Self Hosted RoostGPT - Deploy on AWS using Terraform

To self-host RoostGPT stack, we need the below infrastructure resources.

- MySQL or Postgres Database
- SSL Certificates and a DNS domain
- oAuth application related client id, secret and DNS configuration for redirect
- Identify an IP CIDR range and a cloud data-center region and availability zone for configuring cloud compute and networking resources

The below resources will be provisioned using Terraform script

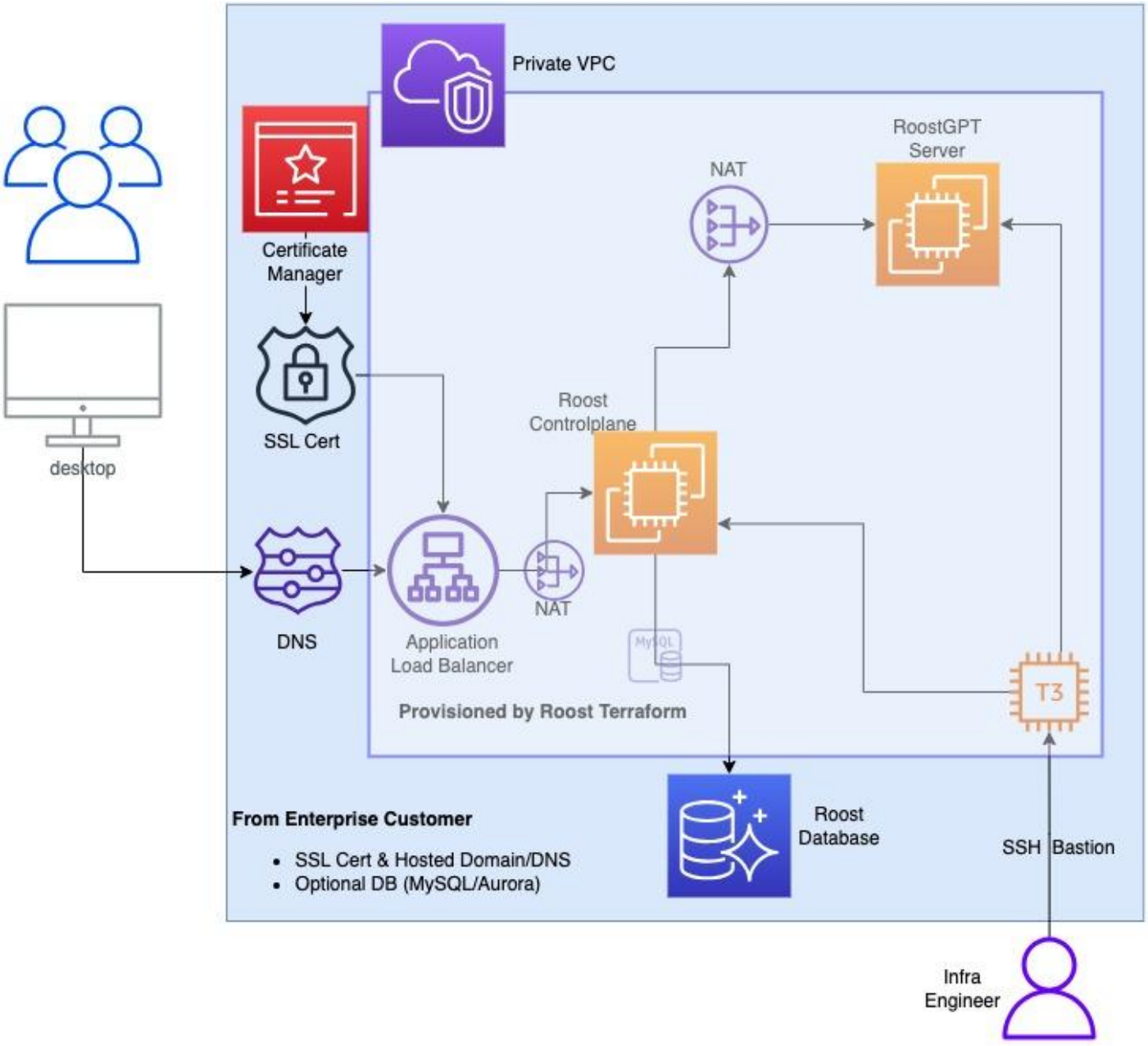
- VPC and corresponding public and private subnets and NAT gateway
- Ubuntu Compute instances (EC2) and associated storage volumes
- Application Load-balancer and target groups

