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1 About BC GOV Cloud

- What is BC Gov Cloud Pathfinder ?
 - We're a central team in BC Gov tasked with delivering Cloud
 - We've onboarded to the GoC Cloud Brokerage
 - We have a service order with 1 Cloud Service Provider that includes an SEA
 - We are on a mission to collaborate with the GoC to use several CSPs
 - We want to offer a consistent service experience across several clouds; our on-prem OpenShift container platform, AWS and others.
 - Our clients are all Ministries in BC Government
- Customer Focus
 - Our Customers: Project Managers / Product Owners / Expense Authorities
 - Our Users: Developer Teams
 - Compliance Users: Security Operations OCIO
- Good Service
 - Who do I go to if I have quality issues with Cloud Pathfinder's service?

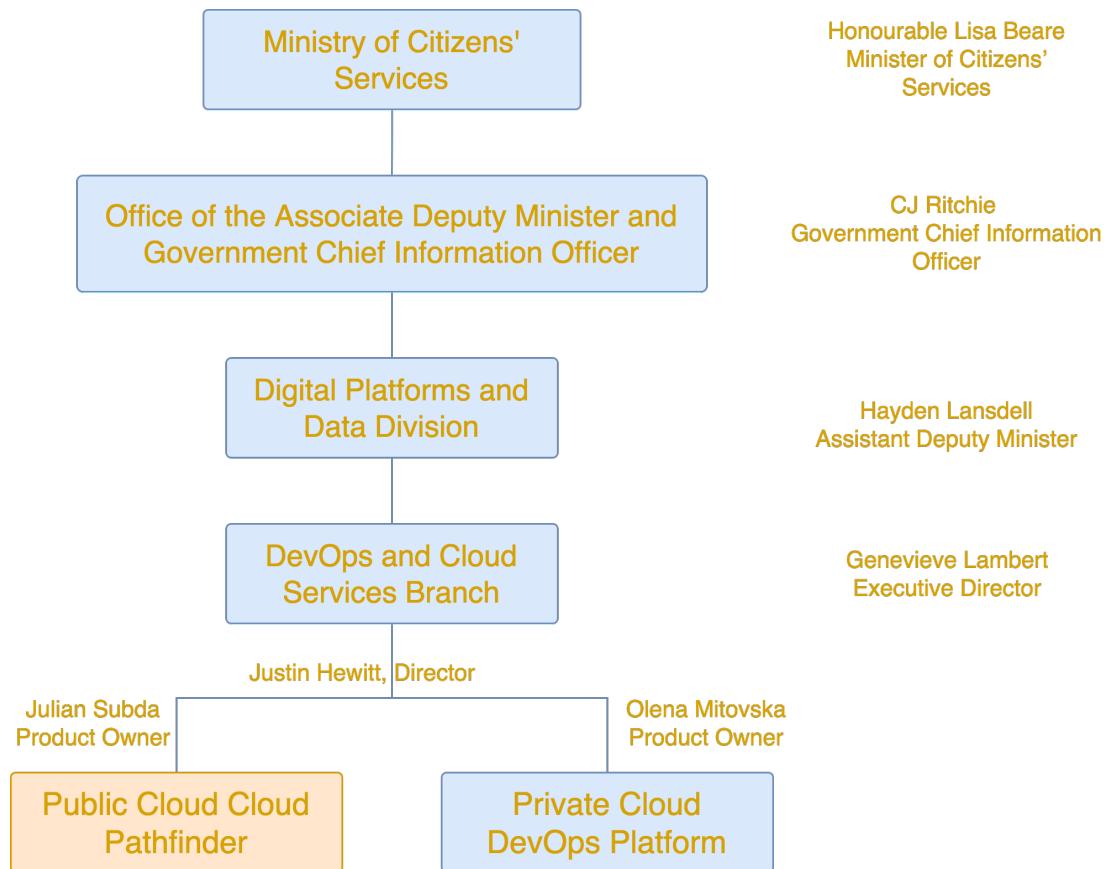


Figure 1: organization ladder

2 SEA at BC Gov

- AWS SEA at BC Gov

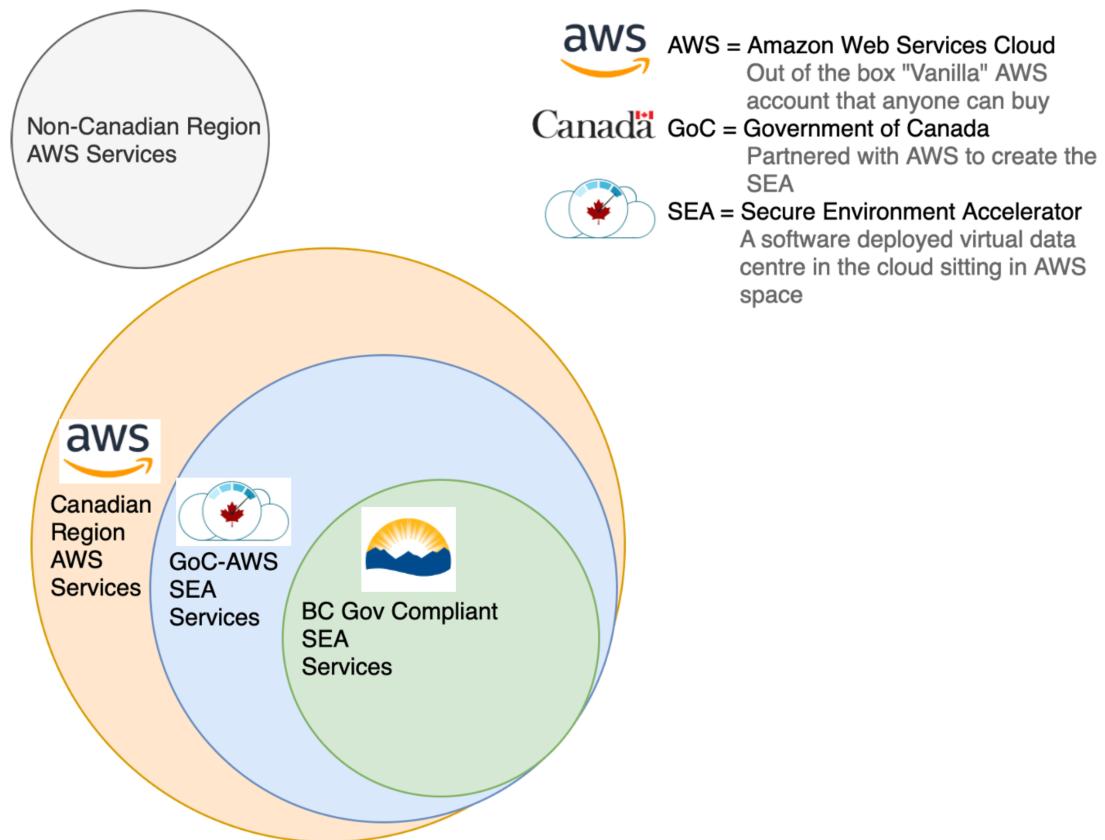


Figure 2: AWS SEA

- The above images shows the relationship between services offered in different scopes of the various contexts of the AWS SEA. BC Gov teams will be working primarily in the green area with some services from the blue.
- The green services have been tested by the Cloud Pathfinder team for good fit within the guardrails of the environment.
- Some services are not compatible but in general there is a pattern for teams to use the blue ones if needed.

