

# AWS re:Invent

NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV

# Get hands-on with IPv6

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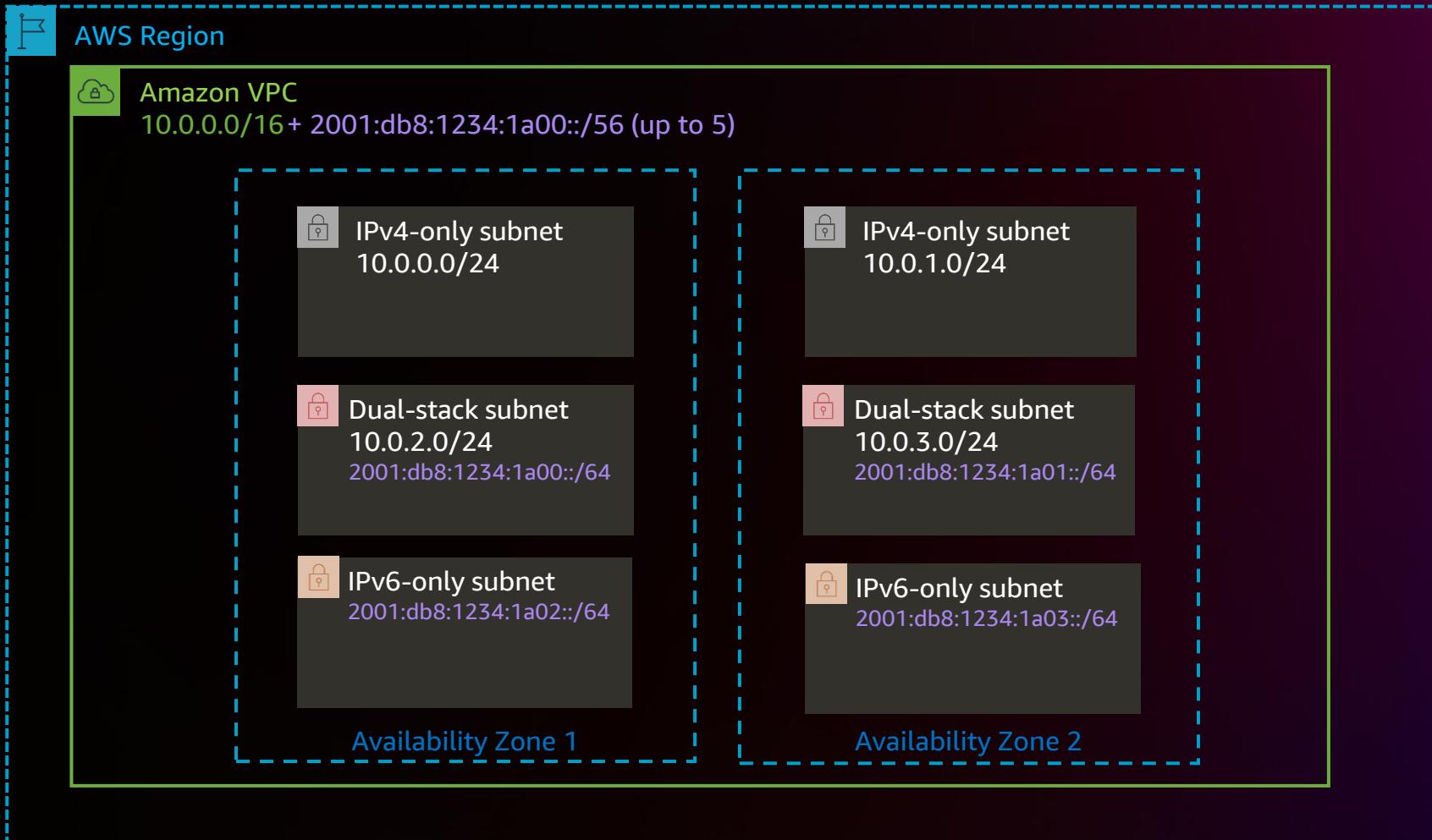
Senior Solutions Architect, Networking Specialist, WWPS  
AWS

# Agenda

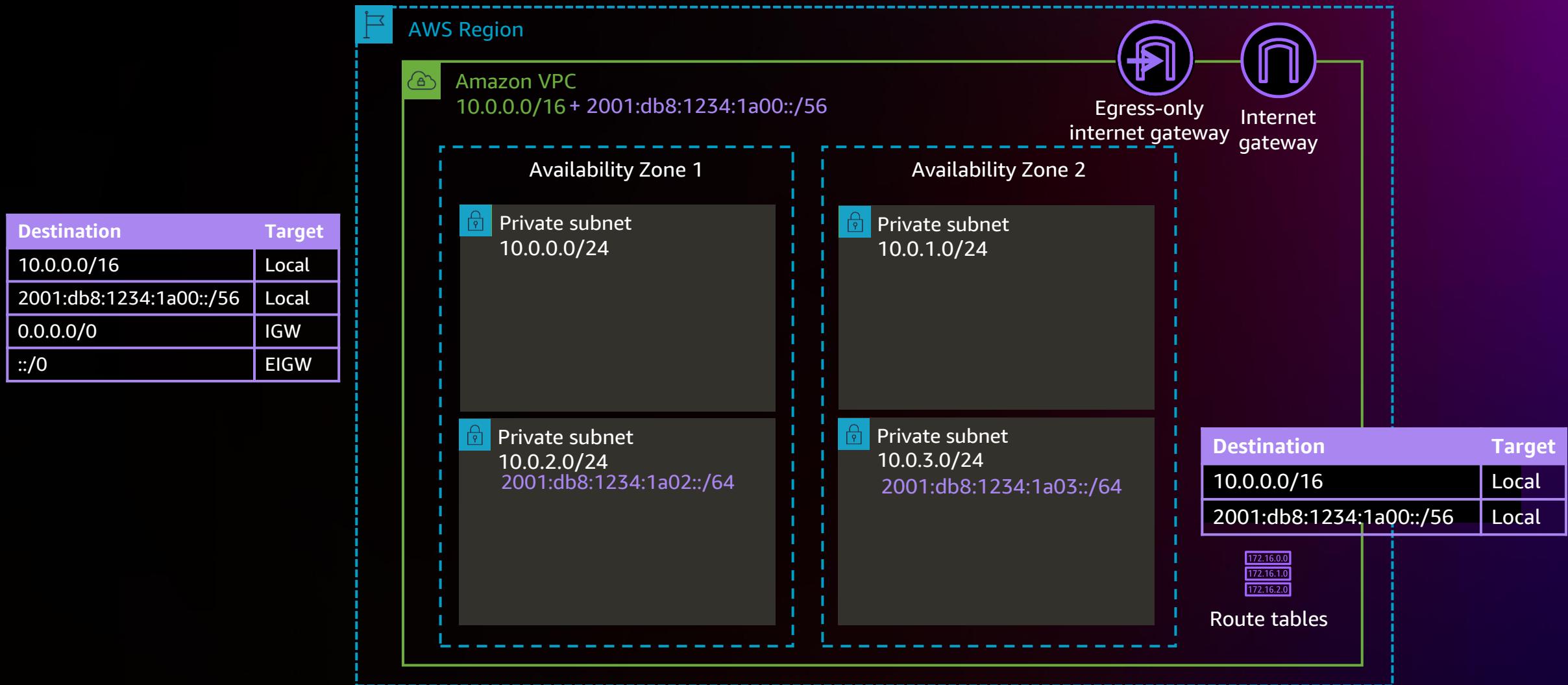
- IPv6 for Amazon VPC
- Load balancing and traffic management
- Event logistics
- Workshop scenario

