C3 AI Installation Guide – Microsoft Azure

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C3 AI Deployment Options: Guidance for Enterprise Customers

C3 AI offers flexible deployment models to meet the diverse needs of enterprise customers. Selecting the appropriate deployment option is a critical decision that impacts project timelines, service-level agreements (SLAs), and roles and responsibilities (RACI). This document outlines each option, highlights key considerations, and underscores the benefits of the C3 AI SaaS/PaaS Subscription, which is the recommended approach for most organizations.

1. C3 AI SaaS / PaaS Subscription (Preferred Standard Option)

The standard C3 AI SaaS/PaaS (Software as a Service / Platform as a Service) subscription is the most typical deployment option to leverage the C3 AI Platform and Applications. It is a fully hosted and managed service by C3 AI in Microsoft Azure. Customers may select their preferred Azure region for data residency.

Key Features and Benefits:

- **Lower Total Cost of Ownership (TCO):**
  Standardized technologies and processes enable rapid deployment, streamlined support, and efficient issue resolution. C3 AI maintains specific enterprise SLAs to deliver an industry-leading service with lower TCO.
- **Reduced Operational Burden:**
  Internal teams can focus on leveraging AI applications for business value, rather than managing infrastructure setup and maintenance.
- **Scalability:**
  The SaaS/PaaS model supports seamless scaling as business needs evolve. C3 AI manages all scaling needs and capacity planning required to ensure consistently available platform and applications.
- **Security and Compliance:**
  C3 AI employs industry standard cybersecurity and access control practices to safeguard customer applications and data. C3 AI holds and maintains critical compliance attestations like SOC2, ISO27001, and FedRAMP.

Why Choose SaaS/PaaS?
This model is the fastest, most cost-effective way to realize value from C3 AI products and generate AI-driven insights. It is recommended for organizations seeking minimal operational overhead and maximum agility.

2. Customer-Hosted, C3 AI-Managed Deployment

For organizations with non-standard data residency, security, or governance requirements, C3 AI supports deployments within a customer's own Azure Virtual Network (VNet). C3 AI Operations manages the deployment, maintenance, and support within the customer's environment. Your organization will have responsibility for portions of the infrastructure

to ensure C3 AI Operations can successfully deploy and manage C3 AI Products. Coordination with C3 AI Operations will be required for future upgrades, change and incident management activities. Additional charges may apply to support a customer-hosted deployment.

Key Considerations

- **Customer Responsibilities:**
  - Provision and secure Azure VNet according to internal policies.
  - Provide timely and required access to C3 AI Operations for installation and ongoing support.
  - Manage and troubleshoot infrastructure changes outside C3 AI's control that may affect availability or performance.
  - Assume all infrastructure hosting costs within the customer's cloud account.
- **Control and Access:** Customers retain greater control and thus greater responsibility over their Azure subscription and can limit permissions granted to C3 AI.

When to Choose This Option
This model is suitable for organizations with:

- Internal processes requiring direct control over cloud resources.
- Policies with non-standard local data residency, security, or governance requirements.

Summary Table

Deployment Model	Managed By	Hosted In	Customer Responsibilities	Recommended For
SaaS/PaaS Subscription (Preferred)	C3 AI	C3 AI Azure Cloud	Minimal	Most organizations
Customer-Hosted, C3 AI-Managed	C3 AI	Customer Azure VNet	VNet provisioning, access, infra costs	Regulated/controlled industries

Selecting the right deployment option is essential for project success. C3 AI strongly recommends the SaaS/PaaS Subscription for most enterprises, as it maximizes value, reduces risk, and accelerates time-to-insight.

If you have questions or require a tailored recommendation, please reach out to your C3 AI representative.

Customer Hosted Install Requirements: Checklist

Summary

For C3 AI to operate in customer-hosted Azure Cloud account, your organization must meet the following requirements consistently throughout the contract term. Deviations from the installation requirements incur additional operational fees.

You agree that your organization will allow C3 AI Operations to deploy all infrastructure required to support the C3 AI applications and platform per this specification and utilizes C3 AI deployment automation. This checklist only applies to customer hosted installations.

Installation and Operational Management Checklist

For C3 AI Operations to deploy a cluster in a customer-hosted deployment, you must provide the following access, network setup, and infrastructure to C3 AI:

1. An IAM role called C3.AdminOps with temporary administrator privileges to a dedicated Azure subscription, AWS account, or GCP project so that C3 AI can perform tasks to set up your deployment.

