Protecting Network and Host-level Boundaries

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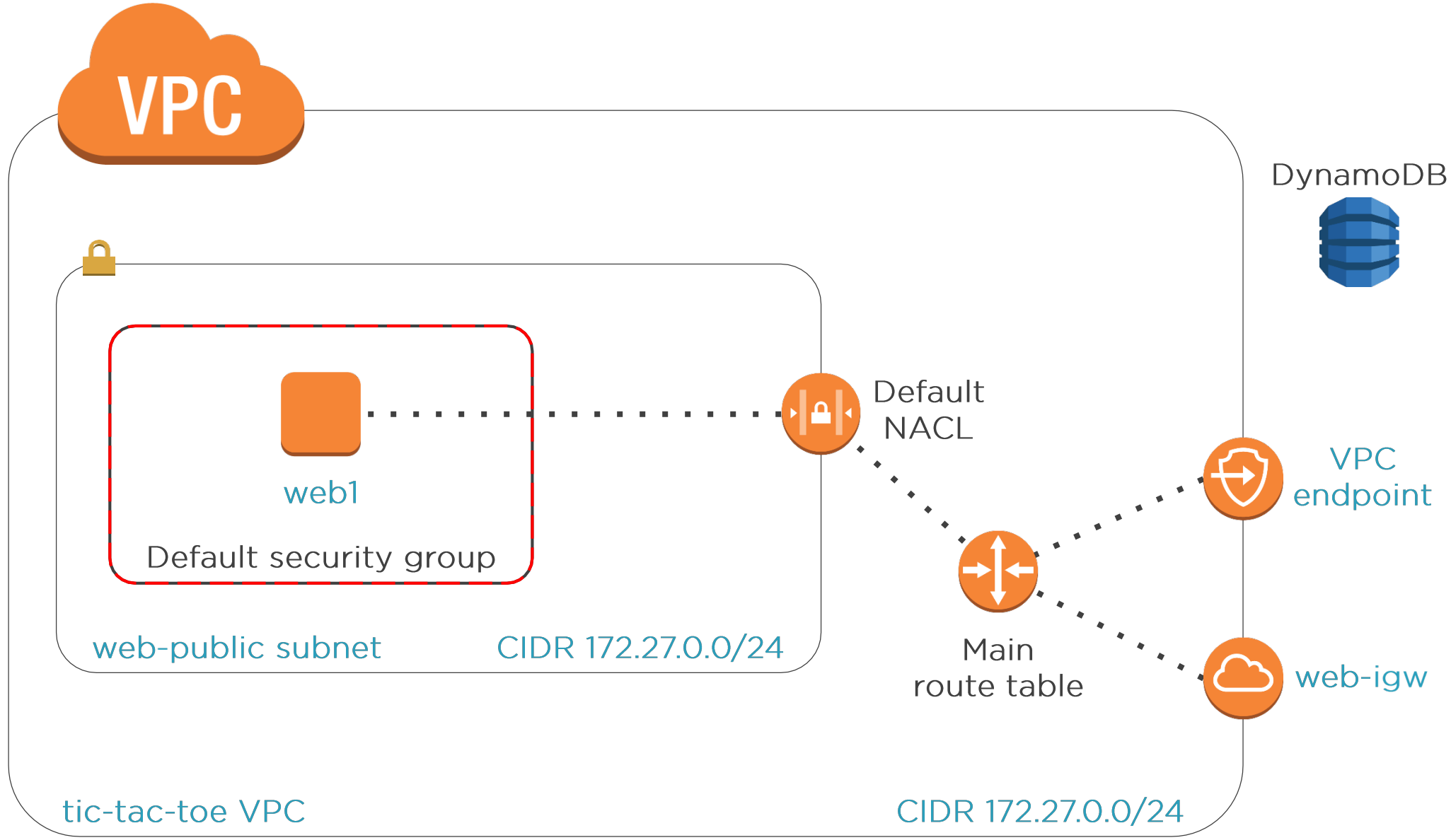

VPC
DynamoDB
web1
Default security group
Default
NACL
VPC
endpoint
web-public subnet
CIDR 172.27.0.0/24
Main
route table
web-igw
tic-tac-toe VPC
CIDR 172.27.0.0/24