2.1 SEA Concepts

- AWS SEA Concept

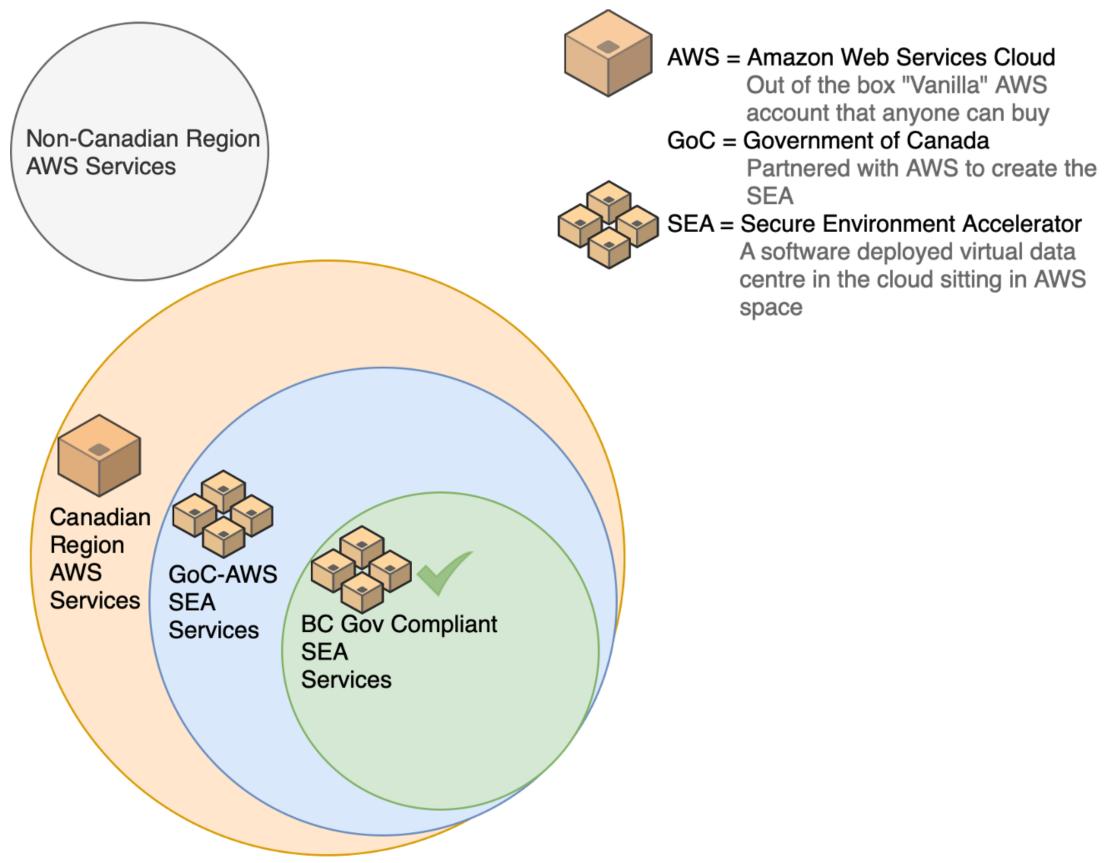


Figure 3: AWS SEA concepts

2.2 Public Cloud SEA Services

- AWS

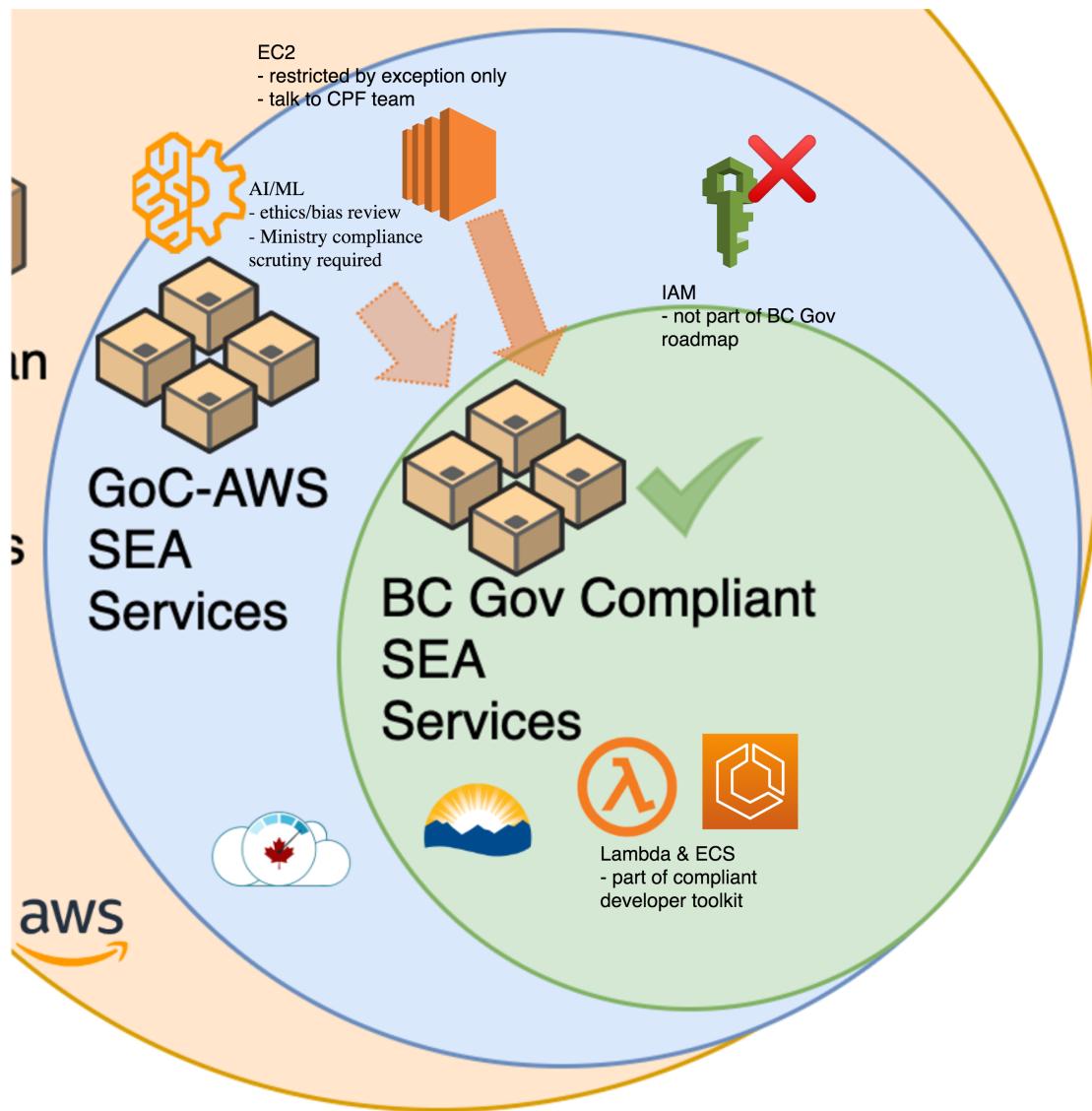


Figure 4: compliant services in aws

::: tip Acronyms

- **CPF**: Cloud pathfinder Team
- **ECS** = Elastic Container Service
- **EC2** = Elastic Compute Cloud/Virtual Machines
- **CSP** = Cloud Service Provider
- **Lambdas** = a serverless technology where code is run on CSP maintained servers, turned off when not in use
- **IAM** = Identity Access Management of users in the CSP
- **AI/ML** = Artificial Intelligence and Machine Learning Cloud services

:::

- We are aiming for a common service experience regardless of which cloud you are consuming in BC Gov.

2.3 SEA Future Growth

Depicted as follows is the growth of services in aws over time

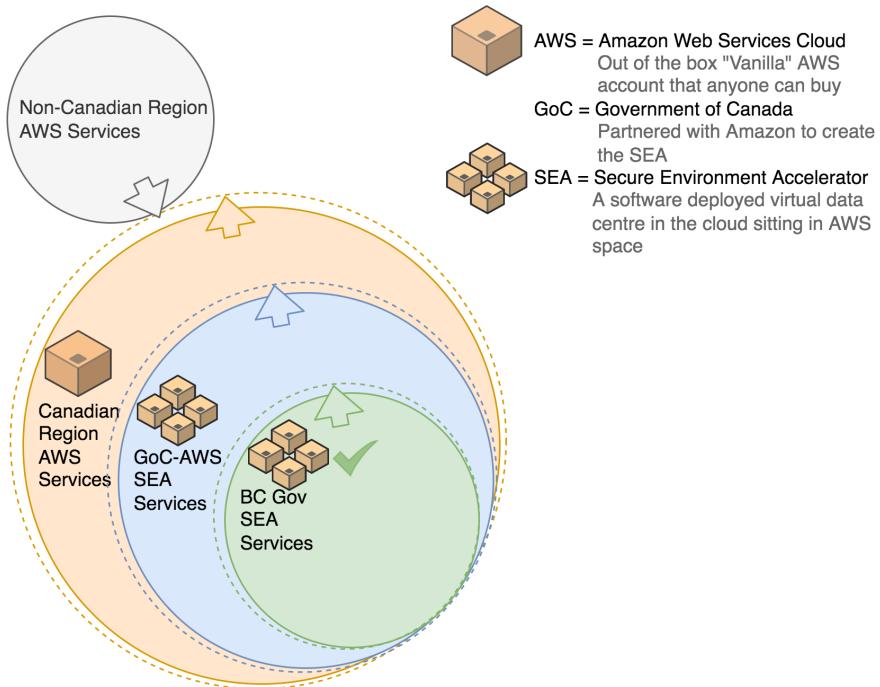


Figure 5: Future growth of AWS SEA

- Over time, regardless of the particular brand of the cloud, the number of services in the SEA available to BC Gov teams will go up and we expect the green set of services to mostly

overlap the blue.