   C3 AI requires administrator privileges to set up an IAM policy and create a role that allows C3 AI Operations to perform installation, setup, and deployment tasks. You can remove administrator access after initial setup and may need to provide administrator access again to support new product releases.

2. An IAM role called C3.Ops with access to your dedicated Azure subscription, AWS account, or GCP project so that C3 AI can manage infrastructure.

3. If your firewall settings prevent C3 AI Operations from configuring access to required endpoints, you must allow access to the following:

   a. Routing to and from the C3 AI network so C3 AI can receive metrics, logs, and observability data to operate the deployment.

   b. Connectivity to endpoints that allow C3 AI product functionality.

4. New VNet and subnet with at least 1024 IP address (/22) available for C3 deployment. Each subnet must be across three availability zones.

5. Static DNS entry for C3 AI URL (for example, c3project.customer.com).

6. Private and public key (and the certificate chain if necessary) from the x509 certificate. C3 AI does not support self-signed certificates or certificates signed by an internal Certificate Authority. You must provide a certificate from a public Certificate Authority.

C3 AI Installation Requirements for Azure

The C3 Agentic AI Platform integrates with core Azure services like Azure VM, Azure Virtual Network (VNet), and IAM, enabling cohesive security and infrastructure management.

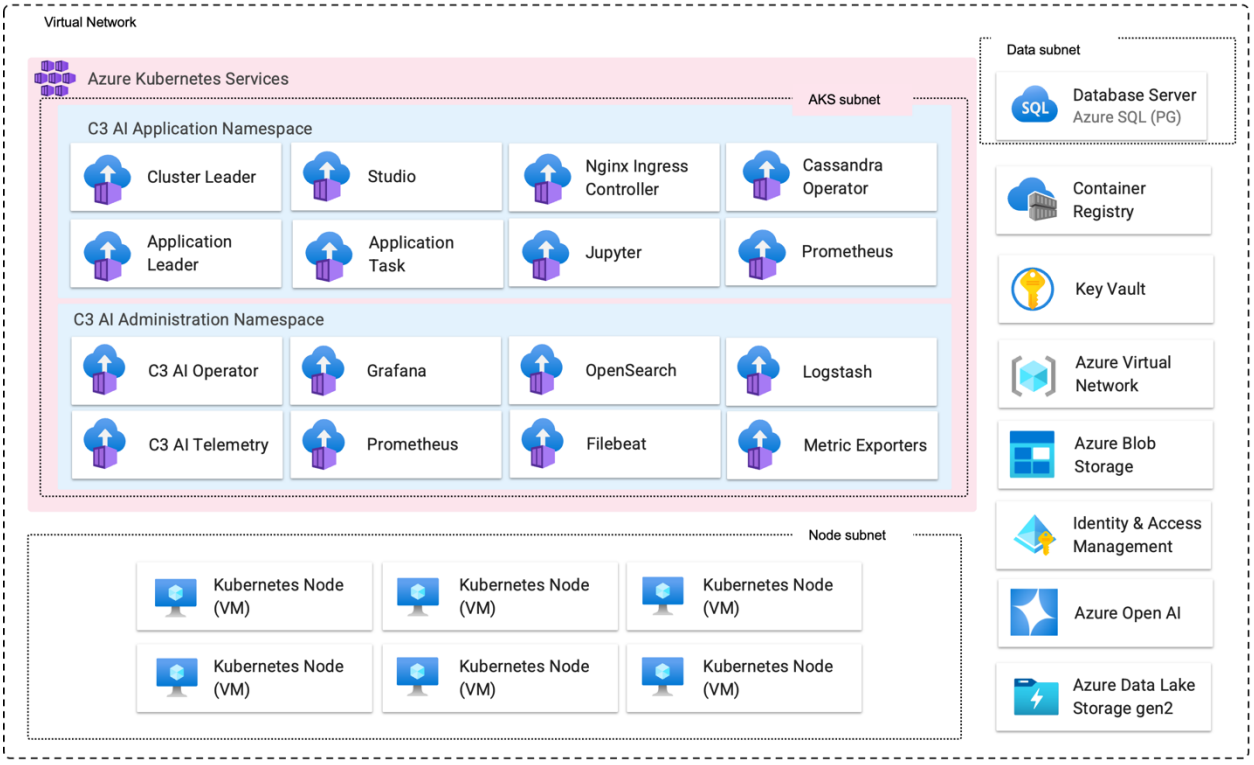

Figure 1. Microsoft Azure Architecture with C3 Agentic AI Platform Deployment

The C3 Agentic AI Platform requires specific Microsoft Azure cloud services and infrastructure for successful deployment, as well as specific access requirements for C3 AI Operations to install, administer, and upgrade the C3 Agentic AI Platform and C3 AI Applications.

