DEPLOYMENT GUIDE

DEPLOYING VTHUNDER ADC FOR WEB APPLICATION SERVICES ON ORACLE CLOUD INFRASTRUCTURE

Reference Architecture for Deploying Highly Available Application Services on Oracle Cloud Infrastructure

OVERVIEW

Organizations require their business-critical applications to be highly available and secure to ensure always-on service availability while considering lower total cost of ownership, including operational costs. Building and maintaining a data center is a large investment, both in terms of capital costs and operational costs. The capital costs include physical server, network hardware, and the operational costs are recurring expenses such as support maintenance fees, and electrical and environmental expenses. It's also required to properly design the data center to scale the capacity required for future growth and to keep the systems up to date on a regular basis. As a result, many organizations have been adopting public cloud services (e.g., IaaS and/or PaaS) to run their business applications and services for a variety of reasons:

- **Agility and efficiency**

  Without any preparation, infrastructure resources are available any time the user needs, which helps minimize IT staff workloads and provide faster service deployment. In addition, there are selections of available locations, regions and countries for the user to pick based on needs.

- **Cost effectiveness**

  The user only needs to pay for the resource used. As a result, the user can take advantage of a utility billing model for data center infrastructure requiring little to no capital cost outlay. Since the cloud service providers build their infrastructure to be scalable and reliable, the user can eliminate a big concern on designing redundant and future proof infrastructure, which could double up the capital expense and operational cost.

While public cloud service providers are responsible for ensuring the security and availability of their infrastructure, organizations are still responsible for the reliability and security of the application services. This requirement does not differ from on-premises data center deployments. Thus, it is important to understand the specific details and requirements of how to properly design and deploy application services in a public cloud environment such as Oracle Cloud Infrastructure.

A10 Networks vThunder® series is the certified solution, available on the marketplace of many public cloud services including Oracle Cloud Infrastructure. The A10 Thunder® Application Delivery Controller (ADC) works seamlessly with any business application to ensure fast, secure, and consistent application delivery. Deploying the A10 Thunder ADC solution for various business applications on Oracle Cloud enables organizations to enjoy reliable application services, strengthens high availability using a local redundancy feature, as well as global server load balancing, and maximizes elasticity and performance for business-critical applications. The A10 Harmony® Controller is the centralized management platform for A10 Thunder series products. It is also available on the Oracle Cloud marketplace and provides detailed per-application visibility and analytics for all the Thunder application services.

This guide provides the reference architecture and detailed configuration steps of how to build highly available and secure business application services running on Oracle Cloud infrastructure using the A10 vThunder ADC.

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CHALLENGES OF DEPLOYING BUSINESS CRITICAL APPLICATIONS

When an organization deploys business applications, they must maximize their service availability and uptime as much as possible. There are many ways and approaches to achieve this goal from a servers and network infrastructure point of view. The first and obvious approach is eliminating a single point-of-failure on the application server by adding a backup or secondary server with a server load balancer (e.g., ELB, ALB, SLB, ADC). The organization can have not only fast failover in case of a server failure but also use all available resources by load balancing the application traffic during normal operation. Of course, single point-of-failure possibility exists on the networking devices including access, edge and gateway routers and load balancers. Therefore, redundancy on network and routers (e.g., VRRP) is also highly recommended. To avoid any outage due to site or facility failures (e.g., disaster recovery), they may want to design their services, so they are deployed on multiple sites and geographically distributed. However, there will be challenges to maintain and efficiently operate multiple data centers. The biggest motivation for enterprises to move to public cloud environments is reducing operational challenges and complexity.

ORACLE CLOUD INFRASTRUCTURE SERVICES

Oracle Cloud Infrastructure is a public cloud service designed for enterprises, offering powerful compute and networking performance, as well as a comprehensive portfolio of infrastructure and platforms. It enables the user to run their mission-critical business applications in a highly available hosted environment. This section covers an overview of the Oracle Cloud Infrastructure services relevant to A10 vThunder ADC deployment. For additional information, please refer to the Oracle Cloud Infrastructure Documentation.

REGIONS AND AVAILABILITY DOMAINS

Oracle Cloud Infrastructure has a concept of *Regions and Availability Domains* to provide high-availability connectivity and services globally. A region is a localized geographic area where Oracle Cloud data centers reside, and it consists of one or more availability domains. Availability domains are physical data centers isolated from each other, and do not share infrastructure such as network, power or cooling, therefore, a failure at one availability domain is unlikely to impact the service and availability of the others within the same region.

The availability domains within the same region are connected to each other by a low-latency and high-bandwidth network, which makes it possible for an organization to build highly secure and redundant systems and services in multiple availability domains for both high availability and disaster recovery purposes.

***NOTE**: Traffic between availability domains and between regions is encrypted.*

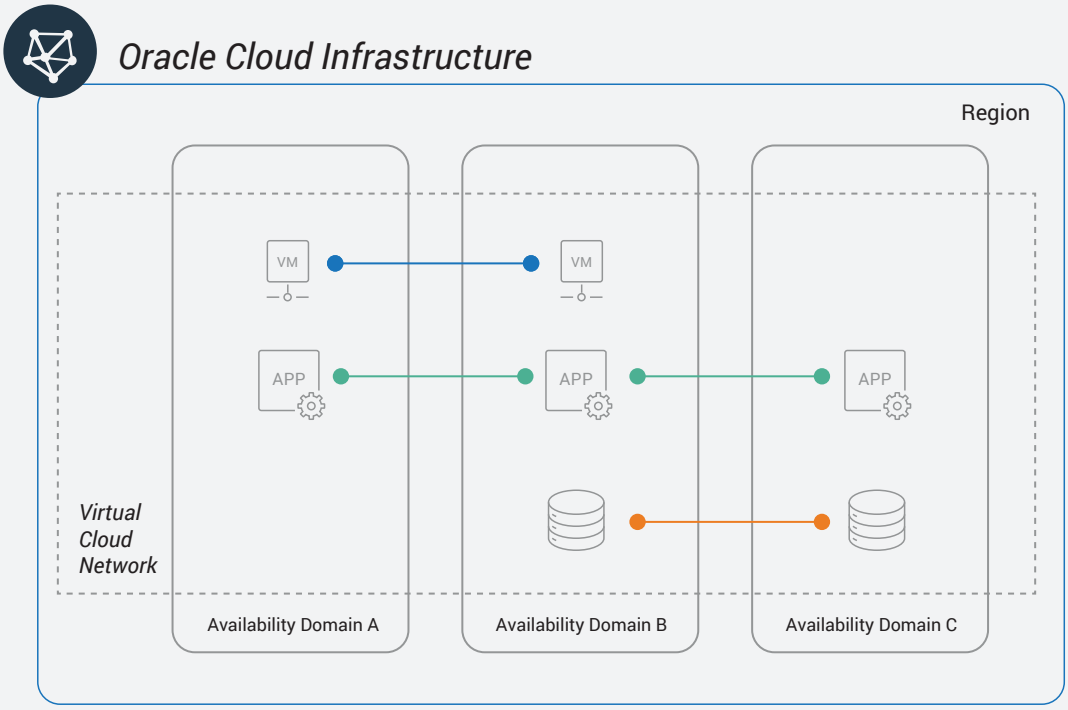


Figure 1: Architecture of a Region on Oracle Cloud Infrastructure

In order to properly build resilient services using multiple availability domains on Oracle Cloud Infrastructure, Oracle recommends that users distribute their application servers across all availability domains within the region and use a load balancer to effectively operate application services.

***NOTE**: Oracle Cloud Infrastructure offers a native load balancer, which has limited capabilities. For detail, see https://docs.cloud.oracle.com/iaas/Content/Balance/Concepts/balanceoverview.htm#LBlimits*

***NOTE**: Deploying a native load balancer requires the user to create one or more components called "Load Balancer Listeners" for each traffic type (i.e. TCP, HTTP. HTTPS) you monitor and associate security policies accordingly. For more details, see https://docs.cloud.oracle.com/en-us/iaas/Content/Balance/Concepts/balanceoverview.htm*

VIRTUAL CLOUD NETWORK (VCN) AND SUBNETS

One of the first steps of the Oracle Cloud Infrastructure resource design is to create a VCN with one or more subnets. A VCN is a software-defined network including subnets, route tables and gateways, that the user sets up in a region of the Oracle Cloud Infrastructure data centers.

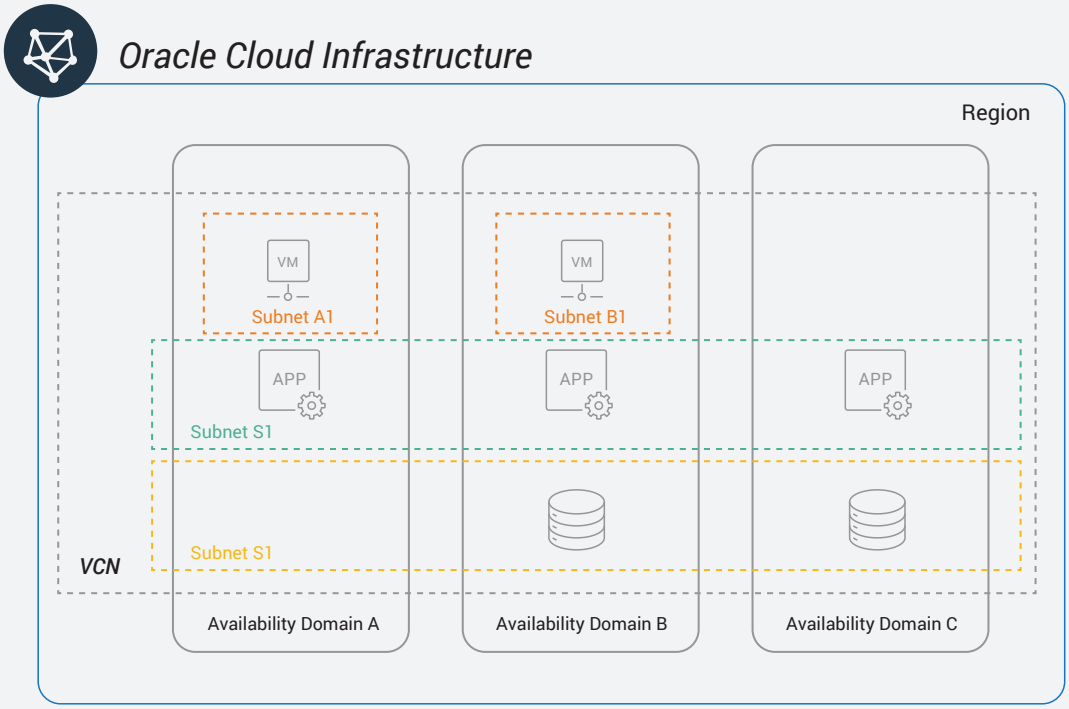


Figure 2: VCN and Subnets concept in a Region

A VCN covers a single, contiguous IPv4 CIDR block of the user's choice. Subnets are subdivisions of the VCN and can be set as either availability domain (AD)-specific or regional for each subnet depending on their need. Oracle recommends using regional subnets because they are more flexible and support high availability design for availability domain failure. All VNICs in each subnet use the same route table, security lists, and DHCP options. The user can designate a subnet as public if you want to assign a public IP address on the VNIC within the subnet.

