
AWS
re:Invent
NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV

ENT327

Automate compliance for mission-critical SAP workloads like Eli Lilly

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Eli Lilly Co.

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AWS

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Agenda

- Lilly's ERP transformation program
- Design considerations
- SAP deployment framework (SDF) architecture
- Git branching and merging strategy for ERP systems
- Automated continuous compliance (ACC)
- SAP operations automation solutions
- Journey and lessons learned

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Eli Lilly at a glance



We unite caring with discovery to create medicines that make life better for people around the world

- 146 years strong – company founded on May 10, 1876
- Headquarters in Indianapolis, Indiana, USA
- More than 36,000 employees worldwide
- Clinical research done in more than 55 countries
- Products marketed in 120 countries
- Research and manufacturing facilities in 7 countries

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Lilly ERP transformation program

Our objective



Migrate to a single, modern instance of SAP S/4HANA on AWS to support all of our global supply chain, manufacturing, and finance operations

Drivers

- Migrate from ECC to S/4HANA
- Cloud scalability, automation, and breadth of tools
- Modern user interface

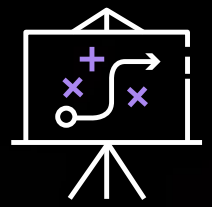
Expected outcomes

- Simplified business processes that can be managed in real time
- Improved employee, customer, and vendor self-service experience
- Reduced training effort and complexity

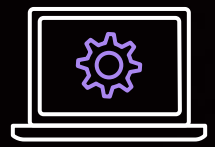
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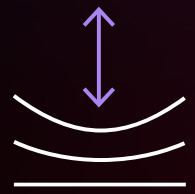
Design considerations



Enterprise cloud strategy



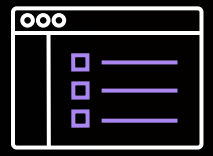
Automation



Resilience



Security



Leverage native services



Hybrid operating model



Increase agility



Compliance

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Services we'll be covering

Compute



Amazon EC2

Serverless



AWS Lambda

Application/infrastructure management



AWS Systems Manager



AWS CloudFormation



AWS Step Functions



AWS Certificate Manager (ACM)



AWS Secrets Manager



AWS KMS



Amazon Route 53



AWS Identity and Access Management (IAM)

Storage/database and networking



Amazon EBS



Amazon FSx for NetApp ONTAP



Amazon S3



Amazon EFS



Elastic Load Balancing (ELB)



Amazon DynamoDB

CI/CD and monitoring



Amazon CloudWatch



Amazon EventBridge



AWS CodeDeploy



AWS CodePipeline



AWS CodeBuild



Amazon SNS



AWS Config

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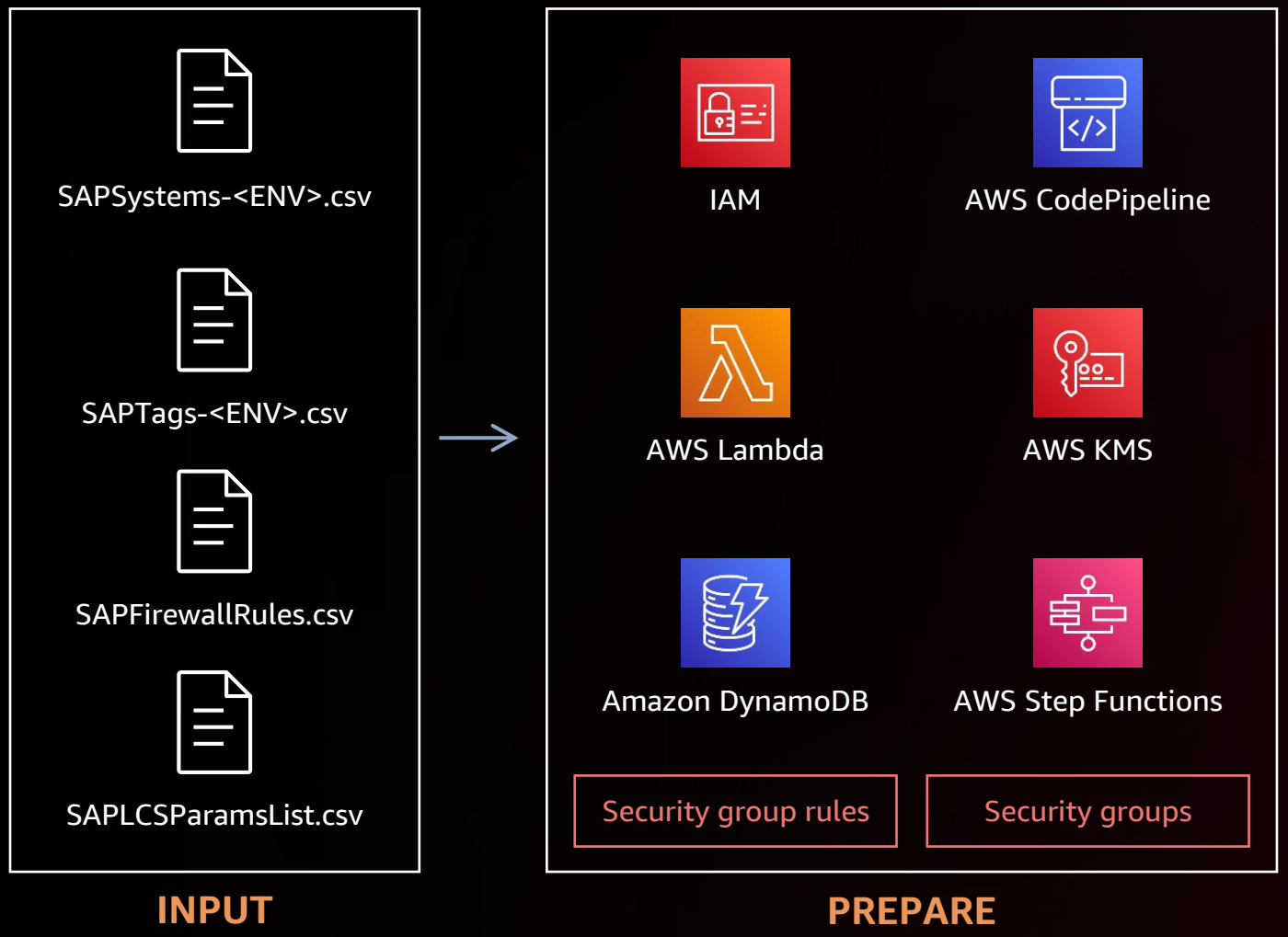
SAP deployment framework (SDF) architecture



