



Jenkins

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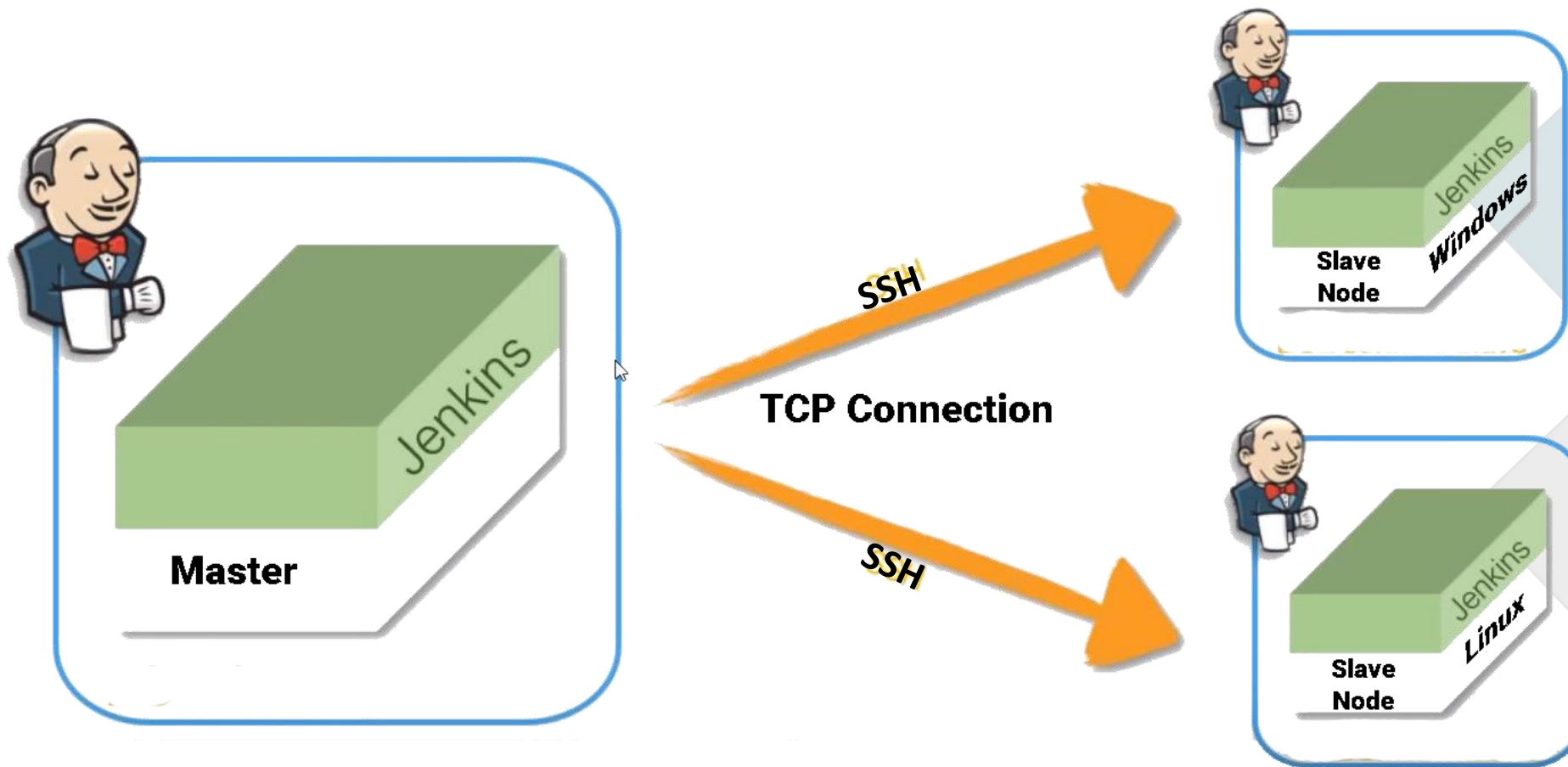
5. Hosting & Managing Master & Slaves