Install and upgrade requirements including Bill of Materials (BOM) details can be reviewed on the documentation site https://docs.c3.ai/versions-and-compatibility/upgrade-requirements/8.9.

The following sections describe the specific services and access needs, including network configurations and subnet requirements, security group egress and ingress rules, and subnet-level access control lists (ACLs).

Required Microsoft Azure cloud services

The table below describes the Microsoft Azure cloud infrastructure services required by the C3 Agentic AI Platform. You are required to provide access to the services below configured to C3 AI specifications as documented in the HashiCorp Terraform scripts.

Microsoft Azure Service	Version	Description
Azure Kubernetes Engine (AKS)	1.34	Operating environment responsible for the deployment, scaling, and management of the C3 Agentic AI Platform and C3 AI Applications.
Azure Key Vault	Current version	Securely store and manage sensitive information such as secrets, keys, and certificates.
Azure PostgreSQL (Flexible servers)	15	Relational data required for internal operations of the C3 Agentic AI Platform.
Azure Blob Store	Current version	Reliable and secure object storage used for the management of application and platform configuration and other ancillary tasks.
Azure Identity and Access Management (IAM)	Current version	Fine-grained access control and visibility for centrally managing cloud service account resources. You must create a role called C3.Ops in your Azure deployment. Add the IAM policy specifications defined in the HashiCorp Terraform scripts.
Azure Resource Manager	3.89.0	To get and set resources (IAM policy) by project.
Azure Virtual Network (VNet)	Current version	Dedicated, isolated network for inter-C3Cluster communication.
Azure Virtual Machines	Current version	Compute instances required by Azure Kubernetes Engine.

Microsoft Azure Service	Version	Description
Azure Open AI Service	Current version	Advanced AI models developed by OpenAI, such as GPT-4, DALL-E, and Codex.
Azure Data Lake Service gen2	Current Version	Data storage solution designed for big data analytics.

Microsoft Azure cloud access requirements

The table below describes the access requirements for C3 AI Operations to install, administer, and upgrade the C3 AI Applications and C3 Agentic AI Platform.

To ensure security, operational excellence, and customer trust, C3 AI leverages an industry standard privileged access management (PAM) for infrastructure access and authentication. All access by our C3 AI Operations team to customer hosted deployments will be managed exclusively through this PAM solution. This approach ensures every interaction with the systems is secure, fully auditable, and aligned with industry best practices.

Why PAM and what this means for you:

Centralized Access Control: All infrastructure access is managed through a single, secure platform, reducing complexity and risk.

Enhanced Security: PAM enforces strong authentication and zero-trust principles, ensuring only authorized personnel can access your systems.

Full Auditability: Every session and command is logged, providing complete visibility for compliance and security reviews.

Rapid Access Revocation: Access can be granted or revoked instantly, minimizing exposure during personnel changes or incident response.

Operational Efficiency: Our Operations team benefits from streamlined workflows, reducing time-to-resolution for support and maintenance tasks.

Industry Best Practices: PAM aligns with leading security frameworks and compliance standards, reinforcing trust and reliability.

Requirements of the PAM solution:

- One time use of Azure service principal role to deploy the cluster and for select infrastructure upgrades

- Service account created in your SSO / Active Directory used to manage the C3 AI Platform
- Azure Lighthouse role assignments for designated C3 AI Operations personnel

C3 AI Operations will deploy and install the PAM solution. You can request an audit log of user access by contacting C3 AI Customer Support.

