
AWS
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Observability patterns for highly available applications

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Today’s session is . . .

- **Level**: 300 discussion
- **Expectations**: Observability on AWS
- **Audience**: DevOps/operations eng., system admins, SAs
- **Type**: Chalk talk = interactive conversation, whiteboarding
- **Goal**: Discuss some observability patterns for HA apps

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Agenda

Observability pillars

Examples of highly available (HA) architectures

Operational challenges with monitoring HA architectures

AWS observability solutions to the rescue

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Why AWS Cloud Operations?



Return on investment (ROI)

241% ROI over 3 years*



Staff productivity

62% more efficient IT infrastructure staff



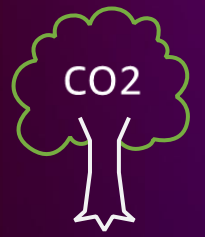
Operational resilience

57% decrease in downtime



Business agility

37% decrease in time to market



Carbon savings

88% reduction in carbon footprint of IT operations

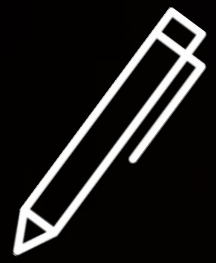
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Based on independent research of 1,500 AWS enterprise customers
*Source: "The Total Economic Impact of AWS Cloud Operations: Cost Savings And Business Benefits Enabled By Operation on AWS. May 2022. A commissioned study conducted by Forrester Consulting on behalf of Amazon Web Services."

Your journey to operating at cloud scale

Get started with AWS Cloud Operations

Set up



Establish a secure foundation for governance and compliance

Build and migrate



Migrate applications to the cloud or build new applications

Operate



Simplify ops management with an integrated experience to manage and monitor resources and apps to detect and remediate risks quickly

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Pillars of observability

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What is observability?



A measure of how well we can understand a system from the work it does

90% of the methods in this service complete in under 200 milliseconds

This API is handling 1500 HTTP requests per second

CPU utilization for this service is at 85%

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What is instrumentation?

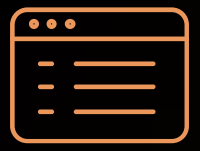
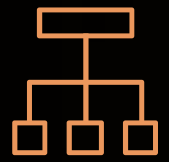


Calls to this database took, on average, 50 milliseconds

Instrumentation: Measuring events in software using code (a type of structural monitoring)

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Observable systems should emit events: Metrics, logs, and traces

 Metrics	“Our application is 35% slower than last week after this configuration change”	✓
 Logs	“The database won’t start after the update”	✓
 Traces	“What are the dependencies for this service?”	✓

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What is high availability?



Ability to operate continuously without interruption for a specific period of time





Measures:

