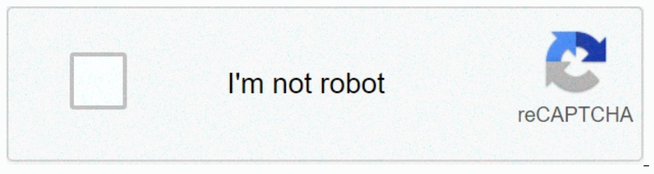

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Ids and ips aws

In a regular enterprise network, customers have VPC across multiple accounts within an AWS Region to segment workloads. These segmentations can take different forms and depend on the company structure, security policies, business functions, and models. Segmentation drivers may vary. For example, segmentation can be driven by security and regulatory requirements, costs, or technology. VARIOUS VPC and applications can have different requirements for reaching resources on the internet, such as downloading updates or communicating with other internet-based applications. This can be a complex task to meet your business requirements with a secure outgoing internet architecture using an Independent Software Vendor (ISV) firewall that can perform in-line in-line packet inspections on AWS. Security features such as security groups and network ACLs help build layered network defenses for your VPC. Nat gateways can be used to access the internet. However, they don't provide advanced traffic inspection features that your business might need, such as antivirus, web filtering, and data loss prevention. To conduct inline in-depth packet inspections, customers typically use isv firewall solutions in their AWS environments. This security solution can be hosted on every VPC and account. However, this type of design is not well scaled, becomes difficult to manage, and can be expensive. Centralizing your security solutions in VPC and using intra-VPC connectivity helps solve these challenges. In this post, we show you the architectures that AWS Transit Gateway uses to set up VPC hubs that host centralized security solutions. It allows you to check internet bound traffic from various VPC in a simplified, centralized, and scalable way. The Transit Gateway Architecture allows several ways to route traffic to and from VPC running your AWS Marketplace firewall that supports a variety of configuration modes. How to integrate third-party firewall tools into an AWS environment provides details about design considerations for possible architectures to attach your VPC to transit gateways. When deploying firewall solutions, we recommend that you deploy them across multiple Availability Zones. Within a zone, you can deploy a firewall as a standalone instance, or configure it as a cluster. Specific implementation details vary by firewall vendor. When deploying as a cluster, cluster members synchronize configuration and firewall status information. This enables faster failover in the same Availability Zone in case of a problem with one member of the cluster. In this architecture, we have configured firewall solutions as clusters in every Zone in active-passive mode. In passive-active mode, one firewall actively manages traffic while the other is synchronized and ready to transition to Country. When a failure occurs, the load distribution between firewalls does not change when the passive node takes traffic from the active firewall. This provides automatic device failover between clusters. We then use Border Gateway Protocol (BGP) to fail to cross availability zones if both firewalls in a cluster in a particular Availability Zone become unavailable. We chose the passive-enabled deployment method because it is a common method recommended by firewall vendors when implementing in cloud environments. This allows for a quick failover in one Availability Zone if there is a problem with one of the firewall instances. We demonstrated fortinet firewall hosting from AWS Security Hub VPC and grouped them in active passive mode. A VPN attachment is created on the active Fortinet firewall of the transit gateway. We decided to use Fortinet because of our previous experience with Fortinet FortiGate. However, the architecture presented in this post can be implemented with any partner firewall vendors listed in the Additional Resources section at the end of this post. With this configuration, you achieve high firewall availability, simplified management, excessive cluster subscription avoidance, and optimized costs. All talking VPC's are directly attached to the transit gateway. You can add black hole routes in the talk routing table to prevent traffic between talking VPC's being routed through firewalls, as shown in the following diagram. Figure 1. Example of a Transit Gateway deployment connecting 3 VPC to the Internet via a dedicated VPC Security Hub. Firewall in VPC Security Center uses VPN attachments to Transit Gateway. The solution overview Design solution focuses on allowing traffic out of the VPC to talk to the internet, and allowing traffic back. Communication between the talking VPC is blocked by the transit gateway using the black hole route. Incoming communication from the internet to one of the VPC's speaking via transit gateway is outside the scope of this post. The default security policy on firewalls denies incoming traffic from the Internet to internal resources. To reach the destination, use two route tables in the transit gateway: Hub route table: Allows the VPC hub (hosting security solution) to reach one of the talking VPC. Route table spoke: Allows VPN speak to communicate to internet via VPC hub, but does not allow communication between talking VPC. The solution consists of four parts: Create an AWS CloudFormation Transit Gateway stack. It consists of corresponding routing tables and sharing transit gateways using AWS RAM. Create transit gateway attachments and configure VPC speaks with the appropriate routing. Create a stack of firewalls. hub account in an existing VPC. The firewall configuration includes policies, VPN, BGP, and routing configurations. Configures the required route table entries in the transit gateway routing table. Transit gateway deployment steps are shared between different accounts. Once created, transit gateway sharing can be done in two ways: Automatically with AWS Organizations. Set Enable Sharing with Organization to True when launching the AWS CloudFormation stack. Manually use AWS RAM. Create an AWS RAM share in a hub account by specifying an account CARD for each account that you want to share a transit gateway with. Create a transit gateway AWS CloudFormation stack Use the following AWS CloudFormation templates. AWSTemplateFormatVersion: Description 2010-09-09: Create a Transit Gateway with two routing tables, and optional sharing through Resource Access Manager. Parameter: TgwName: Type: Default String: Transit Gateway ShareWithOrg: Type: String Default: Description 'false': Enable sharing with all AWS Accounts in AWS Organization AllowedValues: - true - false OrgId: Type: String Description: Enter Organization Id (for example. o-12345) if Organization sharing is MasterAccountId enabled: Type: String Description: Master account Id in AWS Organization Metadata: AWS::CloudFormation::Interface: ParameterGroups: - Label: default: Gateway Transit Details Parameter: - TgwName - Label: default: (Optional) Enable sharing with AWS Organizational Parameters: - ShareWithOrg - OrgId - MasterAccountIdLabels Parameter: TgwName: default: Transit Gateway Name ShareWithOrg: default: Enable Sharing with OrgId Organization: default: AWS Organization Id MasterAccountId: default: Master Account Id Condition: EnableRAM: ! Same with-- ! Ref ShareWithOrg - true resources: Tgw: Type: AWS::EC2::TransitGateway Properties: AutoAcceptSharedAttachments: enable DefaultRouteTableAssociation: enable DefaultRouteTablePropagation: enable Description: TransitGateway DnsSupport: enable VpnEcmpSupport: enable Tags: - Key: Name Value: ! Ref TgwName TgwShare: Type: AWS::RAM::ResourceShare DependsOn: Tgw Condition: EnableRAM Properties: AllowExternalPrincipals: True Name: TGW-Org-Share Principals:- ! Sub 'arn:aws:organizations::${MasterAccountId}:organization/${OrgId}' ResourceArns: - ! Sub 'arn:aws:ec2:${AWS::Region}:${AWS::AccountId}:transit-gateway/${Tgw}' TgwHubRouteDomain: Type: AWS Properties::EC2::TransitGatewayRouteTable: TransitGatewayId: ! Ref Tgw Tags: - Key: Name Value: Hub Routing Domain TgwSpokeRouteDomain: Type: AWS Properties::EC2::TransitGatewayRouteTable: TransitGatewayId: ! Ref Tgw Tags: - Key: Name Value: Spoke Routing Domain Outputs: TransitGatewayId: Description: Value 'TransitGateway Id': ! Ref Tgw Template creates the following resource: Transit gateway Two transit gateway route tables: hub and RAM sharing resource, if you decide to set Enable Sharing with Organization to Follow these steps: Launch a template using the AWS CloudFormation console. Save the transit gateway ID created by the stack, and confirm that it is in an Available state. Important: If you decide to use RAM sharing resources in a stack, be sure to enable sharing with AWS organizations under an Aws Organization master account. Create transit gateway attachments and configure VPC that speaks the appropriate route Use the following AWS CloudFormation template. AWSTemplateFormatVersion: Description 2010-09-09: Create Transit Gateway attachments with specific VPC and optionally create default routes to Tgw in up to 4 route tables Parameter: TransitGatewayId: Type: String Description: Enter Transit Gateway Id AllowedPattern: .+ ConstraintDescription: Transit Gateway Id required VpcId: Type: AWS::EC2::VPC::Id Description: Vpc Id for Transit Gateway Attachment Subnet: Type: Description<AWS::EC2::Subnet::Id> List: Select two subnets for Transit Gateway Attachment in VPC RouteTable1: Type: String Description: (Optional) Enter Subnet Route Table Id to include the default route to Transit Gateway RouteTable2: Type: String Description: (Optional) Enter the Subnet Route Table Id to include the default route to Transit Gateway RouteTable3: Type: String Description: (Optional) Enter the Subnet Route Table Id to include the default route to The RouteTable4 Transit Gateway : Type: String Description: (Optional) Enter the Subnet Route Table Id to include the default route to the Gateway Transit Metadata: AWS::CloudFormation::Interface: ParameterGroups: - Label: default: Gateway Transit Attachment Parameters: - TransitGatewayId - VpcId - SubnetIds - Label: default: (Optional) Update the following Route Table with the default route to the TGW Parameter: - RouteTable1 - RouteTable2 - RuteTable3 - RouteTable4Labels Parameters: TransitGatewayId: default: Transit Gateway Id VpcId: default: VPC Id SubnetIds: default: Subnet Ids RouteTable1: default: Route Table 1 RouteTable Id2: default: Route Table 2 Route IdTable3: default: Route Table 3 RouteTable Route4: default: Route Table 4 Condition Id: EnableTgwRoute1: ! No, no, no, no, no, no Same with-- ! Ref RouteTable1 - '' EnableTgwRoute2: ! No, no, no, no, no, no Same with-- ! Ref RouteTable2 - '' EnableTgwRoute3: ! No, no, no, no, no, no Same with-- ! Ref RouteTable3 - '' EnableTgwRoute4: ! No, no, no, no, no, no Same with-- ! Ref RouteTable4 - '' Resource: TgwAttachment: Type: AWS::EC2::TransitGatewayAttachment Properties: TransitGatewayId: ! Ref TransitGatewayId VpcId: ! Ref VpcId SubnetIds: ! Ref SubnetIds TgwRoute1: Type: AWS::EC2::Route DependsOn: TgwAttachment Condition: EnableTgwRoute1 Properties: RouteTableId: ! Ref RouteTable1 DestinationCidrBlock: 0.0.0.0/0 TransitGatewayId: ! Ref TransitGatewayId TgwRoute2: Type: AWS::EC2::Route DependsOn: TgwAttachment Condition: EnableTgwRoute2 RouteTableId: ! Ref RouteTable2 </AWS::EC2::Subnet::Id> </AWS::EC2::Subnet::Id> 0.0.0.0/0 TransitGatewayId: ! Ref TransitGatewayId TgwRoute3: Type: AWS::EC2::Route DependsOn: TgwAttachment Condition: EnableTgwRoute3 Properties: RouteTableId: ! Ref RouteTable3 DestinationCidrBlock: 0.0.0.0/0 TransitGatewayId: ! Ref TransitGatewayId TgwRoute4: Type: AWS::EC2::Route DependsOn: TgwAttachment Condition: EnableTgwRoute4 Properties: RouteTableId: ! Ref RouteTable4 DestinationCidrBlock: 0.0.0.0/0 TransitGatewayId: ! Ref TransitGatewayId This template creates the following resource: VPC as an attachment to the Update transit gateway for your personal subnet route table, with the default route pointing to the transit gateway In each spoke account to connect to the transit gateway, follow these steps: Launch the template in the console using AWS CloudFormation. Provide the following parameters: Transit ID Gateway Spoke VPC (transit gateway attachment created for this VPC Subnet ID) (select at least two subnets for transit gateway attachment) route table ID (subnet route table ID that passes their outbound traffic to the transit gateway) 3. Note the transit gateway attachment IDs, and confirm that they are in Available status. Create a stack of firewalls The Fortinet firewall is configured in an active/passive configuration and hosted from VPC Security Hub with public and private subnets. The VPN interface, management interface, and outbound interface are on a public subnet and require internet connectivity via an internet gateway. A high availability synchronization subnet (HA-sync) is a private subnet (internal only) used for the heartbeat between two instances i.e. HA. Before you deploy the security solution, complete the following prerequisite: Create an Elastic IP address and note its allocation ID. It is used as the IP address of the customer gateway on the master FortiGate firewall for VPN connections. For more information, see Elastic IP Address. Create VPN attachments with elastic IP addresses (created in the previous step) to associate with the active FortiGate firewall for each Availability Zone of the transit gateway. For more information, see Transit Gateway VPN Attachments. Download the VPN configuration for the VPN connection created by navigating to the Site-to-AWS Site VPN connection in the Amazon VPC console. Select Fortinet as the vendor, FortiGate 40+ series as the platform, and FortiOS 5.0+ as the software. For more information about creating VPNs, see Your Site-to-Site VPN Tunnel Options for Site-to-Site VPN Connections. Confirm that your VPN subnet ACL network and the security groups associated with the FortiGate firewall allow traffic from the public IP address of the transit gateway VPN attachment. Use the following AWS CloudFormation templates. AWSTemplateFormatVersion: Description 2010-09-09: template >- AWS CloudFormation for implementing FGCP-based HA solution with two FortiGates v6.0.5 in same AZ Metadata: 'AWS::CloudFormation::Interface': ParameterGroups: - Label: default: VPC Configuration Parameters: - VPCID - VPCCIDR - VPNSubnet - EgressSubnet - HAsyncSubnet - HAmgmtSubnet - Label: default: FortiGate Instance Configuration Parameters: - InstanceType - CIDRForInstanceAccess - AZForInstances - KeyPair - VPNSubnetRouterIP - EgressSubnetRouterIP - HAmgmtSubnetRouterIP - Label: default: IP Interface Configuration for FortiGate 1 Parameters: - FortiGate1VPNIP - FortiGate1EgIPress - FortiGate1HAsyncIP - FortiGate1HAmgmtIP - Label: default: INTERFACE IP Configuration for FortitiGate 2 Parameters: - FortiGate2VPNIP - FortiGate2EgressIP - FortiGate2HAsyncIP - FortiGate2HAmgmtIP - Label: default: INTERFACE IP Configuration for the Cluster Parameters: - ClusterVPNIP - ClusterEgressIP - Label: default: VPN configuration Parameters: - RemoteGatewayIP - CustomerGatewayIP - AllocationIDCustomerGatewayIP - PresharedKey - Label: default: B CONFIGURATION PARAMETERS: - LocalAS - RemoteAS - LocalPeerIP - RemotePeerIP - AdvertiseNetwork - Netmask Parameters: VPCID: Type: 'AWS::EC2::VPC::Id' Description: Select the VPC to use VPCCIDR: Type: String Default: 192.168.0.0/16 Description: Provide a network CIDR for the VPC VPNSubnet : Type: Description 'AWS::EC2::Subnet::Id': Select subnet for