1. Getting Started

Roost provides terraform scripts to spin up and configure the RoostGPT platform easily. Below are the steps for deploying Roost on AWS using Terraform

High-Level Architecture

Roost Terraform scripts create the below components in the AWS cloud



Interactive diagram at https://docs.roost.ai/arch

Prerequisites

- User Account with Admin privileges / Policies enabled to run terraform scripts
- region
- route53_hosted_zone_id
- ec2_ami (for Ubuntu Jammy 22.04)
- enterprise_dns
- ip_block_vpc (VPC CIDR where Roost would be set up)
- okta_client_id or appropriate auth provider (please refer next section)
- company name

Download the Terraform scripts

```
curl -LO https://github.com/roost-io/roost-support/raw/refs/heads/master/terraform-ec2.zip
```

2. OAuth Provider Setup

Roost supports various authentication mechanisms as mentioned below

1. Okta
2. Google
3. Microsoft Azure ADFS

OKTA Auth Client Setup

- Sign in to your OKTA account with admin privileges (*If you do not have an existing Okta account, then sign-up at* Home | Okta Developer)
- From the left navigation menu, go to Applications -> Applications.
- Select Create App Integration → OIDC - OpenID Connect → Web Application, then click Next
- Fill in the suitable **App integration name,** upload the logo.
- Add **Sign-in redirect URIs**
  - https://<DNS_NAME>/login
- Allow Access to users thru Assignments → Controlled Access
  - Select the groups of users or Allow access to everyone
- Save and Make a note of the Okta Client ID and the Client Secret (It is needed later in the config below)
- From the left navigation menu, go to Security -> API
- Make a note of **Issuer URI** for default Authorisation Server
  - something like https://{your_domain}.okta.com/oauth2/default

Google Auth Client Setup

- Integrating Google Sign-In into your web app | Google Sign-In for Websites | Google Developers
- Login to https://console.cloud.google.com/apis/credentials
- Create Credentials, Select OAuth Client and Application Type as Web Application
- Add Authorised JavaScript Origin as
  - https://<DNS_NAME>

- Add Authorised redirect URIs

    - https://<DNS_NAME>/login
    - https://<DNS_NAME>/api/auth/redirect/google
- Download the JSON
- Make a note of the Google Client ID and the Client Secret (It is needed later in the config below)

Azure ADFS Auth Client Setup

`Roost 0Auth2 Setup - Windows Server 2016/2019 - ADFS 4.0`

1. Open the **Server Manager** from **Start Menu,** Select **Tools** > **AD FS Management**
2. From the **AD FS Management** screen, go to **AD FS → Application Groups**
3. Click **Add Application Group** on right panel

1. Fill in a **name** (**Roost**) for the application group
2. Select **Server Application Web browser accessing a web API** and click **Next**
3. Make note of the **Client Identifier** value. This will be the value for the `AZURE_ADFS_CLIENT_ID` variable
4. Fill the **Redirect URI** (https://<DNS_NAME>/login) and click Add, then Next
5. Check the **Genrate a shared secret** box
6. Use the **Copy to clipboard** button to retrieve the secret. This will be the value for the `AZURE_ADFS_CLIENT_SECRET` variable. Click **Next**
7. Enter the Web API identifier (Same as RedirectUri - https://<DNS_NAME>/login) and click A**dd,** then **Next**
8. On the **Access Control Policy** screen, select a policy, usually **Permit everyone** and click **Next**
9. On the **Configure Application Permissions** screen, select the scope **openid** and click **Next**
10. **Review the settings and click Next**
11. Close the wizard by clicking **Close**. Our application is now registered in ADFS.

