Deployment Guide

VeloCloud SD-WAN AWS Virtual Edge

Services

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DOC-08373-01

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Chapter 1

AWS Virtual Edge Deployment Guide

This document provides step-by-step instructions for the AWS Virtual Edge Deployment Guide.

Chapter 2

AWS Virtual Edge Deployment Overview

This overview of the AWS Virtual Edge Deployment Guide provides a general overview, a CloudFormation Template Overview, and CloudFormation Downloads (Green Field VPC Template and Brown Field Template).

General Overview

Multi-cloud or hybrid cloud deployments have become increasingly popular over the past few years, and as Enterprise customers move their workload to the Public Cloud infrastructure, they expect to extend SD-WAN from remote branches to the Public Cloud to guarantee SLA. There are two main options offered by Arista depending on the following use cases: leveraging distributed VCGs to establish IPSec towards Public Cloud or deploying the Virtual Edges directly in public cloud virtual private network. This document describes how to deploy Virtual Edges in AWS.

For a small branch deployment that demands a throughput less than 1G, a single Virtual Edge can be deployed in the private network (AWS VPC). For larger data center deployments that demand multi-gig throughput, hub clustering can be deployed.

CloudFormation Template Overview

There are two CloudFormation default templates, New - Green Field VPC and Existing - Brown Field VPC; both represent a common deployment within AWS, as indicated in the topology illustration in the topic titled, Deploying Virtual Edge with CloudFormation. These two CloudFormation default templates create necessary resources, collect the Orchestrator target, and collect the activation key to push via the CLOUD-INIT.

> **CAUTION:** No matter which template you choose, make sure that you review and understand the template before deploying. Both CloudFormation templates are intended to be used as a reference, and they might need altering to accommodate your specific environment.

CloudFormation Template Values

Listed below are the values included in the CloudFormation templates:

- Attach Interfaces to VeloCloud Instance (GE1 – eth0 / GE2 – eth1 / GE3 – eth2)
- Allocate Elastic IP and attach to GE2
- Create LAN-side and WAN-side Security Groups – Allowed Ports:
  - WAN: GE1 & GE2: UDP 2426 – VeloCloud Multipath Protocol
  - WAN: GE1 & GE2: TCP 22 – SSH Access (for Support Access)
  - WAN: GE1 & GE2: UDP 161 – SNMP
  - LAN: GE3 – ICMP Only (add additional protocols after deployment or modify the template as needed)
- Public Route Table (VPC Router): 0.0.0.0/0 to the Internet Gateway

- Private Route Table (VPC Router): 0.0.0.0/0 to ENI (VeloCloud Edge GE3)
- Deactivate Source/Destination Check on all interfaces

CloudFormation Template Downloads

There are two available templates for you to choose from to deploy a Virtual Edge, either New - Green Field VPC or Existing - Brown Field VPC. While these template will activate a Virtual Edge, the simplicity of the topology will not accommodate all environments. Therefore, you must edit your environment accordingly. For a better understanding of the CloudFormation template structure and syntax see: https://aws.amazon.com/cloudformation/aws-cloudformation-templates/.

NEW – Green Field VPC Template

Use the NEW – Green Field Template if you want to create a new VPC.

EXISTING – Brown Field Template

If you use the EXISTING – Brown Field Template, the VPC, subnets, and route tables will not be not created. The EXISTING – Brown Field template populates the existing VPC and subnets available for that region.

IAM Permissions

For the Cloud Formation template, the minimum permissions needed are as follows. Customers must ensure they have sufficient quota limits available for the services used in the Cloud Formation template.

```
s3:PutObject s3:GetObject cloudformation:CreateStack cloudformation:DeleteStack cloudformatio
n:DescribeStacks ec2:DescribeAvailabilityZones ec2:DescribeVpcs ec2:DescribeSubnets ec2:DeleteCus
tomerGateway ec2:CreateCustomerGateway ec2:DeleteVpnConnection ec2:CreateVpnConnection
 ec2:DescribeKeyPairs
```

Chapter 3

Deploying Virtual Edge with CloudFormation

The following are required before you begin to deploy the Virtual Edge with CloudFormation templates:

- AWS account and login information
- Familiarity with AWS networking concepts (see: https://docs.aws.amazon.com/vpc/latest/userguide/VPC_Networking.html)
- RSA Public Key (see: https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-key-pairs.html)
- CloudFormation Template (one of the following):
  - Green Field Deployment
  - Brown Field Deployment
- Orchestrator target and admin account to login

Instructions on how to deploy a Virtual Edge with CloudFormation templates are described below. However, make sure to adhere to the prerequisite requirements prior to deployment.

As part of the VeloCloud SD-WAN solution, Customers deploy the VeloCloud Virtual Edges in AWS, typically in a VPC. Edge(s) can be deployed via few methods, namely AWS console and Cloud Formation Template. Total provisioning time typically takes around ~30 minutes.

Available Regions

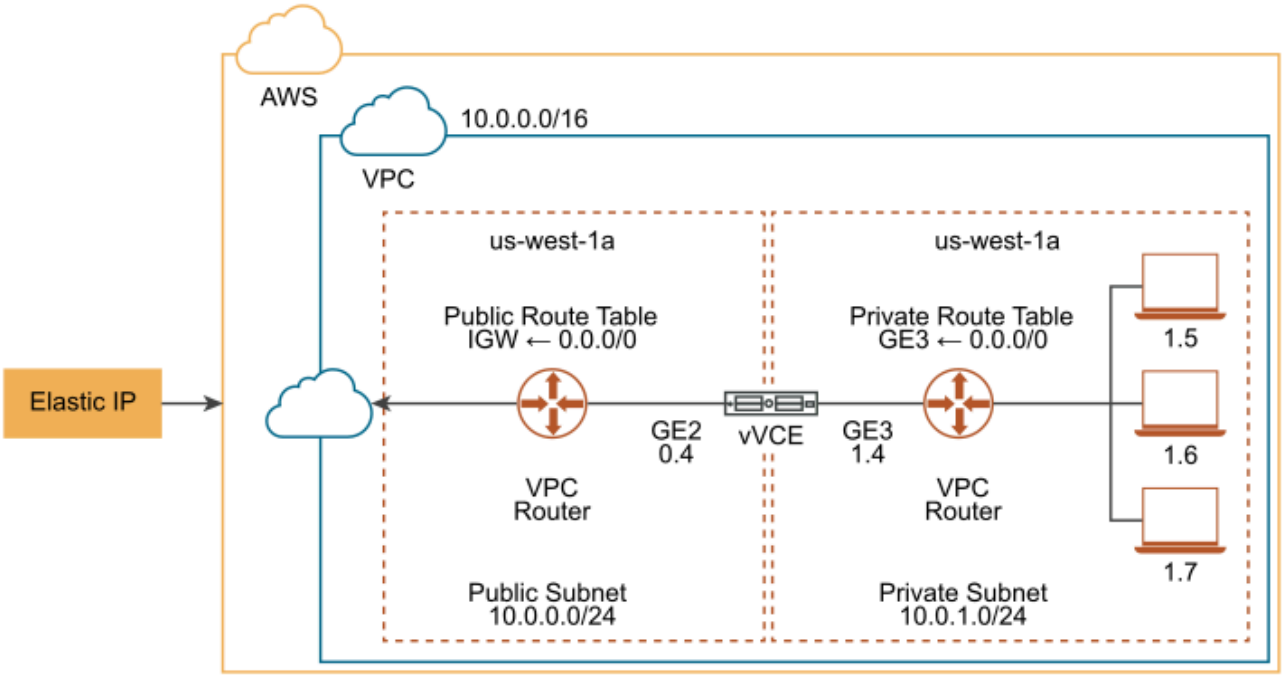
Basic Topology

The VeloCloud Edge AMI is available in all AWS commercial regions with EC2 service, with China being the exception.

