COLLABORATE14
TECHNOLOGY AND APPLICATIONS FORUM FOR THE ORACLE COMMUNITY

#C14LV

Deploying High Availability and Business Resilient R12 Applications over the Cloud

Session ID#: 13773

Deploying R12 applications over the cloud - The best practices you need to know and the pitfalls to avoid

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Introduction – Sampat Palani

- Engaged with CTR as the Director, Infrastructure & Cloud Solutions.
- 12+ Years working with Oracle and related products: Oracle RDBMS, Oracle Applications, Unix & Linux
- 4+ Years building and supporting enterprise class applications that leverage the cloud.
- Certified Oracle Specialist, Six Sigma Green Belt, Java Programmer, PMP & CSM.
- More about me ? http://samx18.io

Introduction - CTR

- Global Systems Integrator – North Americas & Asia Pacific locations.
- Oracle Gold Partner.
- AWS & Rackspace Partner.
- Working with clients since 1998 to Deploy & Support Oracle products both on site and in a cloud model.
- More about CTR? http://ctrworld.com

Session Agenda

- Summary – What the session will cover
- Pre-requisites and Assumptions
- Critical Components and Terminology
- Business Resilient Oracle Applications – Focus Areas
- Deploying a Cloud Centric Architecture (AWS)
- High Availability and Effective Disaster Recovery Solutions
- Securing Your Cloud deployments
- A Sample Case Study
- Additional Resources – Where I can explore more
- Questions / Feedback ?

Summary

This session covers the best practices for deploying a High availability and business resilient Oracle applications R12 leveraging the cloud module.

The session and the related white-paper will also highlight the common pitfalls as we deploy over the cloud and how to avoid them.

For the purpose of this session we will be using Amazon's AWS (Amazon Web Services) as an example of the cloud solutions provider and we will discuss how to deploy Oracle Applications on AWS that supports the business resiliency.

The session will also include a sample client case study of a high-availability cloud based architecture.

Pre- requisites & Assumptions

A few pre-requisites and assumptions to get the most of this session.

- Oracle Applications DBA Concepts – Installation, Cloning, Patching & Basic Architecture
- Oracle Database Concepts – Cloning, Installation, Basic Architecture, RMAN, Data Guard.
- Comfortable executing Basic Operating System commands
- Basic Understanding of Cloud Deployment Architectures
- Key Accounts
  - Active OTN Account
  - Oracle Support Account
  - AWS Account

Critical Components and Terminology

Oracle Components & Versions

- Oracle Applications – R 12.1.3
- Oracle RDBMS – 11gR2
- Oracle Recovery Manager
- Oracle Secure Backup Cloud Module
- Oracle Dataguard

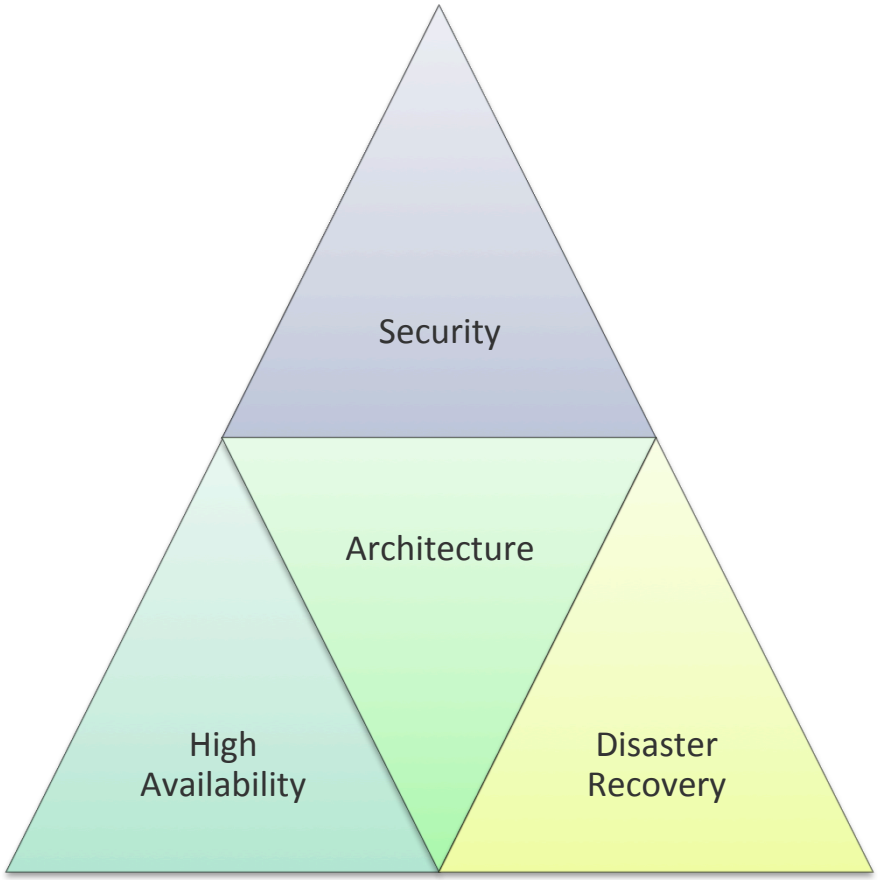
Critical Components and Terminology

Amazon Web Services (AWS) components

- Elastic Cloud Compute (EC2)
- Simple Storage Service (S3)
- AWS Virtual Private Cloud (VPC)
- Elastic Block Storage Volumes (EBS Volumes)
- Elastic IP addresses
- Amazon Machine Images (AMI)