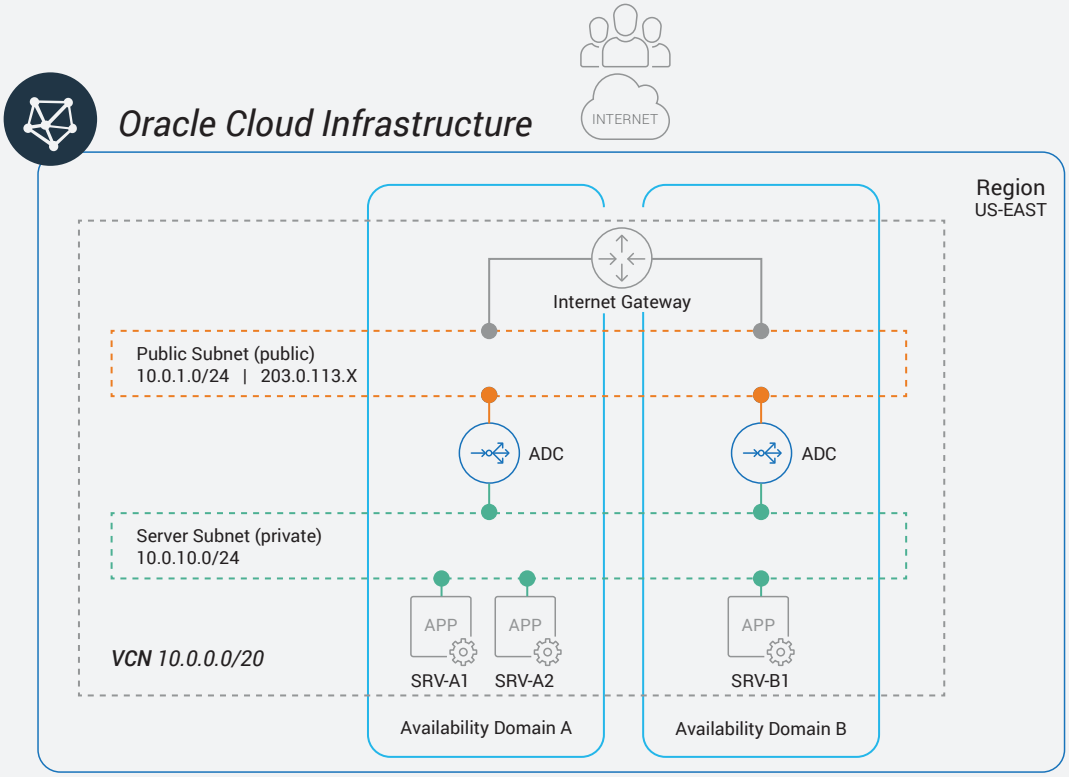


Figure 3: Example Subnets design across multiple Availability Domains

A10 THUNDER ADC ON ORACLE CLOUD

A10 Networks Thunder ADC provides intelligent Layer 4-7 load balancing to optimize, accelerate and secure an organization's application services hosted in any cloud environment including Oracle Cloud Infrastructure. vThunder ADC deployed in the Oracle Cloud Infrastructure has the same features, configuration and management as the physical appliance, which enables easy and unified operation. With A10 Harmony Controller, the user can consolidate all operations and management and apply the same security policy regardless of location and platform. In addition, consolidated application visibility and analytics are available.

A10 VTHUNDER ADC MODELS

vThunder ADC is available with two choices of license type in Oracle Cloud Marketplace. The user can bring their own license or pay the hourly-based price depending on the use. If the user has A10's FlexPool consumption-based license (https://www.a10networks.com/how-to-buy/flexpool-licensing/), the user can select a bring-your-own-license (BYOL) type and allocate the capacity from the pool on the vThunder running on Oracle Cloud infrastructure.

TABLE 1: A10 VTHUNDER ADC FOR ORACLE CLOUD PRODUCT SPECIFICATIONS

Throughput	Up to 10 Gbps
Image	Available on Marketplace (QCOW2)
VM Shapes	• VM.Standard2.x (X7-based standard compute. Processor: 2.0 GHz Intel Xeon Platinum 8167M) • Available OCPU options – 1, 2, 4, 8, 16 or 24 ***NOTE***: 1 OCPU equals 2 vCPU
License Types	• Pre-installed per-OCPU based price: - 1 OCPU to 24 OCPU • BYOL bandwidth license: - Lab/developer, 200 Mbps, 1 Gbps, 4 Gbps, 10 Gbps • FlexPool license - Up to 10 Gbps • 30-days trial license available

NOTE: *Oracle has been expanding performance and offering of compute instances. The 10 Gbps bandwidth throughput was tested with the X6-based VM.standard. B1 compute shape.*

NOTE: *Want to try out A10 vThunder? Access https://get.a10networks.com/vthunder-trial/*

A10 VTHUNDER ADC ADVANTAGES

Adding Thunder ADC to the user application deployment in Oracle Cloud deployments provides the following benefits:

- **Advanced load balancing** – Thunder ADC offers intelligent L4-7 load balancing supporting a comprehensive algorithm, performance acceleration features including TLS offload, customizable server health-check, and application-aware advanced scripting using aFleX®.
- **High capacity and high performance** – vThunder ADC can offer high-performance application throughput (~10Gbps) and serve thousands (maximum 4,096) of virtual servers (VIPs) on a single virtual appliance deployed in Oracle Cloud Infrastructure. It also supports a high density of application delivery partitions (ADP) that can be used for multi-tenancy deployment.
- **Higher availability** – Due to the nature of server load balancing technology, service availability is guaranteed even when one of the application servers fails. Thunder ADC supports the VRRP-A feature, which eliminates a single point-of-failure of the ADC in a site and enables quick failover using Layer 4-based session synchronization. The user can also enable disaster recovery (DR) and/or intelligent geolocation-based load balancing among multiple sites using global server load balancing (GSLB) at no extra cost.
- **Integrated security** – Thunder ADC offers several security features that can be added on top of ADC functionality without any additional software licensing required. It includes an authentication proxy service named AAM, web application firewall (WAF) and an integrated distributed denial of service (DDoS) attack protection.
- **DevOps ready** – Thunder ADC supports 100% API operation by leveraging A10's REST-based aXAPI®. The user can easily integrate and automate the Thunder ADC's configuration, management and operation to their existing management consoles with using RESTful aXAPI.

INTEGRATION WITH ORACLE CLOUD

ORACLE CLOUD API INTEGRATION FOR HIGH AVAILABILITY

A10 vThunder supports unicast-based VRRP-A to make service highly available in case of active vThunder failure. In the cloud environment, the VIP address needs to be associated with one of the attached VNIC IP addresses (e.g., secondary IP). In order to achieve successful failover, A10 vThunder implements a workflow to move the VIP address and other floating IP address from the failed vThunder instance to a new active vThunder instance using Oracle-Cloud-SDK when VRRP-A failover occurs. This process and configuration are covered in the later section of this document.

QUICK DEPLOYMENT USING TERRAFORM

The Terraform script helps the user create an instance of vThunder with three network interfaces on the public cloud including Oracle Cloud Infrastructure. The user can choose either a vThunder insurance on a totally new infrastructure environment (e.g., VCN, subnets, security groups, internet gateway et al.) or in the existing infrastructure. For more details and obtaining the Terraform scripts, visit to A10 Networks Github page https://github.com/a10networks/a10-terraform.

REFERENCE ARCHITECTURE

DEPLOYMENT OPTIONS FOR HIGHLY AVAILABLE SERVICES

When deploying application services along with A10 Thunder ADC on the Oracle Cloud Infrastructure environment, there are several options to build highly available services.

1. **Deploy services with the ADC among multiple availability domains within a region**
2. **Deploy services across multiple regions with the ADC running a global server load balancer feature**
3. **Deploy services on both Oracle Cloud Infrastructure and on-premises datacenter with the ADC using GSLB** (so called hybrid-cloud deployments)

DEPLOY SERVICES WITH AN ADC AMONG MULTIPLE AVAILABILITY DOMAINS WITHIN A REGION

Oracle Cloud Infrastructure provides one or more availability domains in a region that are isolated from each other, fault tolerant, and very unlikely to fail simultaneously. The availability domains within the same region are connected to each other with a low-latency and high-bandwidth network. This makes it possible to build a resilient and highly available system. (ref: link)

As documented on the Oracle Cloud doc, users are required to set up one or more load balancers to enable high availability using multiple available domains. By using the A10 vThunder ADC instead of the native load balancer in Oracle Cloud, the user can simplify network configurations and operations, and have many other advantages. For example, the user doesn't have to create a load balancer listener entity for each service protocol and can eliminate network design complexity. Here are some examples of features and benefits from using the vThunder ADC;

- Highly available application services using multiple available domains in the Oracle Cloud
- Advanced Layer 4-7 server load balancing
- Faster ADC failover using the VRRP-A feature
- Full-proxy architecture with aFleX scripting and customizable server health checks
- Comprehensive application security with integrated security features
- Automation for DevOps and SecOps with 100% API operation support
- Consolidated visibility and detailed analytics for multiple devices deployment using Harmony Controller

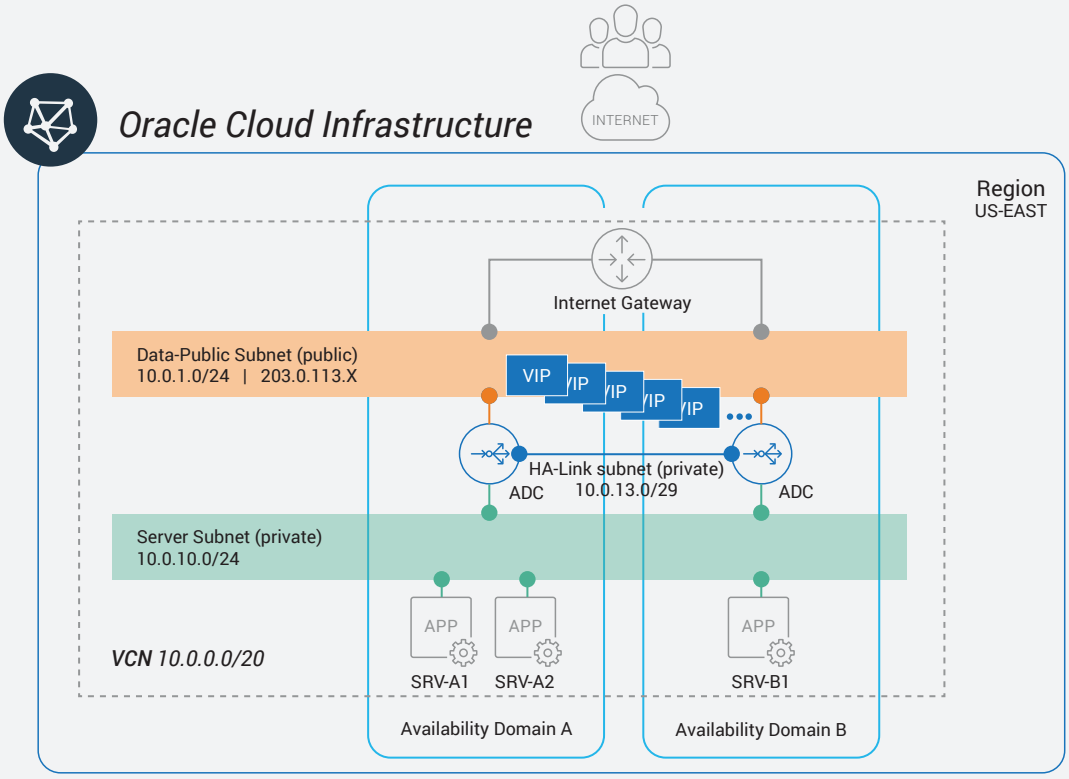


Figure 4: Multiple availability domains deployment using ADC in a high availability pair

***NOTE**: In this example, one dedicated interface is assigned as the VRRP-A interface for high availability (HA) communication and syncronization. The user can use other data ports (e.g. server side or gateway side interfaces) for that purpose.*

DEPLOY SERVICES ACROSS MULTIPLE REGIONS WITH THE ADC RUNNING GSLB

One of the biggest advantages of using a public cloud service is that the user can choose to deploy the same services in different geographical locations or regions across the globe. Generally, the user would deploy an application service in the region where it is most heavily used, because using closer resources gets faster response. The ideal scenario is to use the service that is closest to the end user or has lower utilization to minimize latency. Here, the global server load balancing feature plays an important role. It expands server load balancing functionality across global data centers (or regions) for high availability and fault tolerance. It is designed with advanced geographic and network intelligence to select the best region for each user request, while safeguarding their network for disaster recovery.

Oracle Cloud Infrastructure offers over 10 regions (ref: link) so that the user can select multiple regions based on their requirements and user presence. Global server load balancing is the inclusive feature of the A10 Thunder ADC, even on the public cloud, so the user can use it to take advantage of global application presence and intelligently distribute the application traffic across multiple regions.

