

Oracle in the Cloud: AWS and Azure

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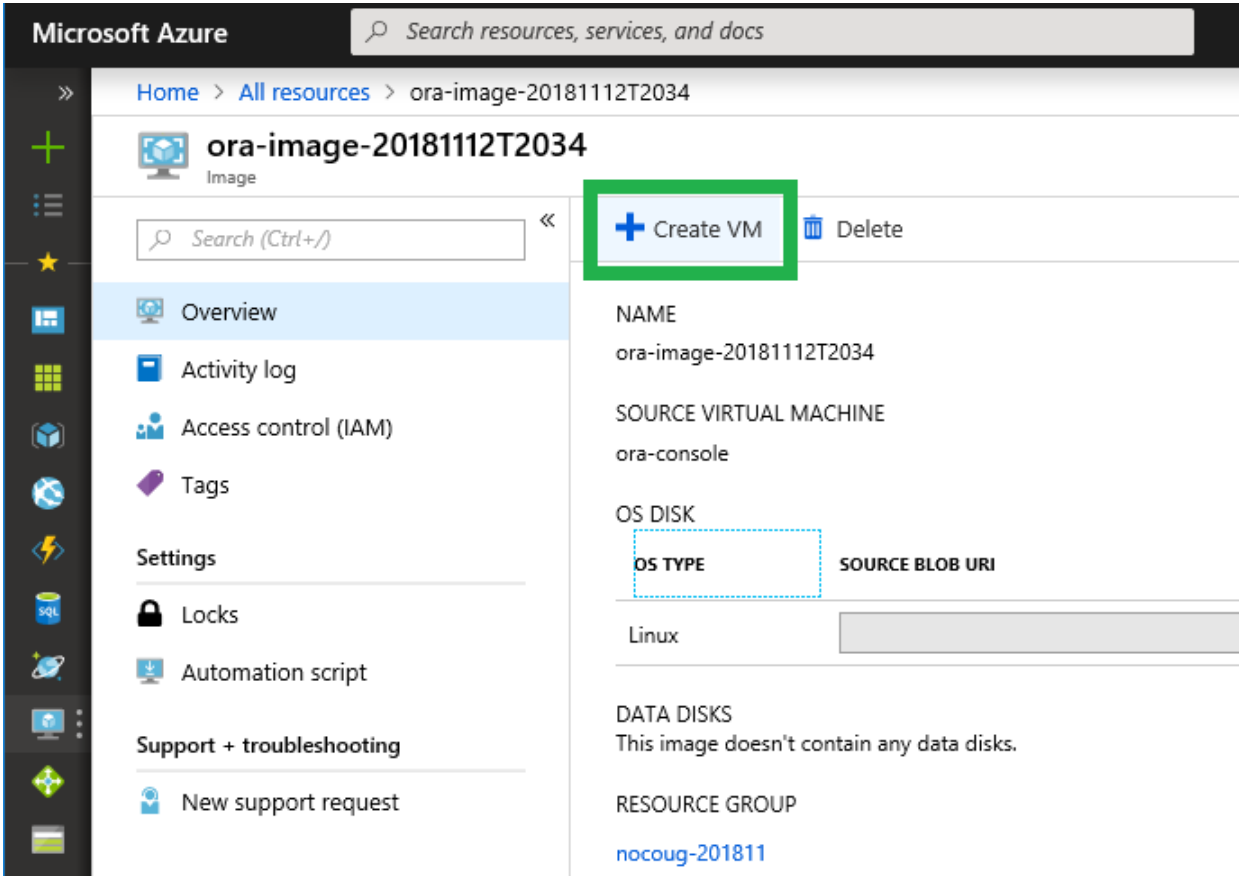
Goal: Create Oracle Databases Using...