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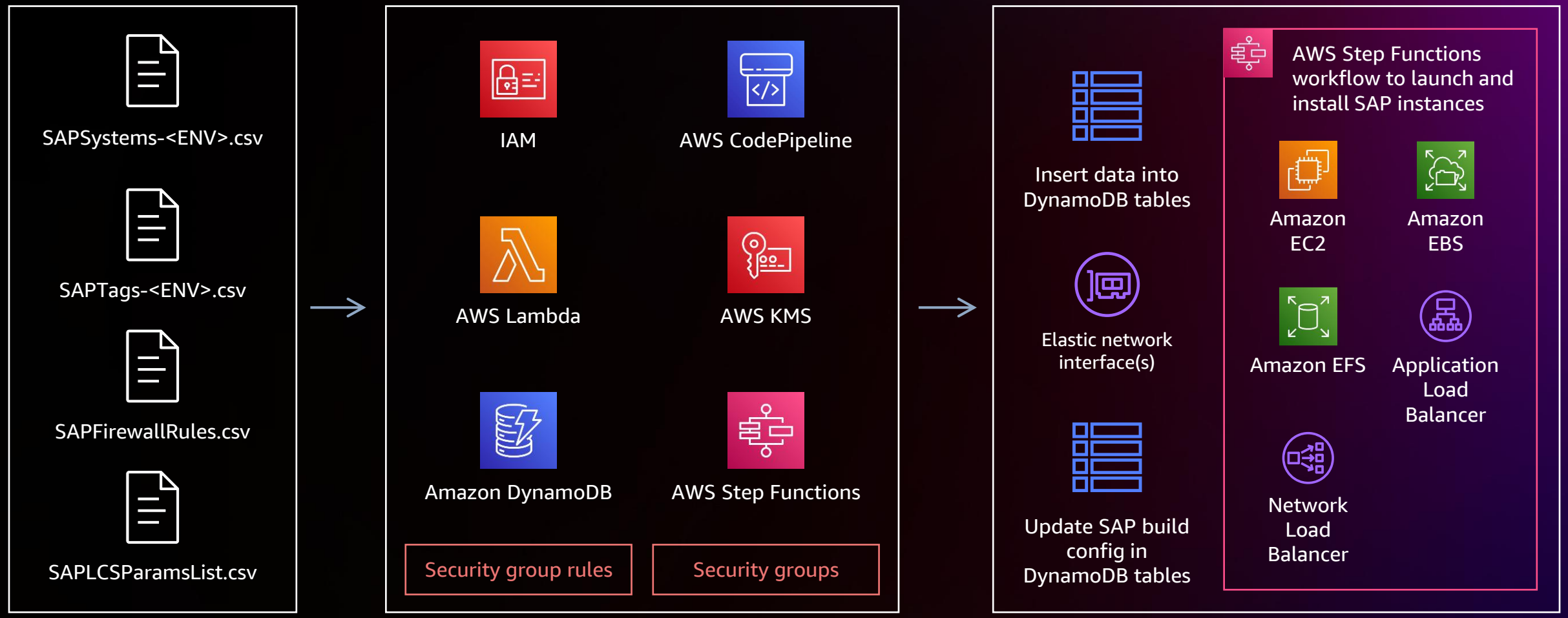
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SAP deployment framework (SDF) architecture



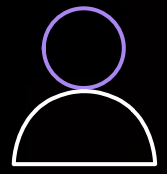
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SAP deployment framework (SDF) architecture



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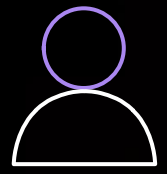
SDF CodePipeline design components



AWS Account
CodePipeline

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SDF CodePipeline design components



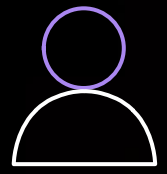
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SAP Environment
CodePipeline

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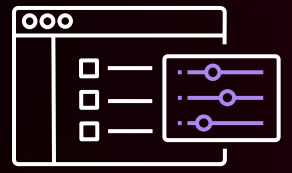
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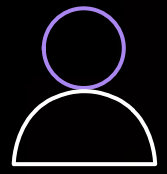
SAP Environment
CodePipeline