In a basic topology example, the AWS VPC (10.0.0.0/16) is divided into a Public subnet (10.0.0.0/24) and a Private subnet (10.0.1.0/24). The Virtual Edge routes between the two subnets. The Public VPC Routes will forward all offnet traffic to the Internet Gateway. The VPC Router in the Private subnet will forward all traffic to the LAN facing interface on the Virtual Edge (ENI of GE3). In this example, a default route is used to forward all traffic from the workloads, but is not necessary. RFC1918 summarization or specific branch/hub prefixes can be used to narrow what is sent to the Virtual Edge. For example, if the workloads in the Private Subnet

need to be accessible via the SSH from publicly sourced IPs, then the VPC Router could be configured to point the default route (0.0.0.0/0) to the Internet Gateway and RFC1918 summarization to the Virtual Edge.

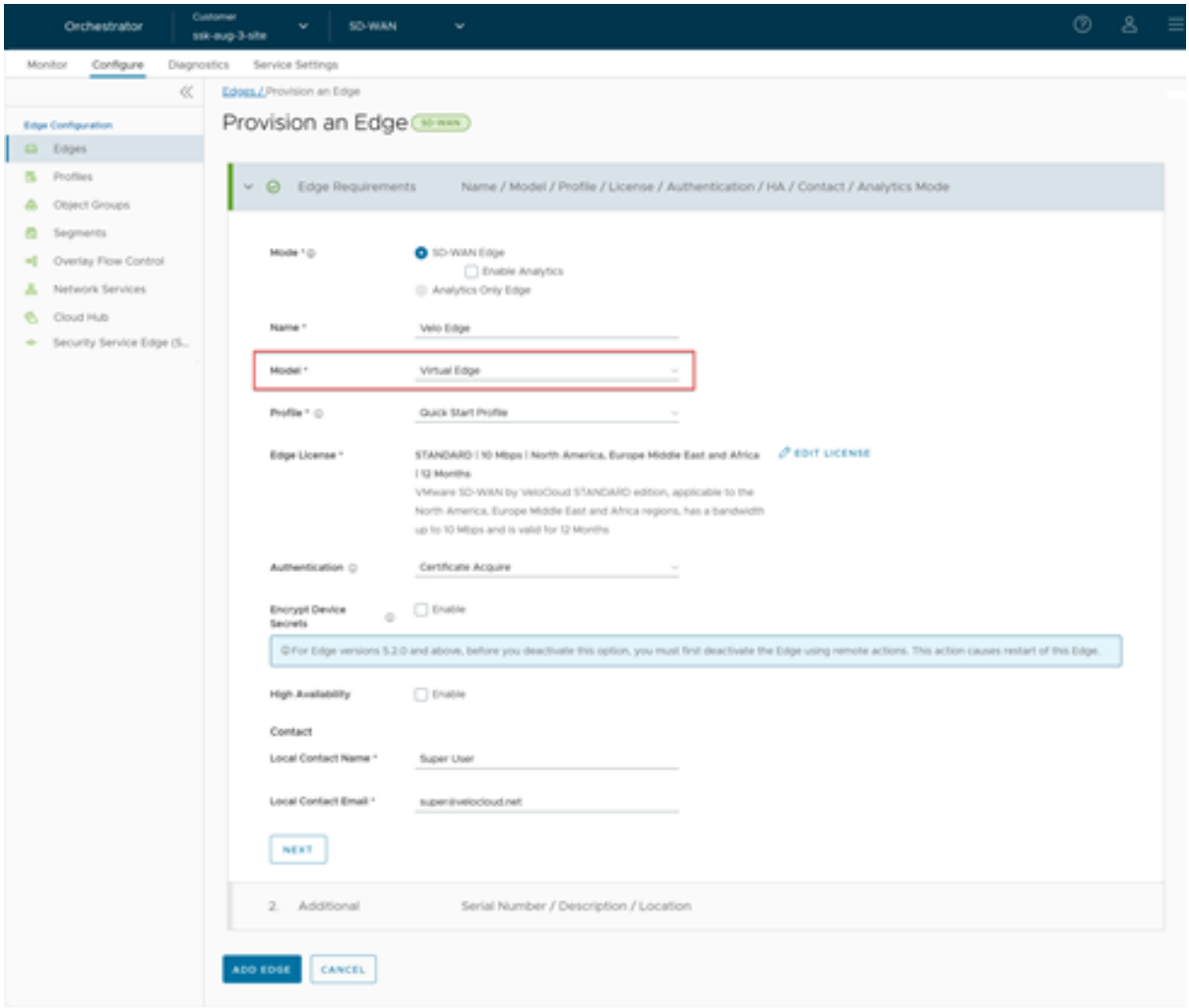
Figure 3-1: Deploying Virtual Edge with CloudFormation



1. **Add the Virtual Edge to the Enterprise via the Orchestrator**
   a. Login to the Orchestrator.

b. Go to **Configure** > **Edges** from the navigation panel, and select the **Add Edge** button. The **Provision an Edge** screen appears.

Figure 3-2: Provision an Edge

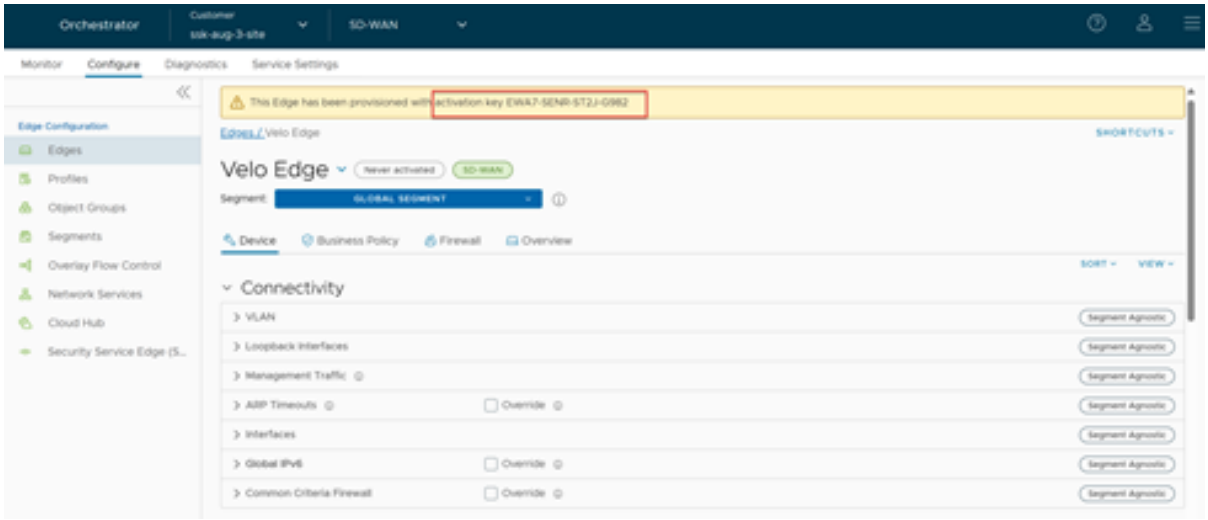


c. In the **Provision an Edge** dialog box:

1. In the **Name** text box, enter a unique name for the Edge.
2. From the **Model** drop-down menu, choose **Virtual Edge**.
3. From the **Profile** drop-down menu, choose a profile for the Virtual Edge.
4. From the **Edge License** drop-down menu, select an Edge license. The list displays the licenses assigned to the Enterprise, by the Operator.
5. Enter all the required details and select **Next** to configure the additional parameters like Serial number, Location, and so on.
6. Select **Add Edge**.

d. The Virtual Edge is provisioned with an activation key. Make a note of the activation key, as it will be used when you deploy the CloudFormation template.

Figure 3-3: Activation Key



For more information, see the topic *Provision a New Edge* in the *Arista VeloCloud SD-WAN Administration Guide*.

