

Baseline Architecture

These step by step instructions describe how to setup the baseline architecture upon which the three solutions illustrated in [Centralizing outbound Internet traffic for dual stack IPv4 and IPv6 VPCs](#) are based. The following diagrams outline the network architecture and the corresponding route tables we're going to setup:

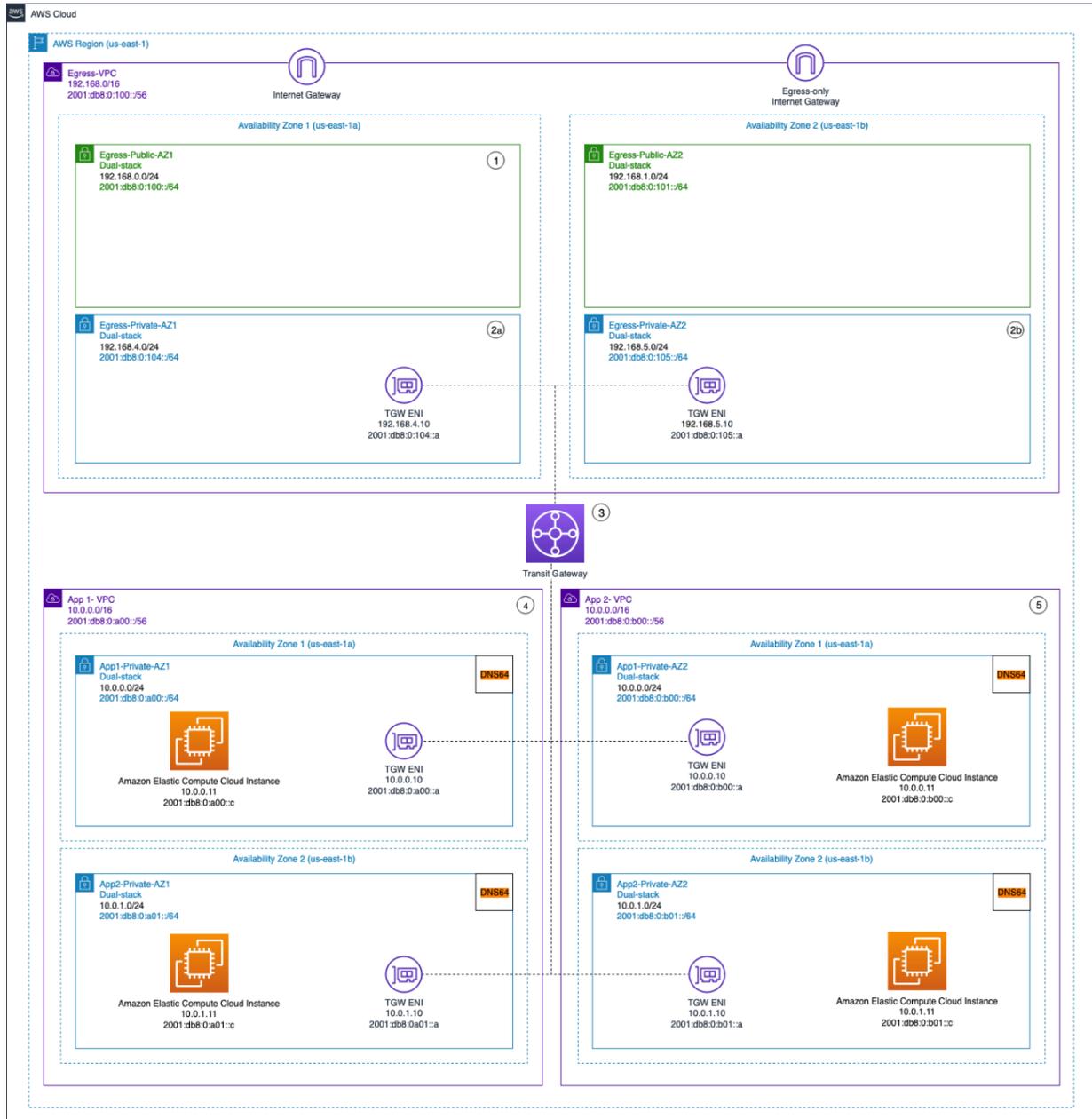


Figure 1: Baseline Architecture

1	Egress VPC Public Subnet - Dual-stack	
	ROUTE	NEXT HOP
	2001:db8:0:100::/56	local
	2001:db8:0:a00::/56	Transit GW
	2001:db8:0:b00::/56	Transit GW
	::/0	Egress Only Internet GW
	0.0.0.0/0	Internet GW

2a	Egress VPC Private Subnet - Dual-stack - AZ1	
	ROUTE	NEXT HOP
	192.168.0.0/16	local
	2001:db8:0:100::/56	local

