Analyze Root Cause and End-User Impact using AWS X-Ray

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Agenda

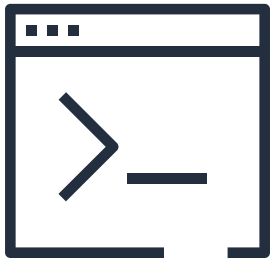
- Monitoring and debugging modern applications
- AWS X-Ray overview
- Root cause and end-user impact analysis using AWS X-Ray
- Demo
- Q&A

Monitoring and Debugging Modern Applications

Monitoring and Debugging Modern Applications

Built on Containers and Serverless

Distributed Microservices Architecture



Autonomous and Independent Components

Analyze Impact of Isolated Errors

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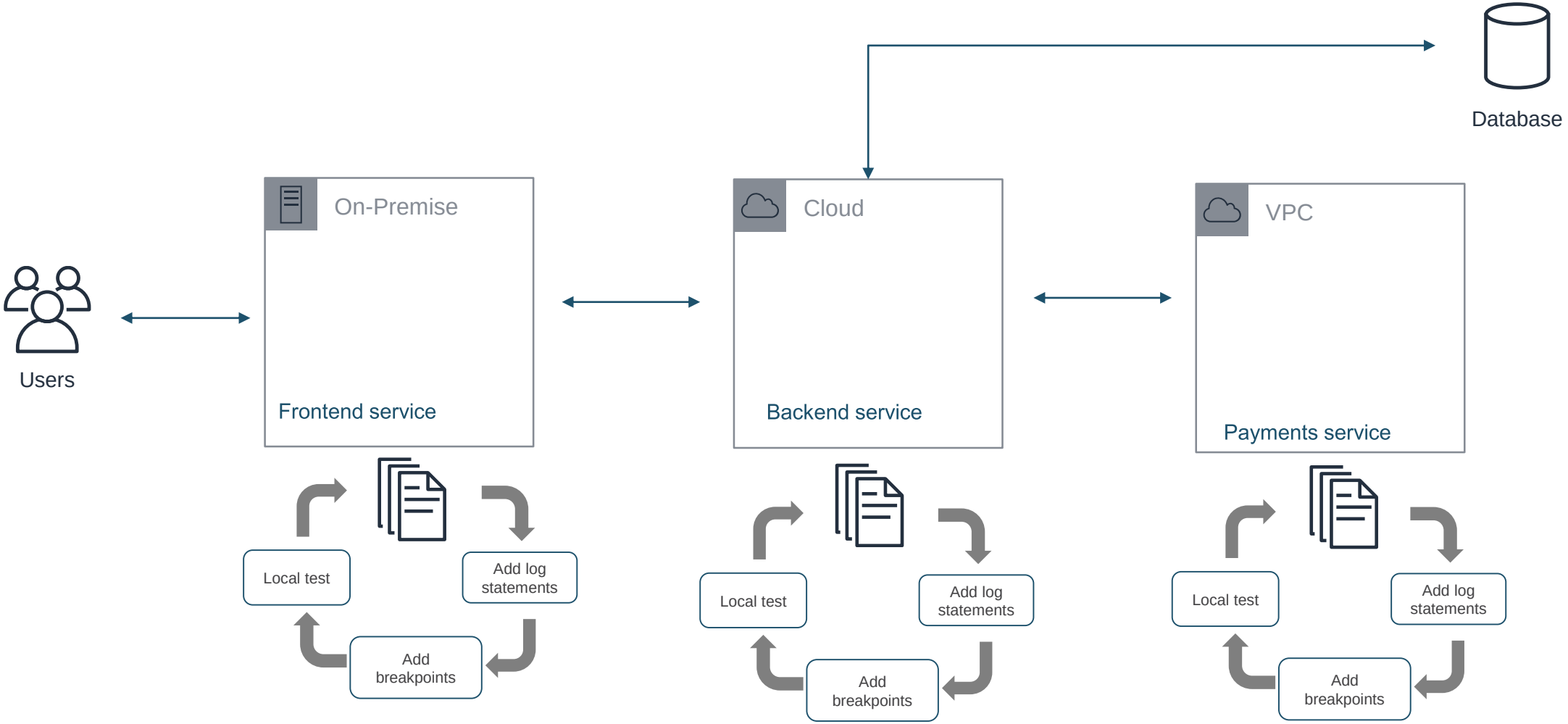
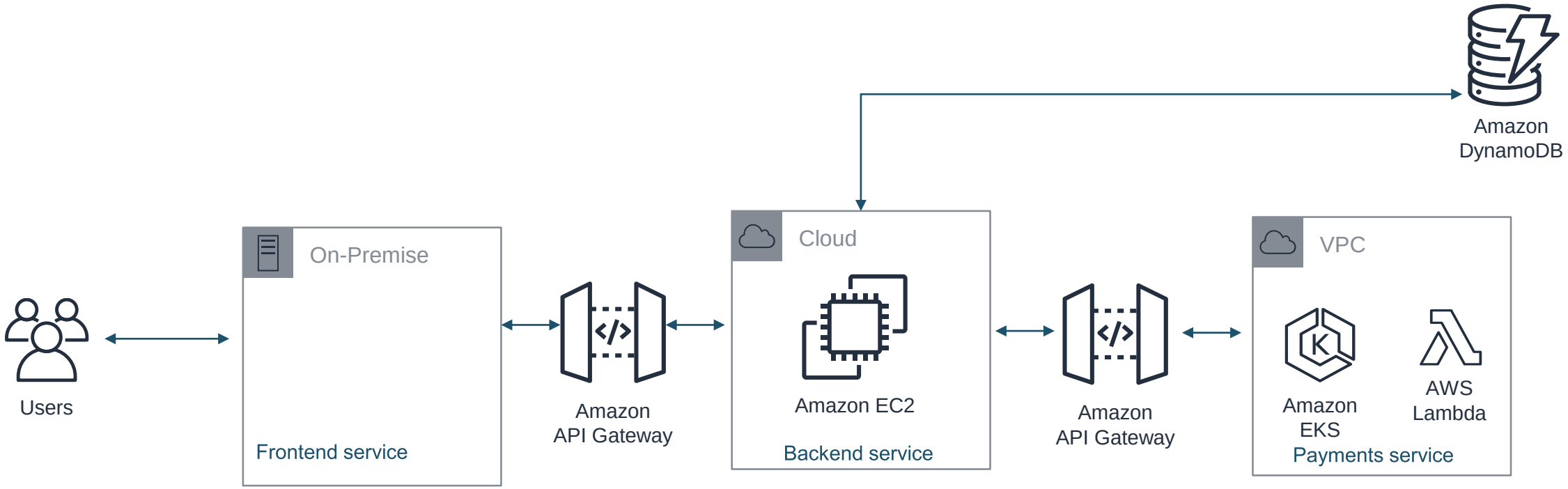
Traditional Debugging Does Not Scale