1. Now, we need to **Configure the Claims** for Application

1. Open the P**roperties** for the application group we just created.
2. Select the **Web application** entry (**Roost - Web API**) and click **Edit**
3. On the **Issuance Transform Rules** tab, click the **Add Rule** button
4. Select **Send LDAP Attributes as Claims** and click **Next**
5. Give the rule a name (**Roost Claims**) and select **Active Directory** as the attribute store.
6. Now configure the below claims (**LDAP Attribute => Outgoing Claim Type**):

1. E-Mail-Addresses => E-Mail Address
2. Given-Name => Given Name
3. Surname => Surname

4. SAM-Account-Name => Windows Account Name
5. User-Principal-Name => UPN

1. Click **Finish** to save the claims
2. You should now see the rule added. Click **OK** a couple of times to save the settings.

1. Now the setup is complete. We set these 3 values as environment variables:

1. `AZURE_ADFS_CLIENT_ISSUER` - Domain of ADFS Server (https://adfs.contoso.com)
2. `AZURE_ADFS_CLIENT_ID` - Client Identifier of server application
3. `AZURE_ADFS_CLIENT_SECRET` - Client Secret we copied to clipboard

If don’t want to use Client Secret, then Add an Native Application and pass `AZURE_ADFS_CLIENT_SECRET` variable as empty

3. Database Setup

Roost stores the status of the GPT workflow and other relevant information in Database. Roost supports MySQL, Postgres and Amazon Aurora DB. Any one database is needed for RoostGPT to work.

Below are the steps to setup an RDS in AWS

Amazon Aurora (MySQL Compatible) OR MySQL

1. Select RDS
2. Choose Create Database
3. Select “Easy Create” for “Amazon Aurora with MYSQL compatibility" or "MySQL"
4. Modify the RDS Security Group to allow TCP port 3306 access to the Control plane Instance security group only
5. Make a note of the writer instance database end-point, user, and password (It is needed later in the config below)

Create a new user with read-write privileges and avoid using an admin login.

```
# Sample command to create a user using MySQL CLI
# Provide password on prompt

mysql -h <SQL Host URL> -u <root|master|admin> -p
```

```
CREATE USER 'Roost'@'%' identified WITH mysql_native_password by 'Roost#123';
CREATE DATABASE roostio;
GRANT ALL on roostio.* to 'Roost'@'%';

# Execute the Roost Schema file, if available
\. /var/tmp/Roost/db/roost.sql
```

Amazon Aurora (PostgreSQL Compatible) OR PostgreSQL

1. Select RDS
2. Choose Create Database
3. Select “Easy Create” for “Amazon Aurora with PostgreSQL compatibility" or "PostgreSQL"
4. Modify the RDS Security Group to allow TCP port 5432 access to the Control plane Instance security group only
5. Make a note of the writer instance database end-point, user, and password (It is needed later in the config below)
6. Create a new user with read-write privileges and avoid using an admin login.

```
psql "host=<PG Host URL> user=<admin> dbname=postgres port=5432 sslmode=require"
```

```
CREATE DATABASE roostio;                                -- creates app database [5]
CREATE USER roost WITH PASSWORD 'Roost#123';            -- creates login role [3]
GRANT ALL PRIVILEGES ON DATABASE roostio TO roost;      -- DB-level grant [4]

-- Connect to the new DB (reconnect as admin or roost), then set schema privileges
\c roostio
GRANT USAGE ON SCHEMA public TO roost;
GRANT ALL ON ALL TABLES IN SCHEMA public TO roost;
GRANT USAGE ON ALL SEQUENCES IN SCHEMA public TO roost;
ALTER DEFAULT PRIVILEGES IN SCHEMA public
  GRANT ALL ON TABLES TO roost;
ALTER DEFAULT PRIVILEGES IN SCHEMA public
  GRANT USAGE ON SEQUENCES TO roost;

-- Execute the Roost Schema file, if available
\i /var/tmp/Roost/db/roost.sql
```