- Global server load balancing architecture for higher availability and optimal user experience
- Advanced Layer 4-7 server load balancing
- Faster failover using VRRP-A feature
- Full-proxy architecture with aFleX scripting and customizable server health checks
- Comprehensive application security with integrated security features

- Automation for DevOps and SecOps with 100% API operation support
- Consistent and unified policy management to secure workloads for multiple regions using Harmony Controller
- Consolidated application analytics and policy enforcement for multiple regions deployments from one central location using Harmony Controller

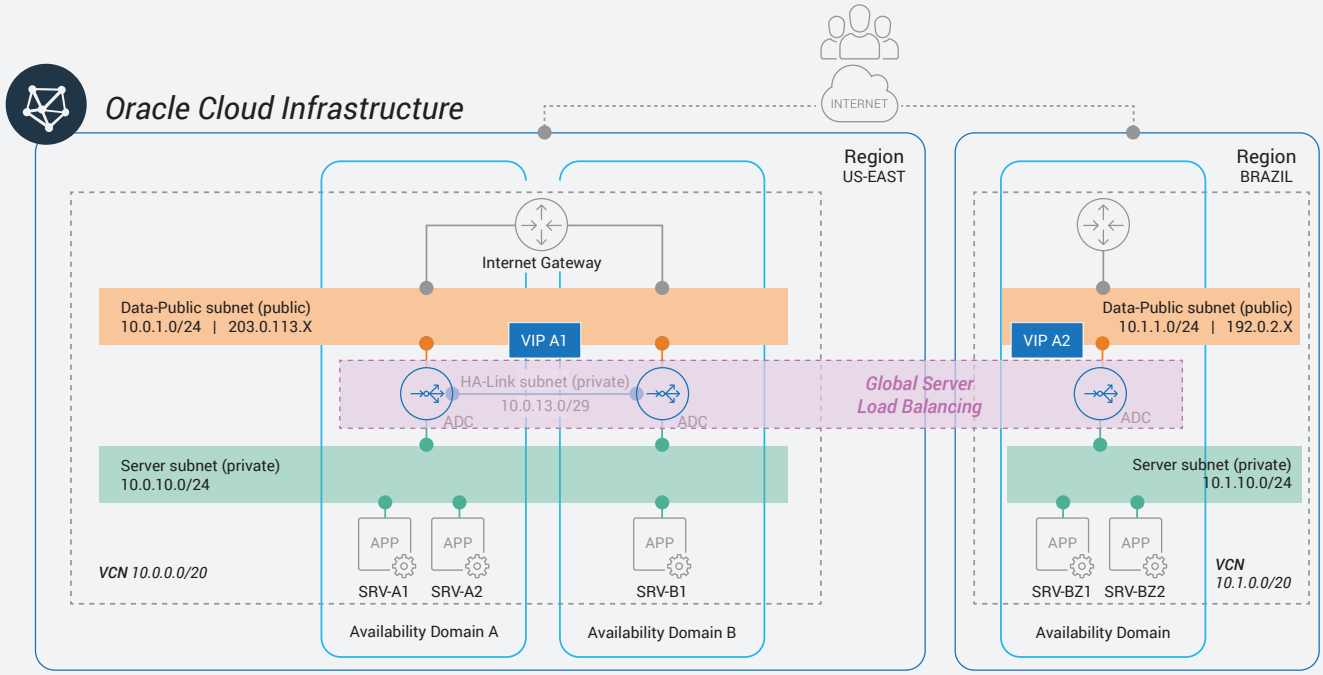


Figure 5: Multiple regions deployment using ADC with GSLB

DEPLOY SERVICES ON BOTH ORACLE CLOUD INFRASTRUCTURE AND ON-PREMISES DATACENTER WITH THE ADC USING GSLB

When transitioning to the public cloud from a local or on-premises data center, it is required for an organization to have services up and running in both the on-premises data center and one of regions in the public cloud. As an alternative requirement case, an organization may want to design their service deployment using on-premises as a primary resource and the public cloud as a backup or secondary resource. This architecture design is referred to as hybrid-cloud or Polynimbus service deployment where they want to fully utilize both resources in different locations with less complex operation. This is another example where A10 Thunder ADC can help.

As an example, during normal operation, an administrator may want all user traffic to come to an on-premises data center and use Oracle Cloud as a secondary resource. They can enable GSLB to control the traffic on the ADCs hosted in both on-premises and the cloud. It intelligently monitors the sites health, server loads and usage, proximity and response time. If there is any issue (e.g., unexpected heavy traffic or downed application service) in the on-premises site, GSLB can automatically distribute or forward the user traffic to secondary services hosted in Oracle Cloud, thereby ensuring a better user experience. The A10 Thunder ADC has feature parity regardless of form factor – either hardware appliance or virtual appliance – in private cloud or public cloud. Thus, the operator can apply the same features and security policies in any cloud or form factor.

- Global server load balancing for intelligent traffic control using on-premises and cloud data centers
- Advanced Layer 4-7 server load balancing
- Faster failover using VRRP-A feature
- Full-proxy architecture with aFleX scripting and customizable server health-checks
- Comprehensive application security with integrated security features
- Automation for DevOps and SecOps with 100% API operation support
- Consistent and unified policy management to secure workloads for hybrid-cloud deployment using Harmony Controller
- Consolidate visibility and detailed analytics for hybrid-cloud deployments from one central location using Harmony Controller

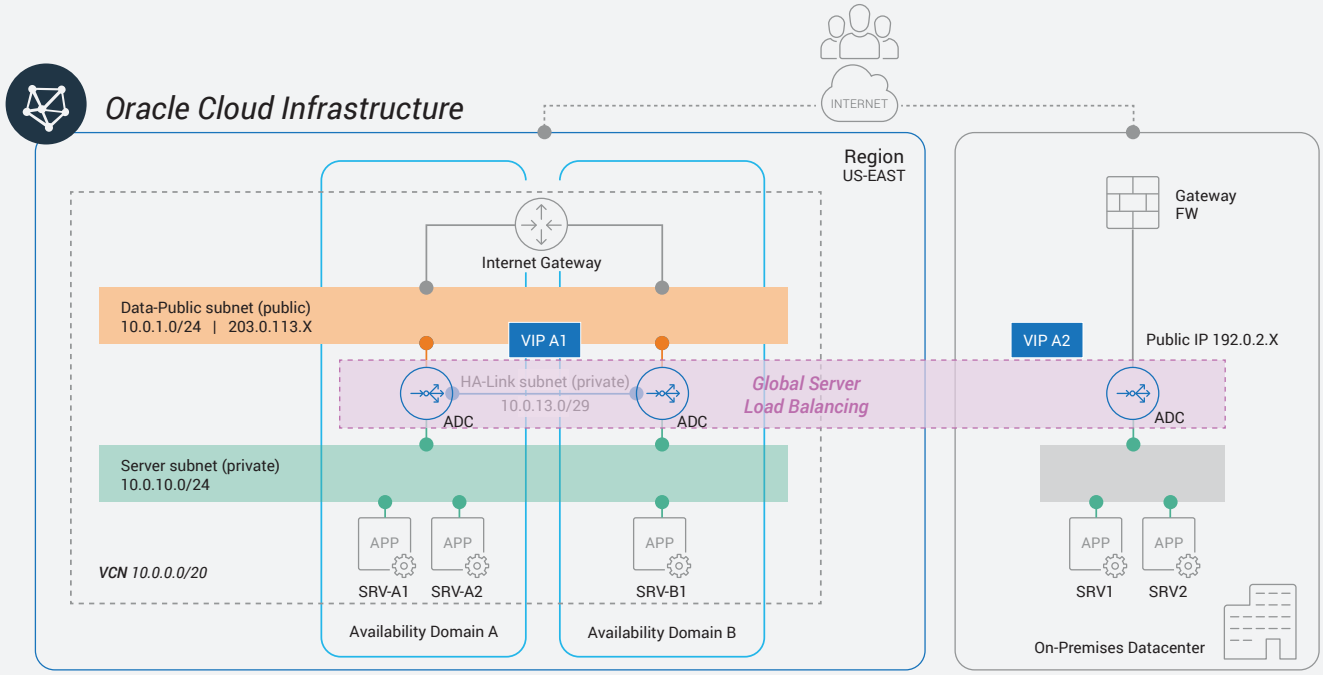


Figure 6: Hybrid-cloud (Polynimbus) deployment using ADC with GSLB

DEPLOYMENT SCENARIO

As a deployment example, this document uses the first deployment option described in the previous section where a web application service is deployed in one region using two available domains for redundancy in Oracle Cloud Infrastructure.

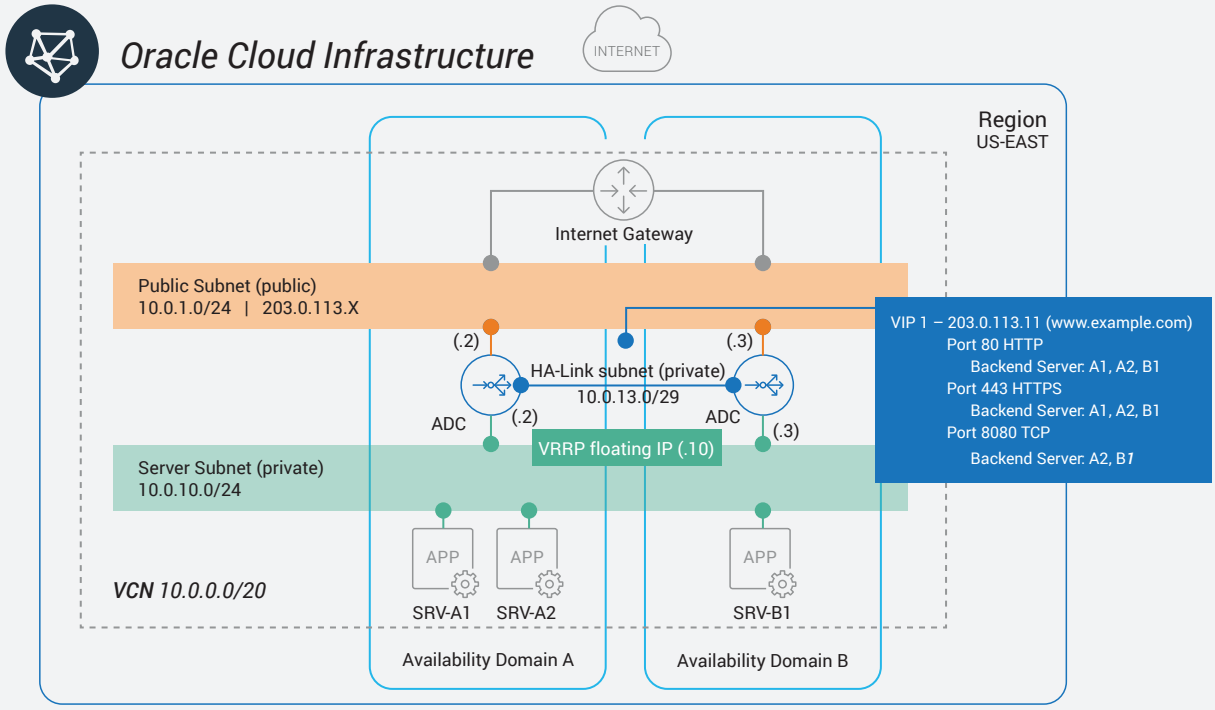


Figure 7: Example deployment topology and network information

DEPLOYMENT PREREQUISITES

To deploy vThunder ADC for a business application running in Oracle Cloud Infrastructure, the user needs the following:

- Oracle Cloud Infrastructure accounts and access information
  - Confirm available resources and regions
  - Define IAM and compartment policies accordingly
- vThunder ADC (image available in the Oracle Cloud Marketplace)
  - Prepare appropriate license (BYOL including FlexPool or trial/ pre-installed OCPU-based license)
- (Optional) Harmony Controller for centralized management and application visibility and analytics
  - Prepare appropriate license
- SSH key pair (openssh format) for SSH and console access to vThunder and other Linux VM instances hosted in Oracle Cloud. For example,
  - Private key – In this guide, "*ssh_key_priv.pem*" is used as private key
  - Public key – In this guide, "*ssh_key.pub*" is used as public key

***NOTE**: For detailed information and steps, refer to https://docs.cloud.oracle.com/en-us/iaas/Content/GSG/Tasks/creatingkeys.htm*

CONFIGURATION STEPS OVERVIEW

The high-level configuration steps of this example deployment are as follows:

1. Prepare API keys (used for HA failover operation)
2. Define and set VCN and subnets in Oracle Cloud
3. Install two vThunder ADC instances
4. Configure vThunder ADC
    a. General and interfaces
    b. High-availability (VRRP-A and failover) configuration
    c. SLB virtual service (VIP) configuration

API KEYS AND CONFIG FILE PREPARATION

API keys are required to perform the VRRP-A failover process in an Oracle Cloud Infrastructure deployment. vThunder supports unicast-based VRRP-A to provide redundancy when an active vThunder goes down for any reason. In the Oracle Cloud environment, a public IP address is assigned for a VIP as a secondary IP on the uplink / gateway facing interface. The secondary public IP address(es) have to be moved from the failed vThunder to a new active vThunder when the failover is triggered. The A10 vThunder in the Oracle Cloud implements this workflow and can automatically move the VIP address(es) and other floating IP addresses to the new active vThunder using API-based Oracle functions.

The following files need to be prepared before starting the vThunder configuration.

- API key pair to create API signing key. For example,
    - Private key: oci_api_key.pem (RSA 2K key, PEM format)
    - Public key: oci_api_key_pub.pem
        - Public API key need to be uploaded to the user account on Oracle Cloud portal.