# Amazon VPC: IP addressing

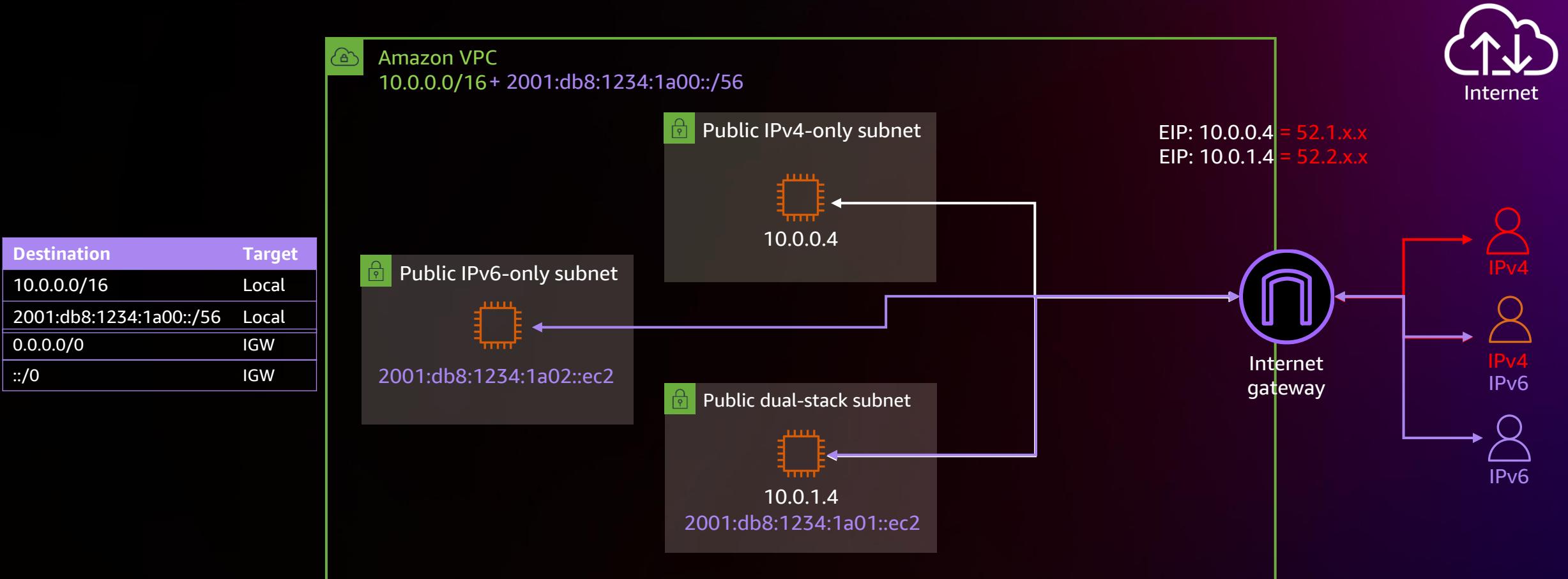
## IPV4-ONLY, DUAL STACK, AND IPV6-ONLY SUBNETS