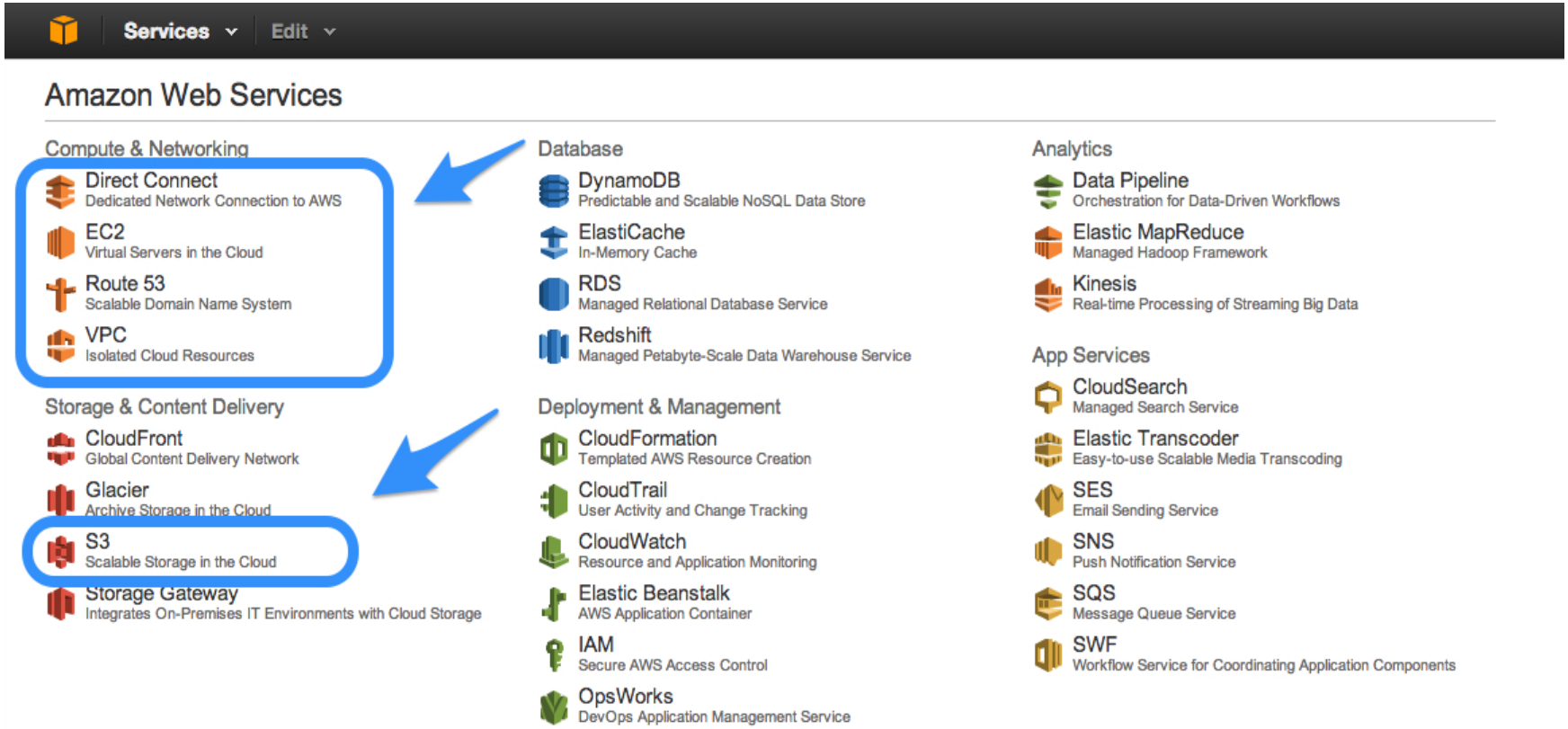
Business Resiliency – Building Blocks

The key building blocks that are at the core of any system that effectively supports business resiliency



The Architecture – AWS Cloud

The AWS Management Console – The key ones we will use to setup our initial architecture



