AWS re:Invent

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Applying AWS machine learning to next-gen DevOps

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Principal Product Manager
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Director, Site Reliability Engineering
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Speaker introductions



Jacob Sullivan

Principal Product Manager
AWS AI DevOps

15 years of experience founding and maturing technology startups, driving customer-centric technology products from concept to launch, and building strategic partnerships to support business growth and competitive advantage



Ashutosh Agnihotri

Director, Site Reliability Engineering
Fidelity Investments

25+ years of experience in enterprise infrastructure and digital transformations; background and expertise include areas such as public cloud, DevOps, and driving innovation-focused initiatives within large global organizations

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This presentation is a case study of the Fidelity Investments experience.

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1946

Fidelity Management & Research Company founded

1965

Fidelity purchases first computer





1995

Fidelity becomes an internet pioneer as first mutual fund to create a home page

2016

Fidelity's first product application deployed to the cloud

2019

Fidelity launches multi-cloud hybrid strategy

TODAY

4,300+ applications on public cloud

aws

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Enterprise cloud at Fidelity

VISION

Execute on an enterprise cloud platform strategy accelerating delivery of new capabilities, providing access to innovation and delivering value to our customers and for Fidelity

OBJECTIVES

- Efficiency through common architecture and standards
- Increased stability and controlled risk through production support model
- Financial accountability and effective resource utilization
- Unified focus brings improved productivity and collaboration
- Manage CSP dependencies and vendor concentration risk

Cloud platform	FinOps	Security & compliance	Automation	Training & upskilling
Enable **core cloud services** and automate **development pipelines**	Drive **financial accountability** through robust FinOps practice	Establish **standards and automatic** software updates to align with **security best practices**	Focus on **advanced automation** and management through cloud native capabilities as well as Fidelity automation	 Optimize workforce through **training and change management**

aws

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Challenges of operating in the cloud



Finding Signals

- Complex
- Metrics Based Monitoring
- ~40k alerts per month
- 90% noise



Dependency Mapping

- Discovery
- Cloud Resources
- Application



Incident Management

- Collaborate
- Analyze
- Engage
- RCA
- MTTR



Enterprise Scale

- Accounts
- Security
- IaC
- Business Requirements

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Cloud patterns at Fidelity

- >1000 AWS accounts
- 260K CloudFormation stacks
- 190K CloudWatch alarms
- 150K containers
- 75K Lambda functions
- 70K EC2 instances
- 126K cloud roles
- 52K encryption keys
- 88K storage containers
- 25K route tables
- 172K network interfaces
- 8.8K network peers

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Cloud services onboarding

SECURITY REVIEW

A service is considered approved when it has been reviewed by security teams and guidelines for safe usage have been documented

CONTROLS

- ***Preventive controls*** allow application teams to detect violations before deploying resources in the cloud
- The purpose of the ***detective controls*** is to ensure services are running safely after they are deployed in cloud



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Amazon DevOps Guru service review

Service onboarding

Enable AI/ML-powered service to improve the performance of operational applications

- GameDays
- Security huddle

Security review

- Analyze AWS service through corporate security lens
- Canary release
- Approved for enterprise cloud team
- Guardrails
- Automation, training, and documentation

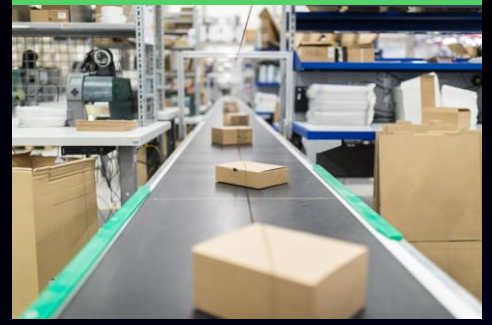
GameDays



Security huddle



Rollout at scale



Training



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GameDays recap



Set the target

- Review Amazon DevOps Guru
- Have fun
- Learn something new



GameDays

- DevOps Guru overview
- Fault injections
- Review insights after DevOps Guru magic happens



Planning

- Environment setup
- Automate
- Identify SMEs for breakout rooms
- Pick a pattern for testing
- Data modeling