***NOTE**: For detailed procedures and information for API keys creation, refer to Oracle Cloud Doc https://docs.cloud.oracle.com/en-us/iaas/Content/Functions/Tasks/functionssetupapikey.htm*

- Oracle Cloud Infrastructure CLI configuration file (txt format)
    - This config file is required to use the Oracle Functions for failover process. Please make sure to name and import this file as “config” on to the vThunder.
    - This needs to be created containing the following information. (Use a text editor)
        - User = User account OCID, see Where to Get the Tenancy’s OCID and User’s OCID.
        - Fingerprint = Public API key fingerprint that was uploaded in the previous step. See, 1. Set up an Oracle Cloud Infrastructure API Signing Key for Use with Oracle Functions.
        - Key file = full path of private API key file on the vThunder
        - Pass phrase = add pass phrase if the private key is generated with a pass phrase (optional)
        - Tenancy = OCID of the tenancy in which the user will be creating and deploying functions. See, Where to Get the Tenancy’s OCID and User’s OCID.
        - Region = Region identifier of the Oracle Cloud Infrastructure in which the user is deploying services.

***NOTE**: For more details of the Oracle Cloud configuration file for Oracle Functions, refer to Oracle Cloud doc https://docs.cloud.oracle.com/en-us/iaas/Content/Functions/Tasks/functionsconfigureocicli.htm*

    - An example of a ‘***config***’ file below to be imported to the vThunder. See the section later in the document for the detailed procedures.

```
[DEFAULT]
user=ocid1.user.oc1..aaaaaaa1b2c3d4e5f6g7h8i9j0k1l2m3n4o5p6q7s8t9u0
fingerprint=1b:2c:3d:4e:5f:6g:7h:8i:9j:0k:1l:2m:3n:4o:5p:6q
key_file=/a10data/cloud/oci_api_key.pem
pass_phrase=
tenancy=ocid1.tenancy.oc1..aaaaaaaagz11111111bbbbbbbb2222222ccccccccc3333333333
region=us-ashburn-1
```

DEPLOY THE VTHUNDER ON ORACLE CLOUD INFRASTRUCTURE

The vThunder ADC image is available in the Oracle Marketplace so the user doesn't have to upload the image file and create a custom image for vThunder installations. This section describes how to prepare their Oracle Cloud Infrastructure environment and launch the vThunder ADC.

CONFIGURE VCN AND SUBNETS ON THE ORACLE CLOUD PORTAL

The user starts with planning and allocating resources such as region, available domains, VCN and subnets for this deployment. The first step is to create a virtual cloud network (VCN) and subnets on the ***Oracle Cloud portal***.

1. Select region in which to deploy the application service
2. Select the available domains to use
3. Create a VCN and associate it with a CIDR
4. Create subnets within the VCN

NOTE: *Please also configure appropriate resources and rules to the VCN, such as Internet Gateways, Route Tables, Security List and others.*

The following table shows an example of VCN and subnet assignment.

NOTE: *The user may use separate VCNs for management and data networks. Please consult with the administrator to design VCN and subnets accordingly.*

TABLE 2: EXAMPLE VCN AND SUBNET ASSIGNMENT

COMPONENTS	NAME	VALUE	NOTES
Region	US-EAST		
Available Do-mains	AD1, AD2		
VCN	VCN-a10demo	10.0.0.0/20	
Subnet	Data-Public	10.0.1.0/24	Public/ Regional
	Server	10.0.10.0/24	Private (or Private) / Regional
	HA-Link	10.0.13.0/29	Private/ Regional
	Mgmt-US-East-AD1	10.0.11.0/24	Public/ AD1 specific
	Mgmt-US-East-AD2	10.0.12.0/24	Public/ AD2 specific

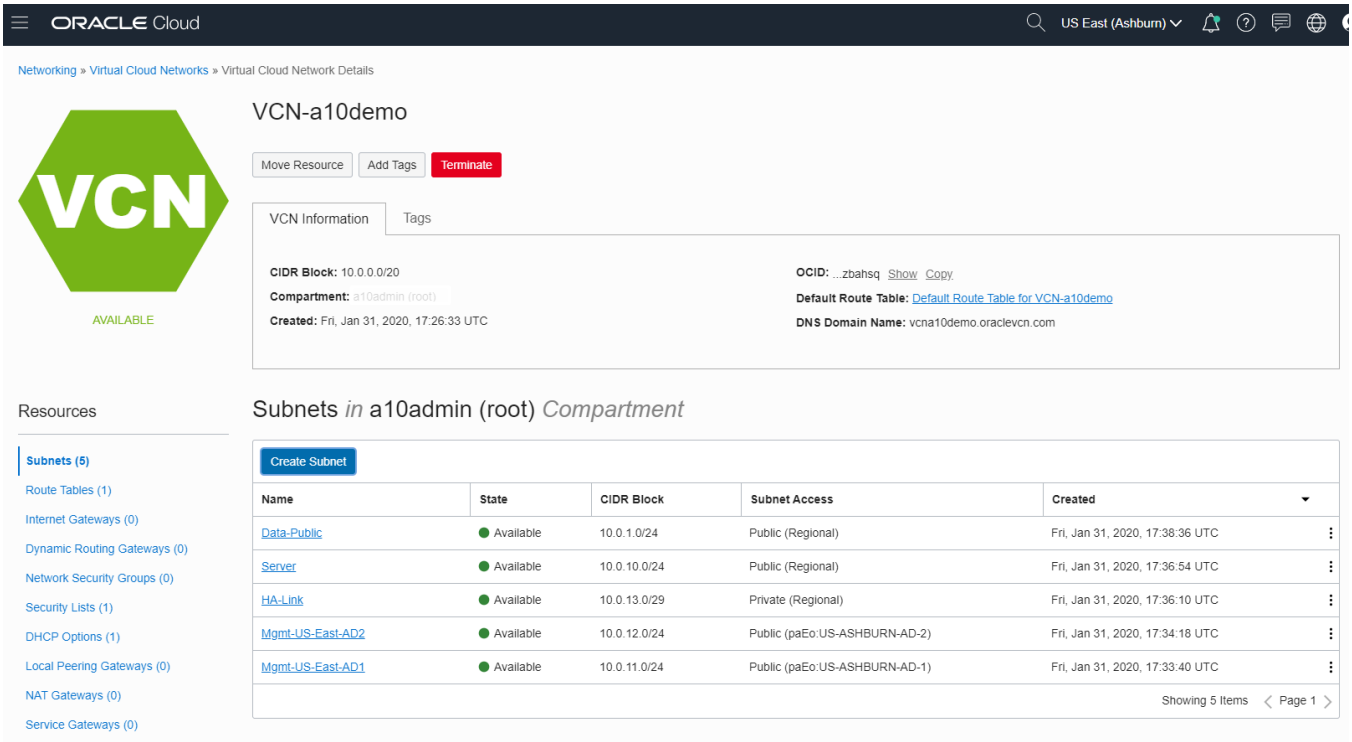


Figure 8: Example VCN Details on the Oracle Cloud portal

INSTALL VTHUNDER INSTANCE

Here are the detailed steps to install the vThunder ADC as a compute instance in Oracle Cloud Infrastructure.

1. On the ***Oracle Cloud portal***, navigate to ***Marketplace***
   - Select "A10 Networks" from the publisher and chose the "A10 vThunder Application Delivery Controller" image with appropriate license type

   NOTE: *There are two pricing options – BYOL and paid (pre-installed) license*

   - Select appropriate ***Version*** and ***Compartment***, and then ***Launch Instance***

   NOTE: *Choose the ACOS version marked as default unless there is any specific reason.*

2. On ***Create Compute Instance*** page, specify the vThunder instance properties and specification. This document used the following specifications.
   - Network configuration here is for management interface
   - Select appropriate compute shape from the list upon clicking "Change Shape".

   NOTE: *Currently six VM compute shapes, from Standard2.1 to Standard2.24, are supported along with bare metal. If any of shapes are not seen in the complete list, contact the administrator for a limit increase. See Service Limit.*

   NOTE: *If the organization has a separate VCN for the management network, please use it accordingly. VCN and subnets for the data network will be configured under VNIC configuration*

TABLE 3: VTHUNDER ADC INSTANCE AND NETWORK CONFIGURATION SPECIFICATIONS

	PRIMARY ADC	*SECONDARY ADC*	*NOTES*
Instance Name	vThunderADC-1	vThunderADC-2	
Availability Domain	AD1	AD2	
Instance Shape	VM.Standard 2.4	VM.Standard 2.4	Selected based on VNIC counts (4) required in this de-ployment
CONFIGURE NETWORKING			
VCN Compartment	a10demo	A10demo	
VCN	VCN-a10demo	VCN-a10demo	
Subnet Compartment	a10demo	a10demo	For mgmt. interface
Subnet	Mgmt-US-East-AD1	Mgmt-US-East-AD2	For mgmt. interface
Public IP assignment	Yes	Yes	

***NOTE**: A subnet for management can be set as AD-specific unless there is any specific reason to be regional*

***NOTE**: A10 Networks recommends using the VM.Standard 2.4 or larger when considering system capacity including OCPU, Memory and vNICs. Smaller instanced can be used for trials and lab use.*

3. Add ***SSH Key*** (i.e., SSH public key prepared in prerequisite) for the console and SSH access and click ***Create***
4. Next, add data interfaces to the vThunder ADC. On the "***vThunderADC-X***" instance page, select ***Attached VNICs*** from the 'Resources' menu on the left side, and click ***Create VNIC*** (repeat 3 times for all interfaces)

TABLE 4: VTHUNDER ADC INTERFACE SETTINGS

	vThunderADC-1	*vThunderADC-2*
2nd VNIC	VCN: VCN-a10demo Name: p1-data Subnet: Data-Public Check on Assign public IP address ✓ Skip Source/Destination Check	VCN: VCN-a10demo Name: p1-data Subnet: Data-Public Check on Assign public IP address ✓ Skip Source/Destination Check
3rd VNIC	VCN: VCN-a10demo Name: p2-server Subnet: Server	VCN: VCN-a10demo Name: p2-server Subnet: Server
4th VNIC	VCN: VCN-a10demo Name: p3-ha Subnet: HA-link	VCN: VCN-a10demo Name: p3-ha Subnet: HA-link

***NOTE**: Skip Source/Destination Check - The source/destination check causes this VNIC to drop any network traffic whose source or destination is not this VNIC. Only mark the checkbox if you want this VNIC to skip the check and forward that traffic (for example, to perform Network Address Translation).*