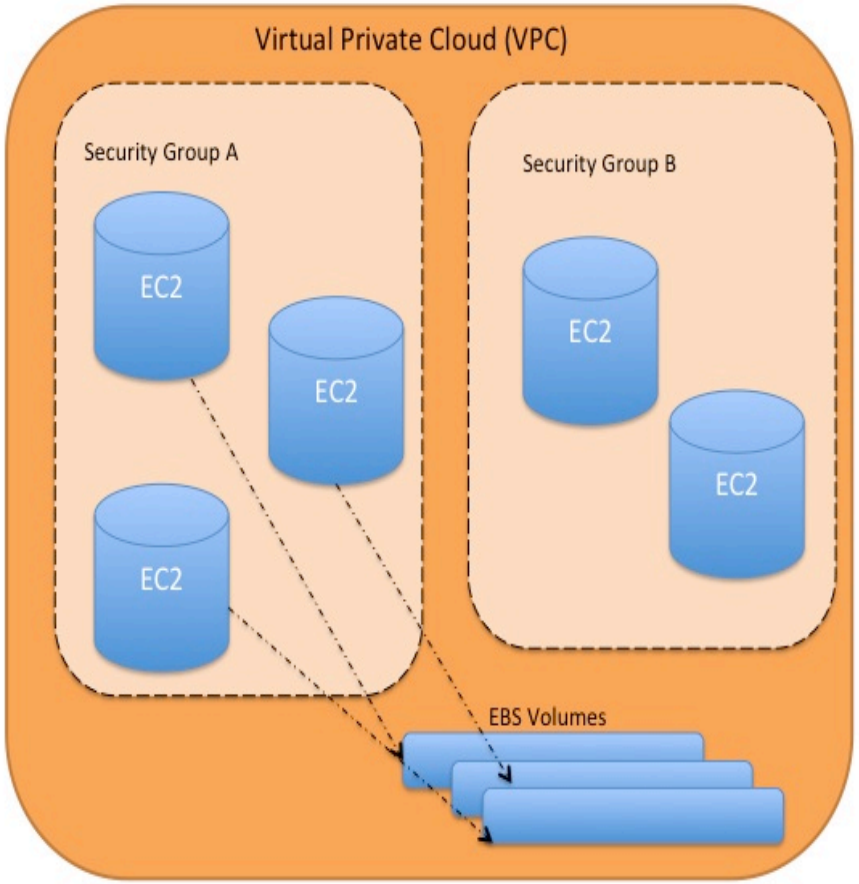
The Architecture – Setup

Get the initial setup correct and then scale as your business demands

- ✓ Setup your Virtual Private Cloud
  - ✓ Setup subnets based on AZs
- ✓ Setup security groups associated with the VPC
  - ✓ Multiple security groups
- ✓ Create an EC2 instance.
  - ✓ Launch within your VPC
  - ✓ Choose a suitable AMI
  - ✓ Attach elastic IPs as needed
- ✓ Create EBS volumes (Storage)
  - ✓ Align with your hardware sizing exercise
  - ✓ Attach and allocate to your instances
- ✓ Setup access
  - ✓ SSH keys as needed

The Architecture – Basic Setup

- Virtual Private Cloud
  - Security Group A
    - EC Instance (Apps Tier-Web)
    - EC Instance (Apps Tier-Web)
    - EC Instance (Apps Tier – CM)
  - Security Group B
    - EC Instance (DB – Primary)
    - EC Instance (DB – Standby)
  - EBS Volumes
  - Elastic IPs



High Availability

High availability characterizes a system that is designed to avoid the loss of service by reducing or managing failures as well as minimizing planned downtime for the system.

- HA is NOT absolute fault tolerant
- Most well designed HA systems Will experience failure
- Acceptable Time to Recover
- Trade-off between cost and system availability
- Business needs are diverse & HA systems will need to adapt.
- HA as an insurance
  - Loss of service
  - Loss of customers
- HA as an opportunity
  - New opportunities by continues availability
  - Scale up to new demands

Disaster Recovery – Leverage the Cloud

Traditional DR Systems

- Expensive
  - Deployment
  - Maintenance (Testing)
- Time Consuming
- Challenges
  - Technical
  - Geographical
  - Economical

Cloud Based DR

- Relatively less expensive
- No big Bang approach needed
  - Scale your DR solution with your business needs
- Test often & test agile
- Rollout changes faster
  - Process changes
  - Technical Changes

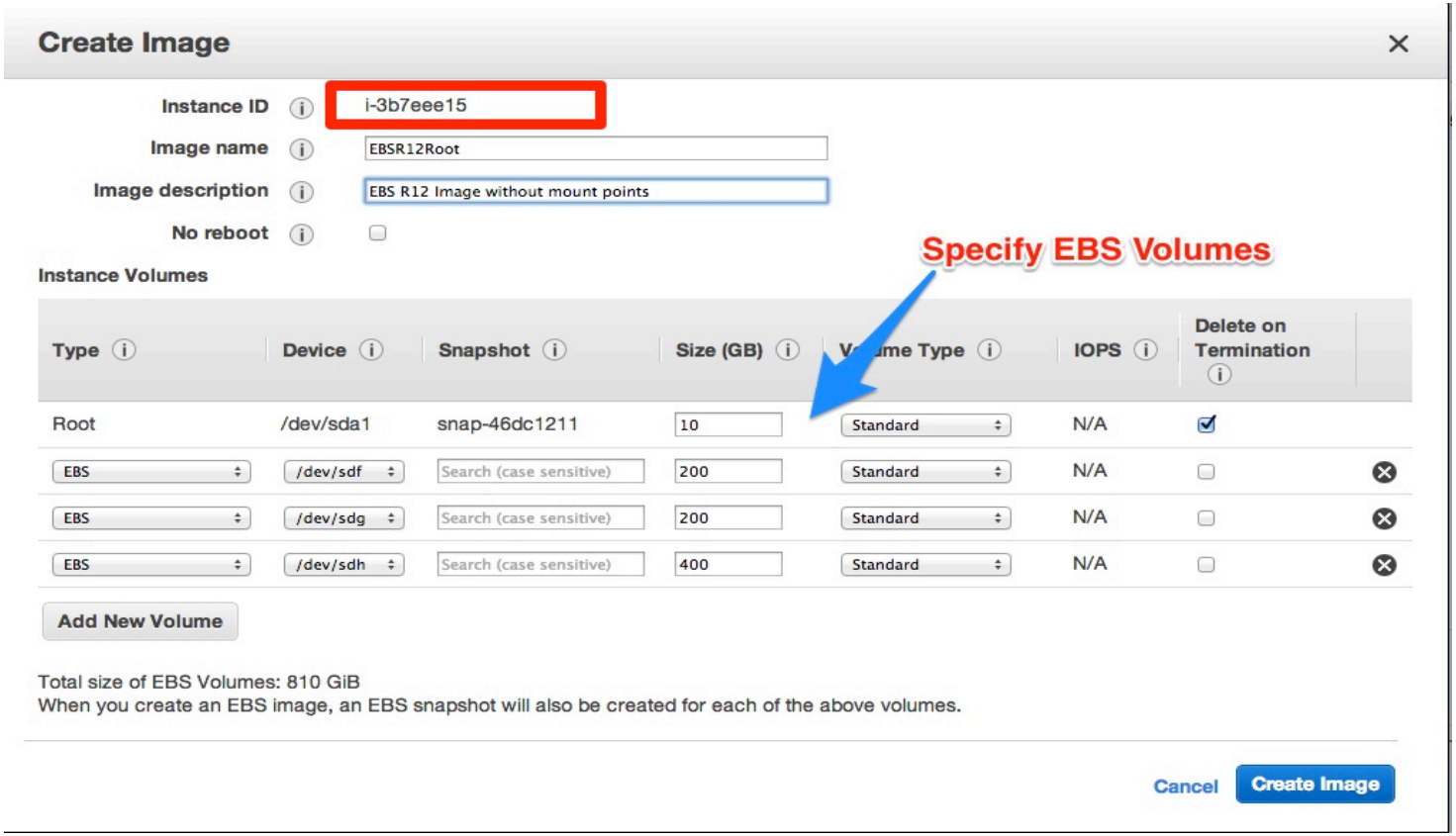
HA & DR Cloud Deployment Solutions

Both Oracle and AWS provide multiple options and solutions available be to achieve this.