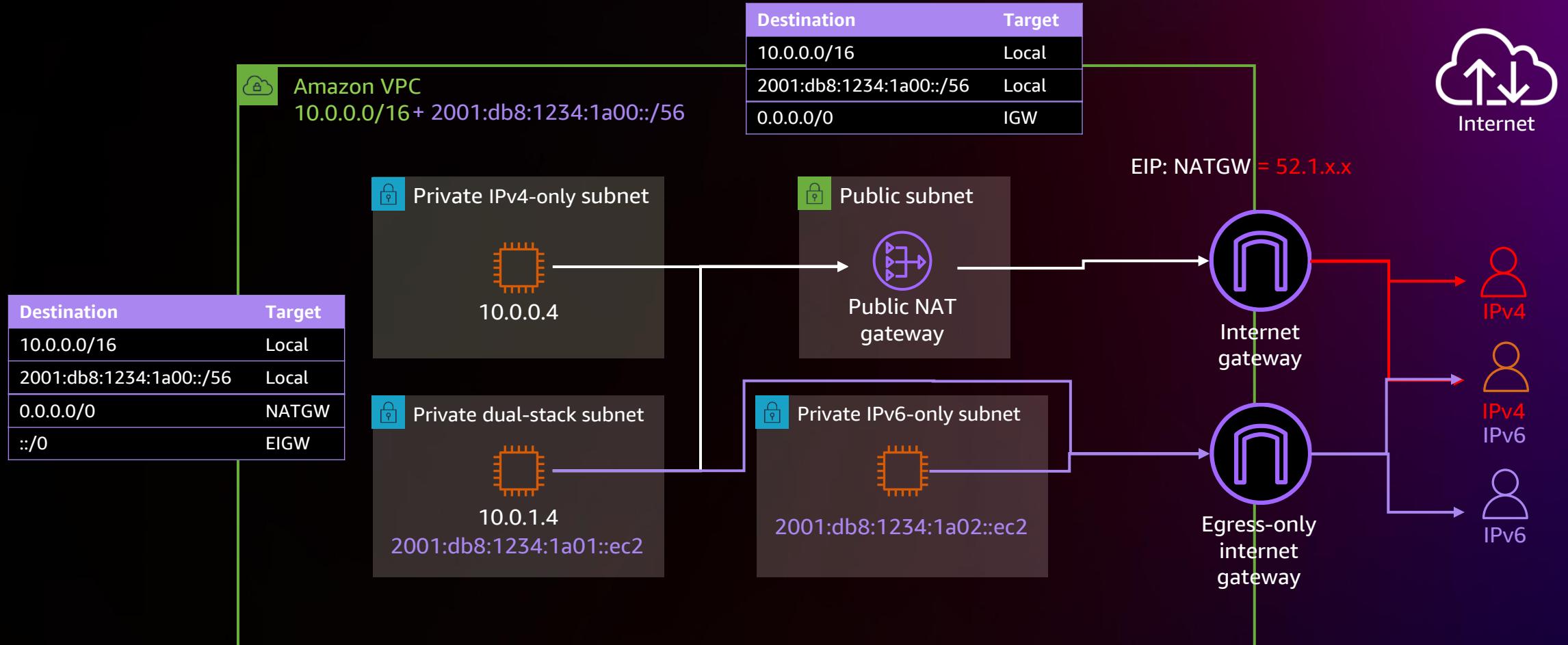
# Amazon VPC: Routing



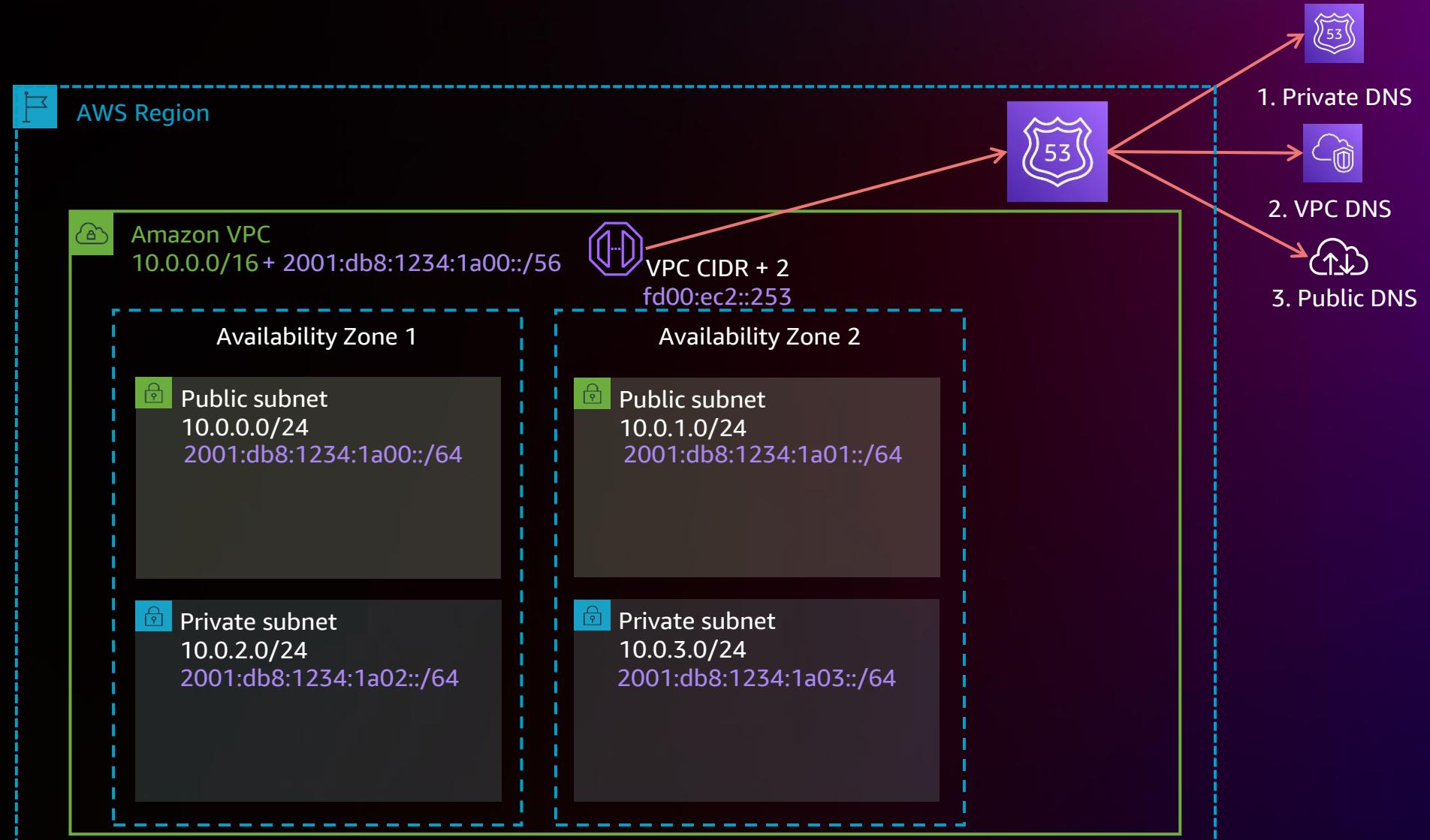
# Public subnets: Internet connectivity



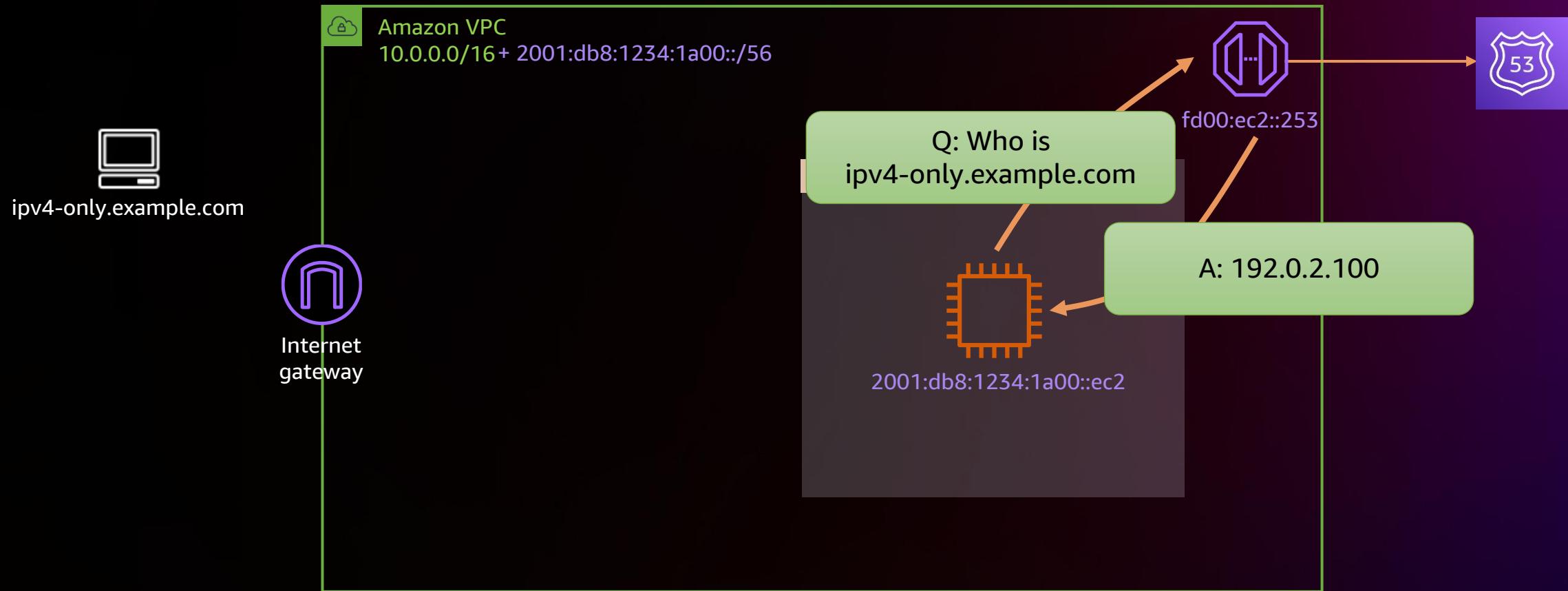
# Private subnets: Internet connectivity