2.4 Training Landscape

Below is the Training landscape for the AWS

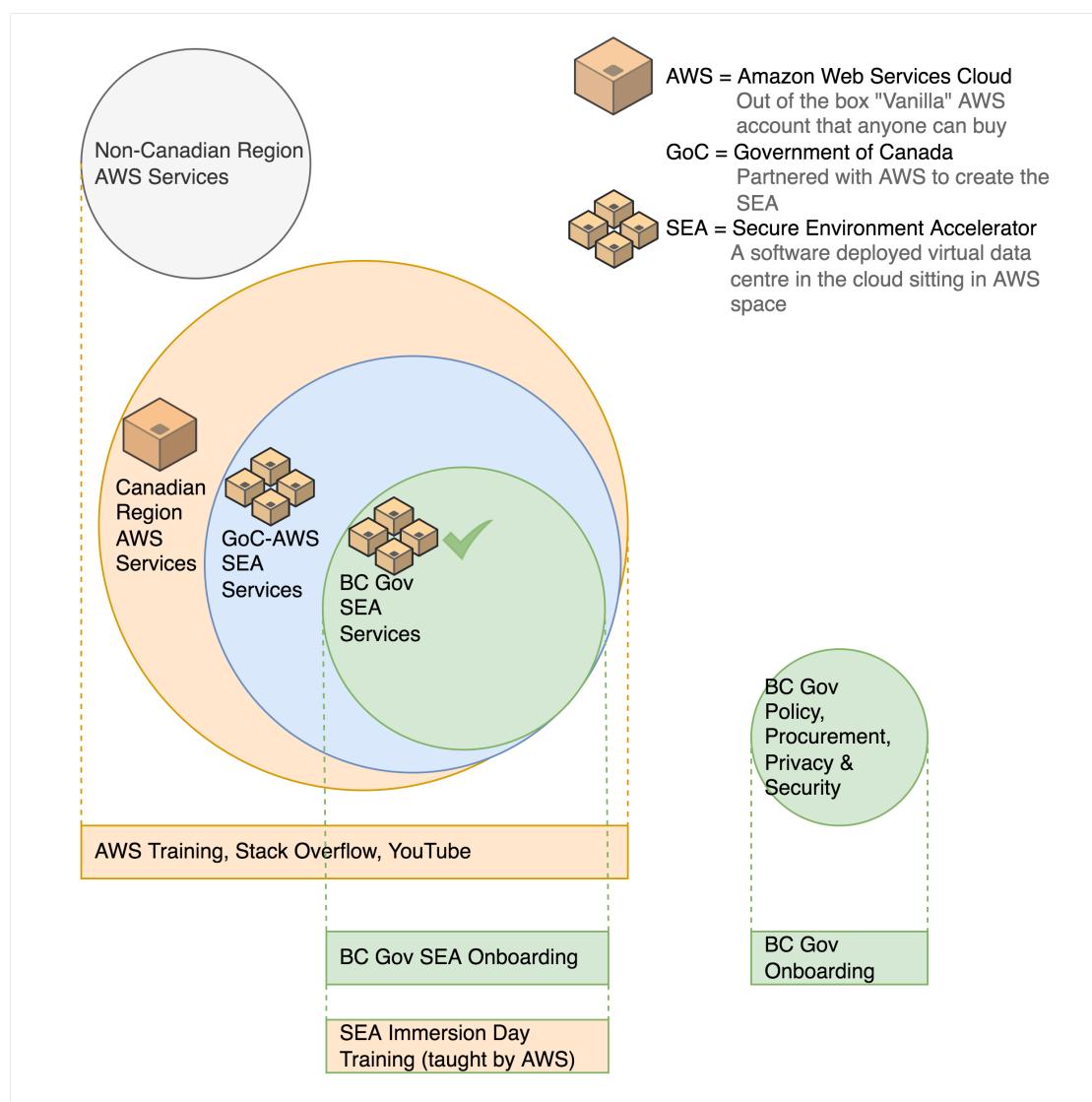


Figure 6: Trainig Landscape

2.5 Training Components

- AWS SEA Training Components

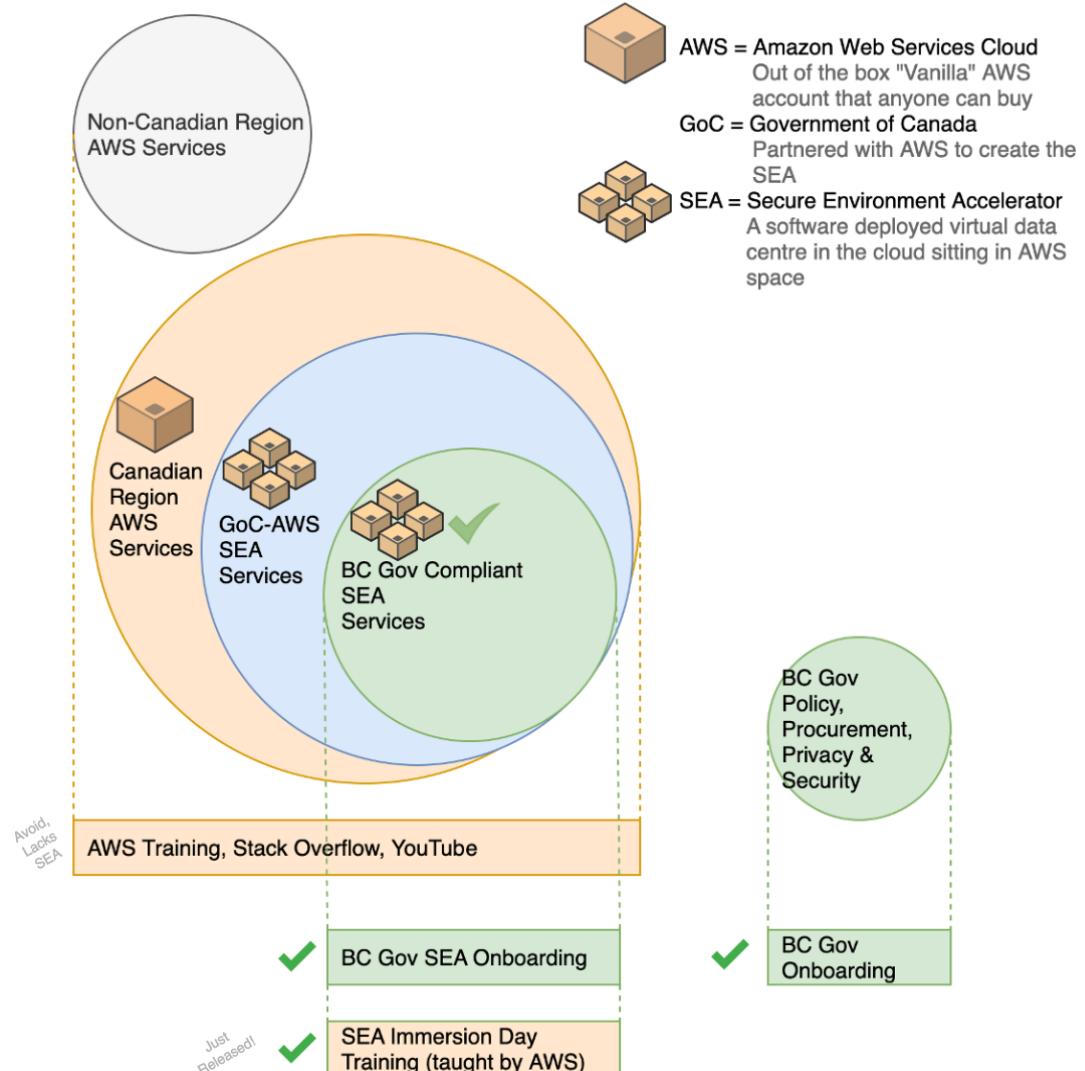


Figure 7: Training Components

- We see here that the training available online and from each Cloud Service Provider like AWS does not take into account the SEAs as these are very cutting-edge environments. Over time the training will catch up. For now, we have customized training so that teams do not get confused when the patterns they learned elsewhere do not function in the SEA. We show them equivalent, safe ways of operating in the SEA.

2.6 Training Track

- Training Track (all CSP pattern)

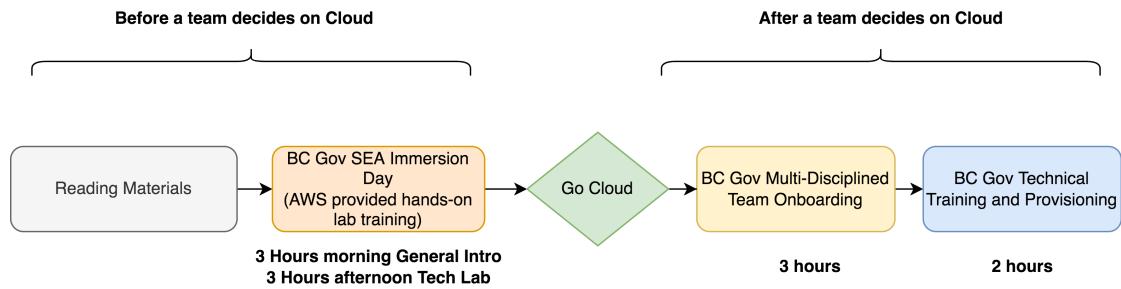


Figure 8: Trainig Track

2.7 Audience



Figure 9: people jumping into a swimming pool together

- POs, Devs and Compliance; group start
- Shared understanding from the beginning
- Journey together