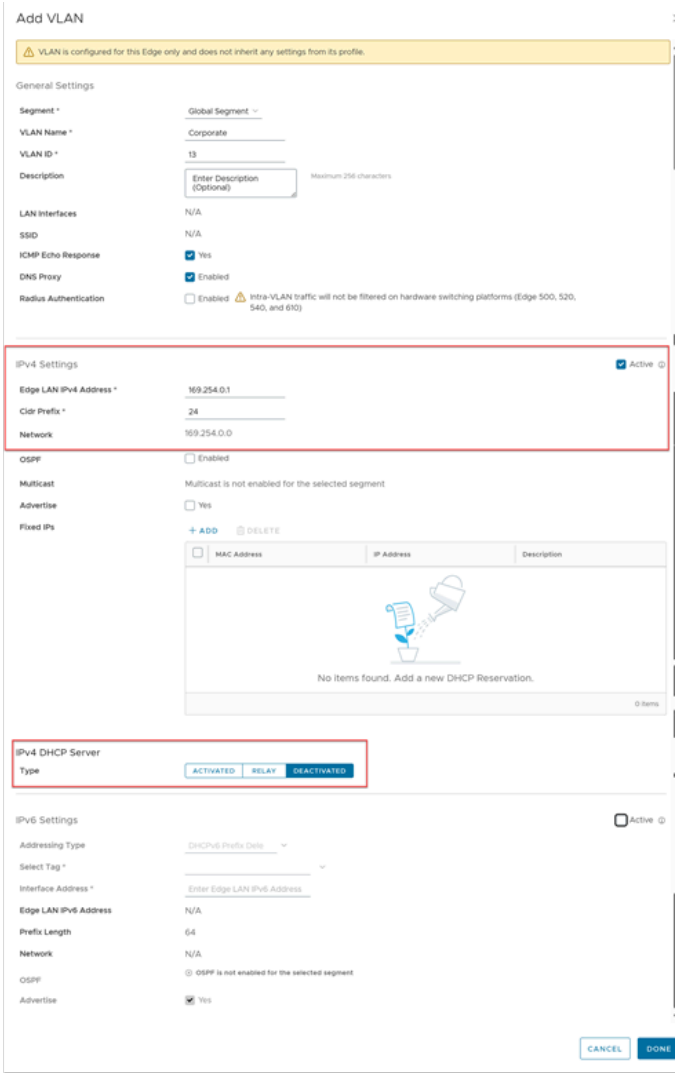
2. **Add VLAN IP**: The VLAN configuration must have an IP address assigned to it in order to save the Device Settings, but the IP address will not be used. For example, use IP address 169.254.0.1. Follow the steps below to add the VLAN IP address.

a. For the Virtual Edge that was just created, select the **Device** tab on the Orchestrator.

b. Scroll down to the **Configure VLAN** section, and select the **Add VLAN** button.

The **Add VLAN** dialog box displays.

Figure 3-4: Add VLAN



c. In the **Add VLAN** dialog box:

1. From the **Segment** drop-down menu, select a segment.
2. In the **VLAN Name** text box, enter a unique name for the VLAN.
3. In the **VLAN ID** text box, enter a VLAN ID.
4. To configure IPv4 settings, under **IPv4 Settings** select the **Active** check box.
   - **a.** In the **Edge LAN IP Address** text box, enter an IP address (for example:169.254.0.1).
   - **b.** In the **Cidr Prefix** text box, enter 24.
   - **c.** The **Network value** will be configured based on the Cidr Prefix.
   - **d.** Deselect the **Advertise** check box.
   - **e.** Under **IPv4 DHCP Server**, select **Deactivated** as the DHCP Type.

5. After configuring the required parameters, select **Done**.

For additional information, see the topic *Configure VLAN for Edges* in the *Arista VeloCloud SD-WAN Administration Guide*.

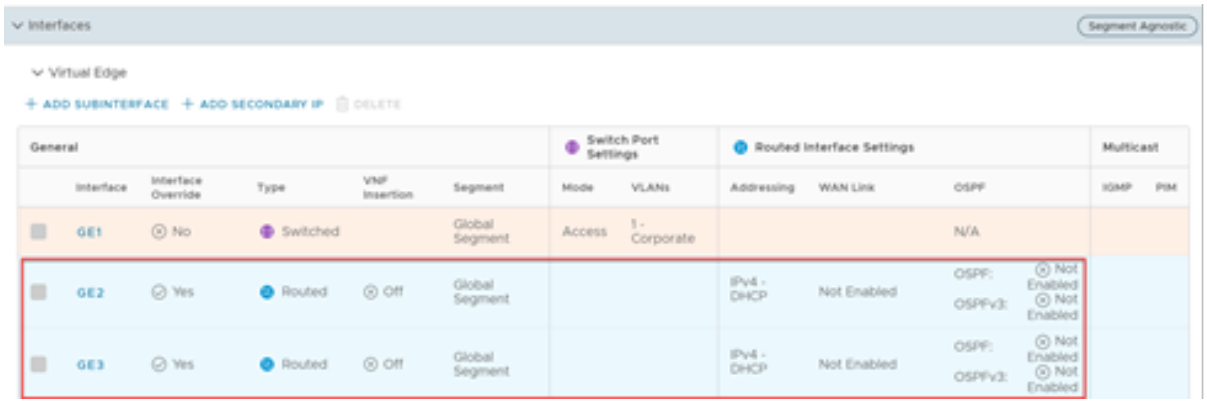
3. **Configure Virtual Edge Interfaces**

> **Warning:** The **Device Settings** must be configured first in the Orchestrator first before Edge activation. If you skip this step, the Virtual Edge will activate, but will go offline a few minutes later.

a. Go to the Virtual Edge's Device settings by navigating to **Configure** > **Edge** > **Device tab**.

b. Scroll down to the **Interfaces** section.

Figure 3-5: Configure Virtual Edge Interfaces



c. Select the **Edit** link for the GE2 interface to change the interface settings.
The dialog box for the GE2 interface settings appears.

d. In the GE2 **Interface Settings** dialog box, select the **Override Interface** check box and complete the following steps:

1. In the **Capability** drop-down menu, change the GE2 interface capability from **Switched** to **Routed**.
2. Choose DHCP from the **Addressing Type** drop-down menu.
3. Activate the WAN Overlay by checking the **Enable WAN Link** check box.

e. Select the **Edit** link for the GE3 interface to change the interface settings.
The dialog box for the GE3 interface settings appears.

f. In the GE3 interface settings dialog box, select the **Override Interface** check box and complete the following steps:

1. Deactivate the WAN Overlay by unchecking the **Enable WAN Link** check box, as this interface will be used for the LAN-side gateway.
2. Uncheck the **NAT Direct Traffic** check box to deactivate NAT direct traffic.

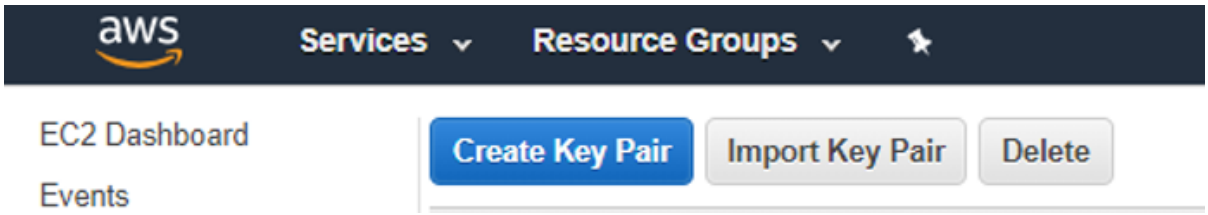
4. **Launch Virtual Edge via CloudFormation**

> **Note:**
>
> - If this is the first deployment of the Virtual Edge, you may need to “Subscribe” to the Edge version in the AWS Marketplace before deploying from the CloudFormation Template.
> - For additional information on how to configure AWS specific components, please refer to the AWS documentation.

a. Log into the AWS console.

b. Create or Import a Key Pair.