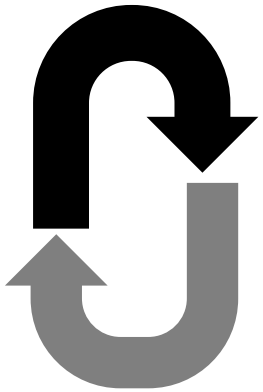
Tracing For Your Modern Applications



AWS X-Ray Overview

AWS X-Ray Overview

Analyze and Debug Issues Quickly



End-to-End View of Individual Services

Identify Customer Impact

Cloud Agnostic

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AWS X-Ray Overview

AWS X-Ray helps developers analyze and debug applications built using microservices architecture to identify the root cause and end-user impact.

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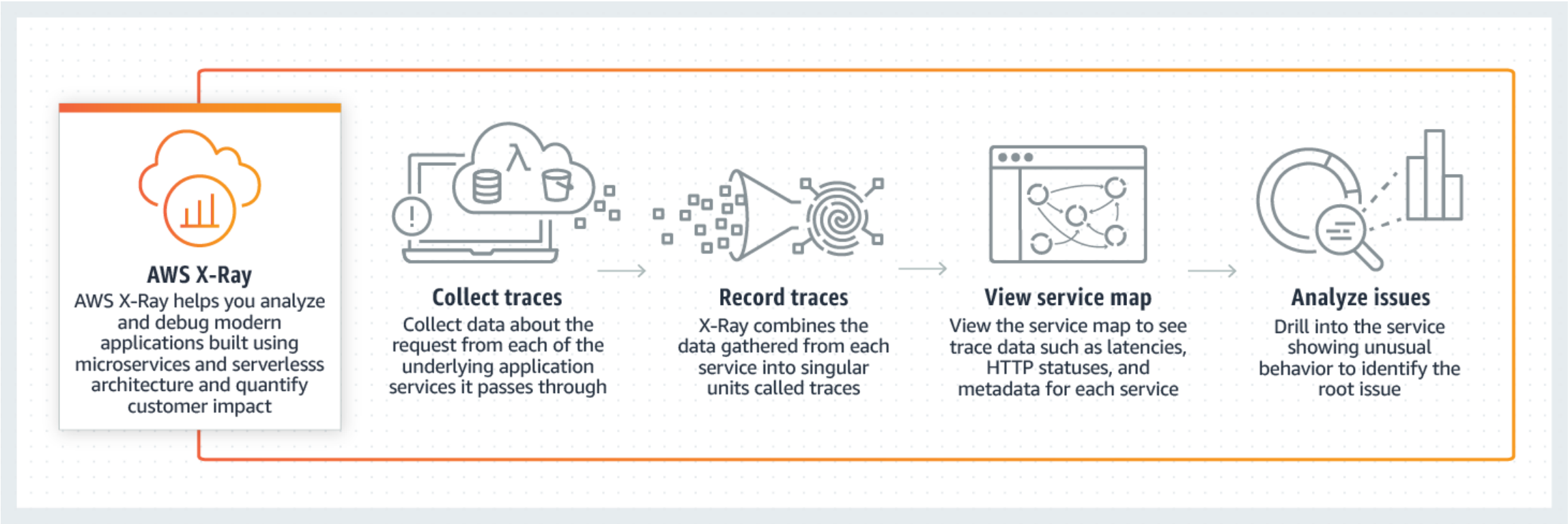
How AWS X-Ray Works