3 Procurement Value Proposition

3.1 Negotiation of our First Service Order

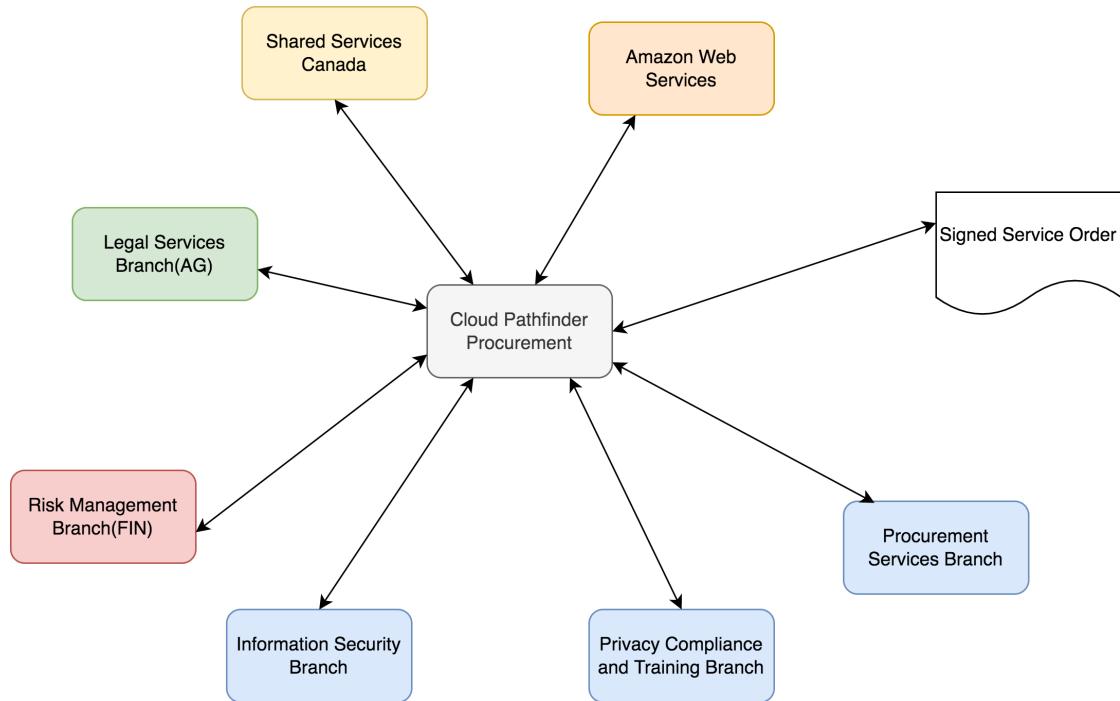


Figure 10: negotiation of our first service order

Actually it went more like this

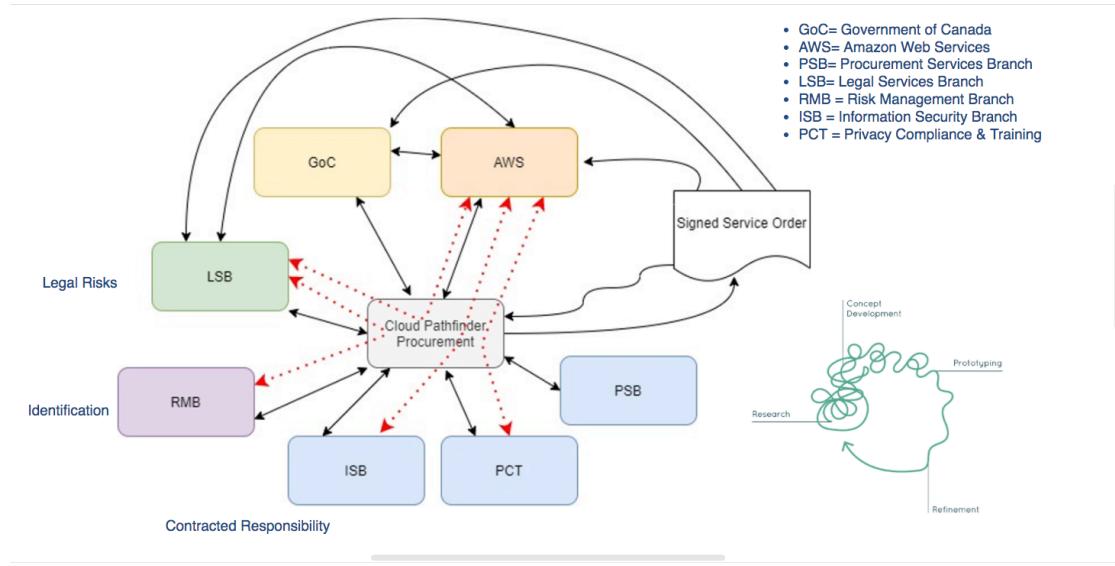


Figure 11: How it actually went

3.2 Procurement Value Add for Ministries

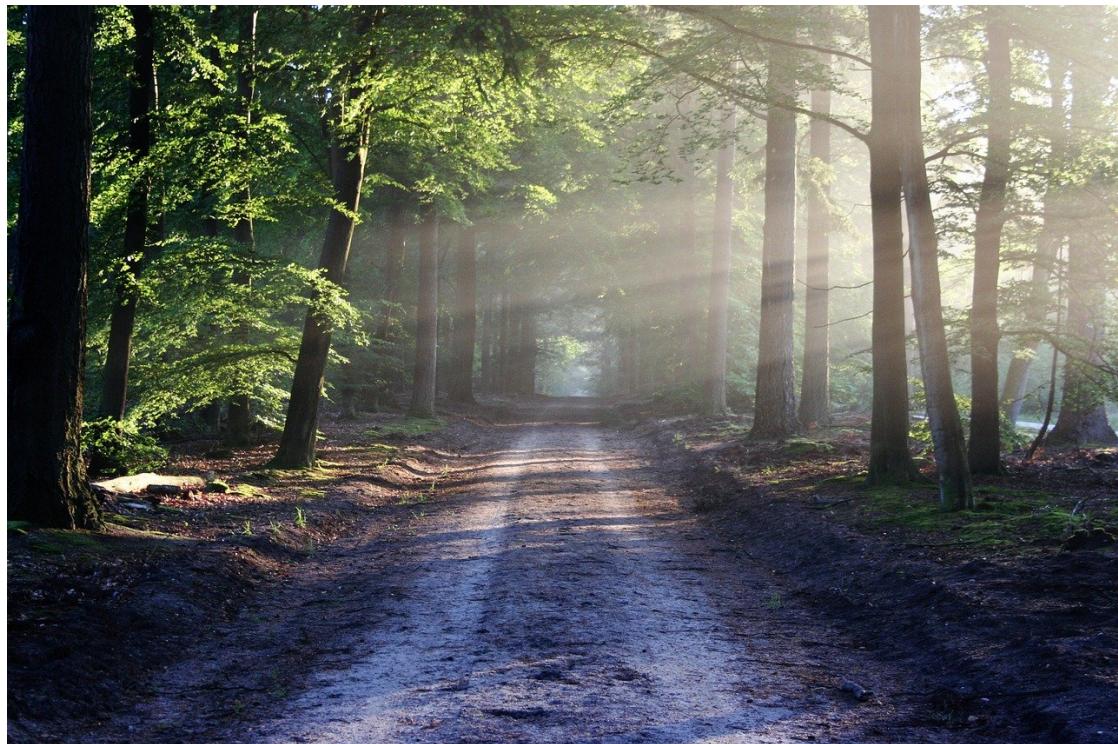


Figure 12: pathway in a forest with trees on either side

- Don't have to negotiate privacy, security, legal terms with vendors
- Don't have to dig into the cloud services
- Only need to focus on describing their project in the PIA and STRA

