
  - earlyprintk=ttyS0 console=ttyS0 rootdelay=300 numa=off
- Remove the following parameters from GRUB_CMDLINE_LINUX
  - rhgb quiet crashkernel=auto
- Rebuild grub2 config
- # grub2-mkconfig -o /boot/grub2/grub.cfg

- # vi /etc/ssh/sshd_config
- Update the following lines
  - PasswordAuthentication yes
  - ClientAliveInterval 180
RHEL 7 :: Package Requirements

- Assumption – registered to RHN/Satellite for subscription
- # yum install -y wget yum-utils net-tools
- # subscription-manager repos --enable rhel-7-server-extras-rpms
- # yum -y install WALinuxAgent
- # systemctl enable waagent.service
- Edit /etc/waagent.conf
  - ResourceDisk.FileSystem=ext4
  - ResourceDisk.EnableSwap=y
  - ResourceDisk.SwapSizeMB=2048
  - Provisioning.DeleteRootPassword=y
- # rm -rf /etc/udev/rules.d/7*-persistent-net.rules
- # subscription-manager unregister
- # waagent --force --deprovision
- # export HISTSIZE=0
- # poweroff
Convert Image to VHD Format - VHDX is not currently supported

- virt-manager default image location is: /var/lib/libvirt/images

- **RHEL 6**
  - # qemu-img convert -f raw -o subformat=fixed -O vpc rhel6.7-azure-template.img rhel6.7-azure-template.vhd

- **RHEL 7**
  - # qemu-img convert -f raw -o subformat=fixed -O vpc rhel7.2-azure-template.img rhel7.2-azure-template.vhd

- qemu-img also supports conversion of: vmdk, qcow2, vdi, etc.
Azure CLI Installation

- Install Azure CLI on an admin system:
  - Node.js 0.10 application
  - Support for Windows, OS X, Linux
  - `npm install -g azure-cli`

- For RHEL6:
  - `# subscription-manager repos --enable rhel-server-rhscl-6-rpms`
  - `# yum -y install nodejs010`
  - `# scl enable nodejs010 bash`
  - `# npm install -g azure-cli`

Azure CLI
Upload image to Azure

- `# azure account download`
- Save the download “[something].publishsettings”
- `# azure account import “[something].publishsettings”`
- Stores credentials into `~/.azure` directory
- `# azure account list`
- `# azure account show “your-subscription-ID”`
- `# azure vm image create rhel6-rhug --location "Central US" --os Linux /var/lib/libvirt/images/rhel6.7-azure-template.vhd`
- `# azure vm image create rhel7-rhug --location "Central US" --os Linux /var/lib/libvirt/images/rhel7.2-azure-template.vhd`

More about locations:
https://azure.microsoft.com/en-us/regions
Create/Start a VM in Azure

- **Deploying a machine with an SSH public key (recommended)**
  
  - # azure vm create rhel6-rhug-2 rhel6-rhug azure-user --location "Central US" --vm-size Medium --ssh -t .ssh/id_rsa.pub -P
  
  - # azure vm create rhel7-rhug rhel7-rhug azure-user --location "Central US" --vm-size Medium --ssh -t .ssh/id_rsa.pub -P

- **Deploying a machine with a password (Upper+lower+number+symbol)**
  
  - # azure vm create rhel6-rhug-2 rhel6-rhug azure-user Pa$$w0rd --location "Central US" --vm-size Medium --ssh
  
  - # azure vm create rhel7-rhug rhel7-rhug azure-user Pa$$w0rd --location "Central US" --vm-size Medium --ssh

Minimum recommended size for RHEL should be Medium (Standard_A2)
- 2vcpu, 3.5gb ram, 1 nic

Sizing details

Get info on RHEL VM

- # azure vm show rhel6-rhug-2
  - info: Executing command vm show
  - + Getting virtual machines
  - data: DNSName "rhel6-rhug-2.cloudapp.net"
  - data: Location "Central US"
  - data: VMName "rhel6-rhug-2"
  - data: IPAddress "100.115.226.91"
  - data: InstanceStatus "RoleStateUnknown"
  - data: InstanceSize "Medium"
  - data: Image "rhel6-rhug"
  - data: OSDisk hostCaching "ReadWrite"
  - data: OSDisk name "rhel6-rhug-2-rhel6-rhug-2-0-201602160055210847"
  - data: OSDisk mediaLink "https://rhel66azuretemplatevhd14.blob.core.windows.net/vm-images/k1xc400s.fmc201602160055210394.vhd"
  - data: OSDisk sourceImageName "rhel6-rhug"
  - data: OSDisk operatingSystem "Linux"
  - data: OSDisk iOType "Standard"
  - data: ReservedIPName"
  - data: VirtualIPAddresses 0 address "40.122.51.113"
  - data: VirtualIPAddresses 0 name "rhel6-rhug-2ContractContract"
  - data: VirtualIPAddresses 0 isDnsProgrammed true
  - data: Network Endpoints 0 localPort 22
  - data: Network Endpoints 0 name "ssh"
  - data: Network Endpoints 0 port 22
  - data: Network Endpoints 0 protocol "tcp"
  - data: Network Endpoints 0 virtualIPAddress "40.122.51.113"
  - data: Network Endpoints 0 enableDirectServerReturn false
  - info: vm show command OK
RHEL in Azure!
RHEL in Azure
Azure CLI

- Azure CLI is a Node.js application – I installed it on my admin server

Commands:

- help: account  Commands to manage your account information and publish settings
- help: config   Commands to manage your local settings
- help: hdinsight Commands to manage HDInsight clusters and jobs
- help: mobile   Commands to manage your Mobile Services
- help: network  Commands to manage your networks
- help: sb       Commands to manage your Service Bus configuration
- help: service  Commands to manage your Cloud Services
- help: site     Commands to manage your Web Sites
- help: sql      Commands to manage your SQL Server accounts
- help: storage  Commands to manage your Storage objects
- help: vm       Commands to manage your Virtual Machines
Resources:

Sign up for an Azure trial:
https://portal.azure.com

Log into your RHN account:
http://rhn.redhat.com

Register RHEL sub to the Cloud Access portal:
https://access.redhat.com/cloude/manager/image_imports/new

Virtual Machine conversion

Red Hat RHEL deploy in Azure
https://access.redhat.com/articles/1989673

Partnership and announcements


Summary

- Partnership of Red Hat and Microsoft Azure
- RHEL 6 and RHEL 7 are both supported offerings
- Options: Build new workloads or convert existing workloads
- Options: Use Azure Marketplace or bring your own RHEL sub