# Automated Deployments with CloudFormation

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# Module Overview

CloudFormation fundamentals

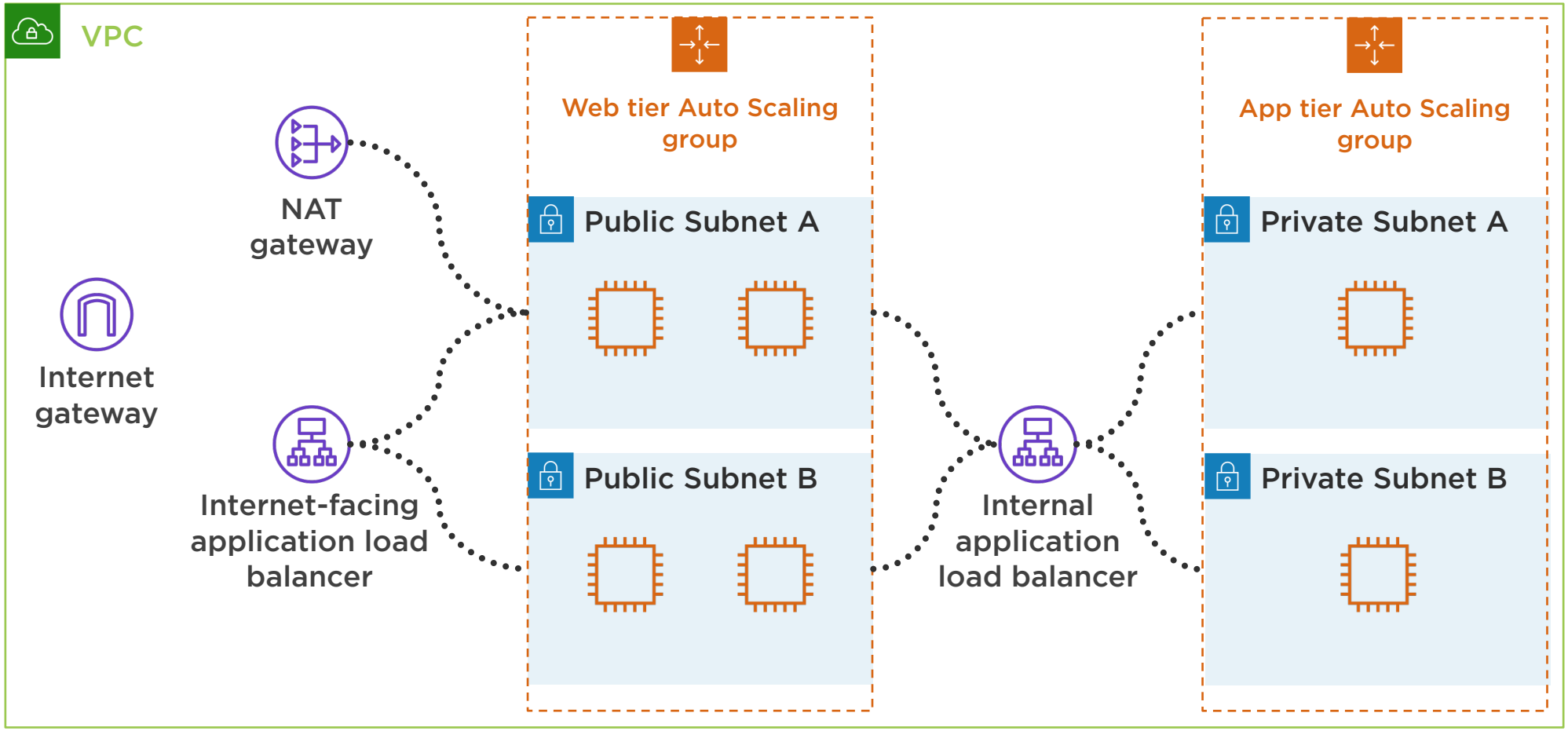
Review application architecture

Application load balancers

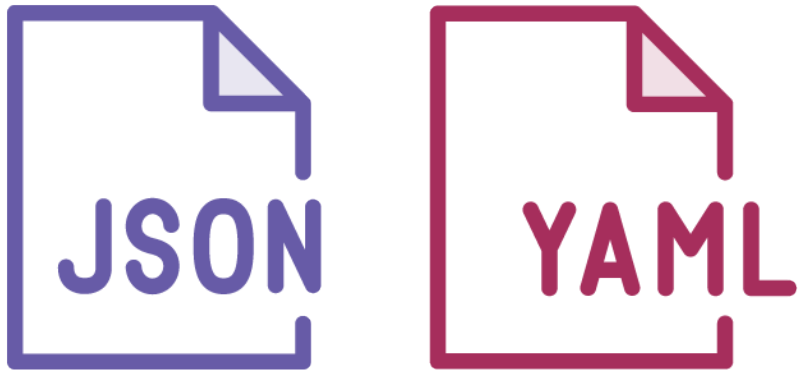
Auto Scaling groups

Deploy sample application

# Sample Application Architecture



# Template

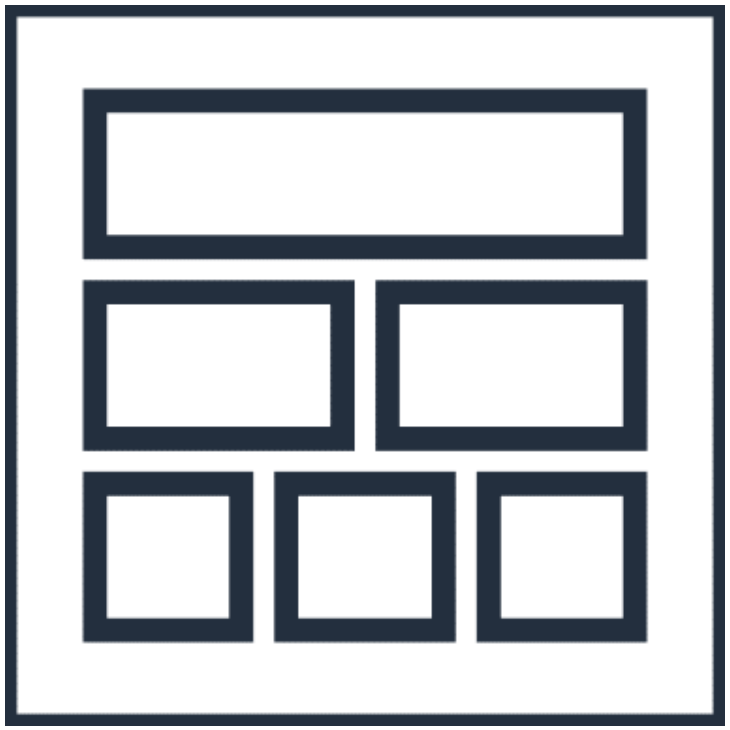



JSON or YAML document that describes AWS resources

Infrastructure as code

Used to create a stack

# Stack



Created by a template

Collection of resources that you create, update, and delete as a single unit

You can manually manage individual resources in a stack

# Multiple Templates

Different teams manage different resources

Resources have different lifecycles

Distributing resources across different stacks makes them easier to manage

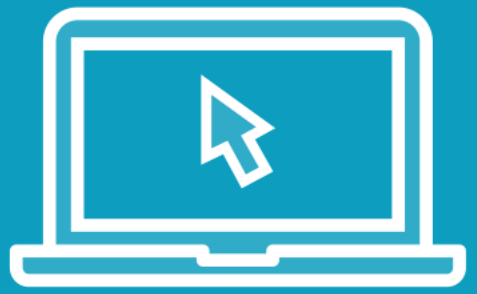
# CloudFormation Templates

**Download them from https://github.com/benpiper/architecting-reliability-aws**

- `app-stack.json`