SAP System
CodePipeline

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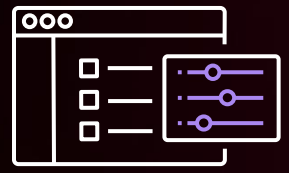
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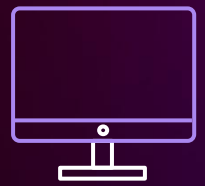
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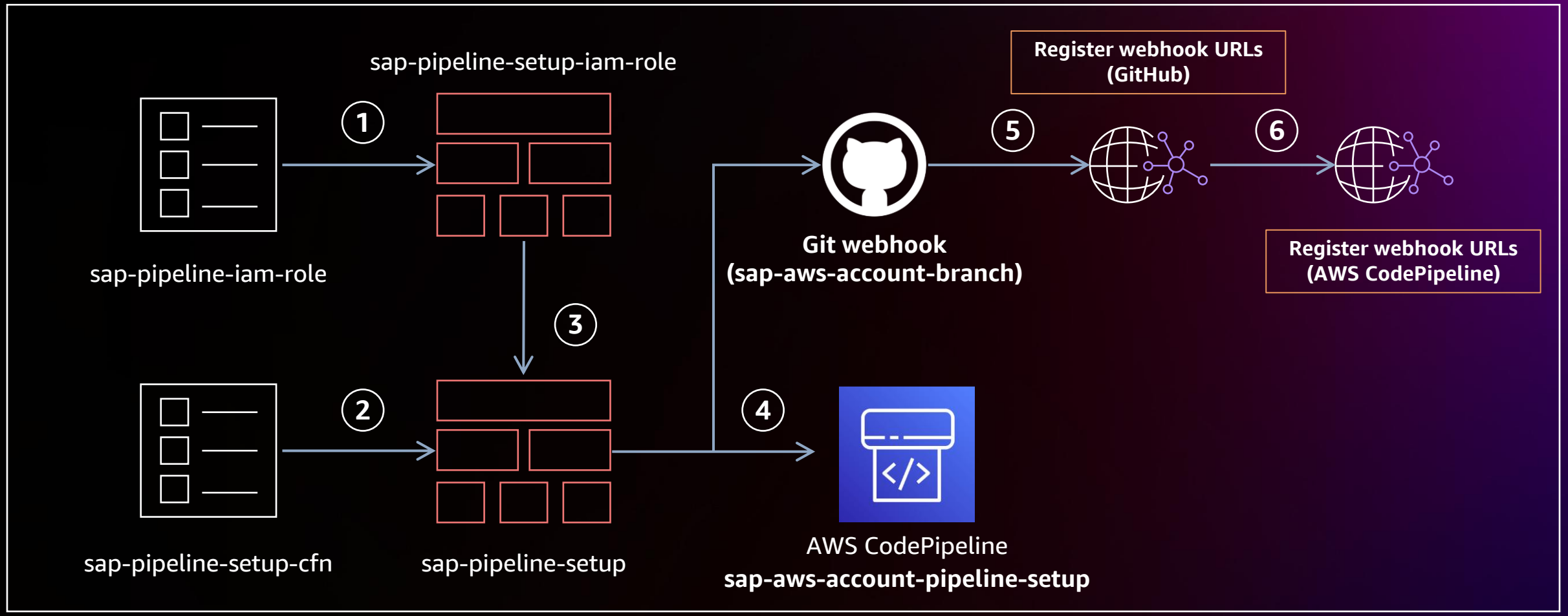
SAP System
CodePipeline



State Machine for SAP
Server build

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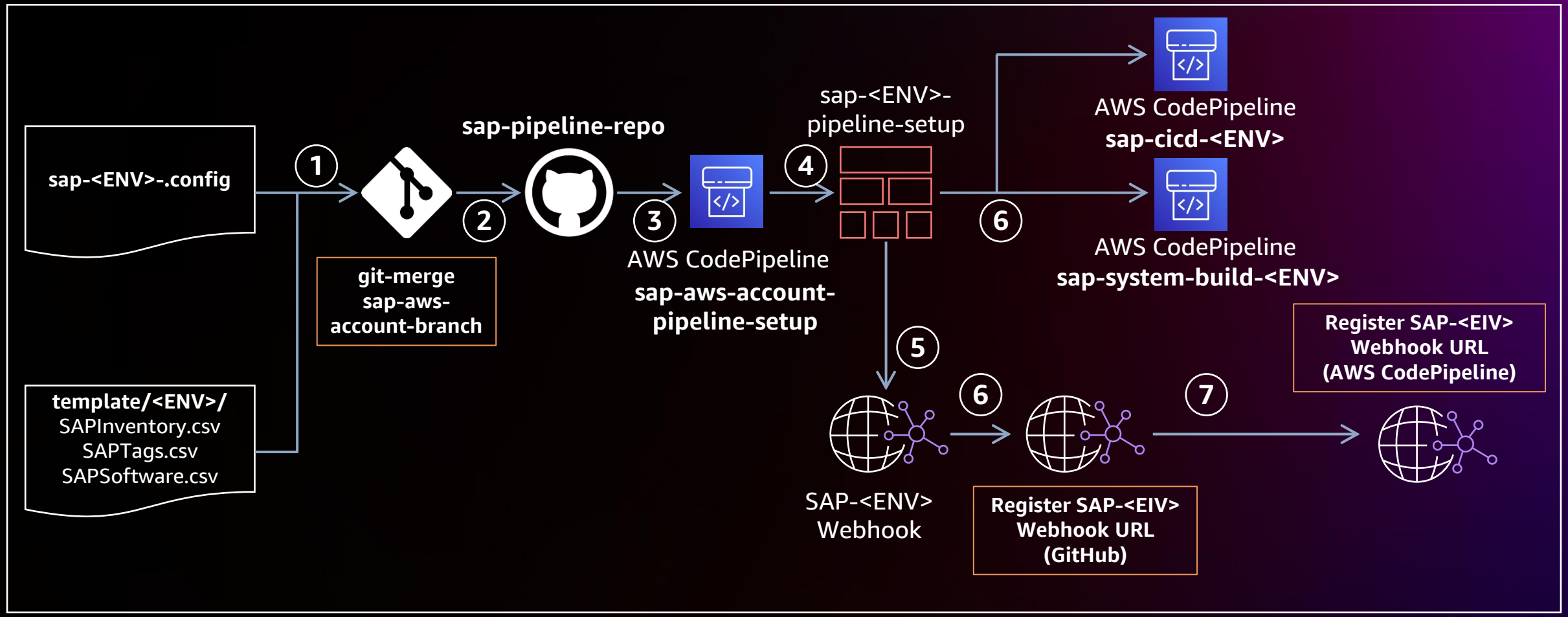
AWS account CodePipeline solution



