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Installation Overview

CircleCI Server v2.17.x uses the CircleCI 2.0 architecture.

The following sections provide planning information, system requirements and step-by-step instructions for installing CircleCI Server on Amazon Web Services (AWS) with Terraform.

Refer to the changelog for what's new and fixed in this release.

If you are looking to update an existing installation, see our guide to Updating a Server Installation.

Support Packages

CircleCI 2.0 may be installed without a support package, on AWS, using the examples and instructions in this document. Alternatively, if you do decide to go ahead with a support package, there are a number of benefits, as detailed below:

Non-AWS Platform Support

With a Platinum CircleCI support package it is possible to install and configure CircleCI on Azure or any other platform used in your organization. Contact CircleCI support or your account representative to get started.

Externalization

With a Platinum support agreement, it is possible to improve performance and resilience by configuring the following services to run externally to the Services machine:

- PostgreSQL
- MongoDB
- Vault
- Rabbitmq
- Redis
- Nomad

Contact CircleCI support or your account representative to evaluate your installation against the current requirements for running external services.
System Requirements

This section defines the system and port access requirements for installing CircleCI v2.17.

Services Machine

The Services machine hosts the core of our Server product, including the user-facing website, API engine, datastores, and Nomad job scheduler. It is best practice to use an isolated machine.

The following table defines the Services machine CPU, RAM, and disk space requirements:

<table>
<thead>
<tr>
<th>Number of daily active CircleCI users</th>
<th>CPU</th>
<th>RAM</th>
<th>Disk space</th>
<th>NIC speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;50</td>
<td>8</td>
<td>32GB</td>
<td>100GB</td>
<td>1Gbps</td>
</tr>
<tr>
<td>50-250</td>
<td>12</td>
<td>64GB</td>
<td>200GB</td>
<td>1Gbps</td>
</tr>
<tr>
<td>251-1000</td>
<td>16</td>
<td>128GB</td>
<td>500GB</td>
<td>10Gbps</td>
</tr>
<tr>
<td>1001-5000</td>
<td>20</td>
<td>256GB</td>
<td>1TB</td>
<td>10Gbps</td>
</tr>
<tr>
<td>5000+</td>
<td>24</td>
<td>512GB</td>
<td>2TB</td>
<td>10Gbps</td>
</tr>
</tbody>
</table>

Nomad Clients

Nomad client machines run the CircleCI jobs that are scheduled by the Nomad Server on the Services machine. Following are the Minimum CPU, RAM, and disk space requirements per client:

- CPU: 4 cores
- RAM: 32GB
- Disk space: 100GB
- NIC speed: 1Gbps

The following table defines the number of Nomad clients to make available as a best practice. Scale up and down according to demand on your system:

<table>
<thead>
<tr>
<th>Number of daily active CircleCI users</th>
<th>Number of Nomad client machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;50</td>
<td>1-5</td>
</tr>
<tr>
<td>50-250</td>
<td>5-10</td>
</tr>
<tr>
<td>250-1000</td>
<td>10-15</td>
</tr>
<tr>
<td>5000+</td>
<td>15+</td>
</tr>
</tbody>
</table>

Server Ports

Below all ports required by a CircleCI 2.0 installation are listed for each machine type.
## Services Machine