- Backup Solutions
  - Snapshots
  - Amazon Machine Images (AMI)
  - Recovery Manager Backups to S3
- Load Balance Deployments
  - Elastic Load Balancer
  - Custom Load Balancer
- Physical Standby Deployments
  - Oracle Dataguard
  - Availability Zones

Backup Options – Snapshots & AMIs

Snapshots and AMI's are quick out of the box backup options available with AWS.



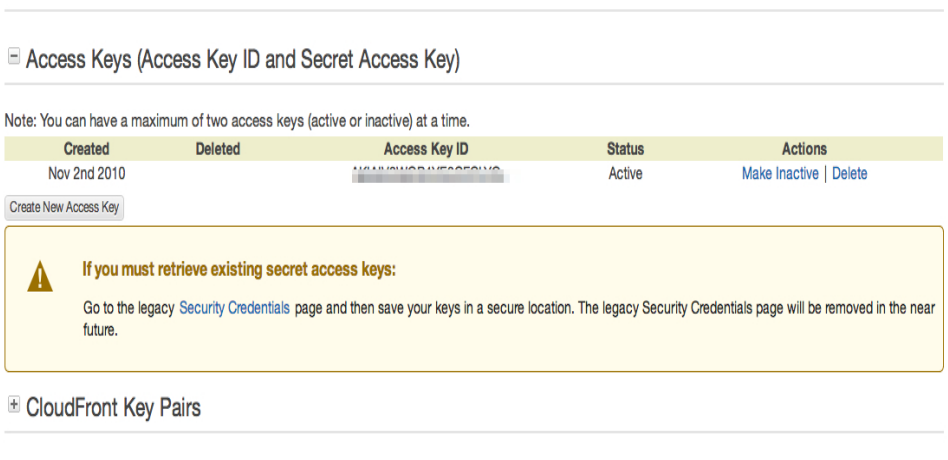
- Not consistent

Why RMAN Backups to S3

- ✓ S3 blocks are more reliable than tapes
- ✓ Always available
  - ✓ Tapes are traditionally stored off site at a safe location
- ✓ Easily encrypt your backup sets
- ✓ Verify your backups easily
  - ✓ No need to login to Oracle or RMAN

RMAN & AWS S3 Backups – What you need

- AWS Security ID and the Secret Key from the AWS Management Console
  - Security Credentials screen from the AWS Console



- Enable archive logging at your database.