VPN EgressSubnet: Type: Description 'AWS::EC2::Subnet::Id': Select subnet for Egress HAsyncSubnet: Type: 'AWS::EC2::Subnet::Id' Description: Select subnet for HAsync HAm Description: Select subnet for HAmgmt VPNSubnetRouterIP: Type: Description 'AWS::EC2::Subnet::Id': Select subnet for HAmgmt VPNSubnetRouterIP: Type: Default String: 192.168.1.1 Description: >- Provide the IP address of the AWS intrinsic router (First IP of VPN Subnet) Egress Sub Description: >- Provide the IP address of the AWS intrinsic router (First IP of Egress Subnet) HAmgmtSubnetRouterIP: Type: Default String: 192.168.4.1 Description: > AWS Intrinsic Router (First IP of HAmgmt Subnet) FortiGate1VPNIP: Type: Default String: 192.168.1.11/24 Description: >- Provide IP address in CIDR form for FortiGate 1 vpn interface (IP of VPN Subnet) FortiGate2VPNIP : Type: Default String : 192.168.1.12/24 Description: >- Provide an IP address in the form of CIDR for the FortiGate 2 vpn interface (IP of VPN Subnet) FortiGate1EgressIP: Type: Default String: 192.168.2.11/24 Description: >- Provide an IP address in the form of CIDR for the outgoing interface of FortiGate 1 (IP of Egress Subnet) FortiGate2EgressIP: Type: String Default: 192.168.2.12/24 Description: >- Provide IP address in CIDR form for outgoing interface of FortiGate 2 (IP of EGress Subnet) FortiGate1HAsyncIP: Type: Default String: 192.168.3.11/24 Description: >- Provide IP address in CIDR form for ha synchronization interface 1 (IP of HAsync Subnet) FortiGate2HAsyncIP: Type: Default String: 192.168.3.12/24 Description: >- Provide ip address in CIDR form for FortiGate 2 ha synchronization interface (IP of HAsync Subnet) FortiGate1HAmgmtIP: Type: Default String: 192.168.4.11/24 Description: >- Provides IP address in the form of CIDR for management interface ha FortiGate 1 (IP of HAmgmt Subnet) FortiGate2HAmgmtIP: Type: Default String: 192.192.192.00168.4.12/24 Description: >- Provide the IP address in the CIDR form for the FortiGate 2 ha management interface (IP of HAmgmt Subnet) ClusterVPNIP: Type: Default String: 192.168.1.13/24 Description: >- IP address in the form CIDR for Cluster vpn interface (IP of VPN Subnet) ClusterEgressIP: Type: Default String: 192.168.2.13/24 Description: >- Provide IP address in CIDR form for exit interface of Cluster (IP of Egress Subnet) InstanceType : Type: Default String: c5.xlarge Description : Select instance type for FortiGates AllowedValues: - c4.xlarge - c4.2xlarge - c4.4xlarge - c4.8xlarge - c5.xlarge - c5.2xlarge - c5.4xlarge - c5.9xlarge CIDRForInstanceAccess: Type: Default String: 0.0.0.0/0 Description: Provides network CIDR from which FortiGate instances will be accessed KeyPair: Type: 'AWS::EC2::KeyPair::KeyName' Description: Select keypair for associate with FortiGates AZForInstances: Type: 'AWS::EC2::AvailabilityZone::Name' Description: Select Availability Zone for fortiGates RemoteGatewayIP: Type: String Description: Enter the public ip of VPN endpoint in AWS CustomerGatewayIP: Type: String Description: Enter the Router ID to be used for BGP PresharedKey: Type: String Description: Enter the preshared key for BGP NoEcho: 'true' LocalAS: Type: String Default: 65000 Description: Enter the Local ASN for BGP RemoteAS: Type : String Description: Enter Remote ASN for BGP LocalPeerIP: Type: String Description: Enter Local Peer IP , usually the .2 side belongs to the local RemotePeerIP: Type: String Description: Enter the Remote Peer IP, normally .1 side of AWS AdvertiseNetwork: Type: String Description: Enter the network to be advertised via BGP Netmask: Type: String Description: Enter netmask for the network to be advertised via BGPIDCustomerGatewayIP Allocation: Type: String Description: Enter id for CGW Allocation Mapping: RegionMap: ap-northeast-1: fgtami: ami-0b7ea934fc0a83064 ap-northeast-12: fgtami: ami-ebe59d9a ap-south-1: fgtami: ami-08509cefe5c6372a8 ap-southeast-1: fgtami: ami-01b05e38c6388f84f ap-southeast-2: fgtami: ami-029bca18bc8f272cd ca-central-1: fgtami: ami-0b1d312dc1c41030e eu-central-1: fgtami: ami-0a4498f9a72cf2537 eu-west-1: fgtami: ami-0c1f71f51fb106a31 eu-west -2: fgtami: ami-0d333d8821f37aa36 eu-west-3: fgtami: ami-0a97f4194a0515b21 sa-east-1: fgtami: ami-0851b028d263ced22 us-east-1: fgtami: us-east-2: fgtami: ami-07c2582e55a222dd3 us-west-1: fgtami: ami-0aa77e91cb3eab854 us-west-2: fgtami: ami-00a5f7f2848b21194 Resource: InstanceRole: Type: 'AWS::IAM::Role' Property: AssumeRolePolicyDocument: Version: 2012-10-17 Statement: - Effect: Allow Principal: Services: - ec2.amazonaws.com: - 'sts:AssumeRole' Path: / Policy: - PolicyName: ApplicationPolicy PolicyDocument: Version: 2012-10-17 Statement: - Effect: Allow Action: - 'ec2:Describe*' - 'ec2:AssociateAddress' - 'ec2:AssignPrivateIpAddresses' - 'ec2:UnassignPrivateIpAddresses' - 'ec2:ReplaceRoute' Resource: '*' InstanceProfile: Type: 'AWS::IAM::InstanceProfile' Properties: Path: / Roles: - ! Ref InstanceRole FortiGateSecGrp: Type: Property 'AWS::EC2::SecurityGroup': VpcId: ! Ref VPCID GroupDescription: FortigateSecGrp SecurityGroupIngress: - Description: Allow remote access to FGT IpProtocol: '-1' FromPort: '0' ToPort: '65535' CidrIp: ! Ref CIDRForInstanceAccess - Description: Allow local