

Deployment #5

Task: Follow each step of this deployment lab to accomplish your deployment 5. Create a secure Jenkins architecture with your current VPC you made during class.

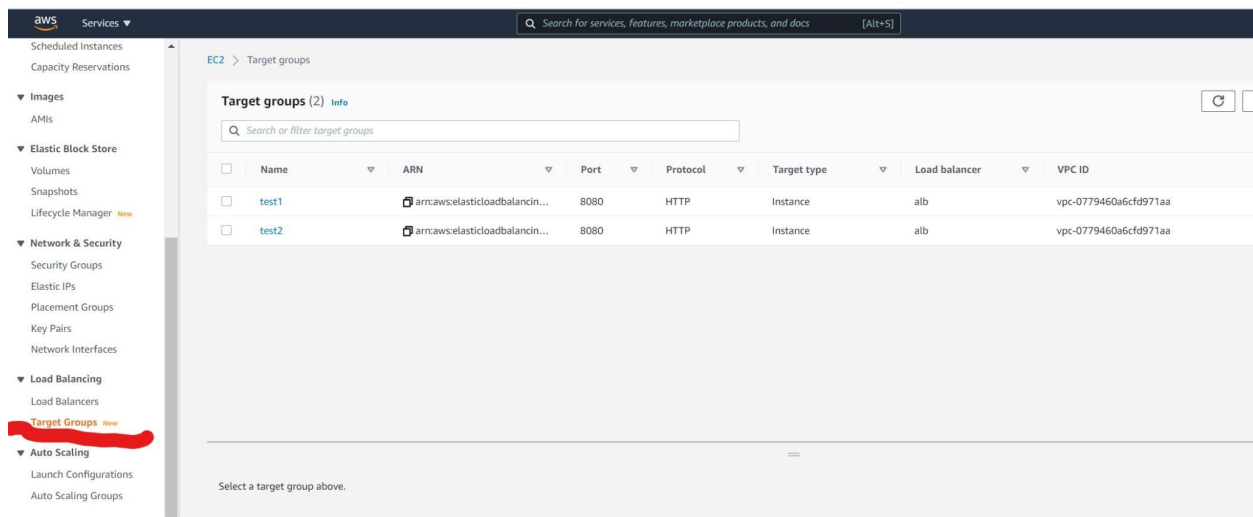
Step 1: Configure Jenkins on the EC2 in the private subnet.

Tips: AWS changed the way you'll need to download and install Jenkins on the EC2. You will need to download java-openjdk11 and epel from {amazon-linux-extras}. Then add Jenkins to the local repository, add the key to the repository and finally install Jenkins:

```
sudo amazon-linux-extras install java-openjdk11
sudo amazon-linux-extras install epel
sudo wget -O /etc/yum.repos.d/jenkins.repo \
https://pkg.jenkins.io/redhat-stable/jenkins.repo
sudo rpm --import https://pkg.jenkins.io/redhat-stable/jenkins.io.key
sudo yum upgrade
sudo yum install epel-release java-11-openjdk-devel
sudo yum install jenkins
sudo systemctl start jenkins
```

Step 2: Create a Target Group and Load Balancer

Click on Target Group under Load Balancing:



Create Target Group:

- Select **instance**
- Create a Target name
- Select **HTTP 8080**
- Select your VPC
- Select **HTTP1**
- Select **HTTP**

- Enter **/login**

- Select advance health check settings: select **override** and enter **8080**

Basic configuration

Settings in this section cannot be changed after the target group is created.

Choose a target type

☒ Instances

- Supports load balancing to instances within a specific VPC.

☐ IP addresses

- Supports load balancing to VPC and on-premises resources.
- Facilitates routing to multiple IP addresses and network interfaces on the same instance.
- Offers flexibility with microservice based architectures, simplifying inter-application communication.

☐ Lambda function

- Facilitates routing to a single Lambda function.
- Accessible to Application Load Balancers only.

Target group name

Jenkin-01

A maximum of 32 alphanumeric characters including hyphens are allowed, but the name must not begin or end with a hyphen.