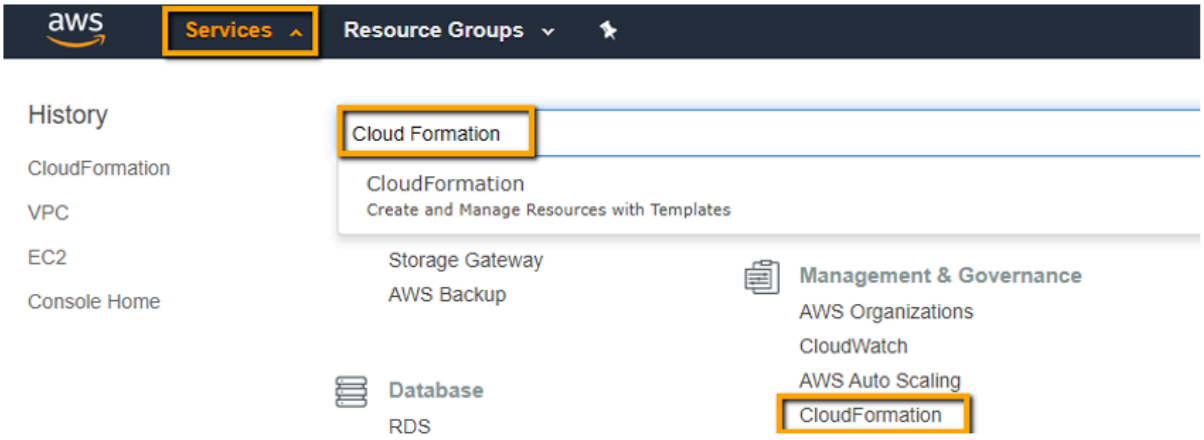
Figure 3-6: Create or Import Key Pair



> **Note:** For additional information regarding AWS EC2 Instance Keys see: https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-key-pairs.html.

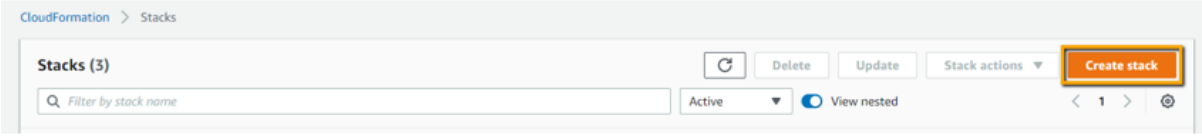
c. Navigate to CloudFormation.

Figure 3-7: CloudFormation



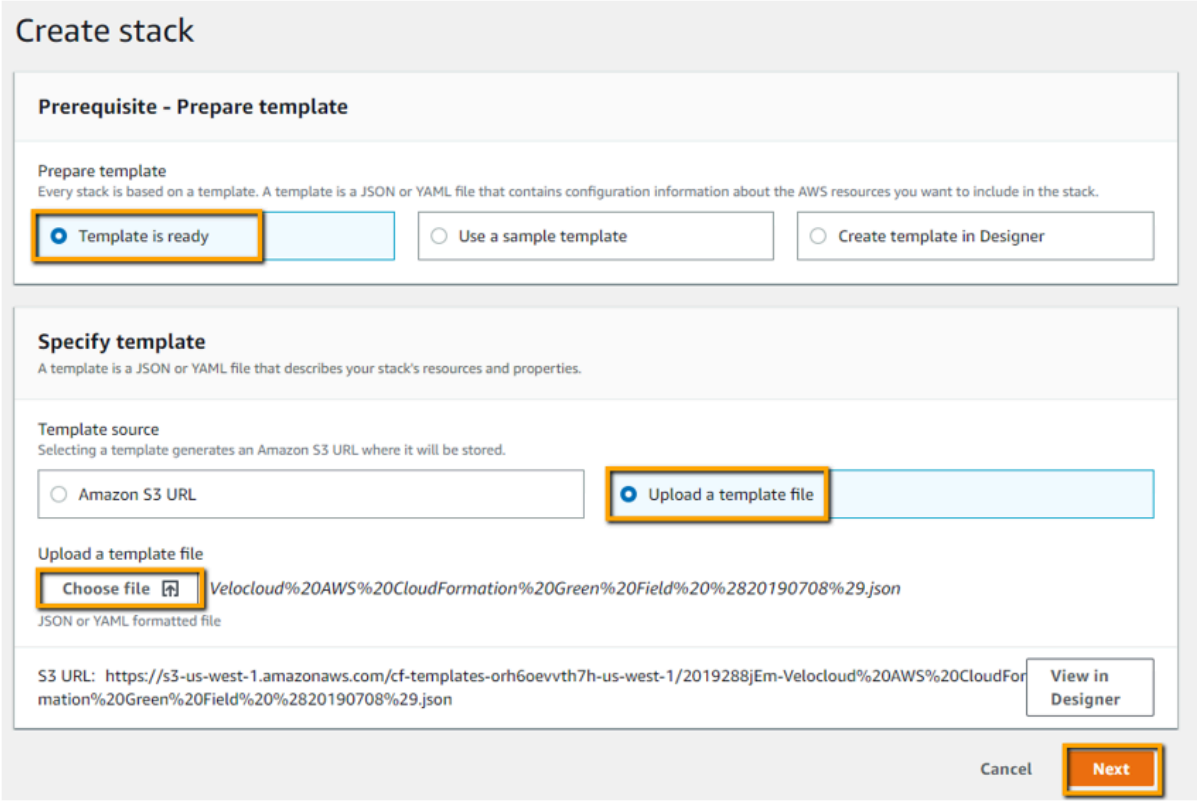
d. Create a CloudFormation stack.

Figure 3-8: CloudFormation Stack



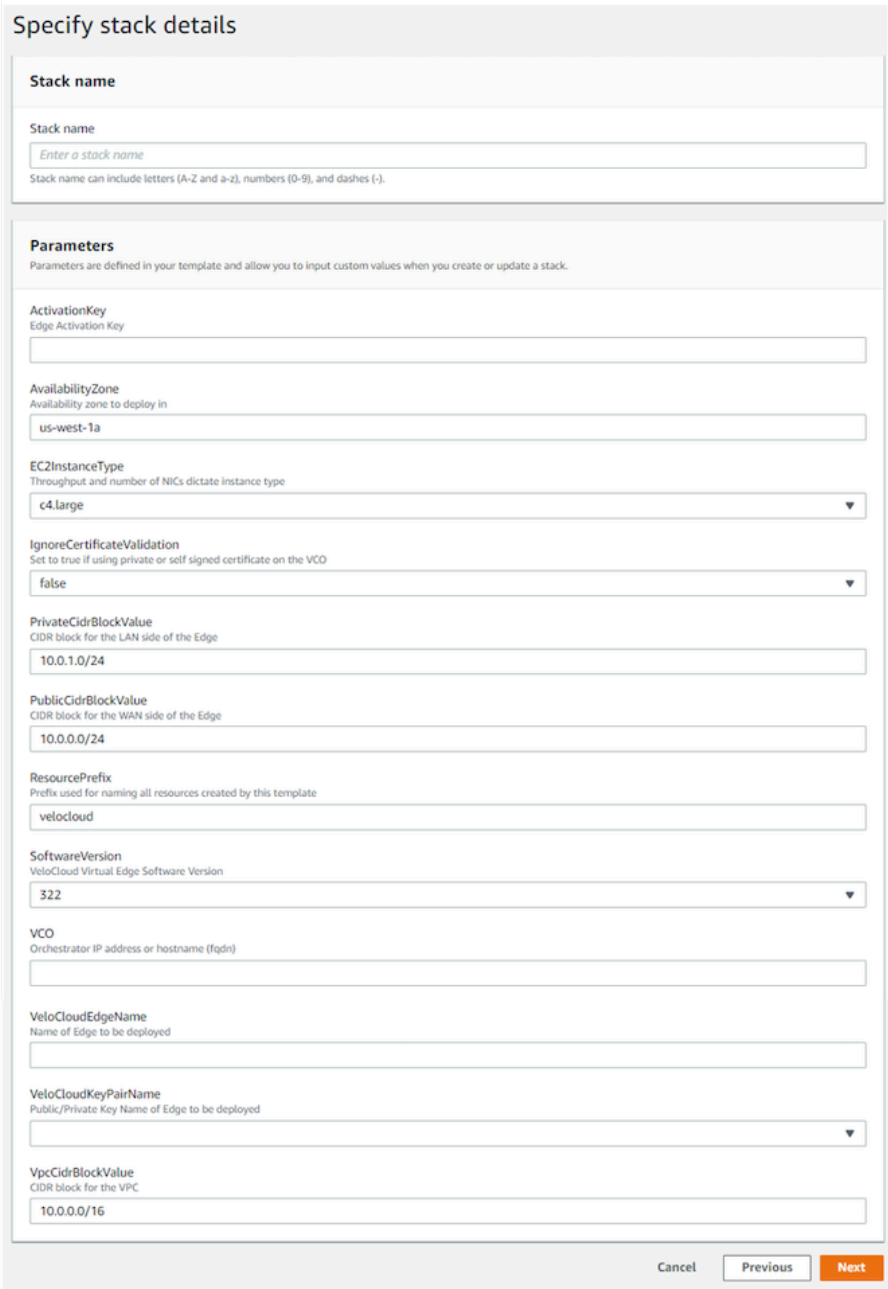
e. Upload the CloudFormation template.