AWS X-Ray Instrumentation

Strong Open Source Community

.NET
(with .NET Core 2.0)

Go (beta)

Java

Python

Ruby (beta)

Node.js

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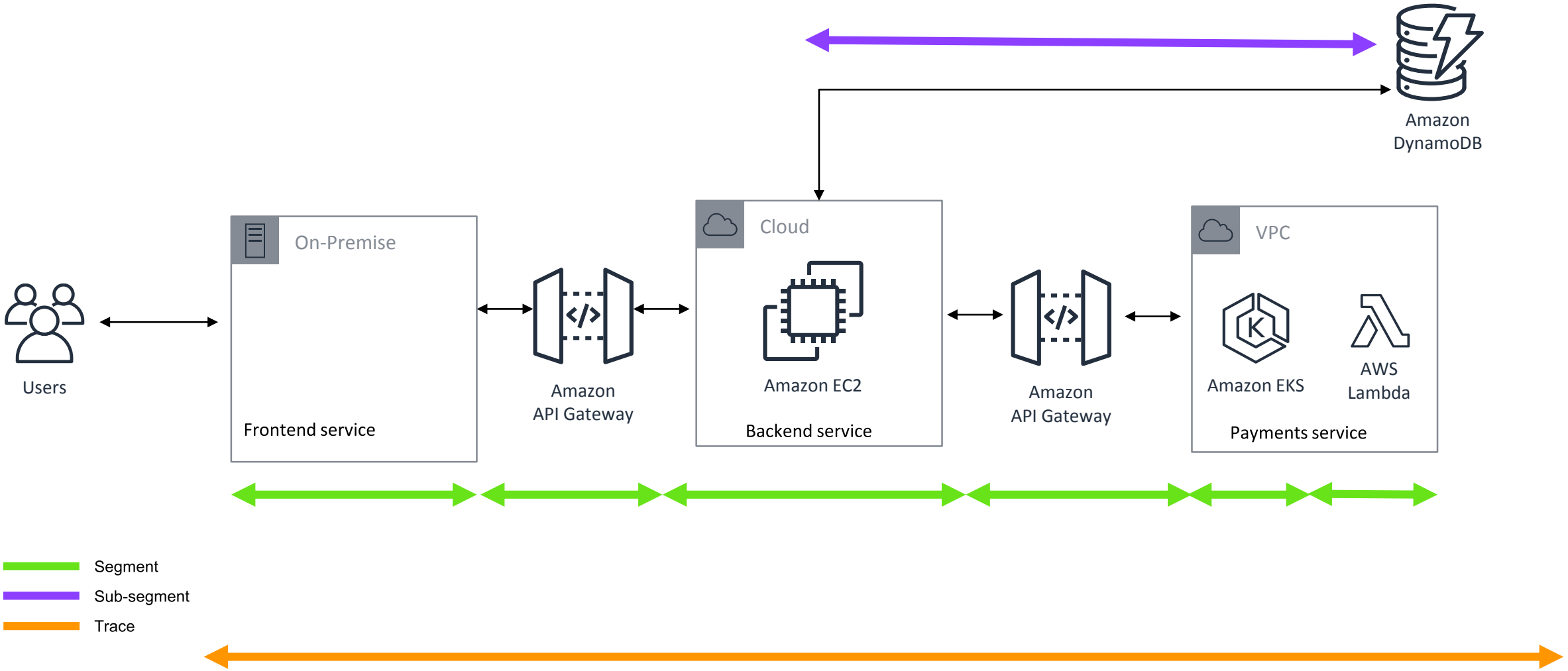
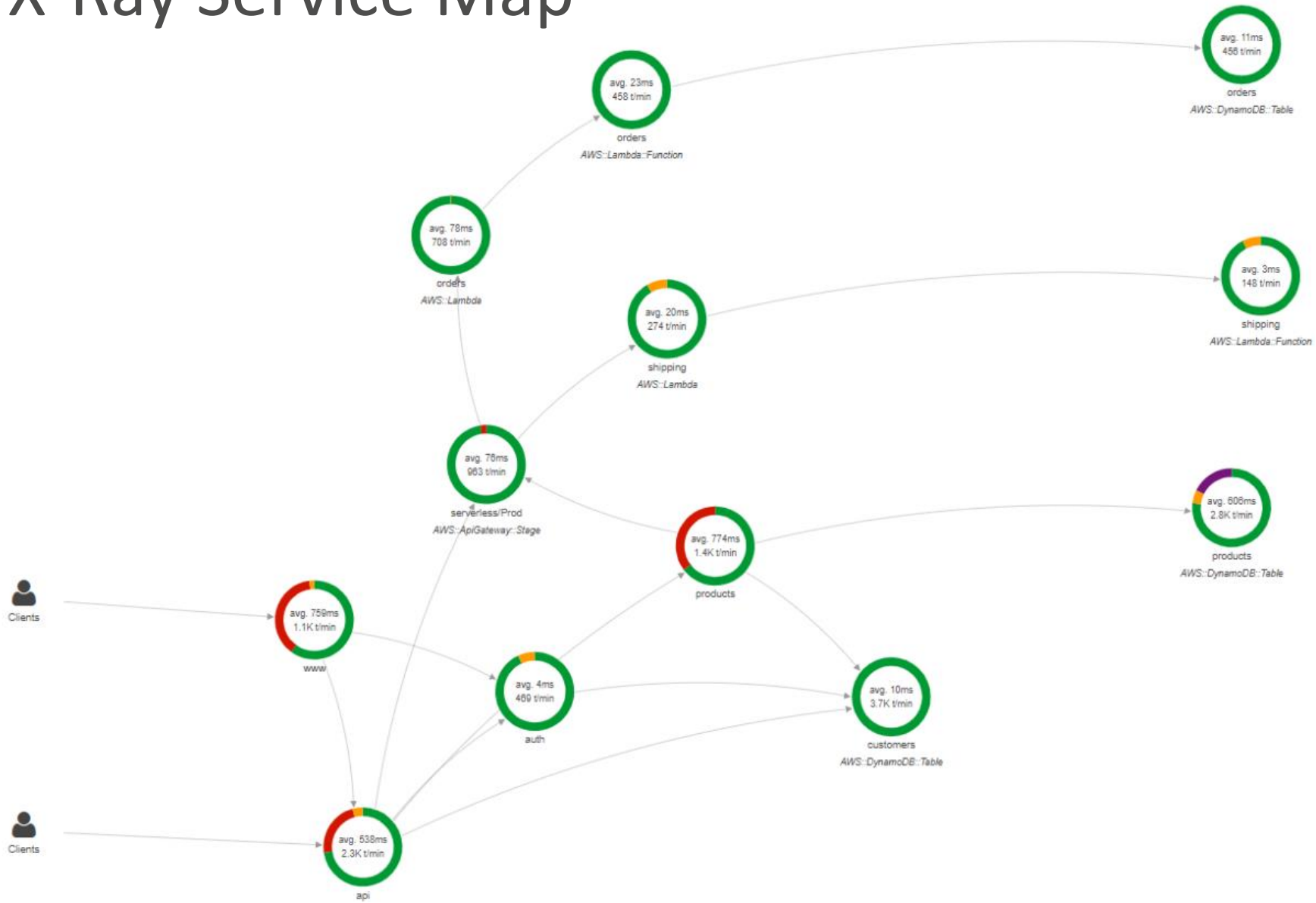
AWS X-Ray for your Modern Applications

