
AWS
re:Invent
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COP345

Visibility into internet issues impacting your application performance

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Network Architect
EA Sports

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Agenda

- Observability in Amazon CloudWatch
- Customer challenges with internet monitoring today
- How Amazon CloudWatch Internet Monitor addresses these needs
- Demo
- Behind the scenes: how does it work?
- Customer case study : EA Sports
- Q&A

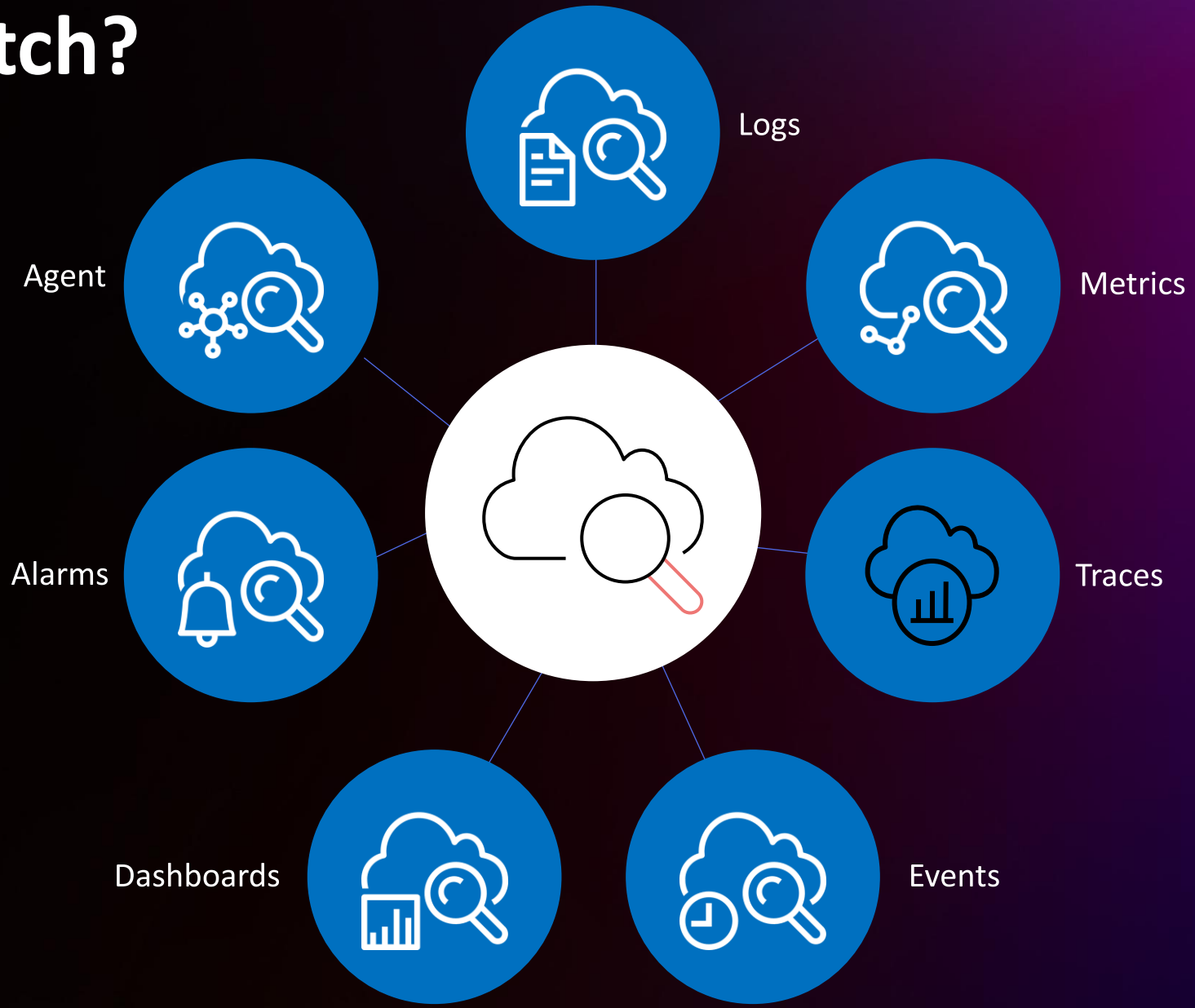
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Observability in CloudWatch

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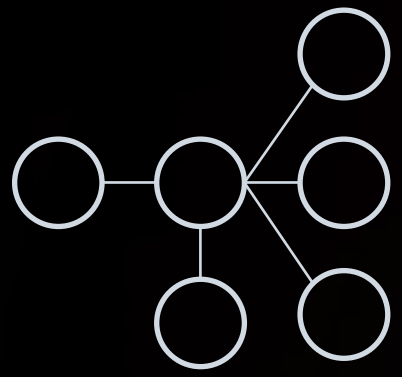
What is CloudWatch?

Complete observability for cloud resources and applications



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AWS diagnostic & observability tools



Understand distributed architecture

- ServiceLens
- AWS X-Ray



Zoom in to individual components

- Logs Insights
- Resource Manager



Understand the customer experience

- Synthetics
- Evidently
- Real User Monitoring (RUM)

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Issues for internet-facing applications



Internet clients

Public internet



Customer applications
(AWS Regions)

Is there an issue with the end user application?

For example, a bug in a recent update.

Is there an issue with the public internet?

For example, congestion in the ISP-A network for users between Las Vegas and AWS.

Is there an issue with the AWS network that's serving internet traffic?

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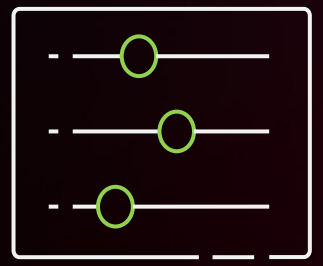
Customer challenges with internet monitoring



Lack of visibility across geographies



Economical solutions for continuous monitoring



Simplifying monitoring with multiple client locations



Taking action to improve end user experience

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Addressing customer needs

AMAZON CLOUDWATCH INTERNET MONITOR CAPABILITIES



Continuously monitor availability and performance of applications



Quickly visualize the impact of issues, pinpoint locations, and providers that are affected



Global view of traffic patterns and health events



Insights to improve user experience by rerouting traffic through different Regions or other AWS services

Amazon Virtual Private Cloud (Amazon VPC)
Amazon WorkSpaces
Amazon CloudFront

Amazon CloudWatch Internet Monitor is supported in 20 commercial AWS Regions, with cross-Region support

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User personas



Application Developer

- Maintain high quality-of-service for internet-facing applications
- Rule out the internet as the cause of an issue within minutes
- Avoid spending unnecessary time debugging application



DevOps / Network Operator

- Monitor networks continuously to understand performance impact on app
- Route user traffic to alternate endpoints as needed

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Amazon CloudWatch Internet Monitor



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Behind the scenes

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Edge networking services



2008 Amazon CloudFront



2010 Amazon Route 53



2018 AWS Global Accelerator

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Edge networking services



2008 Amazon CloudFront



2010 Amazon Route 53



2018 AWS Global Accelerator



2015 AWS WAF



2016 AWS Shield

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Delivering to the global internet



Automated monitoring



Automated traffic engineering



Managed by a team of operators

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Application monitoring



2009 Amazon CloudWatch



2016 AWS X-Ray



2019 CloudWatch Synthetics

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Application monitoring



2009 Amazon CloudWatch



2019 CloudWatch ServiceLens



2016 AWS X-Ray



2021 CloudWatch RUM



2019 CloudWatch Synthetics



2022 CloudWatch Internet Monitor

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The challenge of scale

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But the scale, the dimensions!



AWS infrastructure

- 96 AZs
- 30 Regions
- 200+ services

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But the scale, the dimensions!



AWS infrastructure

- 96 AZs
- 30 Regions
- 200+ services



AWS global network

- 400+ edge locations
- 90+ cities
- Thousands of internet peers
- Hundreds of Tbps capacity

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But the scale, the dimensions!