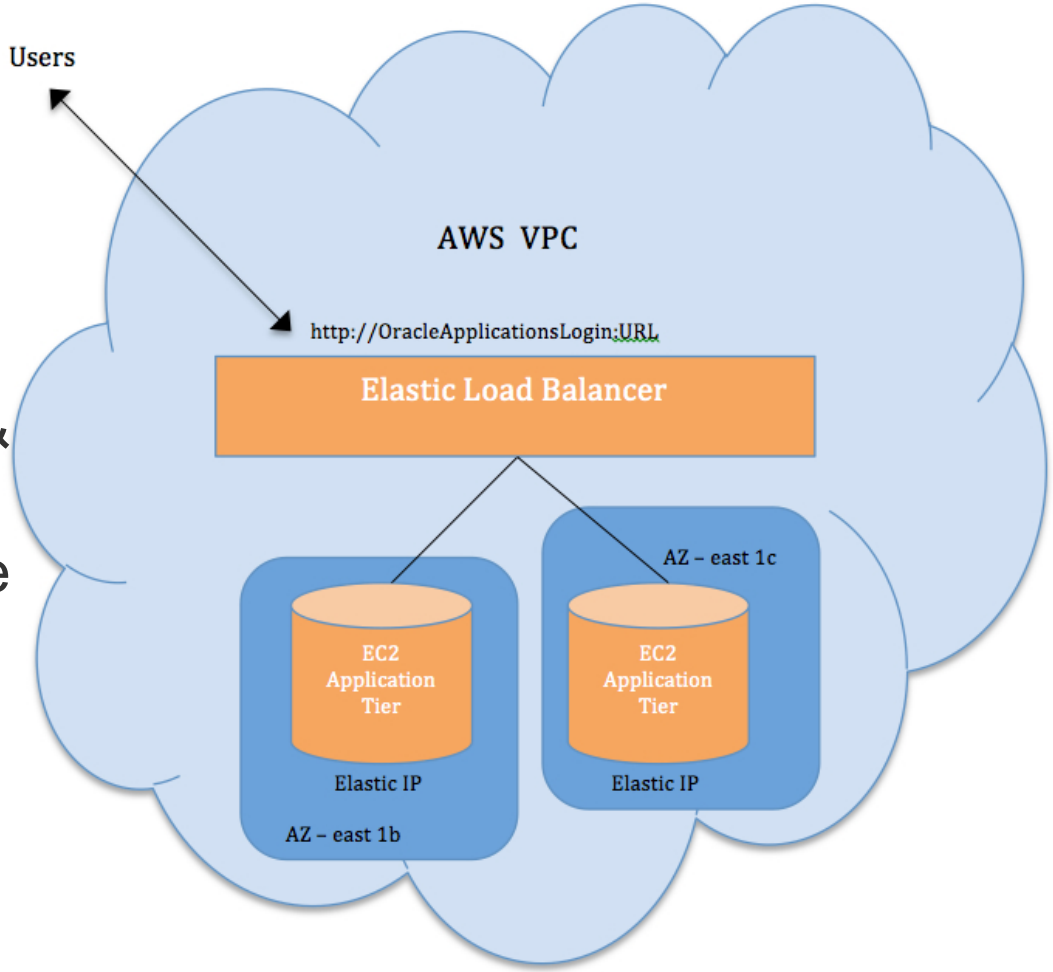
RMAN & AWS S3 Backups – What you need

- Download the Oracle Secure Backup Cloud Module from OTN & extract
- Create a Oracle DB wallet secure directory and note its location
- Run the OSB java installer (*java -jar osbws_install.jar*)
  - *AWS Security ID*
  - *AWS Security Key*
  - *OTN User ID*
  - *OTN Password*
  - *Oracle Wallet location*
- Installer will log on to your AWS account and create S3 buckets
- Setup a RMAN configuration for SBT type device
- Backup & Test a restore.

Load Balance Oracle Application Tiers

Option 1 – Using AWS Elastic Load Balancer

- ✓ Create a new AWS load balancer
- ✓ Attach load balancer to the VPC
- ✓ Specify details – Ports & timeout
- ✓ Associate ELB to Oracle Application Tiers



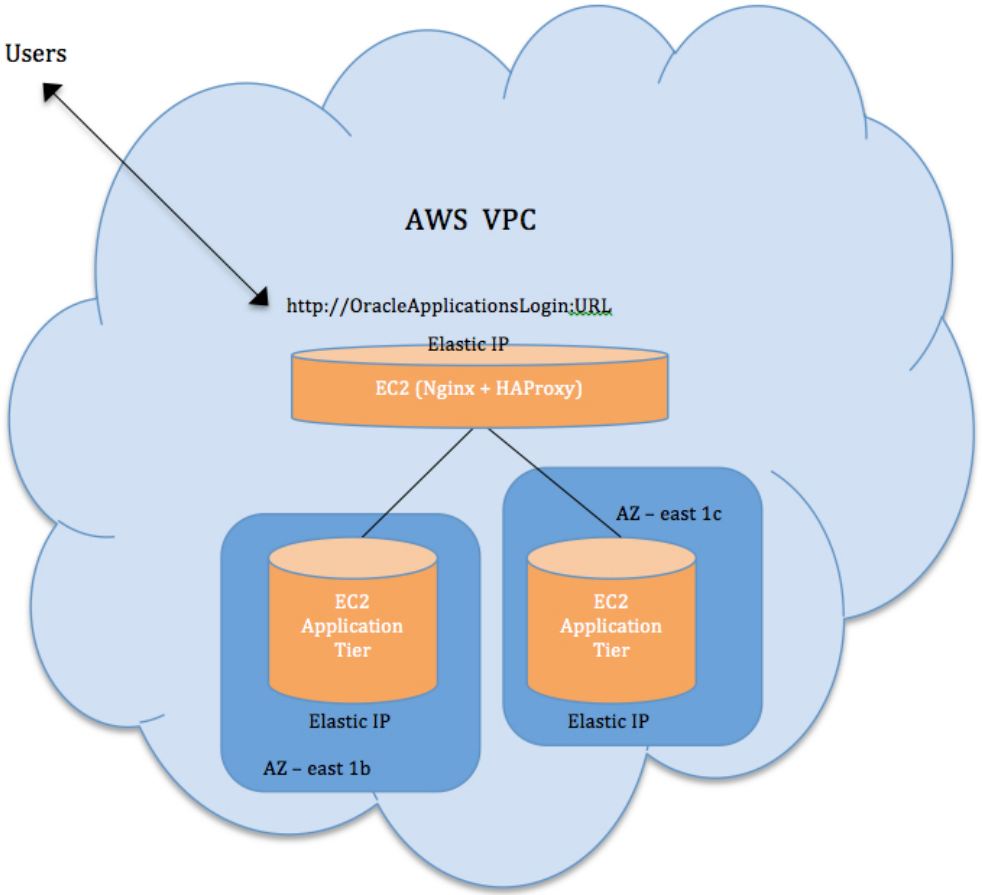
Cons

- Cannot associate a static IP to EBLs
- Can cause user timeouts with long running reports