VPC access to FGT IpProtocol: '-1' FromPort: '0' ToPort: '65535' CidrIp: ! Ref VPCCIDR FortiGateSecGrpHArule: DependsOn: FortiGateSecGrp Type: 'AWS::EC2::SecurityGroupIngress' Properties: GroupId: ! Ref FortiGateSecGrp Description: Allow FGTs to access each other IpProtocol: '-1' FromPort: '0' ToPort: '65535' SourceSecurityGroupId:! Ref FortiGateSecGrp Fgt1: Type: Property 'AWS::EC2::Instance': ImageId: ! FindInMap - RegionMap - ! Ref 'AWS::Region' - fgtami InstanceType: ! Ref InstanceType IamInstanceProfile: ! Ref InstanceProfile KeyName: ! Ref KeyPair NetworkInterfaces: - NetworkInterfaceId: ! Ref fgt1eni0 DeviceIndex: '0' - NetworkInterfaceId: ! Ref fgt1eni1 DeviceIndex: '1' - NetworkInterfaceId: ! Ref fgt1eni2 DeviceIndex: '2' - NetworkInterfaceId: ! Ref fgt1eni3 DeviceIndex: '3' Tags: - Key: Name Value: ! Join -' -- - ! Ref 'AWS::StackName' - '-FortiGate1' UserData: ! Base64 'Fn::Join': - |+ - - global configuration system - set hostname Fgt1 - set admintimeout 60 - end - system configuration settings - set enable allow-subnet-overlap - end - system interface configuration - edit port1 - set alias vpn - set static mode - ! Sub 'set ip ${ClusterVPNIP}' - set allowaccess ping https ssh fgfm - next - edit port2 - set aka egress - set static mode - ! Sub 'set ip ${ClusterEgressIP}' - set allowaccess ping - set mtu-override enable - set mtu 9001 - next - edit port3 - set alias hasync - set static mode - ! Sub 'set ip ${FortiGate1HAsyncIP}' - set allowaccess ping - set mtu-override enable - set mtu 9001 - next - edit port4 - set aka hamgmt - set static mode - ! Sub 'set ip ${FortiGate1HAmgmtIP}' - set allowaccess ping https ssh - set mtu-override enable - set mtu 9001 - next - end - config static router - edit 1 - ! Sub 'set etc${RemoteGatewayIP}' - set device port1 - ! Sub 'set gateway ${VPNSubnetRouterIP}' - next - edit 2 - set port perangkat2 - ! 'set gateway ${EgressSubnetRouterIP}' - next - end - configuration firewall policy - - 1 - set outbound-all name - set srcintf port2 - set dstintf port1 - set srcaddr all - set dstaddr all - set action accept - set schedule always - set service ALL - set logtraffic all - set nat enable - next - end - config system ha - set group-name group1 - set mode a-p - set hbdev port3 50 - set session-pickup enable - set ha-mgmt-status enable - config ha-mgmt-interface - edit 1 - set interface port4 - ! Sub 'set gateway ${HAmgmtSubnetRouterIP}' - next - end - set override disable - set priority 255 - set unicast-hb enable - ! Sub - 'set unicast-hb-peerip ${peerip}' - peerip: ! Pick -- '0'- ! Separate -- - ! Ref FortiGate2HAsyncIP - end- ipsec vpn configuration phase1-interface - edit tunnel0-tgw - set the interface port1 - ! Sub 'set local-gw ${ClusterVPNIP}' - set dhgrp 2 - attachment dhgrp 14 - proposal set aes128-sha1 - add proposal aes128-sha256 - add proposal aes256-sha1 - add propasal aes256-sha256 - set keylife 28800 - ! Sub 'set remote-gw ${RemoteGatewayIP}' - ! Sub 'set psksecret ${PresharedKey}' - next - end - config vpn ipsec phase2-interface - edit tunnel0-tgw - set phase1name tunnel0-tgw - set proposal aes128-sha1 - add proposal aes128-sha256 - add proposal aes256-sha1 - add proposal aes256-sha256 - set dhgrp 2 - set dhgrp 14 - set pfs enable - set keylifeseconds 3600 - next - end - config system interface - edit tunnel0-tgw - set vdom root - ! Sub 'set ip ${LocalPeerIP} 255.255.255.255' - set allowaccess ping - set type tunnel - set tcp-mss 1379 - ! Sub 'set remote-ip ${RemotePeerIP} 255.255.255.252' - set snmp-index 6 - set interface port1 - next - end - config router bgp - ! Sub 'set as ${LocalAS}' - ! Sub 'set router-id ${CustomerGatewayIP}' - config neighbor - ! Sub 'edit ${RemotePeerIP}' - ! Sub 'set remote-as ${RemoteAS}' - end - end - config router bgp - config neighbor - ! Sub 'edit ${RemotePeerIP}' - set capability-default-originate function - end - end - config router bgp - network configuration - edit 1 - ! Sub 'set prefix ${AdvertiseNetwork} ${Netmask}' - next - end - end - config router bgp - config redistribute static - enable status set - end - end - config router bgp - config redistribute connected - set status enable - end - end - config router prefix-list - edit default_route - configuration rules - edit 1 - set the prefix 0.0.0.0 0.0.0 - next - end - next - end - end - router configuration route-map - edit routemap1 - configuration rules - edit 1 - set match-ip-address default_route - next - end - next - next - end - configuration firewall policy - edit 1 - set forwardvpn name - set srcintf port1 - set dstintf tunnel0-tgw - set srcaddr all - set dstaddr all - set accept action - set the schedule always - set the all service - set fsso disable - set nat enable - next - end - config firewall policy - edit 2 - set name returnvpn - set srcintf - set dstintf port1 - set srcaddr all - set dstaddr all - set action accept - set schedule always - set srcaddr all - set dstaddr all - set action accept - set schedule always - set service ALL - atur fsso disable - set nat enable - next - end - config firewall policy - edit 3 - set name awsinternet - set srcintf tunnel0-tgw - set dstintf port2 - set srcaddr all - set dstaddr all - set action accept - set schedule always - set