Figure 3-9: Upload CloudFormation Template



f. Specify the stack details as indicated in the image below:

Figure 3-10: Specify Stack Details

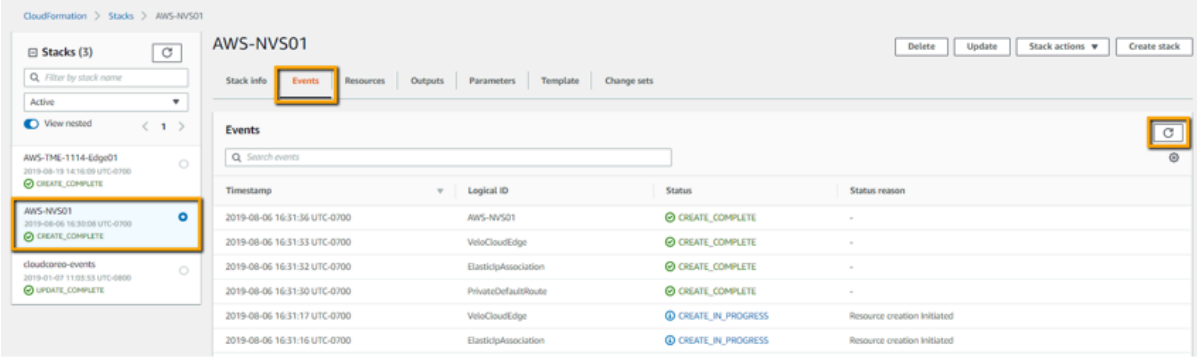


For the few remaining screens, you can leave those parameters, fields, or text boxes as default settings unless you have a specific need to change them. The final step is to create the stack.

g. Review and create the stack.

h. Monitor your deployment progress.

Figure 3-11: Monitor Deployment



Chapter 4

EC2 Instance Types

Bandwidth throughput and the number of network interfaces must be considered when sizing the Virtual Edge. The minimum number of network interfaces required is three (GE1, GE2, and GE3).

For supported instances and throughput for Virtual Edges on instance types, refer to the *Public Cloud* section in the topic *SD-WAN Edge Performance and Scale Data* in the *Arista VeloCloud SD-WAN Administration Guide*.

Chapter 5

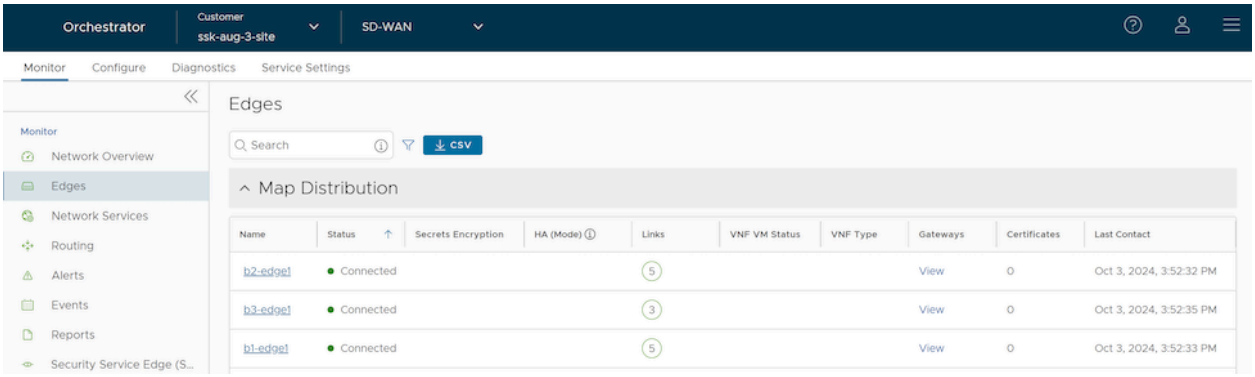
Verify the Virtual Edge is Activated in the VeloCloud Orchestrator

Once the instance is running in AWS and all information provided was correct, the Virtual Edge will reach out to the VeloCloud Orchestrator with the activation key, activate and perform the software update if needed (and reboot if upgraded). The typical deployment time is between three to four minutes.

1. Log into the VeloCloud Orchestrator.
2. Go to **Monitor** > **Edges**.

   The **Edges** screen appears.

   Figure 5-1: Monitor Edges



3. Verify your Virtual Edge by selecting the link in the **Name** column.

Connecting the Virtual Edge to Networking services like Transit Gateway

For information on Virtual Edge connectivity to Transit Gateway using the Transit Gateway Connect Service, see the topic *Configure Edge for Amazon Web Services (AWS) Transit Gateway (TGW) Connect Service* in the *Arista VeloCloud SD-WAN Administration Guide*.

Appendix A

References

- New - Greenfield Template VPC
- Existing - Brownfield Template VPC
- Related Documents