Module Overview

Creating a public subnet

Creating and using an IAM instance profile

Using SSH key pairs

Using VPC endpoints

Network access control lists

Demo

- Create the tic-tac-toe VPC
- Create internet gateway
- Add default route
- Reconfigure default security group

Demo

Create IAM role to allow access to DynamoDB

Role will contain a trust policy to allow EC2 instances to assume the role

Launch instance and attach instance profile

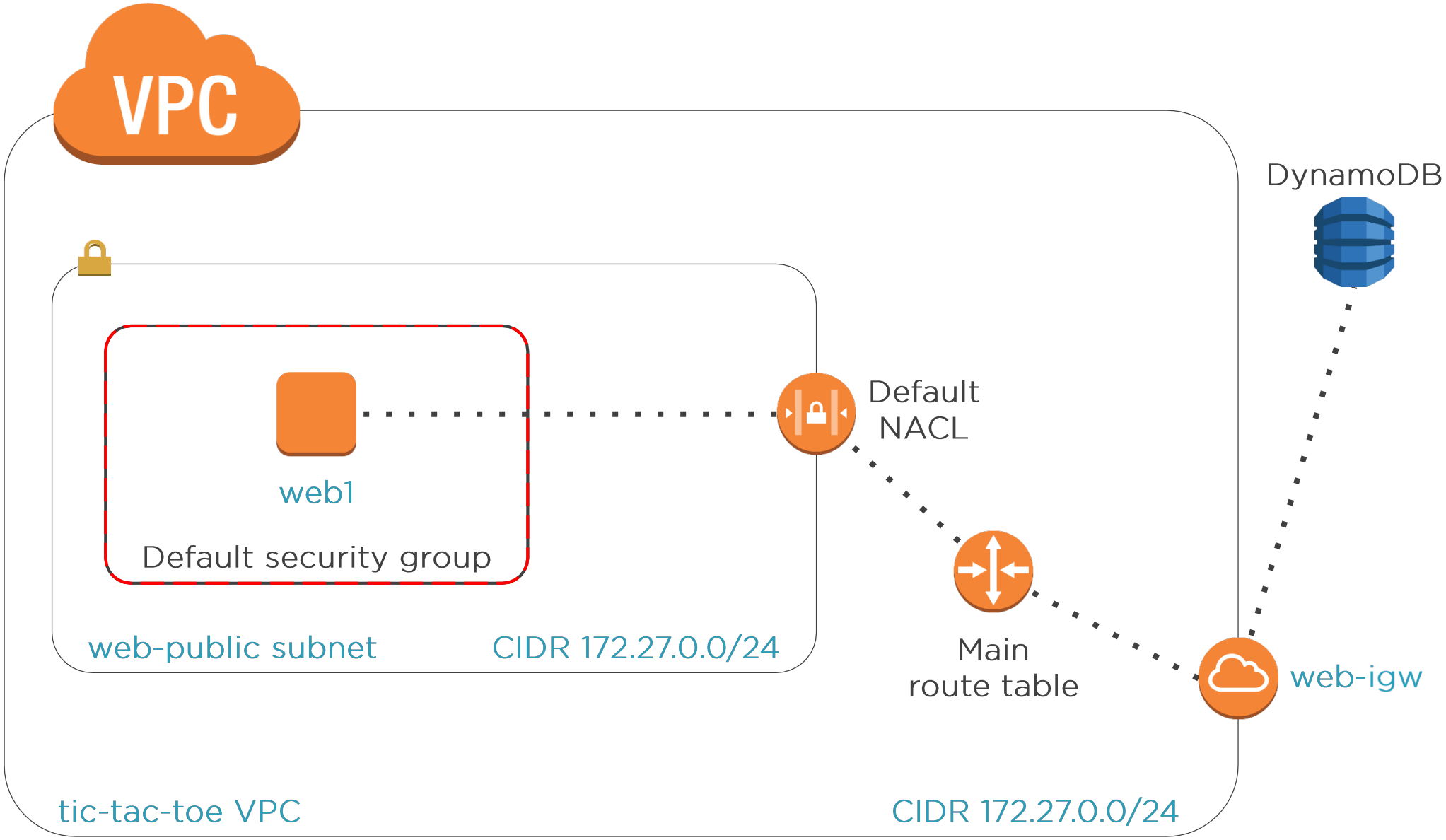
Demo

SSH into instance using OpenSSH client

Linux comes with the client installed