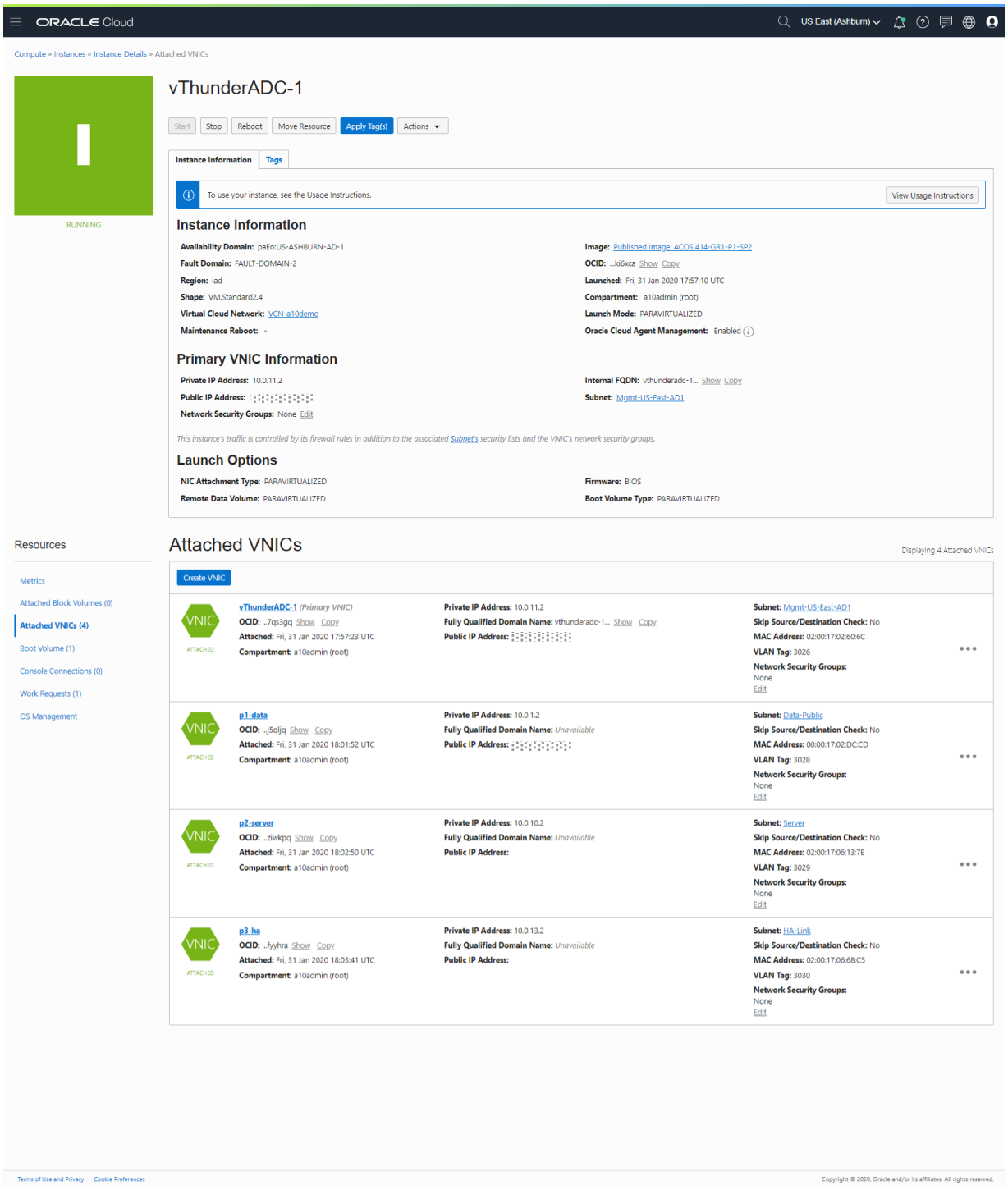


Figure 9: vThunderADC-1 instance information

5. ***[vThundeADC-1 only]*** To assign the secondary IP addresses used for the virtual server VIP address, go to ***p1-data*** VNIC, select ***IP address*** from the 'Resources' menu, and click ***Assign Private IP address***
   - Private IP address: 10.0.1.5
   - On the Public IP Address section
     - Select "RESERVED PUBLIC IP"
     - Compartment: a10demo
     - Select "Create a New Reserved Public IP"
     - Name: VIP1
   - Click ***Assign***

   NOTE: *This IP is a shared resource for HA and should exist only on active an vThunder, therefore this step is required only on one of the vThunder ADCs (e.g. vThunderADC-1).*

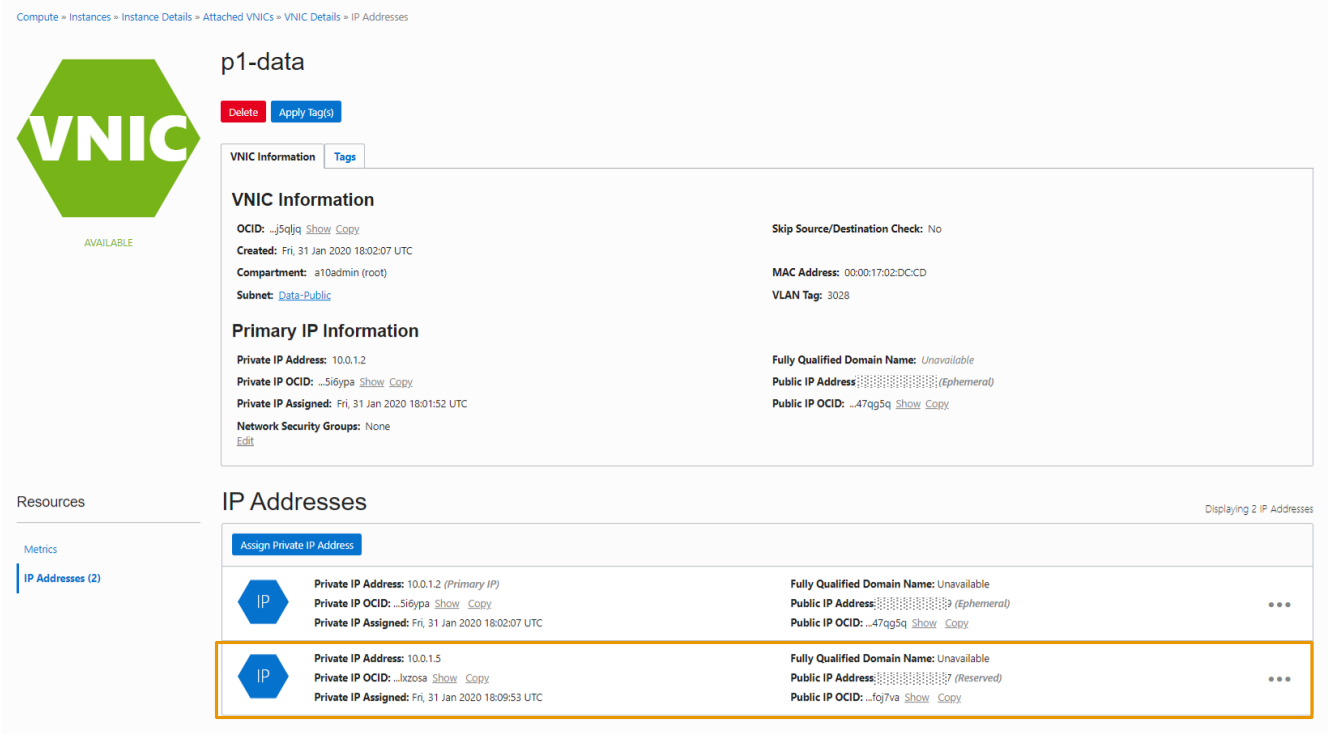


Figure 10: Adding secondary IP as VIP on p1-data VNIC

6. ***[vThundeADC-1 Only]*** To assign the secondary IP address used for a floating IP as a gateway address for backend servers, go to "***p2-server***" VNIC and click ***Assign Private IP address***
   - Private IP address: 10.0.10.10
   - Check "NO PUBLIC IP"
   - Click ***Assign***

   NOTE: *This IP is a shared resource for HA and should exist only on active the vThunder, therefore this step is required only on one vThunder (e.g. vThunderADC-1).*

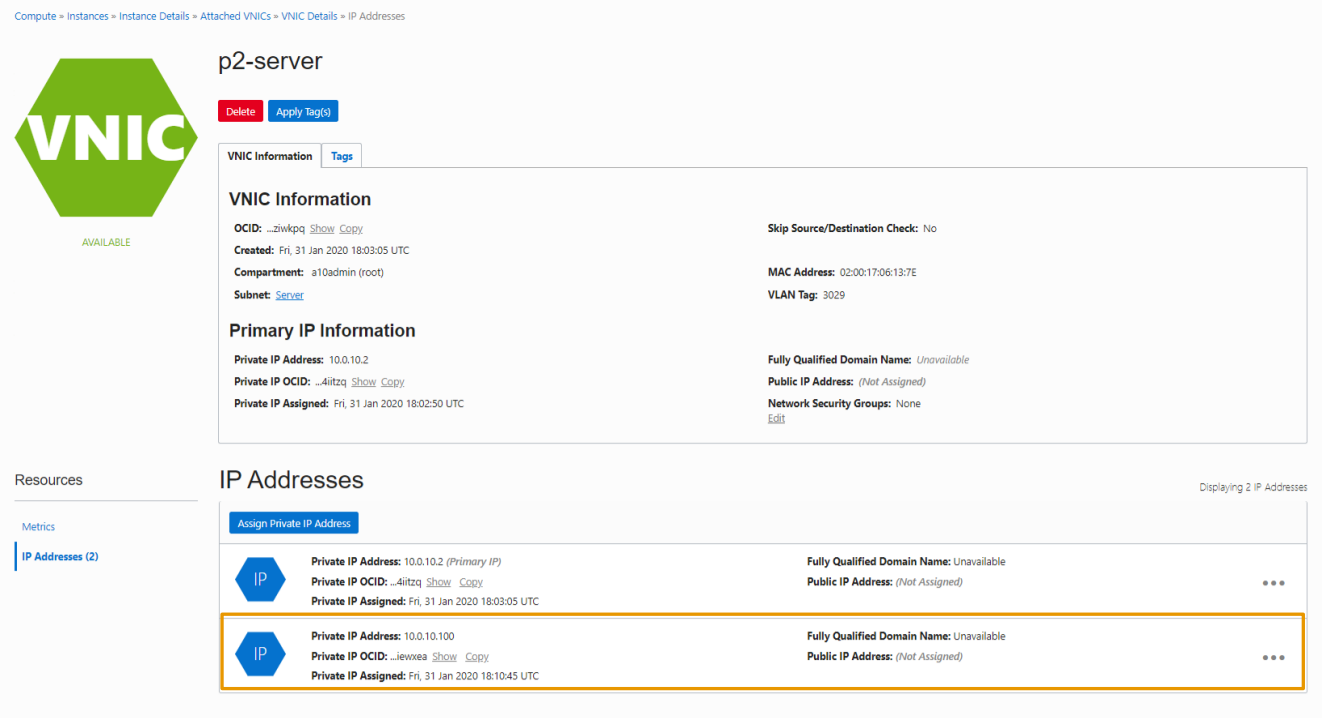


Figure 11: Adding a secondary IP as floating IP on p2-server VNIC

7. Reboot the vThunder in the ***Oracle Cloud portal***. This will populate the newly created primary VNICs to the vThunder instances.

CONFIGURE VTHUNDER

ACCESS VTHUNDER ADC

Once the vThunder instance is installed and running, the user can find the public IP assigned to the instance on the Primary VNIC, which is associated as the management port on the vThunder. This section describes how to access vThunder ADC from a command line interface (CLI), graphical user interface (GUI) to configure the device.

- **CLI** – The CLI is a text-based interface in which you type commands on a command line. The user can access the CLI directly through using Secure Shell (SSH) version 2.
- **GUI** – This is a web-based interface over HTTPS protocol, in which the user clicks buttons, menus and other graphical icons to access the configuration or management pages. From these pages, the user can type or select values to configure or manage the device.

The user can configure the vThunder devices using the CLI or GUI. In addition, A10 vThunder offers wizard-based configuration tools called AppCentric Templates (ACT).

- ***AppCentric Templates (ACT)*** – This is a GUI plug-in module that enhances the user experience to deploy, monitor and troubleshoot applications in a frictionless manner. AppCentric Templates can be accessed via the GUI, following by navigating to ***System > App Template***.

NOTE: *The user can also configure and manage Thunder ADC using the Harmony Controller, a centralized management and analytics system. For more details, refer to Harmony Controller documentation.*

Access information:

- GUI
  - Default user: admin
  - Default password: <unique ID of instance OCID>
    - The user can obtain the unique ID from the instance OCID in the Oracle Cloud portal, navigate to ***Compute > Instances > 'your vThunder Instance'*** and find OCID in the ***Instance Information***
    - The syntax of instance OCID will help get the unique ID for the instance
      OCID syntax: - ocid1.<RESOURCE TYPE>.<REALM>.[REGION][.FUTURE USE].<UNIQUE ID>
    - Example: Use the section in **bold** as your login password
      ocid1.instance.oc1.iad.**anuwcljswtg6jvt3yqx3nwh2qzwsb5vsphsisfs7kwlhmv4tcc4q**

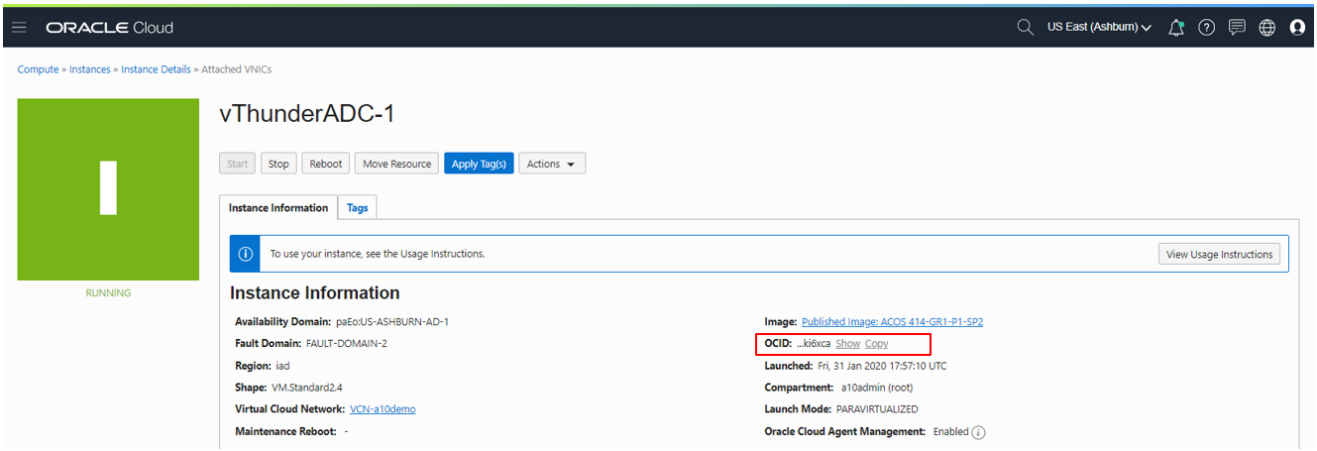


Figure 12: vThunder ADC instance OCID

NOTE: *The user can change the default password on either the GUI or CLI. Please consult with administrator.*

- CLI over SSH
  - Default user: admin
  - SSH authentication, use the SSH private key that is created in the prerequisites

NOTE: *If the user is accessing the vThunder and the data port/ethernet interfaces are not shown from the CLI command "show interface brief" or on the **GUI > Network > Interface**. In this case, please go ahead and reboot the vThunder.*

GENERAL CONFIGURATION

In this step, the user starts configuring the vThunder system and data interfaces based on IP addresses assigned on VNICs. The user can configure this using either the GUI or CLI. This section describes the configuration steps using CLI.