AWS account CodePipeline automation

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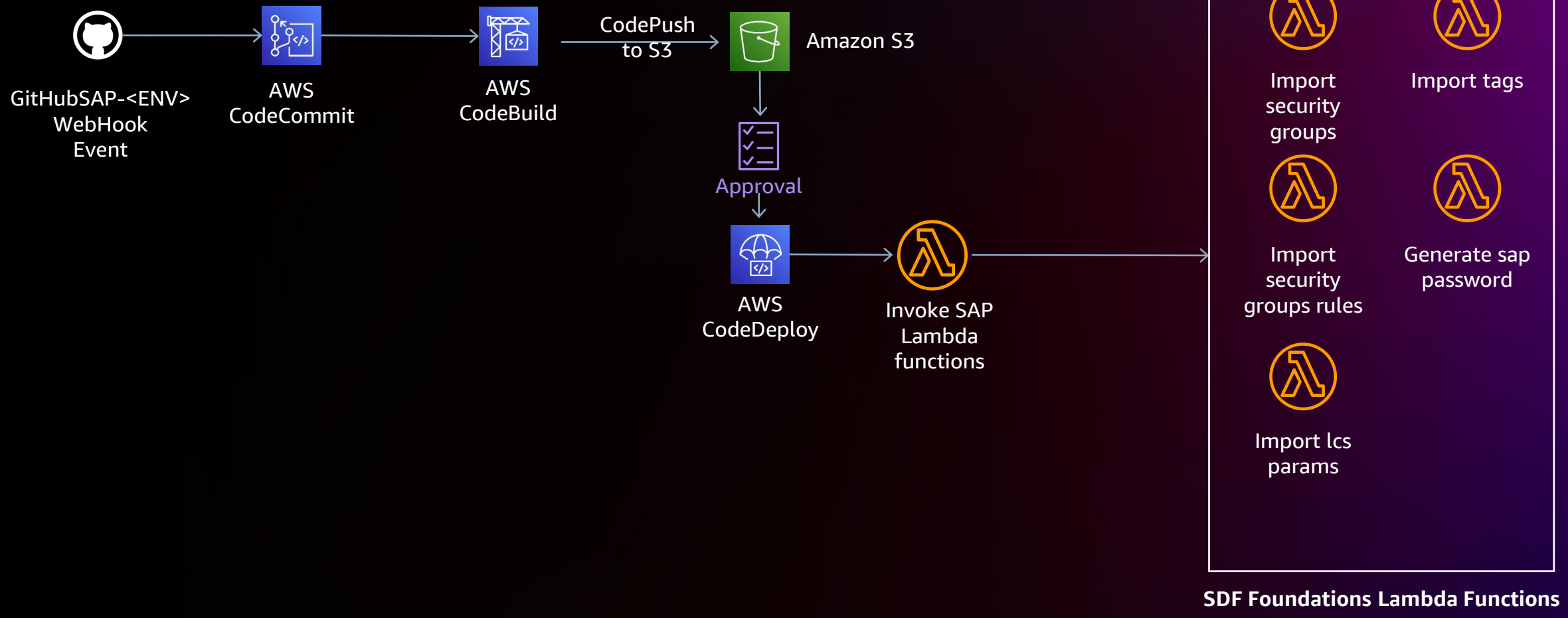
AWS account CodePipeline solution