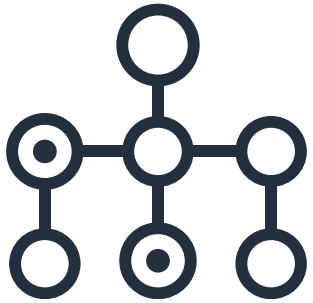


AWS X-Ray Service Map

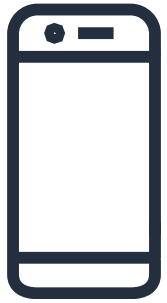


Root Cause and End-User Impact Analysis using AWS X-Ray

AWS X-Ray Groups



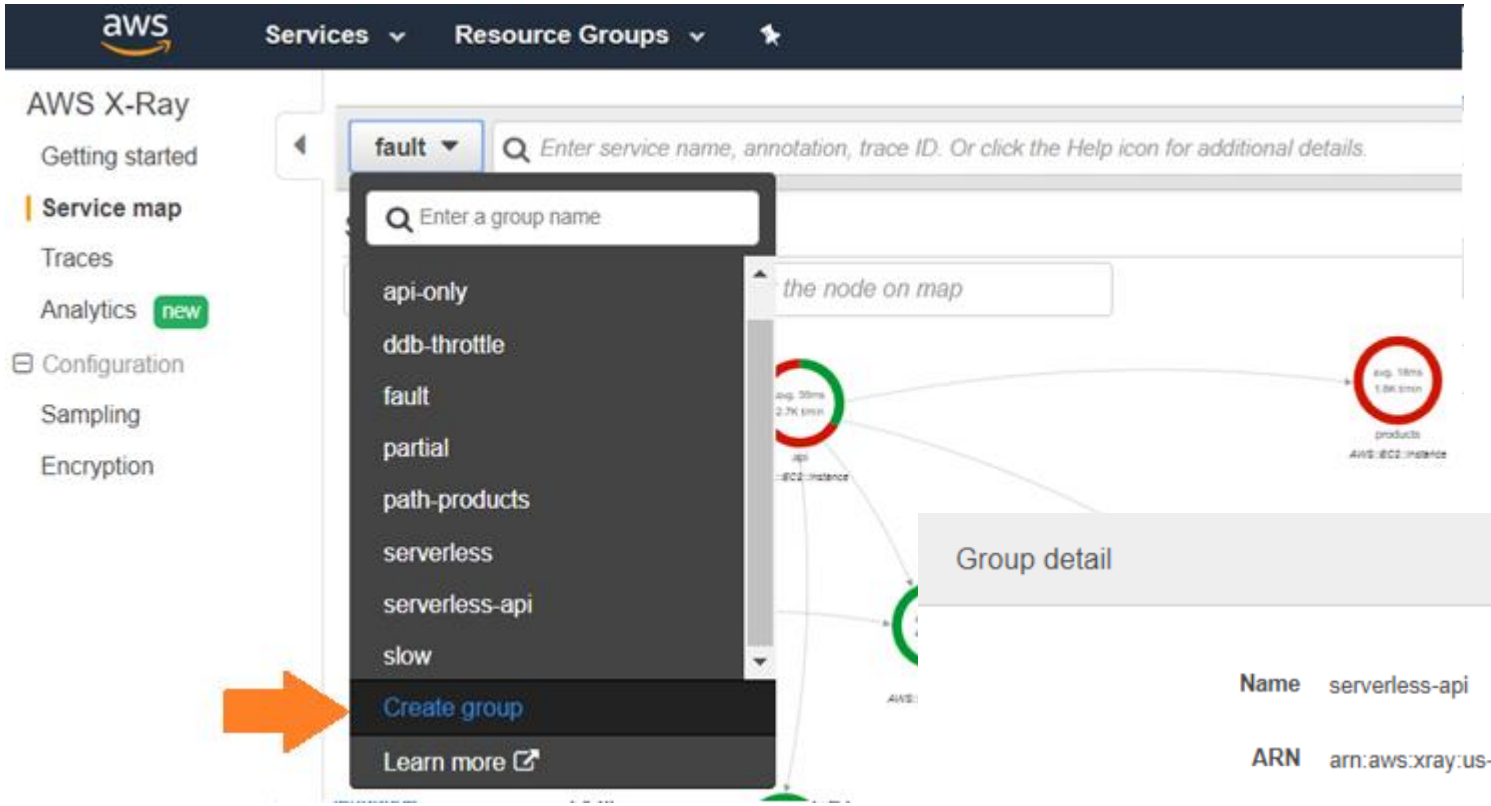
Focus on selected workflows

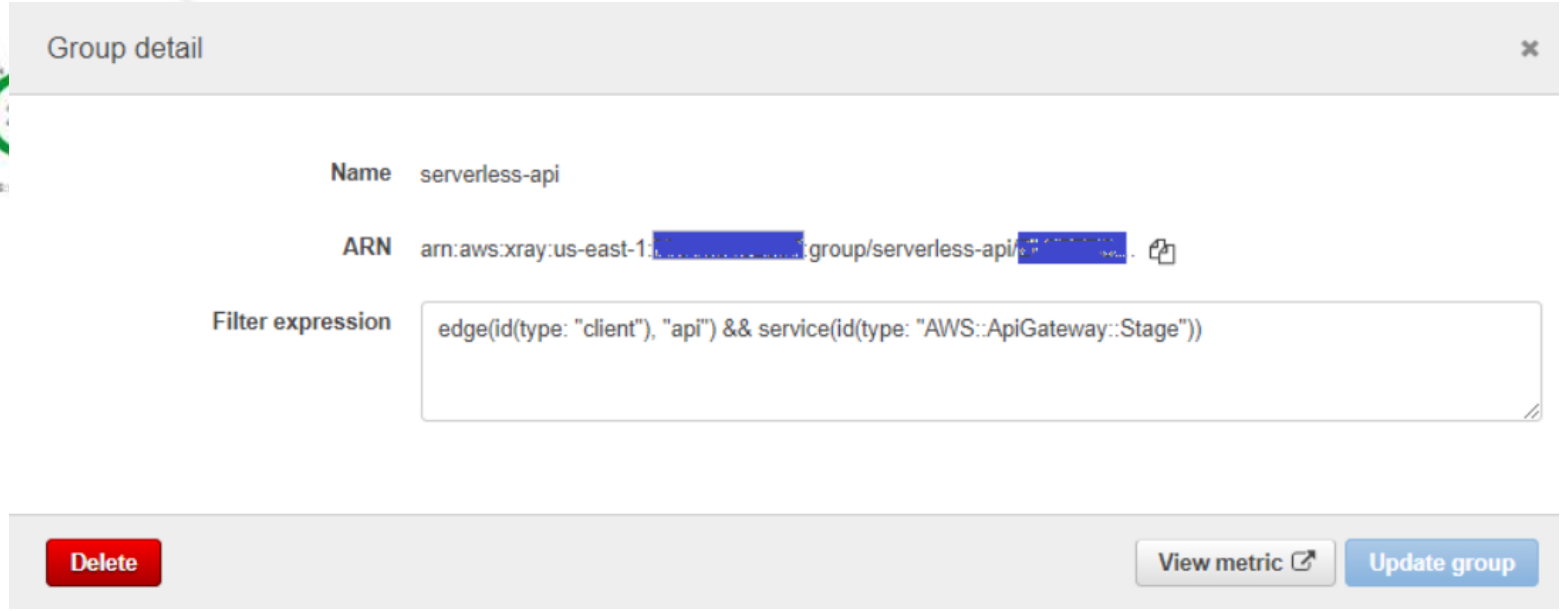


Get alerted on increased error/fault rates

Increase visibility on selected services/end-users