- Azure Virtual Machine (unmanaged)
 - ~~Infrastructure as code: Resource Manager Templates~~
 - Manual: Azure Portal
- Amazon Relational Database Service (managed)
 - Infrastructure as code: CloudFormation
 - Manual: AWS Console
- Amazon Elastic Compute Cloud (unmanaged)
 - Infrastructure as code: CloudFormation
 - Manual: AWS Console

Compare Configuration Approaches

- Brainstorm advantages and disadvantages of:
 1. Manual approach
 2. Cloud vendor's proprietary infrastructure-as-code system
 3. Generic infrastructure-as-code system
(Chef, Puppet, Ansible, SaltCloud, Terraform, etc.)

Azure Portal: Create VM from Image



Azure Portal: Review VM Details

The screenshot shows the Microsoft Azure portal interface for creating a virtual machine. The breadcrumb navigation is: Home > All resources > ora-image-2018112T2034 > Create a virtual machine. The page title is "Create a virtual machine". A green banner indicates "Validation passed". The "Review + create" tab is selected in the navigation menu. The VM name is "ora-image-2018112T2034" and the size is "Standard B1ms" with "1 vcpu, 2 GB memory".

BASICS	
Subscription	Free Trial
Resource group	nocoug-201811
Virtual machine name	ora-console
Region	East US
Availability options	No infrastructure redundancy required
Authentication type	SSH public key
Username	centos

DISKS	
OS disk type	Premium SSD
Use managed disks	Yes

At the bottom, there are four buttons: "Create" (highlighted with a green border), "Previous", "Next", and "Download a template for automation".

Not Shown: Creating the Image

- Azure does not offer a managed Oracle service
- You must first:
 1. Create a virtual machine from a stock Linux image
 2. Download, install and configure Oracle
 3. Capture an image of the virtual machine
- Oracle supplies *commercial* images in the Azure Marketplace; you must bring your own license.
- Oracle does not supply a *free* image (Express Edition) in the Marketplace.

Amazon RDS CloudFormation Template Excerpt

```
[...]
```

```
  DbInst:
```

```
    Type: "AWS::RDS::DBInstance"
```

```
    Properties:
```

```
      DBInstanceClass: "db.t2.medium"
```

```
      AllocatedStorage: 20 # GiB
```

```
      StorageType: "gp2" # General-purpose SSD
```

```
      StorageEncrypted: true
```

```
      LicenseModel: "license-included"
```

```
      VPCSecurityGroups:
```

```
        - !Ref DbServerGenExVpcSecGrp
```

```
      MasterUserPassword: !Ref DbPassword
```

```
      BackupRetentionPeriod: 1 # days
```

```
      [...]
```

Amazon Console: Create Database

The screenshot shows the AWS Management Console interface for creating a database. The top navigation bar includes the AWS logo, 'Services', 'Resource Groups', a search icon, a notification bell, a user profile dropdown, 'N. Virginia' region, and 'Support'. The breadcrumb trail is 'RDS > Create database'. On the left, a vertical sidebar shows four steps: 'Step 1: Select engine', 'Step 2: Choose use case', 'Step 3: Specify DB details' (which is highlighted in bold), and 'Step 4: Configure advanced settings'. The main content area is titled 'Specify DB details' and contains a section for 'Instance specifications'. This section includes a link to the 'AWS Simple Monthly Calculator' for cost estimation. Below this, there are two dropdown menus: 'DB engine' is set to 'Oracle Database Standard Edition Two', and 'License model' is set to 'license-included'. Another dropdown menu shows 'DB engine version' set to 'Oracle 12.1.0.2.v14'.

Amazon Console: Launch EC2 Instance

The screenshot shows the AWS Management Console interface. At the top, the navigation bar includes the AWS logo, 'Services', 'Resource Groups', a notification bell, the user 'nocoug201708 @ paulm', the region 'N. Virginia', and 'Support'. On the left sidebar, the 'IMAGES' section is expanded to show 'AMIs'. A 'Launch' button is highlighted with a green box. The main content area displays a table of AMIs with a search filter 'AMI Name : ora-image-2018'. The table has columns for Name, AMI Name, AMI ID, Source, Owner, and Visibility. Below the table, there are tabs for 'Details', 'Permissions', and 'Tags'. The 'Details' tab is active, showing a list of key-value pairs for the selected AMI.