service ALL - atur logtraffic all - atur default av-profile - atur default ips-sensor - atur default daftar aplikasi - atur ssl-ssh-profile certificate-inspection - atur default profil dnsfilter - atur fsso disable - set nat enable - next - end Fgt2: Type: 'AWS::EC2::Instance' Properties: ImageId: ! FindInMap - RegionMap - ! Ref 'AWS::Region' - fgtami InstanceType: ! Ref InstanceType IamInstanceProfile: ! Ref InstanceProfile KeyName: ! Ref KeyPair NetworkInterfaces: - NetworkInterfaceId: ! Ref fgt2eni0 DeviceIndex: '0' - NetworkInterfaceId: ! Ref fgt2eni1 DeviceIndex: '1' - NetworkInterfaceId: ! Ref fgt2eni2 DeviceIndex: '2' - NetworkInterfaceId: ! Ref fgt2eni3 DeviceIndex: '3' Tags: - Kunci: Nilai Nama: ! Bergabunglah - '' - ! Ref 'AWS::StackName' - '-FortiGate2' UserData: ! Base64 'Fn::Join': - |+ - - sistem konfigurasi global - atur nama host Fgt2 - atur admintimeout 60 - akhir - pengaturan sistem konfigurasi - atur mengaktifkan allow-subnet-overlap - akhir - antarmuka sistem konfigurasi - edit port1 - atur alias vpn - atur mode statis - ! Sub 'set ip ${FortiGate2VPNIP}' - set allowaccess ping https ssh fgfm - next - edit port2 - set alias egress - set mode statis - ! Sub 'set ip ${FortiGate2EgressIP}' - set allowaccess ping - set mtu-override enable - set mtu 9001 - next - edit port3 - set alias hasync - set mode statis - ! Sub 'set ip ${FortiGate2HAsyncIP}' - set allowaccess ping - set mtu-override enable - set mtu 9001 - next - edit port4 - set alias hamgmt - set mode statis - ! Sub 'set ip ${FortiGate2HAmgmtIP}' - set allowaccess ping https ssh - set mtu-override enable - set mtu 9001 - next - end - config router statis - edit 1 - ! Sub 'set dst ${RemoteGatewayIP}' - atur port perangkat1 - ! Sub 'set gateway ${VPNSubnetRouterIP}' - berikutnya - edit 2 - set port perangkat2 - ! Sub 'set gateway ${EgressSubnetRouterIP}' - next - end - config firewall policy - edit 1 - set name outbound-all - set srcintf port2 - set dstintf port1 - set srcaddr all - set dstaddr all - set action accept - set schedule always - set service ALL - set srcaddr all - set dstaddr all - set action accept - set schedule always - set service ALL - set service ALL - set logtraffic all - set nat enable - next - end - config system ha - set group-name group1 - set mode a-p - set hbdev port3 50 - set session-pickup enable - set ha-mgmt-status enable - config ha-mgmt-interface - edit 1 - set interface port4 - ! Sub 'set gateway ${HAmgmtSubnetRouterIP}' - next - end - set override disable - set priority 1 - set unicast-hb enable - ! Sub - 'set unicast-hb-peerip ${peerip}' - peerip: ! Pilih - '0' - ! Pisahkan - / - ! Ref FortiGate1HAsyncIP end - ipsec vpn configuration phase1-interface - edit tunnel0-tgw - set the interface port1 - ! Sub 'set local-gw ${ClusterVPNIP}' - set dhgrp 2 - add dhgrp 14 - set proposal aes128-sha1 - - proposal aes128-sha256 - add proposal aes256-sha1 - add propasal aes256-sha256 - set keylife 28800 - ! Sub 'set remote-gw ${RemoteGatewayIP}' - ! Sub 'set psksecret ${PresharedKey}' - next - end - config vpn ipsec phase2-interface - edit tunnel0-tgw - set phase1name tunnel0-tgw - set proposal aes128-sha1 - add proposal aes128-sha256 - add proposal aes256-sha1 - add proposal aes2 56-sha1 - attachment proposal aes256-sha256 - set dhgrp 2 - add dhgrp 14 - set pfs enable - set keylifeseconds 3600 - next - end - config system interface - edit tunnel0-tgw - set vdom root - ! Sub 'set ip ${LocalPeerIP} 255.255.255.255' - set allowaccess ping - set type tunnel - set tcp-mss 1379 - ! Sub 'set remote-ip ${RemotePeerIP} 255.255.255.252' - set snmp-index 6 - set interface port1 - next - end - config router bgp - ! Sub 'set as ${LocalAS}' - ! Sub 'set router-id ${CustomerGatewayIP}' - config neighbor - ! Sub 'edit ${RemotePeerIP}' - ! Sub 'set remote-as ${RemoteAS}' - end - end - config router bgp - config neighbor - ! Sub 'edit ${RemotePeerIP}' - set capability-default-originate function - end - end - config router bgp - network configuration - edit 1 - ! Sub 'set prefix ${AdvertiseNetwork} ${Netmask}' - next - end - end - config router bgp - config redistribute static - enable status set - end - config router bgp - config redistribute connected - set status enable - end - end - config router prefix-list - edit default_route - config rule - edit 1 - set prefix 0.0.0 0.0 0.0.0.0 - next - end - next - end - router configuration route-map - edit route map1 - configuration rules - edit 1 - set match-ip-address default_route - next - end - next - end - configuration firewall policy - edit 1 - set forwardvpn name - set srcintf port1 - set dstintf tunnel0-tgw srcaddr all - set dstaddr all - set action accept - set schedule always - set service ALL - set fsso disable - set nat enable - next - end - config firewall policy - edit 2 - set name returnvpn - set srcintf tunnel0-tgw - set dstintf port1 - set srcaddr all - set d all - set accept action - set schedule always - set all services - set