AWS X-Ray Groups



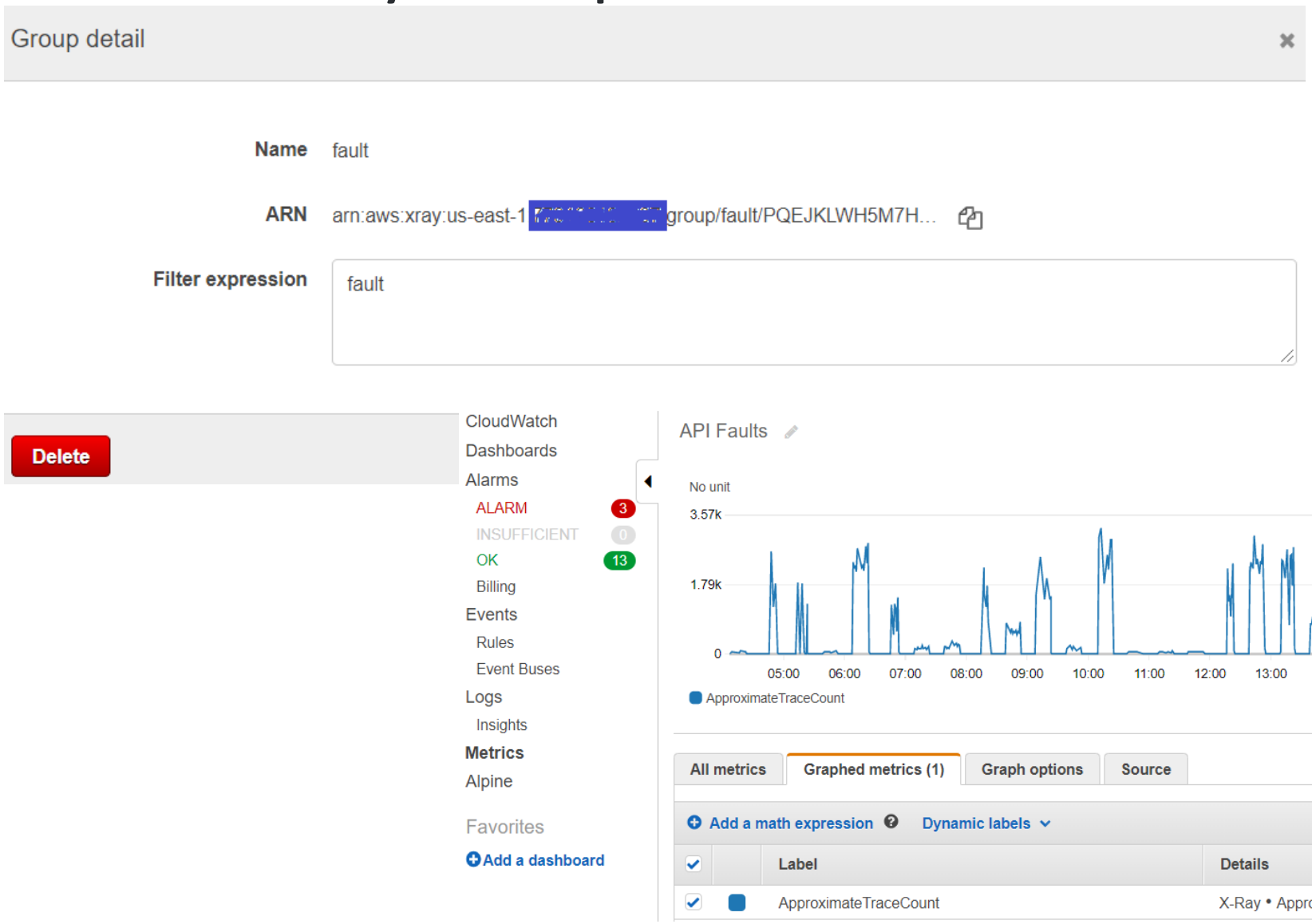


Focus on selected workflows

AWS X-Ray Groups

Focus on selected workflows

AWS X-Ray Groups



Get alerted on increased error/fault rates

AWS X-Ray Groups

Increase visibility on selected services/end-user

Group detail

Name slow

ARN arn:aws:xray:us-east-1:779168132807:group/slow/W3ULUGNWUD4N...