AWS infrastructure

- 96 AZs
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AWS global network

- 400+ edge locations
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Internet end users

- 4.9B people
- 1 million routes
- 74K networks
- 167K towns & cities

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Simplification



AWS global network



- Round-trip time
- Availability



Internet

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Simplification



AWS global network

- Regions & edge



- Round-trip time
- Availability



Internet

- City + AS

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Simplification



AWS global network

- Regions & edge

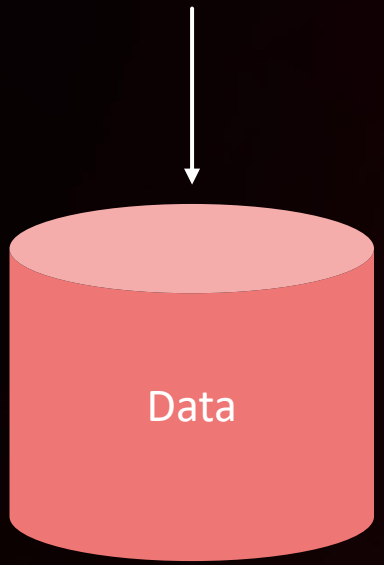


- Round-trip time
- Availability



Internet

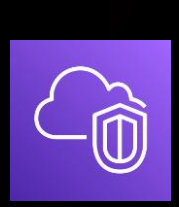
- City + AS



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Simplification



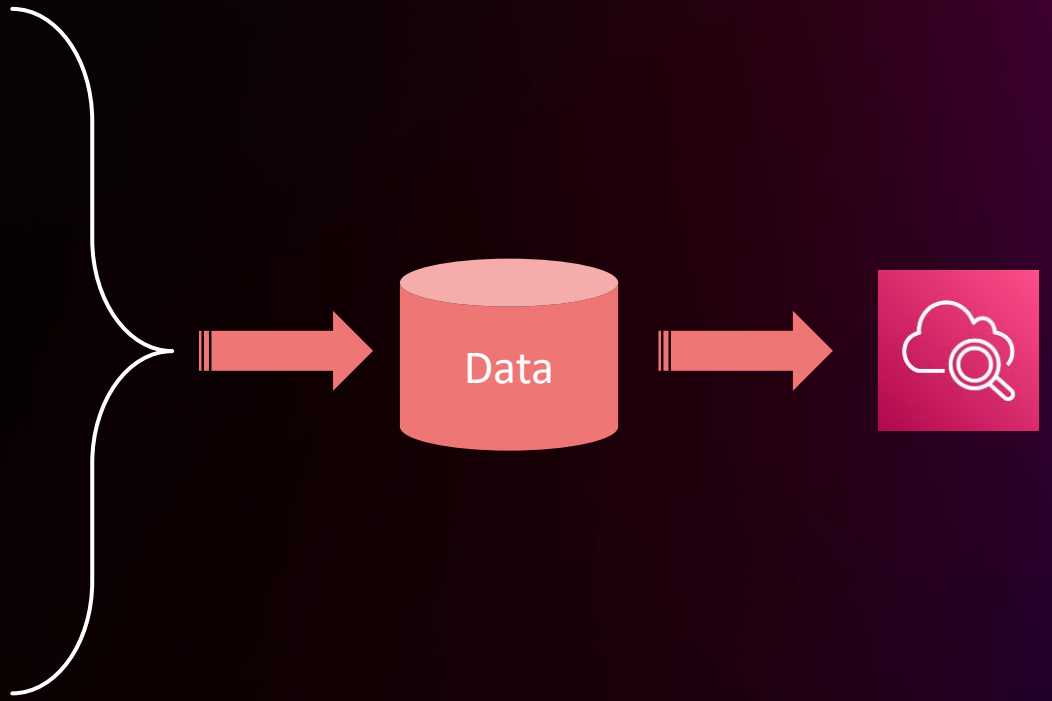
Amazon VPC



Amazon CloudFront



Amazon WorkSpaces



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Listening to our customers

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Rising to the occasion

- Personalized view
- Onboarding with zero code
- Low cost
- Experience scores and anomaly detection





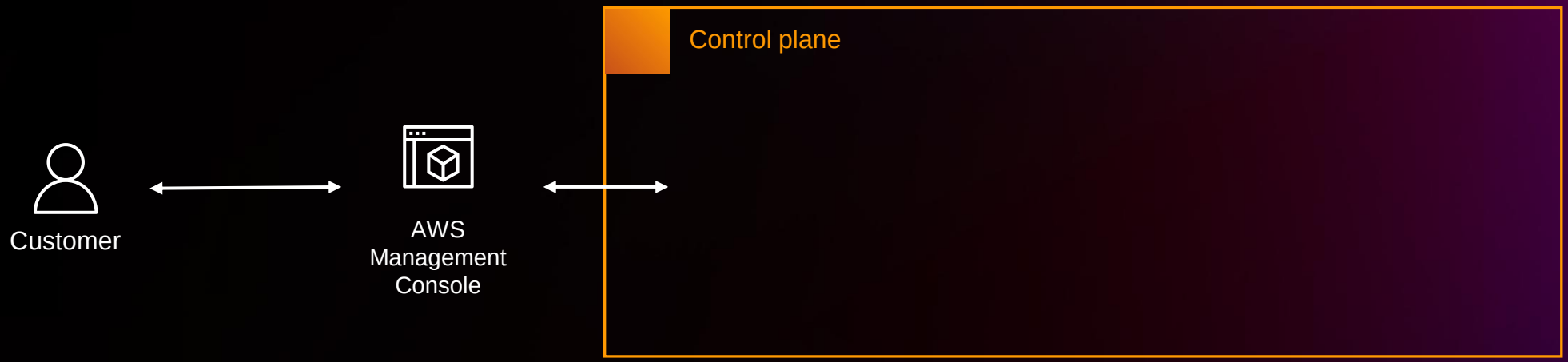

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Getting it right

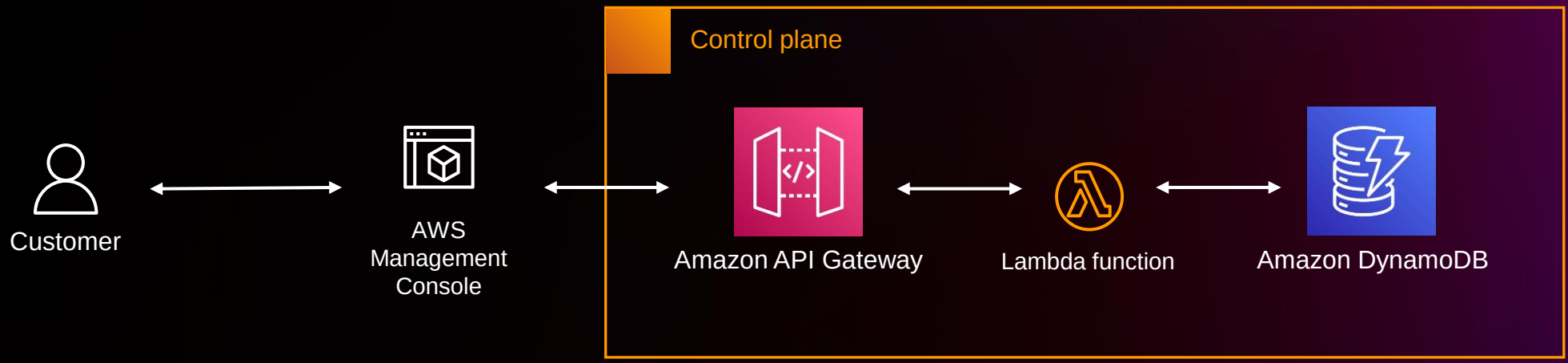
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Developing: Both easy and hard