Access Requirements	Description
A dedicated Azure subscription	When creating the project, C3 AI requires: (1) Subscription identifier, (2) Cloud region.
Secure internet access to the Azure cloud subscription	Secure, remote access via internet (VPN access is acceptable) to a bastion host from which C3 AI Operations personnel can administer cloud infrastructure and C3 AI services.
A bastion host accessible by C3 AI Operations to manage the cluster	The bastion host will be used by C3 AI Operations to administer the C3 AI Applications and C3 Agentic AI Platform. Software utilities required to be installed on the bastion host must include: RedHat 8, Azure Command-Line Interface (CLI) use latest version, kubectl v1.34,Helm v3.12, HashiCorp Terraform (>=1.13.0), Python 3.12, and Docker.
Access to C3 AI and third-party library and image repositories	Access to C3 AI and third-party repositories for the container images, Python libraries, NodeJS libraries, and runtime billing data collection. If connecting to remote C3 AI, Python, and NodeJS artifact repositories violates security standards, the C3 Agentic AI Platform can be configured to connect to local artifact repositories such as Azure Container registry, JFrog, and Anaconda Enterprise.
X.509 certificate for terminating network encryption	A fully qualified domain name for C3 AI cluster ingress configuration (for example, c3project.customer.com). You are responsible for providing the private and public key (and the certificate chain if necessary) from the x509 certificate to C3 AI. These are placed in a Kubernetes secret and used by C3 AI cluster ingress controller. C3 AI does not support self-signed certificates or certificates signed by an internal Certificate Authority. You must provide a certificate from a public Certificate Authority.

Network configuration

To deploy the C3 Agentic AI Platform in your own Azure Virtual Network (VNet), C3 AI will create the VNet following the steps enumerated in the VNet requirements section below.

VNet requirements

The VNet must meet the following requirements to host a C3 AI cluster.

- Azure subscription
- VNet region
- VNet sizing
- VNet IP address ranges
- DNS
- Subnets
- Security groups
- Subnet-level network ACLs

Azure subscription

The Azure subscription containing the C3 Agentic AI Platform must have end-to-end encryption enabled using encryption at host. Data stored on the host is encrypted at rest and flows encrypted to the Azure Storage service. Encryption at host must be enabled and can be accomplished using the Azure Portal or CLI. To enable encryption at host using the Azure CLI, run the following.

```
az feature register --name EncryptionAtHost --namespace Microsoft.Compute
```

VNet region

The Azure region where deployment will occur. Refer to Azure documentation for a list of available regions.

VNet sizing

You can share one VNet with multiple clusters in a single Azure subscription. However, you cannot reuse subnets or security groups between clusters. Be sure to size your VNet and subnets to C3 AI specifications.

VNet IP address ranges

C3 AI does not impose strict limits on VNet netmasks. These are our recommendations.

For AKS deployment, C3 AI sets up two non-overlapping network address spaces with distinct purposes:
Primary VNet - By default, the primary virtual network uses a /22 (we typically use 10.0.0.0/22, but any equivalent /22 range works).
Kubernetes pod and service networks - In addition to the primary VNet, AKS requires separate private CIDR ranges that should not overlap with the primary VNet. We use:
172.18.0.0/15 for Kubernetes services
172.16.0.0/18 for Kubernetes pods

These secondary CIDR ranges are internal to Kubernetes and are not subnets carved out of the primary /22 VNet.

DNS

The VNet will have DNS hostnames and DNS resolution enabled.

Subnets

C3 AI must have access to at least two subnets for each cluster. There will be one (1) of each of the following subnets:

- DMZ public subnets for load balancing
- Data private subnets for Postgres
- AKS private subnets for the AKS cluster
- AKS Pod private non-routable subnets for pods running in the AKS cluster

NOTE: Additional subnets might be required depending on whether it is a C3 AI-managed or customer-managed deployment: including, Azure Bastion, Tool, Key Vault, and Service Account subnets. Contact the C3 AI CoE for more information.

Subnet route table

The route table for workspace subnets must have quad-zero (0.0.0.0/0) traffic that targets the appropriate network device.

Additional subnet requirements

- Subnets must have outbound access to the public network using a NAT gateway and internet gateway, or other similar customer-managed appliance infrastructure.

- The NAT gateway must be set up in its own subnet that routes quad-zero (0.0.0.0/0) traffic to an internet gateway or other customer-managed appliance infrastructure.

Security groups

C3 AI must have access to at least one Azure security group and no more than five security groups. You can reuse existing security groups rather than create new ones.

Security groups must have the following rules.

Endpoint access

If your firewall settings prevent C3 AI Operations from configuring endpoint access, you must allow outbound access to the following endpoints to allow C3 AI product functionality:

- api.github.com
- codeload.github.com
- Cloudfront.net
- conda.anaconda.org
- docker.io
- files.pythonhosted.org
- github.com
- grafana.com
- Huggingface.co
- jfrog.c3.ai
- nodejs
- npmjs.com
- prdgkemis.c3.ai (if MIS access is needed)
- pypi.org
- pypi.python.org
- quay.io
- registry.c3.ai
- registry.npmjs.org
- repo.anaconda.com
- repo.continuum.io
- telemetry.c3.ai
- vault.c3iot.io
  You must allow outbound access to the following endpoints for C3 AI Monitoring. These IP addresses collect standard operational metrics:
- 44.230.42.147/32
- 54.187.151.165/32