AWS CodePipeline automation for SAP environments

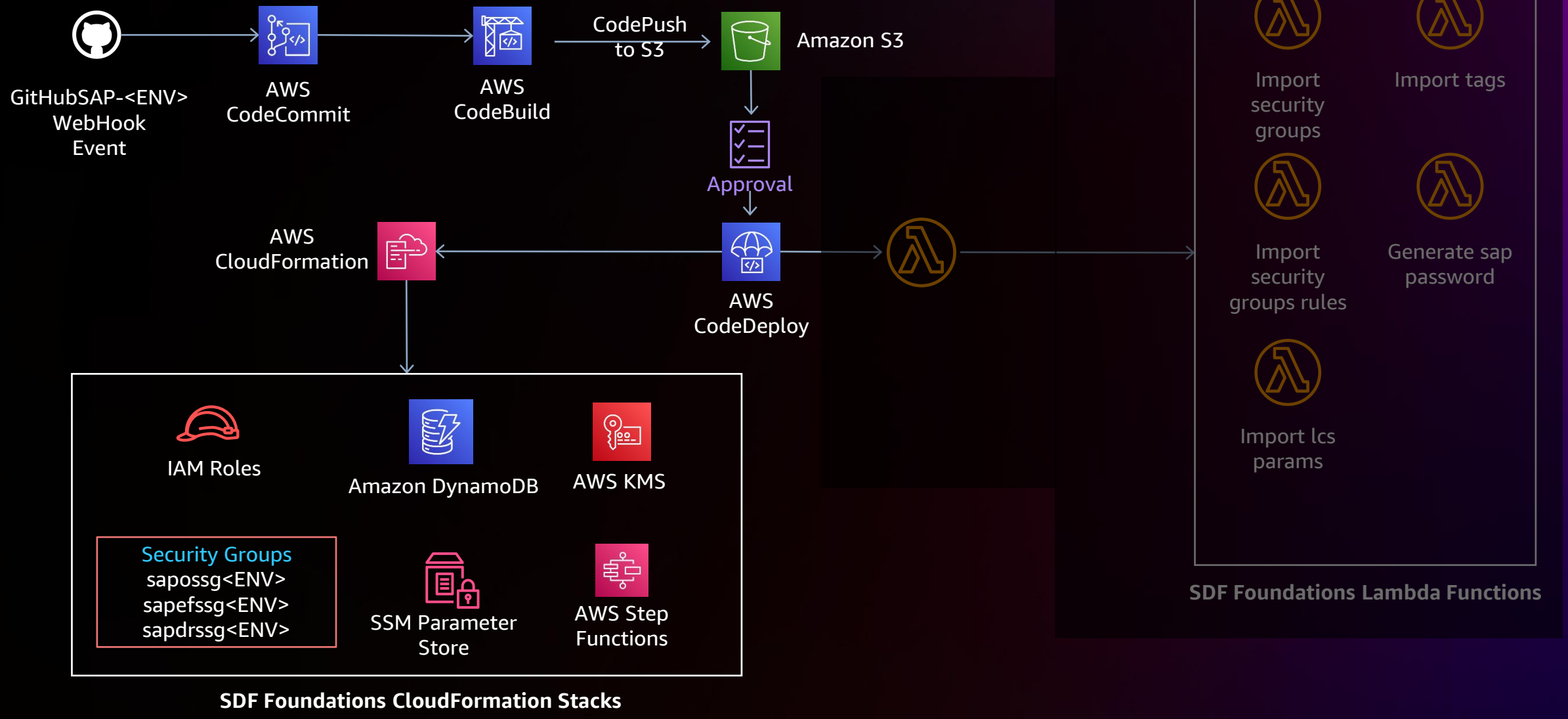
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SAP environment CodePipeline



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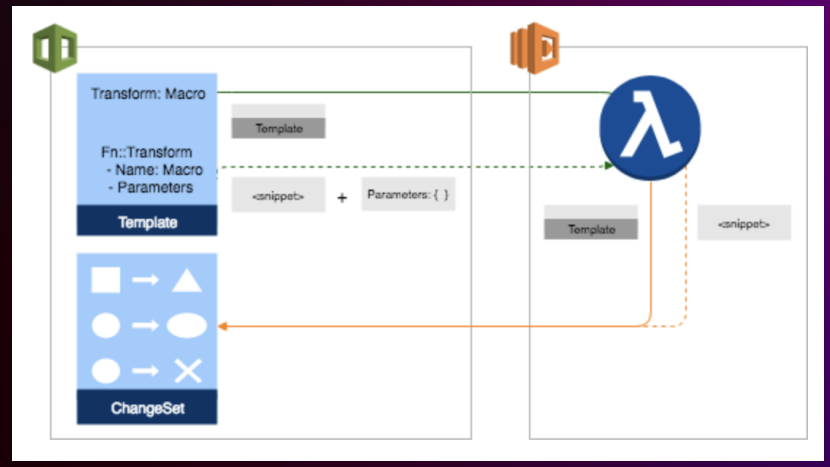
SAP system CodePipeline details

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○	insert-update-efs-ids-in-ddb	Deploy	Succeeded	AWS Lambda	9 hours ago	9 hours ago	1 minute 34 seconds
○	insert-update-eni-ids-in-ddb	Deploy	Succeeded	AWS Lambda	9 hours ago	9 hours ago	32 seconds
○	create-update-efs	Deploy	Succeeded	AWS CloudFormation	9 hours ago	9 hours ago	2 minutes 38 seconds
○	create-update-enis	Deploy	Succeeded	AWS CloudFormation	9 hours ago	9 hours ago	1 minute 35 seconds
○	insert-update-security-group-ids-in-ddb	Deploy	Succeeded	AWS Lambda	9 hours ago	9 hours ago	32 seconds
○	import-sap-software-information	Deploy	Succeeded	AWS Lambda	9 hours ago	9 hours ago	32 seconds
○	import-cloudformation-template-params-list	Deploy	Succeeded	AWS Lambda	9 hours ago	9 hours ago	32 seconds
○	import-sap-tags	Deploy	Succeeded	AWS Lambda	9 hours ago	9 hours ago	31 seconds
○	import-sap-software-info	Deploy	Succeeded	AWS Lambda	9 hours ago	9 hours ago	3 minutes 7 seconds
○	import-sap-system-info	Deploy	Succeeded	AWS Lambda	9 hours ago	9 hours ago	1 minute 33 seconds
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SAP system CodePipeline details