2b	Egress VPC Private Subnet - Dual-stack - AZ2	
	ROUTE	NEXT HOP
	192.168.0.0/16	local
	2001:db8:0:100::/56	local

3a	Transit Gateway App-RouteTable	
	ROUTE	NEXT HOP

3b	Transit Gateway Egress-RouteTable	
	ROUTE	NEXT HOP
	2001:db8:0:a00::/56	Transit GW Attachemnt App VPC 1
	2001:db8:0:b00::/56	Transit GW Attachemnt App VPC 2

4	App 1 VPC	
	ROUTE	NEXT HOP
	10.0.0.0/16	local
	2001:db8:0:a00::/56	local

5	App 2 VPC	
	ROUTE	NEXT HOP
	10.0.0.0/16	local
	2001:db8:0:b00::/56	local

Figure 2: Route Tables configuration for the Baseline Architecture

VPCs Setup

1. Create the following three VPCs: Egress-VPC, App1-VPC, and App2-VPC. Provide CIDR values for each, as shown in Figure 1 above. For IPv6, you can choose to use an Amazon-provided IPv6 CIDR block. This will give you an IPv6 block automatically from Amazon. Alternatively, you can use a block from an IPAM pool or an IPv6 CIDR that you own and bring to AWS (BYOIPv6). For more information, see [Getting Started with Amazon VPC](#).
2. Create the subnets in each of the VPCs as depicted in Figure 1. For more information, see [Creating a Subnet](#). For IPv6, choose the IPv6 provided CIDR you allocated in the previous step and specify a hexadecimal pair for the subnet. The IPv6 address in Figure 2 above are given as an example. Ensure that you enable DNS64 in the subnet settings for the Application subnets. You may enable it also in the Egress subnets if you need that functionality in those subnets as well.

Application VPCs and Transit Gateway Setup

Next, we show you how to deploy a new transit gateway, attach it to all of the of three VPCs, and set up routing for connectivity between the VPCs:

1. In the VPC console, choose Transit gateways and create a new Transit Gateway. Use the name TGW-Internet, add a suitable description, and make sure to uncheck Default route table propagation and Default route table association.
2. Choose Transit Gateway Attachments and create the attachments described in the following table. For each of the attachments, make sure to check IPv6 support when creating them.

	A	B	C	D	E
1	AWS Transit Gateway ID	Attachment type	Attachment name tag	Subnet IDs	Transit Gateway Associated Route Table (per attachment)
2	TGW-Internet	VPC	Egress-Attachment	Egress-Private-AZ1 Egress-Private-AZ2	Egress-RouteTable

3	TGW-Internet	VPC	App1-Attachment	App1-Private-AZ1 App1-Private-AZ2	App-RouteTable
4	TGW-Internet	VPC	App2-Attachment	App2-Private-AZ1 App2-Private-AZ2	App-RouteTable

Table 1: Transit Gateway Attachments

1. Choose Transit Gateway Route tables and create two route tables. Name the route tables Egress-RouteTable and App-RouteTable and associate both route tables with the transit gateway, TGW-Internet.
2. Under Transit Gateway route tables, choose App-RouteTable, Associations, Create association. Associate both App1-Attachment and App2-Attachment to this route table.
3. Under Transit Gateway route tables, choose Egress-RouteTable, Associations, Create association. Associate Egress-Attachment to this route table.
4. On the same route table, Egress-RouteTable, choose Routes, choose Create route, and enter the IPv6 CIDR of App1-VPC with the attachment App1-Attachment. Then enter a second route for the IPv6 CIDR of App2-VPC with the attachment App2-Attachment.

Egress VPC Setup

1. Create and attach an Internet Gateway to the VPC Egress-VPC. Use IGW as the Name tag for this Internet Gateway. For more information, see [Creating and Attaching an Internet Gateway](#).
2. Create and attach an egress only internet gateway to the VPC Egress-VPC. Use EIGW as the Name tag for this Internet Gateway. For more information, see [Creating and Attaching an Egress-only Internet Gateway](#).
3. Create two new route tables in Egress-VPC. For Name tags, use Egress-Public-RT and Egress-Private-RT.
4. Add an IPv4 default route in the route table Egress-Public-RT, with the destination set to 0.0.0.0/0. Associate the route with the Internet Gateway IGW as the target. Also add an IPv6 default route in the same route table, with the destination set to ::/0. Associate the route with the Egress-only Internet Gateway as the target. For more information, see [Adding and Removing Routes from a route table](#). Then edit the subnet association and add both the Egress-Public-AZ1 and Egress-Public-AZ2 subnets to this route table.
5. Add routes for App1 and App2 VPCs in the Egress-Public-RT, with the destination set to the CIDR of both VPCs and the target set to the Transit Gateway.