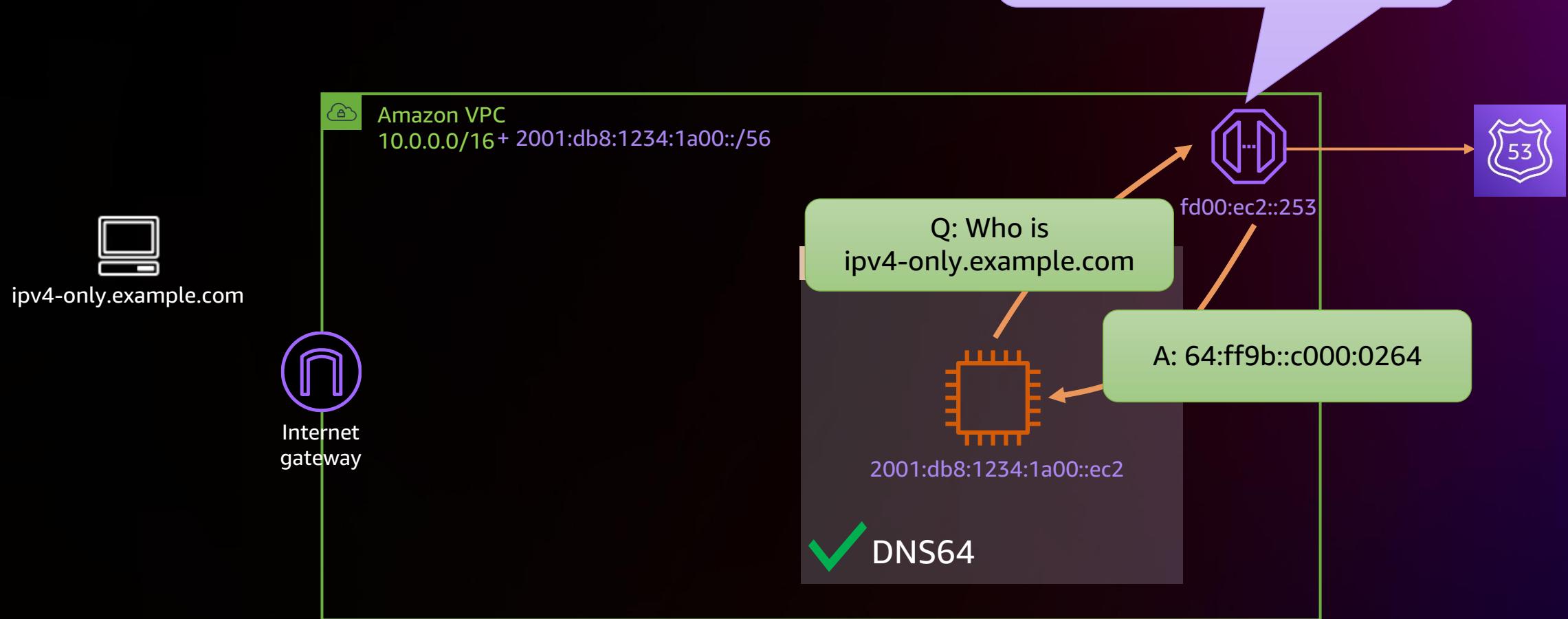
# Amazon VPC: DNS



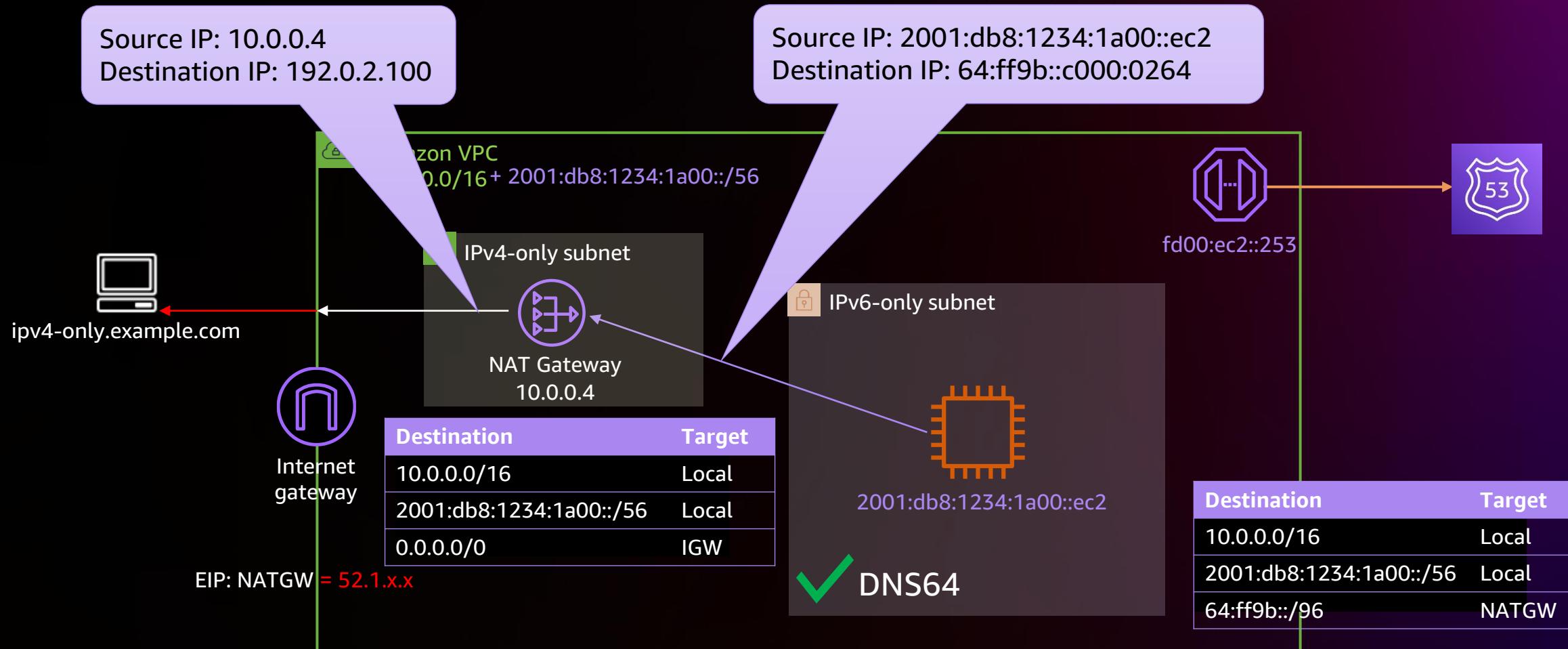
# Address translation: 6-to-4



# Address translation: DNS64

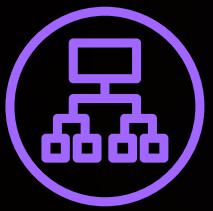


# Address translation: NAT64

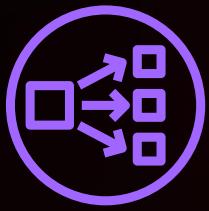


# Load balancing and traffic management

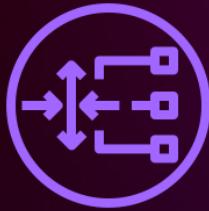
# Elastic Load Balancing



Application Load  
Balancer

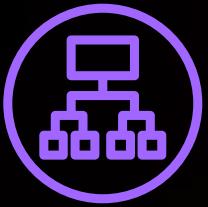


Network Load  
Balancer



Gateway Load  
Balancer

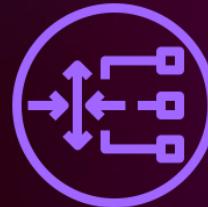
# Elastic Load Balancing



Application Load  
Balancer



Network Load  
Balancer



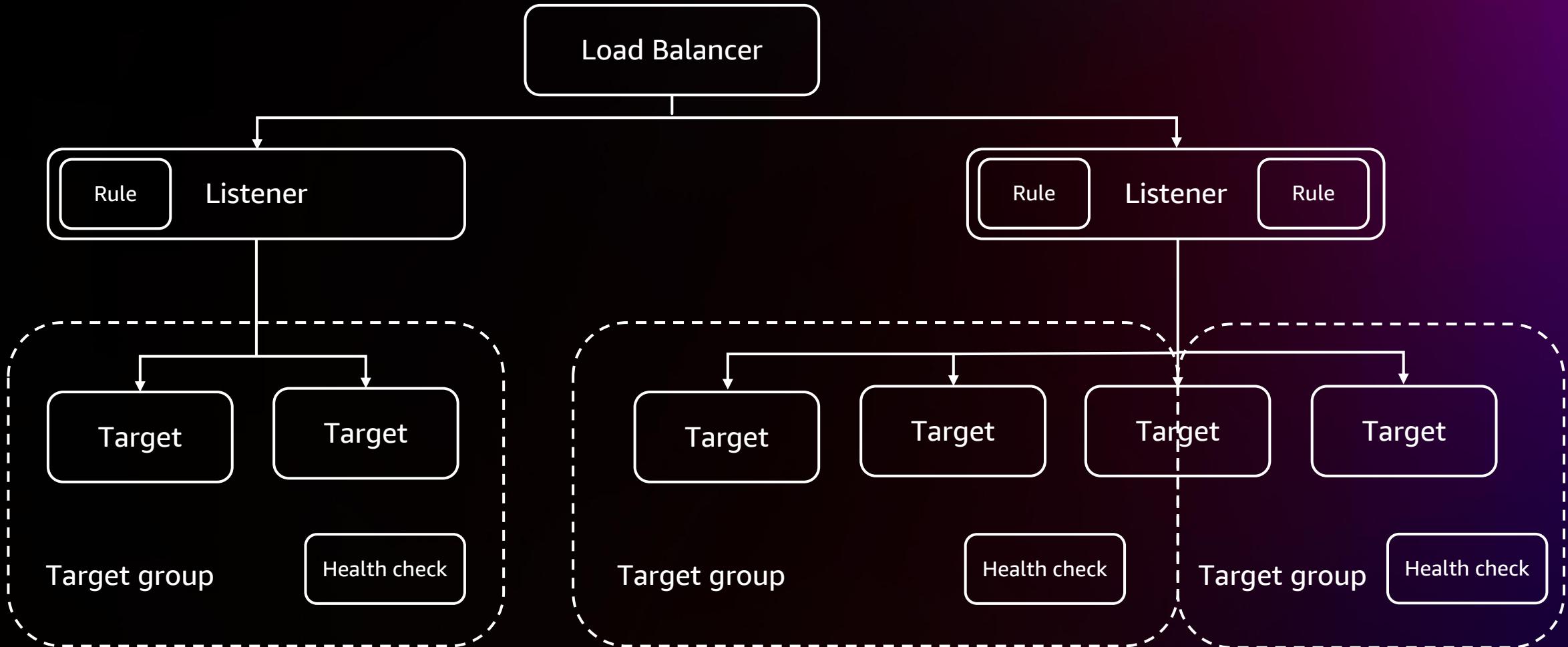
Gateway Load  
Balancer

- Layer 7
- Targets: IP, instance, AWS Lambda
- Terminates flows
- Listener: HTTP, HTTPS, gRPC
- Front end: virtual IP

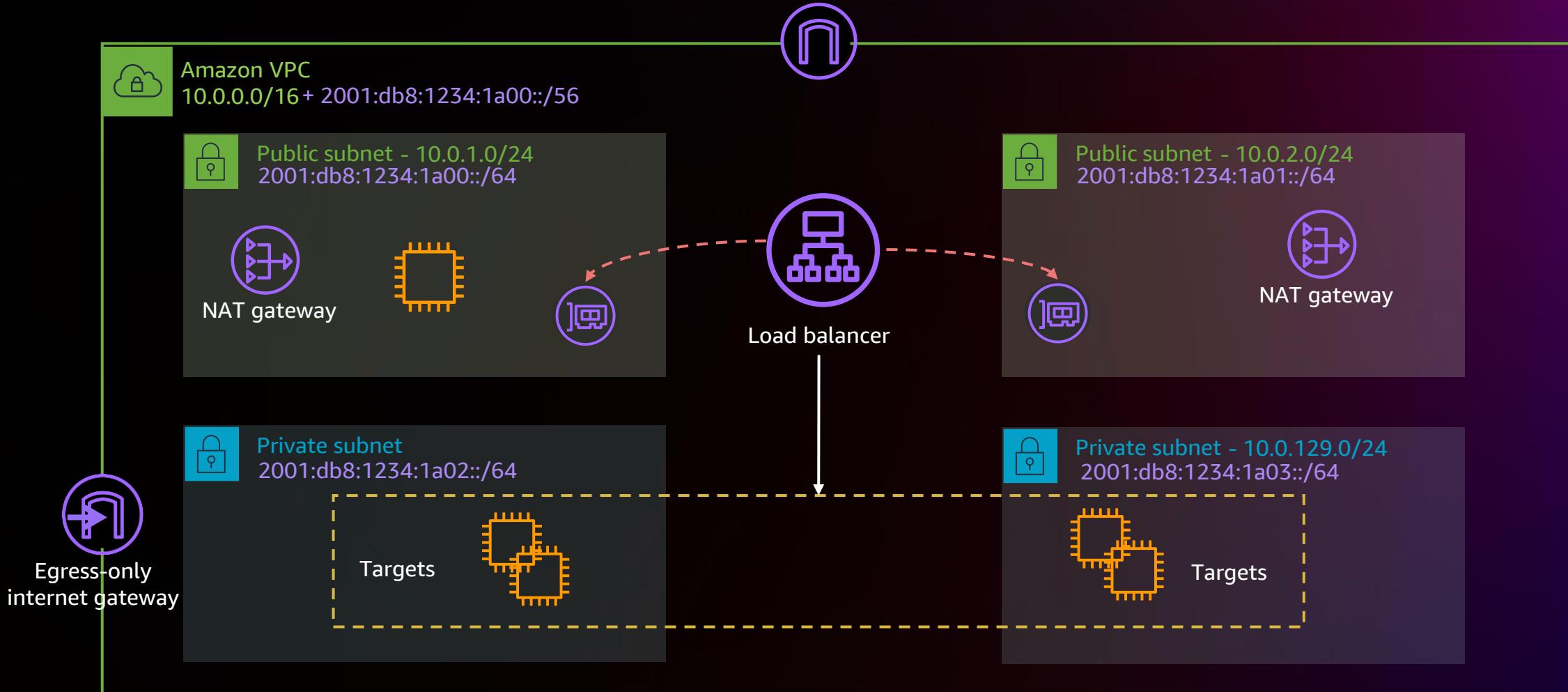
- Layer 4
- Targets: IP, instance, Application Load Balancer
- Terminates flows
- Listener: TCP, UDP, TLS
- Front end: virtual IP

- Layer 3 gateway and Layer 4 load balancing
- Targets: IP, instance
- Transparent pass through of flows
- Listener: IP
- Route table entry