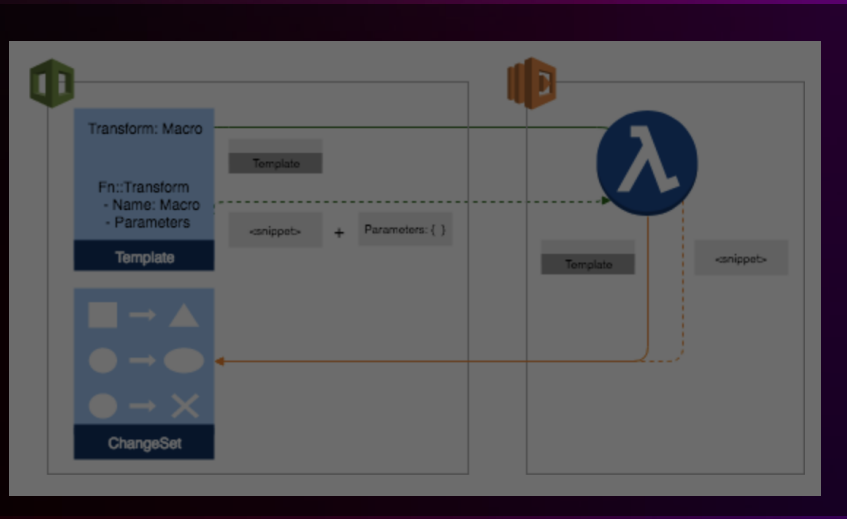
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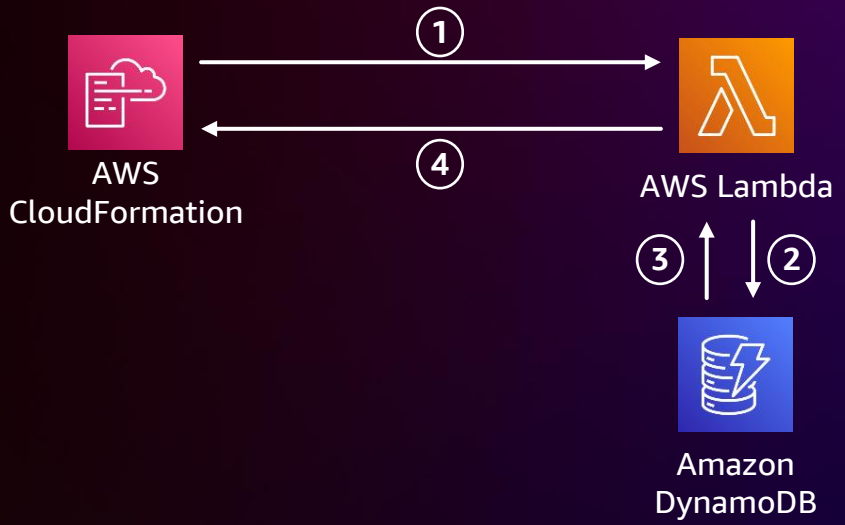


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○	import-sap-system-info	Deploy	Succeeded	AWS Lambda	9 hours ago	9 hours ago	1 minute 33 seconds
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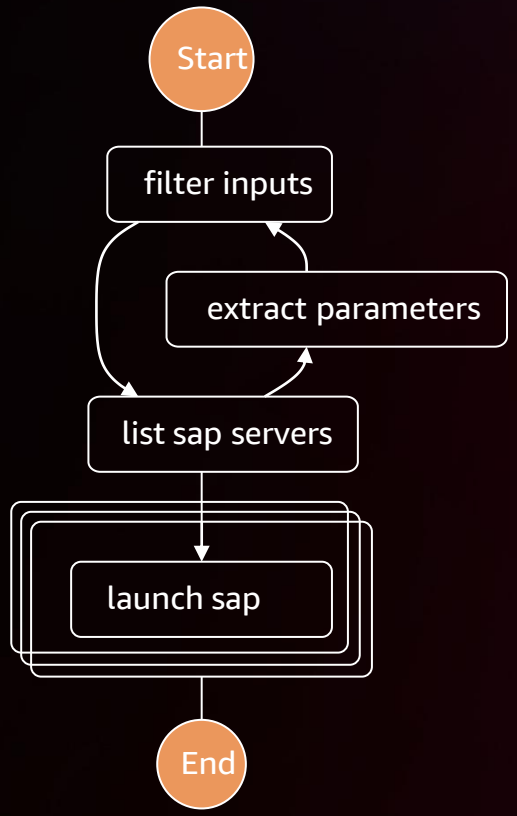
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State machines for SAP system build