1. Increase application availability
2. Add fault tolerance
3. Eliminate single points of failure

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Operational challenges



Correlate telemetry signals



Application complexity



End-user experience



Operational cost

Technical

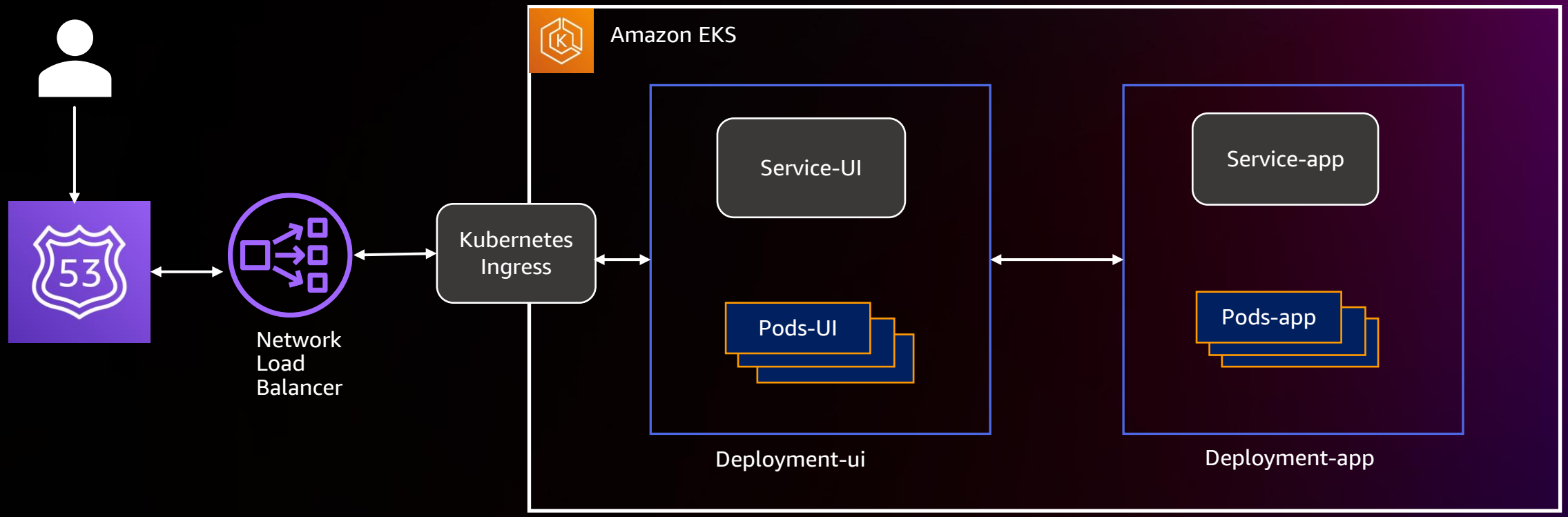
Business

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Common highly available architectures