fsso disable - set nat enable - next - end - configuration firewall policy - edit 3 - set awsinternet name - set srcintf tunnel0-tgw - set dstintf port2 - set srcaddr all - set dstaddr all - set accept action - set the always schedule - set the ALL service - set fsso disable - set logtraffic all - set av-profile defaults - set the default ips-sensor - set the default application-list - set ssl-ssh-profile inspection-certificate - set the default dnsfilter profile - set nat enable - next - end fgt1eni0: Type: 'AWS::EC2::NetworkInterface' Properties: Description: port1 GroupSet: - ! Ref FortiGateSecGrp SourceDestCheck: SubnetId 'false': ! Ref VPNSubnet Tags: - Key: Value Name:! Join -' -- - ! Ref 'AWS::StackName' - '-fgt1eni0' - Key: Value eth0 PrivateIpAddresses:- PrivateIpAddress:! Select - '0' - - - / - ! Ref FortiGate1VPNIP Primary: 'true' - PrivateIpAddress: ! Pick -- '0'- ! Separate -- - ! Ref ClusterVPNIP Primary: 'false' fgt2eni0: Type: 'AWS::EC2::NetworkInterface' Property: Description: port1 GroupSet:- ! Ref FortiGateSecGrp SourceDestCheck: SubnetId 'false': ! Ref VPNSubnet Tags: - Key: Value Name:! Join -' -- - ! Ref 'AWS::StackName' - '-fgt2eni0' - Key: Interface Value: eth0 PrivateIpAddress: ! Pick -- '0'- ! Separate -- - ! Ref FortiGate2VPNIP Fgt1EIP: Type: Property 'AWS::EC2::EIP': Domain: vpc DependsOn: Fgt1 Fgt2EIP: Type: 'AWS::EC2::EIP' Property: Domain: vpc DependsOn: Fgt2 ClusterEgressEIP: Type: Property 'AWS::EC2::EIP': Domain: vpc DependsOn: Fgt1 ClusterIPASSOCIATION1: Type: 'AWS::EC2::EIPAssociation' Property: AlokasiId: ! Ref AlokasiIDCustomerGatewayIP NetworkInterfaceId: ! Ref fgt1eni0 PrivateIpAddress: ! Pick -- '0'- ! Separate -- - ! Ref ClusterVPNIP fgt1eni1: Type: Properties 'AWS::EC2::NetworkInterface': Description: port2 GroupSet: - ! Ref FortiGateSecGrp SourceDestCheck: SubnetId 'false': ! Ref EgressSubnet Tags: - Key: Value Name:! Join -' -- - ! Ref 'AWS::StackName' - '-fgt1eni1' PrivateIpAddresses: - PrivateIpAddress: ! Pick -- '0'- ! Separate -- - ! Ref FortiGate1EgressIP Primary: 'true' - PrivateIpAddress: ! Pick -- '0'- ! Separate -- - ! Ref ClusterEgressIP Primary: 'false' fgt2eni1: Type: 'AWS::EC2::NetworkInterface' Property: Description: port2 GroupSet:- ! Ref FortiGateSecGrp SourceDestCheck: SubnetId 'false': ! Ref EgressSubnet Tags: - Key: Value Name:! Join -' -- - ! Ref 'AWS::StackName' - '-fgt2eni1' PrivateIpAddress: ! Pick -- '0'- ! Separate -- - ! Ref FortiGate2EgressIP fgt1eni2: Type: Properties 'AWS::EC2::NetworkInterface': Description: port3 GroupSet:- ! Ref FortiGateSecGrp SourceDestCheck: SubnetId 'false': ! Ref HAsyncSubnet Tags:- Key: Value Name:! Join -' -- - ! Ref 'AWS::StackName' - '-fgt1eni2' PrivateIpAddress: ! Pick -- '0'- ! Separate -- - ! Ref FortiGate1HAsyncIP fgt1eni3: Type: 'AWS::EC2::NetworkInterface' Property: Description: port4 GroupSet:- ! Ref FortiGateSecGrp SourceDestCheck: SubnetId 'false': ! Ref HAmgmtSubnet Tags: - Key: Value Name:! Join -' -- - ! Ref 'AWS::StackName' - '-fgt1eni3' PrivateIpAddress: ! Pick -- '0'- ! Separate -- - ! Ref FortiGate1HAmgmtIP fgt2eni2: Type: 'AWS::EC2::NetworkInterface' Property: Description: port3 GroupSet:- ! Ref FortiGateSecGrp SourceDestCheck: SubnetId 'false': ! Ref HAsyncSubnet Tags:- Key: Value Name:! Join -' -- - ! Ref 'AWS::StackName' - '-fgt2eni2' PrivateIpAddress: ! Pick -- '0'- ! Separate -- - ! Ref FortiGate2HAsyncIP fgt2eni3: Type: 'AWS::EC2::NetworkInterface' Property: Description: port4 GroupSet:- ! Ref FortiGateSecGrp SourceDestCheck: SubnetId 'false': ! Ref HAmgmtSubnet Tags: - Key: Value Name:! Join -' -- - ! Ref - '-fgt2eni3' PrivateIpAddress: ! Pick -- '0'- ! Separate -- - ! Ref FortiGate2HAmgmtIP Fgt1EIPASSOCIATION: Fgt1EIPASSOCIATION: Property 'AWS::EC2::EIPAssociation': AlokasiId: ! GetAtt - Fgt1EIP - Network AllocationInterfaceId: ! Ref fgt1eni3 PrivateIpAddress: ! Pick -- '0'- ! Separate -- - ! Ref FortiGate1HAmgmtIP DependsOn: Fgt1EIP Fgt2EIPASSOCIATION: Type: Property 'AWS::EC2::EIPAssociation': AlokasiId: ! GetAtt - Fgt2EIP - Network AllocationInterfaceId: ! Ref fgt2eni3 PrivateIpAddress: ! Pick -- '0'- ! Separate -- - ! Ref FortiGate2HAmgmtIP DependsOn: Fgt2EIP ClusterIPASSOCIATION2: Type: 'AWS::EC2::EIPAssociation' Property: AlokasiId: ! GetAtt - ClusterEgressEIP - Network AllocationInterfaceId: ! Ref fgt1eni1 PrivateIpAddress: ! Pick -- '0'- ! Separate -- - ! Ref ClusterEgressIP DependsOn: ClusterEgressEIP Outputs: Username: Value: admin Description: Username for the Fortigates Password: Value: ! Description of Ref Fgt1: Password for FortiGates FortiGate1LoginURL: Value: ! Join - '' - 'https://' - ! Ref Fgt1EIP Description: Login URL for HAmgmt fortiGate 1 FortiGate2LoginURL interface: Value: ! Join - '' - 'https://' - ! Ref Fgt2EIP Description: The login URL for the HAmgmt fortiGate 2 template interface acts on the following resource: Create a FortiGate instance in ha pairs per Availability Zone. Configures the required firewall policies. Configure VPN and BGP on each of your FortiGate firewalls. To implement it, follow these steps: Launch the following template using AWS CloudFormation in the console. Provide the appropriate parameters necessary to configure the FortiGate firewall. There are five configuration parts: FortiGate Cluster VPN BGP VPC VPC VPC configuration This includes the VPC configuration along with the subnet information on which the FortiGate firewall is launched. CloudFormation VPC Settings Configuration FortiGate This includes