- `network-stack.json`

# Reviewing the CloudFormation Templates

# Demo



**Load `app-stack.json` and `network-stack.json` into your favorite text editor**

# Nested Stack

`app-stack.json` **creates the parent stack**

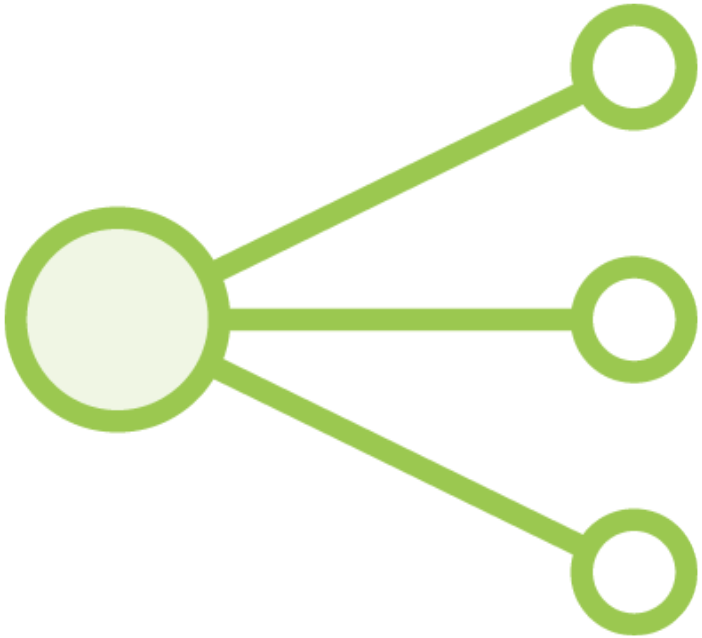
**It calls** `network-stack.json` **to create the nested stack**

# Stack Output

**Key-value pair that CloudFormation makes available to other stacks and via the `aws cloudformation describe-stacks` CLI command**

# Application Load Balancers

# Application Load Balancer (ALB)



Supports HTTP and HTTPS traffic

You can use any TCP port

Listener receives connection from a client and proxies it to an instance in the target group

Uses round-robin load balancing by default

Can monitor health of instances

# Application Load Balancer Schemes

| Internet-facing | Internal |
| --- | --- |
| Reachable from the internet | *Not* reachable from the internet |
| Public IP addresses | Private IP addresses |
| Public DNS name | Private DNS name |