First, log into the vThunder CLI over SSH, go to enable mode and then configuration mode.

```
$ ssh -i ssh_key_priv.pem admin@203.0.113.51
Last login: Sat Feb  1 00:45:56 2020 from 192.0.2.123

System is ready now.

[type ? for help]
```

```
vThunderADC-1>enable
Password:                    /* No password by default */
vThunderADC-1#configure
vThunderADC-1(config)#
```

Before starting configuration, please confirm the status of all the interfaces and each MAC address. Run the “show interface brief” command and note the MAC addresses on each interface and compare them to the MAC addresses in the attached VNICs of the vThunder instance. Please make sure that the MAC correlates to the vThunder ethernet ports for the corresponding function.

```
vThunderADC-1(config)# sh int br
Port     Link   Dupl   Speed   Trunk Vlan MAC              IP Address          IPs   Name
-------------------------------------------------------------------------------------
mgmt     Up     auto   auto    N/A   N/A  0200.1702.606c  10.0.11.5/24          1
1        Disb   None   None    none  1    0200.1702.dccd  0.0.0.0/0             0
2        Disb   None   None    none  1    0200.1706.137e  0.0.0.0/0             0
3        Disb   None   None    none  1    0200.1706.68c5  0.0.0.0/0             0
```

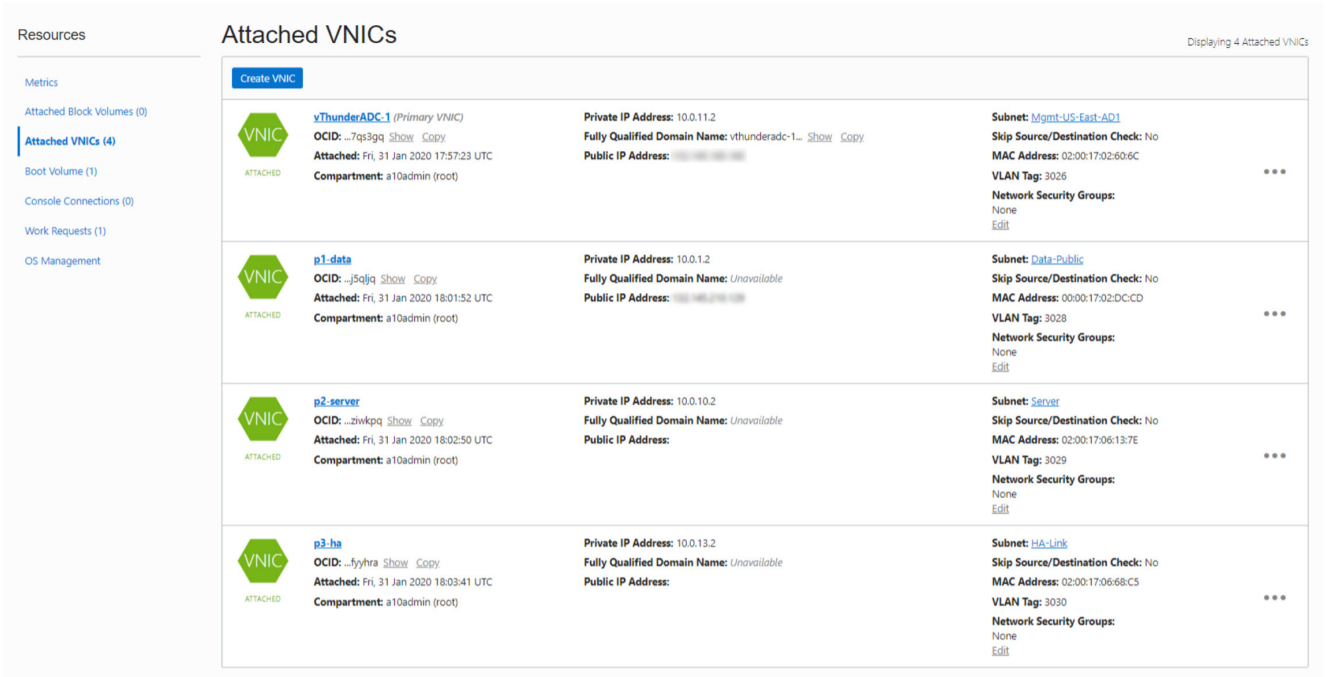


Figure 13: Attached VNIC information under the vThunder instance in the Oracle Cloud portal

In a typical Thunder ADC deployment, it’s recommended to use a VE (virtual ethernet with VLAN) interface for its flexibility and usability rather than using the ethernet port directly. Therefore, please note the IP addresses assigned on all data interfaces to configure the vThunder using the CLI from the “Attached VNICs information of Oracle Cloud Portal” instance page.

***NOTE**: VLAN IDs (or VE IDs) can be a number between 2 - 4096*

In this document, the following information is used to configure the interface, routes and system-related items on both vThunder ADCs.

TABLE 5: VTHUNDER SYSTEM & NETWORK CONFIGURATION DETAILS

HOST NAME	vThunderADC-1	vThunderADC-2
P1-Data VNIC (interface ethernet 1)	Interface ve 101 (VLAN 101) IP address 10.0.1.2 255.255.255.0	Interface ve 101 (VLAN 101) IP address 10.0.1.3 255.255.255.0
P2-Server VNIC (interface ethernet 2)	Interface ve 110 (VLAN110) IP address 10.0.10.2 255.255.255.0	Interface ve 110 (VLAN110) IP address 10.0.10.3 255.255.255.0
P3-HA Link VNIC (interface ethernet 3)	Interface ethernet 3 IP address 10.0.13.2 255.255.255.248	Interface ethernet 3 IP address 10.0.13.3 255.255.255.248
Route	IP route 0.0.0.0 /0 10.0.1.1	IP route 0.0.0.0 /0 10.0.1.1
Others	DNS primary 4.2.2.1 system-jumbo-global enable-jumbo (**see note below**) Allow SSH access on port 3 for configuration sync	DNS primary 4.2.2.1 system-jumbo-global enable-jumbo (**see note below**) Allow SSH access on port 3 for configuration sync

***NOTE**: When the "system-jumbo-global enable-jumbo" command is run on the CLI config mode, it will be prompted to reboot the vThunder. Once booted, the user can configure mtu size 9216 on ethernet 2 and 3.*

Here is the sample CLI configuration from vThunderADC-1. The user can modify this sample config based on their deployment design, copy and paste on the CLI of their vThunder ADC.

```
!
hostname vThunderADC-1
!
ip dns primary 4.2.2.1
!
vlan 101
  untagged ethernet 1
  router-interface ve 101
!
vlan 110
  untagged ethernet 2
  router-interface ve 110
!
system-jumbo-global enable-jumbo
!
interface ethernet 1
  name p1-data
  mtu 9216
  enable
!
enable-management service ssh
  ethernet 3
!


interface ethernet 2
  name p2-server
  mtu 9216
  enable
!
interface ethernet 3
  name p3-ha
  enable
  ip address 10.0.13.2 255.255.255.248
!
interface ve 101
  ip address 10.0.1.2 255.255.255.0
!
interface ve 110
  ip address 10.0.10.2 255.255.255.0
!
!
ip route 0.0.0.0 /0 10.0.1.1
!
```

Updated interface status of the vThunderADC-1.

```
vThunderADC-1#show interfaces brief
Port    Link  Dupl  Speed  Trunk Vlan MAC             IP Address          IPs  Name
-------------------------------------------------------------------------------
mgmt    Up    auto  auto   N/A   N/A  0200.1702.606c  10.0.11.2/24          1
1       Up    Full  10000  none  101  0000.1702.dccd  0.0.0.0/0             0  p1-data
2       Up    Full  10000  none  110  0200.1706.137e  0.0.0.0/0             0  p2-server
3       Up    Full  10000  none  1    0200.1706.68c5  10.0.13.2/29          1  p3-ha
ve101   Up    N/A   N/A    N/A   101  0000.1702.dccd  10.0.1.2/24           1
ve110   Up    N/A   N/A    N/A   110  0200.1706.137e  10.0.10.2/24          1
```

IMPORT API PRIVATE KEY AND CLOUD CONFIG FILE TO VTHUNDER ADC

A10 vThunder ADC has a tighter integration with Oracle Cloud Infrastructure using APIs, enabling an ADC high availability deployment. This section describes how to import an API key and cloud config file that are used for the automation of ADC failover workflow.

1. Locate the API private key (oci_api_key.pem) prepared in the API Key Preparation section. On the vThunder CLI (config) mode, import the file as "oci_api_key.pem". By default, this file is stored in the vThunder under the ***/a10data/cloud/*** directory.

```
vThunderADC-1# conf
vThunderADC-1(config)#import cloud-creds oci_api_key.pem use-mgmt-port scp://192.168.0.254/root/
oci/oci_api_key.pem
User name []?root
Password []?
Done.


vThunderADC-1(config)#show cloud-creds
--------------------------------------------------
Name                              Permissions
--------------------------------------------------
oci_api_key.pem                    0400
--------------------------------------------------
```

NOTE: *The user can also download the file from a file share service such as Dropbox using the shared download link. Copy and paste the link into the command, as shown below. If the link is not set with a password, the user can use the vThunder login and password (Default user: admin, default password: <Unique ID of the Instance OCID>)*

```
vThunderADC-1(config)#import cloud-creds oci_api_key.pem use-mgmt-port https://www.dropbox.
com/s/qwerty123456780/oci-config?
User name []?admin
Password []?
Done.
```

2. Locate the cloud config file (filename: config) prepared in the API Keys Preparation section. On the vThunder CLI (config) mode, import the file as "***config***".

```
vThunderADC-1(config)#import cloud-config config use-mgmt-port scp://192.168.0.254/root/oci/con-
fig
User name []?root
Password []?
Done.
```

```
vThunderADC-1(config)#sh cloud-config config
[DEFAULT]
user=ocid1.user.oc1..aaaaaaa1b2c3d4e5f6g7h8i9j0k1l2m3n4o5p6q7s8t9u0
fingerprint=1b:2c:3d:4e:5f:6g:7h:8i:9j:0k:1l:2m:3n:4o:5p:6q
key_file=/a10data/cloud/oci_api_key.pem
pass_phrase=
tenancy=ocid1.tenancy.oc1..aaaaaaaagz11111111bbbbbbbb2222222ccccccccc3333333333
region=us-ashburn-1
```

***NOTE**: Key_file name (e.g. oci_api_key.pem) in the config must match the user's cloud-cred key file imported earlier.*

HIGH AVAILABILITY (VRRP-A) CONFIGURATION

In this section, you will configure the device redundancy feature, VRRP-A, on both vThunder ADCs. Here is the list of the CLI commands to form the VRRP-A and make vThunderADC-1 as an active device. You can copy and paste the following config, with appropriate modification if needed, to your vThunder ADCs.

TABLE 6: VTHUNDER VRRP-A CONFIGURATION EXAMPLE

vThunderADC-1	*vThunderADC-2*

vrrp-a common
  device-id 1
  set-id 1
enable
exit
!
vrrp-a vrid 0
  floating-ip 10.0.10.10
  blade-parameters
  priority 220
  exit
!
vrrp-a interface ethernet 3
!
vrrp-a peer-group
peer 10.0.13.3
exit
!
vrrp-a session-sync enable
	vrrp-a common
	  device-id 2
	  set-id 1
	enable
	exit
	!
	vrrp-a vrid 0
	floating-ip 10.0.10.10
	preempt-mode disable
	  blade-parameters
	  priority 150
	  exit
	!
	vrrp-a interface ethernet 3
	!
	vrrp-a peer-group
	peer 10.0.13.2
	exit
	!
	vrrp-a session-sync enable

CONFIGURE THE VIRTUAL SERVER (VIP) ON VTHUNDER ADC-1

The user can configure virtual services, or VIP, using the CLI, GUI, AppCentric Templates (ACT) or Harmony Controller.