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Microservices

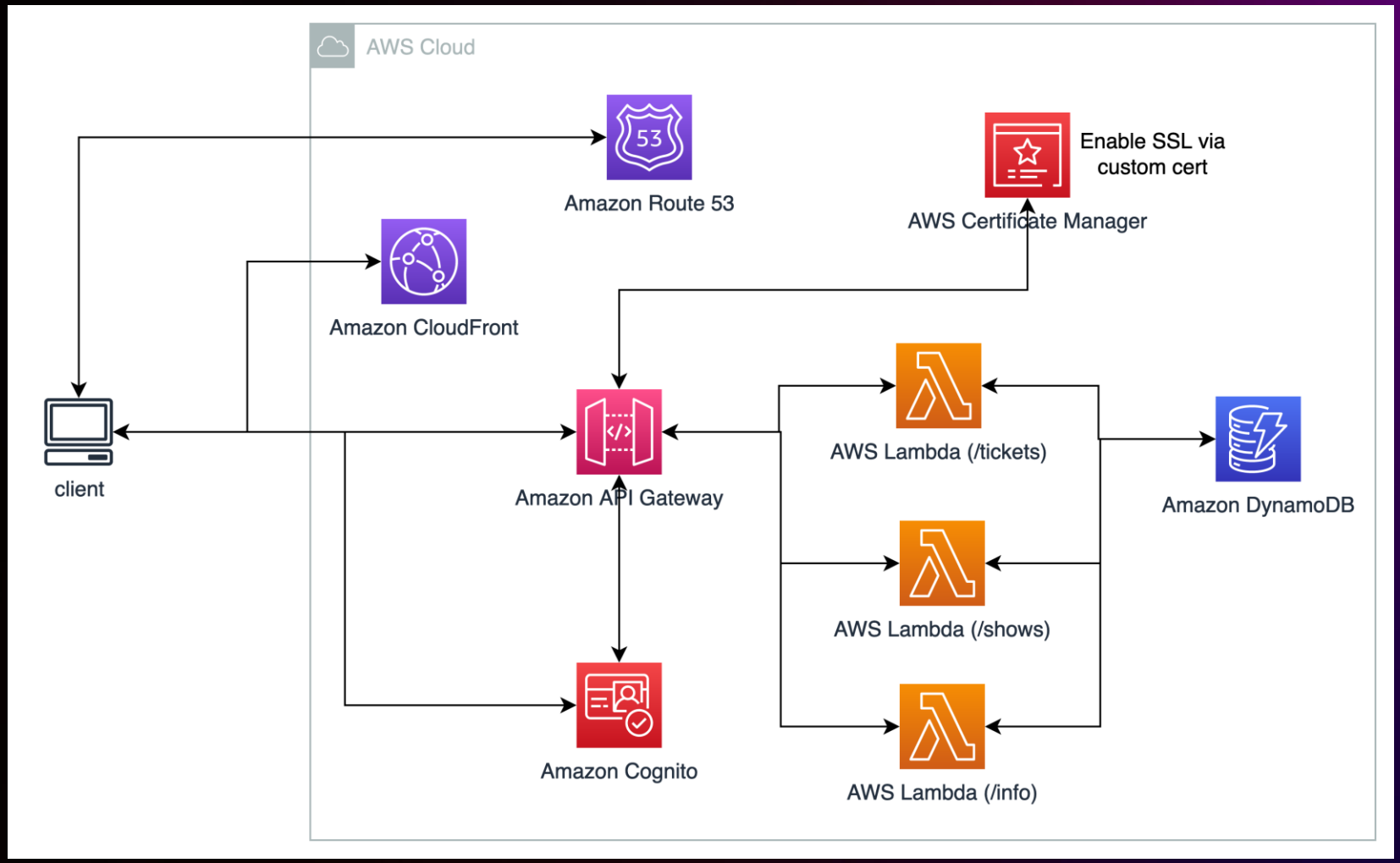


- Route53, load balancers
- Auto scaling
- Container orchestration services