- Master Slave Architecture
- Jenkins Master
- Jenkins Slave
- Setting Up Jenkins Slave
- Adding a Private Key in Jenkins





Master & Slave Architecture





Master & Slave Architecture



- Jenkins supports the master-slave architecture - Many slaves work for a master
- Also known as Jenkins Distributed Builds
- Allows to run jobs on different environments like Linux, Windows, MacOS, etc.
- Can run the same test case on different environments in parallel
- Helps in achieving the desired results quickly
- All of the job results are collected & combined on the master node for monitoring



Jenkins Master



- Your Main Jenkins server is the master machine
- The tasks performed by the master are:
 - Scheduling build jobs
 - Dispatching builds to the slaves for the execution
 - Monitor the slaves
 - Recording and presenting the build results
 - Can also execute build jobs directly



Jenkins Slave



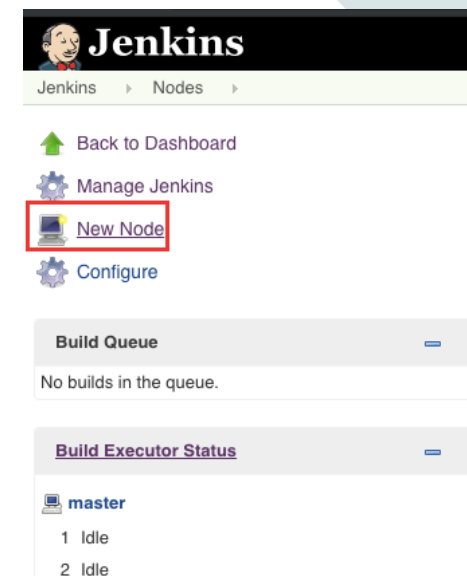
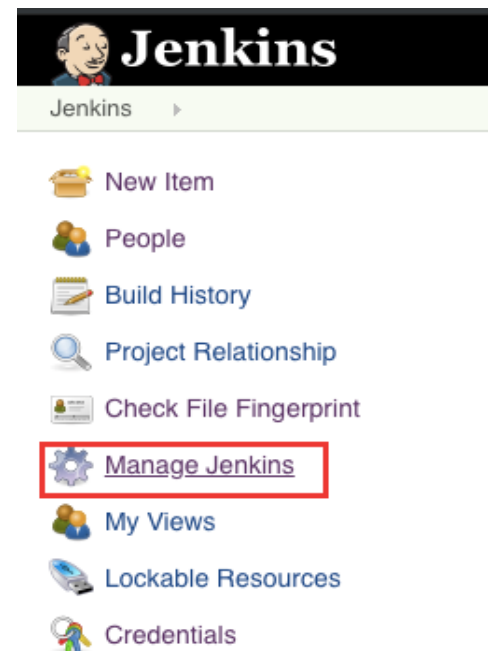
- Java executable that runs on a remote machine
- Characteristics:
 - Hears requests from the Jenkins Master instance
 - Slaves can run on a variety of operating systems
 - The job of a Slave is to do as they are told to, which involves executing build jobs dispatched by the Master.
 - We can configure a project to always run on a particular Slave machine or a particular type of Slave machine, or simply let Jenkins pick the next available Slave



Setting Up A Jenkins Slave

- **Steps**


- Go to **Jenkins dashboard -> Manage Jenkins -> Manage Nodes**
- Give a name to the node & then click **OK**
- For the first time user, only one option of “**Permanent Agent**” will be present
- Another option, “**Copy Existing Node**” which is self-explanatory
- A page opens where we specify the configuration of the slave machine







Cont'd...





 **Jenkins**

Jenkins ▸ Nodes ▸

 [Back to Dashboard](#)

 [Manage Jenkins](#)


 [New Node](#)

 [Configure](#)


Node name


☒ **Permanent Agent**
Adds a plain, permanent agent.
Select this type if no other type is specified.

☐ **Copy Existing Node**
Copy from


Build Queue 

No builds in the queue.

