Module 5: AWS Elasticity and Management Tools

3 qwik LABS

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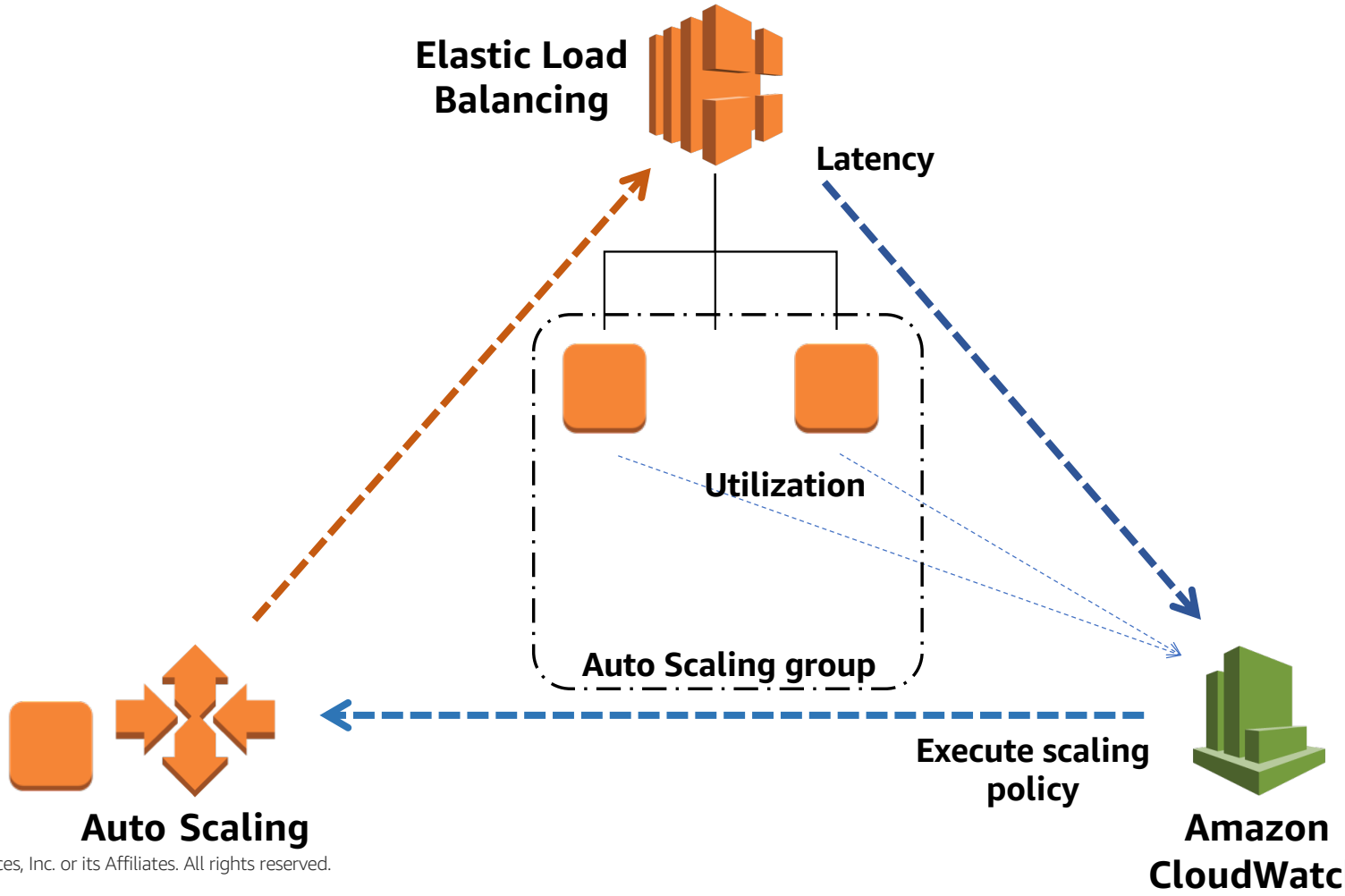
Triad of Services



Elastic Load Balancing

Elastic Load Balancing

- Distributes traffic across multiple EC2 instances, in multiple Availability Zones
- Supports health checks to detect unhealthy Amazon EC2 instances
- Supports the routing and load balancing of HTTP, HTTPS, SSL, and TCP traffic to Amazon EC2 instances

Classic Load Balancer: How It Works

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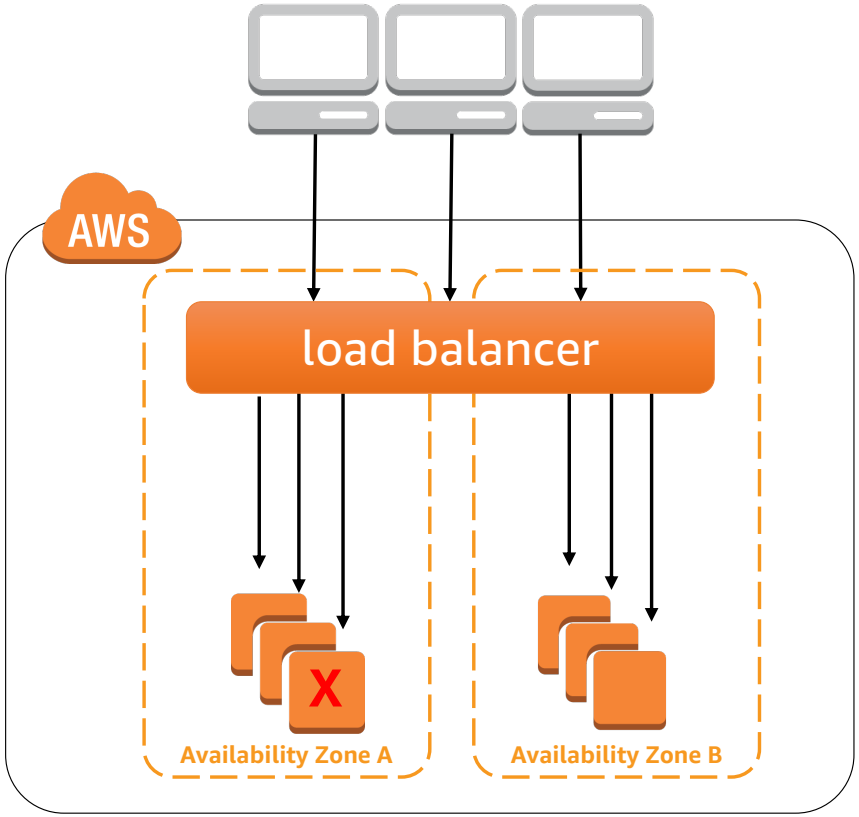
- Register instances with your load balancer.
- Load balancer routes request at either:
  - Transport layer (TCP)
  - Application layer (HTPP/HTTPS)
- Intended for applications build within the EC2-Classic network
  - Recommendation for new applications is to use Application Load Balancer or Network Load Balancer