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Serverless application

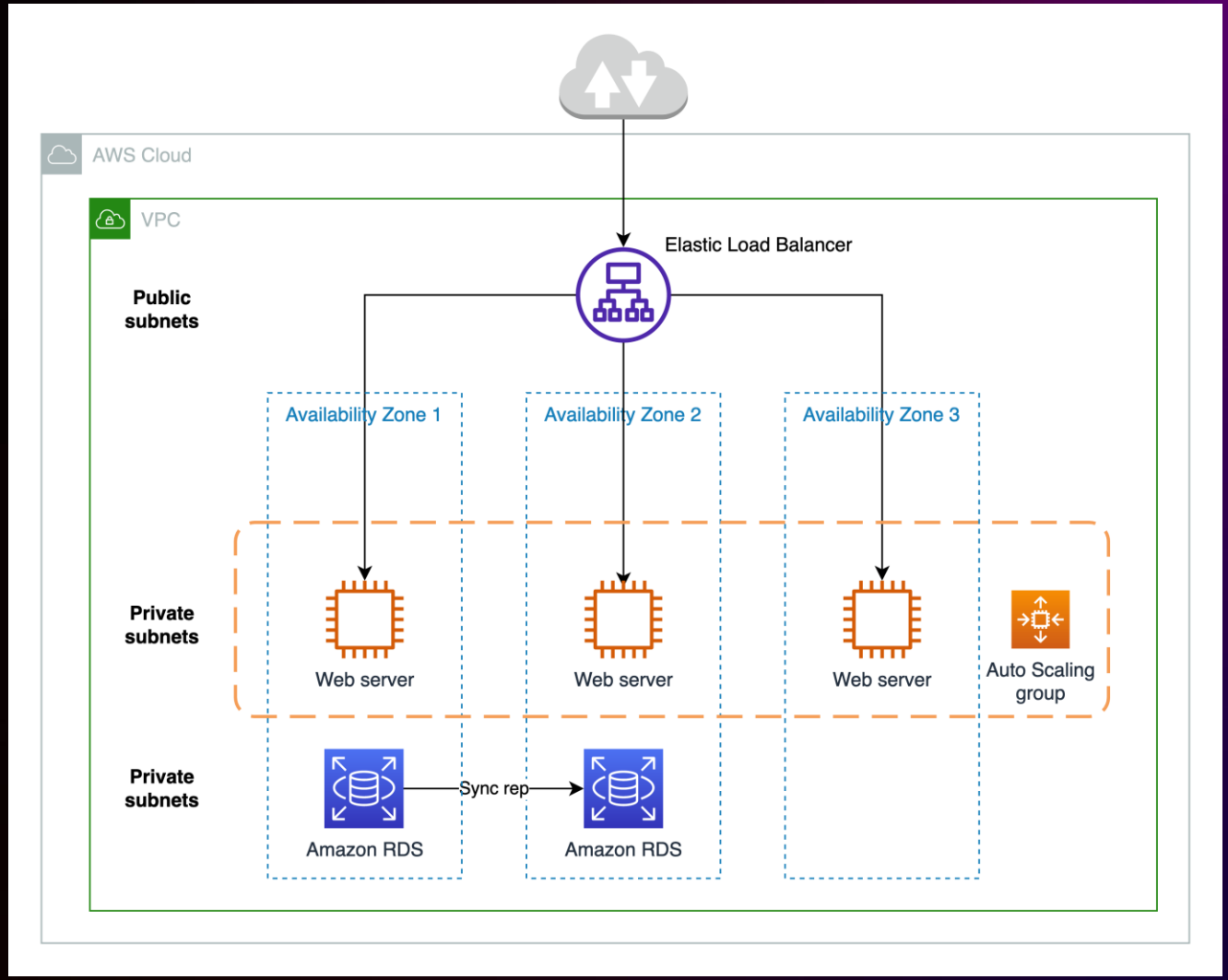
- Amazon CloudFront
- Fully managed, serverless solutions