Protocol

HTTP

Port

8080

VPC

VPC

Select the VPC with the instances that you want to include in the target group.

company-vpc

vpc-0779460a6cfd971aa
IPv4: 192.168.0.0/16

Protocol version

☒ HTTP1

Send requests to targets using HTTP/1.1. Supported when the request protocol is HTTP/1.1 or HTTP/2.

☐ HTTP2

Send requests to targets using HTTP/2. Supported when the request protocol is HTTP/2 or gRPC, but gRPC-specific features are not available.

☐ gRPC

Send requests to targets using gRPC. Supported when the request protocol is gRPC.

Health checks

The associated load balancer periodically sends requests, per the settings below, to the registered targets to test their status.

Health check protocol

HTTP

Health check path

Use the default path of "/" to ping the root, or specify a custom path if preferred.

/login

Up to 1024 characters allowed.

Advanced health check settings

Restore defaults

- Select create load balancer
- Select create application load balancer
- Name your load balancer
- Select select internet facing
- Select IPv4
- Select your VPC
- Select two AZ's and two public subnet
- Select select the security group for the ALB
- Select HTTP and your target group
- Finally select create load balancer

The screenshot displays the AWS Management Console interface. On the left, a navigation sidebar lists various services under categories like 'Images', 'Elastic Block Store', 'Network & Security', 'Load Balancing', and 'Auto Scaling'. The 'Load Balancing' section is highlighted, showing 'Load Balancers' and 'Target Groups'. The main panel shows the 'Instances (3)' page with a table of running EC2 instances. The table has columns for Name, Instance ID, Instance state, Instance type, and Status check. Three instances are listed: 'A-sshEC2' (ID: i-0a0676ac0231b5aa9), 'Mast-pass' (ID: i-04484ba3a74ab3eea), and 'JK-agent' (ID: i-01a1bacd42116cd85), all running on t2.micro instances with successful status checks. Below the table, a message says 'Select an instance above'.

Name	Instance ID	Instance state	Instance type	Status check
A-sshEC2	i-0a0676ac0231b5aa9	Running	t2.micro	2/2 checks passed
Mast-pass	i-04484ba3a74ab3eea	Running	t2.micro	2/2 checks passed
JK-agent	i-01a1bacd42116cd85	Running	t2.micro	2/2 checks passed

Select an instance above

https://console.aws.amazon.com/ec2/v2/home?region=us-east-1#LoadBalancers:

aws

Services

Search for services, features, marketplace products, and docs

[Alt+S]

Tech-1

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New EC2 Experience

EC2 Dashboard

Events

Tags

Limits

Instances

Instances

Instance Types

Launch Templates

Spot Requests

Savings Plans

Reserved Instances

Dedicated Hosts

Scheduled Instances

Capacity Reservations

Images

AMIs

Elastic Block Store

Volumes

Snapshots

Create Load Balancer

Actions

Filter by tags and attributes or search by keyword

Name	DNS name	State	VPC ID	Availability Zones	Type	Created At	Monitoring
alb	alb-1269873126.us-east-1.elb.amazonaws.com	Active	vpc-0779460a6cf0971aa	us-east-1a, us-east-1b	application	September 10, 2021 at 7:34...	

Load balancer: alb

DescriptionListenersMonitoringIntegrated servicesTags

Basic Configuration

Name	alb
ARN	arn:aws:elasticloadbalancing:us-east-1:266686430719:loadbalancer/app/alb/fd9c44e80235a66d
DNS name	alb-1269873126.us-east-1.elb.amazonaws.com (A Record)
State	Active
Type	application
Scheme	internet-facing
IP address type	IPv4
VPC	vpc-0779460a6cf0971aa
Availability Zones	subnet-b20ed6df3fe17a9 - us-east-1a

Feedback

English (US)

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Select load balancer type

Elastic Load Balancing supports four types of load balancers: Application Load Balancers, Network Load Balancers, Gateway Load Balancers, and Classic Load Balancers. Choose the load balancer type that meets your needs. [Learn more about which load balancer is right for you](#)

Application Load Balancer

HTTP
HTTPS

Create

Choose an Application Load Balancer when you need a flexible feature set for your web applications with HTTP and HTTPS traffic. Operating at the request level, Application Load Balancers provide advanced routing and visibility features targeted at application architectures, including microservices and containers.