Application Load Balancer: How It Works

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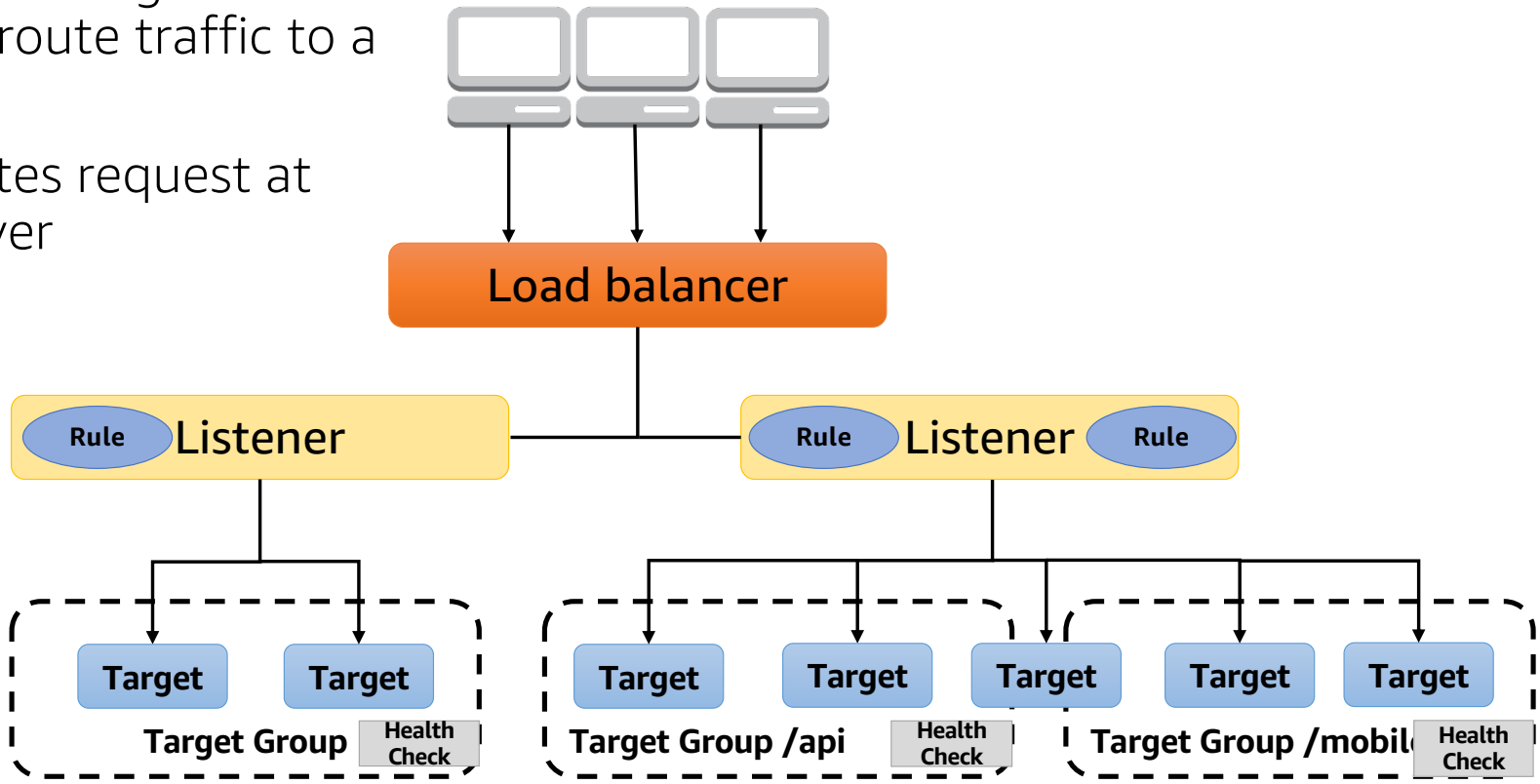
- Register instances as targets in a target group, and route traffic to a target group.
- Load balancer routes request at the Application layer (HTPP/HTTPS).



Network Load Balancer: How it Works

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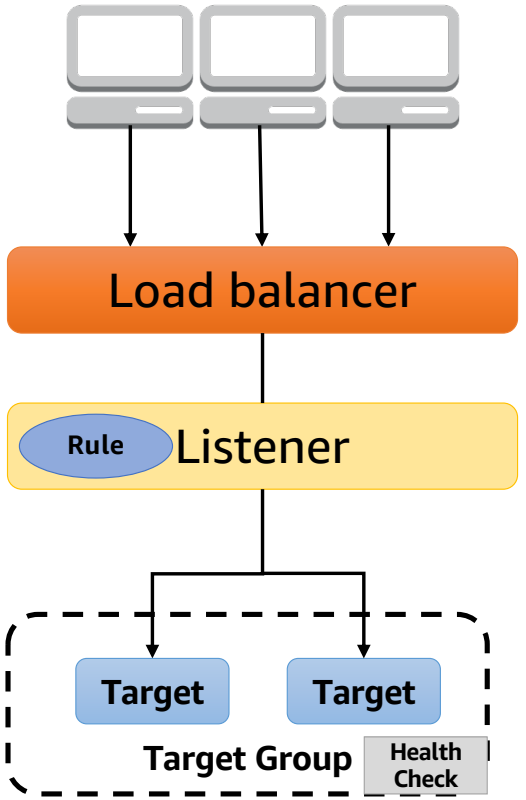
- Register instances as targets in a target group, and route traffic to a target group.
- Load balancer routes request at the Transport layer (TCP).



Load Balancer Comparison

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Feature	Classic Load Balancer	Application Load Balancer	Network Load Balancer
Protocols	TCP, SSL, HTTP, HTTPS	HTTP, HTTPS	TCP
Platforms	EC2-Classic, VPC	VPC	VPC
Cross-zone load balancing	Yes	Yes	Yes
Logging	Yes	Yes	Yes
Path-based routing	No	Yes	No
Sticky sessions	No	Yes	No
Static IP	No	No	Yes

Amazon CloudWatch

Amazon CloudWatch

- A monitoring service for AWS Cloud resources and the applications you run on AWS
- Visibility into resource utilization, operational performance, and overall demand patterns
- Custom application-specific metrics of your own
- Accessible via AWS Management Console, APIs, AWS SDK, or AWS CLI