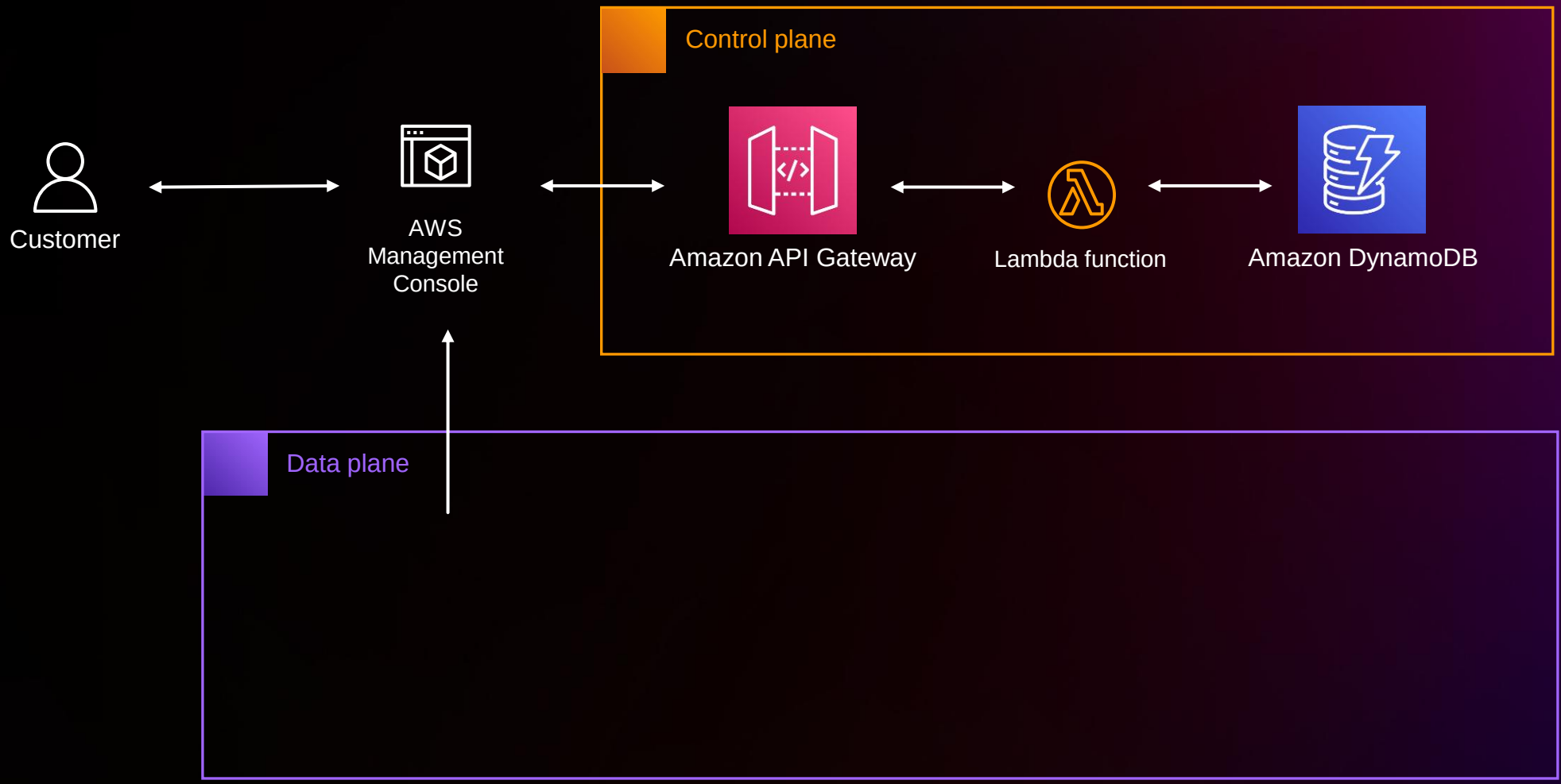
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Developing: Both easy and hard



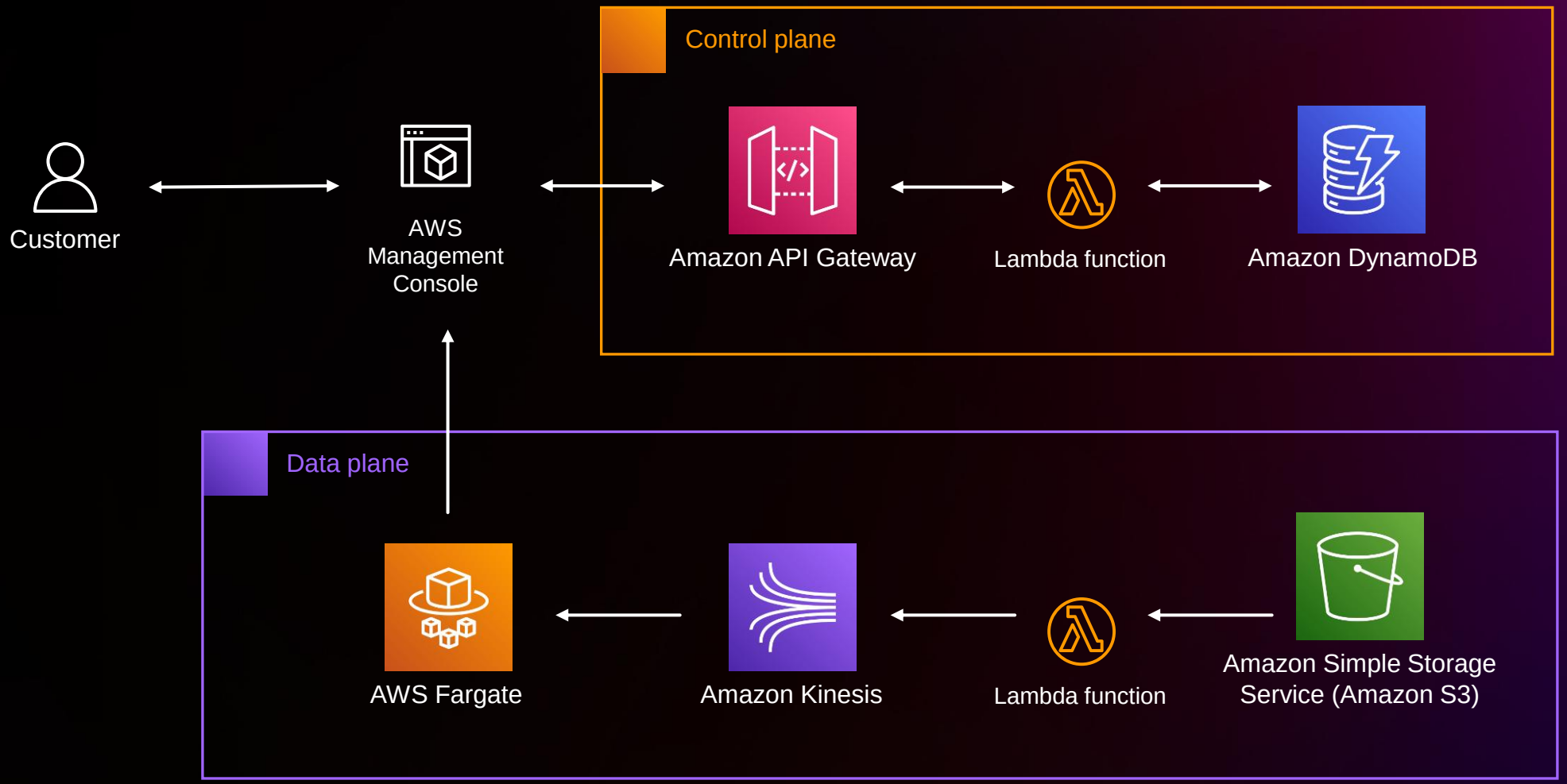
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Developing: Both easy and hard



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Developing: Both easy and hard



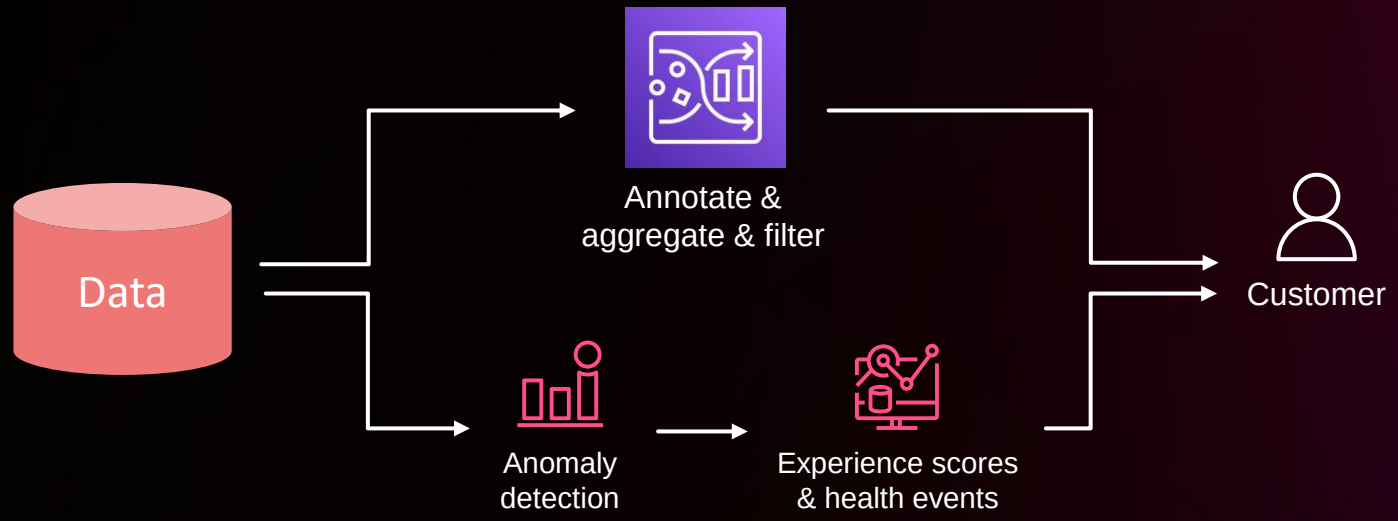
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The harder part