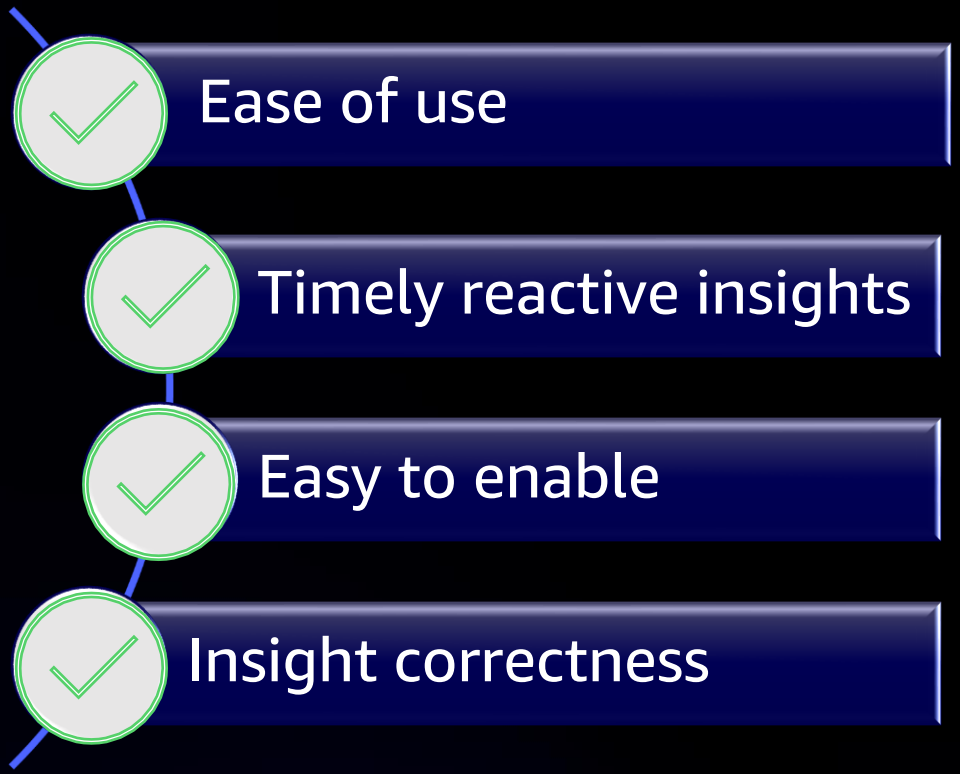
Results and recognition

- Compare notes
- Token prizes for winners

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GameDays evaluation for DevOps Guru



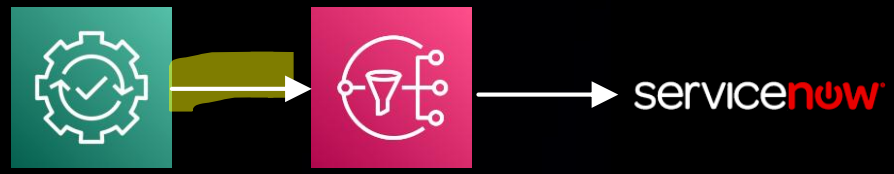


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Future

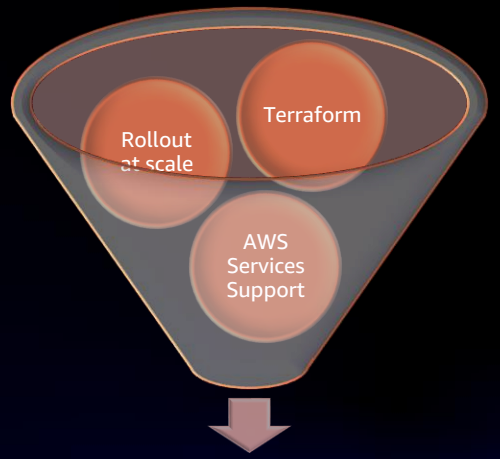
DevOps Guru onboarding

- Security clearance for enterprise-wide usage
- Build a rollout plan for opt-in model
- Corporate monitoring tool integration
- GameDays with other business units



Friction points

- Lack of AWS Organizations support
- Lack of support for other IaC
- Limited AWS services supported



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Thank you!

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