You must allow inbound access to the following C3 AI Operations endpoints to operate the deployment:

- 12.226.154.130/32
- 13.214.249.29/32
- 18.136.19.189/32
- 34.231.113.223/32
- 34.232.23.54/32
- 34.238.215.224/32
- 34.82.144.175/32
- 52.48.79.190/32
- 54.76.64.220/32
- 70.35.33.244/32

Egress (outbound)

- Allow all TCP and UDP access to the workspace security group (for internal traffic)
- Allow TCP access to 0.0.0.0/0 for these ports:
    - 443: for C3 AI infrastructure, cloud data sources, and library repositories

Ingress (inbound)

- Allow all TCP and UDP access to the workspace security group (for internal traffic)
- 443: for C3 AI application access
- 22: for SSH access to a bastion host

Subnet-level network ACLs

Subnet-level network ACLs must not deny ingress or egress to any traffic.

- ALLOW ALL from Source 0.0.0.0/0. This rule must be prioritized.
- Egress:
    - Allow all traffic to the C3 AI cluster VNet CIDR, for internal traffic.
    - Allow TCP access to 0.0.0.0/0 for these ports:
        - 443: for C3 AI infrastructure, cloud data sources, and library repositories.

HashiCorp Terraform Configuration

HashiCorp Terraform is a popular open-source tool for creating safe and predictable cloud infrastructure across several cloud providers. Terraform scripts are used to create the cloud infrastructure required by the C3 Agentic AI Platform and automate the deployment of the C3 Agentic AI Platform in your Azure subscription.

NOTE: For C3 AI customer-managed deployments, any customization performed on the Terraform scripts must be reapplied with each version of the Terraform scripts from C3 AI.

Getting started

In this section, you install and configure requirements to use Terraform. You then configure Terraform authentication. Following completion of this section, you go to "Installation Steps" section below to deploy and configure the cloud infrastructure required by the C3 Agentic AI Platform.

Requirements

To use Terraform to create cloud infrastructure resources required by the C3 Agentic AI Platform in your Azure account, you must have the following:

- An Azure subscription and Azure resource group.
- An account-level admin user in your Azure account.
- On your local development machine, you must have:
    - The HashiCorp Terraform CLI. See Install Terraform on the Terraform website to download the binary of the required Terraform version specified in the `main.tf` file example in the "Installation Steps" section below. Select AMD64 or ARM64 to matches the client hardware from which you will run the Terraform scripts.
    - The Azure CLI, signed in through the `az login` command with a user that has `Owner` rights to your subscription to access Microsoft Azure Cloud. See How to install the Azure CLI and Sign in with Azure CLI for more information.
    - The Kubernetes CLT - kubectl. See the Kubernetes website for more information about kubectl and related commands for infrastructure creation and deployment.
    - The Helm CLI. See Installing Helm on the Helm website for more information.
- Privileges to deploy, operate, and delete the infrastructure services. See the "README.md" file in the downloaded Registry folder for the most up-to-date information.

NOTE: As a security best practice, when authenticating with automated tools, systems, scripts, and apps, C3 AI recommends you sign in through the `az login` command with an Azure

Active Directory (Azure AD) service principal. See Sign in with a service principal and Authenticating with Azure Service Principal for more information.

Installation Steps

Installation of the C3 Agentic AI Platform on Microsoft Azure is a multi-step process due to limitations of HashiCorp Terraform and Azure-specific configuration requirements. The installation process is the following:

1. Create the Microsoft Azure Virtual Network (VNet) and required Azure services.
2. Validate the configuration of the VNet and required Azure services and provide C3 AI Operations access to the cluster.

To create a VNet, C3 AI requires the use of HashiCorp Terraform and will provide a set of Terraform scripts to assist you in the creation of the VNet and required Azure services.

NOTE: See the "HashiCorp Terraform Requirements" section above to ensure all requirements are met prior to completing the installation steps below.

A description of the Terraform modules is below. See the README.md file in the downloaded Registry folder for the most up-to-date information.

