Cloud Engineering

Week 11 Intro

SWINBURNE UNIVERSITY OF TECHNOLOGY

Typical Week

Watch Lecture Videos for the week before your first class

Attend every Q&A session – useful assessment tips

Attend every Lab

- Read Entire Instructions before Class
- Can get ahead on labs using Lab Reports to free up time

Start working on assignments and preparing for tests early

Typical Week

Consultation

- Every Teaching Week
- Underutilised

Discussion Board on Swinburne Canvas

- General questions

Week 11 Intro

This week:

– Multi-Cloud

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Multi-Cloud

Multi-Cloud

AWS and Oracle

Introduction to Multi-Cloud

Next week

Next Week

Complete Remaining Assessments (see Swinburne Canvas for details)

Certification

- AWS Certified Cloud Practitioner
- AWS Solutions Architect Associate
- Oracle Cloud Infrastructure (OCI) Foundations Associate
- Oracle Cloud Infrastructure (OCI) Architect Associate

Cloud Engineering

Why Multi-Cloud?

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Why Multi-Cloud?

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Why Multi-Cloud

Recap

Public Cloud

Private Cloud

Hybrid Cloud

Multi Cloud

Why Multi-Cloud

Competition heating up

Economies of Scale

Greater Competition

Range of Services

Customer

Why Multi-Cloud

Customer - Why?

1. Lower costs

- Profit

- Remain viable

Why Multi-Cloud

Customer - Why?

2. No Vendor Lock-In

- Risk of price increase
- Ease of Moving Vendors
- Remaining Competitive

Why Multi-Cloud

Customer - Why?

3. Best Cloud for Each Part of Infrastructure

e.g.
OCI for Oracle Database
AWS EC2 for Compute

Why Multi-Cloud

Customer - Why?

4. Compliance or Legal Reasons

- Must use multiple vendors

Why Multi-Cloud

Customer - Why?

5. Disaster Recovery

- Failover
- Same City
- Low Latency

Why Multi-Cloud

Customer - Why?

6. Marketability

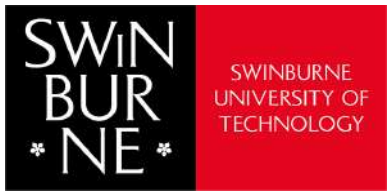
- Brand Name

Why Multi-Cloud

Customer - Why?

Plus more

Cloud Provider



Why Multi-Cloud

Cloud Provider – Why?

1. Win Customer Completely

- Migration

Why Multi-Cloud

Cloud Provider – Why?

2. Win Market Share

- Piece of the action
- Foot in the door

Why Multi-Cloud

Cloud Provider – Why?

3. Defend Market Share

- Keep Piece of the action
- Keep Foot in the door

Why Multi-Cloud

Cloud Provider – Why?

4. Marketing

- Embrace Trends
- Build Trust

Why Multi-Cloud

Cloud Provider – Why?

5. Cross-Selling

- Promote proprietary service
  e.g. Oracle Database

You (IT Worker)

Why Multi-Cloud

You (IT Worker) – Why?

1. Potential Employment

- Stand out

- Beyond Certification

Why Multi-Cloud

You (IT Worker) – Why?

2. Win Business

- Understand your customer's requirements
- Best solution for them
- Promote strengths

Cloud Engineering

Comparing AWS and OCI

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Comparing AWS and OCI

This presentation:

- AWS and OCI
- How they compare
- Focusing on what we have learnt

Comparing AWS and OCI

Overview

- AWS & OCI are different
  - Different web management interface
  - AWS Organisations vs OCI compartments
- AWS & OCI have a lot in common

Comparing AWS and OCI

Infrastructure Overview

AWS	OCI
Region	Region
≥ 3 AZs per Region	≥ 1 ADs per Region, 3 FD per AD
VPC	VCN
Subnet	Subnet
Security Group	Network Security Group
NACL	Security List
Route Table	Route Table
Internet Gateway	Internet Gateway
NAT Gateway	NAT Gateway