[Learn more >](#)

Network Load Balancer

TCP
TLS
UDP

Create

Choose a Network Load Balancer when you need ultra-high performance, TLS offloading at scale, centralized certificate deployment, support for UDP, and static IP addresses for your application. Operating at the connection level, Network Load Balancers are capable of handling millions of requests per second securely while maintaining ultra-low latencies.

[Learn more >](#)

Gateway Load Balancer

IP

Create

Choose a Gateway Load Balancer when you need to deploy and manage a fleet of third-party virtual appliances that support GENEVE. These appliances enable you to improve security, compliance, and policy controls.

[Learn more >](#)

Classic Load Balancer

PREVIOUS GENERATION
for HTTP, HTTPS, and TCP

Create

Choose a Classic Load Balancer when you have an existing application running in the EC2-Classical network.

[Learn more >](#)

aws

Services

Search for services, features, marketplace products, and docs

Name must be unique within your AWS account and cannot be changed after the load balancer is created.

ALB

A maximum of 32 alphanumeric characters including hyphens are allowed, but the name must not begin or end with a hyphen.

Scheme

Info

Scheme cannot be changed after the load balancer is created.

☒ Internet-facing

An internet-facing load balancer routes requests from clients over the internet to targets. Requires a public subnet. [Learn more](#)

☐ Internal

An internal load balancer routes requests from clients to targets using private IP addresses.

IP address type

Info

Select the type of IP addresses that your subnets use.

☒ IPv4

Recommended for internal load balancers.

☐ Dualstack

Includes IPv4 and IPv6 addresses.

Network mapping

Info

The load balancer routes traffic to targets in the selected subnets, and in accordance with your IP address settings.

VPC

Info

Select the virtual private cloud (VPC) for your targets. Only VPCs with an internet gateway are enabled for selection. The selected VPC cannot be changed after the load balancer is created. To confirm the VPC for your targets, view your [target groups](#).

company-vpc

vpc-0779460a6cfd971aa

IPv4: 192.168.0.0/16

Mappings

Info

aws

Services

Search for services, features, marketplace products, and docs

VPC

Info

Select the virtual private cloud (VPC) for your targets. Only VPCs with an internet gateway are enabled for selection. The selected VPC cannot be changed after the load balancer is created. To confirm the VPC for your targets, view your [target groups](#).

company-vpc

vpc-0779460a6cfd971aa

IPv4: 192.168.0.0/16

Mappings

Info

Select at least two Availability Zones and one subnet per zone. The load balancer routes traffic to targets in these Availability Zones only. Availability Zones that are not supported by the load balancer or the VPC are not available for selection. Subnets cannot be removed after the load balancer is created, but additional subnets can be added. Availability Zones that are not supported by the load balancer or the VPC are disabled. At least two subnets must be specified.

☒ us-east-1a

Subnet

subnet-0b20e6de6f3fe17a9

public-a

IPv4 settings

Assigned by AWS

☒ us-east-1b

Subnet

subnet-0ce67ccdba7302939

public-b

IPv4 settings

Assigned by AWS

aws

Services

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Security groups

Info

A security group is a set of firewall rules that control the traffic to your load balancer.

Security groups

Select security groups

Q |

connection

VPC: vpc-0779460a6cfd971aa

sg-009494509a72f45ae

launch-wizard-1

VPC: vpc-0779460a6cfd971aa

sg-070cbaf0456bfe99e

default

VPC: vpc-0779460a6cfd971aa

sg-0748fdb1b691b2ae7

Web_access

VPC: vpc-0779460a6cfd971aa

sg-07fe1bbe0ffed077b

Jenkin_mas

VPC: vpc-0779460a6cfd971aa

sg-093dc32fb4474b539

Grp_A-Grp_B

VPC: vpc-0779460a6cfd971aa

sg-0b5c1fb94f4b1c35d

JKN-access2

VPC: vpc-0779460a6cfd971aa

sg-0ea37af5c9012b9d5

JKN-access

VPC: vpc-0779460a6cfd971aa

sg-0ef991a05736f1c77

Remove

Feedback

English (US)

aws

Services

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Listeners and routing

Info

A listener is a process that checks for connection requests, using the protocol and port you configure. Traffic received by the listener is then routed per your specification. You can specify multiple rules and multiple certificates per listener after the load balancer is created.