Amazon CloudWatch Facts

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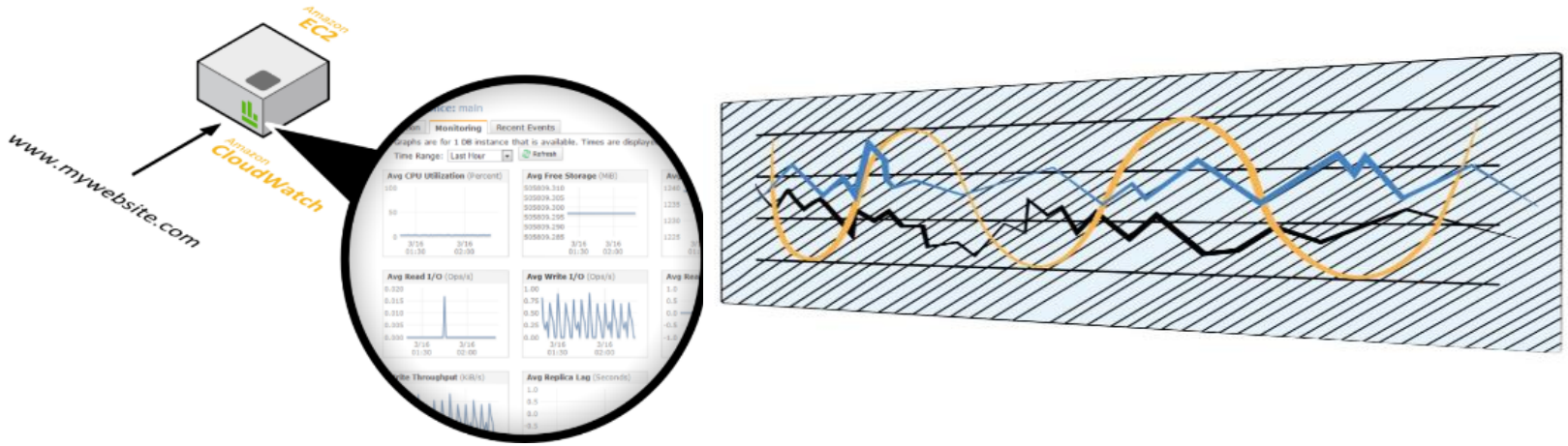
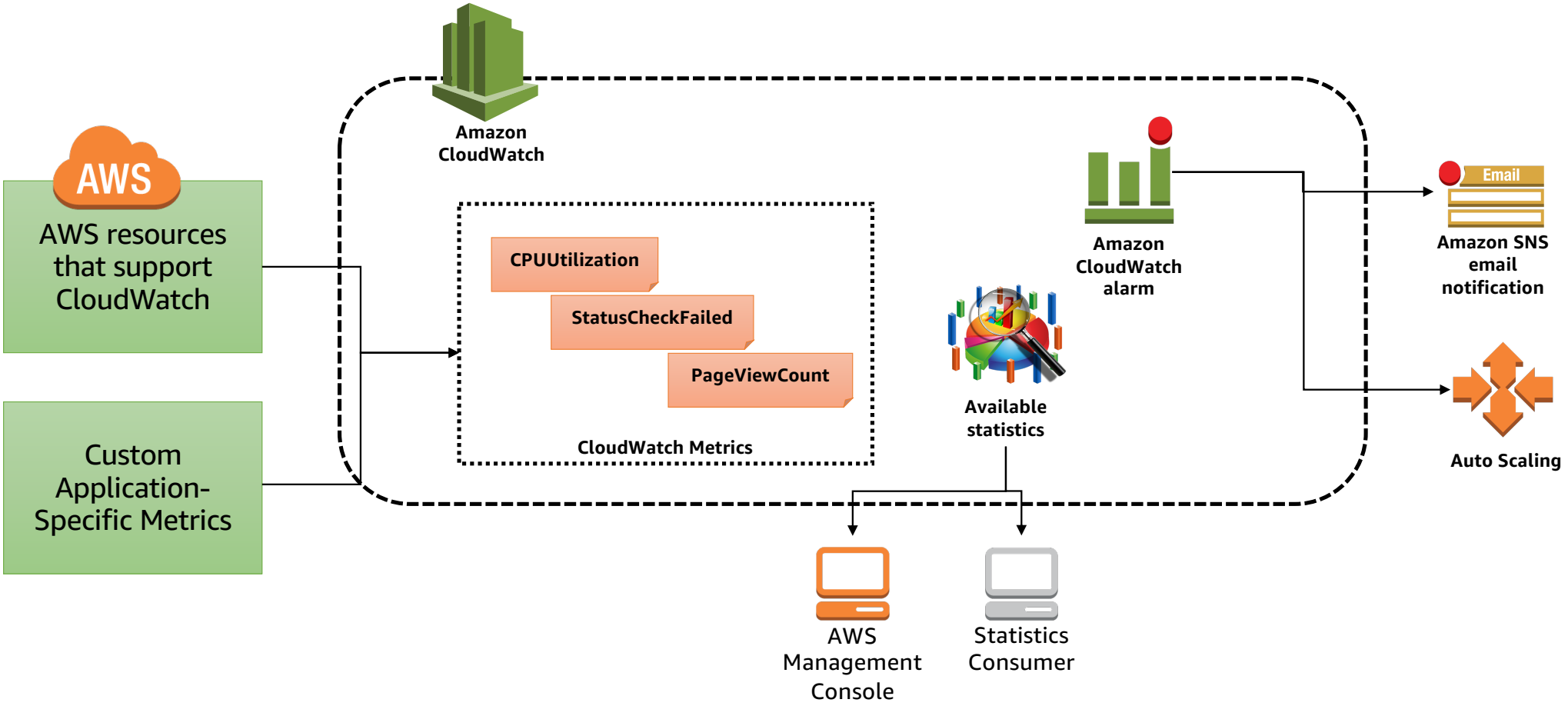
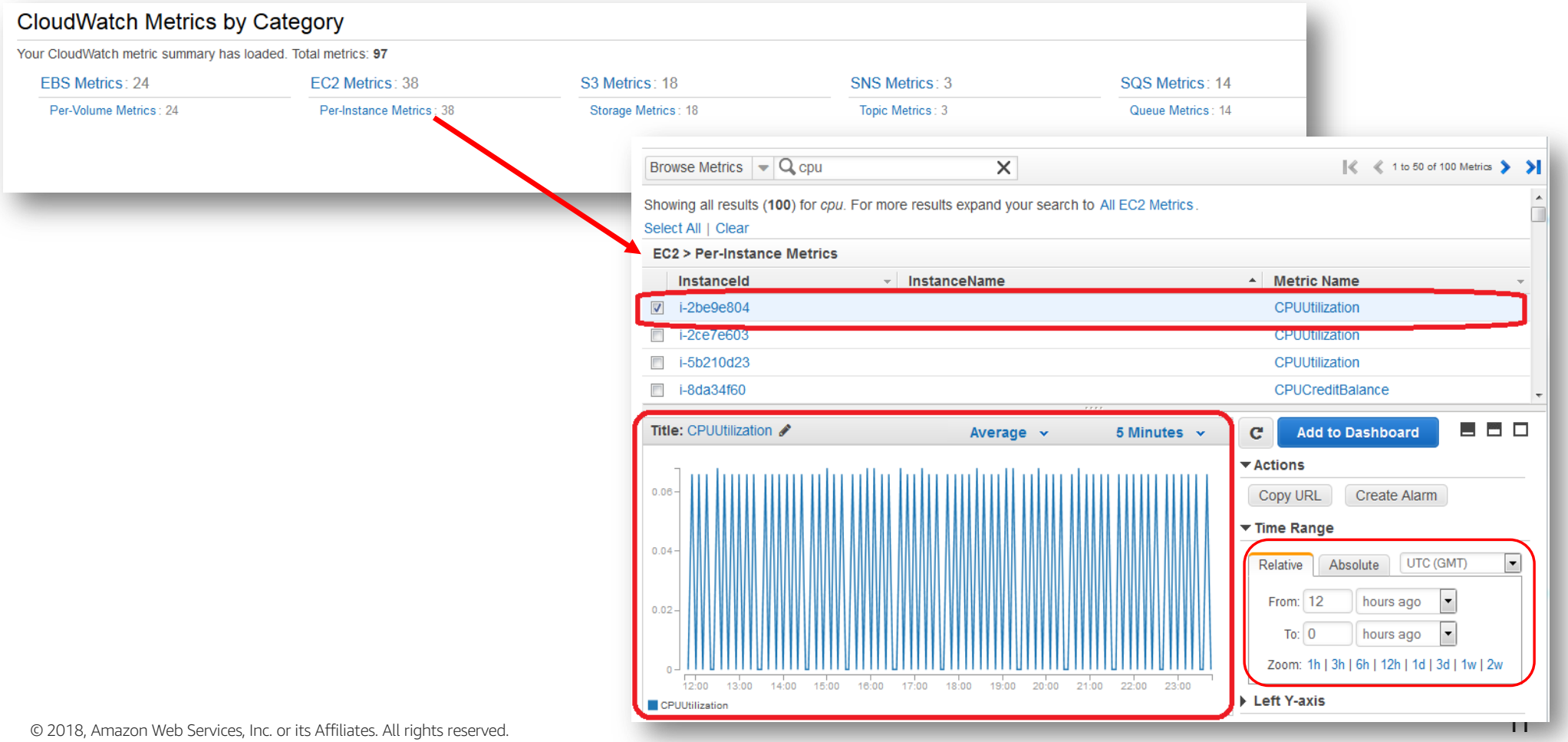
- Monitor other AWS resources
  - View graphics and statistics
- Set alarms