private IP addresses for the four interfaces in FortiGate 1 and FortiGate 2. CloudFormation Active Fortigate Settings CloudFormation Passive Fortigate Settings Cluster configuration Cluster VPN IP address and cluster outgoing IP address are configured in the FortiGate firewall as secondary IP addresses on VPNs and the interface exits appropriately. They are required to achieve high availability (HA). In the event of a failure, this secondary IP address is moved to the standby node via an API call initiated from FortiOS on its management interface. Provide cluster VPN IP address and cluster outgoing IP address for Fortinet. CLOUDFormation Fortigate Cluster Settings VPN Configuration The following parameters are required in the FortiGate firewall to create a VPN connection to a transit gateway: Remote gateway IP address: The AWS public IP address for a VPN connection created at the transit gateway. Customer gateway IP address: The public IP address (Elastic IP address) to be used in the FortiGate firewall interface stops the VPN. Elastic IP address allocation ID: The ID used for ip address of the gateway. IPsec pre-divide key. Enter a value for the VPN parameter of the VPN configuration file you downloaded earlier, based on the following screenshot. CloudFormation VPN settings Examples of how you can retrieve the BGP parameter from the VPN configuration file are provided in the screenshot below. Configuration of Downloaded Fortinet Vpn Configuration File BGP Configuration Use the following BGP parameters to create a relationship between the FortiGate firewall and the transit gateway: Autonomous System Number Local (customer) Autonomous System Number (ASN) Remote AWS ASN Local peer IP address Remote peer IP address This parameter can be obtained from a previously downloaded VPN configuration file. You can also provide CIDR for VPC Security Hub along with netmask, to advertise with this VPN attachment to the transit gateway. BGP CloudFormation Settings Notice 2 instances launched by AWS CloudFormation. Sign in to the FortiGate1 instance using its administrator's public IP address and instance ID as a password. Change the default initial password. By default, templates launch FortiGate1 as active and FortiGate2 as passive. Confirm that the FortiGate firewall has synchronized its configuration, and that their HA health status is OK. Verify that the tunnel interface is up and the CIDR of the talking VPC is learned through BGP on the FortiGate firewall. Configure the required route entries in the transit gateway routes table The last and final step is to configure the transit gateway routes table. This allows VPC on different spoke accounts to reach the internet through security solutions hosted on hub accounts. To do this, create the necessary associations and propagations. In the VPC console, in the left navigation pane, select Gateway Transit Route Table, Hub Route Table. In the bottom pane, select Associations, and create an association. Select one of the VPN attachments you created with the Active FortiGate instance in the previous section. Repeat this process for all VPN attachments that you have created with other active FortiGate firewalls. In the bottom pane, under the same routing table, select Propagation. Create a docking route for each existing VPC attachment. In the VPC console, select The Gateway Transit Route Table, the Spoke Routes table. Create an association, and select one of the VPC attachments you created earlier. Repeat this process for all remaining VPC attachments that you create. Below the same route table, create a docking route for each VPN attachment. Summary In this post, We introduce solutions using AWS Transit Gateway to check outbound Internet traffic and filter it according to your security policy requirements. You achieve this by creating the following resources: A transit gateway that centralizes communication between the talking VPC and the VPC Security Center A Security Hub hosting security equipment that checks outgoing internet traffic We use the Fortinet FortiGate firewall for traffic inspection. You can deploy similar security solutions from several other partners from the AWS Marketplace, such as Palo Alto Networks, Check Point, and Cisco. Additional Resources Other ISV Product Configuration Templates can be found here Palo Alto Networks Check Point Cisco Fortinet About Author Shiva Vaidyanathan is Cloud Infrastructure Architect on AWS. He provides technical guidance, design, and lead implementation projects to customers who ensure their success on AWS. Prior to joining AWS, he had worked on several research projects on how to perform secure computing on public cloud infrastructure. He holds an MS degree in Computer Science from Rutgers University and an MS in Electrical Engineering from New York University. Abdul Kittana is a Senior Security Architect with AWS Professional Services. He has been part of AWS for over 2 years, and before joining AWS, he was a security consultant for various vendors and security-focused lawmakers for more than 12 years. He holds a BSC in Computer Engineering from Eastern Mediterranean University. University.

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