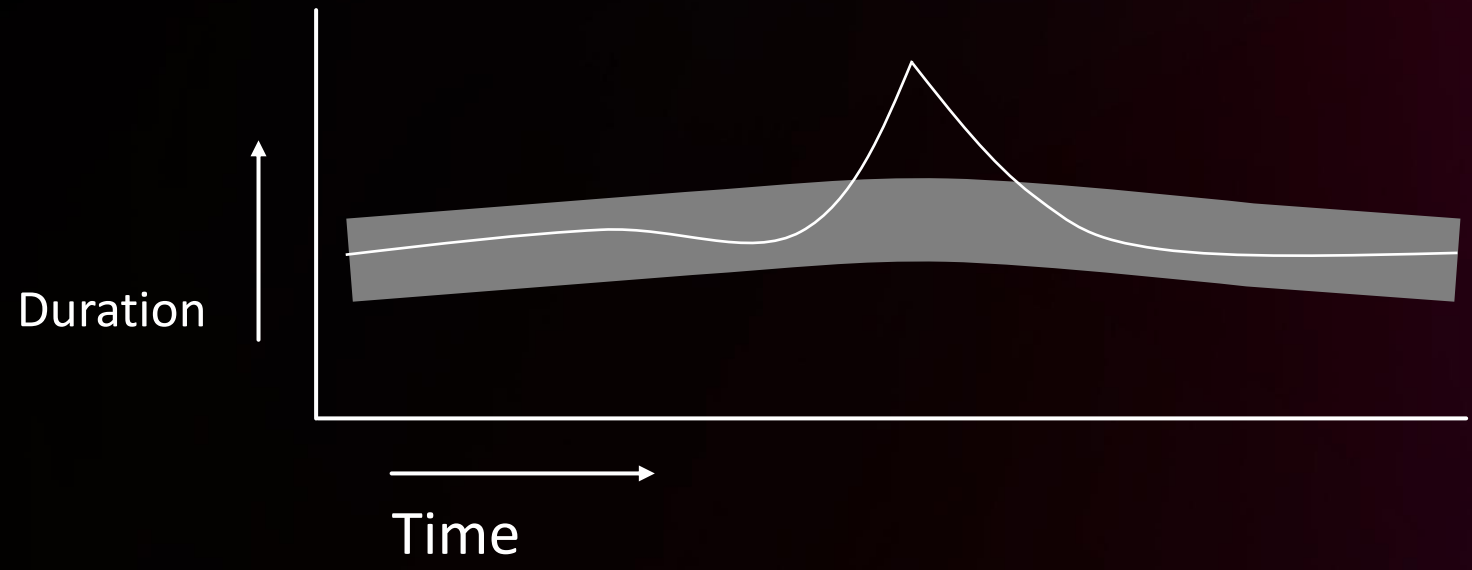
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The harder part



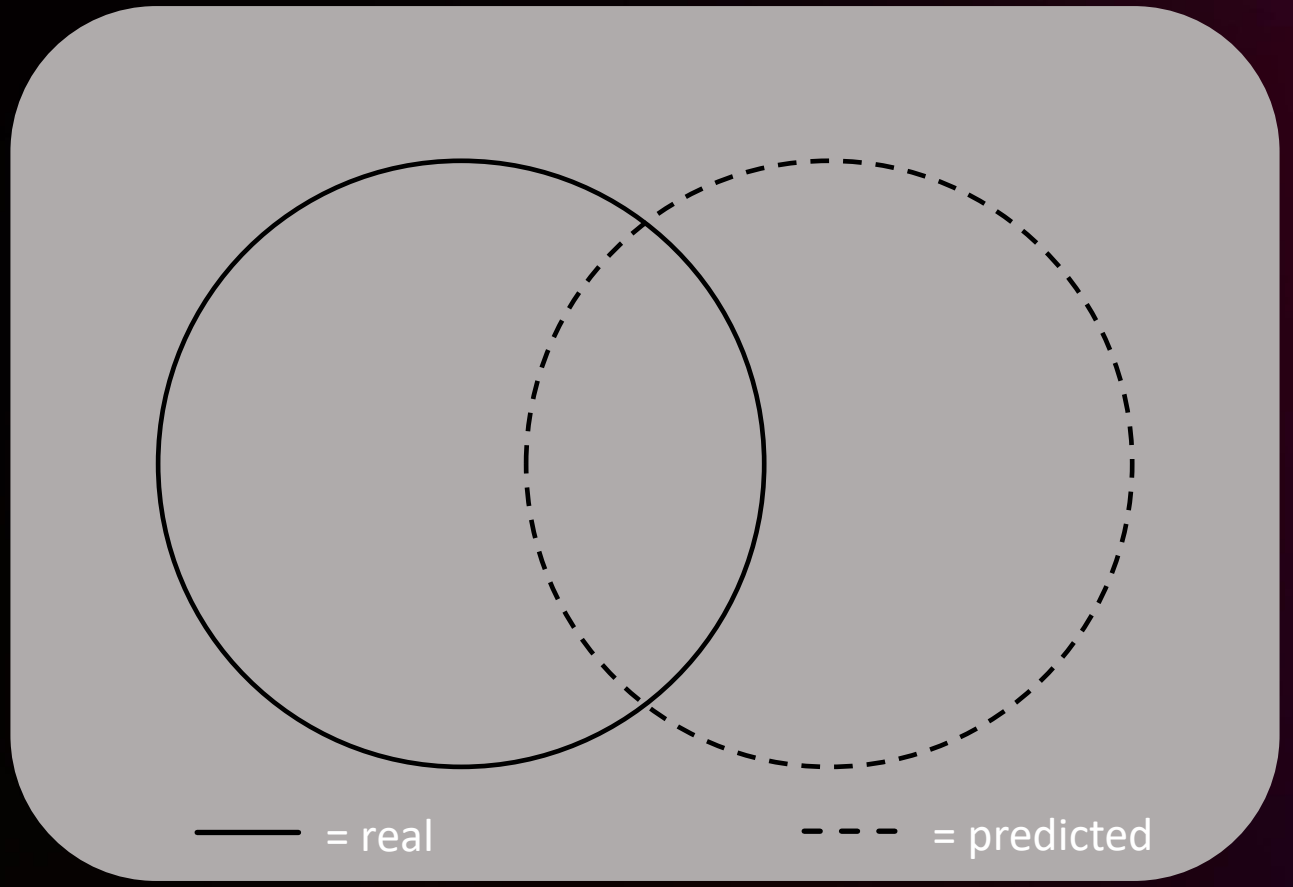
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Anomaly detection



