



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 17th, 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

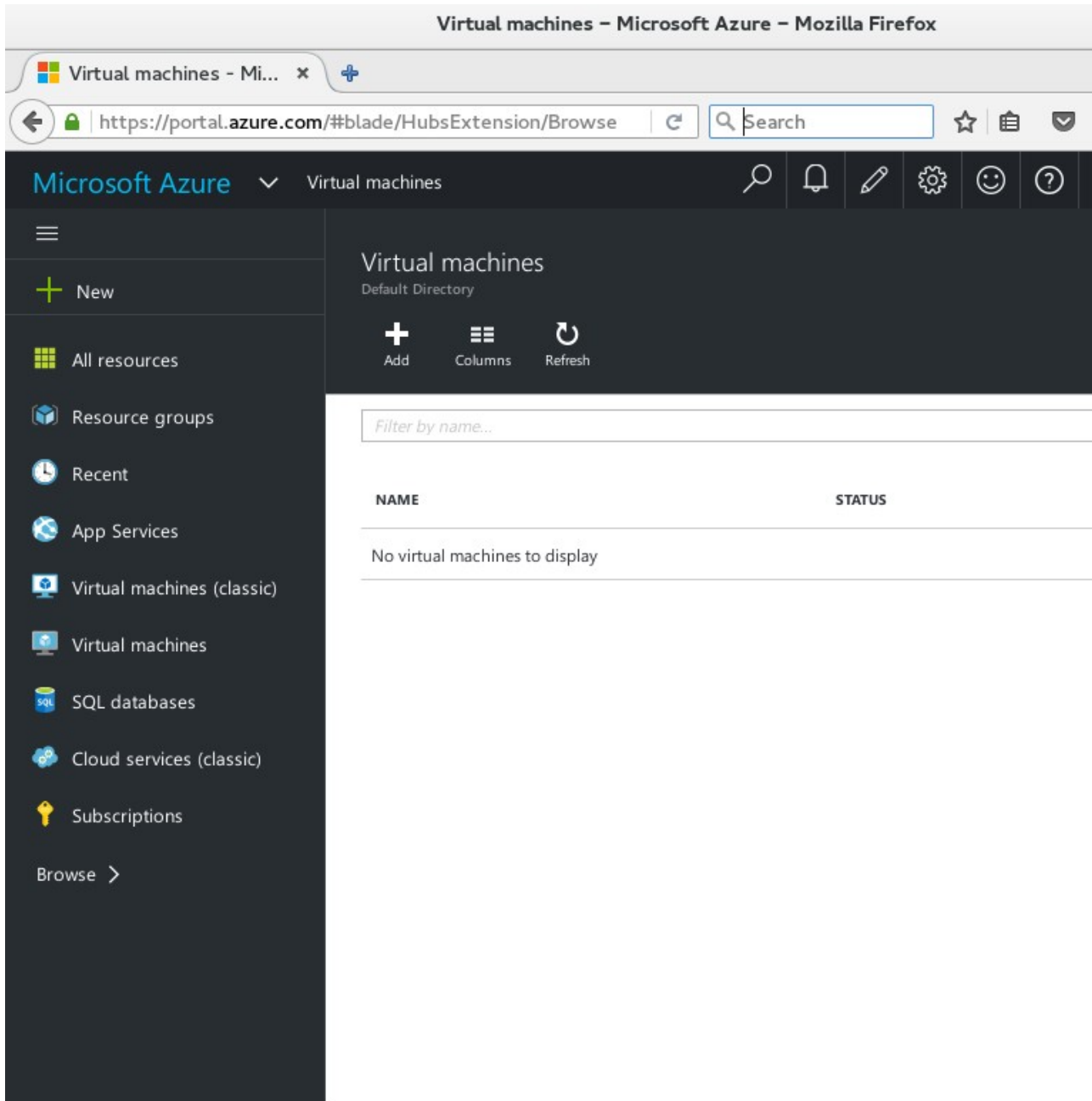


Steps needed to migrate existing RHEL to Azure

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>



The screenshot shows the Microsoft Azure portal interface in a Mozilla Firefox browser. The browser's address bar displays the URL <https://portal.azure.com/#blade/HubsExtension/Browse>. The page title is "Virtual machines - Microsoft Azure - Mozilla Firefox".