<table>
<thead>
<tr>
<th>Port number</th>
<th>Protocol</th>
<th>Direction</th>
<th>Source / destination</th>
<th>Use</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>TCP</td>
<td>Inbound</td>
<td>End users</td>
<td>HTTP web app traffic</td>
<td></td>
</tr>
<tr>
<td>443</td>
<td>TCP</td>
<td>Inbound</td>
<td>End users</td>
<td>HTTPS web app traffic</td>
<td></td>
</tr>
<tr>
<td>7171</td>
<td>TCP</td>
<td>Inbound</td>
<td>End users</td>
<td>Artifacts access</td>
<td></td>
</tr>
<tr>
<td>8081</td>
<td>TCP</td>
<td>Inbound</td>
<td>End users</td>
<td>Artifacts access</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>TCP</td>
<td>Inbound</td>
<td>Administrators</td>
<td>SSH</td>
<td></td>
</tr>
<tr>
<td>8800</td>
<td>TCP</td>
<td>Inbound</td>
<td>Administrators</td>
<td>Admin console</td>
<td></td>
</tr>
<tr>
<td>8125</td>
<td>UDP</td>
<td>Inbound</td>
<td>Nomad Clients</td>
<td>Metrics</td>
<td>Only if using externalized Nomad Servers</td>
</tr>
<tr>
<td>4647</td>
<td>TCP</td>
<td>Bi-directional</td>
<td>Nomad Clients</td>
<td>Internal communication</td>
<td></td>
</tr>
<tr>
<td>8585</td>
<td>TCP</td>
<td>Bi-directional</td>
<td>Nomad Clients</td>
<td>Internal communication</td>
<td></td>
</tr>
<tr>
<td>7171</td>
<td>TCP</td>
<td>Bi-directional</td>
<td>Nomad Clients</td>
<td>Internal communication</td>
<td></td>
</tr>
<tr>
<td>3001</td>
<td>TCP</td>
<td>Bi-directional</td>
<td>Nomad Clients</td>
<td>Internal communication</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>TCP</td>
<td>Bi-directional</td>
<td>GitHub Enterprise / GitHub.com (whichever applies)</td>
<td>Webhooks / API access</td>
<td></td>
</tr>
<tr>
<td>443</td>
<td>TCP</td>
<td>Bi-directional</td>
<td>GitHub Enterprise / GitHub.com (whichever applies)</td>
<td>Webhooks / API access</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>TCP</td>
<td>Outbound</td>
<td>AWS API endpoints</td>
<td>API access</td>
<td>Only if running on AWS</td>
</tr>
<tr>
<td>Port number</td>
<td>Protocol</td>
<td>Direction</td>
<td>Source / destination</td>
<td>Use</td>
<td>Notes</td>
</tr>
<tr>
<td>-------------</td>
<td>----------</td>
<td>-----------</td>
<td>----------------------</td>
<td>----------------------</td>
<td>----------------------------------------------------------------------</td>
</tr>
<tr>
<td>443</td>
<td>TCP</td>
<td>Outbound</td>
<td>AWS API endpoints</td>
<td>API access</td>
<td>Only if running on AWS</td>
</tr>
<tr>
<td>5432</td>
<td>TCP</td>
<td>Outbound</td>
<td>PostgreSQL Servers</td>
<td>PostgreSQL database connection</td>
<td>Only if using externalised databases. Port is user-defined, assuming the default PostgreSQL port.</td>
</tr>
<tr>
<td>27017</td>
<td>TCP</td>
<td>Outbound</td>
<td>MongoDB Servers</td>
<td>MongoDB database connection</td>
<td>Only if using externalized databases. Port is user-defined, assuming the default MongoDB port.</td>
</tr>
<tr>
<td>5672</td>
<td>TCP</td>
<td>Outbound</td>
<td>RabbitMQ Servers</td>
<td>RabbitMQ connection</td>
<td>Only if using externalized RabbitMQ</td>
</tr>
<tr>
<td>6379</td>
<td>TCP</td>
<td>Outbound</td>
<td>Redis Servers</td>
<td>Redis connection</td>
<td>Only if using externalized Redis</td>
</tr>
<tr>
<td>4647</td>
<td>TCP</td>
<td>Outbound</td>
<td>Nomad Servers</td>
<td>Nomad Server connection</td>
<td>Only if using externalized Nomad Servers</td>
</tr>
<tr>
<td>443</td>
<td>TCP</td>
<td>Outbound</td>
<td>CloudWatch Endpoints</td>
<td>Metrics</td>
<td>Only if using AWS CloudWatch</td>
</tr>
</tbody>
</table>
# Nomad Clients