Terraform Module	Description
aks-cluster	Configures Azure Kubernetes Service (AKS), including VNet configuration, endpoint access, authorized IP addresses, and the version of Kubernetes used by the cluster.
aks-nodepool	Configures the AKS node groups, including default instance size, required subnet, and permissions assigned to each node.
aks-sa	Configures the managed identity to be used by the C3 AI cluster.
bootstrap	Configures the necessary Identity and Access Management (IAM) roles and policies to allow a Terraform orchestrator to deploy all services required for the C3 Agentic AI Platform on Azure.
c3cluster	Coordinates the execution of all other Terraform modules.
delegated-iam	Configures the IAM roles and role assignment to the C3 AI cluster.

Terraform Module	Description
firewall	Configures ingress and egress security rules.
iam	Configures the required IAM roles and policies.
kms	Configures the Azure Key Management service.
network	Configures the VNet, including public and private subnets, internet gateway, CIDR blocks, DHCP, and NAT.
postgres	Creates an Azure PostgreSQL database and assigns the database to the database subnet.
resource-group	Seeds the application role and secret in the Azure Secrets Manager.
storage-account	This module configures the Azure storage account to be used with the C3 AI cluster.

In addition to the required tools listed in the "HashiCorp Terraform Requirements" section, install TFSwitch, which is a tool used to switch easily between Terraform versions.

See Install TFSwitch and TFSwitch Quick Start on the TFSwitch website for more information.

1. Create the VNet and required Azure services

This guide shows you how to create the cloud infrastructure services required by the C3 Agentic AI Platform using HashiCorp Terraform on Azure.

1.1 Run the bootstrap module

This module creates the necessary IAM roles and policies to configure the VNet and required Azure services. Configure a new `main.tf` file below, replacing the CAPITALIZED variable names with your values.

NOTE: The cluster name must adhere to the following restrictions:

- For Dev and QA clusters: <stg><cloud><customerabbreviation>; in which <cloud> is az. For example, `stgazcust`
- For Production clusters: <prd><cloud>customerabbreviation>; in which <cloud> is az. For example, `prdazcust`
- The cluster name should not include a hyphen and must start with a letter; only lowercase letters and numbers are allowed with no other special characters or diacritics (accented letters); and should be less than 15 characters total.

NOTE: For more configuration options, download the Terraform module from C3 AI Registry folder provided by C3, and view the "Inputs" section in the main README.md file.

```
module "bootstrap" {
  source              = "<c3_url>/tf-registry__c3/azure/c3//modules/bootstrap"
  version             = ">VERSION_NUMBER"
  cluster_name        = "CLUSTER_NAME" # Replace with Name of c3 deployment
  region              = "REGION"
  setup_role_principal_id = "IDENTITY_OBJECT_ID" # Object_id of the identity used to
assume the infrastructure creation role

}


provider "azurerm" {
  features {}
  partner_id     = "AZURE_PARTNER_ID" # Microsoft partner ID, please reach out to C3 AI
CoE if you don't know it.
  tenant_id      = "AZURE_TENANT_ID"
  subscription_id = "AZURE_SUBSCRIPTION_ID"
}

terraform {
  required_version = ">=1.13.0"
  required_providers {
    azurerm = {
      source  = "hashicorp/azurerm"
      version = "4.57.0"
    }
  }
}
```

NOTE: Replace the following:

- CLUSTER_NAME with the name of the C3 AI cluster. The cluster name must adhere to the following restrictions:
    - For Dev and QA clusters: <stg><cloud><customer_abbreviation>; in which <cloud> is az. For example, `stgazcust`
    - For Production clusters: <prd><cloud>customer_abbreviation>; in which <cloud> is az. For example, `prdazcust`
    - The cluster name should not include a hyphen and must start with a letter; only lowercase letters and numbers are allowed with no other special characters or diacritics (accented letters); and should be less than 15 characters total.
- VERSION_NUMBER with the version of the `bootstrap` module listed on the C3 AI BOM for the release version.
- REGION with the region where the infrastructure will be deployed. See the Azure regions mapping list for more information.
- IDENTITY_OBJECT_ID is the object identifier used to assume the infrastructure creation role. To get the Object ID, navigate to "Azure Active Directory", search for User, then select the user and get their Object ID.
- AZURE_PARTNER_ID is the Microsoft partner ID. Contact the C3 AI CoE for more information.
- AZURE_TENANT_ID with the Azure tenant where the C3 Agentic AI Platform will be deployed.
- AZURE_SUBSCRIPTION_ID with the Azure subscription ID.

1.2 Run Terraform commands

After configuring the main.tf file, run the following Terraform commands from the same directory

```
tfswitch
terraform init
terraform plan --out out.plan
terraform apply "out.plan"
```

NOTE: If you receive a "Command not found: Terraform" after running the commands above, the `terraform` binary might not be in your path. See the Get Started in Azure – Install CLI page on the HashiCorp Terraform website for more information.