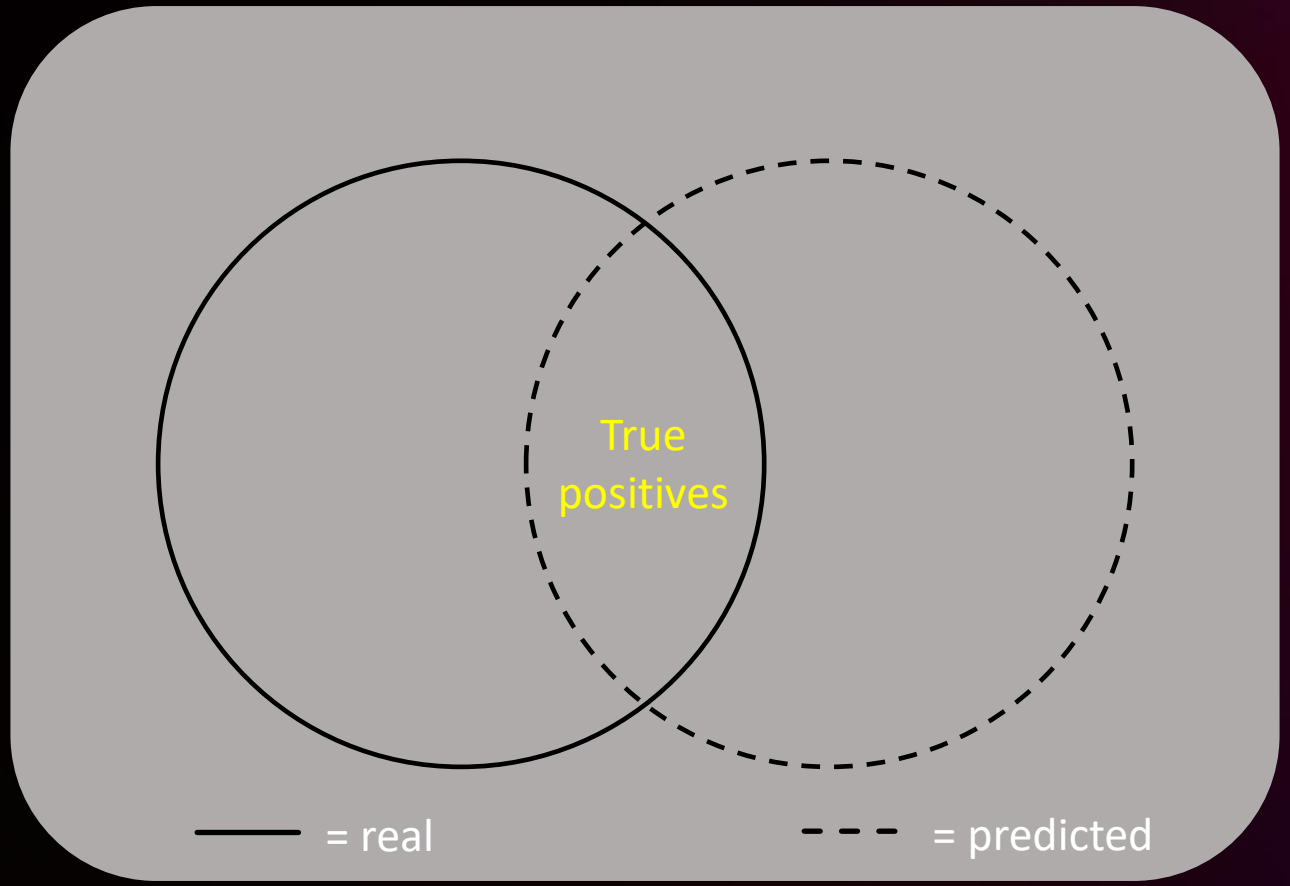
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Precision & recall



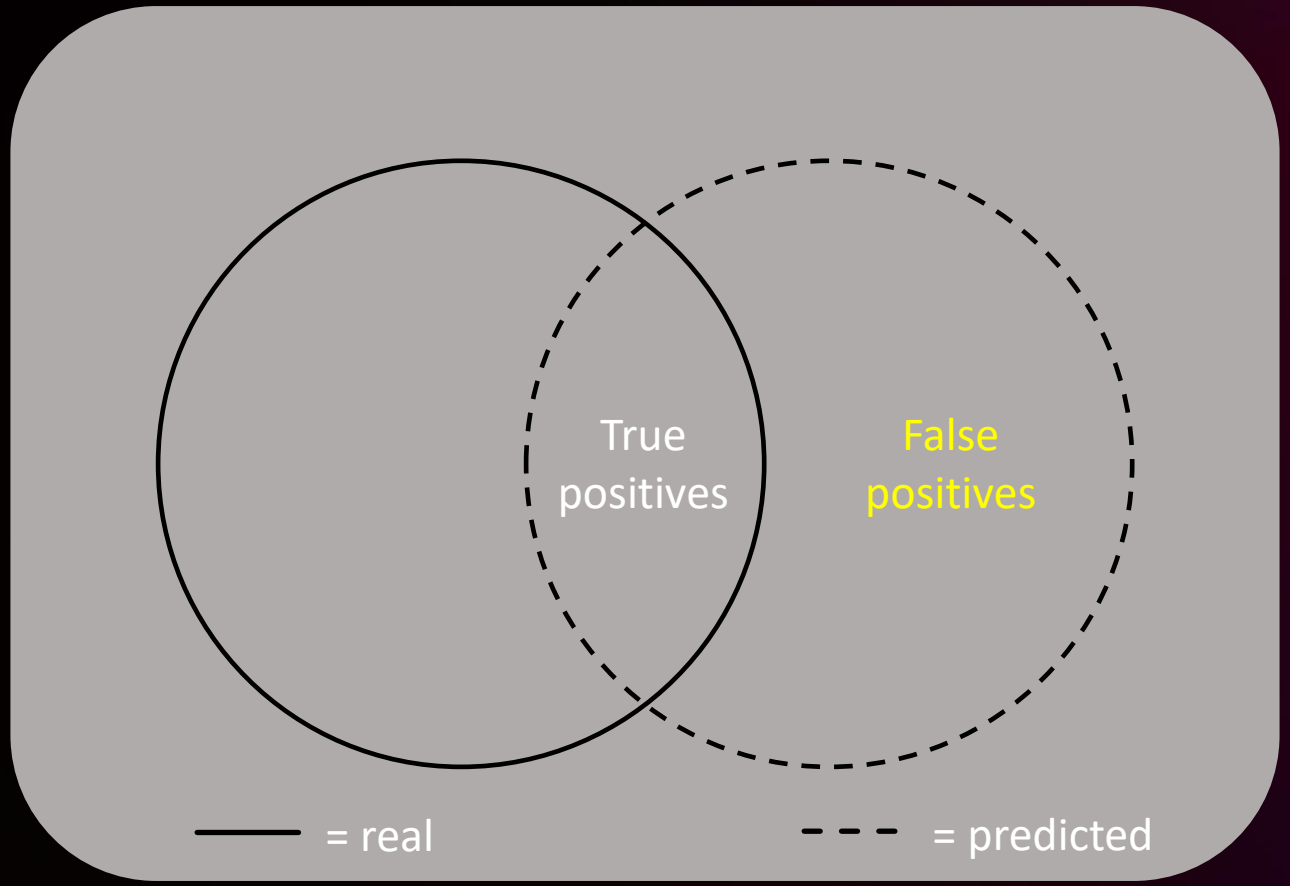
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Precision & recall



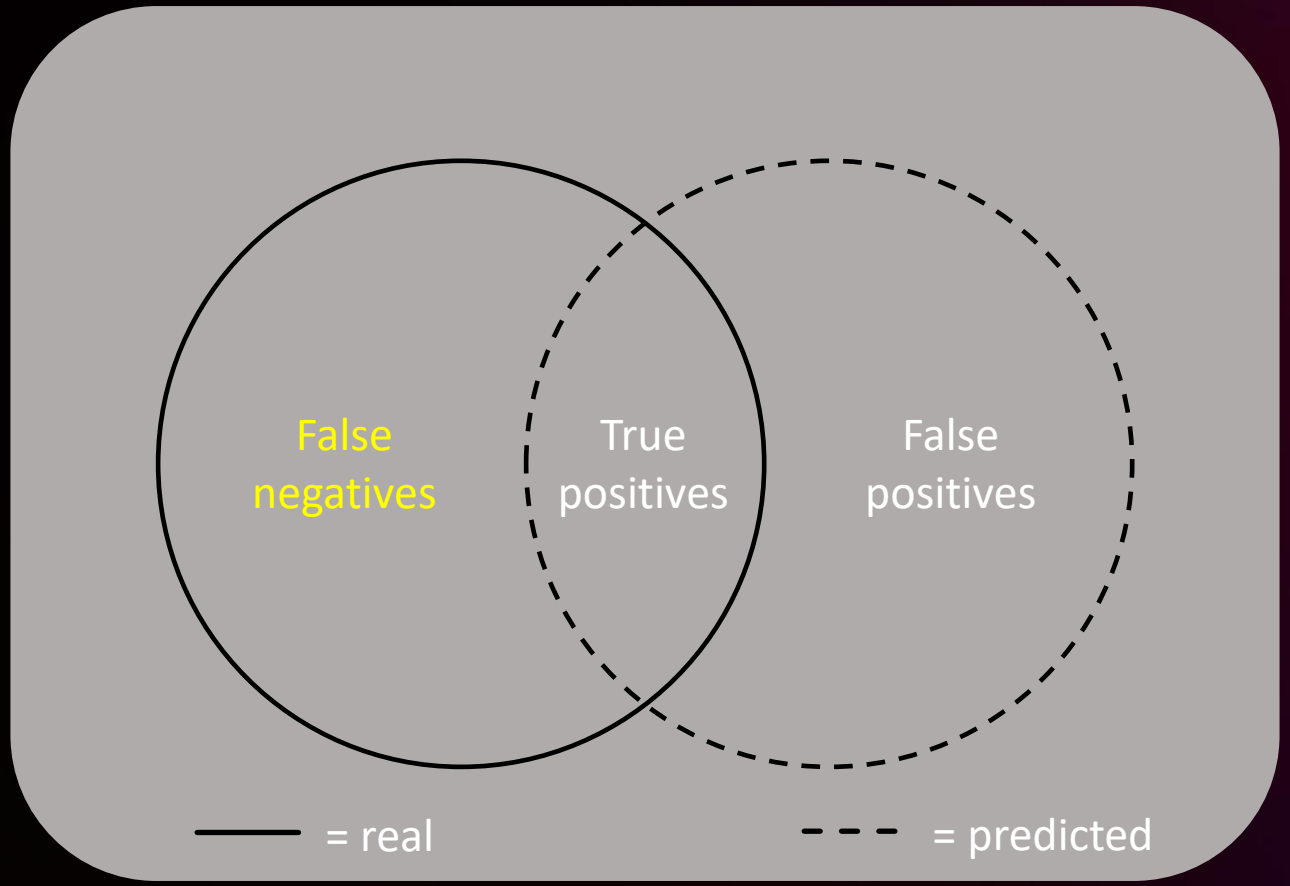
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Precision & recall