3.3 Cloud LifeCycle Value Add for Ministries

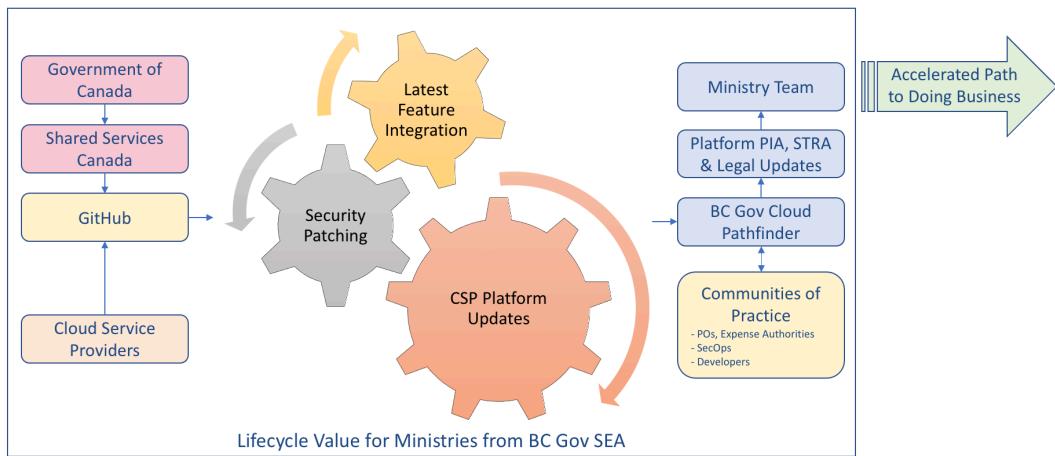


Figure 13: cloud value for ministries

4 Shared Responsibility Model

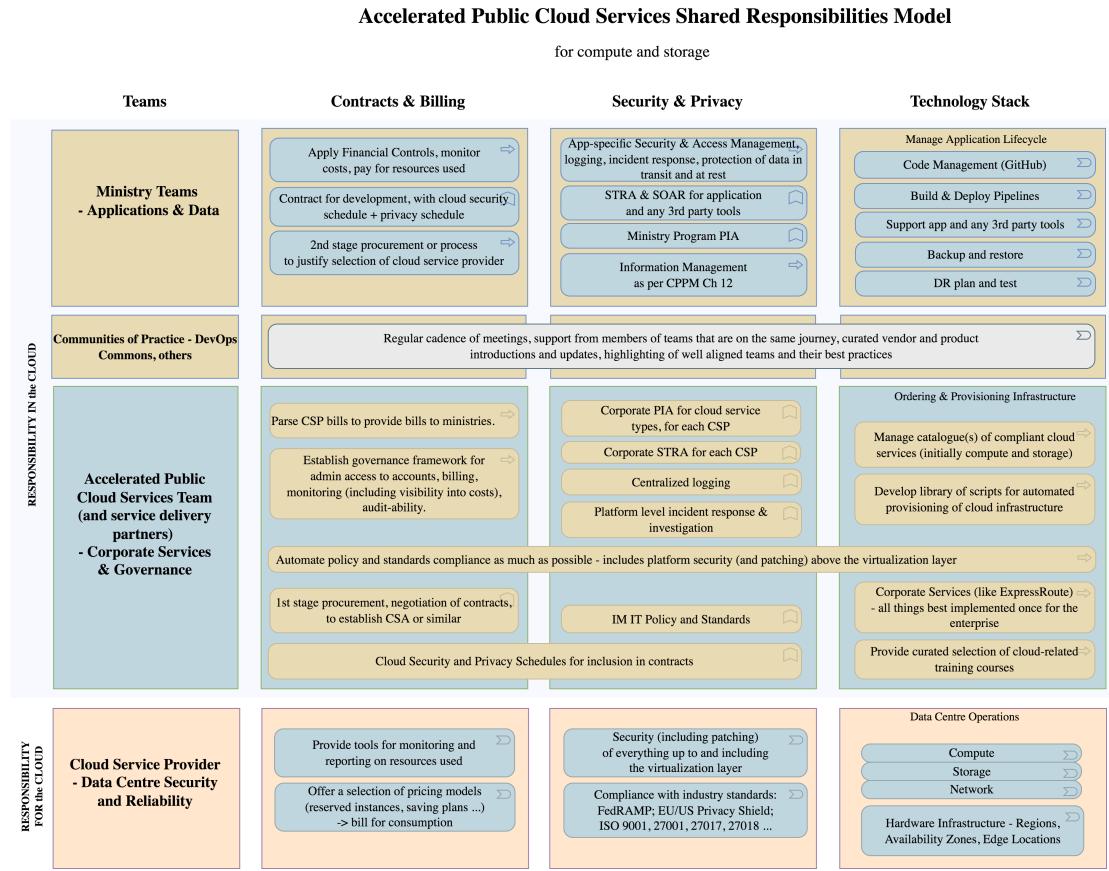


Figure 14: shared responsibility model

5 Providing an SEA Service

5.1 The SEA is non-trivial

- There is a lot of complexity that is simplified by Cloud Pathfinder providing SEA as a service to Ministries
- Several thousand dollars per month to run empty
- Requires a full-time highly-skilled team to stay on top of it