1.3 Run the c3cluster module

This module coordinates execution of all other Terraform modules.

Configure a new `main.tf` in a separate directory from the bootstrap module, replacing the CAPITALIZED variable names with your values.

Be sure to login as the service principal that you specified as `setup_role_principal_id` in the bootstrap module.

Contact your account manager for C3 Control IPs (the list of IP addresses required by C3 AI). These IP addresses enable access for C3 AI Services to manage and maintain the C3 AI cluster. Replace the `CIDR_TO_WHITELIST` parameter below with the list of IP addresses.

NOTE: C3 AI requires a set of CIDR blocks to be whitelisted for C3 AI Operations to deploy the C3 Agentic AI Platform.

NOTE: C3 AI infrastructure Terraform modules create a new VNet and subnets. If your organization must separately create these network artifacts, the Terraform module can be modified to utilize them rather than create new ones. For details, refer to the examples/existing_network/README.md file contained in the Terraform module documentation.

main.tf

```
module "c3cluster" {
  source      = "<c3_url>/tf-registry__c3/azure/c3"
  version     = ">VERSION_NUMBER"
  c3_region   = "REGION"
  cluster_name = "CLUSTER_NAME" # Replace with Name of C3 deployment

  # Please reach out to C3 CoE to obtain C3 control Ips
  ip_allowlist = [
   "CIDR_TO_WHITELIST",
  ]

  # Please reach out to C3 AI CoE to obtain the list of Domains to whitelist for CORS policy
  storage_cors_domains = ["http://*.DOMAIN_NAME"]
  pg_create_mode      = "Default" # Only use Default at creation time

}

provider "azurerm" {
  features {}
  partner_id     = "AZURE_PARTNER_ID" # Microsoft partner ID, please reach out to C3 AI
CoE if you don't know it
  tenant_id      = "AZURE_TENANT_ID"
  subscription_id = "AZURE_SUBSCRIPTION_ID"
}

terraform {
  required_version = ">= 1.13.0"
  required_providers {
    azurerm = {
      source  = "hashicorp/azurerm"
      version = "4.57.0"
    }
  }
}
```

NOTE: Replace:

- AZURE_TENANT_ID with the Azure tenant where the C3 Agentic AI Platform will be deployed.
- AZURE_SUBSCRIPTION_ID with the Azure subscription ID.
- CIDR_TO_WHITELIST with the list required C3 AI IP addresses.

- REGION with the Azure region where the C3 Agentic AI Platform will be deployed. See the Azure regions mapping list for more information.
- CLUSTER_NAME with the name of the C3 AI cluster. The cluster name must adhere to the following restrictions:
    - For Dev and QA clusters: <stg><cloud><customerabbreviation>; in which <cloud> is az. For example, `stgazcust`
    - For Production clusters: <prd><cloud>customerabbreviation>; in which <cloud> is az. For example, `prdazcust`
    - The cluster name should not include a hyphen and must start with a letter; only lowercase letters and numbers are allowed with no other special characters or diacritics (accented letters); and should be less than 15 characters total.
- VERSION_NUMBER with the version of the `c3cluster` module listed on the C3 AI BOM for the release version.

1.3.1 Implement CORS policy for C3 AI Ex Machina

If the installation of the C3 Agentic AI Platform includes C3 AI Ex Machina, setting the C3 AI CORS domain is all that is necessary. The CORS policy facilitates file uploads for C3 AI Ex Machina.

See `storage_cors_domains` in the main.tf example above.

Also, see the cors_rules.tf template example in the Terraform modules for more configuration details.

After configuring the main.tf file run the example below from the same directory as the new main.tf file

```
tfswitch
terraform init
terraform plan --out out.plan
terraform apply "out.plan"
```

2. Validate and provide access to the cluster

Step summary: Validate the configuration of the VNet and required Azure services and provide C3 AI Operations access to the cluster

After the VNet and required cloud services are configured, you are required to execute the C3 AI Cluster Validation Utility and provide the results to C3 AI. If all checks performed by the

C3 AI Cluster Validation Utility pass, the VNet is suitable for C3 AI Operations to deploy the C3 Agentic AI Platform on the Kubernetes cluster.

NOTE: If the cluster validation utility fails, you must remediate all exceptions. All checks must pass for C3 AI Operations to be able to deploy the C3 Agentic AI Platform on your Kubernetes cluster. See the next section for details.