# Health Checks

Each instance must pass its health check before receiving traffic

Sends HTTP GET request and looks for a success code

# HTTP Request and Response

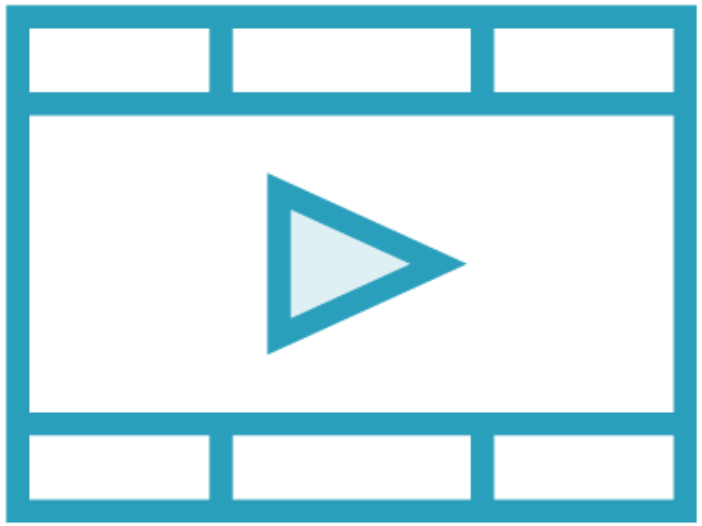
Protocol: HTTP

Port: TCP/80

Request Method: GET

Status Code: 200 OK

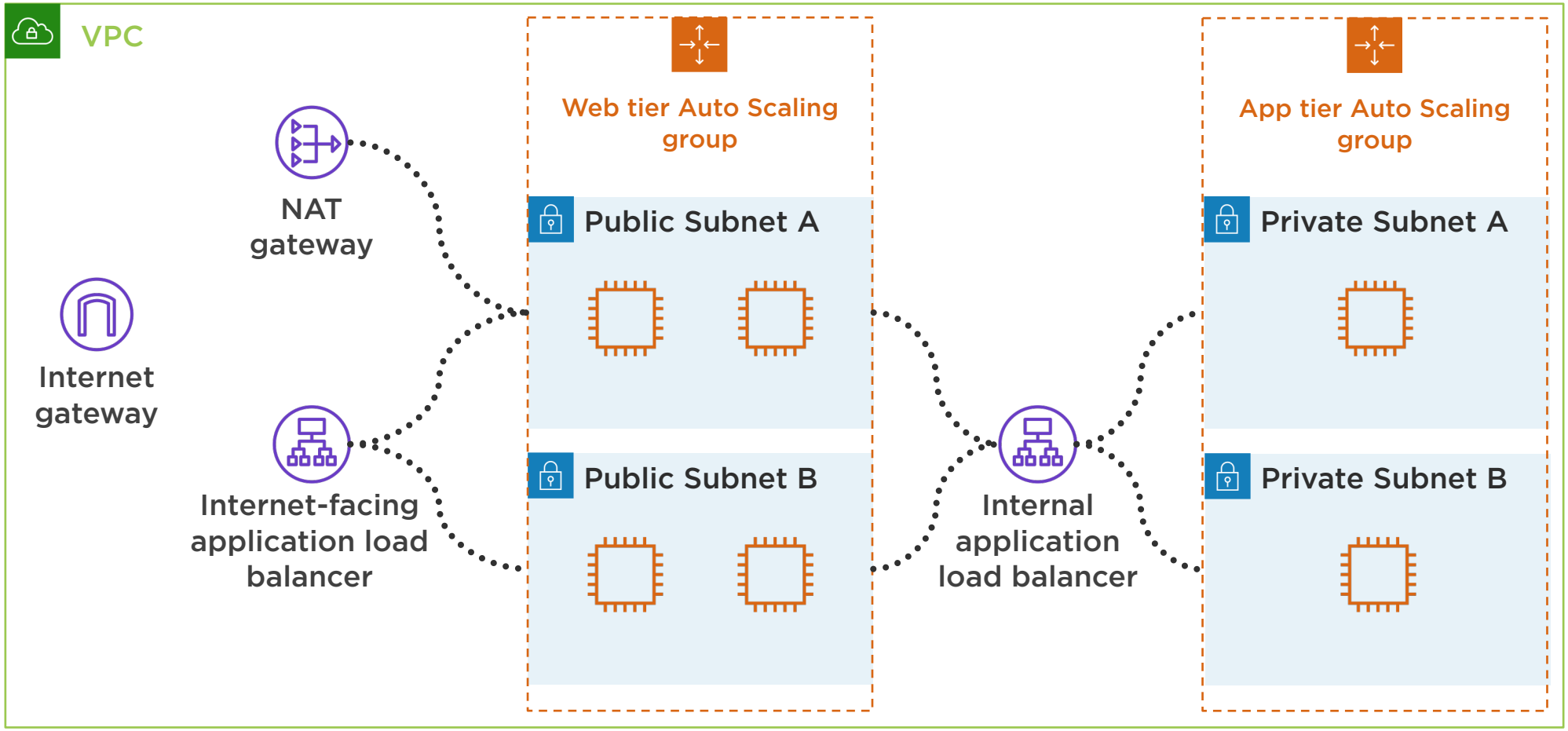
# Course Recommendation



*AWS Networking Deep Dive: Elastic Load Balancing (ELB)*

# Auto Scaling Groups

# Sample Application Architecture



# Auto Scaling Tasks

Launch a certain number of instances into the Auto Scaling group

Add the instances to the ALB target group

Terminate and recreate unhealthy instances

Scale in or out based on average group CPU utilization