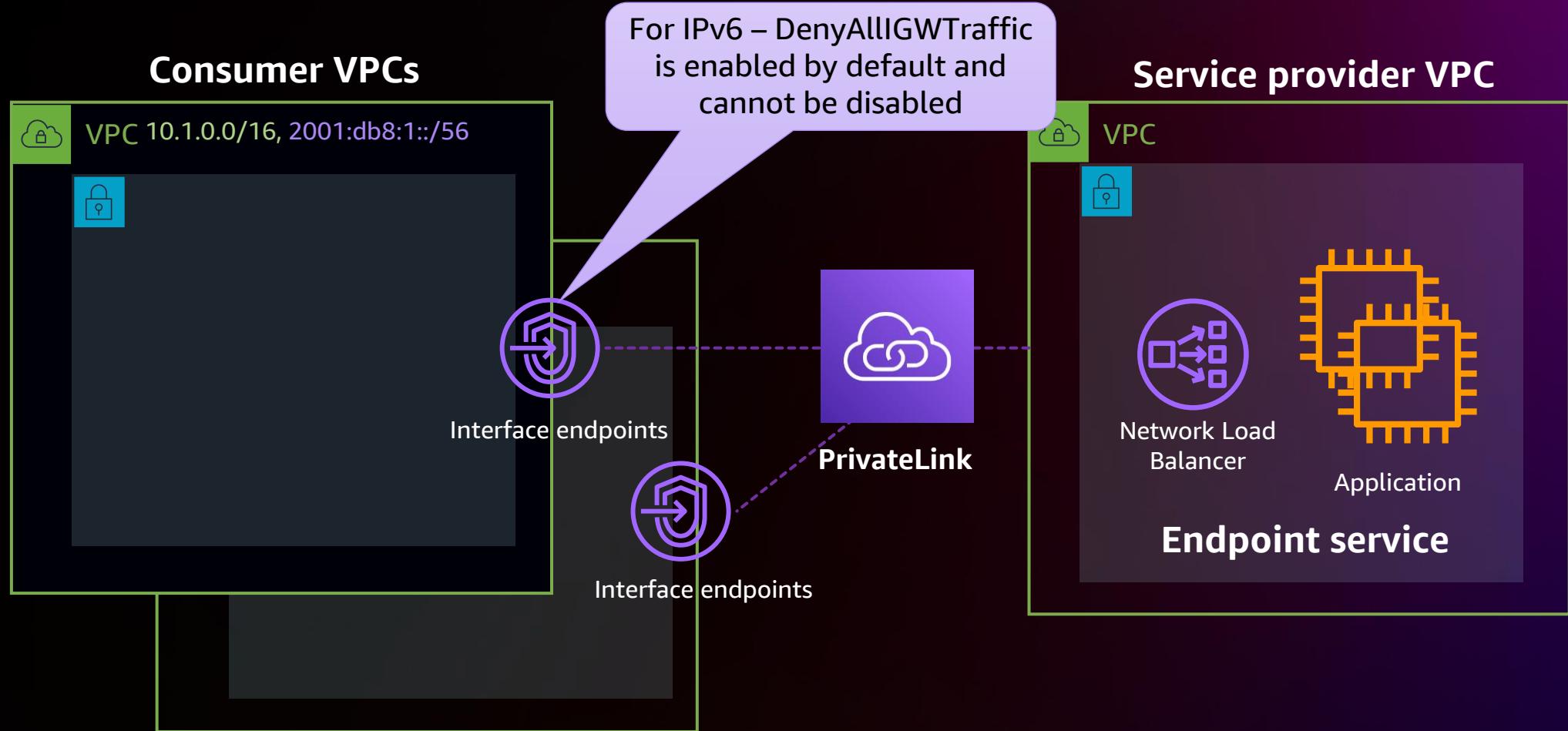
# Elastic Load Balancing



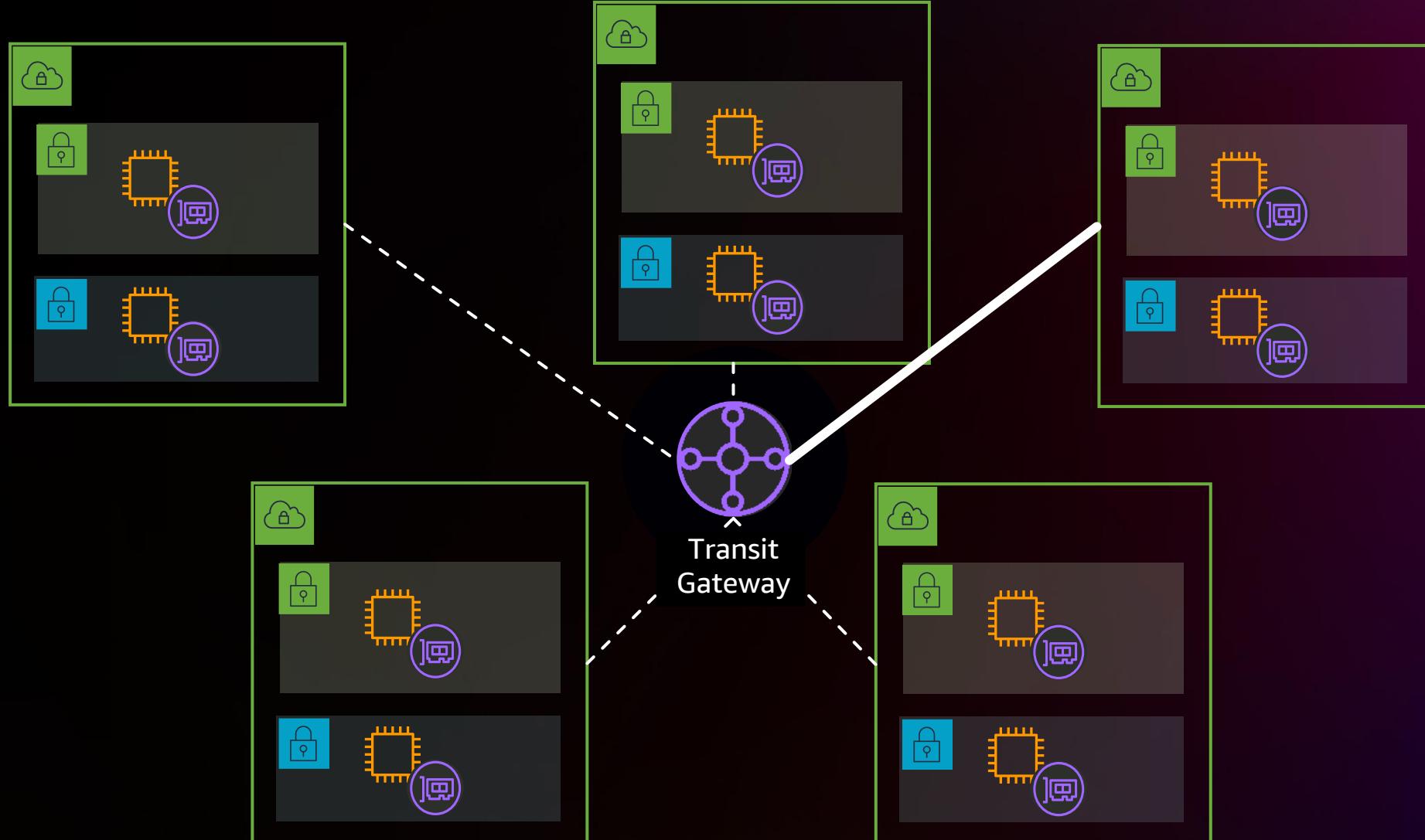
# Elastic Load Balancing



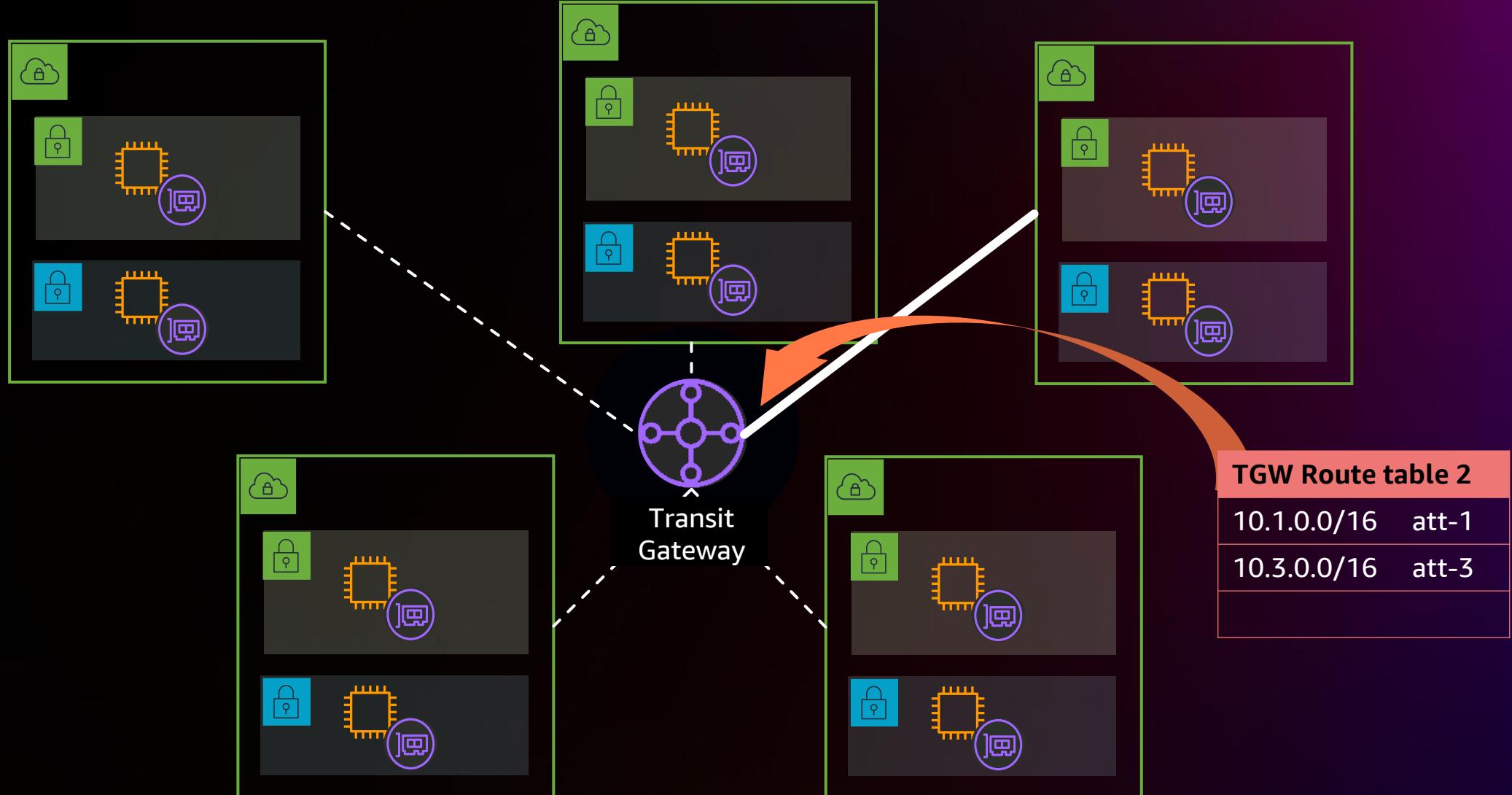
# AWS PrivateLink



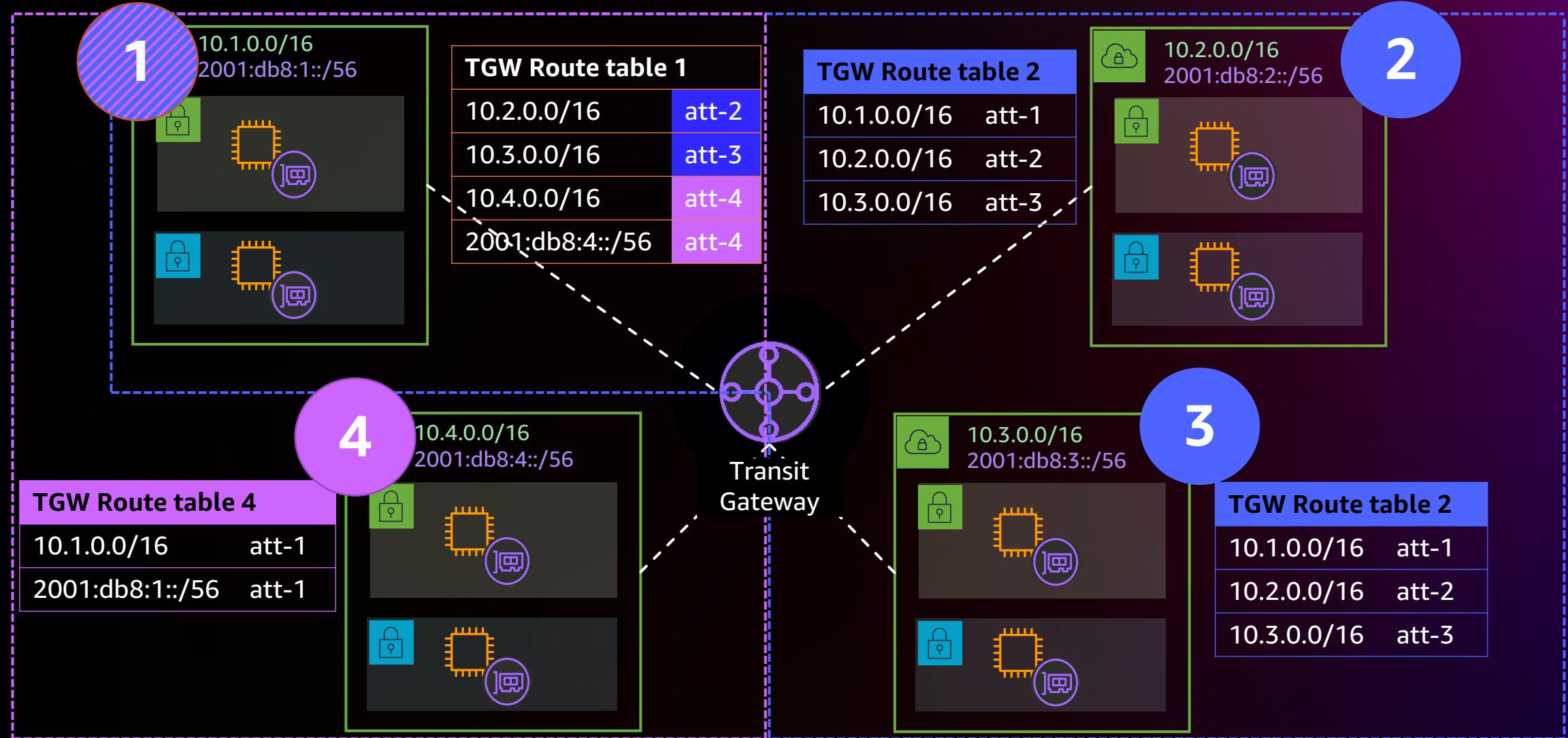
# Transit Gateway



# Transit Gateway



# Transit Gateway route tables and domains



# Event logistics

# Getting started with this workshop

- As a participant, you will have access to an AWS account with any optional preprovisioned infrastructure and IAM policies needed to complete this workshop
- The AWS account will only be available for the duration of this workshop; you will lose access to the account thereafter
- The optional preprovisioned infrastructure will be deployed to a specific region; check your workshop content to determine whether other regions will be used
- Be sure to review the terms and conditions of the event; do not upload any personal or confidential information in the account