<table>
<thead>
<tr>
<th>Port number</th>
<th>Protocol</th>
<th>Direction</th>
<th>Source / destination</th>
<th>Use</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>64535-65535</td>
<td>TCP</td>
<td>Inbound</td>
<td>End users</td>
<td>SSH into builds feature</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>TCP</td>
<td>Inbound</td>
<td>Administrators</td>
<td>CircleCI Admin API access</td>
<td></td>
</tr>
<tr>
<td>443</td>
<td>TCP</td>
<td>Inbound</td>
<td>Administrators</td>
<td>CircleCI Admin API access</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>TCP</td>
<td>Inbound</td>
<td>Administrators</td>
<td>SSH</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>TCP</td>
<td>Outbound</td>
<td>GitHub Enterprise / GitHub.com (whichever applies)</td>
<td>Download Code From Github.</td>
<td></td>
</tr>
<tr>
<td>4647</td>
<td>TCP</td>
<td>Bi-directional</td>
<td>Services Machine</td>
<td>Internal communication</td>
<td></td>
</tr>
<tr>
<td>8585</td>
<td>TCP</td>
<td>Bi-directional</td>
<td>Services Machine</td>
<td>Internal communication</td>
<td></td>
</tr>
<tr>
<td>7171</td>
<td>TCP</td>
<td>Bi-directional</td>
<td>Services Machine</td>
<td>Internal communication</td>
<td></td>
</tr>
<tr>
<td>3001</td>
<td>TCP</td>
<td>Bi-directional</td>
<td>Services Machine</td>
<td>Internal communication</td>
<td></td>
</tr>
<tr>
<td>443</td>
<td>TCP</td>
<td>Outbound</td>
<td>Cloud Storage Provider</td>
<td>Artifacts storage</td>
<td>Only if using external artifacts storage</td>
</tr>
<tr>
<td>53</td>
<td>UDP</td>
<td>Outbound</td>
<td>Internal DNS Server</td>
<td>DNS resolution</td>
<td>This is to make sure that your jobs can resolve all DNS names that are needed for their correct operation.</td>
</tr>
</tbody>
</table>
### GitHub Enterprise / GitHub.com

<table>
<thead>
<tr>
<th>Port number</th>
<th>Protocol</th>
<th>Direction</th>
<th>Source / destination</th>
<th>Use</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>TCP</td>
<td>Inbound</td>
<td>Services Machine</td>
<td>Git access</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>TCP</td>
<td>Inbound</td>
<td>Nomad Clients</td>
<td>Git access</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>TCP</td>
<td>Inbound</td>
<td>Nomad Clients</td>
<td>API access</td>
<td></td>
</tr>
<tr>
<td>443</td>
<td>TCP</td>
<td>Inbound</td>
<td>Nomad Clients</td>
<td>API access</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>TCP</td>
<td>Bi-directional</td>
<td>Services Machine</td>
<td>Webhooks / API access</td>
<td></td>
</tr>
</tbody>
</table>

### PostgreSQL Servers

<table>
<thead>
<tr>
<th>Port number</th>
<th>Protocol</th>
<th>Direction</th>
<th>Source / destination</th>
<th>Use</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>5432</td>
<td>TCP</td>
<td>Bi-directional</td>
<td>PostgreSQL Servers</td>
<td>PostgreSQL replication</td>
<td>Only if using externalized databases. Port is user-defined, assuming the default PostgreSQL port.</td>
</tr>
</tbody>
</table>

### MongoDB Servers

<table>
<thead>
<tr>
<th>Port number</th>
<th>Protocol</th>
<th>Direction</th>
<th>Source / destination</th>
<th>Use</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>27017</td>
<td>TCP</td>
<td>Bi-directional</td>
<td>MongoDB Servers</td>
<td>MongoDB replication</td>
<td>Only if using externalized databases. Port is user-defined, assuming the default MongoDB port.</td>
</tr>
</tbody>
</table>
### RabbitMQ Servers