Windows 10 comes with the client installed as of the April 2018 update

Using VPC Endpoints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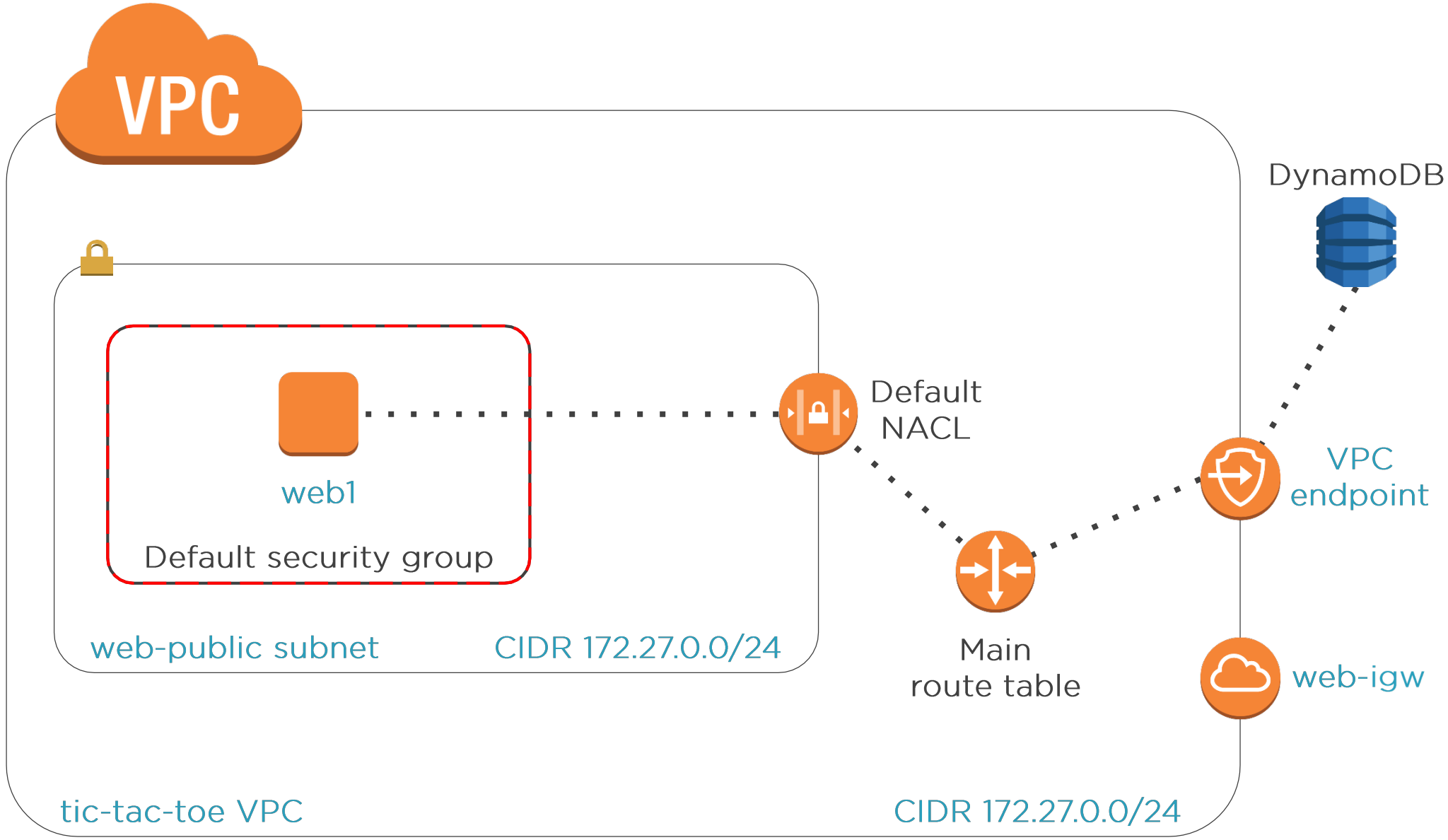
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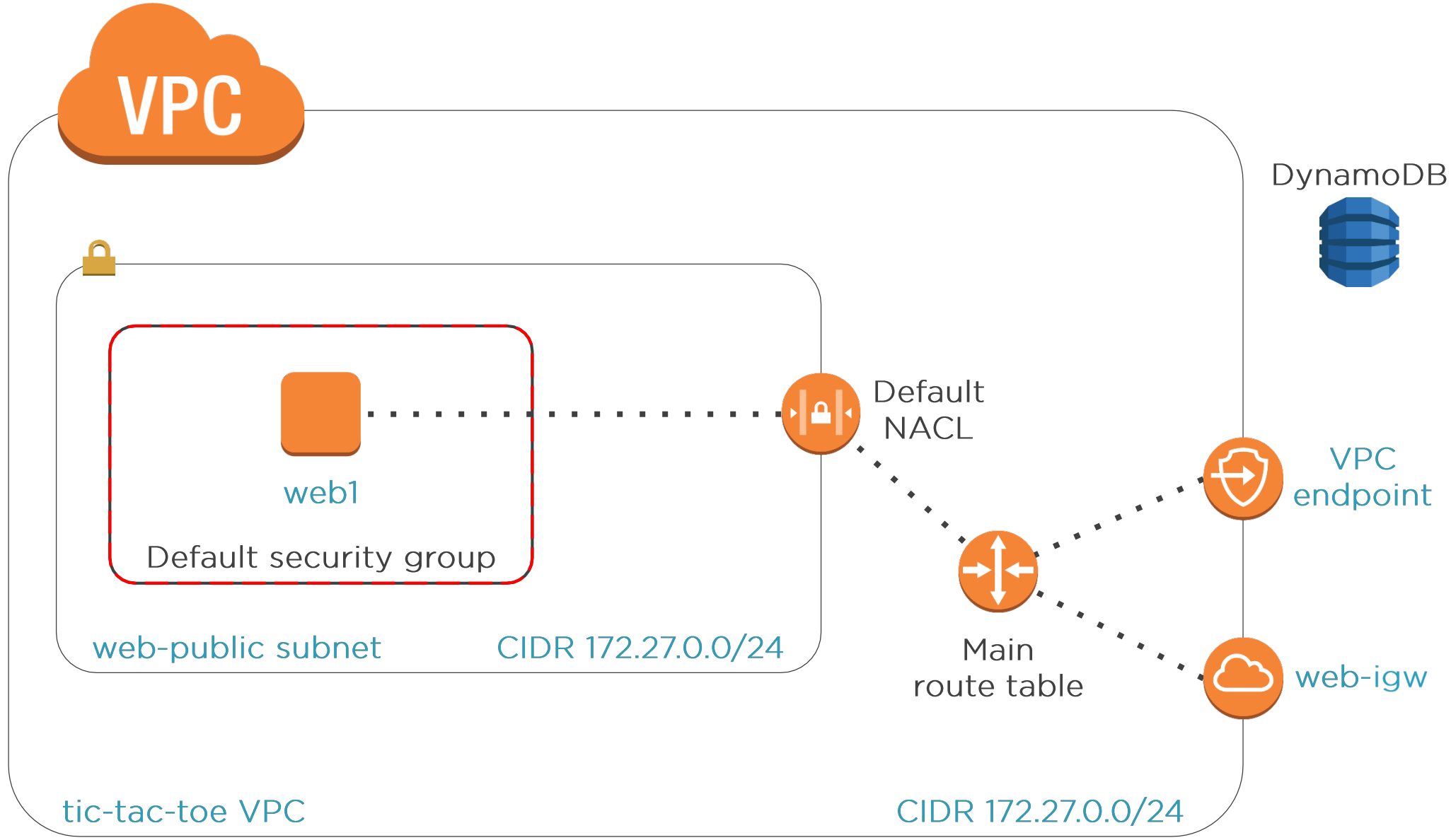
Demo