▼ Listener HTTP:80

Remove

Protocol

HTTP

Port

80

1-65535

Default action

Forward to

Select a target group

Create target

Q

In use

test1

Target type: Instance

HTTP

test2

Target type: Instance

HTTP

Add listener

► Tags - optional

Consider adding tags to your load balancer. Tags enable you to categorize your AWS resources so you can more easily manage them. The 'Key' is required, but 'Value' is optional. For example, you can have Key = production-webserver, or Key = webserver, and Value = production.

Summary

Review and confirm your configurations. [Estimate cost](#)

Basic configuration

Edit

ALB

Security groups

Edit

Security group not defined

Network mapping

Edit

VPC [vpc-0779460a6cfd971aa](#)

Listeners and routing

Edit

• HTTP-80 defaults to

Summary

Review and confirm your configurations. [Estimate cost](#)

Basic configuration [Edit](#)

ALB

- Internet-facing
- IPv4

Security groups [Edit](#)

Security group not defined

Network mapping [Edit](#)

VPC [vpc-0779460a6cfd971aa](#)

- us-east-1a
[subnet-0b20e6de6f3fe17a9](#)
public-a
- us-east-1b
[subnet-0ce67ccdba7302939](#)
public-b


Listeners and routing [Edit](#)

- HTTP:80 defaults to
Target group not defined

Tags [Edit](#)

None

Attributes

 Certain default attributes will be applied to your load balancer. You can view and edit them after creating the load balancer.

Cancel

Create load balancer

Scheduled Instances

Capacity Reservations

Images

AMIs

Elastic Block Store

Volumes

Snapshots

Lifecycle Manager

Network & Security

Security Groups

Elastic IPs

Placement Groups

Key Pairs

Network Interfaces

Load Balancing

Load Balancers

Target Groups

Auto Scaling

Launch Configurations

Auto Scaling Groups

Feedback

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Tech-1

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Create Load Balancer

Actions

Filter by tags and attributes or search by keyword

Name	DNS name	State	VPC ID	Availability Zones	Type	Created At	Monitoring
alb	alb-1269873126-us-east-1.elb.amazonaws.com	Active	vpc-0779460a6cfd971aa	us-east-1a, us-east-1b	application	September 10, 2021 at 7:34...	

Load balancer: alb

DescriptionListenersMonitoringIntegrated servicesTags

Basic Configuration

Name	alb
ARN	arn:aws:elasticloadbalancing:us-east-1:266686430719:loadbalancer/app/alb/fd9c44e80235a66d
DNS name	alb-1269873126-us-east-1.elb.amazonaws.com (A Record)
State	Active
Type	application
Scheme	internet-facing
IP address type	ipv4
VPC	vpc-0779460a6cfd971aa
Availability Zones	subnet-0b20e6de6f3fe17a9 - us-east-1a

Details

Target type	Instance	Protocol : Port	HTTP: 8080	Protocol version	HTTP1	VPC	vpc-0779460a6cfd971aa
Load balancer	alb						
Total targets	1	Healthy	1	Unhealthy	0	Unused	0
Initial	0	Draining	0				

Targets

Monitoring

Health checks

Attributes

Tags

Registered targets (1)

Filter resources by property or value

Instance ID	Name	Port	Zone	Health status	Health status details
i-04484ba3a74ab3eea	Master-pass	8080	us-east-1a	healthy	

Feedback

English (US)

