Architecture Diagrams

Multicast Reference Architectures with AWS Transit Gateway

Multicast Reference Architectures with AWS Transit Gateway: Architecture Diagrams

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Multicast Traffic in a Single VPC

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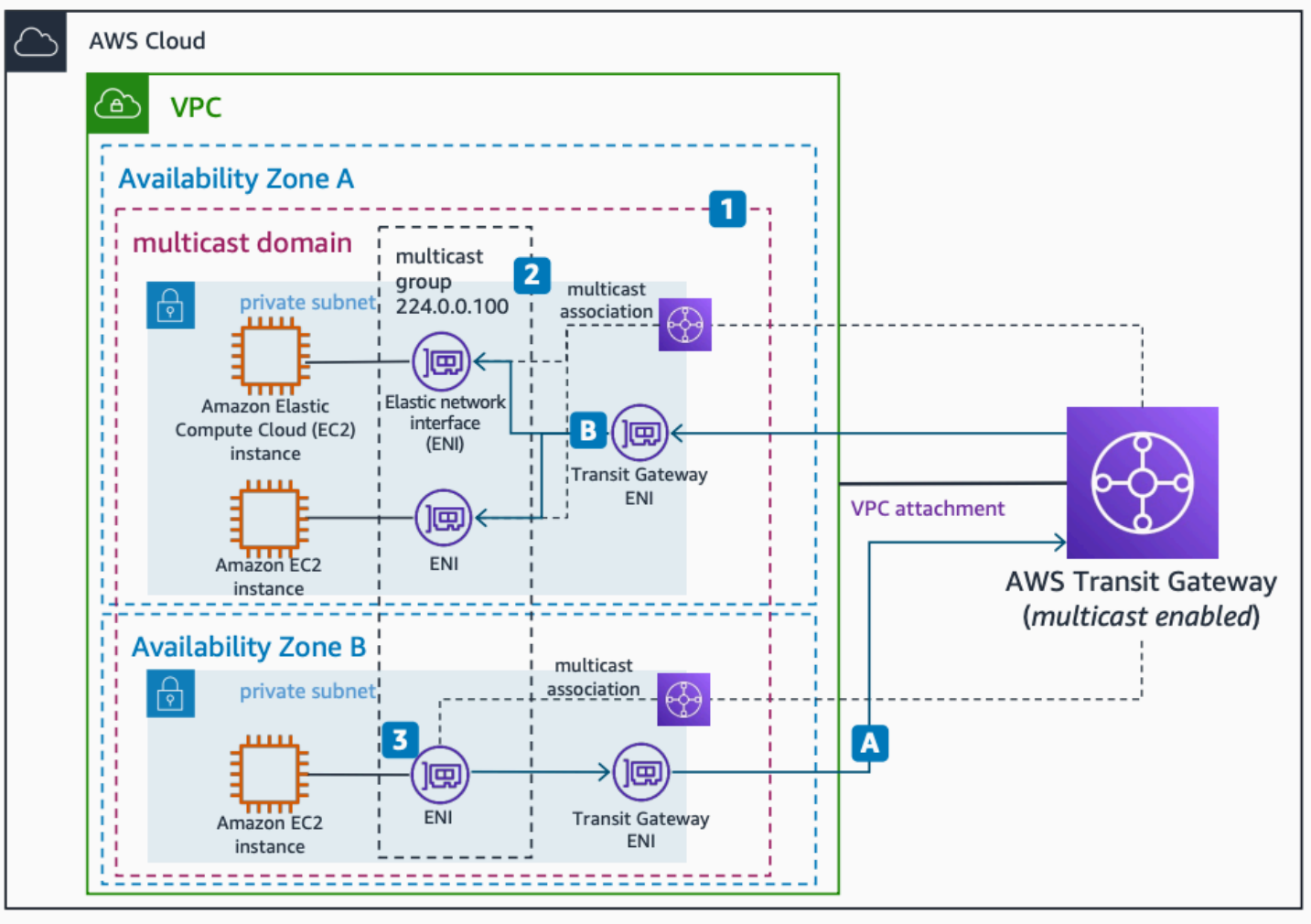
This architecture uses AWS Transit Gateway with multicast enabled to build multicast applications in a single Amazon VPC. You achieve segmentation by creating multicast domains that define which subnets participate in multicast communication.