<table>
<thead>
<tr>
<th>Port number</th>
<th>Protocol</th>
<th>Direction</th>
<th>Source / destination</th>
<th>Use</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>5672</td>
<td>TCP</td>
<td>Inbound</td>
<td>Services Machine</td>
<td>RabbitMQ connection</td>
<td>Only if using externalized RabbitMQ</td>
</tr>
<tr>
<td>5672</td>
<td>TCP</td>
<td>Bi-directional</td>
<td>RabbitMQ Servers</td>
<td>RabbitMQ mirroring</td>
<td>Only if using externalized RabbitMQ</td>
</tr>
</tbody>
</table>

### Redis Servers

<table>
<thead>
<tr>
<th>Port number</th>
<th>Protocol</th>
<th>Direction</th>
<th>Source / destination</th>
<th>Use</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>6379</td>
<td>TCP</td>
<td>Inbound</td>
<td>Services Machine</td>
<td>Redis connection</td>
<td>Only if using externalized Redis</td>
</tr>
<tr>
<td>6379</td>
<td>TCP</td>
<td>Bi-directional</td>
<td>Redis Servers</td>
<td>Redis replication</td>
<td>Only if using externalized Redis, and using Redis replication (optional)</td>
</tr>
</tbody>
</table>

### Nomad Servers

<table>
<thead>
<tr>
<th>Port number</th>
<th>Protocol</th>
<th>Direction</th>
<th>Source / destination</th>
<th>Use</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>4646</td>
<td>TCP</td>
<td>Inbound</td>
<td>Services Machine</td>
<td>Nomad Server connection</td>
<td>Only if using externalized Nomad Servers</td>
</tr>
<tr>
<td>4647</td>
<td>TCP</td>
<td>Inbound</td>
<td>Services Machine</td>
<td>Nomad Server connection</td>
<td>Only if using externalized Nomad Servers</td>
</tr>
<tr>
<td>4648</td>
<td>TCP</td>
<td>Bi-directional</td>
<td>Nomad Servers</td>
<td>Nomad Servers internal communication</td>
<td>Only if using externalized Nomad Servers</td>
</tr>
</tbody>
</table>
Installation Prerequisites

CircleCI uses Terraform to automate parts of the infrastructure for your CircleCI Server install, so you will need to install this first:

- Visit Download Terraform and choose the correct package for your architecture.

Ensure you have the following information available before beginning the installation procedure:

- A CircleCI License file (.rli). Contact CircleCI support for a license and request a cluster-enabled license to run jobs on dedicated instances for best performance.
- Your AWS Access Key ID and Secret Access Key.
- Name of your AWS EC2 key pair.
- AWS Region, for example us-west-2.
- AWS Virtual Private Cloud (VPC) ID and AWS Subnet ID. If your account is configured to use a default VPC, your default VPC ID is listed under Account Attributes, which you will find from the AWS management console on the EC2 dashboard page.
- Set your VPC (enableDnsSupport) setting to true to ensure that queries to the Amazon provided DNS server at the 169.254.169.253 IP address, or the reserved IP address at the base of the VPC IPv4 network range plus two will succeed. See the Using DNS with Your VPC Amazon Web Services documentation for additional details.

Private Subnet Requirements

The following additional settings are required to support using private subnets on AWS with CircleCI:

- The private subnet for builder boxes must be configured with a NAT gateway or an internet gateway configured for the outbound traffic to the internet via attached route tables.
  
  The subnet should be large enough to never exhaust the addresses.

- The VPC Endpoint for S3 should be enabled. Enabling the VPC endpoint for S3 should significantly improve S3 operations for CircleCI and other nodes within your subnet.

- Adequately power the NAT instance for heavy network operations. Depending on the specifics of your deployment, it is possible for NAT instances to become constrained by highly parallel builds using Docker and external network resources. A NAT that is inadequate could cause slowness in network and cache operations.

- If you are integrating with github.com, ensure that your network access control list (ACL) whitelists ports 80 and 443 for GitHub webhooks. When integrating with GitHub, either set up CircleCI in a public subnet, or set up a public load balancer to forward github.com traffic.