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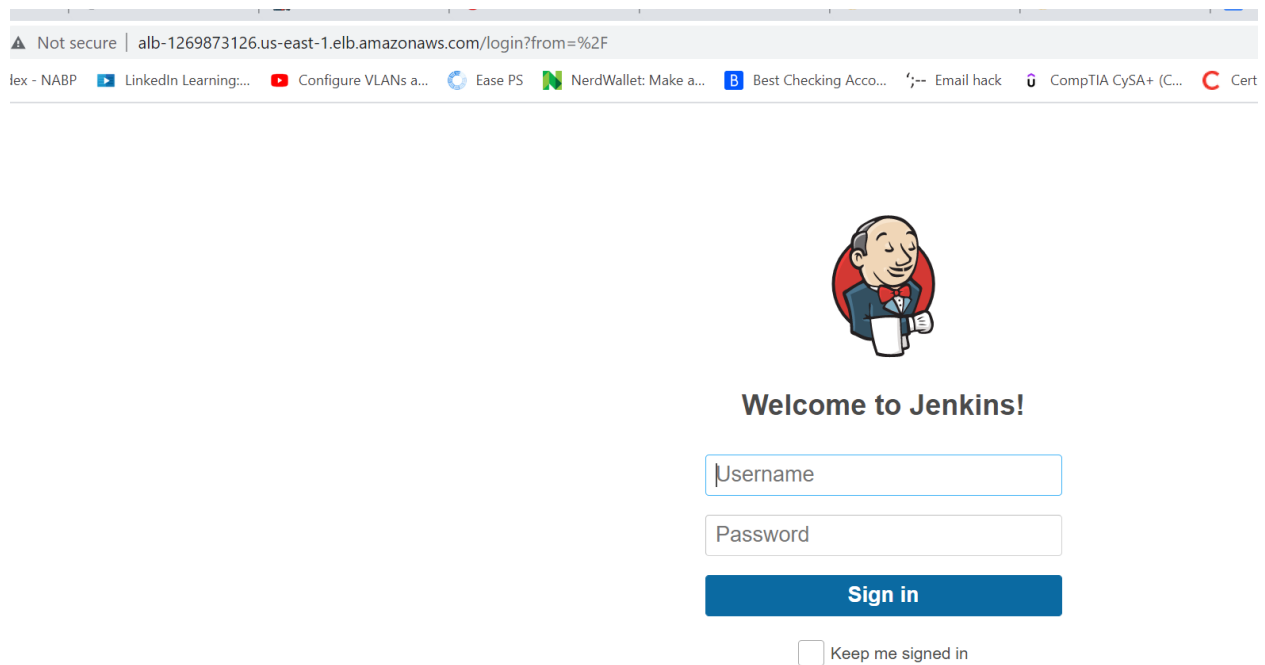
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Cookie

The ALB takes a few minutes to set up. Once the ALB is set, you will see the status is active and the target group is healthy in the Target Group section .

Step 3: Configure Jenkins UI using the ALB

Enter the domain name of the ALB to access Jenkins setup page:



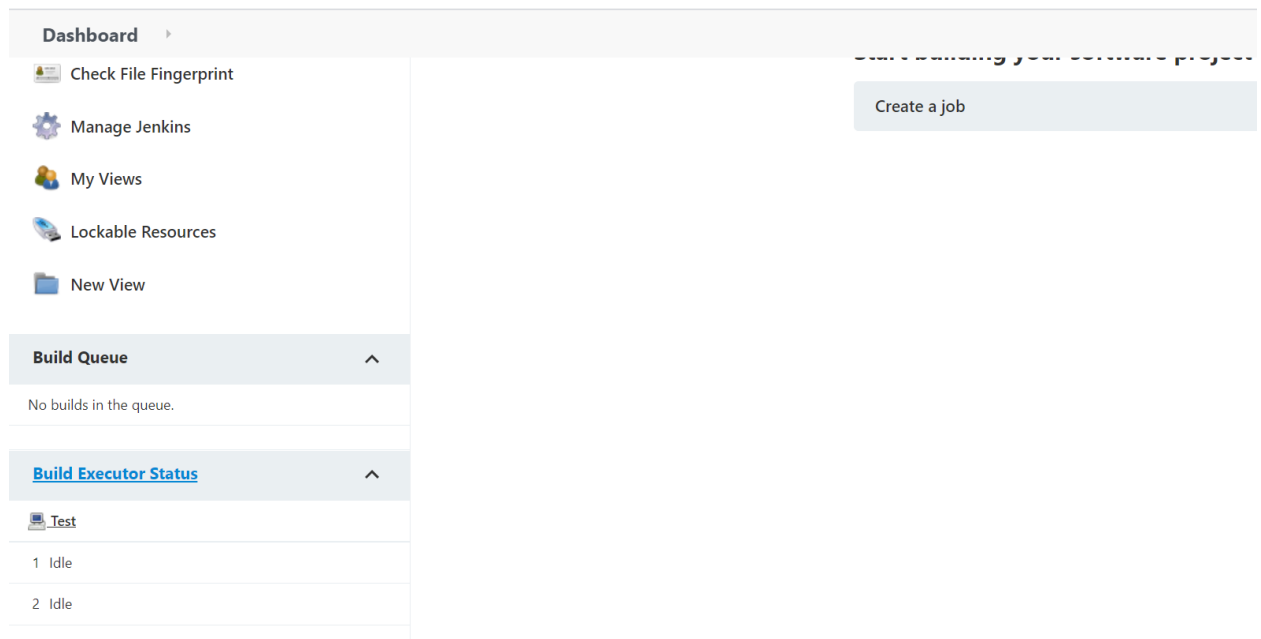
The screenshot shows a web browser window with the address bar displaying 'alb-1269873126.us-east-1.elb.amazonaws.com/login?from=%2F'. The page features the Jenkins logo (a cartoon man in a suit) and the text 'Welcome to Jenkins!'. Below this, there are input fields for 'Username' and 'Password', a blue 'Sign in' button, and a checkbox labeled 'Keep me signed in'.