Build Executor Status 

 **master**


1 Idle
2 Idle

 **win**


1 Idle





Setting Up A Jenkins Slave


 **Jenkins**

Jenkins ▸ Nodes ▸

 Back to Dashboard

 Manage Jenkins


 New Node

 Configure

Build Queue


No builds in the queue.

Build Executor Status

 master

1 Idle

2 Idle

 win (offline)

Name

win002

Description

Windows Slave

of executors

1

Remote root directory

C:\jenkins

Labels

Usage

Use this node as much as possible

Launch method

Launch agent by connecting it to the master

Launch agent agents via SSH

Launch agent by connecting it to the master

Launch agent via execution of command on the master

Custom WORKDIR path

Internal data directory

remoting

Fail if workspace is missing

☐

Availability

Keep this agent online as much as possible

Node Properties

☐ Disable deferred wipeout on this node

☐ Environment variables

☐ Tool Locations

Save



Setting Up A Jenkins Slave




- **Name:** Name of the Slave should be unique
- **Description:** (Optional) Description helpful for other team members
- **# of executors:**
 - Max. no. of concurrent builds Jenkins may perform on this agent
 - Good practice would be the no. of CPU cores on the machine
- **Remote root directory:**
 - An agent needs to have a directory dedicated to Jenkins
 - Specify the path to this directory on the agent
- **Labels:**
 - Labels are used to group multiple agents into one logical group
 - Multiple labels must be separated by a space



Cont'd...

- Node is down
- Click on the slave node

 **Jenkins** [Amit](#) | [log o](#)

[Jenkins](#) > [Nodes](#) > [ENABLE AUTO REFRESH](#)

[Back to Dashboard](#)
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Build Queue
No builds in the queue.

Build Executor Status

master
1 Idle
2 Idle

win002 (offline)

S	Name ↓	Architecture	Clock Difference	Free Disk Space	Free Swap Space	Free Temp Space	Response Time
	master	Windows 10 (amd64)	In sync	349.93 GB	6.62 GB	349.93 GB	0ms
	win002		N/A	N/A	N/A	N/A	N/A
	Data obtained	1 min 13 sec	1 min 13 sec	1 min 13 sec	1 min 13 sec	1 min 13 sec	1 min 13 sec

Refresh status



Cont'd...



- Go to Manage -> Configure Global Security
- In the Agents Section -> Select Fixed -> Give TCP PORT

Jenkins > Configure Global Security

Configure Global Security

☒ Enable security
Disable remember me ☐
Access Control

Security Realm

☐ Delegate to servlet container
☒ Jenkins' own user database
☐ Allow users to sign up
☐ LDAP

Authorization

☒ Anyone can do anything
☐ Legacy mode
☐ Logged-in users can do anything
☐ Matrix-based security
☐ Project-based Matrix Authorization Strategy

Markup Formatter

Markup Formatter
Treats all input as plain text. HTML unsafe characters like < and & are escaped to their respective character entities.

Agents

TCP port for inbound agents ☒ Fixed : ☐ Random ☐ Disable

CSRF Protection



Cont'd...

- In the Agent – Master Security -> Check Enable Agent
- You may Give a Fixed SSHD Port to run Jenkins on your slave machine

Crumb Algorithm

☒ Default Crumb Issuer

☐ Enable proxy compatibility

Plugin Manager

☐ Use browser for metadata download

Hidden security warnings

Security warnings...

API Token

☐ Generate a legacy API token for each newly created user (Not recommended)

☐ Allow users to manually create a legacy API token (Not recommended)

☒ Enable API Token usage statistics

Agent → Master Security

☒ Enable Agent → Master Access Control

Rules can be tweaked [here](#)

SSH Server

SSHD Port

☒ Fixed : ☐ Random ☐ Disable

Save Apply



Cont'd...