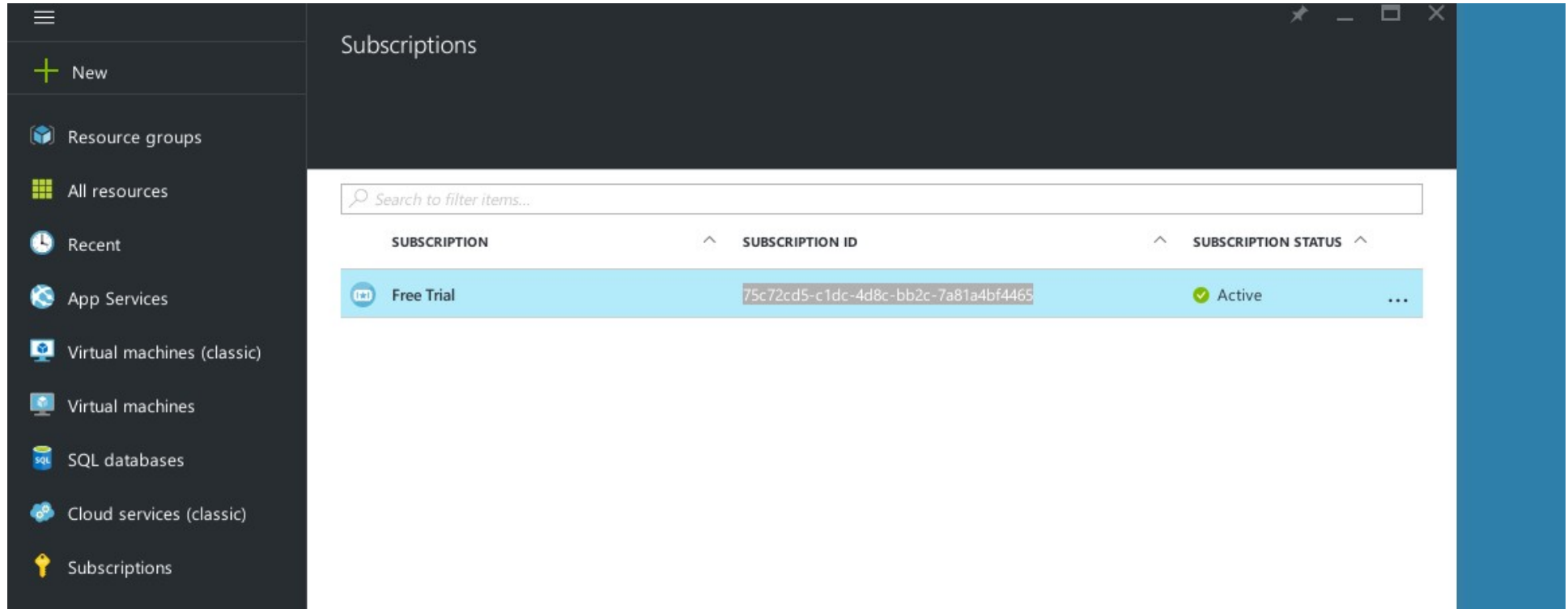
The main content area is titled "Virtual machines" and shows a "Default Directory". Below the title, there are three action buttons: "Add" (plus icon), "Columns" (list icon), and "Refresh" (refresh icon). A search filter box labeled "Filter by name..." is present above a table.

NAME	STATUS
No virtual machines to display	

The left sidebar contains a navigation menu with the following items: "New", "All resources", "Resource groups", "Recent", "App Services", "Virtual machines (classic)", "Virtual machines", "SQL databases", "Cloud services (classic)", and "Subscriptions". At the bottom of the sidebar is a "Browse >" link.



Find your Azure Subscription ID



The screenshot shows the Azure portal interface for the 'Subscriptions' section. On the left is a navigation sidebar with options like 'New', 'Resource groups', 'All resources', 'Recent', 'App Services', 'Virtual machines (classic)', 'Virtual machines', 'SQL databases', 'Cloud services (classic)', and 'Subscriptions'. The main content area is titled 'Subscriptions' and features a search bar and a table. The table has three columns: 'SUBSCRIPTION', 'SUBSCRIPTION ID', and 'SUBSCRIPTION STATUS'. A single row is visible, representing a 'Free Trial' subscription with the ID '75c72cd5-c1dc-4d8c-bb2c-7a81a4bf4465' and a status of 'Active'.