The Below Images shows the Complexity of the SEA

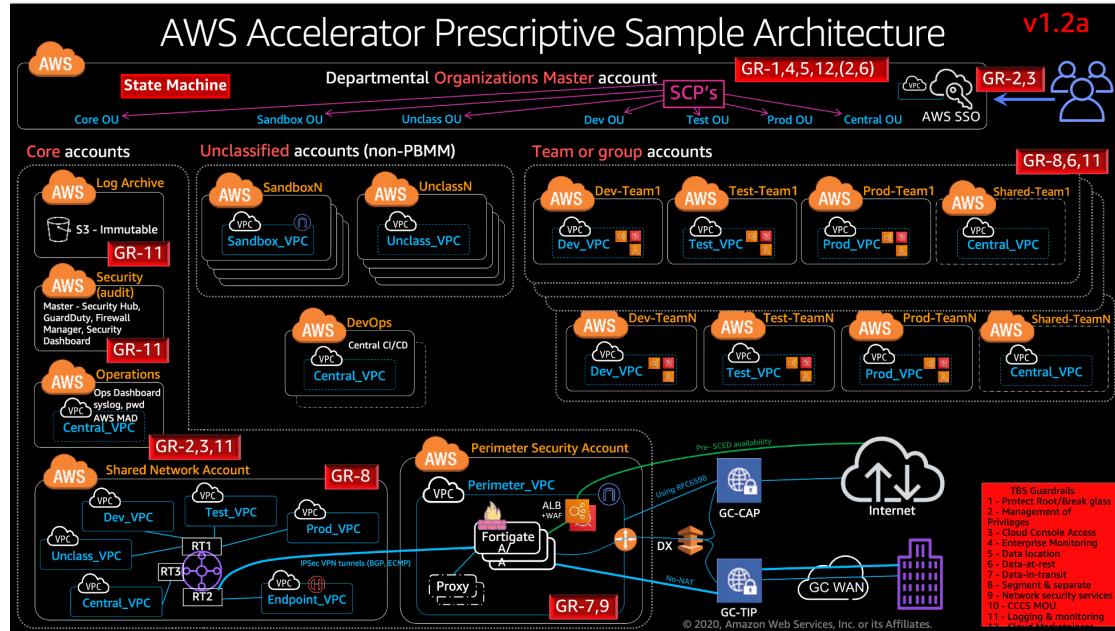


Figure 15: The SEA Architecture

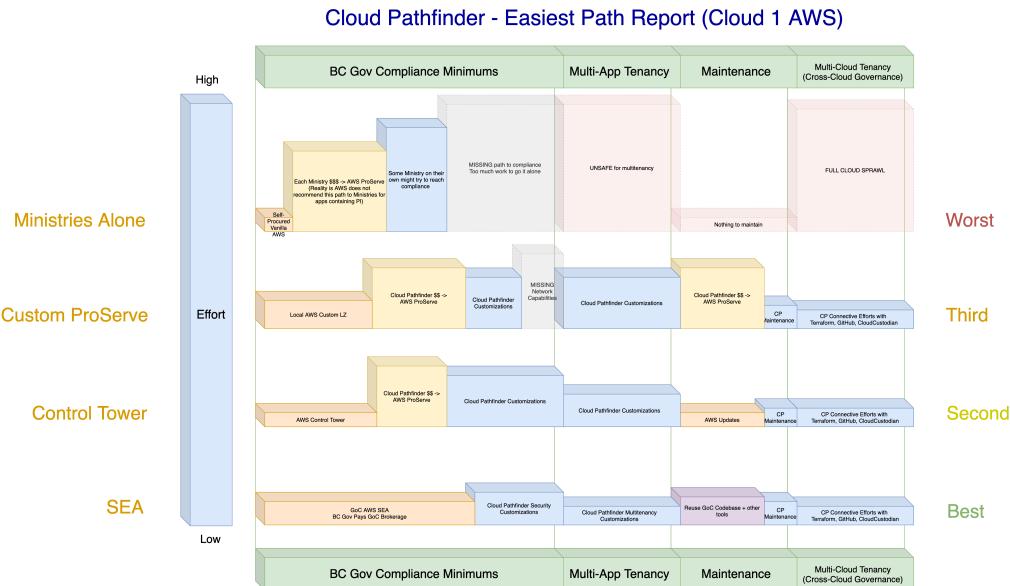


Figure 16: Cloud pathfinder easiest path report

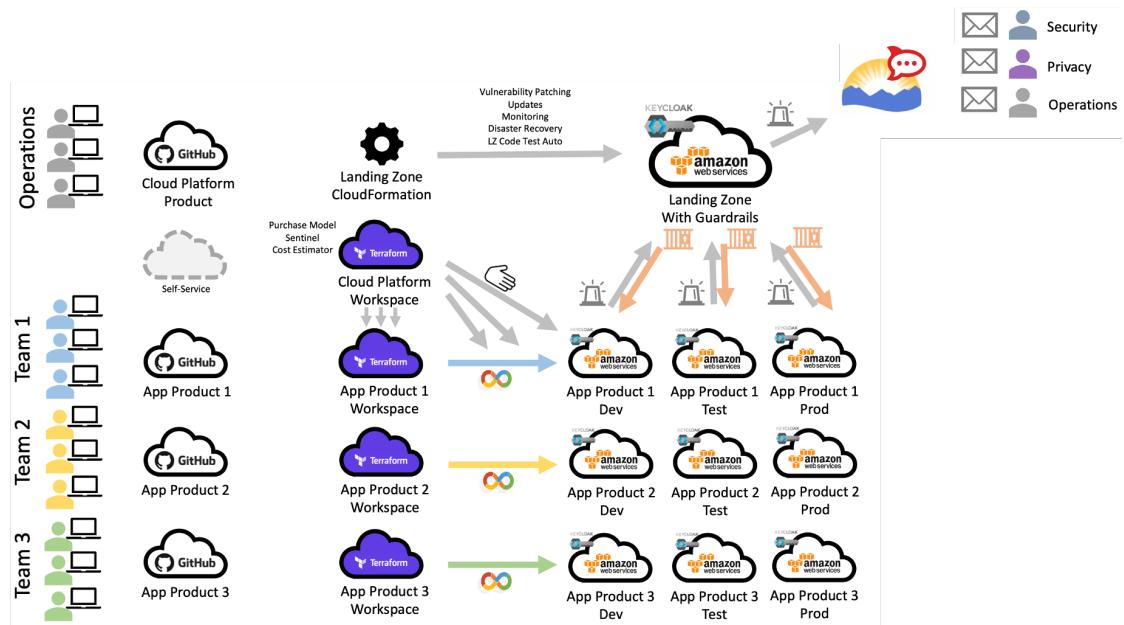


Figure 17: BC Gov AWS Early version

- AWS calls this a “Lightweight Landing Zone”
- Product Custom built by AWS Professional Services “ProServe”

5.2 BC Gov AWS SEA

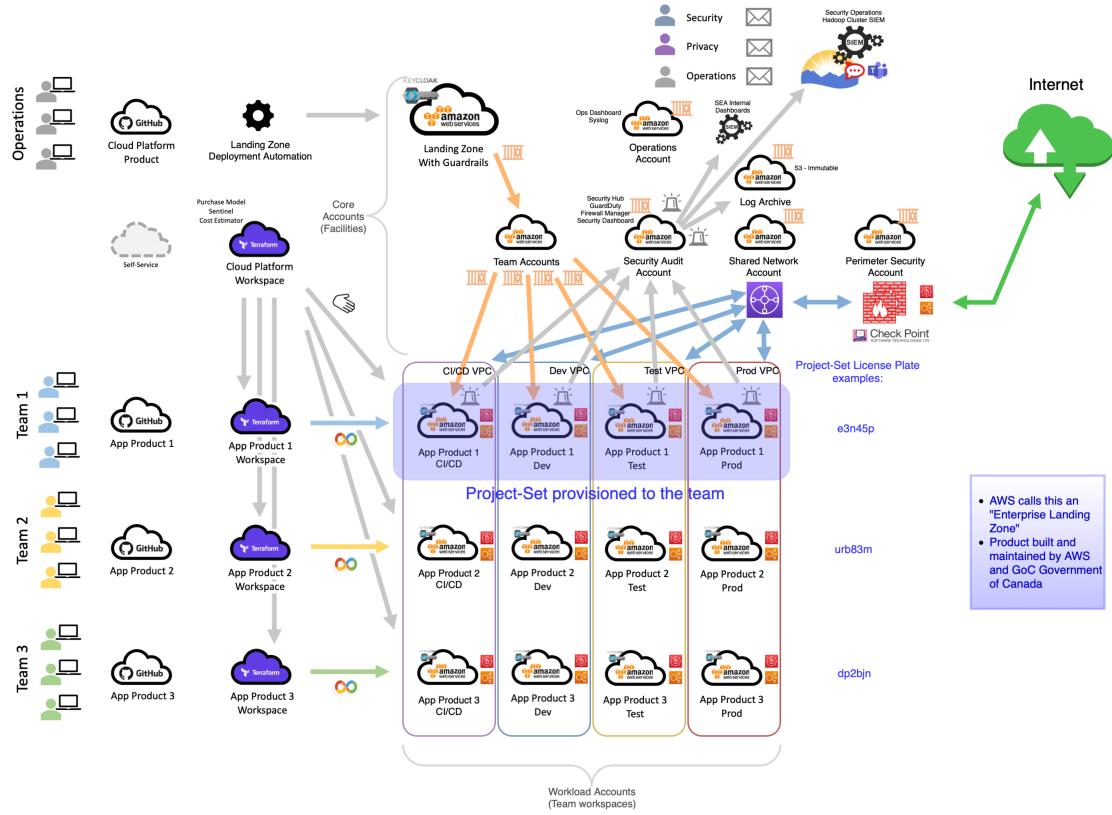


Figure 18: BC Gov AWS SEA

- AWS calls this an “Enterprise Landing Zone”
- Product built & maintained by AWS and GoC Government of Canada

6 Billing

6.1 Billing Examples T-Shirt Estimate Scenario 1 - Small

! Usage based Expense may increase or decrease

AWS Services	Metrics	Estimated Expense / Month
Traffic	25 Visitors a day	
Amazon Simple Storage Service	80 GB	\$ 2.00
Elastic Load Balancer	300KB/second/client connection	\$ 25.00
Amazon DynamoDB	1 GB, 1 million requests	\$ 4.00

AWS Services	Metrics	Estimated Expense / Month
Elastic Container Service - Fargate	1 container deployed twice, each 2 vCPU, 4GB	\$ 48.39
Data Transfer Out	50 GB	\$ 4.50
Amazon CloudWatch Logs	50 GB	\$ 28.00
AWS SEA Services(*)	Amazon GuardDuty, AWS Config, KMS	\$ 40.00
Estimated Monthly Total	-	\$ 129.14

- ALB: 1.08GB/hr, 25connections/sec, 2min duration,1 request per second
- Factor in backups, cold storage, dev & test environments which will increase costs depending on how far a team chooses to implement.

6.2 Billing Examples T-Shirt Estimate Scenario 2 - Medium

! Usage based Expense may increase or decrease

AWS Services	Metrics	Estimated Expense / Month
Traffic	250 Visitors a day	
Amazon Simple Storage Service	800 GB	\$ 20.00
Elastic Load Balancer	300KB/second/client connection	\$ 88.00
Amazon DynamoDB	10 GB, 10 million requests	\$ 18.00
Elastic Container Service - Fargate	3 container deployed twice, each 2 vCPU, 4GB	\$ 145.16
Data Transfer Out	500 GB	\$ 45.00
Amazon CloudWatch Logs	500 GB	\$ 278.00
AWS SEA Services(*)	Amazon GuardDuty, AWS Config, KMS	\$ 40.00
Estimated Monthly Total	-	\$ 634.16

- ALB: 10.8gb/hr, 250connections/sec, 2min duration,10 request per second
- Factor in backups, cold storage, dev & test environments which will increase costs depending on how far a team chooses to implement.

6.3 Billing Examples T-Shirt Estimate Scenario 3 - Large

! Usage based Expense may increase or decrease

AWS Services	Metrics	Estimated Expense / Month
Traffic	2500 Visitors a day	
Amazon Simple Storage Service	8,000 GB	\$ 200.00
Elastic Load Balancer	300KB/second/client connection	\$ 712.00
Amazon DynamoDB	100 GB, 100 million requests	\$ 178.00
Elastic Container Service - Fargate	3 container deployed twice, each 2 vCPU, 4GB	\$ 145.16
Data Transfer Out	5000 GB	\$ 450.00
Amazon CloudWatch Logs	5000 GB	\$ 2,775.00
AWS SEA Services(*)	Amazon GuardDuty, AWS Config, KMS	\$ 40.00
Estimated Monthly Total	-	\$ 4,500.16

- ALB: 10.8gb/hr, 250connections/sec, 2min duration,10 request per second
- Factor in backups, cold storage, dev & test environments which will increase costs depending on how far a team chooses to implement.

6.4 Custom Cost Examples ?

Yes!