Amazon CloudWatch Architecture



CloudWatch Metrics Examples



Auto Scaling

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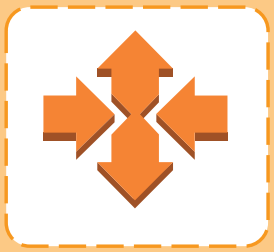

Auto Scaling

- Scale your Amazon EC2 capacity automatically
- Well-suited for applications that experience variability in usage
- Available at no additional charge

Auto Scaling Benefits

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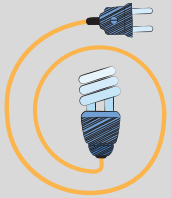
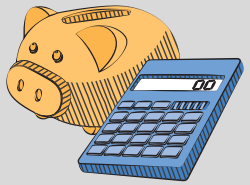
Better fault tolerance



Better availability

Better cost management



Launch Configurations

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- A launch configuration is a template that an Auto Scaling group uses to launch EC2 instances.
- When you create a launch configuration, you can specify:
  - AMI ID
  - Instance type
  - Key pair
  - Security groups
  - Block device mapping
  - User data

Auto Scaling Groups

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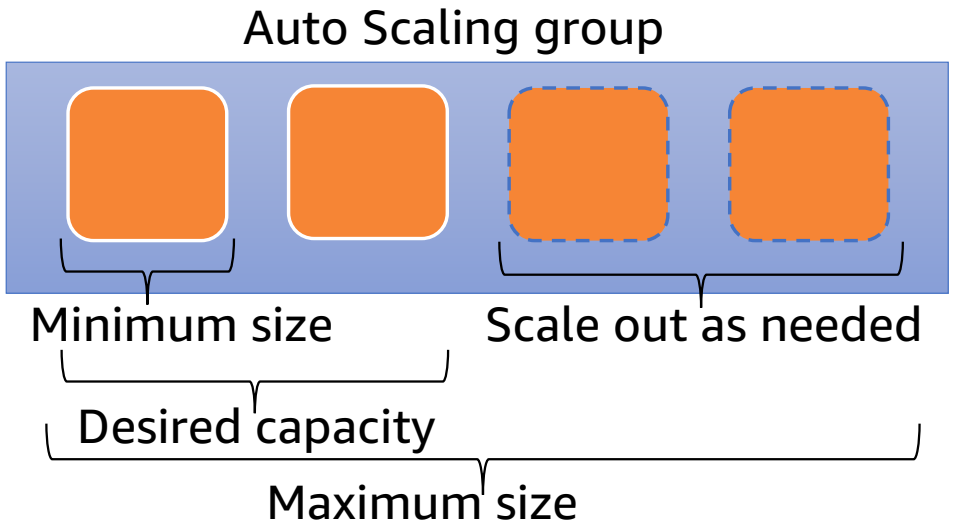
- Contain a collection of EC2 instances that share similar characteristics.
- Instances in an Auto Scaling group are treated as a logical grouping for the purpose of instance scaling and management.



Dynamic Scaling

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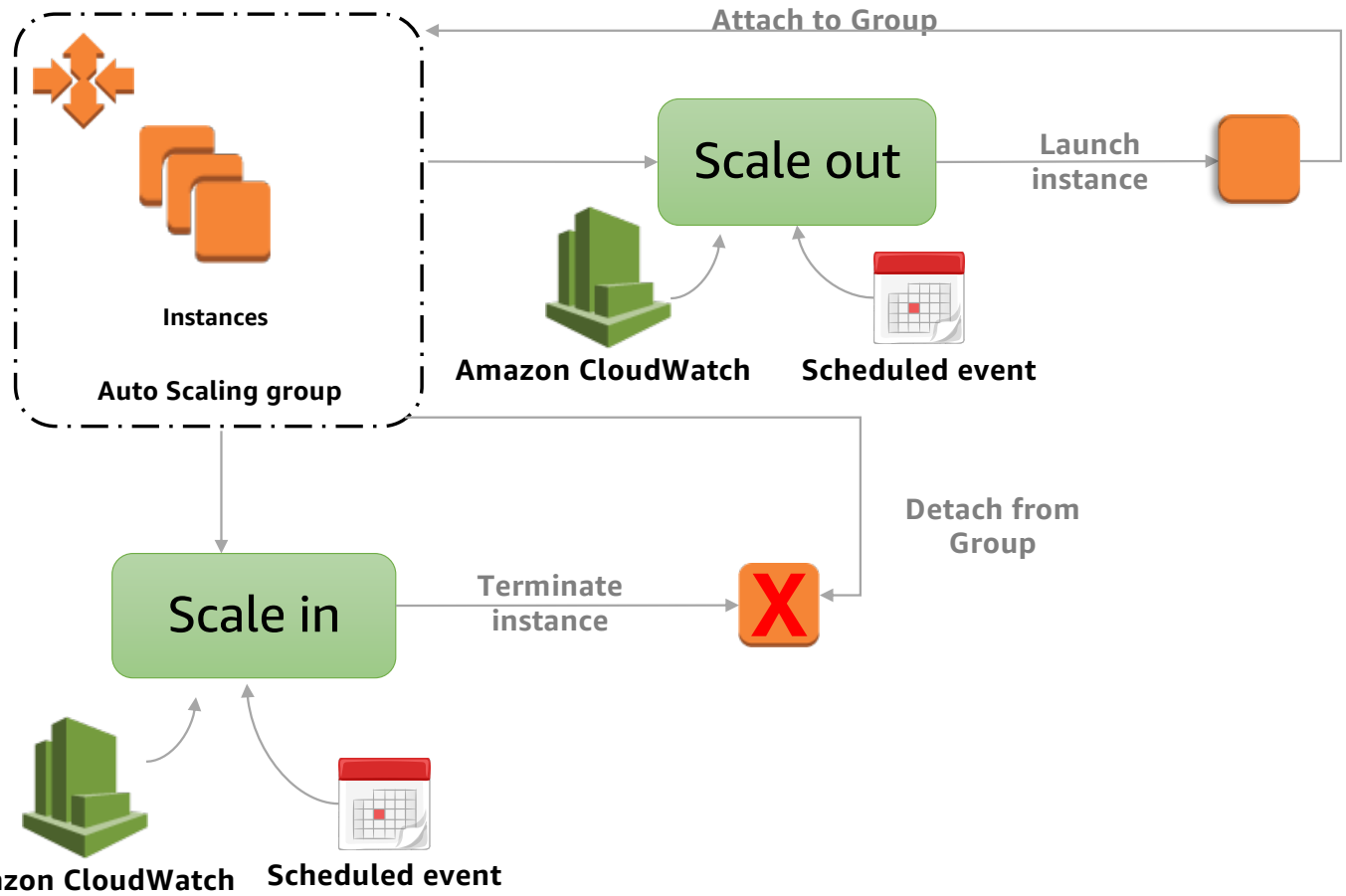
- You can create a scaling policy that uses CloudWatch alarms to determine:
  - When your Auto Scaling group should scale out.
  - When your Auto Scaling group should scale in.