SUBSCRIPTION	SUBSCRIPTION ID	SUBSCRIPTION STATUS
Free Trial	75c72cd5-c1dc-4d8c-bb2c-7a81a4bf4465	Active



Register your Subscriptions for Cloud Access

https://access.redhat.com/cloude/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 E
Quantity	1

CANCEL

Submit



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.

Redhat Login	marc@skinnerlabs.com
Email Address	marc@skinnerlabs.com
Name	marc skinner
Company Name	No company listed
Cloud Provider	Microsoft Azure
Microsoft Account Number	75c72cd5-cldc-4d8c-bb2c-7a81a4bf4465
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
 - Kickstart in Azure: <http://bit.ly/1oHM9yY>
 - 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

<https://azure.microsoft.com/en-us/documentation/articles/xplat-cli-install>



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

<https://azure.microsoft.com/en-us/documentation/articles/virtual-machines-size-specs>



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!

The screenshot displays the Microsoft Azure portal interface. The top navigation bar shows the path: Microsoft Azure > Virtual machines (classic) > rhel6-rhug-2 > Settings. The left sidebar contains a navigation menu with options like 'New', 'Resource groups', 'All resources', 'Recent', 'App Services', 'Virtual machines (classic)', 'Virtual machines', 'SQL databases', 'Cloud services (classic)', and 'Subscriptions'. The main content area is split into two panes. The left pane, titled 'Virtual machines (classic)', shows a list of VMs with a table header 'NAME' and one entry 'rhel6-rhug-2'. The right pane, titled 'rhel6-rhug-2', shows the VM's status as 'Starting' and provides a table of essential details:

Property	Value
Resource group	rhel6-rhug-2
DNS name	rhel6-rhug-2.cloudapp.net
Status	Starting
Operating system	Linux
Location	Central US
Size	Standard A2 (2 Cores, 3.5 GB memory)
Subscription name	Free Trial
Virtual IP address	40.122.51.113
Subscription ID	75c72cd5-c1dc-4d8c-bb2c-7a81a4bf4465
Virtual network/subnet	-

Below the essentials, there is a 'Monitoring' section with a 'CPU percentage today' chart. The chart area is currently empty, displaying a message: 'Monitoring may not be enabled. Click here to turn on Diagnostics.' The x-axis of the chart is labeled with 'FEB 15', '6 AM', '12 PM', and '6 PM'. The y-axis is labeled 'CPU PERCENTAGE TODAY' and has a scale from 0% to 100%.



RHEL in Azure

The image displays the Azure portal interface for configuring a virtual machine. On the left, a navigation pane lists various resource types, including 'Virtual machines (classic)'. The main content area shows the 'Settings' page for a VM, with a search bar and a list of categories: 'SUPPORT & TROUBLESHOOTING' and 'GENERAL'. The 'Boot diagnostics' option under 'SUPPORT & TROUBLESHOOTING' is highlighted in blue. To the right, a terminal window shows the boot process of Red Hat Enterprise Linux Server release 6.7 (Santiago), including the kernel version and the 'localhost login:' prompt.

Resource groups
All resources
Recent
App Services
Virtual machines (classic)
Virtual machines
SQL databases
Cloud services (classic)
Subscriptions
Browse >

Delete
e...
dapp.net
3.5 GB memory
All settings →
Add tiles (+)
6 AM

Log Screenshot Settings

Search settings

SUPPORT & TROUBLESHOOTING

- Audit logs >
- Boot diagnostics >**
- Check health >
- Reset password >
- Troubleshoot >
- New support request >

GENERAL

- Properties >
- Disks >
- Network security group >
- IP addresses >
- Endpoints >
- Load balanced sets >
- Availability set >
- Extensions >
- Size >

```
Red Hat Enterprise Linux Server release 6.7 (Santiago)
Kernel 2.6.32-573.el6.x86_64 on an x86_64
localhost login: _
```



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

<https://azure.microsoft.com/en-us/documentation/articles/virtual-machines-linux-create-upload-vhd-redhat>

Red Hat RHEL deploy in Azure

<https://access.redhat.com/articles/1989673>

Partnership and announcements

<https://www.redhat.com/en/partners/strategic-alliance/microsoft>

<https://www.redhat.com/en/about/press-releases/microsoft-and-red-hat-deliver-new-standard-enterprise-cloud-experiences>

<https://azure.microsoft.com/en-us/campaigns/redhat/>



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





Questions?