Block outbound internet access from the instance

Configure VPC endpoint

Network Access Control Lists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Security Group vs. NACL

Security group	NACL
Instance level	Subnet level
Stateful	Stateless
Unnumbered rules	Numbered rules

Demo

Explore the structure of NACL rules

Reconfigure the default NACL

Summary

A public subnet has a default route to an internet gateway

Use an IAM instance profile to grant an instance access to an AWS service

Decide whether to connect to AWS endpoints via the internet or a VPC endpoint

Security groups and network access control lists act as firewalls but differ in significant ways

Coming up Next

Protecting data at rest

Understanding CloudTrail

Event Types

Management

Configuration changes to AWS services

Reading resources

Logging into the management console

Assuming a role

Data

Access to S3 objects

Lambda function execution

CloudTrail logs are stored in S3

Limit what you log to control costs

Demo

Analyze event logs that CloudTrail stores by default

Configure CloudTrail to log all management write events

CloudTrail vs. CloudWatch Logs

CloudTrail vs. CloudWatch Logs

CloudTrail

Logs AWS actions

Stores logs in S3

CloudWatch Logs

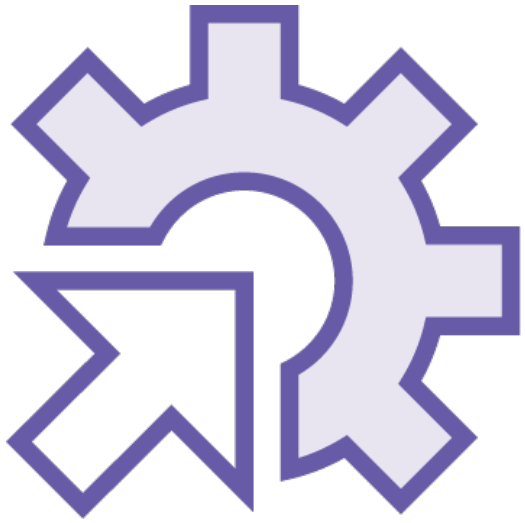
Aggregates logs from CloudTrail *and* non-AWS sources

Provides interface to view and search logs

Configuring CloudWatch Logs

Create a CloudWatch Logs log group to store CloudTrail logs

Configuring CloudWatch Logs



Create IAM service role

- Contains inline service policy that grants CloudTrail permissions to send logs to CloudWatch Logs
- Contains trust policy that allows CloudTrail to assume the role

Role is an IAM principal for CloudTrail to use to authenticate to CloudWatch Logs

Demo

Create a log group in CloudWatch Logs

Create an IAM role for CloudTrail to assume

Browse and search logs in CloudWatch Logs

Demo

Create CloudWatch alarm to trigger when CloudTrail logs a management event

Searching Logs with Athena

Why Athena?

You don't want to use CloudWatch Logs

You want to search the contents of S3 objects

Athena uses SQL

You must provide the schema

AWS provides the schema for CloudTrail logs

Demo

Select the S3 bucket containing the objects to search

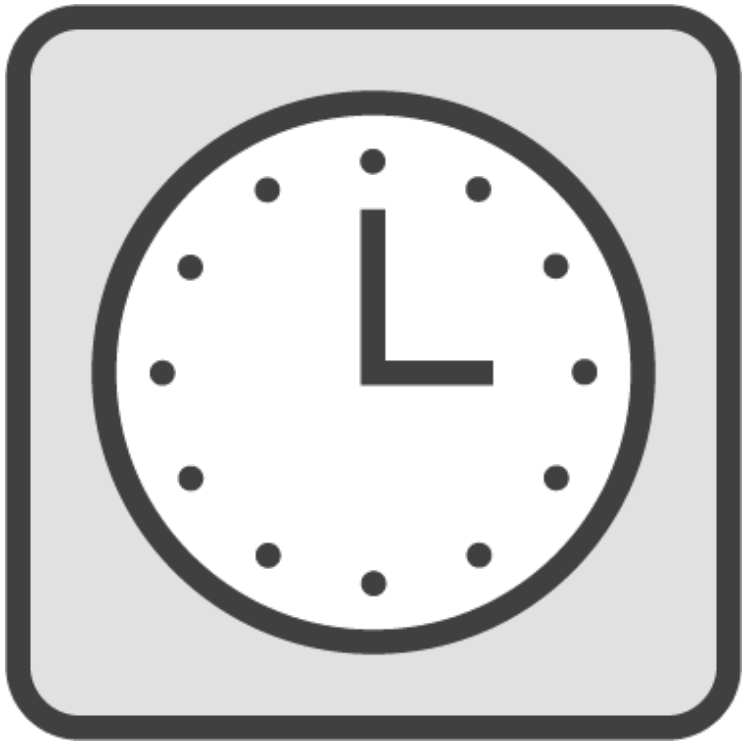
Create a table in Athena

Run queries against CloudTrail logs

Tracking Configuration Changes in AWS Config

Events and Configuration States

AWS Config



Tracks configuration changes over time

Records changes in S3

Notifies of changes