- AWS Pricing Calculator

Screen Shot of the AWS Price Calculator page

- Use AWS Pricing Calculator for now

6.5 Billing Process Example

- These are samples of periodic billing report files we generate for Ministry teams

A	B	C	D	E	F	G	H	I	J	K	L	M	N
year	month	line_item_usage_account_id	Account_Name	Project	License_Plate	Environment	Billing_Group	Owner_Name	Owner_Email	line_item_product_code	product_product_name	line_item_billed_cost	CAD
1	2022	1	xgrDqg-dev	SSO Team	xgrDqg	dev	SSD	awsome@amazon.com	awsome@amazon.com	AWSCloudTrail	AWS CloudTrail	\$0.25	\$0.32
2	2022	1	xgrDqg-dev	SSO Team	xgrDqg	dev	SSD	awsome@amazon.com	awsome@amazon.com	AWSShield	Amazon Shield	\$1.20	\$1.48
3	2022	1	xgrDqg-dev	SSO Team	xgrDqg	dev	SSD	awsome@amazon.com	awsome@amazon.com	AWSLambda	Amazon Lambda	\$18.39	\$23.35
4	2022	1	xgrDqg-dev	SSO Team	xgrDqg	dev	SSD	awsome@amazon.com	awsome@amazon.com	AWSSecretsManager	Amazon Secrets Manager	\$0.14	\$0.17
5	2022	1	xgrDqg-dev	SSO Team	xgrDqg	dev	SSD	awsome@amazon.com	awsome@amazon.com	AWSSimpleNotificationService	Amazon Simple Notification Service	\$0.00	\$0.10
6	2022	1	xgrDqg-dev	SSO Team	xgrDqg	dev	SSD	awsome@amazon.com	awsome@amazon.com	AWSSecretsManager	Amazon Secrets Manager	\$0.81	\$1.03
7	2022	1	xgrDqg-dev	SSO Team	xgrDqg	dev	SSD	awsome@amazon.com	awsome@amazon.com	AWSSecurityHub	AWS Security Hub	\$0.74	\$0.83
8	2022	1	xgrDqg-dev	SSO Team	xgrDqg	dev	SSD	awsome@amazon.com	awsome@amazon.com	AWSSystemsManager	Amazon Systems Manager	\$0.00	\$0.00
9	2022	1	xgrDqg-dev	SSO Team	xgrDqg	dev	SSD	awsome@amazon.com	awsome@amazon.com	AWSSystemsManager	Amazon Systems Manager	\$0.25	\$0.32
10	2022	1	xgrDqg-dev	SSO Team	xgrDqg	dev	SSD	awsome@amazon.com	awsome@amazon.com	AmazonCloudWatch	Amazon CloudWatch	\$0.08	\$0.10
11	2022	1	xgrDqg-dev	SSO Team	xgrDqg	dev	SSD	awsome@amazon.com	awsome@amazon.com	AmazonGuardDuty	Amazon GuardDuty	\$1.75	\$4.76
12	2022	1	xgrDqg-dev	SSO Team	xgrDqg	dev	SSD	awsome@amazon.com	awsome@amazon.com	AmazonMacie	Amazon Macie	\$0.00	\$0.13
13	2022	1	xgrDqg-dev	SSO Team	xgrDqg	dev	SSD	awsome@amazon.com	awsome@amazon.com	AmazonRDS	Amazon Relational Database Service	\$12.67	\$16.09
14	2022	1	xgrDqg-dev	SSO Team	xgrDqg	dev	SSD	awsome@amazon.com	awsome@amazon.com	AmazonSimpleStorageService	Amazon Simple Storage Service	\$0.01	\$0.01
15	2022	1	xgrDqg-dev	SSO Team	xgrDqg	dev	SSD	awsome@amazon.com	awsome@amazon.com	AmazonSimpleNotificationService	Amazon Simple Notification Service	\$0.00	\$0.00
16	2022	1	xgrDqg-dev	SSO Team	xgrDqg	dev	SSD	awsome@amazon.com	awsome@amazon.com	awsaks	AWSx Management Service	\$0.01	\$0.02
17	2022	1	xgrDqg-dev	SSO Team	xgrDqg	dev	SSD	awsome@amazon.com	awsome@amazon.com	AWSCloudTrail	AWS CloudTrail	\$0.24	\$0.33
18	2022	1	xgrDqg-dev	SSO Team	xgrDqg	sandbox	SSD	awsome@amazon.com	awsome@amazon.com	AWSShield	Amazon Shield	\$0.07	\$1.23
19	2022	1	xgrDqg-dev	SSO Team	xgrDqg	sandbox	SSD	awsome@amazon.com	awsome@amazon.com	AWSLambda	Amazon Lambda	\$0.00	\$0.00
20	2022	1	xgrDqg-sandbox	SSO Team	xgrDqg	sandbox	SSD	awsome@amazon.com	awsome@amazon.com	AWSSQS	Amazon Simple Queue Service	\$0.00	\$0.00
21	2022	1	xgrDqg-sandbox	SSO Team	xgrDqg	sandbox	SSD	awsome@amazon.com	awsome@amazon.com	AWSSystemsManager	Amazon Systems Manager	\$0.00	\$0.00
22	2022	1	xgrDqg-sandbox	SSO Team	xgrDqg	sandbox	SSD	awsome@amazon.com	awsome@amazon.com	AWSSecurityHub	AWS Security Hub	\$4.58	\$10.89
23	2022	1	xgrDqg-sandbox	SSO Team	xgrDqg	sandbox	SSD	awsome@amazon.com	awsome@amazon.com	AWSSystemsManager	Amazon Systems Manager	\$0.00	\$0.00
24	2022	1	xgrDqg-sandbox	SSO Team	xgrDqg	sandbox	SSD	awsome@amazon.com	awsome@amazon.com	AmazonAPIGateway	Amazon API Gateway	\$0.00	\$0.00
25	2022	1	xgrDqg-sandbox	SSO Team	xgrDqg	sandbox	SSD	awsome@amazon.com	awsome@amazon.com	AmazonCloudWatch	Amazon CloudWatch	\$0.00	\$0.11
26	2022	1	xgrDqg-sandbox	SSO Team	xgrDqg	sandbox	SSD	awsome@amazon.com	awsome@amazon.com	AmazonECS	Amazon Elastic Compute Cloud	\$17.15	\$47.18
27	2022	1	xgrDqg-sandbox	SSO Team	xgrDqg	sandbox	SSD	awsome@amazon.com	awsome@amazon.com	AmazonGuardDuty	Amazon GuardDuty	\$34.44	\$44.37
28	2022	1	xgrDqg-sandbox	SSO Team	xgrDqg	sandbox	SSD	awsome@amazon.com	awsome@amazon.com	AmazonMacie	Amazon Macie	\$0.00	\$0.13
29	2022	1	xgrDqg-sandbox	SSO Team	xgrDqg	sandbox	SSD	awsome@amazon.com	awsome@amazon.com	AmazonRDS	Amazon Relational Database Service	\$0.34	\$0.43
30	2022	1	xgrDqg-sandbox	SSO Team	xgrDqg	sandbox	SSD	awsome@amazon.com	awsome@amazon.com	AmazonSimpleStorageService	Amazon Simple Storage Service	\$0.11	\$0.15
31	2022	1	xgrDqg-sandbox	SSO Team	xgrDqg	sandbox	SSD	awsome@amazon.com	awsome@amazon.com	AmazonSimpleNotificationService	Amazon Simple Notification Service	\$0.00	\$0.00
32	2022	1	xgrDqg-sandbox	SSO Team	xgrDqg	sandbox	SSD	awsome@amazon.com	awsome@amazon.com	awsaks	AWSx Management Service	\$3.11	\$3.95
33	2022	1	xgrDqg-sandbox	SSO Team	xgrDqg	sandbox	SSD	awsome@amazon.com	awsome@amazon.com	AWSCloudTrail	AWS CloudTrail	\$0.24	\$0.30
34	2022	1	xgrDqg-prod	SSO Team	xgrDqg	prod	SSD	awsome@amazon.com	awsome@amazon.com	AWSShield	Amazon Shield	\$13.50	\$44.72
35	2022	1	xgrDqg-prod	SSO Team	xgrDqg	prod	SSD	awsome@amazon.com	awsome@amazon.com	AWSLambda	Amazon Lambda	\$18.39	\$23.35
36	2022	1	xgrDqg-prod	SSO Team	xgrDqg	prod	SSD	awsome@amazon.com	awsome@amazon.com	AmazonGuardDuty	Amazon GuardDuty	\$0.08	\$0.11
37	2022	1	xgrDqg-prod	SSO Team	xgrDqg	prod	SSD	awsome@amazon.com	awsome@amazon.com	AWSSystemsManager	Amazon Systems Manager	\$0.00	\$0.00
38	2022	1	xgrDqg-prod	SSO Team	xgrDqg	prod	SSD	awsome@amazon.com	awsome@amazon.com	AWSSecretsManager	Amazon Secrets Manager	\$0.01	\$0.01
39	2022	1	xgrDqg-prod	SSO Team	xgrDqg	prod	SSD	awsome@amazon.com	awsome@amazon.com	AWSSecurityHub	AWS Security Hub	\$7.70	\$9.78
40	2022	1	xgrDqg-prod	SSO Team	xgrDqg	prod	SSD	awsome@amazon.com	awsome@amazon.com	AWSSystemsManager	Amazon Systems Manager	\$0.00	\$0.00
41	2022	1	xgrDqg-prod	SSO Team	xgrDqg	prod	SSD	awsome@amazon.com	awsome@amazon.com	AmazonAPIGateway	Amazon API Gateway	\$0.00	\$0.13
42	2022	1	xgrDqg-prod	SSO Team	xgrDqg	prod	SSD	awsome@amazon.com	awsome@amazon.com	AmazonCloudWatch	Amazon CloudWatch	\$0.05	\$0.06
43	2022	1	xgrDqg-prod	SSO Team	xgrDqg	prod	SSD	awsome@amazon.com	awsome@amazon.com	AmazonGuardDuty	Amazon GuardDuty	\$3.49	\$4.44
44	2022	1	xgrDqg-prod	SSO Team	xgrDqg	prod	SSD	awsome@amazon.com	awsome@amazon.com	AmazonMacie	Amazon Macie	\$0.00	\$0.13
45	2022	1	xgrDqg-prod	SSO Team	xgrDqg	prod	SSD	awsome@amazon.com	awsome@amazon.com	AmazonRDS	Amazon Relational Database Service	\$10.69	\$13.58
46	2022	1	xgrDqg-prod	SSO Team	xgrDqg	prod	SSD	awsome@amazon.com	awsome@amazon.com	AmazonS3	Amazon Simple Storage Service	\$0.01	\$0.01
47	2022	1	xgrDqg-prod	SSO Team	xgrDqg	prod	SSD	awsome@amazon.com	awsome@amazon.com	AmazonDNS	Amazon Simple DNS Resolution Service	\$0.00	\$0.10
48	2022	1	xgrDqg-prod	SSO Team	xgrDqg	prod	SSD	awsome@amazon.com	awsome@amazon.com	awsaks	AWS Key Management Service	\$0.01	\$0.02
49	2022	1	xgrDqg-prod	SSO Team	xgrDqg	prod	SSD	awsome@amazon.com	awsome@amazon.com				\$3.82