# Step 1: Sign in via your preferred method

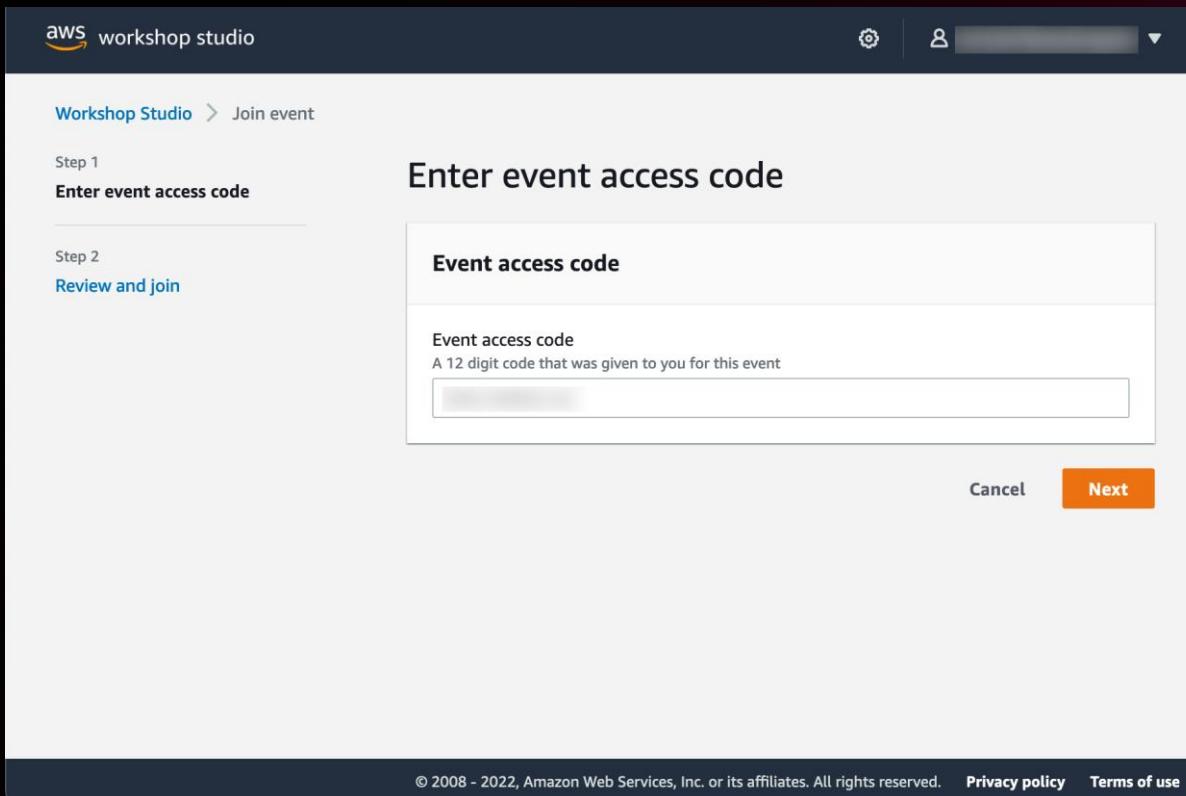
<https://catalog.workshops.aws/join>



A screenshot of the AWS Workshop Studio sign-in interface. The top navigation bar includes the AWS logo and the text "workshop studio". Below the navigation, the text "Workshop Studio &gt; Sign in" is displayed. A central box is titled "Sign in" with the sub-instruction "Choose a preferred sign-in method". Three options are listed: "Email one-time password (OTP)" (highlighted with an orange background), "Login with Amazon" (with a light gray background), and "Amazon employee" (with a light gray background). The bottom of the page features a dark footer bar with the text "© 2008 - 2022, Amazon Web Services, Inc. or its affiliates. All rights reserved." and links for "Privacy policy" and "Terms of use".