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3-tier web application

- Multi-AZs
- Auto scaling
- Storage services provide high durability & availability

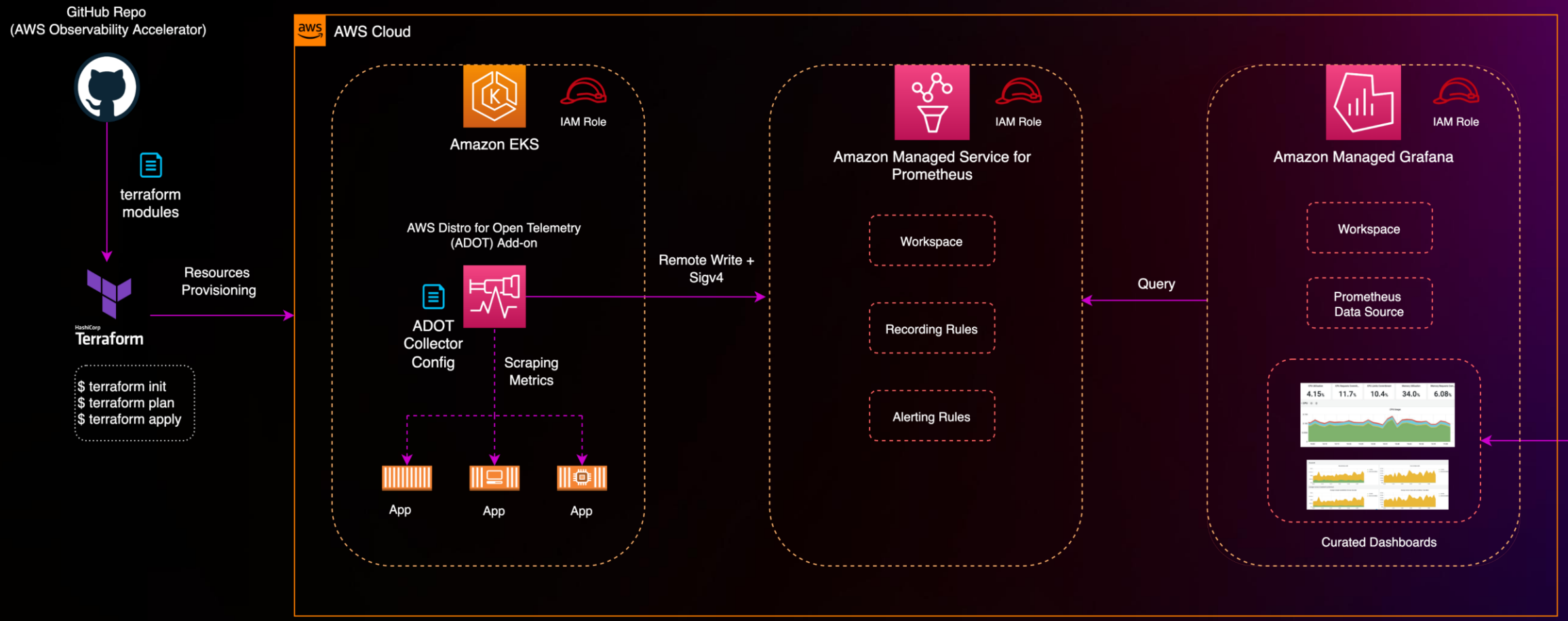


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Appendix: Observability use cases

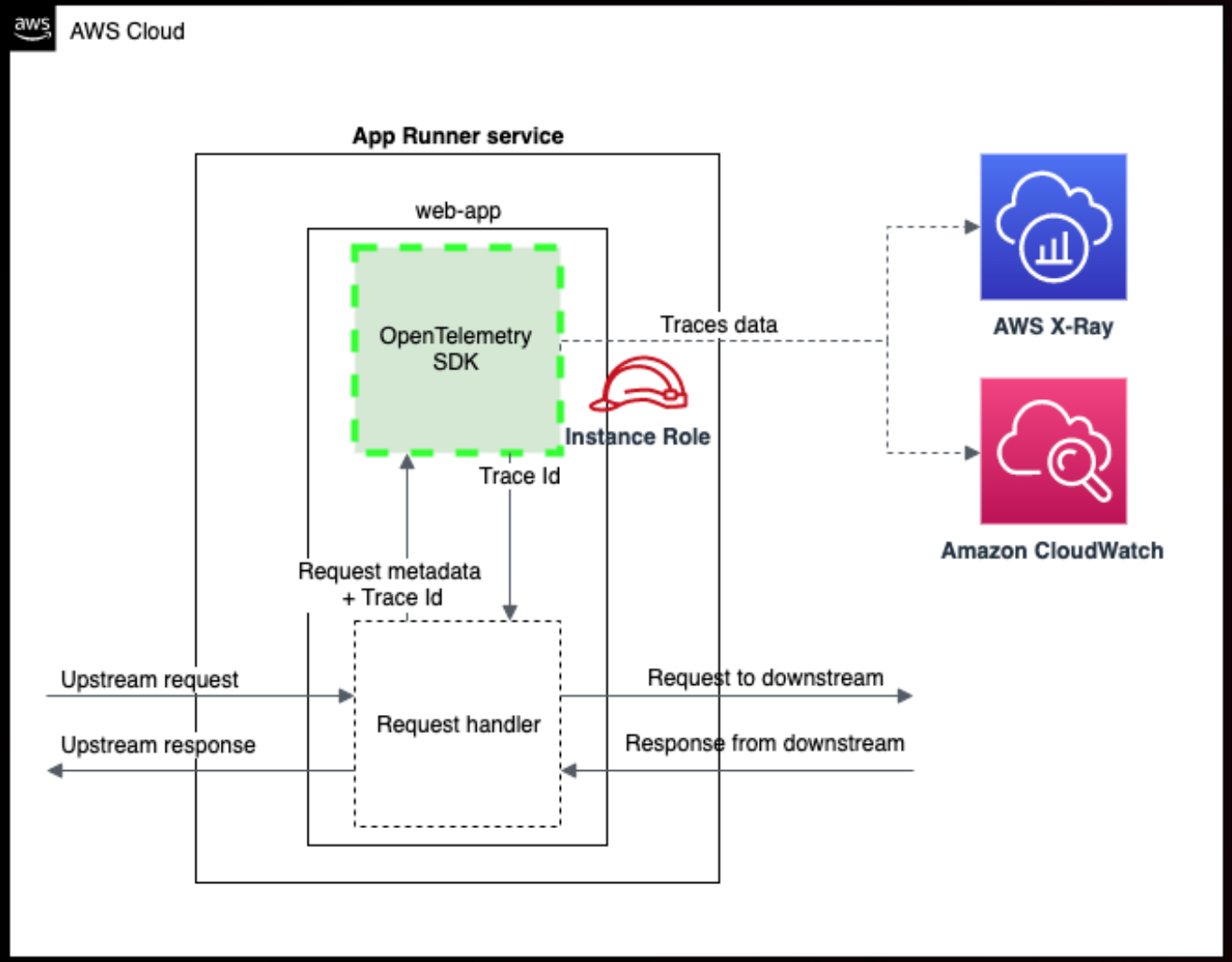
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Solving microservices observability challenges: AWS Observability Accelerator