Load Balance Oracle Application Tiers

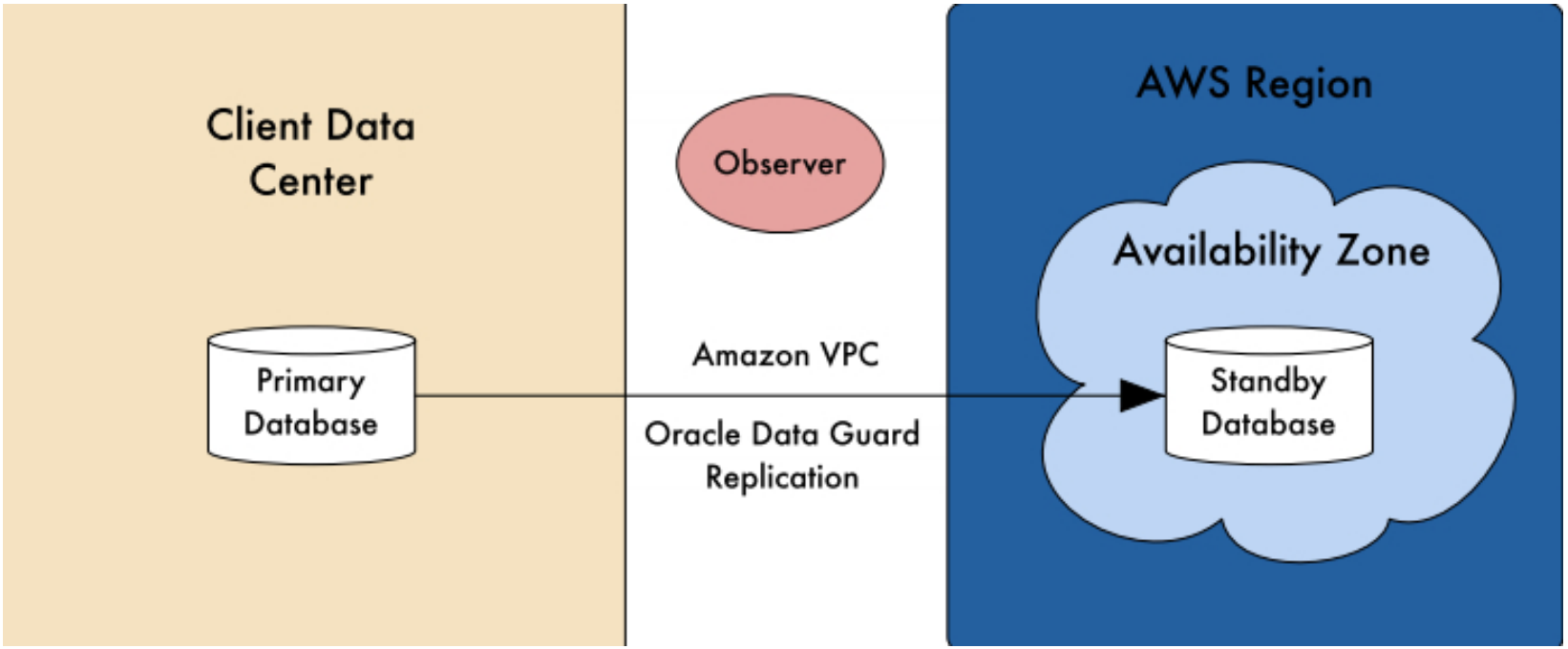
Option 2 – Using Custom Load Balancer

- ✓ 1. Create a new micro-EC2 instance
- ✓ 2. Assign a static elastic IP address to the newly created EC2 instance
- ✓ 3. Setup Nginx and HAProxy
- ✓ 4. Configure HAProxy to load balance between your Oracle Application web tiers
- ✓ 5. If needed, setup SSL with Nginx.



Standby Database (Oracle Data Guard)

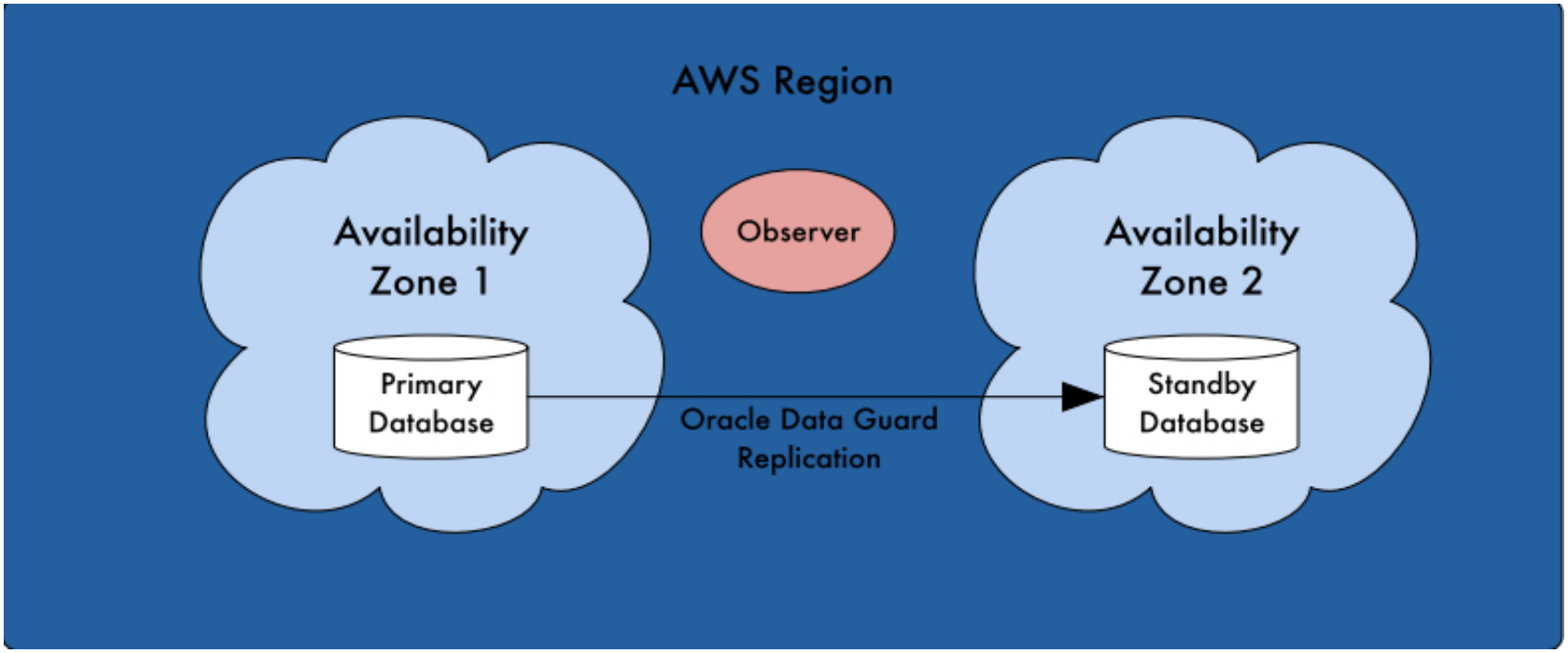
On-Premise Primary & AWS Standby



- Get up and running quickly
- Leverage existing AMIs
- Early cloud adoption stage