A.1 New - Greenfield Template VPC

```
{
 "AWSTemplateFormatVersion": "2010-09-09",
 "Mappings" : {
    "RegionMap" : {
      "af-south-1" : {"452" : "ami-07f4686dce0bfba6f"},
      "ap-south-1" : {"452" : "ami-0c8b08f6d98c4a915"},
      "eu-north-1" : {"452" : "ami-0261b2175572fd9d0"},
      "eu-west-3" : {"452" : "ami-0a02cebf8dbc24c03"},
      "eu-south-1" : {"452" : "ami-0a9e23e3ed38aed9f"},
      "eu-west-2" : {"452" : "ami-0aac326bef1b54867"},
      "eu-west-1" : {"452" : "ami-0f42ac7f701577813"},
      "ap-northeast-3" : {"452" : "ami-034e363c74eeaa491"},
      "ap-northeast-2" : {"452" : "ami-0bb3e6d7a3293c9ee"},
      "me-south-1" : {"452" : "ami-05a34fc02957b91dd"},
      "ap-northeast-1" : {"452" : "ami-09ce132a9f12c1b82"},
      "ca-central-1" : {"452" : "ami-0d3fd350b2c01a8dd"},
      "sa-east-1" : {"452" : "ami-023cad8051eb94cca"},
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      "ap-southeast-1" : {"452" : "ami-0eef1763b228995cd"},
      "ap-southeast-2" : {"452" : "ami-0c618d56c475c5322"},
      "eu-central-1" : {"452" : "ami-0e882252e7aae5884"},
      "ap-southeast-3" : {"452" : "ami-00f61993447e00457"},
      "us-east-1" : {"452" : "ami-04caee13bebe220d8"},
      "us-east-2" : {"452" : "ami-0d47f7a6420842909"},
      "us-west-1" : {"452" : "ami-0a6bdd821b9c2ff68"},
      "us-west-2" : {"452" : "ami-0f24547ffd448377d"},
      "us-gov-east-1" : {"322" : "ami-9b31d0ea", "331" : "ami-b87191c9"},
      "us-gov-west-1" : {"322" : "ami-3b11605a", "331" : "ami-f3d08492"}
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      "Default": "452",
      "AllowedValues": ["322", "331", "452"],
      "ConstraintDescription": "Must be one of the following: 322, 331, or 452"
    },
    "EC2InstanceType": {
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      "Type": "String",
      "Default": "c5.large",
      "AllowedValues": [
        "c4.large", "c4.xlarge", "c4.2xlarge", "c4.4xlarge",
        "c5.large", "c5.xlarge", "c5.2xlarge", "c5.4xlarge"
      ]
    },
    "ResourcePrefix" : {
     "Description" : "Prefix used for naming all resources created by this template",
     "Type" : "String",
     "Default" : "velocloud"
    },
    "AvailabilityZone" : {
      "Description" : "Availability zone to deploy in",
      "Type" : "String",
      "Default" : "us-west-1a"
    },
    "VeloCloudEdgeName" : {
      "Description" : "Name of Edge to be deployed",
      "Type" : "String"
   },
   "ActivationKey" : {
     "Description" : "Edge Activation Key",
     "Type" : "String",
     "AllowedPattern": "^[A-Z0-9-]+$"
   },
   "IgnoreCertificateValidation" : {
     "Description" : "Set to true if using private or self signed certificate on the VCO",
     "Type" : "String",
     "Default" : "false",
     "AllowedValues" : ["true", "false"]
   },
   "VCO" : {
     "Description" : "Orchestrator IP address or hostname (fqdn)",
     "Type" : "String"
   },
   "VpcCidrBlockValue" : {
     "Description" : "CIDR block for the VPC",
     "Type" : "String",
     "Default" : "10.0.0.0/16"
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   "PrivateCidrBlockValue" : {
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     "Type" : "String",
     "Default" : "10.0.1.0/24"
   },
   "PublicCidrBlockValue" : {
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     "Type" : "String",
     "Default" : "10.0.0.0/24"
   },
   "VeloCloudKeyPairName" : {
     "Description" : "Public/Private Key Name of Edge to be deployed",
     "Type" : "AWS::EC2::KeyPair::KeyName"
   }
 },
 "Resources": {
   "VelocloudVPC": {
     "Type": "AWS::EC2::VPC",
     "Properties": {
       "CidrBlock": { "Ref": "VpcCidrBlockValue" },
       "Tags": [ { "Key": "Name", "Value": { "Fn::Join": [ "-", [ { "Ref" : "ResourcePrefix" }, "VPC"] ] } } ]
     }
   },
   "PublicCidrBlock": {
     "Type": "AWS::EC2::Subnet",
     "Properties": {
       "CidrBlock": { "Ref": "PublicCidrBlockValue" },
       "AvailabilityZone": { "Ref": "AvailabilityZone" },
       "VpcId": { "Ref": "VelocloudVPC" },
       "Tags": [ { "Key": "Name", "Value": { "Fn::Join": [ "-", [ { "Ref" : "ResourcePrefix" }, "Public-SN"] ] } } ]
     }
   },
   "PrivateCidrBlock": {
     "Type": "AWS::EC2::Subnet",
     "Properties": {
```

```
      "CidrBlock": { "Ref": "PrivateCidrBlockValue" },
      "AvailabilityZone": { "Ref": "AvailabilityZone" },
      "VpcId": { "Ref": "VelocloudVPC" },
      "Tags": [ { "Key": "Name", "Value": { "Fn::Join": [ "-", [ { "Ref" : "ResourcePrefix" }, "Private-SN"] ] } } ]
    }
  },
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    "Properties": {
      "Tags": [ { "Key": "Name", "Value": { "Fn::Join": [ "-", [ { "Ref" : "ResourcePrefix" }, "IGW"] ] } } ]
    }
  },
  "PrivateRouteTable": {
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    "Properties": {
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      "Tags": [ { "Key": "Name", "Value": { "Fn::Join": [ "-", [ { "Ref" : "ResourcePrefix" }, "Private-RT"] ] } } ]
    }
  },
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      "Tags": [ { "Key": "Name", "Value": { "Fn::Join": [ "-", [ { "Ref" : "ResourcePrefix" }, "Public-RT"] ] } } ]
    }
  },
  "PublicIpAddress": {
    "Type": "AWS::EC2::EIP",
    "DependsOn": [ "VpcGatewayAttachment" ],
    "Properties": {
     "Domain": "vpc"
    }
  },
  "VceInterfaceGe1": {
    "Type": "AWS::EC2::NetworkInterface",
    "Properties": {
      "Description": "Management Interface",
      "SourceDestCheck": "false",
      "SubnetId": { "Ref": "PublicCidrBlock" },
      "GroupSet": [ { "Ref": "VelocloudWANSecurityGroup" } ]
    }
  },
  "VceInterfaceGe2": {
    "Type": "AWS::EC2::NetworkInterface",
    "Properties": {
      "Description": "WAN Interface",
      "SourceDestCheck": "false",
      "SubnetId": { "Ref": "PublicCidrBlock" },
      "GroupSet": [ { "Ref": "VelocloudWANSecurityGroup" } ]
    }
  },
  "VceInterfaceGe3": {
    "Type": "AWS::EC2::NetworkInterface",
    "Properties": {
      "Description": "LAN Interface",
      "SourceDestCheck": "false",
      "SubnetId": { "Ref": "PrivateCidrBlock" },
      "GroupSet": [ { "Ref": "VelocloudLANSecurityGroup" } ]
    }
  },
  "VeloCloudEdge": {
    "Type": "AWS::EC2::Instance",
    "DependsOn": [ "PublicIpAddress" ],
    "Properties": {
      "ImageId": { "Fn::FindInMap" : [ "RegionMap", { "Ref" : "AWS::Region" }, { "Ref": "SoftwareVersion" }] },
      "InstanceType": { "Ref" : "EC2InstanceType" },
      "KeyName": {"Ref": "VeloCloudKeyPairName"},
      "Tags": [
        { "Key": "Name", "Value": { "Fn::Join": [ "-", [ { "Ref" : "ResourcePrefix" }, "vEdge"] ] } },
        { "Key": "Owner", "Value": "Generated with VeloClouds Greenfield CloudFormation Template" }
      ],
      "UserData" : { "Fn::Base64" : { "Fn::Join" : ["", [
        "#cloud-config\n",
        "velocloud:\n",
        "  vce:\n",
        "    vco: ", { "Ref": "VCO" }, "\n",
        "    activation_code: ", { "Ref": "ActivationKey" }, "\n",
        "    vco_ignore_cert_errors: ", { "Ref": "IgnoreCertificateValidation" }, "\n"
      ]]}},
      "NetworkInterfaces": [
        {
          "DeleteOnTermination": "false",
          "NetworkInterfaceId":  { "Ref": "VceInterfaceGe1"},
          "DeviceIndex": 0
        },
        {
          "DeleteOnTermination": "false",
          "NetworkInterfaceId":  { "Ref": "VceInterfaceGe2"},
          "DeviceIndex": 1
        },
        {
          "DeleteOnTermination": "false",
          "NetworkInterfaceId":  { "Ref": "VceInterfaceGe3"},
          "DeviceIndex": 2
        }
      ]
    }
  },
  "VpcGatewayAttachment": {
    "Type": "AWS::EC2::VPCGatewayAttachment",
    "Properties": {
      "VpcId": { "Ref": "VelocloudVPC" },
      "InternetGatewayId": { "Ref": "InternetGateway" }
    },
    "DependsOn": [ "InternetGateway" ]
  },
  "PublicRouteTableAssociation": {
    "Type": "AWS::EC2::SubnetRouteTableAssociation",
    "Properties": {
      "RouteTableId": { "Ref": "PublicRouteTable" },
      "SubnetId": { "Ref": "PublicCidrBlock" }
    }
  },
  "PrivateRouteTableAssociation": {
    "Type": "AWS::EC2::SubnetRouteTableAssociation",
    "Properties": {
      "RouteTableId": { "Ref": "PrivateRouteTable" },
      "SubnetId": { "Ref": "PrivateCidrBlock" }
    }
  },
  "PublicDefaultRoute": {
    "Type": "AWS::EC2::Route",
    "Properties": {
      "DestinationCidrBlock": "0.0.0.0/0",
      "RouteTableId": { "Ref": "PublicRouteTable" },
      "GatewayId": { "Ref": "InternetGateway" }
    },
    "DependsOn": [ "InternetGateway", "VpcGatewayAttachment", "PublicRouteTable" ]
```

```
    },
    "PrivateDefaultRoute": {
      "Type": "AWS::EC2::Route",
      "Properties": {
        "DestinationCidrBlock": "0.0.0.0/0",
        "RouteTableId": { "Ref": "PrivateRouteTable" },
        "NetworkInterfaceId": { "Ref": "VceInterfaceGe3" }
      },
      "DependsOn": [ "VceInterfaceGe3", "PrivateRouteTable" ]
    },
    "ElasticIpAssociation": {
      "Type": "AWS::EC2::EIPAssociation",
      "DependsOn": [ "PublicIpAddress", "VeloCloudEdge" ],
      "Properties": {
        "AllocationId": { "Fn::GetAtt": ["PublicIpAddress", "AllocationId"] },
        "NetworkInterfaceId": { "Ref": "VceInterfaceGe2" }
      }
    },
    "VelocloudWANSecurityGroup": {
      "Type": "AWS::EC2::SecurityGroup",
      "Properties": {
        "GroupDescription": "WAN Facing Security Group",
        "VpcId": { "Ref": "VelocloudVPC" },
        "Tags": [ { "Key": "Name", "Value": { "Fn::Join": [ "-", [ { "Ref" : "ResourcePrefix" }, "WAN-SG"] ] } } ]
      }
    },
    "AllowSNMP": {
      "Type": "AWS::EC2::SecurityGroupIngress",
      "Properties": {
        "GroupId": { "Ref": "VelocloudWANSecurityGroup" },
        "IpProtocol": "udp",
        "FromPort": "161",
        "ToPort": "161",
        "CidrIp": "0.0.0.0/0"
      }
    },
    "AllowSSH": {
      "Type": "AWS::EC2::SecurityGroupIngress",
      "Properties": {
        "GroupId": { "Ref": "VelocloudWANSecurityGroup" },
        "IpProtocol": "tcp",
        "FromPort": "22",
        "ToPort": "22",
        "CidrIp": "0.0.0.0/0"
      }
    },
    "AllowVCMP": {
      "Type": "AWS::EC2::SecurityGroupIngress",
      "Properties": {
        "GroupId": { "Ref": "VelocloudWANSecurityGroup" },
        "IpProtocol": "udp",
        "FromPort": "2426",
        "ToPort": "2426",
        "CidrIp": "0.0.0.0/0"
      }
    },
    "VelocloudLANSecurityGroup": {
      "Type": "AWS::EC2::SecurityGroup",
      "Properties": {
        "GroupDescription": "LAN Facing Security Group - WARNING: Default is Allow Only ICMP, adjust accordingly for other traffic",
        "VpcId": { "Ref": "VelocloudVPC" },
        "Tags": [ { "Key": "Name", "Value": { "Fn::Join": [ "-", [ { "Ref" : "ResourcePrefix" }, "LAN-SG"] ] } } ]
      }
    },
    "AllowLANTraffic": {
      "Type": "AWS::EC2::SecurityGroupIngress",
      "Properties": {
        "GroupId": { "Ref": "VelocloudLANSecurityGroup" },
        "IpProtocol": "icmp",
        "FromPort": "-1",
        "ToPort": "-1",
        "CidrIp": "0.0.0.0/0"
      }
    }
  },
  "Description": "Arista SD-WAN CloudFormation Template (20230216GF)"
}
```