# Step 2: Enter event access code

Enter 12-digit event access code  
If you were given a 1-click join link, you can skip this step



# Step 3: Review terms and join event

The screenshot shows the 'Review and join' step of the AWS Workshop Studio process. The page is titled 'Review and join' and displays 'Event details' for an event named 'AWS General Immersion Day'. The event starts at 9/23/2022 01:13 AM and has a duration of 12 hours. The 'Description' is 'AWS General Immersion Day'. Below the event details is a section titled 'Terms and Conditions' with a sub-section 'Read and accept before joining the event'. The terms list four conditions. At the bottom of the page, there is a checked checkbox labeled 'I agree with the Terms and Conditions' and a 'Join event' button.

aws workshop studio

Workshop Studio > Join event

Step 1  
Enter event access code

Step 2  
Review and join

## Review and join

### Event details

Name	Start time	Duration	Level
AWS General Immersion Day	9/23/2022 01:13 AM	12 hours	-

Description  
AWS General Immersion Day

### Terms and Conditions

Read and accept before joining the event

1. By using AWS Workshop Studio for the relevant event, you agree to the AWS Event Terms and Conditions and the AWS Acceptable Use Policy. You acknowledge and agree that are using an AWS-owned account that you can only access for the duration of the relevant event. If you find residual resources or materials in the AWS-owned account, you will make us aware and cease use of the account. AWS reserves the right to terminate the account and delete the contents at any time.
2. You will not: (a) process or run any operation on any data other than test data sets or lab-approved materials by AWS, and (b) copy, import, export or otherwise create derivative works of materials provided by AWS, including but not limited to, data sets.
3. AWS is under no obligation to enable the transmission of your materials through Event Engine and may, in its discretion, edit, block, refuse to post, or remove your materials at any time.
4. Your use of AWS Workshop Studio will comply with these terms and all applicable laws, and your access to AWS Workshop Studio will immediately and automatically terminate if you do not comply with any of these terms or conditions.

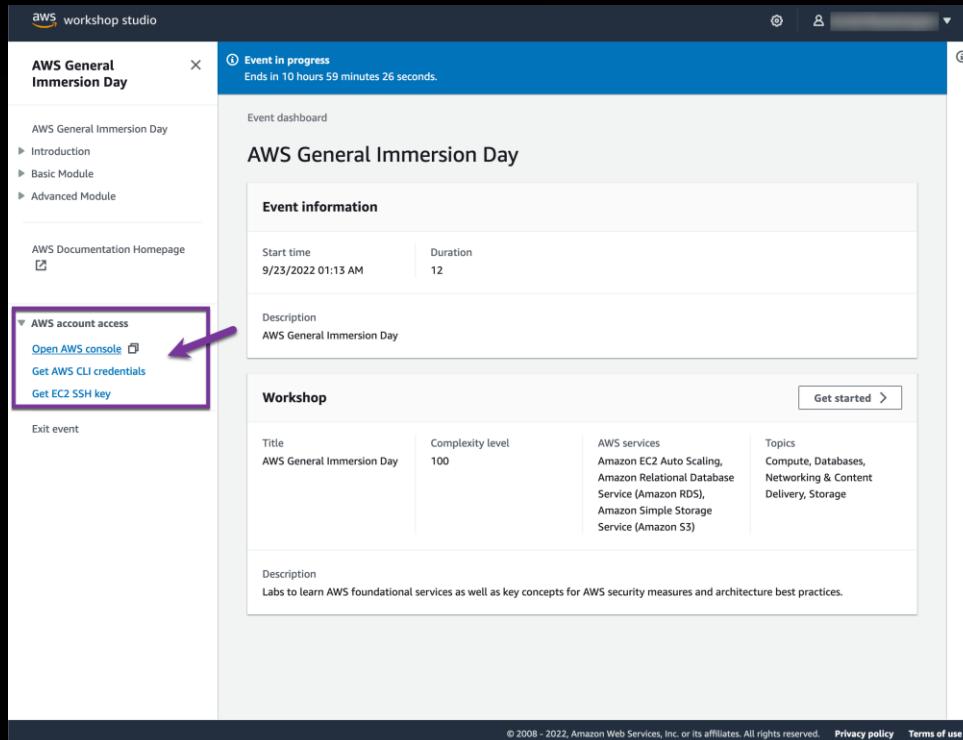
I agree with the Terms and Conditions

Cancel Previous Join event

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# Step 4: Access AWS account

Access the AWS Console or generate AWS CLI credentials as needed



AWS General Immersion Day

Event in progress  
Ends in 10 hours 59 minutes 26 seconds.

Event dashboard

### AWS General Immersion Day

**Event information**

Start time	9/23/2022 01:13 AM	Duration	12
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Description  
AWS General Immersion Day

**Workshop**

Title	AWS General Immersion Day	Complexity level	100
AWS services	Amazon EC2 Auto Scaling, Amazon Relational Database Service (Amazon RDS), Amazon Simple Storage Service (Amazon S3)	Topics	Compute, Databases, Networking & Content Delivery, Storage

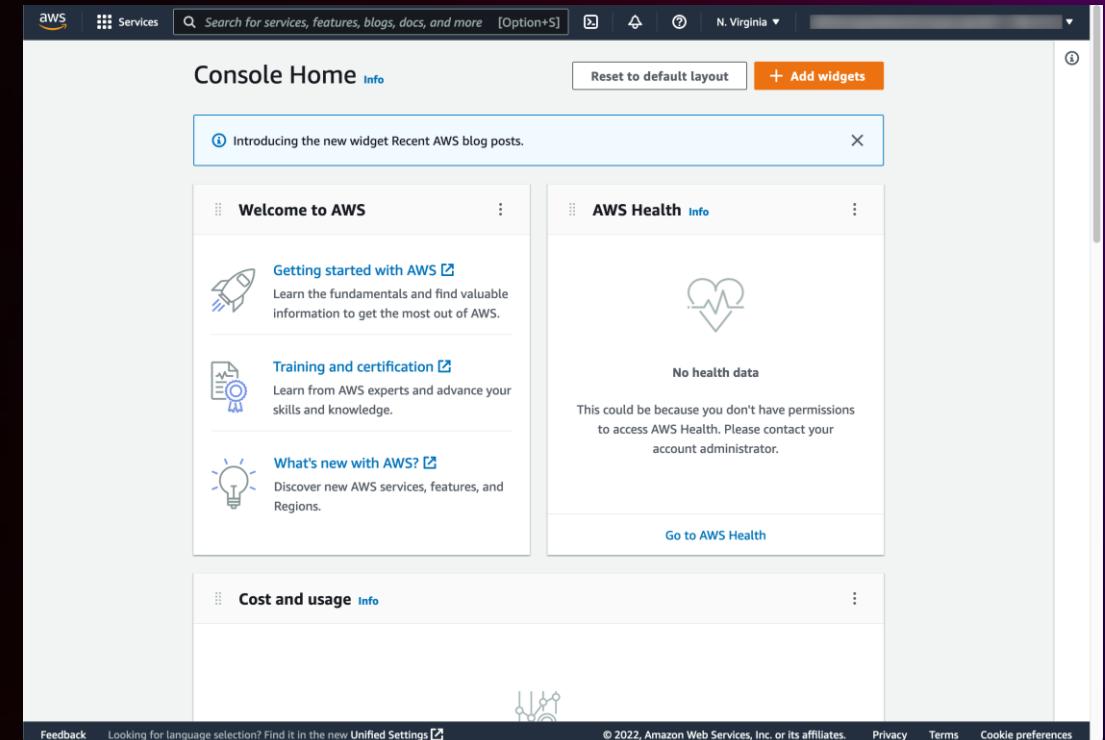
**Description**  
Labs to learn AWS foundational services as well as key concepts for AWS security measures and architecture best practices.

**AWS account access**

- Open AWS console
- Get AWS CLI credentials
- Get EC2 SSH key

Exit event

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Console Home

Search for services, features, blogs, docs, and more [Option+S]

Reset to default layout + Add widgets

### Welcome to AWS

Getting started with AWS [Info](#)  
Learn the fundamentals and find valuable information to get the most out of AWS.