Standby Database (Oracle Data Guard)

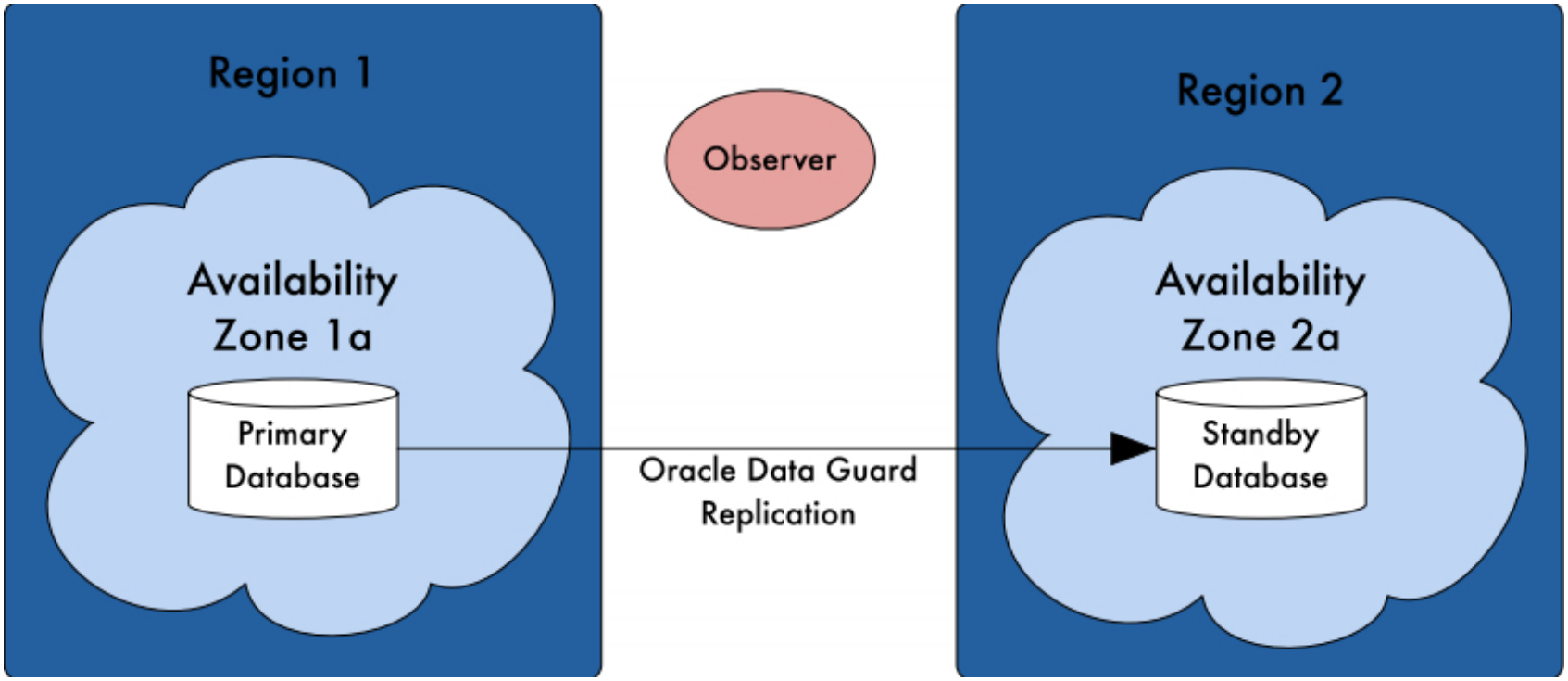
Primary & Standby on AWS cloud



- Create your standby quickly (Primary AMI)
- Deploy in multiple availability zones
- Fast switchover, failover and switchback

Standby Database (Oracle Data Guard)

Primary & Standby on AWS cloud on different regions



- Maximum HA option
- Protect from complete region outages

Standby Database (Oracle Data Guard) – Playbook

- ✓ Setup / Update VPC
  - ✓ New Subnet in a different AZ
- ✓ Create a new EC2 instance
  - ✓ Tip – Create an AMI of your DB Tier & launch the instance using the AMI
  - ✓ Setup security groups accordingly
- ✓ Clone DB Tier via Rapid Clone
  - ✓ Copy ORACLE HOME to the newly created instance
- ✓ Full Database backup to S3
  - ✓ Backup archivelogs as well
- ✓ Execute adcfgclone with the DB TechStack option on standby

Standby Database (Oracle Data Guard) – Playbook

- ✓ Verify listener on secondary
  - ✓ adcfgclone should start the listener atomically
  - ✓ Keep ORACLE SID same
  - ✓ db_unique_name different
- ✓ Update the primary DB
  - ✓ Enable force logging
  - ✓ Create standby redolog files
  - ✓ Update parameter files with DG settings
  - ✓ Update listener files with DG settings
- ✓ Update secondary DB
  - ✓ Create standby redolog files
  - ✓ Update parameter files with DG settings
  - ✓ Update listener files with DG settings

Standby Database (Oracle Data Guard) – Playbook

- ✓ Startup secondary DB (nomount)
- ✓ Check DB and Listener connectivity
- ✓ Create secondary DB using RMAN backup
- ✓ Configure Dataguard Broker
  - ✓ Add primary via DGMGRL
  - ✓ Create new configuration – Max Availability
  - ✓ Add secondary DB to the configuration
- ✓ Enable fast-start failover
- ✓ Run observer
- ✓ Verify