Filter expr

Delete

AWS X-Ray

- Getting started
- Service map
- Traces
- Analytics new
- Configuration
- Sampling
- Encryption

slow | service("serverless/Prod") { responsetime > 1.5 } | 2019/06/04 01:23 - 201

Trace overview

Group by: URL

Done 10

URL	Avg response time	% of Traces	Response
http://storefront.us-east-1.elasticbeanstalk.com/	1.7 sec	50.00%	2 OK, 0 Throttled, 0 Errors, 0 Faul
http://storefront.us-east-1.elasticbeanstalk.com/error/	3.0 sec	25.00%	0 OK, 0 Throttled, 0 Errors, 1 Faul
http://storefront.us-east-1.elasticbeanstalk.com/slow/	3.0 sec	25.00%	0 OK, 0 Throttled, 0 Errors, 1 Faul

Trace list

ID	Age	Method	Response	Response time	URL	Client IP
...f357dc91	2.4 hr	GET	200	1.6 sec	http://storefront.us-east-1.elasticbeanst...	18.213.102.12
...f1c1c029	2.5 hr	GET	200	1.8 sec	http://storefront.us-east-1.elasticbeanst...	18.213.102.12
...f6addd96	2.8 hr	GET	500	3.0 sec	http://storefront.us-east-1.elasticbeanst...	18.213.102.12
...108fbe28	2.8 hr	GET	500	3.0 sec	http://storefront.us-east-1.elasticbeanst...	18.213.102.12

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AWS X-Ray Analytics

Understand End-User Impact

Analyze Root Cause

Compare Trends

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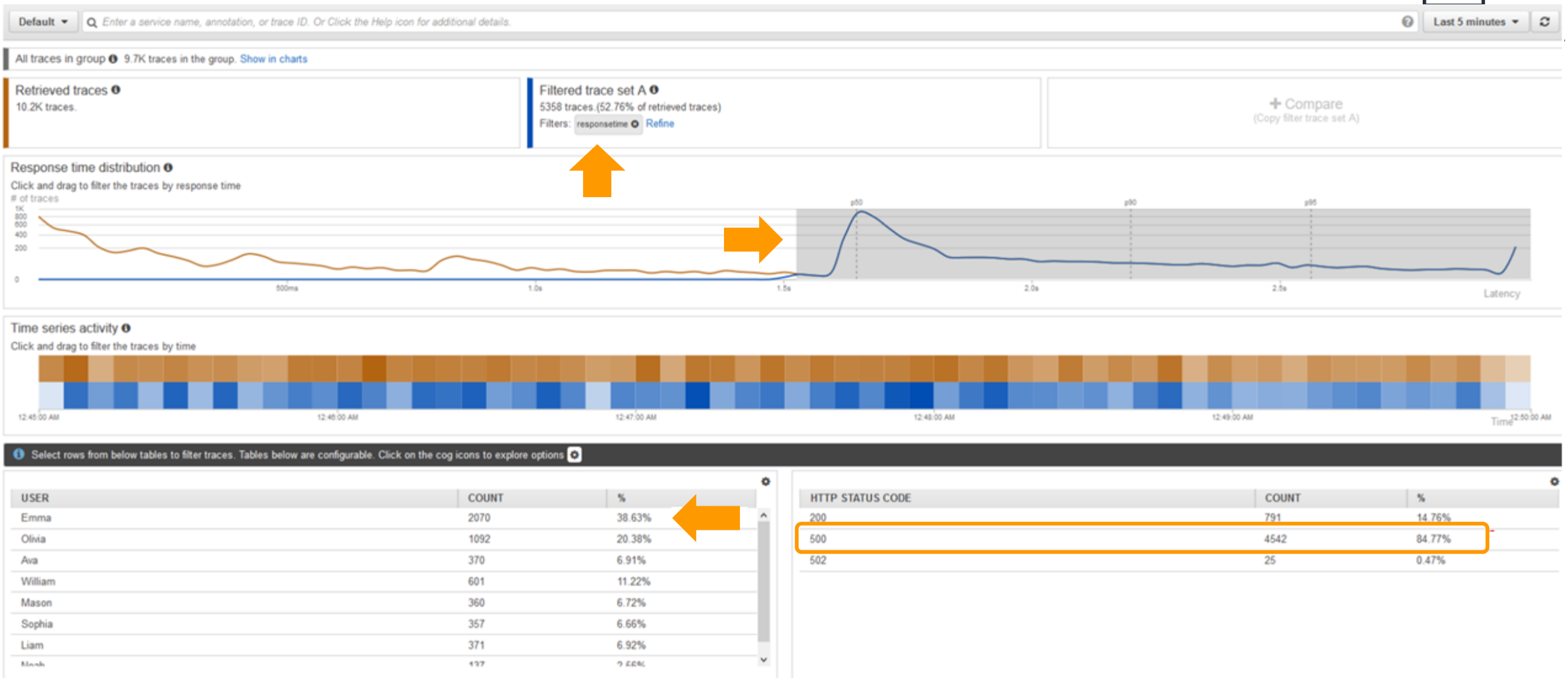
AWS X-Ray Analytics