Figure 19: sample monthly billing report

7 Communities of practice

7.1 Value of Communities

- A strong community will
 - Provide an answer before the platform team can
 - * Operational cost savings
 - * Faster Service turnarounds
 - Self-organize to co-create reusable artifacts
 - * Reduce duplication and one-offs
 - * Lighten application maintenance lifecycle requirements
 - Create Stewards
 - * Early adopters become Influencers
 - * Influencers become Stewards

7.2 Customer Focus – 3 CoPs

::: tip Acronyms

- **OCIO** = Office of the Associate Deputy Minister and Government Chief Information Officer
- **CoP** = Community of Practise
- **SecOps** = OCIO Security Operations Team
- **MISO** = Ministry Information Security Officer, embedded as part of the developer team
- :::
- Our Customers: Project Managers / Product Owners / Expense Authorities

- Our Users: Developer Teams
- Compliance Users: Security Operations OCIO, MISOs

7.3 Service Design Customer Focus

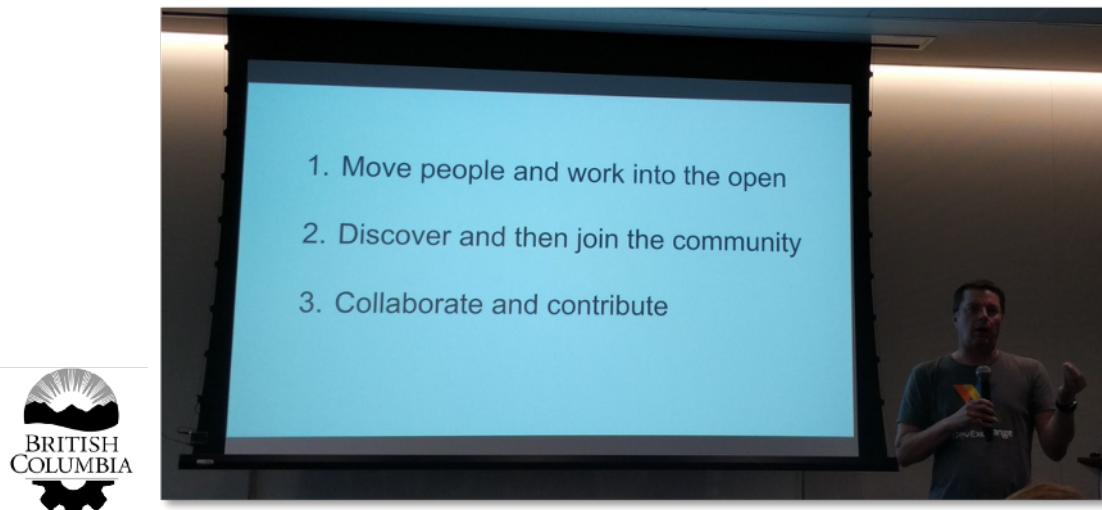
::: tip Acronyms - **UX**: User Experience experts - **SD**: Service Designer :::

- UX / SD engage with 3 Customer/Users groups
 - Gain deep understanding of needs, workflows, pain points
 - Create tickets from this work prioritizing needs
 - Focus on delivery time
 - * Self-serve or fast turnaround
 - * Reliability
 - * Tools teams need

7.4 Strong Communities in BC Gov

- Devops Commons





- Features
 - Every 2 Months
 - History from 2016 onwards
 - Community Focused
 - Daily Open Participation
- Promotes
 - Collaboration on Shared efforts
 - Networking across silos
 - Best practices via Stewards

7.5 Focus of Teams and Rocket Chat

Focus on Teams



Image credit to www.mikewashburn.net/blog/2020/2/19/but-what-are-you-making

Figure 20: image of microsoft teams

- Teams
 - “The Workshop”, it
 - * Internally connects team
 - * Eases conferencing out
 - * Is focused primarily on
 - Leadership
 - Scrum Masters
 - Employees

Focus of RocketChat

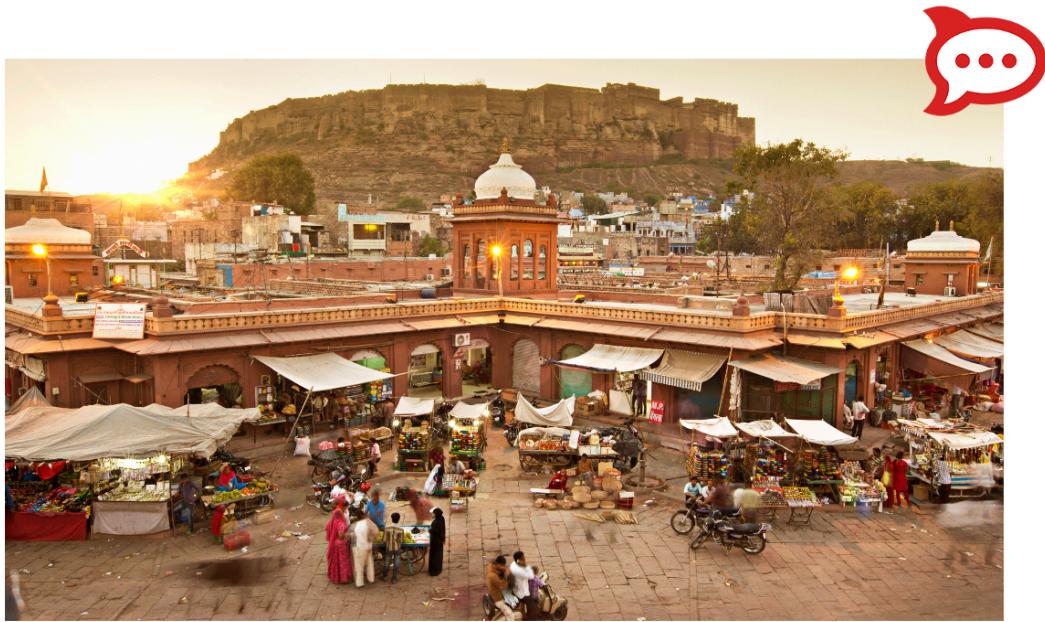


Image credit to placetovisit.city/places-in-jodhpur

Figure 21: image of rocketchat

- RocketChat
 - “The Bazaar”, and just like OCIO Connect, it
 - * Connects People
 - * Highlights Best Practices
 - * Is Inclusive
 - Contractors
 - vendors
 - Leadership
 - Scrum Masters
 - Employees

Recommend Both!



Image credit to [Creative Commons](#)

Bazaar Frontage with Workshops

Figure 22: image of rocket chat

- Bazaars and Workshops
 - Together both provide team's collaboration space and access to community
 - Allows others to find your team and modern video call meetings

A Teams platform



Figure 23: logo of microsoft teams

A Community platform



Figure 24: Rocket chat logo

- Cloud Pathfinder is available on both
- Cloud Pathfinder Rocket chat channel : aws-lz2

8 Service Levels

- Cloud Pathfinder Service Levels
 - Provide training for teams
 - Provision new team members (0.5 business day turnaround)
 - Facilitate and respond to open and private support channels
 - Connect vendor support (cut through vendor complexity)
 - Review and include new requests for cloud components (usually 3 week turnaround)
 - Provide clear billing in multi-tenancy
 - Remove overhead of offboarding contractors or departing employees (IDIR gone? AWS gone!)

9 Demo

- Demo of Authentication to AWS
 - Showing lack of users to manage
 - Make your life easy to not have to delete users

10 Questions ?



Figure 25: image for questions and answers

- *This is where we would normally have a discussion if we were doing a live session



Figure 26: logo called Cloud Pathfinder

11 Overview

Welcome to the Cloud Pathfinder Pre-Reading Material which is the information Pack for BC Gov Ministry Teams Considering Cloud.

Today we will go over the below topics

- About BC Gov Cloud
- SEA at BC Gov
- Procurement Value Proposition
- Shared Responsibility
- Providing an SEA service
- Billing
- Communities of Practice
- Service Levels
- Demos
- Questions & Answers

12 Summary

- About BC Gov Cloud
- SEA at BC Gov