- You can use alarms to monitor:
  - Any of the metrics that AWS services send to Amazon CloudWatch.
  - Your own custom metrics.

Auto Scaling Basic Lifecycle



AWS Trusted Advisor?

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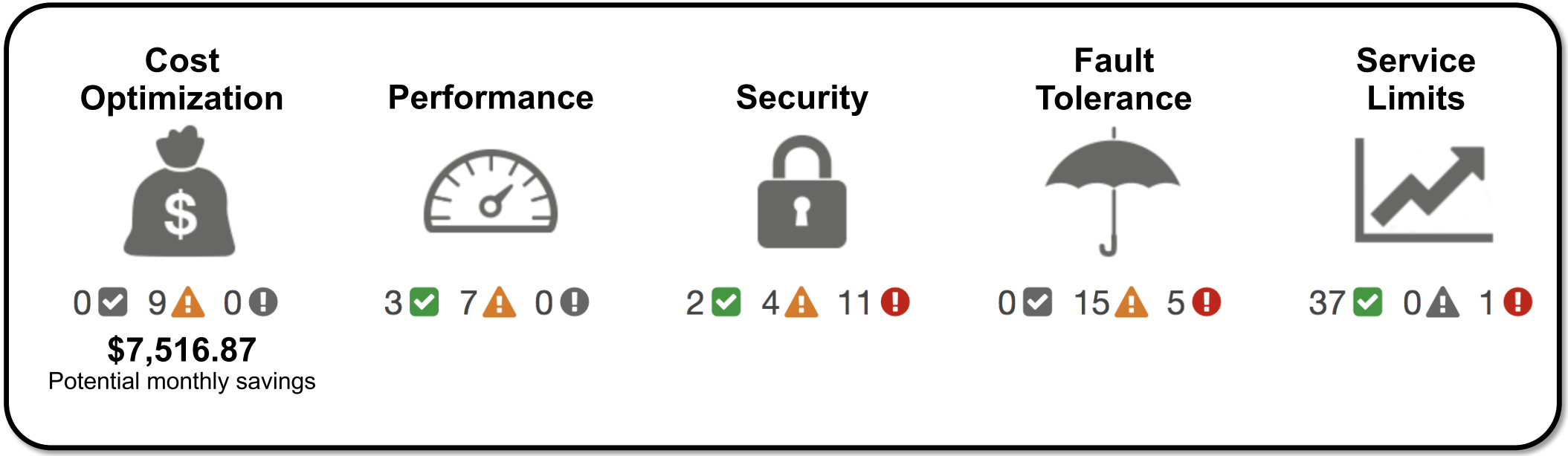
A service providing guidance to help you reduce cost, increase performance, and improve security



Trusted Advisor: Core vs. Full

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Core Checks and Recommendations (included)

- Seven core checks around security and performance
- Service Limits

Full Trusted Advisor Benefits

(With Business or Enterprise support)

- Full set of checks
- Notifications
- Programmatic Access via API

Knowledge Check

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- **True or False**: Auto Scaling helps you ensure that you have the correct number of EC2 instances available to handle the load for your application.

  True

- Q: What feature would you use with an Auto Scaling policy to determine when your Auto Scaling group should scale out/in?

  Amazon CloudWatch alarms

- Q: You have an application composed of individual services and need to route a request to a service based on the content of the request. What type of load balancer should you use?

  Application Load Balancer

- Q: Which AWS service serves as a best practice and recommendation engine?

  AWS Trusted Advisor

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Lab 3: Scale and Load Balance your Architecture

~ 40 minutes

What You're Starting With: Lab 2 Review

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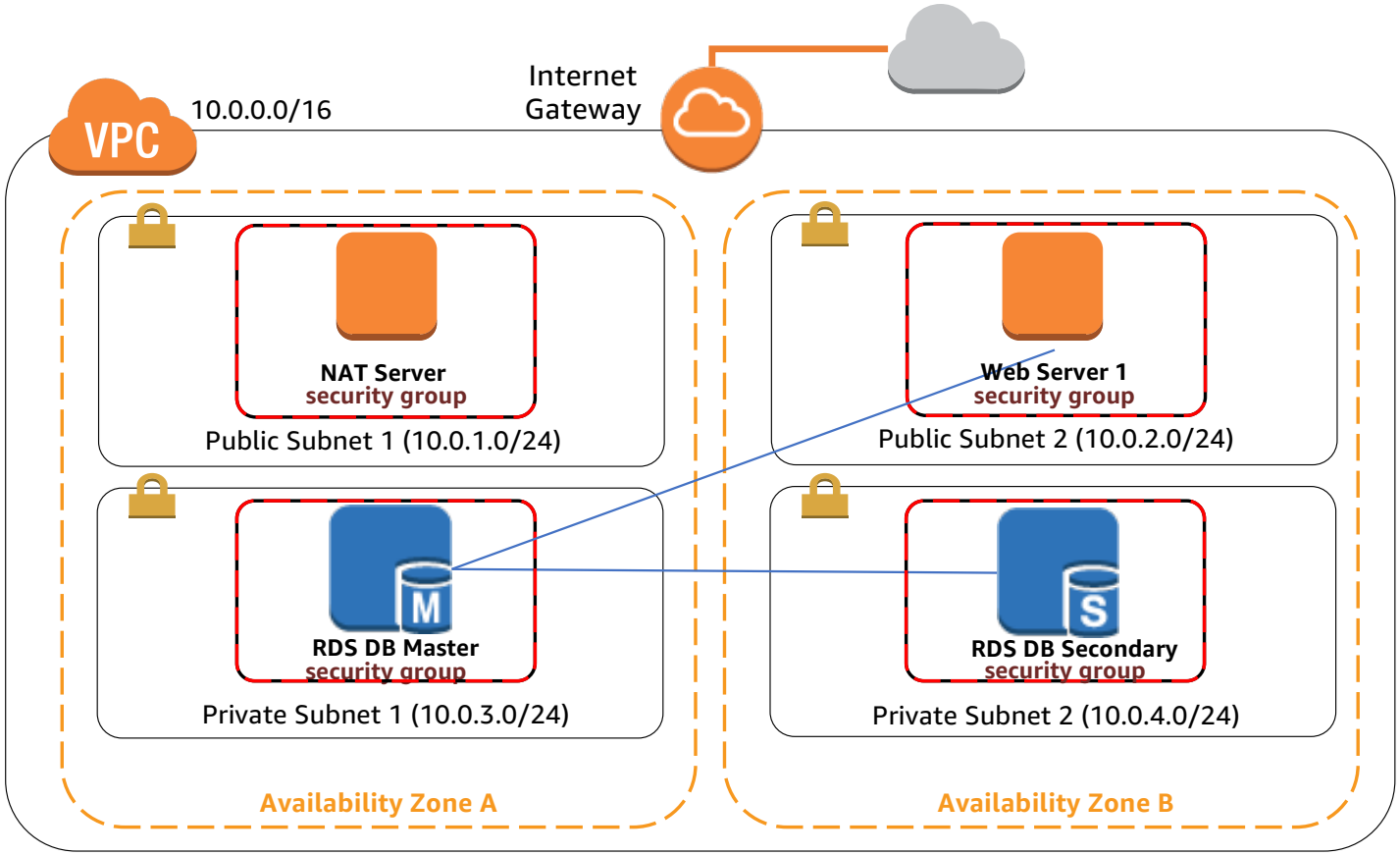