Comparing AWS and OCI

Networking and Storage

AWS	OCI
VPN	VPN
Direct Connect	Fast Connect
VPG	DRG
CGW	CPE
EC2	OCI Compute Instance
AMI	VM Image
Lambda	OCI Functions
EBS	Block Volume
EFS	File Storage
S3	Object Storage
Bucket	Bucket
Object	Object

Comparing AWS and OCI

DB & Security

AWS	OCI
RDS MySQL	MySQL Database
DynamoDB	Oracle NoSQL Database
RDS Oracle	Oracle Database
-	Oracle Autonomous Database
RDS Multi-AZ	Data Guard
IAM	IAM
Policies	Policies
Users & Groups	Users & Groups
WAF	WAF
CloudWatch	OCI Monitoring Service
Shared Responsibility Model	Shared Responsibility Model
KMS	KMS

Comparing AWS and OCI

Conclusion

- Many services available at both
- Growing maturity in industry
- Cloud continuing to evolve
- Multi-Cloud

Cloud Engineering

Connecting two Public Clouds

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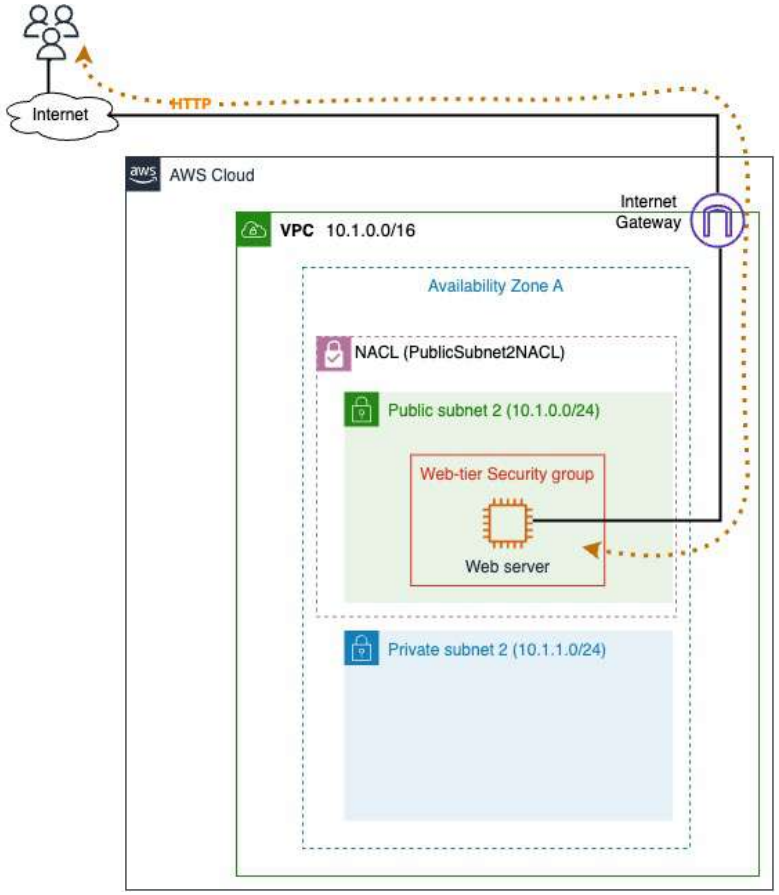
Connecting two Public Clouds

This presentation:

- Connecting AWS to OCI

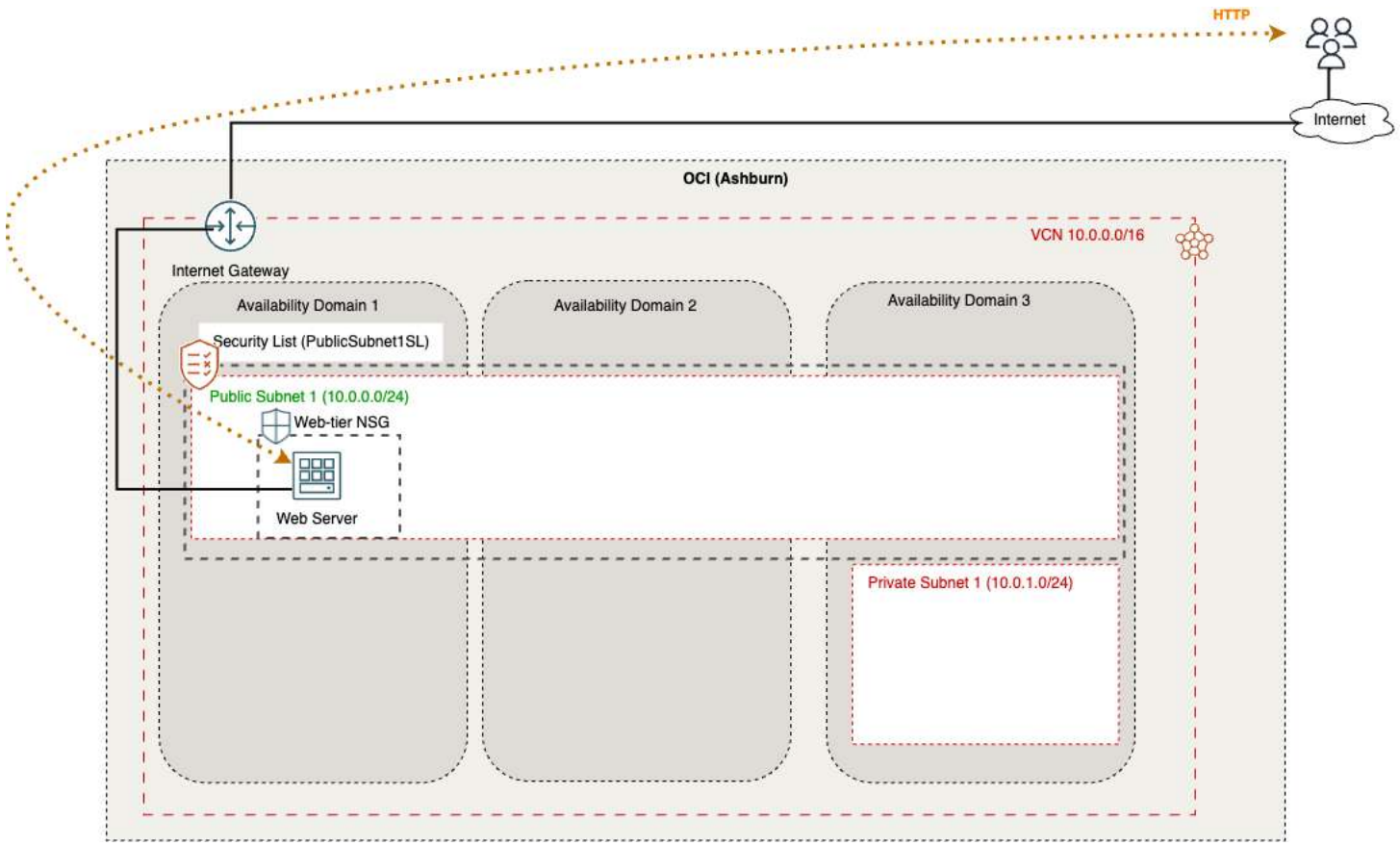
Connecting two Public Clouds

AWS Only



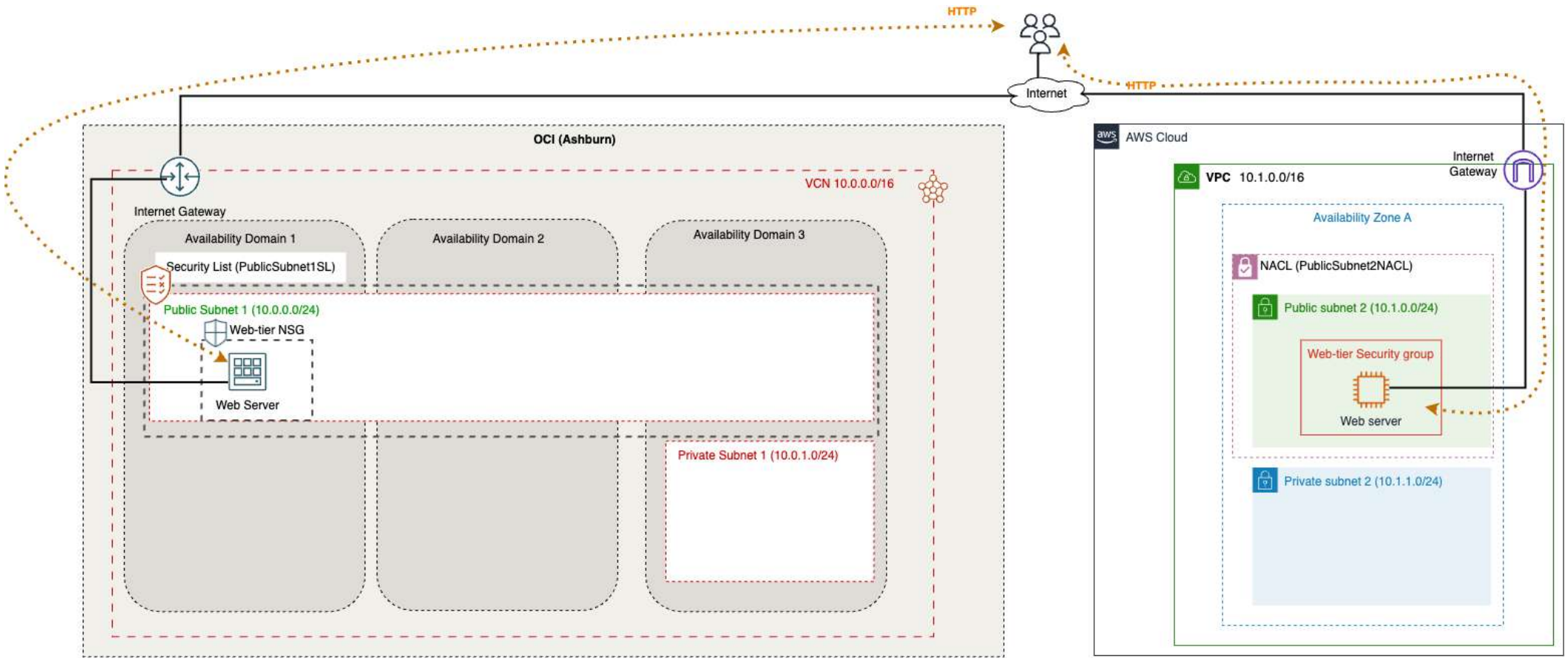
Connecting two Public Clouds

OCI Only

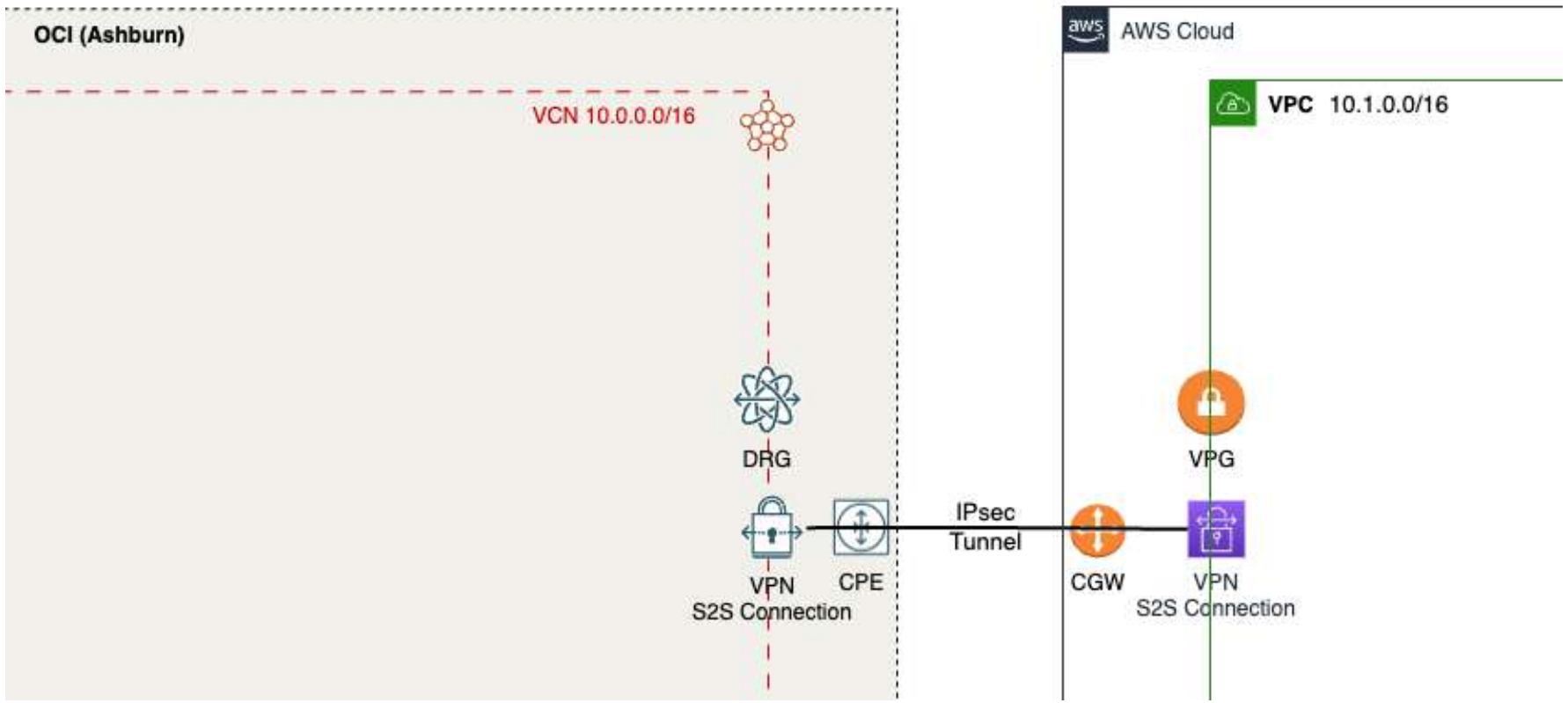


Connecting two Public Clouds

Both, but not connected



Connecting two Public Clouds



Connecting two Public Clouds

Bit more to it

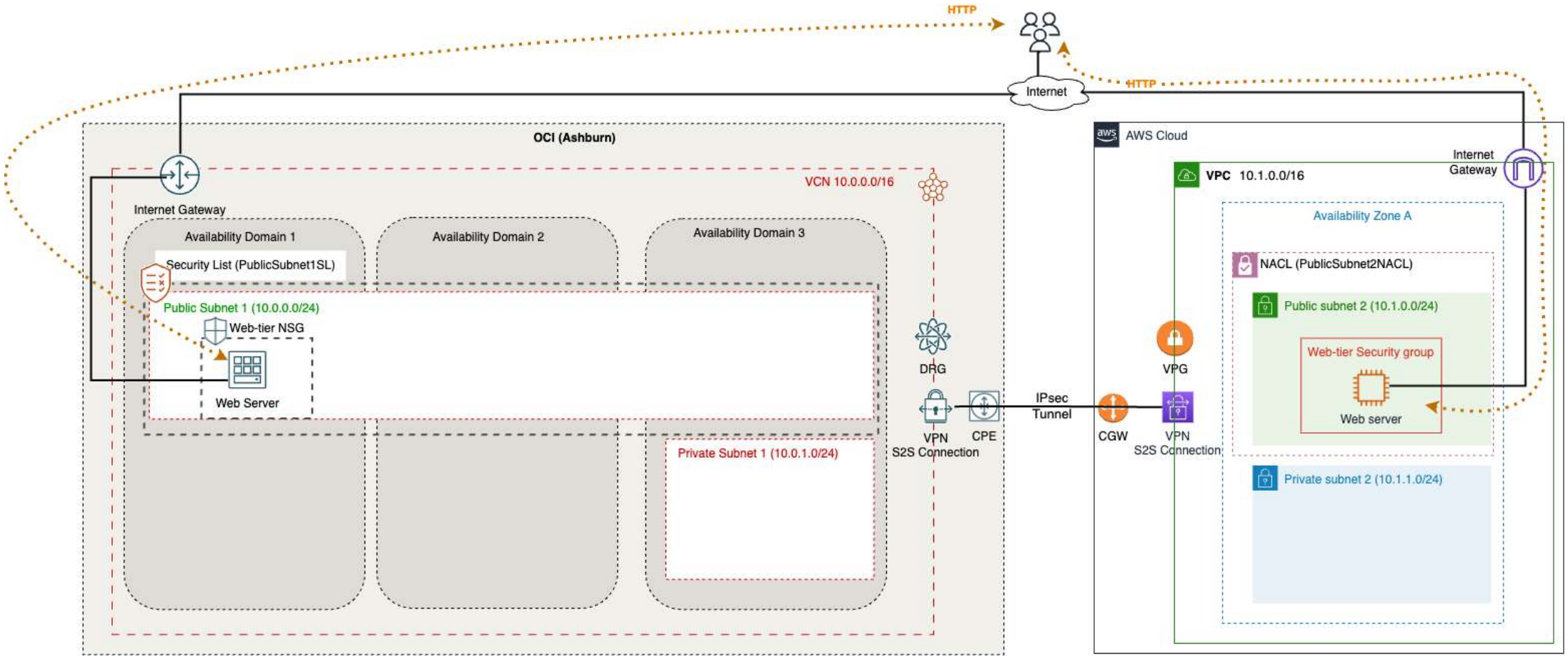
e.g.

- Security Groups

- Security Lists/NACL

Connecting two Public Clouds

Multi-Cloud



Cloud Engineering

Securing Multi-Cloud

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Securing Multi-Cloud

This presentation:

- How we secure multi-cloud
- Need to consider

Securing Multi-Cloud

Connection between the clouds

- Use a VPN
- So what is there to talk about?

Securing Multi-Cloud

Security in the Cloud

- Shared Responsibility Model
- Public Cloud x2 (or more)

Securing Multi-Cloud

Users and Groups

- Identity Federation

Securing Multi-Cloud

Resources and Services

- Security configured differently
- Need technical expertise
- Need to know each cloud

Securing Multi-Cloud

Networking

- Traffic to/from same cloud
- Traffic to/from other cloud

Securing Multi-Cloud

Web Application

- Could use OCI WAF for both
- What if OCI goes down?
- Do we use a separate WAF for each cloud?
- How do we configure DNS to failover automatically from one Cloud to the other?

Securing Multi-Cloud

Automating Deployment

- Challenging to determine security configuration
- Want it reusable
- Automate: AWS CloudFormation, Hashicorp Terraform etc.
- Complex architectures

Securing Multi-Cloud

Key Takeaways

- We have more to consider
- Choices to make
- Security in the Cloud => Security in the Clouds