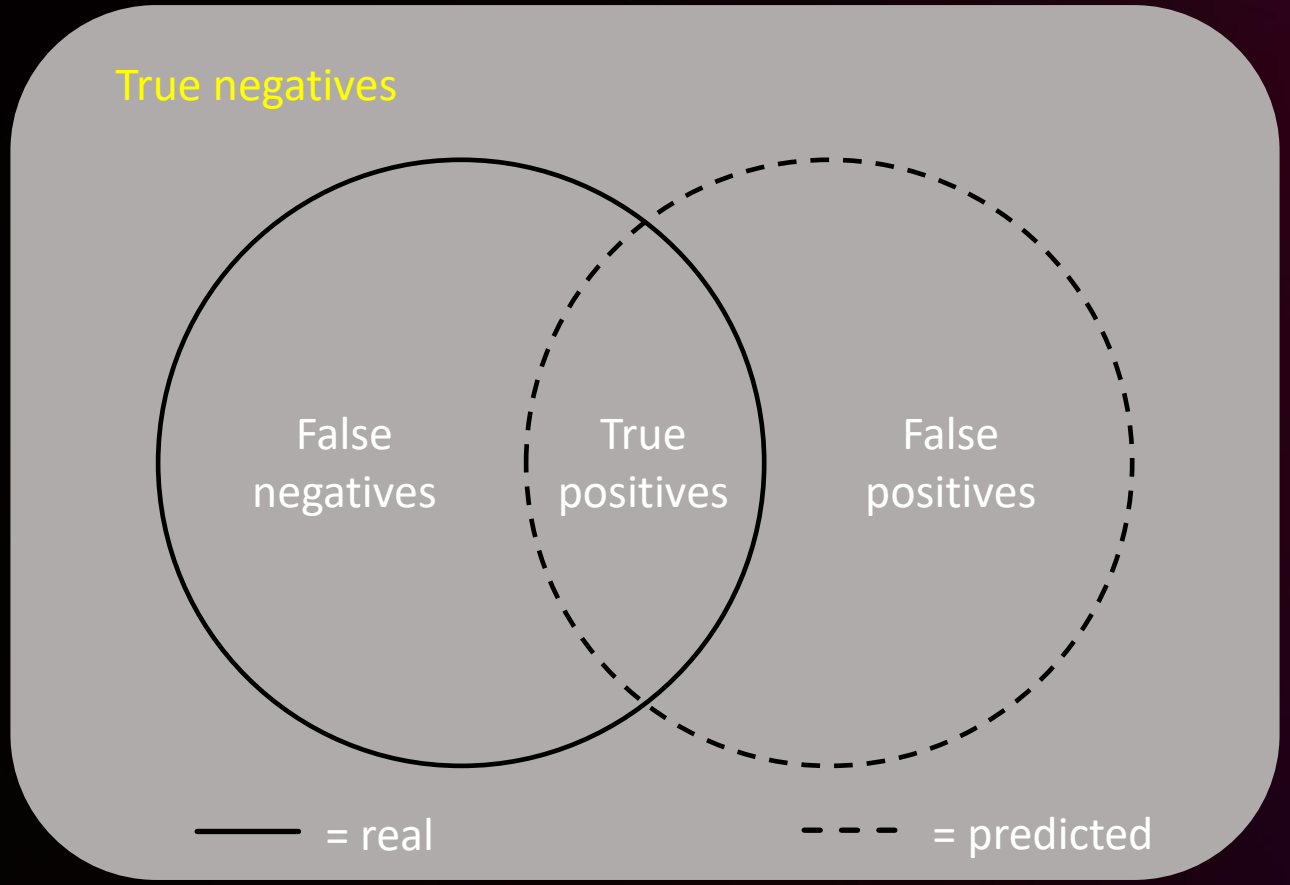
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Precision & recall



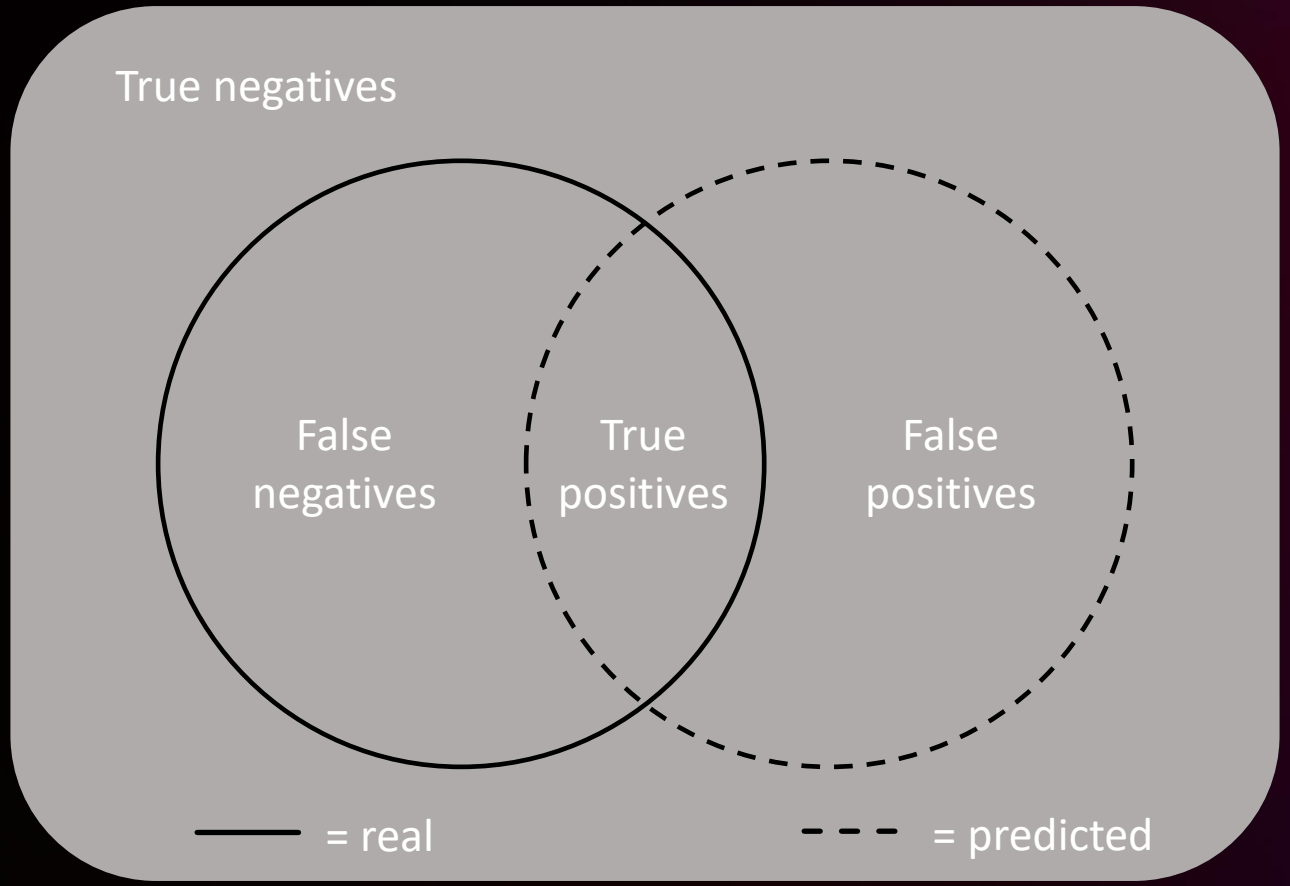
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Precision & recall