# Deploying the Stack

# Demo

**Deploy the application stack from** `app-stack.json`

**Refer to the** `aws-cli-commands.txt` **file**

# Summary

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**CloudFormation saves time and money and reduces errors**

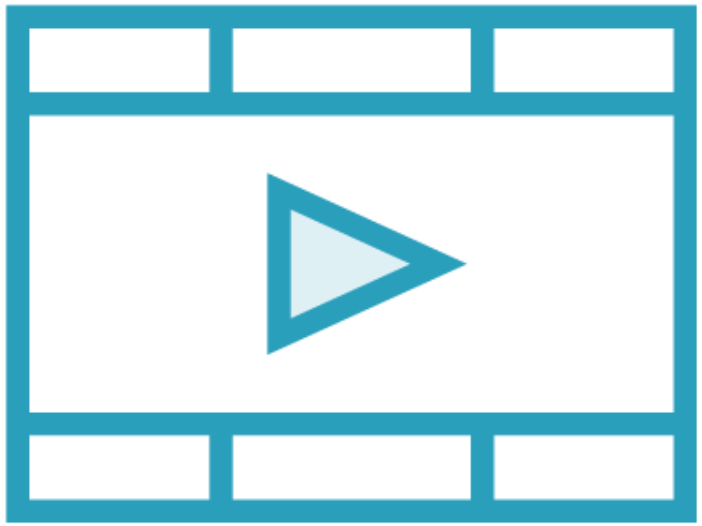
- Fast deployments
- Stacks are all-or-nothing

# Summary

**Elastic load balancing and Auto Scaling work together**

- ELB provides health checks
- Auto Scaling adds instances to the ELB target group

# Course Recommendation



*Architecting for Operational Excellence on AWS*

# Coming up Next

**Multi-region applications with Route 53**