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Distributed tracing: Serverless application

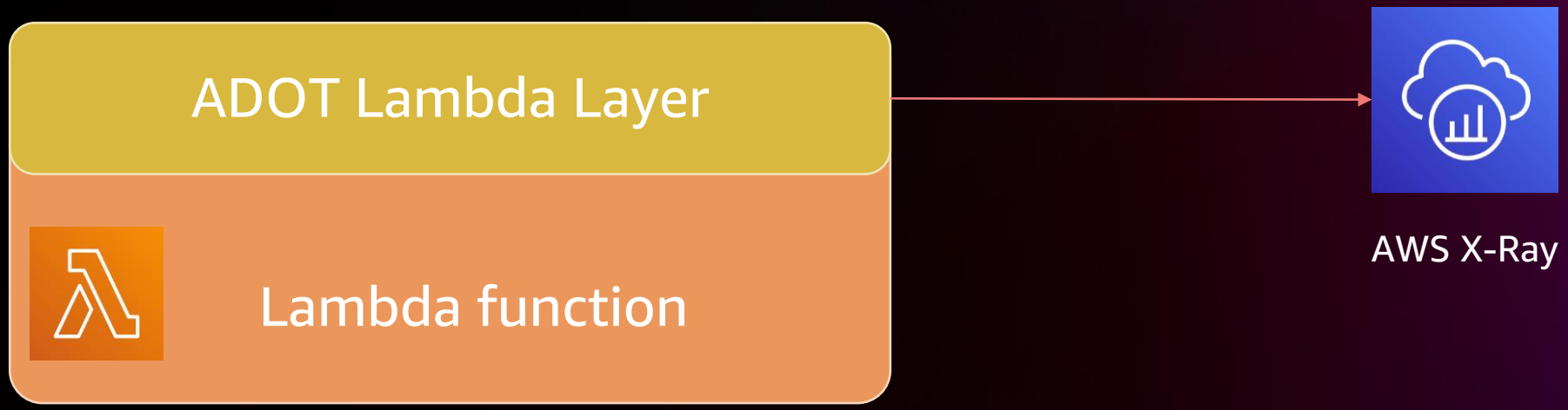


1. Instrument and build your application
2. Set up an IAM role
3. Create and configure App Runner service
4. View tracing data in X-Ray

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AWS Lambda setup

PRE-CONFIGURED OTEL CONFIGURATION TO SEND TRACES TO AWS X-RAY



Plug-and-play user experience by automatically instrumenting a Lambda function, by packaging OpenTelemetry together with an out-of-the-box configuration for Lambda and X-Ray in an easy to setup layer. Users can enable and disable OpenTelemetry for their Lambda function without changing code.

```
> aws lambda update-function-configuration --function-name Function --layers
arn:aws:lambda:<AWSREGION>:123456789:layer:opentelemetry-lambda-extension:8
```

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Takeaways

AWS Observability Accelerator



Enhancing workload observability using EMF



Distributed tracing: Serverless application (App Runner)



Monitor applications and AWS infrastructure using App Insights



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