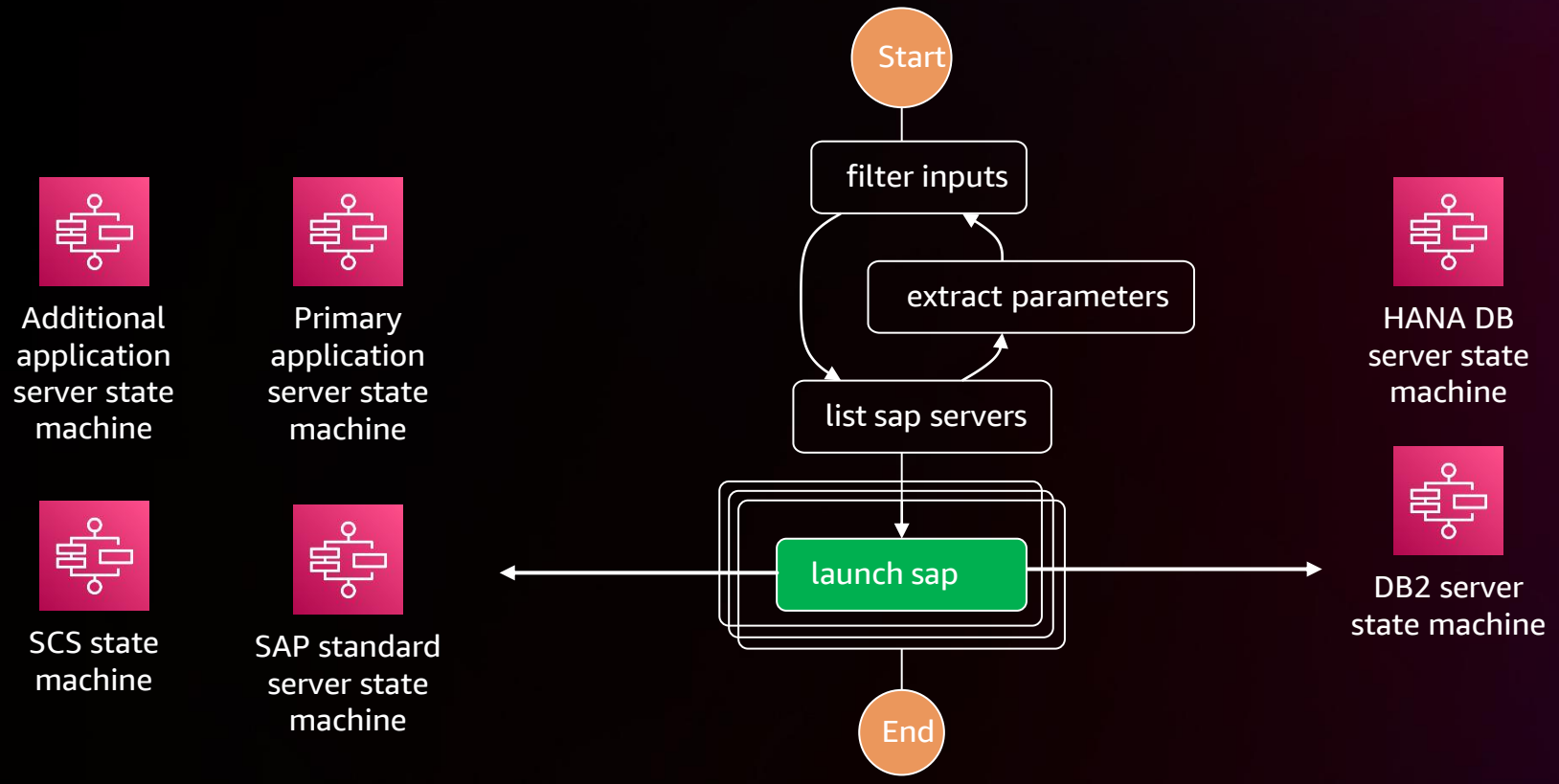
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SAP system state machine



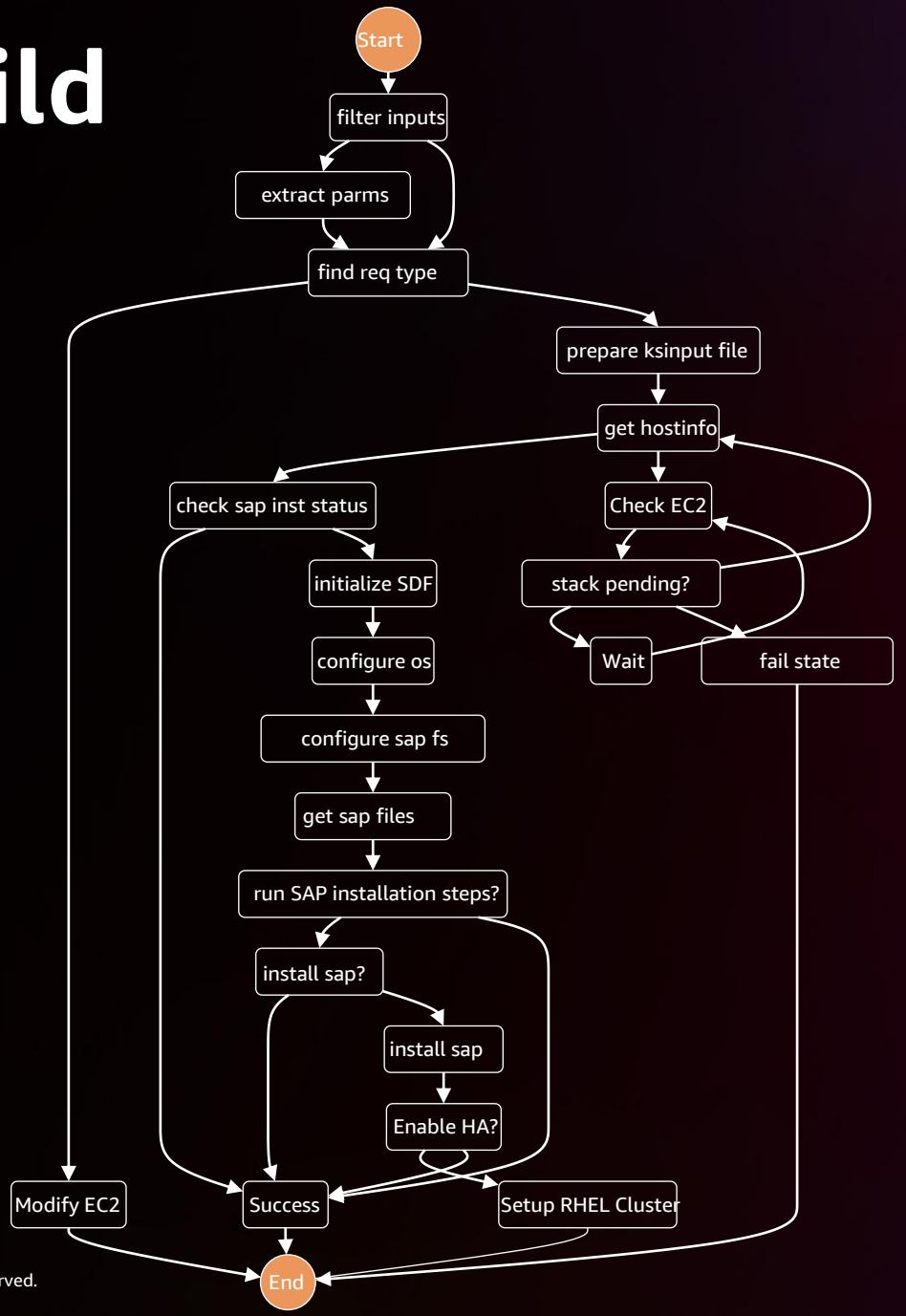
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SAP system state machine