Lab 3 Overview

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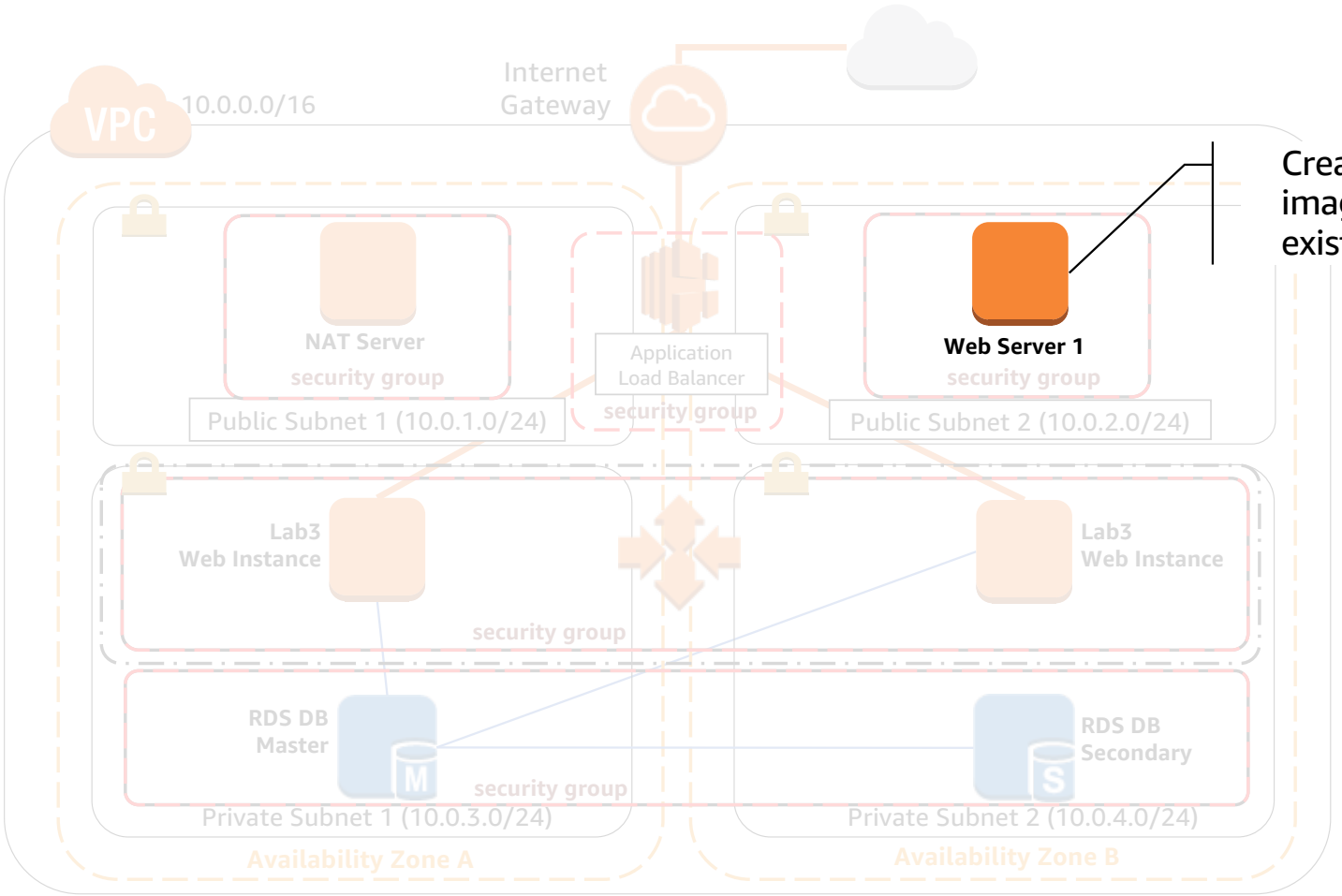
1

- Auto Scaling
  - **Create an AMI** from the running web server instance
  - Add a **load balancer**
  - Create a **launch configuration**
  - Create an **auto scaling group**
  - **Launch instances** within private subnet
  - Add instances to load balancer