- See the Services Machine section of our overview for more information on the specific ports that need to be accessible to instances in your CircleCI installation.

Planning

Have available the following information and policies before starting the installation:
• If you use network proxies, contact your Account team before beginning your install.

• Plan to provision at least two AWS instances, one for Services and one for your first set of Nomad Clients. Best practice is to use an **m4.2xlarge** instance with 8 vCPUs and 32GB RAM for both the Services and Nomad Clients instances.

• AWS instances must have outbound access to pull Docker containers and to verify your license. If you don’t want to give open outbound access, see our [list of ports](#) that will need access.

• In order to provision required AWS entities with Terraform you will require an IAM User with the following permissions (See the [AWS guidance](#) on creating IAM users):

```json
{
    "Version": "2012-10-17",
    "Statement": [
        {
            "Action": [
                "s3:*
            ],
            "Effect": "Allow",
            "Resource": [
                "arn:aws:s3:::circleci-*",
                "arn:aws:s3:::circleci-**",
                "arn:aws:s3:::*"
            ]
        },
        {
            "Action": [
                "sqs:*",
                "iam:*",
                "ec2:StartInstances",
                "ec2:RunInstances",
                "ec2:TerminateInstances",
                "ec2:Describe*",
                "ec2:CreateTags",
                "ec2:AuthorizeSecurityGroupEgress",
                "ec2:AuthorizeSecurityGroupIngress",
                "ec2:CreateSecurityGroup",
                "ec2:DeleteSecurityGroup",
                "ec2:DescribeInstanceAttribute",
                "ec2:DescribeInstanceStatus",
                "ec2:DescribeInstances",
                "ec2:DescribeNetworkAcls"
            ]
        }
    ]
}
```
"ec2:DescribeSecurityGroups",
"ec2:RevokeSecurityGroupEgress",
"ec2:RevokeSecurityGroupIngress",
"ec2:ModifyInstanceAttribute",
"ec2:ModifyNetworkInterfaceAttribute",
"cloudwatch:*",
"autoscaling:DescribeAutoScalingGroups",
"iam:GetUser"
]

"Resource": [
  "*"
],

"Effect": "Allow"
}
Installation on AWS with Terraform

Following is a step by step guide to installing CircleCI Server v2.17 with Terraform.

Define Variables for Terraform

1. Clone the Setup repository. If you already have it cloned, make sure it is up-to-date and you are on the master branch by running:

   ```bash
git checkout master && git pull
   ```

2. Go to the top directory of the enterprise-setup repo on your local machine.

3. Run terraform init to initialize your working directory.

4. Run make init to initialize a terraform.tfvars file (your previous terraform.tfvars if any, will be backed up in the same directory).

5. Open terraform.tfvars in an editor and fill in appropriate AWS values for section 1.

6. If you plan to use 1.0 builders, specify a circle_secret_passphrase in section 2, replacing _ with alpha numeric characters, if not, leave it as is. 1.0 builders are disabled by default in section 3.

7. Specify the instance type to use for your Nomad clients. By default, the value specified in the terraform.tfvars file for Nomad Clients is m4.2xlarge (8 vCPUs, 32GB RAM). To increase the number of concurrent CircleCI jobs that each Nomad Client can run, modify section 2 of the terraform.tfvars file to specify a larger nomad_client_instance_type. Refer to the AWS Amazon EC2 Instance Types guide for details.

   The builder_instance_type is only used for CircleCI 1.0 and is disabled by default in section 3.

8. In section 3 you can:

   a. choose to use 1.0 Builders if your project requires it (by changing the count to 1)

   b. enter proxy details, and enter a prefix if there will be multiple installations within your AWS region – the Services and Nomad client instances will be displayed with this prefix in the AWS console.
Above is an example of the `terraform.tfvars` file you will be editing. The table below shows some of the default settings, and some optional variables that can be used to further customize your cluster. A full list of...
variables and defaults can be found in the `variables.tf` file in the root of the enterprise-setup directory.