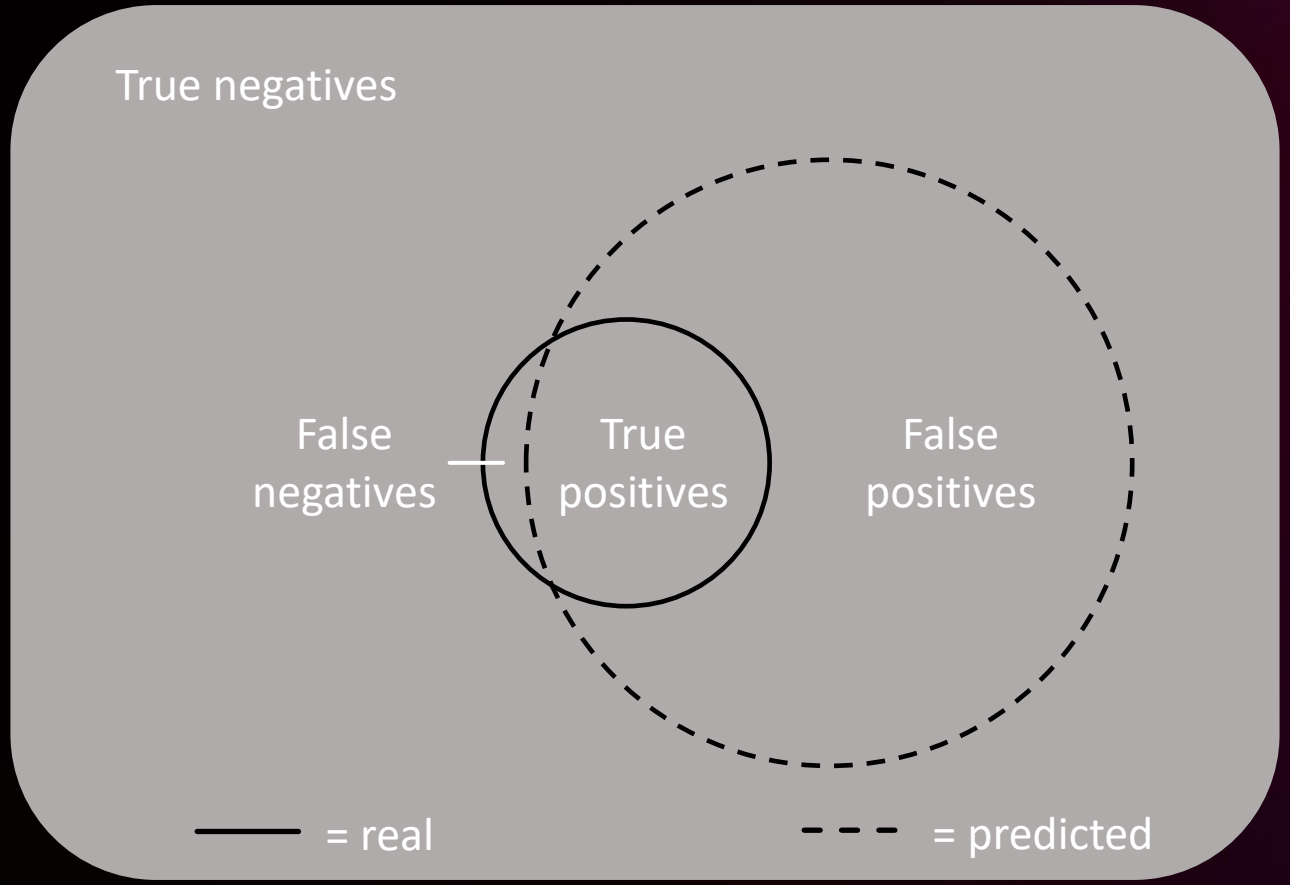
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Precision & recall



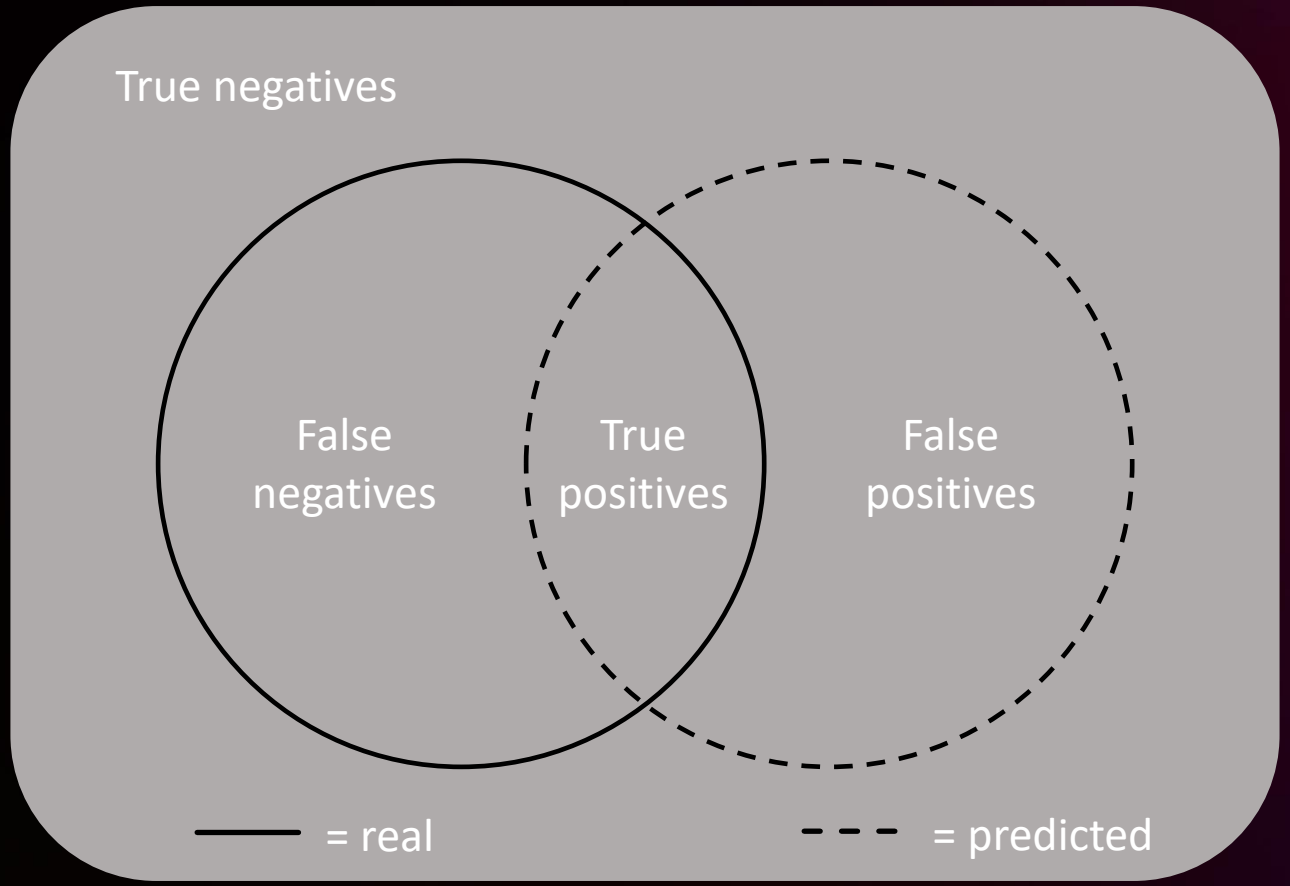
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High recall



