Jenkins Master-Slave Architecture Documentation

This documentation explains how to configure a **Jenkins Master-Slave architecture** capable of executing 5 tasks simultaneously. The process involves setting up a permanent Jenkins agent (slave) and configuring it to connect to the Jenkins master using SSH.

Prerequisites

- Ensure the Jenkins master server is installed and running.
- SSH must be enabled and accessible on both the master and agent machines.
- A sufficient number of executors should be assigned based on the server's processing capacity.

Step 1: Ensure SSH Service is Running

On the Agent Machine:

1. Check the status of the SSH service:

   ```
   sudo systemctl status ssh
   ```

2. If SSH is not running, start it:

   ```
   sudo systemctl start ssh
   ```

3. If SSH is not installed:

   ```
   sudo apt update
   sudo apt install openssh-server
   sudo systemctl start ssh
   sudo systemctl enable ssh  # To start SSH on boot
   ```

Step 2: Create a Permanent Jenkins Agent

On the Jenkins Master:

1. **Go to Jenkins Dashboard**:
   Navigate to **Manage Jenkins > Manage Nodes and Clouds > New Node**.
2. **Provide Agent Details**:
   - **Name**: Enter a name for the agent (e.g., `ramesh`).
   - **Description**: Add a description for the agent.
   - **Number of Executors**: Set the number of parallel tasks the agent can run (e.g., `5`).
   - **Remote Root Directory**:
     - If the agent is on the **same machine as the master**, create a new user for the agent and use the home directory of that user.
     - For remote agents, provide a directory path where the agent workspace will be stored.

Step 3: Set Up the SSH Key Pair

On the Master Machine:

1. Log in as the Jenkins user:

   ```
   su - jenkins
   ```

2. Generate an SSH key pair:

   ```
   ssh-keygen
   ```

   - The keys are usually stored in `/var/lib/jenkins/.ssh/id_ed25519`.

On the Agent Machine:

1. Create the `.ssh` directory:

   ```
   mkdir ~/.ssh
   ```

2. Add the master's public SSH key to the `authorized_keys` file:

   ```
   nano ~/.ssh/authorized_keys
   ```

   - Paste the public key from the master machine here.
3. Copy the private SSH key from the master to use for connecting.

Step 4: Configure the Node in Jenkins

1. **Go to Jenkins Dashboard**:
   Navigate to **Manage Jenkins > Manage Nodes and Clouds > New Node**.
2. **Provide Node Configuration**:
   - **Labels**: Add labels to group or categorize the agent for job assignments.
   - **Launch Method**: Select **Launch agent via SSH**.
3. **Add SSH Details**:
   - **SSH Username**: Provide the username of the agent machine (e.g., `agent1`).
   - **Private Key**: Paste the private key copied from the master machine.
   - **Host Key Verification Strategy**: Select **Non-verifying Verification Strategy**.

Step 5: Specify Java Path on the Agent

1. Check the Java installation on the agent machine:

   ```
   sudo update-alternatives --config java
   ```

2. Copy the path for the selected Java version and paste it into the **Java Path** field in the node configuration.

Step 6: Finalize and Launch the Agent

1. Save the configuration.
2. Click **Launch Agent** to establish a connection with the master.
3. Verify the agent’s status on the Jenkins dashboard. If the setup is successful, the agent will show as **connected**.

Post-Configuration Notes

- The agent can now execute up to 5 tasks in parallel as configured under "Number of Executors."
- Assign jobs to the agent by specifying its label in the job configuration.
- Regularly monitor the agent's status to ensure it is operational and connected.

This documentation summarizes the steps followed to set up the Jenkins master-slave architecture and configure a permanent agent. Let me know if you need further assistance!