Optional vars:

<table>
<thead>
<tr>
<th>Var</th>
<th>Description</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>services_instance_type</td>
<td>Instance type for the centralized services box. We recommend a m4 instance</td>
<td>m4.2xlarge</td>
</tr>
<tr>
<td>builder_instance_type</td>
<td>Instance type for the 1.0 builder machines. We recommend a r3 instance</td>
<td>r3.2xlarge</td>
</tr>
<tr>
<td>max_builders_count</td>
<td>Max number of 1.0 builders</td>
<td>2</td>
</tr>
<tr>
<td>nomad_client_instance_type</td>
<td>Instance type for the nomad clients (2.0 builders). We recommend a XYZ instance</td>
<td>m4.xlarge</td>
</tr>
<tr>
<td>max_clients_count</td>
<td>Max number of nomad clients</td>
<td>2</td>
</tr>
<tr>
<td>prefix</td>
<td>Prefix for resource names</td>
<td>circleci</td>
</tr>
<tr>
<td>enable_nomad</td>
<td>Provisions a nomad cluster for CircleCi Server v2.x</td>
<td>1</td>
</tr>
<tr>
<td>enable_route</td>
<td>Enable creating a Route53 route for the Services box</td>
<td>0</td>
</tr>
<tr>
<td>services_user_data_enabled</td>
<td>Set to 0 to disable automated installation on Services Box</td>
<td>1</td>
</tr>
<tr>
<td>force_destroy_s3_bucket</td>
<td>Add/Remove ability to forcefully destroy S3 bucket when your installation is shut down</td>
<td>false</td>
</tr>
<tr>
<td>services_disable_api_termination</td>
<td>Protect the services instance from API termination. Set to false if you would like to terminate the Services box automatically when your installation is shut down</td>
<td>true</td>
</tr>
</tbody>
</table>

Provision Instances

1. Save your changes to the `tfvars` file and run the following:

   ```bash
   terraform plan
   ```

2. To provision your instances, run the following:

   ```bash
   terraform apply
   ```
You will be asked to confirm if you wish to go ahead by typing **yes**.

3. An IP address will be provided at the end of the Terraform output. Visit this IP to carry on the install process.

**Access Your Installation**

1. You will see a browser-specific SSL/TLS info box. This is just to inform you that on the next screen your browser might tell you the connection to the admin console is unsafe, but you can be confident it is secure. Click Continue to Setup and proceed to your installation IP.

![Figure 2. SSL Security](image)

2. Enter your hostname – this can be your domain name or public IP of the Services Machine instance. At this time you can also upload your SSL public key and certificate if you have them. To proceed without providing these click Use Self-Signed Cert – choosing this option will mean you will see security warnings each time you visit the Management Console.
3. Upload your license.

4. Decide how to secure the Management Console. You have three options:
   a. Anonymous admin access to the console, anyone on port 8800 can access (not recommended)
   b. Set a password that can be used to securely access the Management Console (recommended)
   c. Use your existing directory-based authentication system (for example, LDAP)
5. Your CircleCI installation will be put through a set of preflight checks, once they have completed, scroll down and click Continue.
Installation Setup

You should now be on the Management Console settings page (your-circleci-hostname.com:8800).

You can make changes to the settings on this page at any time but changes here will require downtime while the service is restarted. Some settings are covered in more detail in our Operations Guide.

1. The Hostname field should be pre-populated from earlier in the install process, but if you skipped that step, enter your domain or public IP of the Services machine instance. You can check this has been entered correctly by clicking Test Hostname Resolution.

2. The Services section is only used when externalizing services. Externalization is available with a Platinum service contract. Contact support@circleci.com if you would like to find out more.

3. Under Execution Engines, only select 1.0 Builders if you require them for a legacy project – most users will leave this unchecked.