- Download the ***agent.jar*** file in the given directory
- In this case its “c:\jenkins”

The screenshot shows the Jenkins web interface. At the top, there's a black header with the Jenkins logo and a search bar. Below the header, a breadcrumb trail shows 'Jenkins > Nodes > win002'. On the left sidebar, there are several links: 'Back to List', 'Status', 'Delete Agent', 'Configure', 'Build History', 'Load Statistics', and 'Log'. The main content area is titled 'Agent win002 (Windows Slave)'. It contains instructions on how to connect the agent to Jenkins, with a 'Launch' button highlighted. A blue arrow points from the 'Launch' button to a terminal window showing the command to run the agent. Below the terminal window, there's a section for 'Projects tied to win002' which currently shows 'None'.

Jenkins search

Jenkins > Nodes > win002

Back to List

Status

Delete Agent

Configure

Build History

Load Statistics

Log

Agent win002 (Windows Slave)

Connect agent to Jenkins one of these ways:

- **Launch** Launch agent from browser
- Run from agent command line:
`javaws http://localhost:9090/computer/win002/slave-agent.jnlp`
- Or if the agent is addressless:
`java -jar agent.jar -jnlpUrl http://localhost:9090/computer/win002/slave-agent.jnlp -workDir "C:\jenkins"`

Projects tied to win002

None

Build Executor Status



Cont'd...

- Slave Node is Up

MINGW64/c/jenkins

```
Amit@LAPTOP-JRR5G8TK MINGW64 /c/jenkins
$ java -jar agent.jar -jnlpUrl http://localhost:9090/computer/win002/slave-agent.jnlp -workDir "C:\jenkins"
Aug 07, 2019 9:30:52 PM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using C:\jenkins\remoting as a remoting work directory
Aug 07, 2019 9:30:52 PM org.jenkinsci.remoting.engine.WorkDirManager setupLogging
INFO: Both error and output logs will be printed to C:\jenkins\remoting
Aug 07, 2019 9:30:52 PM hudson.remoting.jnlp.Main createEngine
INFO: Setting up agent: win002
Aug 07, 2019 9:30:52 PM hudson.remoting.jnlp.Main$CuiListener <init>
INFO: Jenkins agent is running in headless mode.
Aug 07, 2019 9:30:52 PM hudson.remoting.Engine startEngine
INFO: Using Remoting version: 3.33
Aug 07, 2019 9:30:52 PM org.jenkinsci.remoting.engine.WorkDirManager initializeWorkDir
INFO: Using C:\jenkins\remoting as a remoting work directory
Aug 07, 2019 9:30:53 PM hudson.remoting.jnlp.Main$CuiListener status
INFO: Locating server among [http://localhost:9090/]
Aug 07, 2019 9:30:53 PM org.jenkinsci.remoting.engine.JnlpAgentEndpointResolver resolve
INFO: Remoting server accepts the following protocols: [JNLP4-connect, Ping]
Aug 07, 2019 9:30:53 PM hudson.remoting.jnlp.Main$CuiListener status
INFO: Agent discovery successful
Agent address: localhost
Agent port: 5000
Identity: 14:df:5d:15:b7:59:63:be:ce:a4:32:fa:e3:12:e0:78
Aug 07, 2019 9:30:53 PM hudson.remoting.jnlp.Main$CuiListener status
INFO: Handshaking
Aug 07, 2019 9:30:53 PM hudson.remoting.jnlp.Main$CuiListener status
INFO: Connecting to localhost:5000
Aug 07, 2019 9:30:53 PM hudson.remoting.jnlp.Main$CuiListener status
INFO: Trying protocol: JNLP4-connect
Aug 07, 2019 9:30:53 PM hudson.remoting.jnlp.Main$CuiListener status
INFO: Remote identity confirmed: 14:df:5d:15:b7:59:63:be:ce:a4:32:fa:e3:12:e0:78
Aug 07, 2019 9:30:54 PM hudson.remoting.jnlp.Main$CuiListener status
INFO: Connected
```

Jenkins

Jenkins > Nodes >

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

S	Name ↓	Architecture	Clock D
	master	Windows 10 (amd64)	
	win002	Windows 10 (amd64)	

Data obtained 45 sec

Build Queue

No builds in the queue.

Build Executor Status

- master**
 - 1 Idle
 - 2 Idle
- win002**
 - 1 Idle