Multicast traffic in a single VPC architecture



The following steps describe the configuration and data flow in this architecture:

A. A multicast domain defines the subnets that participate in multicast communication. Multicast association (domain membership) operates at the subnet level, and a single subnet can only associate with one multicast domain.

B. A multicast group defines the hosts that send or receive the same multicast traffic. You define multiple groups within the same multicast domain. A group IP address identifies each group, and individual ENIs define membership.

The following steps describe the data flow:

1. An ENI associated with a supported Amazon EC2 instance receives multicast traffic by being a multicast group member. Nitro instances can send and receive traffic in a static source group membership configuration. With IGMPv2 enabled, any Nitro instance can send traffic without static configuration.
2. An Amazon EC2 instance in Availability Zone B sends a multicast packet using the multicast group IP address 224.0.0.100.
3. The packet arrives at AWS Transit Gateway, which redirects it to the other instances in the same group located in Availability Zone A.

For more information about multicast on AWS Transit Gateway, see Multicast on transit gateways.

For more information about Nitro instances, see Instances built on the Nitro System.

Further reading

For additional information, see the following resources:

- AWS Architecture Icons
- AWS Architecture Center
- AWS Well-Architected

Diagram history

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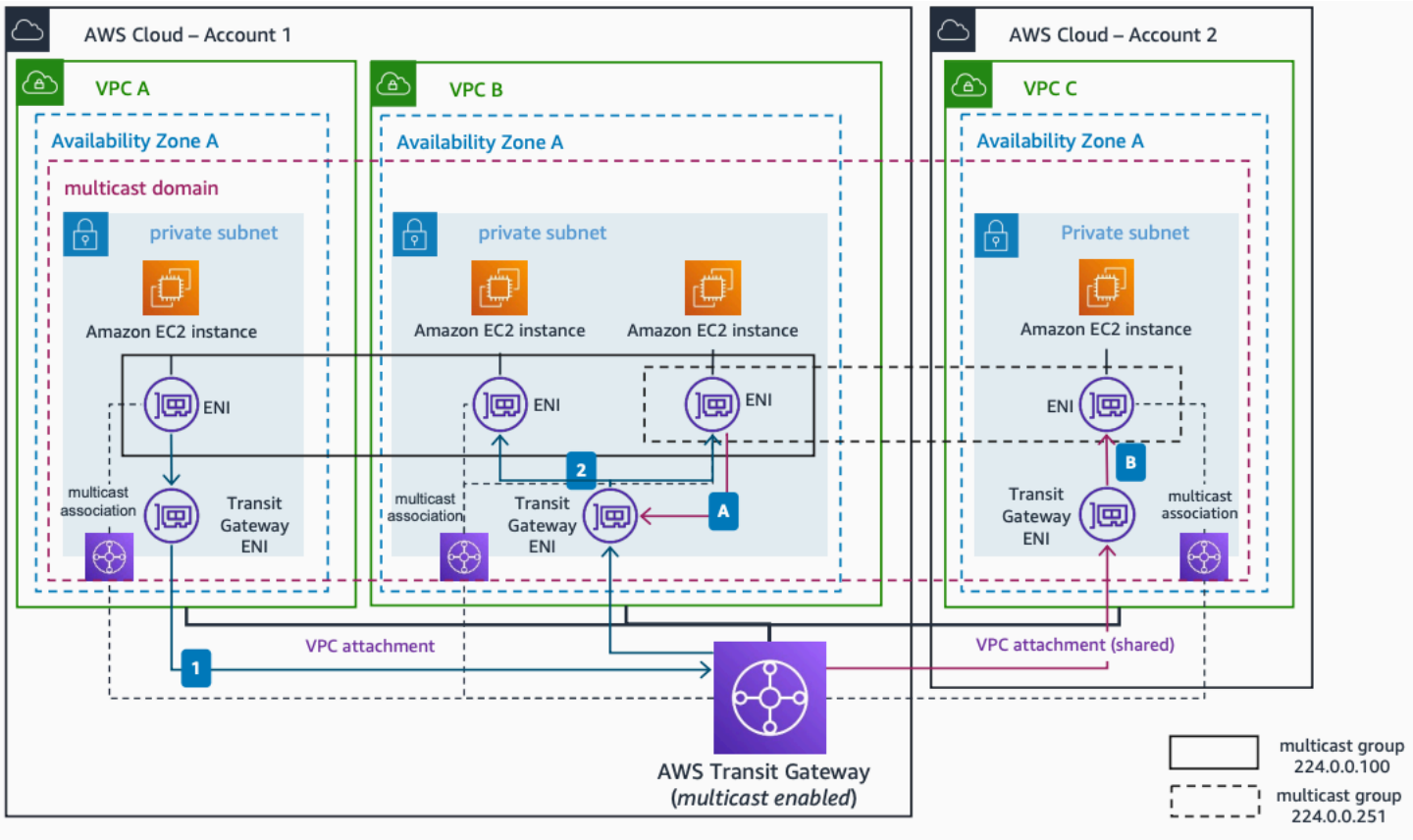
Multicast Traffic in Multi-Account Environments