A.2 Existing - Brownfield Template VPC

```
{
            "AWSTemplateFormatVersion": "2010-09-09",
            "Mappings" : {
            "RegionMap" : {
            "af-south-1" : {"452" : "ami-07f4686dce0bfba6f"},
            "ap-south-1" : {"452" : "ami-0c8b08f6d98c4a915"},
            "eu-north-1" : {"452" : "ami-0261b2175572fd9d0"},
            "eu-west-3" : {"452" : "ami-0a02cebf8dbc24c03"},
            "eu-south-1" : {"452" : "ami-0a9e23e3ed38aed9f"},
            "eu-west-2" : {"452" : "ami-0aac326bef1b54867"},
            "eu-west-1" : {"452" : "ami-0f42ac7f701577813"},
            "ap-northeast-3" : {"452" : "ami-034e363c74eeaa491"},
            "ap-northeast-2" : {"452" : "ami-0bb3e6d7a3293c9ee"},
            "me-south-1" : {"452" : "ami-05a34fc02957b91dd"},
            "ap-northeast-1" : {"452" : "ami-09ce132a9f12c1b82"},
            "ca-central-1" : {"452" : "ami-0d3fd350b2c01a8dd"},
            "sa-east-1" : {"452" : "ami-023cad8051eb94cca"},
            "ap-east-1" : {"452" : "ami-04c9e1c11e244814b"},
            "ap-southeast-1" : {"452" : "ami-0eef1763b228995cd"},
            "ap-southeast-2" : {"452" : "ami-0c618d56c475c5322"},
            "eu-central-1" : {"452" : "ami-0e882252e7aae5884"},
            "ap-southeast-3" : {"452" : "ami-00f61993447e00457"},
            "us-east-1" : {"452" : "ami-04caee13bebe220d8"},
            "us-east-2" : {"452" : "ami-0d47f7a6420842909"},
            "us-west-1" : {"452" : "ami-0a6bdd821b9c2ff68"},
            "us-west-2" : {"452" : "ami-0f24547ffd448377d"},
            "us-gov-east-1" : {"322" : "ami-9b31d0ea", "331" : "ami-b87191c9"},
            "us-gov-west-1" : {"322" : "ami-3b11605a", "331" : "ami-f3d08492"}
            }
            },
            "Parameters": {
            "SoftwareVersion": {
            "Description": "VeloCloud Virtual Edge Software Version",
            "Type": "String",
            "Default": "452",
            "AllowedValues": ["322", "331", "452"],
            "ConstraintDescription": "Must be one of the following: 322, 331, or 452"
            },
            "EC2InstanceType": {
            "Description": "Throughput and number of NICs dictate instance type",
            "Type": "String",
            "Default": "c5.large",
            "AllowedValues": [
            "c4.large", "c4.xlarge", "c4.2xlarge", "c4.4xlarge",
            "c5.large", "c5.xlarge", "c5.2xlarge", "c5.4xlarge"
            ]
            },
            "ResourcePrefix" : {
            "Description" : "Prefix used for naming all resources created by this template",
            "Type" : "String",
            "Default" : "velocloud"
            },
            "ExistingVpc" : {
            "Description" : "Existing VPC ID",
            "Type" : "AWS::EC2::VPC::Id"
            },
            "ExistingPrivateSubnet" : {
            "Description" : "Existing Subnet ID for the LAN side",
            "Type" : "AWS::EC2::Subnet::Id"
            },
            "ExistingPublicSubnet" : {
            "Description" : "Existing Subnet ID for the WAN side",
            "Type" : "AWS::EC2::Subnet::Id"
            },
            "VeloCloudEdgeName" : {
            "Description" : "Name of Edge to be deployed",
            "Type" : "String"
            },
            "ActivationKey" : {
            "Description" : "Edge Activation Key",
            "Type" : "String",
            "AllowedPattern": "^[A-Z0-9-]+$"
            },
            "IgnoreCertificateValidation" : {
            "Description" : "Set to true if using private or self signed certificate on the VCO",
            "Type" : "String",
            "Default" : "false",
            "AllowedValues" : ["true", "false"]
            },
            "VCO" : {
            "Description" : "Orchestrator IP address or hostname (fqdn)",
            "Type" : "String"
            },
            "VeloCloudKeyPairName" : {
            "Description" : "Public/Private Key Name of Edge to be deployed",
            "Type" : "AWS::EC2::KeyPair::KeyName"
            }
            },
            "Resources": {
            "PublicIpAddress": {
            "Type": "AWS::EC2::EIP",
            "Properties": {
            "Domain": "vpc"
            }
            },
            "VceInterfaceGe1": {
            "Type": "AWS::EC2::NetworkInterface",
            "Properties": {
            "Description": "Management Interface",
            "SourceDestCheck": "false",
            "SubnetId": { "Ref": "ExistingPublicSubnet" },
            "GroupSet": [ { "Ref": "VelocloudWANSecurityGroup" } ]
            }
            },
            "VceInterfaceGe2": {
            "Type": "AWS::EC2::NetworkInterface",
            "Properties": {
            "Description": "WAN Interface",
            "SourceDestCheck": "false",
            "SubnetId": { "Ref": "ExistingPublicSubnet" },
            "GroupSet": [ { "Ref": "VelocloudWANSecurityGroup" } ]
            }
            },
            "VceInterfaceGe3": {
            "Type": "AWS::EC2::NetworkInterface",
            "Properties": {
```

```
            "Description": "LAN Interface",
            "SourceDestCheck": "false",
            "SubnetId": { "Ref": "ExistingPrivateSubnet" },
            "GroupSet": [ { "Ref": "VelocloudLANSecurityGroup" } ]
            }
            },
            "VeloCloudEdge": {
            "Type": "AWS::EC2::Instance",
            "DependsOn": [ "PublicIpAddress" ],
            "Properties": {
            "ImageId": { "Fn::FindInMap" : [ "RegionMap", { "Ref" : "AWS::Region" }, { "Ref": "SoftwareVersion" }] },
            "InstanceType": { "Ref" : "EC2InstanceType" },
            "KeyName": {"Ref": "VeloCloudKeyPairName"},
            "Tags": [
            { "Key": "Name", "Value": { "Fn::Join": [ "-", [ { "Ref" : "ResourcePrefix" }, "vEdge"] ] } },
            { "Key": "Owner", "Value": "Generated with VeloCloud Brownfield CloudFormation Template" }
            ],
            "UserData" : { "Fn::Base64" : { "Fn::Join" : ["", [
            "#cloud-config\n",
            "velocloud:\n",
            "  vce:\n",
            "    vco: ", { "Ref": "VCO" }, "\n",
            "    activation_code: ", { "Ref": "ActivationKey" }, "\n",
            "    vco_ignore_cert_errors: ", { "Ref": "IgnoreCertificateValidation" }, "\n"
            ]]}},
            "NetworkInterfaces": [
            {
            "DeleteOnTermination": "false",
            "NetworkInterfaceId":  { "Ref": "VceInterfaceGe1"},
            "DeviceIndex": 0
            },
            {
            "DeleteOnTermination": "false",
            "NetworkInterfaceId":  { "Ref": "VceInterfaceGe2"},
            "DeviceIndex": 1
            },
            {
            "DeleteOnTermination": "false",
            "NetworkInterfaceId":  { "Ref": "VceInterfaceGe3"},
            "DeviceIndex": 2
            }
            ]
            }
            },
            "ElasticIpAssociation": {
            "Type": "AWS::EC2::EIPAssociation",
            "DependsOn": [ "PublicIpAddress", "VeloCloudEdge" ],
            "Properties": {
            "AllocationId": { "Fn::GetAtt": ["PublicIpAddress", "AllocationId"] },
            "NetworkInterfaceId": { "Ref": "VceInterfaceGe2" }
            }
            },
            "VelocloudWANSecurityGroup": {
            "Type": "AWS::EC2::SecurityGroup",
            "Properties": {
            "GroupDescription": "WAN Facing Security Group",
            "VpcId": { "Ref": "ExistingVpc" },
            "Tags": [ { "Key": "Name", "Value": { "Fn::Join": [ "-", [ { "Ref" : "ResourcePrefix" }, "WAN-SG"] ] } } ]
            }
            },
            "AllowSNMP": {
            "Type": "AWS::EC2::SecurityGroupIngress",
            "Properties": {
            "GroupId": { "Ref": "VelocloudWANSecurityGroup" },
            "IpProtocol": "udp",
            "FromPort": "161",
            "ToPort": "161",
            "CidrIp": "0.0.0.0/0"
            }
            },
            "AllowSSH": {
            "Type": "AWS::EC2::SecurityGroupIngress",
            "Properties": {
            "GroupId": { "Ref": "VelocloudWANSecurityGroup" },
            "IpProtocol": "tcp",
            "FromPort": "22",
            "ToPort": "22",
            "CidrIp": "0.0.0.0/0"
            }
            },
            "AllowVCMP": {
            "Type": "AWS::EC2::SecurityGroupIngress",
            "Properties": {
            "GroupId": { "Ref": "VelocloudWANSecurityGroup" },
            "IpProtocol": "udp",
            "FromPort": "2426",
            "ToPort": "2426",
            "CidrIp": "0.0.0.0/0"
            }
            },
            "VelocloudLANSecurityGroup": {
            "Type": "AWS::EC2::SecurityGroup",
            "Properties": {
            "GroupDescription": "LAN Facing Security Group - WARNING: Default is Allow Only ICMP, adjust accordingly for other traffic",
            "VpcId": { "Ref": "ExistingVpc" },
            "Tags": [ { "Key": "Name", "Value": { "Fn::Join": [ "-", [ { "Ref" : "ResourcePrefix" }, "LAN-SG"] ] } } ]
            }
            },
            "AllowLANTraffic": {
            "Type": "AWS::EC2::SecurityGroupIngress",
            "Properties": {
            "GroupId": { "Ref": "VelocloudLANSecurityGroup" },
            "IpProtocol": "icmp",
            "FromPort": "-1",
            "ToPort": "-1",
            "CidrIp": "0.0.0.0/0"
            }
            }
            },
            "Description": "Arista SD-WAN CloudFormation Template (20230216BF)"
            }
```