4. Terraform variables

Please follow the below steps to modify terraform files to incorporate the

- Copy `terraform.tfvars.original` as `terraform.tfvars`
- Fill in the below details (*sample values are already provided*)

```
enterprise_dns = "subdomain.domain.com"
admin_email = "comma separated list of emails"
enterprise_email_domain = "email-domain.com"
company = ""
license_key = ""
roost_jwt_token = "32-character-secure-long-secret"
roost_version = "v1.1.17"

az1_suffix = "b"
az2_suffix = "c"
certificate_arn = "arn:aws:acm:region:account:certificate/cert-id"
ec2_ami = "ami-023a307f3d27ea427"
region = "region"
ip_block_vpc="172.32.255.192"
route53_hosted_zone_id = ""
key_pair = "roost-ssh"

azure_tenant_id = ""
azure_client_id = ""
azure_client_secret = ""
okta_client_id = "your client id"
okta_client_secret = "your client secret"
okta_issuer = "https://account.okta.com/oauth2/default"

is_own_mysql = false
mysql_db_name = "roostio"
mysql_host = "mysqldb_host_url"
mysql_password = "Roost#123"
mysql_port = 3306
mysql_root_password = "Admin#123"
```

```
mysql_username = "Roost"
```

Terraform Variable Definitions

Field	Values	Description
roost_version	"v1.1.17"	
license_key		
prefix	"terraform-gpt"	
region	"us-west-1"	
az1_suffix	"b"	
az2_suffix	"c"	
deletion_protection	false	
route53_hosted_zone_id		
enterprise_dns	"roostgpt.example.com"	
enterprise_ssl_certificate_path	"/var/tmp/Roost/certs/server.cer"	
enterprise_ssl_certificate_key_path	"/var/tmp/Roost/certs/server.key"	
certificate_arn	""	
ec2_ami	"ami-03df6dea56f8aa618"	
key_pair	"roost-gpt-keypair"	
generate_key_pair	true	
device_name	"sdh"	
ip_block_vpc	"172.32.255.192"	
instance_type_controlplane	"c5a.2xlarge"	
instance_type_jumphost	"t3.micro"	

disk_roostgpt	150	
disk_jumphost	150	
disk_controlplane	150	
google_client_id		
google_client_secret		
github_client_id		
github_client_secret		
linkedin_client_id		
linkedin_client_secret		
azure_tenant_id		
azure_client_id		
azure_client_secret		
okta_client_id	"0oa4bweaxcqn2sfTu5d7"	
okta_client_secret	"D5oRtWXUWcl9gp1312dVtuSoumU4vrECO4wSsqAO"	
okta_issuer		
roost_jwt_token		
company		
company_logo	"https://roost.ai/hubfs/logos/Roost.ai-logo-gold.svg"	
enterprise_email_domain	"example.com"	
admin_email	"admin@email"	
admin_email_pass	""	
senders_email	"sender@email"	

is_own_mysql	false	
db_type	"mysql"	
mysql_host	"mysqldb_host_url"	
mysql_password	"Roost#123"	
mysql_username	"Roost"	
mysql_port	3306	
mysql_db_name	"roostio"	
mysql_root_password	"Admin#123"	
senders_email_pass		
email_smtp_host		

5. Upgrading/Maintaining RoostGPT Control-plane

There are multiple options available to refresh or upgrade the RoostGPT stack. The infrastructure engineer can use either of these approaches.

a. Using Terraform Script to upgrade RoostGPT version

Update Terraform Variables in "terraform.tfvars" to reflect the appropriate Roost Version

Field	Values
roost_version	v1.1.17

Run below commands:

```
terraform apply
```

b. Using Terraform Script to refresh control-plane (without any config change)

Run below commands

```
terraform apply --replace="null_resource.provision-controlplane-system" --replace="null_resource.provision-roostgpt-server" --replace="null_resource.run-controlplane-services"
```

c. Using SSH to control-plane instance

RoostGPT control-plane runs a docker compose script and the entire offering can be updated using the below given steps.

- SSH Connect to your infrastructure bastion instance as ubuntu user

- Execute the below snippet with the appropriate Roost Version (after replacing v1.1.17)

```
ssh cp "ROOST_VER='v1.1.17' /var/tmp/Roost/bin/roost-enterprise.sh -c /var/tmp/Roost/config.json -i roostai"
```