Publication date: **May 5, 2022 (Diagram history)**

This architecture uses AWS Resource Access Manager (RAM) to share multicast domains to other AWS accounts. Consumers can associate or disassociate subnets to the multicast domain and register or deregister group members or sources.

Multicast traffic in multi-account environments architecture



The following steps describe the data flow in this architecture:

1. All subnets in VPCs from both accounts associate to the multicast domain. Instances in **Account 1** VPCs use the **224.0.0.100** multicast group. Those instances use IGMP to dynamically join, leave, and send messages within the group.
2. Any multicast message sent by any instance in the group reaches all other members, using AWS Transit Gateway as the multicast router.

For cross-account communication:

A. The Amazon EC2 instance in **Account 2** VPC joins the multicast group **224.0.0.251** using a static source group membership configuration. It can only receive traffic in this mode.

B. An instance in **VPC B** sends multicast traffic to the **224.0.0.251** group using AWS Transit Gateway as the multicast router. If IGMPv2 is enabled for the domain, any Nitro instance can also send traffic.

For more information about using IGMP to join multicast groups, see Automating service discovery using AWS Transit Gateway Multicast with IGMP.

Further reading

For additional information, see the following resources:

- AWS Architecture Icons
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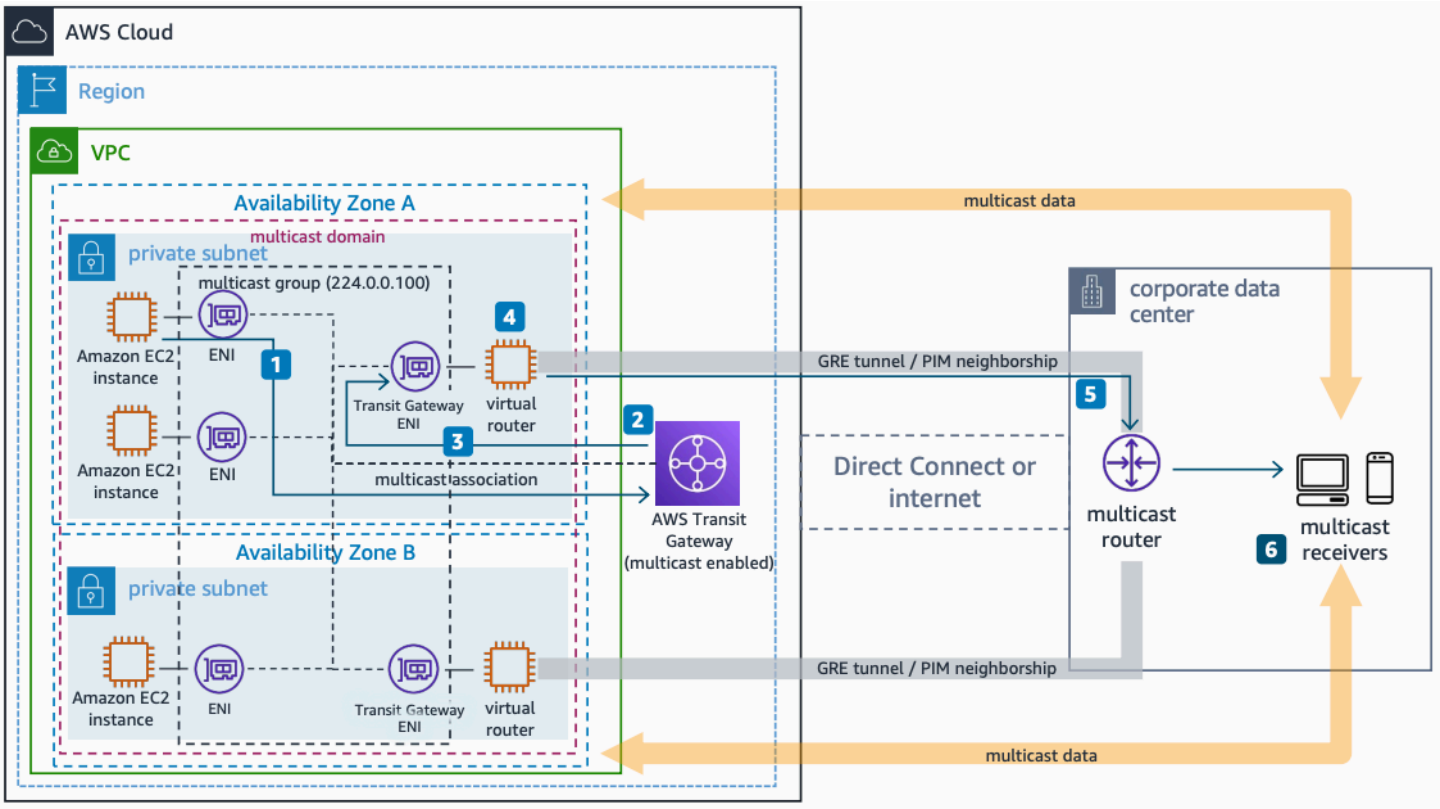
Integrating External Multicast Services and AWS

Publication date: **May 5, 2022 (Diagram history)**

This architecture integrates external multicast services with AWS by deploying third-party multicast-routing-capable appliances in an Amazon VPC. It uses AWS Transit Gateway with multicast enabled and GRE tunnels to deliver multicast packets between AWS and the corporate data center.

Integrating external multicast services architecture



The following steps describe the data flow in this architecture:

1. The multicast source sends traffic to a multicast group through its ENI.
2. AWS Transit Gateway with the multicast domain configuration and registered source and members forwards the packet to the virtual router.
3. The virtual router deployed in the Amazon VPC receives the multicast packets.
4. The virtual routers deliver the multicast packets between network segments using Protocol Independent Multicast (PIM). The packets forward through a Generic Routing Encapsulation

(GRE) tunnel between the virtual routers in AWS and the multicast router in the corporate data center.

5. The on-premises router receives packets through the tunnel and decapsulates them.
6. Decapsulated packets send over the downstream multicast interface to the receivers.

For more information about integrating external multicast services with AWS, see Integrating external multicast services with AWS.

Further reading

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