In this document, for ease of configuration and operation, ACT is used, the A10 ACOS GUI plug-in module that enhances the user experience to deploy, monitor and troubleshoot applications in a frictionless manner. ACT contains wizard-based configuration tools for many different applications and use-case configurations, including Basic LB, HTTPS/SSL Offload, MS Exchange, GSLB and more.

L4 VIP CREATION USING ACT

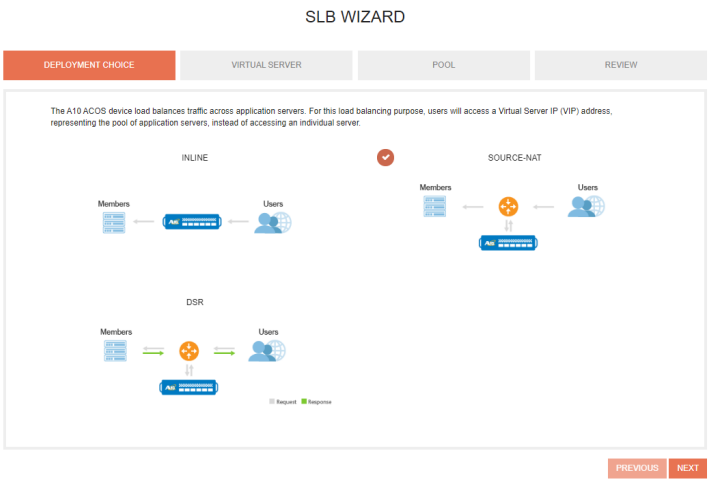
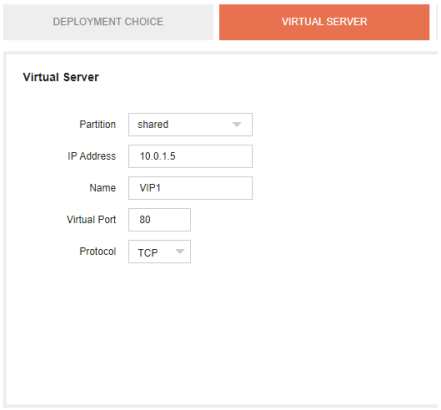
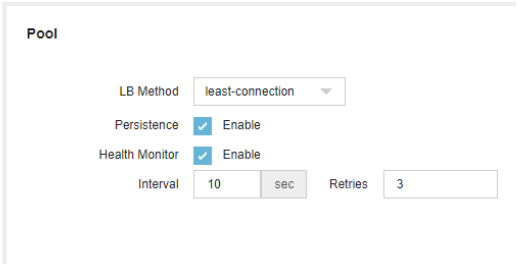
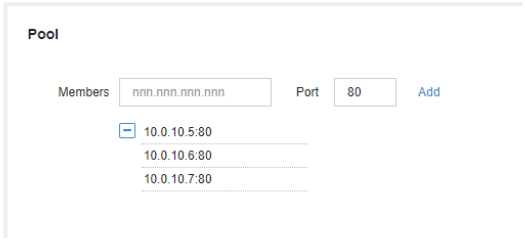
This section explains how to configure a basic VIP (virtual server) for a port 80 web service using the ACT.

***NOTE**: ACT version used in the example is act-v2-1214-17-a10-0.tar.gz*

Figure 14: ACT version (GUI > System > App Template > Setting (icon on top right)

1. Login to vThunderADC-1 GUI and navigate to ***System > App Template*** to access ACT
2. Select ***L4 SLB*** from ACT Store and click to ***Wizard*** from menu
3. On the SLB Wizard, please follow the configuration example below.

TABLE 7: L4 SLB CONFIGURATION EXAMPLE WITH ACT

Deployment Choice	Source-NAT	
Virtual Server	Partition: shared IP address: 10.0.1.5 Name: VIP1 Virtual Port: 80 Protocol: TCP Note: This IP address of the VIP is the secondary IP address created during the vThunder installation step.	
Pool	LB Method: Least-connection Persistence: Enable Health Monitor: Enable	
	Members: 10.0.10.5 port 80 10.0.10.6 port 80 10.0.10.7 port 80	

4. In the 'Review' tab, click '***FINISH***' and push the configuration to the vThunder ADC-1
5. Confirm the VIP service is up and running on vThunder ADC-1

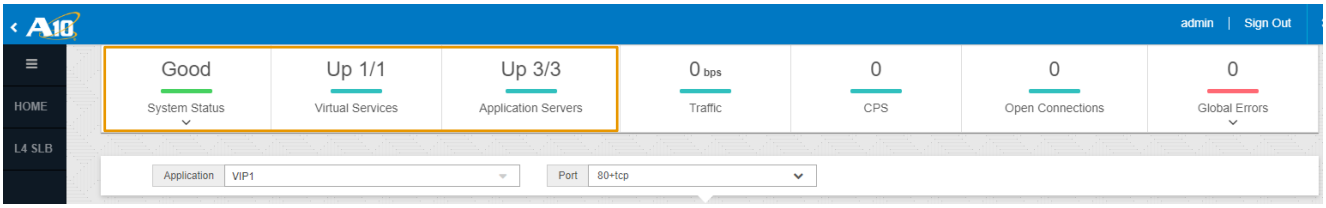


Figure 15: VIP status on ACT L4SLB dashboard

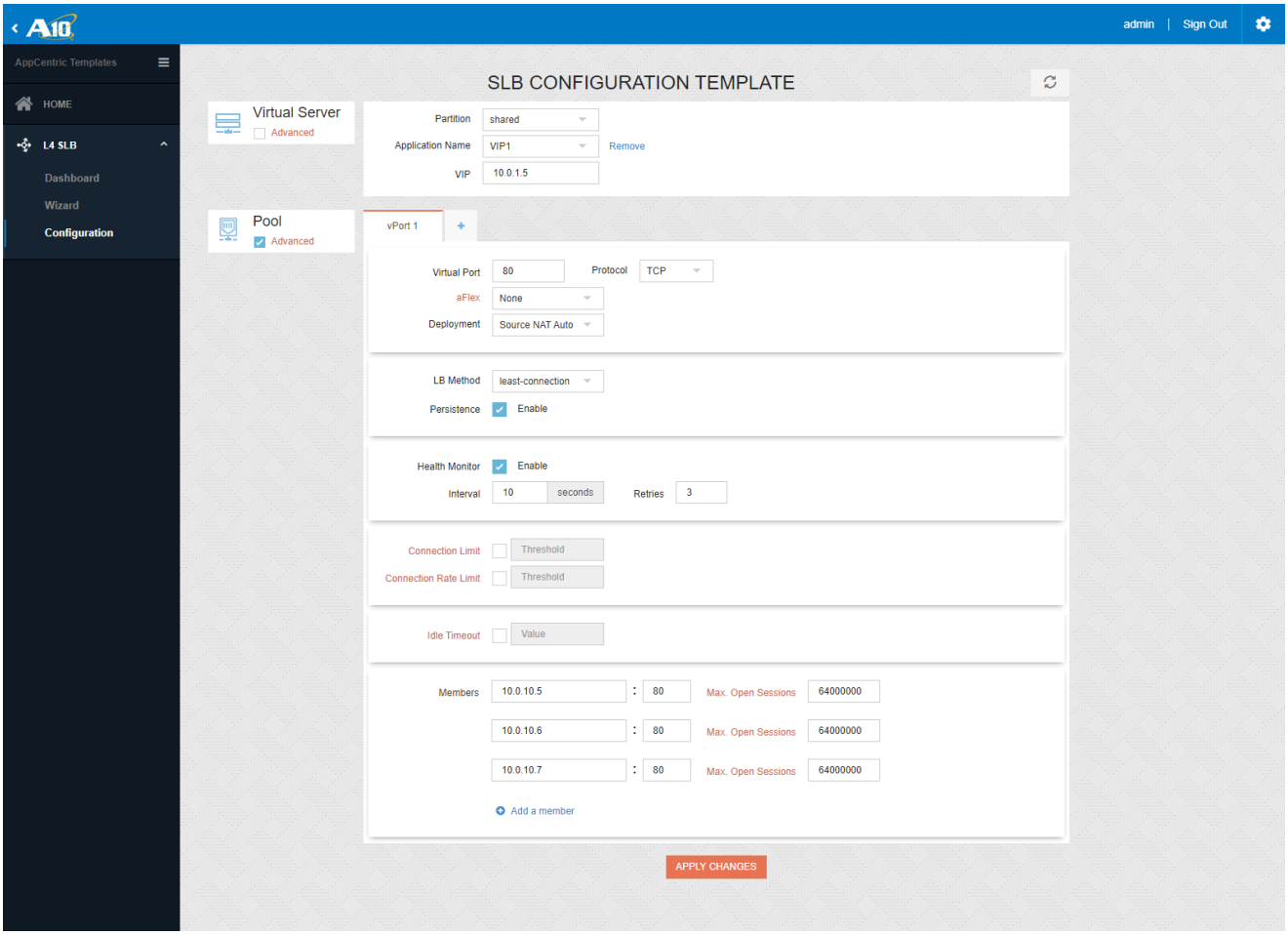


Figure 16: ACT L4 SLB > Configuration to review VIP configuration

ENABLE VRRP-A SESSION SYNCHRONIZATION USING CLI

VRRP-A uses one active device and one standby device for a given VRID. If session synchronization (also called connection mirroring) is enabled, the active device backs up active session entries on the standby device. Session synchronization applies to Layer 4 sessions. To configure session synchronization, apply the "ha-conn-mirror on-syn" CLI command under all (Layer 4) vPorts of the configuration of the VIP.

Using CLI:

```
vThunderADC-1-Active#conf
vThunderADC-1-Active(config)#slb virtual-server VIP1 10.0.1.5
vThunderADC-1-Active(config-slb vserver)#port 80 tcp
vThunderADC-1-Active(config-slb vserver-vport)#ha-conn-mirror
```

Here is the simplified CLI configuration from this section.

```
!
 interval 10
!
slb server srv_10_0_10_5 10.0.10.5
  port 80 tcp
    health-check ping
!
slb server srv_10_0_10_6 10.0.10.6
  port 80 tcp
    health-check ping
!
slb server srv_10_0_10_7 10.0.10.7
  port 80 tcp
    health-check ping
!


slb service-group VIP1_80_tcp_sg tcp
health monitor Hm_VIP1_80
 method least-connection
  health-check Hm_VIP1_80
  member srv_10_0_10_5 80
  member srv_10_0_10_6 80
  member srv_10_0_10_7 80
!
slb template persist source-ip VIP1_per-
sist_template_80
!
slb virtual-server VIP1 10.0.1.5
  port 80 tcp
    ha-conn-mirror on-syn
    source-nat auto
    service-group VIP1_80_tcp_sg
    template persist source-ip VIP1_per-
sist_template_80
```

***NOTE**: The user finds more items in the actual config such as "user-tag" and "sampling-enable," which are generated by ACT wizard for visibility and analytics purposes. Refer to the full configuration in the appendix.*

SYNCHRONIZE THE ADC CONFIGURATION TO VTHUNDERADC-2

This is an optional step to synchronize VIP configuration of vThunder ADC-1 to standby vThunder ADC-2.

***NOTE**: If the user prefers to configure VIPs on vThunder ADC-2 manually, please skip this step.*

***NOTE**: Configure sync command covers most of SLB configuration, security policies except routing and interface settings.*

Before running 'configure sync' command, the user will need to import the SSH private key on to vThunder ADC-1 as it's required for SSH authentication.

Locate the SSH private key (ssh_key_priv.pem) prepared in the Deployment Prerequisites section. On the vThunder CLI (config) mode, import the SSH private key file "ssh_key_priv.pem".

```
vThunderADC-1(config)#import key sync_ssh_priv use-mgmt-port scp://192.168.0.254/root/oci/ssh_
key_priv.pem
User name []?admin
Password []?
Done.


vThunderADC-1(config)#sh pki cert
Name: sync_ssh_priv  Type: key  [Unbound]
```

***NOTE**: If this operation failed with an error related to key file format, please try to convert the private key to OpenSSH format (Old or New) again, then import it again.*

Next, run the 'configure sync' command using the the SSH private key and IP address of vThunderADC-2 (e.g. 10.0.13.3, IP address of HA-Link/ port 3)

```
vThunderADC-1-Active(config)#configure sync all private-key sync_ssh_priv 10.0.13.3
User name []?admin
```

Once this command is successfully run, the user will see that the ADC configurations are synced on vThunderADC-2. This sync process may take a few, ~ 10 seconds, depending on the size of the configuration. If configuration changes related to VIP are made, the sync command would need to be run to sync configurations to the standby vThunder.