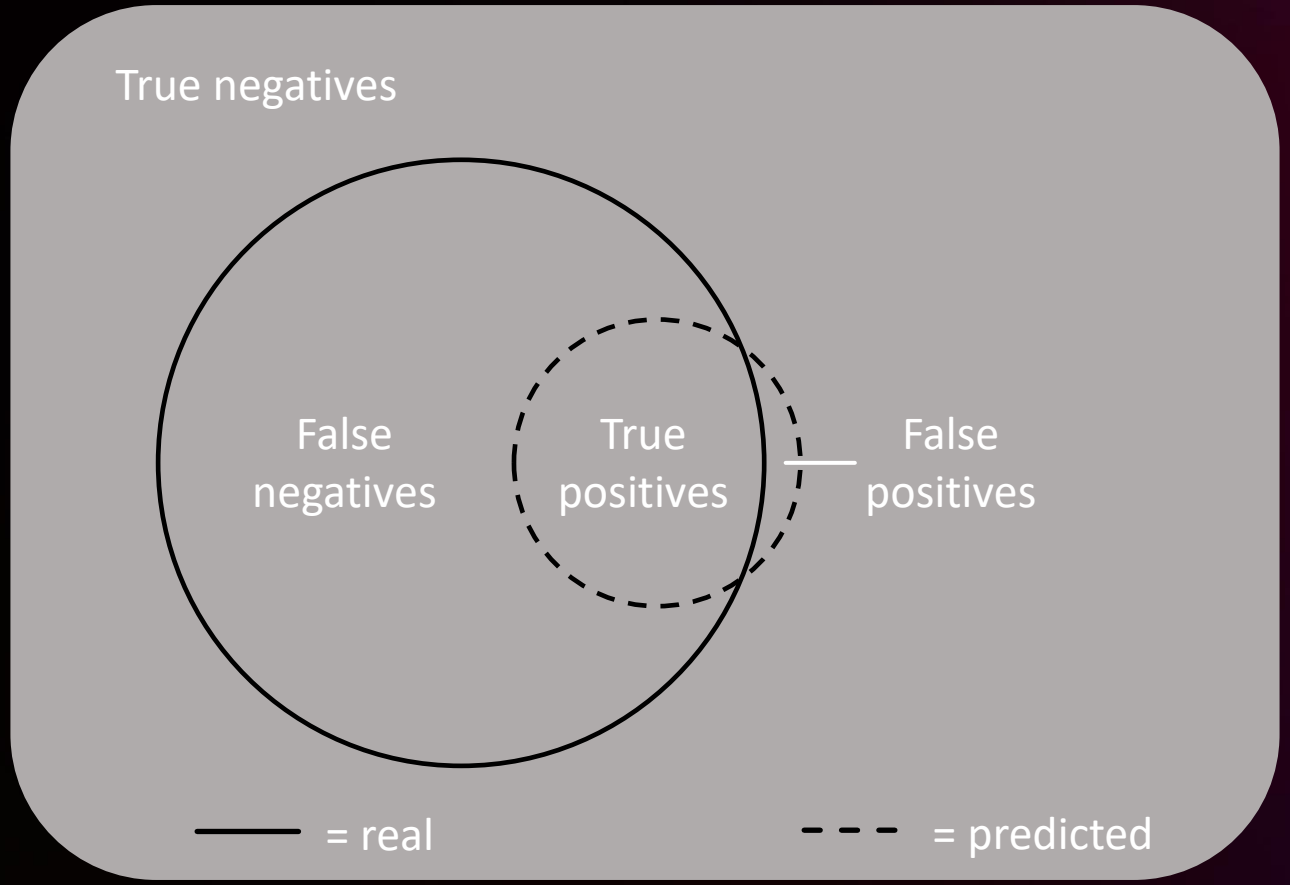
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Precision & recall



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High precision



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Monitoring trade-offs

Client geo

country
state
metro area
city



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Monitoring trade-offs



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Monitoring trade-offs



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Customer case study: EA Sports

Peter Vido

Network Architect
EA Sports

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EA Sports*Net*

AWS Global Consumer Network Insights

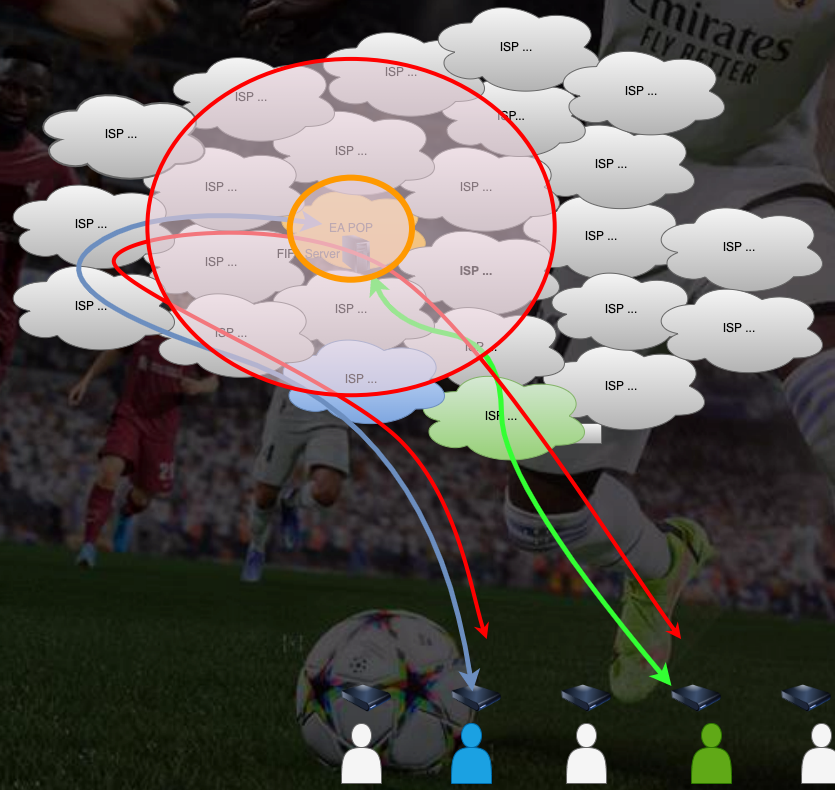
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FIFA Network ISP Data

Player connection and session overview

Often the path between players impacts the quality of their experience.

Understanding the path is a challenge due to security restrictions on gaming devices.



Issues detected in the orange zone are clearly understood with predicted outcomes.

Understanding fluctuations in the red zone represents the next opportunity to improve game play.

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FIFA User Network tracking - EA Internet Health Tracking

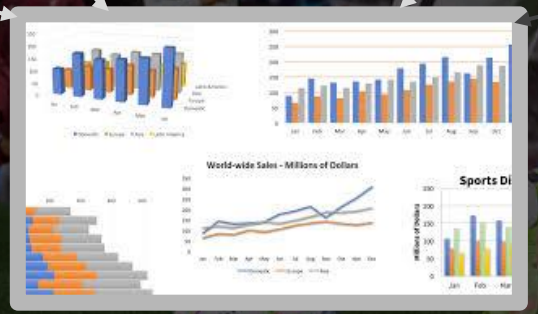
The goal of the EA Sports Network data project is to identify and visualize consumer network connectivity trends.

Application performance data

Operations alarms

Game server performance

Internet performance



The Internet Monitor external peer Flow Analysis module solves a large portion of our blind spot for internet performance.

EA Sports FIFA players performance insights

- Rollup and pivot of player vs. application and ISP performance

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EA Sports - AWS ISP insights

EA Sports has partnered with AWS to establish new levels of internet performance insights for FIFA.
A common gap with cloud-based applications is to understand internet performance and how it impacts the user base.

- Understanding traffic paths globally into EA games
- Evaluating application performance impact due to internet fluctuations
- Reducing mean-time-to-detect (MTTD) issues



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Interested in learning more?

Amazon CloudWatch Internet Monitor blogs

https://aws.amazon.com/blogs/aws/cloudwatch-internet-monitor-end-to-end-visibility-into-internet-performance-for-your-applications/



Amazon CloudWatch Internet Monitor What's New Post

https://aws.amazon.com/about-aws/whats-new/2022/11/amazon-cloudwatch-internet-monitor-preview/



Amazon CloudWatch Internet Monitor documentation

https://docs.aws.amazon.com/AmazonCloudWatch/latest/monitoring/CloudWatch-InternetMonitor.html

Using Internet Monitor in the Amazon CloudWatch User Guide



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Thank you!

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