2

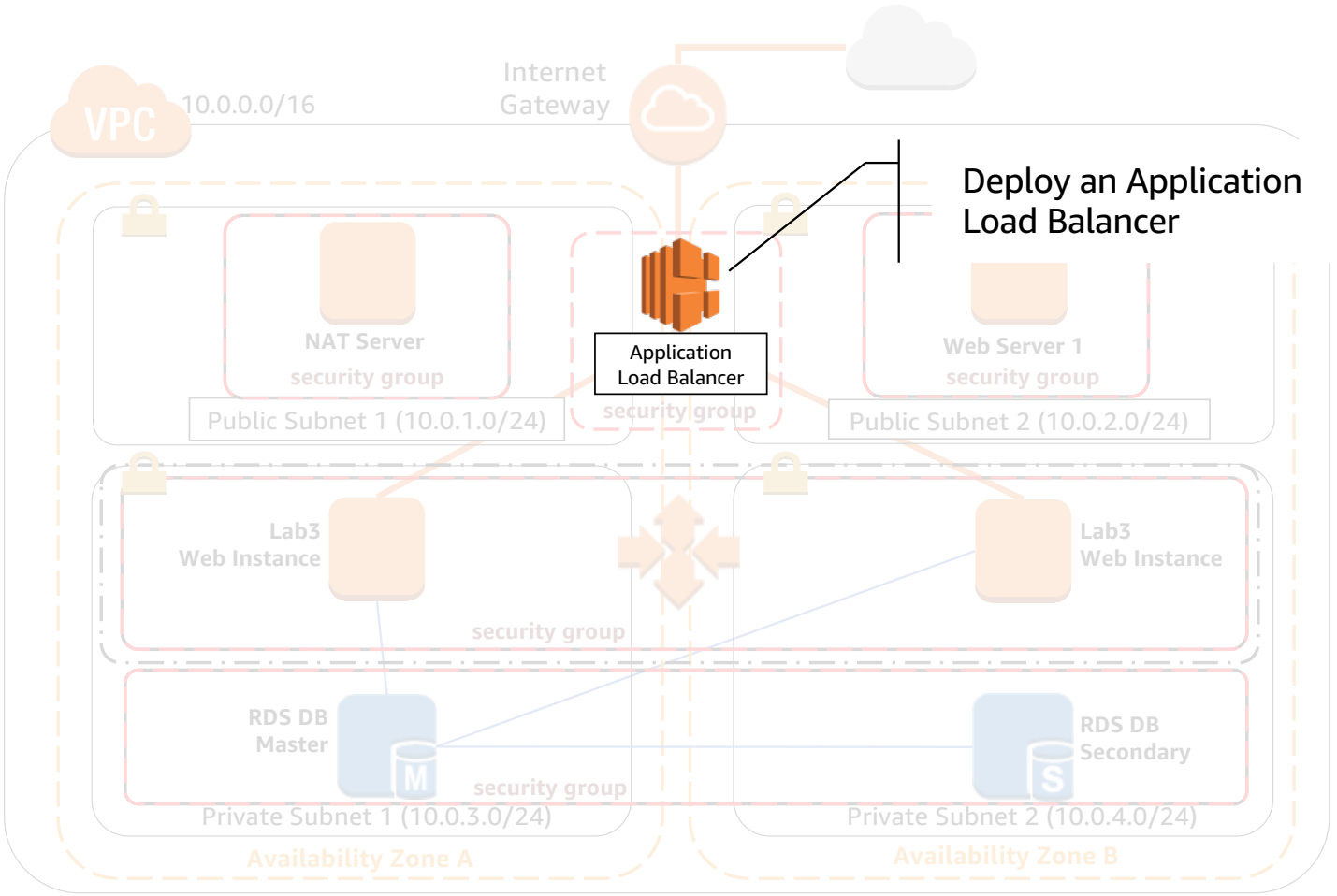
- **Test** auto scaling
- **Monitor** performance with CloudWatch alarms

Lab 3: Scale and Load Balance your Architecture (1 of 5)