Step 4: Create another amazon Linux EC2 inside the same private subnet of the Jenkins master (this EC2 will be the Agent).






Before you configure Jenkins master to ssh into the agent, use your Jump Server to ssh into Jenkins. Next, ssh into the newly created EC2. Once you are able to ssh into the Amazon Linux instance, move on to the next step.

Step 5: Configure the Jenkins master to SSH into the Agent

- Select build executor status
- Select new node
- Create a name for the node and select permanent agent
- Create a name and description
- Enter **2** for executors
- enter **{/home/ec2-user/jenkins}** for remote root directory
- Create a label
- Select use this node as much as possible
- Select launch agent via ssh
- Enter the private IP address of the Agent
- Add SSH credentials (username: **ec2-user** | key: the private key you used to ssh into the agent)
- Select non verifying verification strategy
- save and then look at the logs to see if your setup was successful



Dashboard > Nodes >

-  Back to Dashboard
-  Manage Jenkins
-  New Node
-  Configure Clouds
-  Node Monitoring




Build Queue

No builds in the queue.

Build Executor Status

Test

1 Idle

S	Name ↓	Architecture	Clock Difference	Free Disk Space	Free Swap Space	Free Temp Space	Response Time
	master	Linux (amd64)	In sync	5.90 GB	 0 B	5.90 GB	0ms
	Test	Linux (amd64)	In sync	5.93 GB	 0 B	5.93 GB	36ms

Data obtained	7 min 5 sec	7 min 5 sec	7 min 6 sec	7 min 5 sec	7 min 5 sec	7 min 6 sec
---------------	-------------	-------------	-------------	-------------	-------------	-------------

Refresh state

pps Index - NABP LinkedIn Learning:... Configure VLANs a... Ease PS NerdWallet: Make a... Best Checking Acco... Email hack CompTIA CySA+ (C...

Jenkins

Dashboard > Nodes >

Back to Dashboard

Manage Jenkins

New Node

Configure Clouds

Node Monitoring

Build Queue

No builds in the queue.

Build Executor Status

Test

Idle

Idle

Node name

AWS-Linux

☒ Permanent Agent

Adds a plain, permanent agent to Jenkins. This is called "permanent" because Jenkins doesn't provide higher level of integration with cloud providers.