AWS X-Ray Analytics

Analyze Root Cause

RESPONSE TIME ROOT CAUSE	COUNT	%
api → forward → products.us-east-1.elasticbeanstalk.com ⇒ products → fetch → DynamoDB → wait	1673	36.83%
www → products → store-api.us-east-1.elasticbeanstalk.com ⇒ api → forward → products.us-east-1.elasticbeanstalk.com ⇒ products → fetch → DynamoDB → wait	2566	56.49%
api → forward → products.us-east-1.elasticbeanstalk.com	75	1.65%
www → products → store-api.us-east-1.elasticbeanstalk.com	108	2.38%
www → products → store-api.us-east-1.elasticbeanstalk.com → response	41	0.90%
www → products → store-api.us-east-1.elasticbeanstalk.com ⇒ api → forward → products.us-east-1.elasticbeanstalk.com	2	0.04%
www → products → store-api.us-east-1.elasticbeanstalk.com ⇒ api → forward → products.us-east-1.elasticbeanstalk.com ⇒ products → fetch → DynamoDB	7	0.15%

Trace List

URL	USERS	RESPONSE	RESPONSE TIME
http://store-api.us-east-1.elasticbeanstalk.com/products/	Emma	500	1.729
http://store-api.us-east-1.elasticbeanstalk.com/products/	William	500	1.69
http://storefront.us-east-1.elasticbeanstalk.com/products/	Mason	500	1.757
http://storefront.us-east-1.elasticbeanstalk.com/	Olivia	500	1.665
http://store-api.us-east-1.elasticbeanstalk.com/products/	William	500	1.706

FAULT ROOT CAUSE	COUNT
api → error ⇒ products → error → error → error → error ⇒ products (AWS::DynamoDB::Table)	1297
api → error ⇒ products → error → error → error → error → error ⇒ products (AWS::DynamoDB::Table)	225
www → error → error ⇒ api → error ⇒ products → error → error → error → error ⇒ products (AWS::DynamoDB::Table)	1996

Response Time Root Cause
Error Root Cause
Fault Root Cause

FAULT ROOT CAUSE MESSAGE	COUNT	%
ProvisionedThroughputExceededException: The level of configured provisioned throughput for the table was exceeded. Consider increasing your provisioning level with the UpdateTable API. status code: 4	4437	97.69%
http request to products failed with status code: 500	37	0.81%
http request to api failed with status code: 502	14	0.31%

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AWS X-Ray Analytics

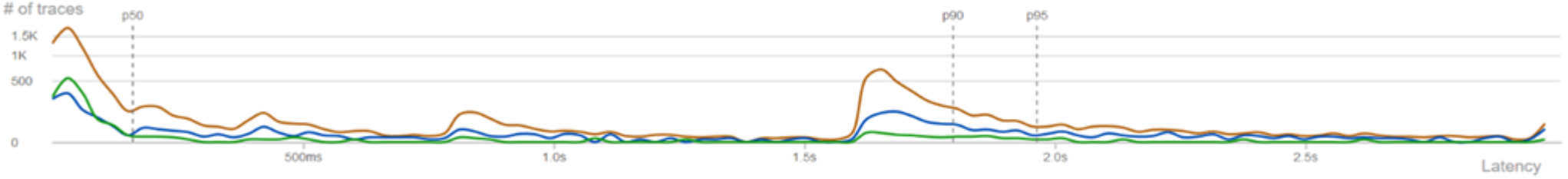
Compare Trends

Retrieved traces
10.3K traces.

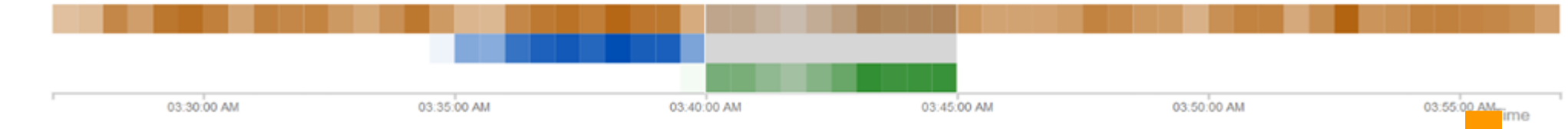
Filtered trace set A
1899 traces.(18.45% of retrieved traces)
Filters: timerange

Filtered trace set B
1354 traces.(13.15% of retrieved traces)
Filters: timerange

Response time distribution
Click and drag to filter the traces by response time



Time series activity
Click and drag to filter the traces by time



USER	COUNT	%	Δ
William	189	13.96%	0.00%
Olivia	279	20.61%	0.17%
Sophia	88	6.50%	0.23%
Mason	98	7.24%	0.76%
Emma	433	31.98%	-0.41%
Noah	74	5.47%	0.62%

HTTP STATUS CODE	COUNT	%	Δ
200	1218	89.96%	32.87%
400	16	1.18%	0.39%
401	22	1.62%	-0.22%
500	97	7.16%	-32.01%
-	1	0.07%	-0.19%

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Demo

Thank you!