Owned by me	AMI Name	AMI ID	Source	Owner	Visibility	
<input checked="" type="checkbox"/>	ora-image-20...	ora-image-201...	ami-0cd9e1310775f5ff8	894838266932/...	894838266932	Private

AMI ID	AMI Name
ami-0cd9e1310775f5ff8	ora-image-20181115T0815
Owner	Source
894838266932	894838266932/ora-image-20181115T0815
Status	State Reason
available	-
Creation date	Platform
November 15, 2018 at 8:15:26 AM UTC-8	Other Linux
Architecture	Image Type
x86_64	machine

Amazon Console: Review Details

The screenshot shows the 'Review' step of the Amazon EC2 instance launch process. The breadcrumb navigation includes: 1. Choose AMI, 2. Choose Instance Type, 3. Configure Instance, 4. Add Storage, 5. Add Tags, 6. Configure Security Group, and 7. Review (highlighted). The main heading is 'Step 7: Review Instance Launch'. Below this, there is a section for 'AMI Details' showing the selected AMI: 'ora-image-20181115T0815 - ami-0cd9e1310775f5ff8' (Oracle Express Edition). Below that is the 'Instance Type' section with a table of instance specifications. At the bottom right, there are three buttons: 'Cancel', 'Previous', and 'Launch' (highlighted with a green box).

aws Services Resource Groups nocoug201708 @ paulm N. Virginia Support

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

AMI Details [Edit AMI](#)

ora-image-20181115T0815 - ami-0cd9e1310775f5ff8
Oracle Express Edition
Root Device Type: ebs Virtualization type: hvm

Instance Type [Edit instance type](#)

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
t2.small	Variable	1	2	EBS only	-	Low to Moderate

[Cancel](#) [Previous](#) [Launch](#)

Not Shown: Creating the Image

- Amazon offers managed Oracle as a service, but you can also choose an unmanaged installation.
- You must first:
 1. Create an EC2 instance from a stock Linux image
 2. Download, install and configure Oracle
 3. Create an Amazon Machine Image (AMI) of the instance
- Oracle image coverage in the Amazon Marketplace is spotty, with many unofficial or third-party images.

Amazon EC2 CloudFormation Template Excerpt

[...]

DbInst:

Type: "AWS::EC2::Instance"

Properties:

InstanceType: "t2.small"

ImageId: "ami-0cd9e1310775f5ff8"

BlockDeviceMappings:

- DeviceName: "/dev/sda1"

Ebs:

VolumeSize: 50 # GiB

SecurityGroupIds:

- !Ref DbServerGenExVpcSecGrp

KeyName: "lenovo-201807"

Tags:

- { Key: "Name" , Value: "oracle-cfn" }

[...]

Compare Unmanaged and Managed Cloud

- Brainstorm advantages and disadvantages of:
 1. Oracle on a cloud-based virtual machine
 2. Oracle as a cloud-based service

Learning Resources

- Azure

- Azure Linux Virtual Machines

docs.microsoft.com/en-us/azure/virtual-machines/#5-minute-linux-quickstarts

- Azure Resource Manager Templates

docs.microsoft.com/en-us/azure/azure-resource-manager/resource-group-authoring-templates

- Amazon

- Relational Database Service (RDS) Oracle

docs.aws.amazon.com/AmazonRDS/latest/UserGuide/CHAP_GettingStarted.CreatingConnecting.Oracle.html

- CloudFormation

docs.aws.amazon.com/AWSCloudFormation/latest/UserGuide/GettingStarted.html

- AWS Loft (free training and advice)

aws.amazon.com/start-ups/loft/sf-loft/

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Thank you for attending.

Questions and comments are appreciated.

The AWS RDS CloudFormation template
was previously published, at:

<https://github.com/sqlxpert/infra-as-code-aws-nocoug-journal/>

Please e-mail me if you wish a copy of the
AWS EC2 template (not Oracle-specific).