☐ Copy Existing Node

Copy from

OK

Dashboard ▸ Nodes ▸ Test

Back to List

Status

Delete Agent

Configure

Build History

Load Statistics

Script Console

Log

System Information

Disconnect

Build Executor Status

^

Name

Test

Description

test

Number of executors

2

Remote root directory

/home/ec2-user/jenkins

Labels

agent-linux

Usage

Save

Remote root directory

/home/ec2-user/jenkins

Labels

agent-linux

Usage

Use this node as much as possible

Launch method

Launch agents via SSH

Host

192.168.44.162

Credentials

ec2-user (test)

Add ▾

Host Key Verification Strategy

Save

Adding SSH credentials:

Choose SSH Username with private key

Launch method

SSH Username with private key

Scope
Global (Jenkins, nodes, items, all child items, etc)

ID
worker-ssh

Description
ssh into agent

Username
ec2-user

☐ Treat username as secret

Private Key
☐ Enter directly

Passphrase
☐ Disable deferred wipeout on this node
☐ Environment variables
☐ Tool Locations

Enter username and select [ENTER DIRECTLY]
- No passphrase for the key

Nodes Worker-node Use this node as much as possible

Username
ec2-user

☐ Treat username as secret

Private Key
☒ Enter directly

Key
Enter New Secret Below
QoY1yZNzFz1QV1Gjy7R1KkM8N0V6KYUOFot7VVD+pQh+Q707EJSZc1Kshy88c7VN
MzXLwKjRAI7jNxUk6eXg3hJta9ext+6heSSEhH1HwzN+SU0yEy8og==
-----END RSA PRIVATE KEY-----

Passphrase

Add Cancel

Launch agents via SSH

Host

192.168.44.162

Credentials

ec2-user (test)

Add

Host Key Verification Strategy

Non verifying Verification Strategy

Availability

Keep this agent online as much as possible

Node Properties

☐ Disable deferred wipeout on this node

☐ Environment variables

☐ Tool Locations

Save

Advanced...

Back to List

Status

Delete Agent

Configure

Build History

Load Statistics

Script Console

Log

System Information

Disconnect

Build Executor Status

Idle

Idle

SSHLauncher(host='192.168.44.162', port=22, credentialsId='test', jvmOptions='', javaPath='', prefixStartSlaveCmd='', suffixStartSlaveCmd='', launchTimeoutDelay=true, trackCredentials=true)

[09/11/21 02:12:28] [SSH] Opening SSH connection to 192.168.44.162:22.

[09/11/21 02:12:28] [SSH] WARNING: SSH Host Keys are not being verified. Man-in-the-middle attacks may be possible against this connection.

[09/11/21 02:12:28] [SSH] Authentication successful.

[09/11/21 02:12:28] [SSH] The remote user's environment is:

BASH=/usr/bin/bash

BASHOPTS=cmdhist:extquote:force_ignores:hostcomplete:interactive_comments:progcomp:promptvars:sourcepath

BASH_ALIASES=()

BASH_ARGC=()

BASH_ARGV=()

BASH_CHIDS=()

BASH_EXECUTION_STRING=set

BASH_LINENO=()

BASH_SOURCE=()

BASH_VERSION=([0]="4" [1]="2" [2]="46" [3]="2" [4]="release" [5]="x86_64-koji-linux-gnu")

BASH_VERSION="4.2.46(2)-release"

DIRSTACK=()

EUID=1000

GROUPS=()

HOME=/home/ec2-user

HOSTNAME=ip-192-168-44-162.ec2.internal

HOSTTYPE=x86_64

IFS=\$' \t\n'

LANG=en_US.UTF-8

LESSOPEN='||/usr/bin/lesspipe.sh %s'

LOGNAME=ec2-user

MACHTYPE=x86_64-koji-linux-gnu

MAIL=/var/mail/ec2-user

OPTERR=1

OPTIND=1

OSTYPE=linux-gnu

PATH=/usr/local/bin:/usr/bin

PIPESTATUS=([0]="")

PPID=1351

PS4='+ '

PWD=/home/ec2-user

SHELL=/bin/bash

SHELLOPTS=braceexpand:hashall:interactive_comments

SHLVL=1

SSH_CLIENT='192.168.52.150 53204 22'

SSH_CONNECTION='192.168.52.150 53204 192.168.44.162 22'

TERM=dumb

UID=1000

USER=ec2-user

XDG_RUNTIME_DIR=/run/user/1000

XDG_SESSION_ID=13