A.3 Related Documents

The following documentation is available for ***Arista VeloCloud SD-WAN***:

- *Arista VeloCloud SD-WAN Operator Guide*
- *Arista VeloCloud SD-WAN Administration Guide*
- *Arista VeloCloud SD-WAN Gateway Monitoring Guide*
- *Arista VeloCloud SD-WAN Orchestrator Deployment and Monitoring Guide*
- *Arista VeloCloud SD-WAN Partner Guide*
- *Arista VeloCloud SASE Global Settings Guide*
- *Arista VeloCloud SD-WAN Troubleshooting Guide*
- *Arista VeloCloud SD-WAN Design Guide for Enhanced Firewall Services*
- *Arista VeloCloud SD-WAN 6.4 API*
- *Arista VeloCloud Portal API 6.4*
- *Arista AliCloud Virtual Edge Deployment Guide*
- *Arista AWD Virtual Edge Deployment Guide*
- *Arista Azure Virtual Edge Deployment Guide*
- *Arista Google Cloud Platform Virtual Edge Deployment Guide*
- *Arista VeloCloud SASE and QRadar SIEM Integration Guide*
- *Arista VeloCloud SD-WAN and Cloud on AWS Deployment Guide*
- *Arista VeloCloud SD-WAN and Forcepoint SSE Integration Guide*
- *Arista VeloCloud SD-WAN and Google Network Connectivity Center Integration Guide*
- *Arista VeloCloud SD-WAN and Microsoft Route Server Integration Guide*
- *Arista VeloCloud SD-WAN and Netskope SSE Integration Guide*
- *Arista VeloCloud SD-WAN Azure Private Multi-Access Edge Compute Deployment Guide*
- *Arista VeloCloud SD-WAN License Management Guide*