Securing Your Cloud Deployments

Security - Primary business concern while planning enterprise cloud deployments

- Secure your VPC
  - Access via secure VPN tunnel only
- Disable direct SSH & FTP access
  - Enable ssh key-pairs
  - Run services like FTP and VNC under different user accounts
- Disable unused ports
  - Tip – Use multiple security groups as needed
- Patch Regularly and as needed
  - Oracle DB & Applications
  - OS vulnerabilities
  - AWS updates

Securing Your Cloud Deployments

- Use trusted AMI
  - Build your EC2 instances using trusted AMIs
- Audit
  - Ongoing process
  - Proactively identify risks and potential breeches.
- Encryption
  - External exports
  - Backup sent to S3
  - Application clones

Case Study – Signature Group Holdings (SGH)

- The Challenge
  - Quick global implementation
  - Scale for a rapidly growing business
  - Security – Financial holding company
- The {Cloud} Solution
  - Quickly setup development, training and CRP environments on AWS
  - A VPC with a secure VPN connection to SGH on premise network
  - Secure backups using RMAN and S3
  - Private AMIs to spin up instances on demand to support ongoing projects

Case Study – Signature Group Holdings (SGH)

"I am extremely pleased with the work done by Computer Technology Resources (CTR) and Amazon Web Services (AWS). From the very beginning I knew that we had made the right decision in trusting them to manage our Oracle system. I think for me the favorite feature is the flexibility that CTR and AWS have shown by working with us to solve the problems that we faced. They are our true partner and Signature is proud to be working with them"

Karlo Vartan, Vice President of Finance and Information Technology, Signature Group Holdings, Inc

Where Can I Explore More?

- Oracle Support & Documents
  - *Using Load-Balancers with Oracle E-Business Suite Release 12 (Doc ID 380489.1)*
  - *Dataguard Concepts - http://docs.oracle.com/cd/E11882_01/server.112/e41134/toc.htm*
- AWS Documentation
  - Computing - http://aws.amazon.com/ec2/
  - AMI - https://aws.amazon.com/marketplace
  - Security - http://aws.amazon.com/security/

<To be updated with blog>

Thank You

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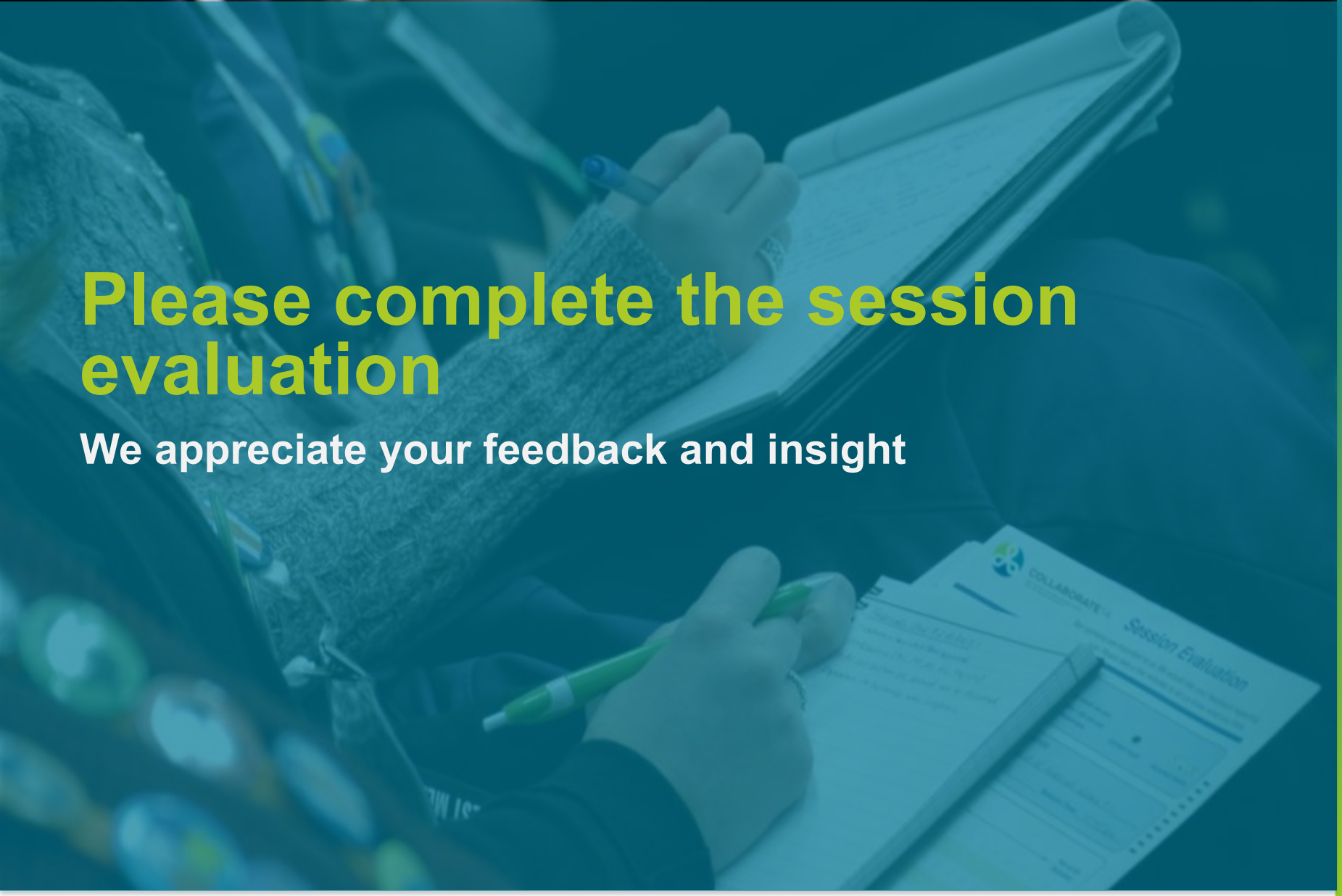

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