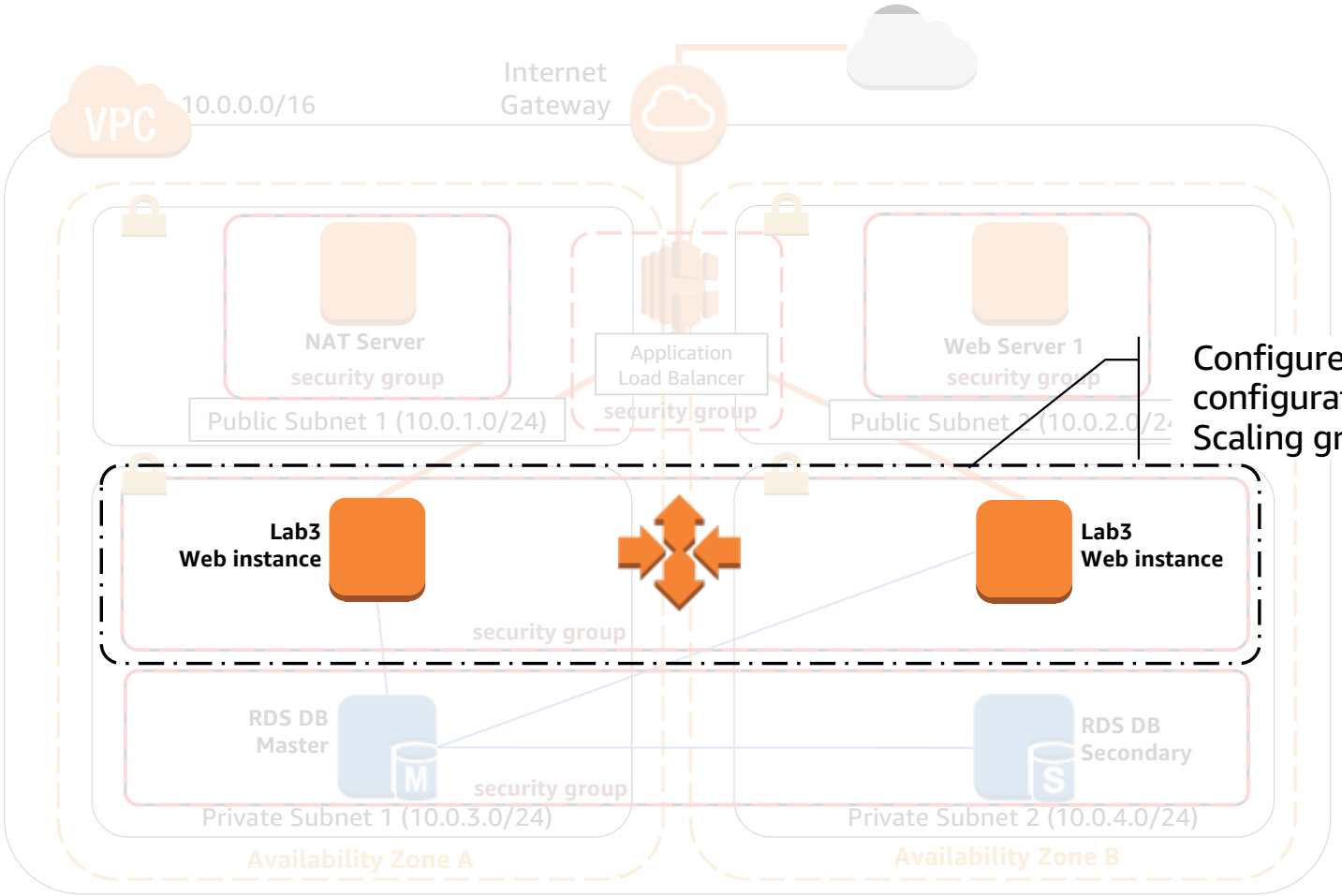


Create an AMI image from an existing instance

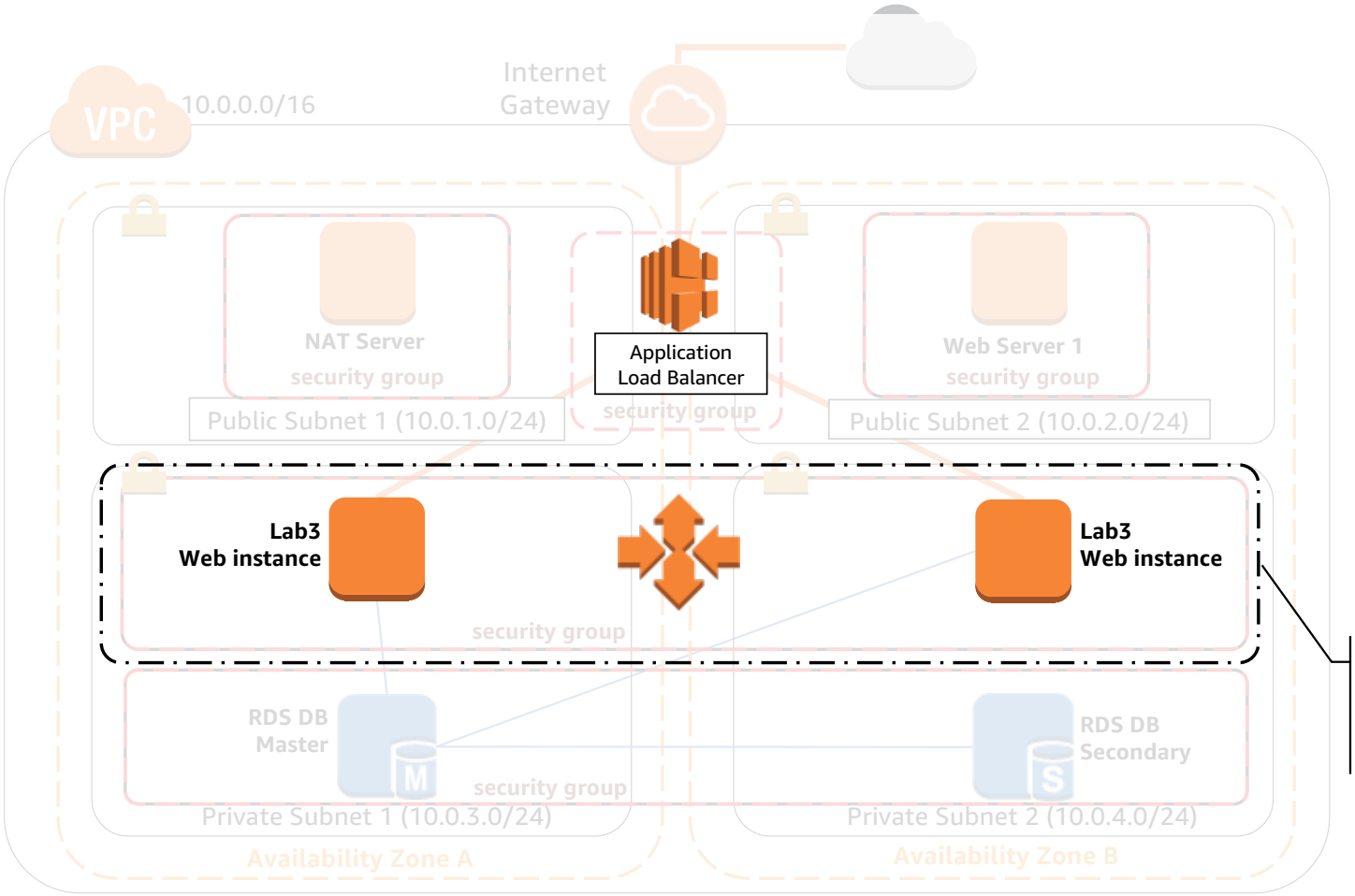
Lab 3: Scale and Load Balance your Architecture (2 of 5)



Lab 3: Scale and Load Balance your Architecture (3 of 5)

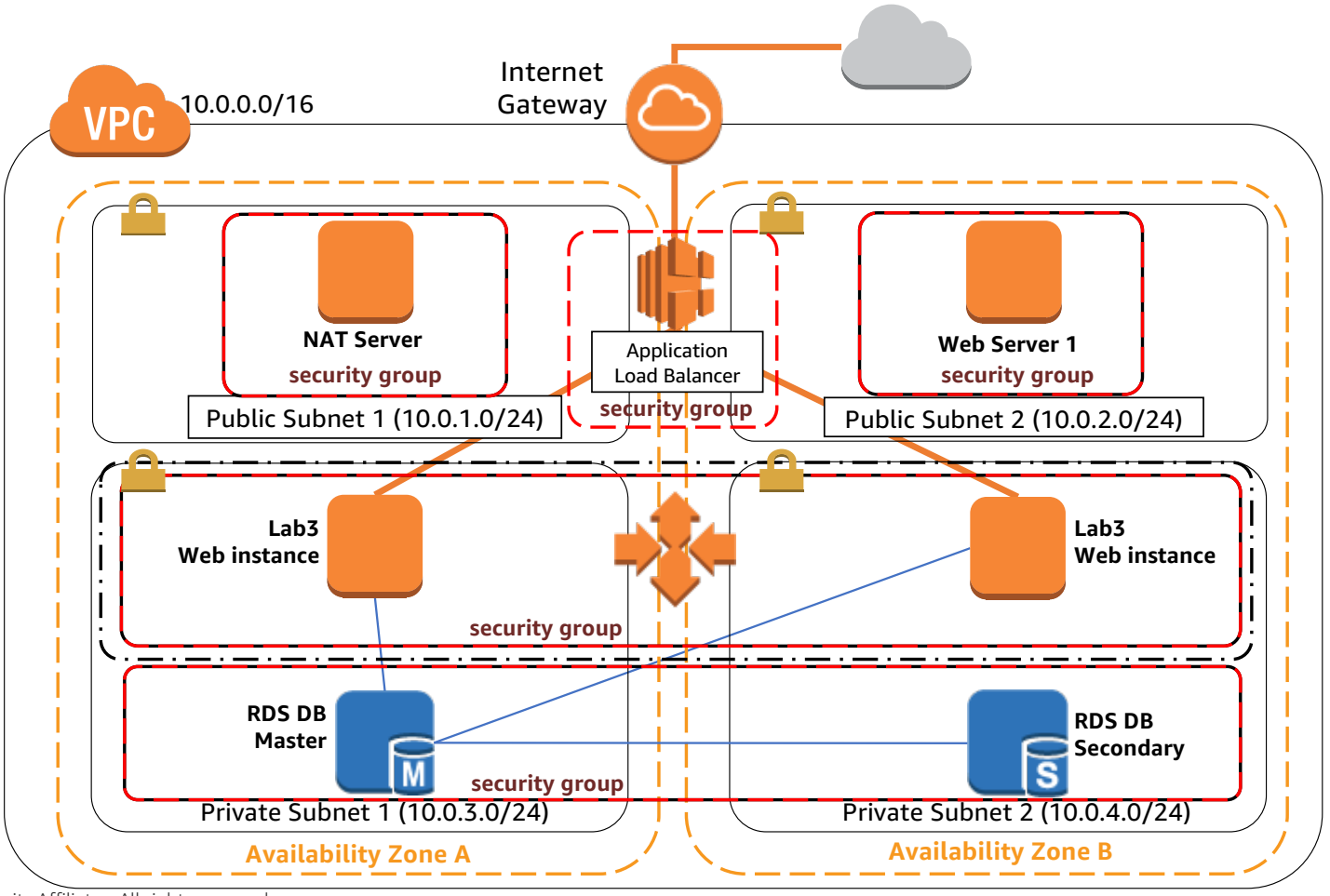


Lab 3: Scale and Load Balance your Architecture (4 of 5)



Test and monitor your Auto Scaling group

Lab 3: Scale and Load Balance your Architecture (5 of 5)



Thanks for participating!

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