Once the checks are successfully completed, provide C3 AI Operations access to the cluster. Refer to the subsequent section for more information.

2.1 Run the C3 AI Cluster Validation Utility and provide results to C3 AI Operations

Contact the C3 AI CoE for more information and to obtain the C3 AI Cluster Validation Utility.

Run the C3 AI Cluster Validation Utility to determine whether the infrastructure requirements are fulfilled to allow the C3 AI Operations to deploy the C3 Agentic AI Platform.

If the C3 AI Cluster Validation Utility indicates the VNet is ready for C3 AI Operations to deploy the C3 Agentic AI Platform on the Kubernetes cluster, provide the output to C3 AI Operations.

If the output indicates the VNet is not ready, remediate all exceptions and rerun the C3 AI Cluster Validation Utility.

2.2 Provide C3 AI Operations access to the cluster

In addition to the output of the C3 AI Cluster Validation Utility, you must provide C3 AI Operations with the following.

Title	Description
C3 AI Operations credentials	Credentials for C3 AI Operations team members
Subscription ID	Subscription ID used in the execution of the Terraform scripts
Tenant ID	Azure Tenant ID used in the execution of the Terraform scripts
Resource Group Name	From Azure Portal, go to “Resource groups” and search “CLUSTERNAME”. By default, it should be CLUSTERNAME-rsgp-01.

Title	Description
AKS cluster name	The name of the AKS cluster where the C3 Agentic AI Platform will be installed. By default, this will be CLUSTERNAME-kube-01; confirm this by going to "Kubernetes services" in the Azure Portal. **NOTE**: The cluster name must adhere to the following restrictions: • For Dev and QA clusters: <stg><cloud><customerabbreviation>; in which <cloud> is az. For example, `stgazcust` • For Production clusters: <prd><cloud>customerabbreviation>; in which <cloud> is az. For example, `prdazcust` The cluster name should not include a hyphen and must start with a letter; only lowercase letters and numbers are allowed with no other special characters or diacritics (accented letters); and should be less than 15 characters total.
Region	The Azure region associated with the AKS cluster, from "Kubernetes services" → the AKS cluster → Overview → Location. See the Azure regions mapping list for more information.
Azure SQL Postgres endpoint	From Azure Portal, go to "Azure Database for PostgreSQL servers" → CLUSTERNAME-pg-shared → Overview → Server name
Azure SQL Postgres credentials	Credentials required for the C3 Agentic AI Platform to connect to PostgreSQL. These can be set by pressing "Reset password" in the Azure Portal at "Azure Database for PostgreSQL servers" → CLUSTERNAME-pg-shared.
C3 Managed Identity Client ID	From Azure Portal, go to "Managed identities", filter to the resource group and click Apply. Select the managed identities CLUSTERNAME-rsgp-c3-01, and CLUSTERNAME -c3privileged-mi-01 and click into each of the managed identities and Share the "Client ID" of each managed identity. Map the CLUSTERNAME -c3privileged-mi-01 managed identity to the C3 AI Kubernetes service account c3-privileged. See Map Cloud Provider Identity to Kubernetes Service account.

Title	Description
Storage Account Keys	From Azure Portal, go to “Storage accounts” → filter to resource group CLUSTERNAME-rsgp-c3-01, and click the one named c3CLUSTERNAME. Select “Access Keys” and share key1.
Domain name	A fully qualified domain name for C3 Cluster ingress configuration (for example, c3project.customer.com)
Public and private key	The private and public key (and the certificate chain if necessary) from the x509 certificate. This will be required for ingress configuration.

It is strongly recommended that the sharing of Postgres credential and certificates occur using Azure Vault.

To grant C3 AI Operations AKS cluster administration permissions in the subscription, create a new role assignment for a C3 AI Operations user, granting them the Azure Kubernetes Service Cluster Admin role.

```
az login

az role assignment create \
  --assignee <OBJECT_ID_OF_THE_USER> \
  --role "Azure Kubernetes Service Cluster Admin Role" \
  --scope
/subscriptions/<SUBSCRIPTION_ID>/resourceGroups/<C3_CLUSTER_RESOURCE_GROU
P>
```

NOTE: Replace:

- <OBJECT_ID_OF_THE_USER> with the user, group, or service principal. Supported format: object id, user sign-in name, or service principal name.
- <SUBSCRIPTION_ID> with the subscription identifier.
- <C3_CLUSTER_RESOURCE_GROUP> with the resource group associated with the cluster.