Scale-Out Computing on AWS, Services Used
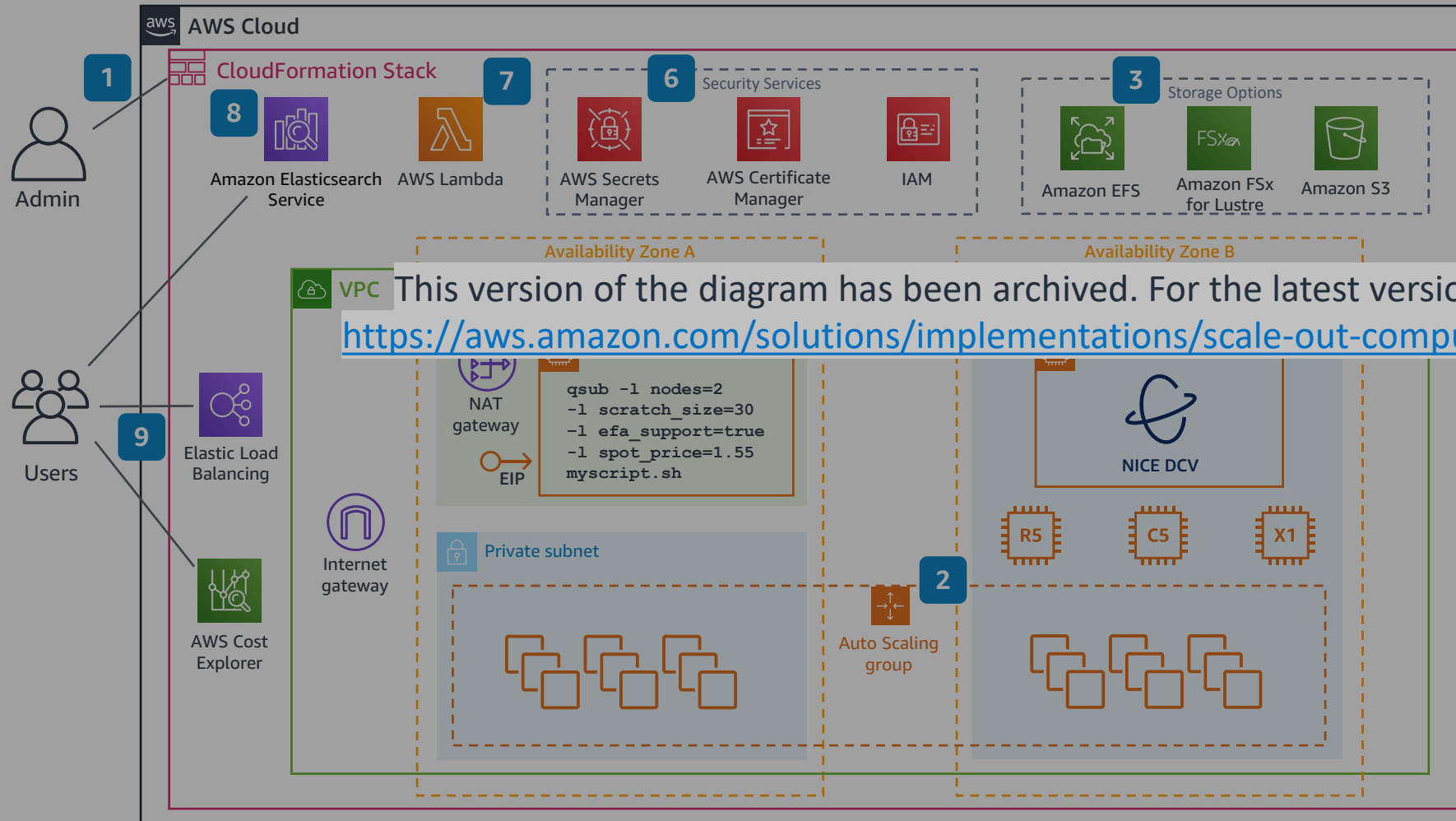
Launch a turnkey scale-out computing environment in minutes

Solution location: https://aws.amazon.com/solutions/scale-out-computing-on-aws/

This version of the diagram has been archived. For the latest version, refer to

https://aws.amazon.com/solutions/implementations/scale-out-computing-on-aws/

1 Specify required parameters (VPC, Subnet, storage, etc.) and launch the **AWS CloudFormation** stack, which launches several nested stacks.

2 Choose to run in **multiple Availability Zones**, or use auto-reallocation in the case an instance isn't available in the Availability Zone.

3 Choose from several storage options: **Amazon EFS**, **Amazon FSx for Lustre**, **Amazon S3**, **Amazon EBS**, and **Instance Store**.

4 Log in, submit, and monitor jobs from the Scheduler Instance.

5 Launch a 2D or 3D Workstation that uses **NICE DCV**, that can be used to submit batch jobs and run GUI tools.

6 Security services and resources that are used include **AWS Secrets Manager, AWS Certificate Manager, Security Groups**, and **AWS Identity and Access Management (IAM)**.

7 **AWS Lambda** is used throughout the entire deployment and architecture.

8 **Amazon Elasticsearch Service** is used to launch an analytics dashboard.

9 **Elastic Load Balancing** is used to ensure accessibility across Availability Zones, and **Cost Allocation Tags** are used with **AWS Cost Explorer**.

AWS Reference Architecture

Scale-Out Computing on AWS, User Access

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AWS Cloud

Users

1 Elastic Load Balancing

2 Scale Out Computing on AWS (SOCA)

Welcome to your SOCA HPC cluster

SSH access · Launch your job · Budget Management

Remote Desktop · Cluster Analytics

7 Storage Options

Auto Scaling group

Amazon FSx for Lustre

Amazon S3

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4 2D/3D Workstation

NICE DCV

5

Scheduler

```
qsub -l nodes=2
-l scratch_size=30
-l efa_support=true
-l spot_price=1.55
myscript.sh
```

Amazon Elasticsearch Service

9

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8

1	Users connect to the Web UI or 2D/3D Workstation using **Elastic Load Balancing**.
2	On the Web UI manage your entire environment, view analytics, add users, launch 2D/3D workstations, monitor jobs, budget info, and more.
3	Leveraging **AWS CloudFormation**, launch a 2D or 3D desktop
4	Use a running 2D/3D Workstation that uses **NICE DCV** to launch batch jobs or run tools.
5	... the scheduler instances, or submit a job from the 2D/3D Workstation.
6	Jobs submitted trigger an event, **AWS CloudFormation**, to launch the resources needed to run the job, e.g. an **Auto Scaling Group**.
7	Jobs can use several storage options for executables, runtime data, and results, choose from **Amazon EFS**, **Amazon FSx for Lustre**, **Amazon S3**, **Amazon EBS**, and **Instance Store**.
8	Log in directly to the Scheduler Instance and submit jobs from there.
9	Job information is sent to **Amazon Elasticsearch** and allows users to view an analytics dashboard.

AWS Reference Architecture