VERIFICATION

Once VIP configuration is done on both vThunder ADCs, it is time to verify the application traffic and service status. Navigate to ACT (***GUI > System > App Template***) and then go to ***L4SLB > Dashboard*** to see the VIP status and traffic and connection statistics.

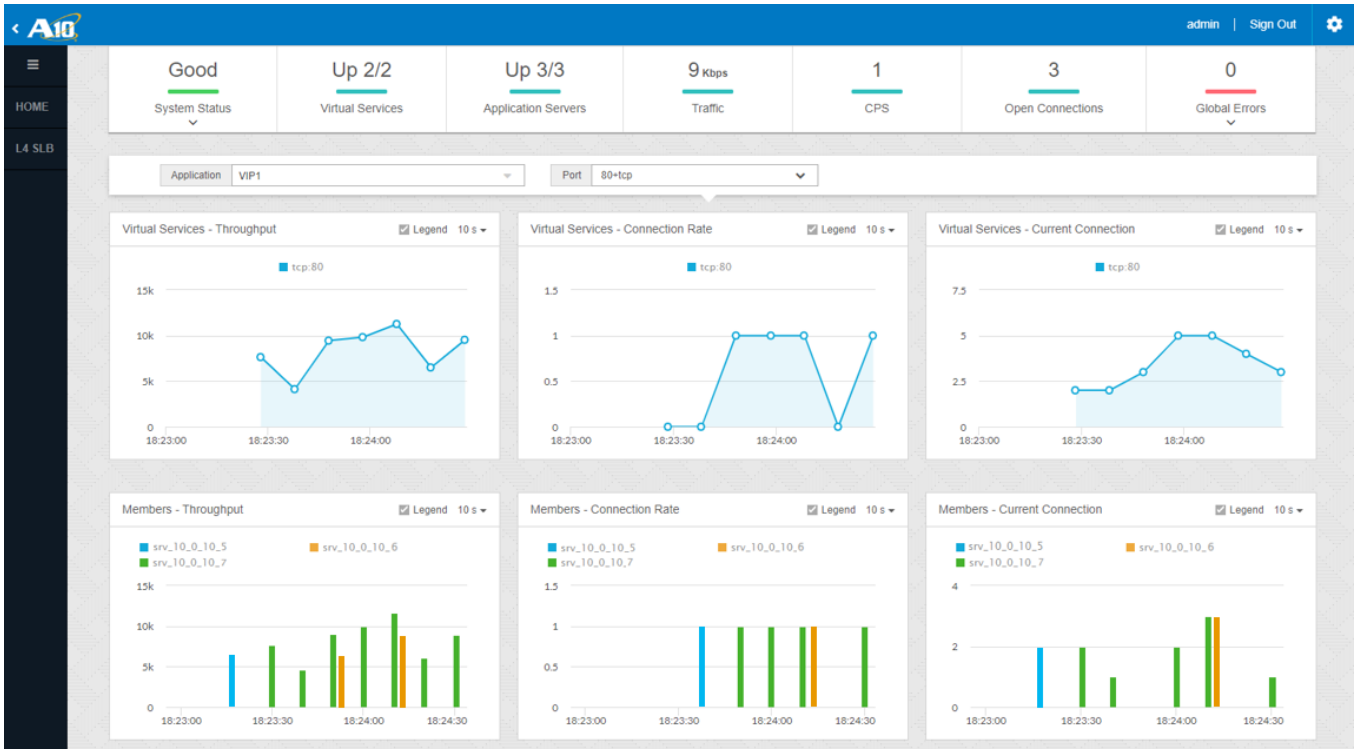


Figure 17: ACT L4 SLB dashboard

As for the verification of the high-availability function, it can be tested using the following command on the active vThunder.

```
vThunderADC-1(config)#vrrp-a force-self-standby enable
```

This will force the active vThunderADC-1 to be in standby mode and the other vThunder in the HA standby mode (vThunderADC-2) to be active. Go to the vThunderADC-2 instance page (***Instance Detail -> Attached VNIC***s -> *Click on the* ***VNIC***) in the Oracle Cloud portal and verify the VIP (secondary IP address) of the P1-Data VNIC and other floating IP addresses of the P2-Server VNIC have moved to the new active instance.

SUMMARY

This document describes the reference architecture for deploying high-availability application services using A10 vThunder ADC in Oracle Cloud Infrastructure and provides the detailed configuration steps of deploying vThunder ADC in high-availability mode and using multiple available domains in Oracle Cloud.

Oracle Cloud Infrastructure is a public cloud service designed for enterprises, offering powerful compute and networking performance and a comprehensive portfolio of infrastructure and platforms that enable users to run the mission-critical business applications in highly available hosted environment. The A10 Thunder ADC works seamlessly with any business application to ensure fast, secure, and consistent application delivery. Deploying the A10 Thunder ADC solution for various business applications in Oracle Cloud enables organizations to enjoy reliable application services, strengthens high availability using local the redundancy feature, as well as global server load balancing, and maximizes elasticity and performance for business-critical applications.

For more information about Thunder ADC products, please refer to:

https://www.a10networks.com/products/thunder-adc/

https://www.a10networks.com/solutions/cloud-security/public-cloud/

https://cloudmarketplace.oracle.com/marketplace/en_US/listing/51617399

APPENDIX A - THUNDER ADC CONFIGURATION

Here is the vThunder ADC configuration used in an actual test environment.

```
// vThuderADC-1 Configuration //
!64-bit Advanced Core OS (ACOS) ver-
sion 4.1.4-GR1-P1-SP2, build 5 (Jun-06-
2019,07:46)
!
vrrp-a common
  device-id 1
  set-id 1
  enable
!
multi-config enable
!
!
system resource-usage max-aflex-file-size
256
!
ip dns primary 4.2.2.1
!
vlan 101
  untagged ethernet 1
  router-interface ve 101
!
vlan 110
  untagged ethernet 2
  router-interface ve 110
!
hostname vThunderADC-1
!
system-jumbo-global enable-jumbo
!
interface ethernet 1
  name p1-data
  mtu 9216
  enable
!
interface ethernet 2
  name p2-server
  mtu 9216
  enable
!
interface ethernet 3
  name p3-ha
  enable
  ip address 10.0.13.2 255.255.255.248
!
interface ve 101
  ip address 10.0.1.2 255.255.255.0
!
interface ve 110
  ip address 10.0.10.2 255.255.255.0
!
vrrp-a vrid 0
```

```
  floating-ip 10.0.10.100
  blade-parameters
    priority 220
!
vrrp-a interface ethernet 3
!
vrrp-a peer-group
  peer 10.0.13.3
!
enable-management service ssh
  ethernet 3
!
ip route 0.0.0.0 /0 10.0.1.1
!
health monitor Hm_VIP1_80
  interval 10
  user-tag uiext_l4_slb_VIP1_HM
!
slb server srv_10_0_10_5 10.0.10.5
  user-tag uiext_l4_slb_srv_10_0_10_5
  port 80 tcp
    health-check ping
    user-tag uiext_l4_slb_VIP1_server_
port_80_vport_80_tcp
    sampling-enable total_conn
    sampling-enable total_fwd_bytes
    sampling-enable total_rev_bytes
!
slb server srv_10_0_10_6 10.0.10.6
  user-tag uiext_l4_slb_srv_10_0_10_6
  port 80 tcp
    health-check ping
    user-tag uiext_l4_slb_VIP1_server_
port_80_vport_80_tcp
    sampling-enable total_conn
    sampling-enable total_fwd_bytes
    sampling-enable total_rev_bytes
!
slb server srv_10_0_10_7 10.0.10.7
  user-tag uiext_l4_slb_srv_10_0_10_7
  port 80 tcp
    health-check ping
    user-tag uiext_l4_slb_VIP1_server_
port_80_vport_80_tcp
    sampling-enable total_conn
    sampling-enable total_fwd_bytes
    sampling-enable total_rev_bytes
!
slb service-group VIP1_80_tcp_sg tcp
  method least-connection
  health-check Hm_VIP1_80
  user-tag uiext_l4_slb_VIP1_sg_tcp_80
  member srv_10_0_10_5 80
  member srv_10_0_10_6 80
  member srv_10_0_10_7 80
!
slb template persist source-ip VIP1_persist_
template_80
  user-tag uiext_l4_slb_VIP1_persist_tem-
plate_80
!
slb virtual-server VIP1 10.0.1.5
  user-tag uiext_l4_slb_VIP1_virtualserver
  port 80 tcp
    ha-conn-mirror on-syn
    source-nat auto
    service-group VIP1_80_tcp_sg
    template persist source-ip VIP1_persist_
template_80
    user-tag uiext_l4_slb_VIP1_80_tcp
    sampling-enable total_l4_conn
    sampling-enable total_fwd_bytes
    sampling-enable total_rev_bytes
!
sflow setting local-collection
!
sflow collector ip 127.0.0.1 6343
!
!
end
```

```
//vThuderADC-2 Configuration//
!64-bit Advanced Core OS (ACOS) ver-
sion 4.1.4-GR1-P1-SP2, build 5 (Jun-06-
2019,07:46)
!
vrrp-a common
  device-id 2
  set-id 1
  enable
!
ip dns primary 4.2.2.1
!
vlan 101
  untagged ethernet 1
  router-interface ve 101
!
vlan 110
  untagged ethernet 2
  router-interface ve 110
!
hostname vThunderADC-2
!
system-jumbo-global enable-jumbo
!
interface ethernet 1
  name p1-data
  mtu 9216
  enable
!
interface ethernet 2
  name p2-server
  mtu 9216
  enable
!
interface ethernet 3
  name p3-ha
  enable
  ip address 10.0.13.3 255.255.255.248
!
interface ve 101
  ip address 10.0.1.3 255.255.255.0
!
interface ve 110
  ip address 10.0.10.3 255.255.255.0
!
!
vrrp-a vrid 0
  floating-ip 10.0.10.100
  blade-parameters
    priority 150
!
vrrp-a peer-group
  peer 10.0.13.2
!
enable-management service ssh
  ethernet 3
!
ip route 0.0.0.0 /0 10.0.1.1
!
health monitor Hm_VIP1_80
  interval 10
  user-tag uiext_l4_slb_VIP1_HM
!
slb server srv_10_0_10_5 10.0.10.5
  user-tag uiext_l4_slb_srv_10_0_10_5
  port 80 tcp
    health-check ping
    user-tag uiext_l4_slb_VIP1_server_
port_80_vport_80_tcp
    sampling-enable total_conn
    sampling-enable total_fwd_bytes
    sampling-enable total_rev_bytes
!
slb server srv_10_0_10_6 10.0.10.6
  user-tag uiext_l4_slb_srv_10_0_10_6
  port 80 tcp
    health-check ping
    user-tag uiext_l4_slb_VIP1_server_
port_80_vport_80_tcp
    sampling-enable total_conn
    sampling-enable total_fwd_bytes
    sampling-enable total_rev_bytes
!
slb server srv_10_0_10_7 10.0.10.7
  user-tag uiext_l4_slb_srv_10_0_10_7
  port 80 tcp
    health-check ping
    user-tag uiext_l4_slb_VIP1_server_
port_80_vport_80_tcp
    sampling-enable total_conn
    sampling-enable total_fwd_bytes
    sampling-enable total_rev_bytes
!
slb service-group VIP1_80_tcp_sg tcp
  method least-connection
  health-check Hm_VIP1_80
  user-tag uiext_l4_slb_VIP1_sg_tcp_80
  member srv_10_0_10_5 80
```

```
  member srv_10_0_10_6 80
  member srv_10_0_10_7 80
!
slb template persist source-ip VIP1_per-
sist_template_80
  user-tag uiext_l4_slb_VIP1_persist_tem-
plate_80
!
slb virtual-server VIP1 10.0.1.5
  user-tag uiext_l4_slb_VIP1_virtualserver
  port 80 tcp
    ha-conn-mirror on-syn
    source-nat auto
    service-group VIP1_80_tcp_sg
    template persist source-ip VIP1_persist_
template_80
    user-tag uiext_l4_slb_VIP1_80_tcp
    sampling-enable total_l4_conn
    sampling-enable total_fwd_bytes
    sampling-enable total_rev_bytes
!
sflow setting local-collection
!
sflow collector ip 127.0.0.1 6343
!
!
end
```

ABOUT A10 NETWORKS

A10 Networks (NYSE: ATEN) provides Reliable Security Always™ through a range of high-performance solutions that enable intelligent automation with deep machine learning to ensure business critical applications are protected, reliable and always available. Founded in 2004, A10 Networks is based in San Jose, Calif., and serves customers globally with offices worldwide.

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