4. Select Cluster in the 2.0 Builders Configuration section. The Single box option will run jobs on the Services machine, rather than a dedicated instance, so is only suitable for trialling the system, or for some small teams.
5. Register CircleCI as a new OAuth application in GitHub.com or GitHub Enterprise by following the instructions provided onscreen.

   If you get an "Unknown error authenticating via GitHub. Try again, or contact us." message, try using http: instead of https: for the Homepage URL and callback URL.

6. Copy the Client ID and Secret from GitHub and paste it into the relevant fields, then click Test Authentication.

7. If you are using GitHub.com, move on to the next step. If using Github Enterprise, you will also need to supply an API Token so we can verify your organization. To provide this, complete the following from your GitHub Enterprise dashboard:

   a. Navigate to Personal Settings (top right) > Developer Settings > Personal Access Tokens.
   b. Click "generate new token". Name the token appropriately to prevent accidental deletion. Do not tick any of the checkboxes, we only require the default public read-level access so no extra permissions are required. We recommend this token should be shared across your organization rather than being owned by a single user.
   c. Copy the new token and paste it into the GitHub Enterprise Default API Token field.
8. If you wish to use LDAP authentication for your installation, enter the required details in the LDAP section.

9. We recommend using an SSL certificate and key for your install. You can submit these in the Privacy section if this step was missed during the installation.

10. We recommend using S3 for storage and all required fields for Storage are pre-populated. The IAM user, as referred to in the planning section of this document, is used here.
11. Complete enhanced AWS Integration options.

12. Complete the Email section if you wish to configure your own email server for sending build update emails. Leave this section is you wish to use our default email server.

   Due to an issue with our third party tooling, Replicated, the Test SMTP Authentication button is not currently working

13. Configure VM service if you plan to use Remote Docker or machine executor features. We recommend using an IAM instance profile for authentication, as described in the planning section of this document. With this section completed, instances will automatically be provisioned to execute jobs in Remote Docker or use the machine executor.
You can preallocate instances to always be up and running, reducing the time taken for Remote Docker and machine executor jobs to start. If preallocation is set, a cron job will cycle through your preallocated instances once per day to prevent them getting into a bad/dead state.

If Docker Layer Caching (DLC) is to be used VM preallocation must be set to 0 – on-demand – for both Remote Docker and machine executor.

14. If you wish to use AWS Cloudwatch or Datadog for collating metrics for your installation, set this up here. For more information see our Monitoring guidance:
15. Artifacts persist data after a job is completed, and may be used for longer-term storage of your build process outputs. By default, CircleCI Server only allows approved types to be served. This is to protect users from uploading, and potentially executing malicious content. The Artifacts setting allows you to override this protection. For more information on safe/unsafe types see our Build Artifacts guidance.

16. After agreeing to the License Agreement and saving your settings, select Restart Now from the popup. You will then be redirected to start CircleCI and view the Management Console Dashboard. It will take a few minutes to download all of the necessary Docker containers.

If the Management Console reports Failure reported from operator: no such image click Start again and it should continue.

Validate Your Installation

1. When the application is started, select Open to launch CircleCI in your browser, and sign up/log in to your CircleCI installation and start running 2.0 builds! You will become the Administrator at this point as you are the first person to sign in. Have a look at our Getting Started guide to start adding projects.
2. After build containers have started and images have been downloaded, the first build should begin immediately. If there are no updates after around 15 minutes, and you have clicked the Refresh button, contact CircleCI support for assistance.

3. You can use our realitycheck repo to check basic CircleCI functionality.

4. If you’re unable to run your first builds successfully please start with our Troubleshooting guide for general troubleshooting topics, and our Introduction to Nomad Cluster Operation for information about how to check the status of Builders in your installation.
Teardown

If you wish to delete your installation of CircleCI Server, please let us know first in case there are any specific, supplementary steps required for your installation. Below is our basic step by step guide to tearing down an installation of CircleCI Server that was made with Terraform:

1. First you need to manually disable the termination protection on the Services machine from the AWS Management Console (If you set services_disable_api_termination = "false" in your terraform.tfvars file, skip this step). To do this:
   a. Navigate to the EC2 Dashboard and locate the Services machine instance
   b. Click to select it
2. Click Actions > Instance Settings > Change Termination Protection
3. Navigate to the S3 dashboard, locate the S3 bucket associated with your CircleCI cluster and delete the bucket and its contents (If you set force_destroy_s3_bucket = "true" in your terraform.tfvars file, skip this step).
4. From a terminal, navigate to your clone of our enterprise-setup repo and run terraform destroy to destroy all EC2 instances, IAM roles, ASGs and Launch configurations created by terraform apply.
Updating a Server Installation

This section describes the Server update process.

Update Steps

1. Take a snapshot of your installation so you can rollback later if necessary (optional but recommended) - steps below
2. Check you are running Docker v17.12.1 and update if necessary
3. Update Replicated to install the new version of CircleCI Server - steps below

Snapshot for Rollback

To take a snapshot of your installation:

1. Go to the Management Console (e.g. your-circleci-hostname.com:8800) and click Stop Now to stop the CircleCI Services machine from running
2. Ensure no jobs are running on the nomad clients – check by running `nomad status`
3. Navigate to the AWS EC2 management console and select your Services machine instance
4. Select Actions > Image > Create Image – Select the No Reboot option if you want to avoid downtime at this point. This image creation step creates an AMI that can be readily launched as a new EC2 instance to restore your installation.

It is also possible to automate this process with the AWS API. Subsequent AMIs/snapshots are only as large as the difference (changed blocks) since the last snapshot, such that storage costs are not necessarily larger for more frequent snapshots, see Amazon's EBS snapshot billing document for details. Once you have the snapshot you are free to make changes on the Services machine.

If you do need to rollback at any point, see our guide to restoring from a backup.

Updating Replicated

Prerequisites

- Your installation is Ubuntu 14.04 or 16.04 based.
- You are running replicated version 2.10.3 on your services machine. Check by running the following:

```
replicated --version
```

- Your installation is not airgapped and you can access the internet from it
- All steps are completed on the Services machine
Preparations

Remember to take a snapshot (described above) before starting the Replicated update process

1. Stop the CircleCI application:

   replicatedctl app stop

   Application shutdown takes a few minutes. Please check the administration dashboard and wait for the status to become "Stopped" before continuing. You can also run the following command to view the app status:

   replicatedctl app status inspect

   Example Output:

   ```
   [
     {
       "AppID": "edd9471be0bc4ea04dfca94718ddf621",
       "Sequence": 2439,
       "State": "stopped",
       "DesiredState": "stopped",
       "Error": "",
       "IsCancellable": false,
       "IsTransitioning": false,
       "LastModifiedAt": "2018-10-23T22:00:21.314987894Z"
     }
   ]
   ```

2. For the replicated update to succeed, it is necessary to update docker to the recommended version, 17.12.1:

   ```
   sudo apt-get install docker-ce=17.12.1~ce-0~ubuntu
   ```

3. Pin the Docker version using the following command:

   ```
   sudo apt-mark hold docker-ce
   ```
Perform Update

1. Perform the Replicated update by executing the update script as follows:

```
curl -sSL "https://get.replicated.com/docker?replicated_tag=2.34.1" | sudo bash
```

Double-check your replicated and docker versions:

```
replicatedctl version # 2.34.1
docker -v # 17.12.1
```

2. Restart the app with

```
replicatedctl app start
```

The application will take a few minutes to spin up. You can check the progress in the administration dashboard or by executing:

```
replicatedctl app status inspect
```

Example output:

```
[
  {
    "AppID": "edd9471be0bc4ea04dfca94718ddf621",
    "Sequence": 2439,
    "State": "started",
    "DesiredState": "started",
    "Error": "",
    "IsCancellable": true,
    "IsTransitioning": true,
    "LastModifiedAt": "2018-10-23T22:04:05.00374451Z"
  }
]
```

You will now be running the latest version of CircleCI Server.