Training and certification [Info](#)  
Learn from AWS experts and advance your skills and knowledge.

What's new with AWS? [Info](#)  
Discover new AWS services, features, and Regions.

### AWS Health

No health data  
This could be because you don't have permissions to access AWS Health. Please contact your account administrator.

Go to AWS Health

### Cost and usage

Feedback Looking for language selection? Find it in the new Unified Settings [Info](#)

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# Step 5: Get started with the workshop

AWS workshop studio

**AWS General Immersion Day**

Event in progress  
Ends in 10 hours 59 minutes 26 seconds.

Event dashboard

## AWS General Immersion Day

**Event information**

Start time	Duration
9/23/2022 01:13 AM	12

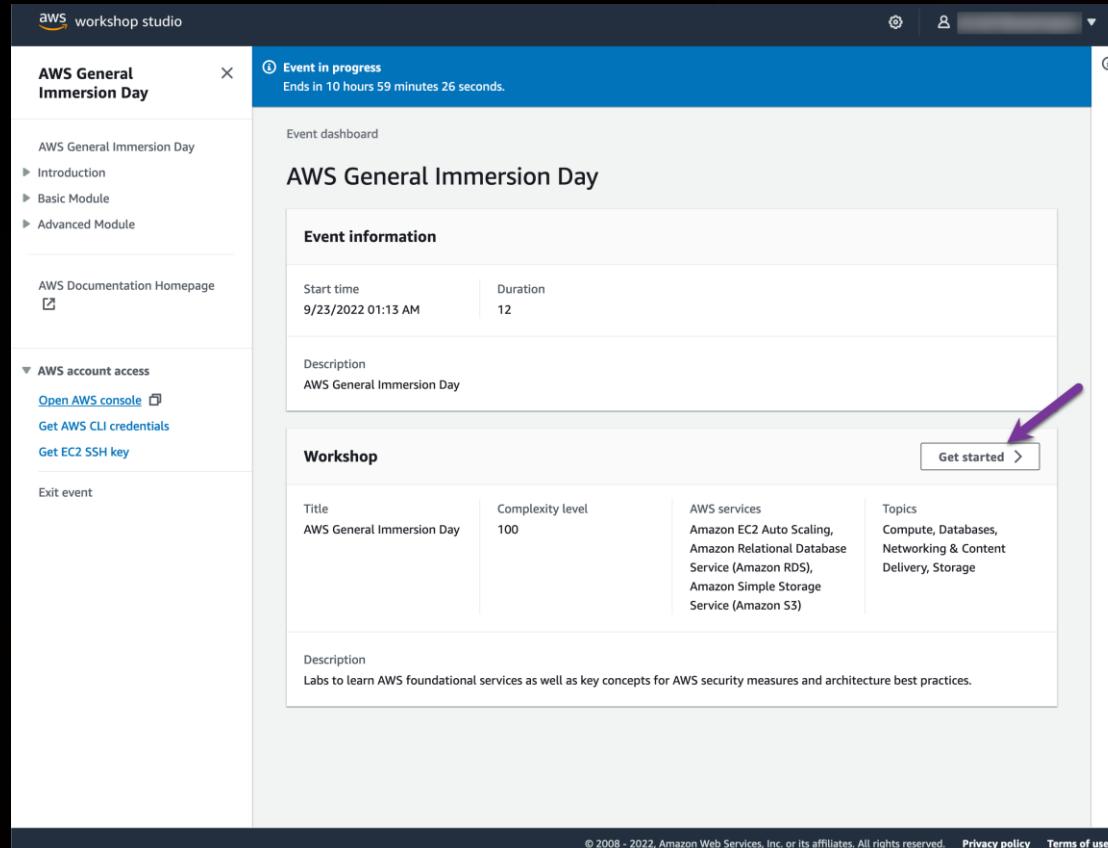
Description  
AWS General Immersion Day

**Workshop**

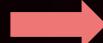
Title	Complexity level	AWS services	Topics
AWS General Immersion Day	100	Amazon EC2 Auto Scaling, Amazon Relational Database Service (Amazon RDS), Amazon Simple Storage Service (Amazon S3)	Compute, Databases, Networking & Content Delivery, Storage

Description  
Labs to learn AWS foundational services as well as key concepts for AWS security measures and architecture best practices.

**Get started >**



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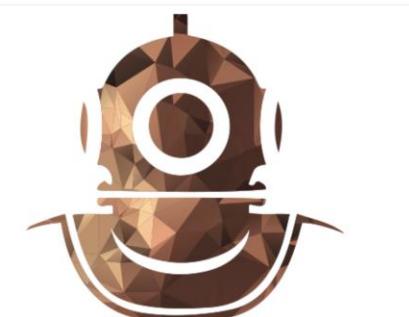
AWS workshop studio

**AWS General Immersion Day**

Event in progress  
Ends in 10 hours 57 minutes 12 seconds.

Event dashboard > AWS General Immersion Day

## AWS General Immersion Day



**IMMERSION DAYS**

In this General Immersion Day workshop, through a mix of service explanation and hands-on labs led by AWS, you will learn about AWS foundational services as well as key concepts for AWS security measures and architecture best practices.

The hands-on labs are largely divided into **basic** and **advanced** modules.

In basic modules, you can learn various features of each AWS foundational service. In advanced modules, you can learn how to connect each service organically to create architecture like 3-tier web application.

[Previous](#) [Next](#)

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# Workshop scenario

# The story

AnyCompany offers a successful API service on AWS used by thousands of businesses; its customers are asking for IPv6 support, and AnyCompany has committed to delivering it

Customers will transition to IPv6 at different times, so AnyCompany must provide dual-stack (IPv4 & IPv6) compatibility for the foreseeable future

Example Corp uses the AnyCompany API service as part of its own corporate applications; Example Corp is exhausting its private IPv4 address space, and there is a corporate initiative to migrate to IPv6-only services across the enterprise

Example Corp deploys their corporate applications in AWS. Each corporate application has its own VPC. Example Corp connects to the AnyCompany API service from their shared services VPC using AWS PrivateLink. Example Corp VPCs connect internally using AWS Transit Gateway.

# The job: AnyCompany

As AnyCompany, you will

- Convert an existing IPv4-only VPC to dual-stack and launch IPv6-only instances (Module 1)
- Make your API service dual-stack using a load balancer listening on TCP port 80 for users on the Internet (Module 2)
- Make your dual-stack API service available over AWS PrivateLink endpoint (Module 3)

# The job: Example Corp

As Example Corp, you will

- Consume the AnyCompany API service in your shared services VPC privately over IPv4 and IPv6  
(Module 3)
- Establish private IPv6 connectivity between the application VPC and the shared services VPC  
(Module 4)
- Deploy an internal-facing application via load balancer in your application VPC; the application must be accessible on HTTP port 80 (Module 5)
- Consume the AnyCompany API service over IPv6 from your application using existing connectivity  
(Module 5)

# Workshop overview



Participant Account



SSM Endpoint



Instance Profile for  
SSM

Security  
Group for  
EC2  
HTTP



Application VPC

10.3.0.0/16 + 2001:db8:1234:3c00::/56

AZ-A

Private IPv6 subnet  
2001:db8:1234:3c06::/64



IPv6 EC2

Dualstack TGW subnet  
10.3.0.0/24 +  
2001:db8:1234:3c00::/64

AZ-B

Private IPv6 subnet  
2001:db8:1234:3c07::/64



IPv6 EC2

Dualstack TGW subnet  
10.3.1.0/24 +  
2001:db8:1234:3c01::/64



Shared Services VPC

10.2.0.0/16 + 2001:db8:1234:2b00::/56

AZ-A

Dualstack TGW subnet  
10.2.4.0/24 +  
2001:db8:1234:2b04::/64

Dualstack Private subnet  
10.2.2.0/24 +  
2001:db8:1234:2b02::/64

AZ-B

Dualstack TGW subnet  
10.2.5.0/24 +  
2001:db8:1234:2b05::/64

Dualstack Private subnet  
10.2.3.0/24 +  
2001:db8:1234:2b03::/64



Service Provider VPC

10.1.0.0/16

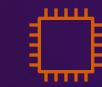
AZ-A

Public subnet  
10.1.0.0/24



NGW

Private IPv4 subnet  
10.1.2.0/24



IPv4 EC2

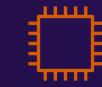
AZ-B

Public subnet  
10.1.1.0/24



NGW

Private IPv4 subnet  
10.1.3.0/24



IPv4 EC2



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# Getting started

- Option 1: Event URL: <https://catalog.workshops.aws/join>
  - Event Access Code: 9426-04d0d9-0b
- Option 2: Shortened URL: <https://s12d.com/net202>
- Workshop URL: <https://catalog.workshops.aws/ipv6-on-aws/>
- Use your laptop or share with a partner



# Resources

IPv6 Landing page



List of AWS services that support IPv6



IPv6 on AWS whitepaper



# Thank you!

Alan Halachmi

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Rohit Aswani

[linkedin.com/in/aswanirohit/](https://linkedin.com/in/aswanirohit/)



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