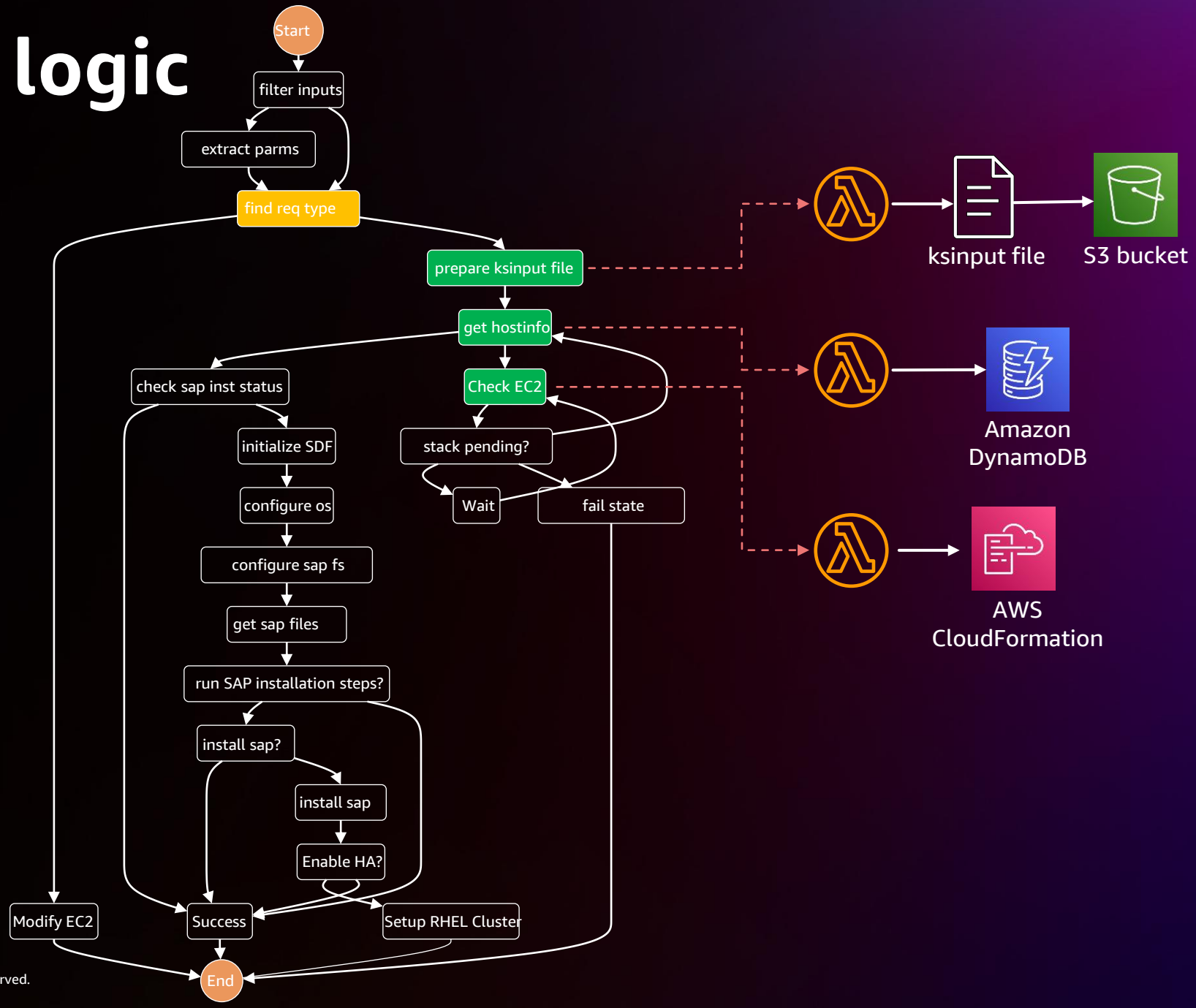
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SAP server build



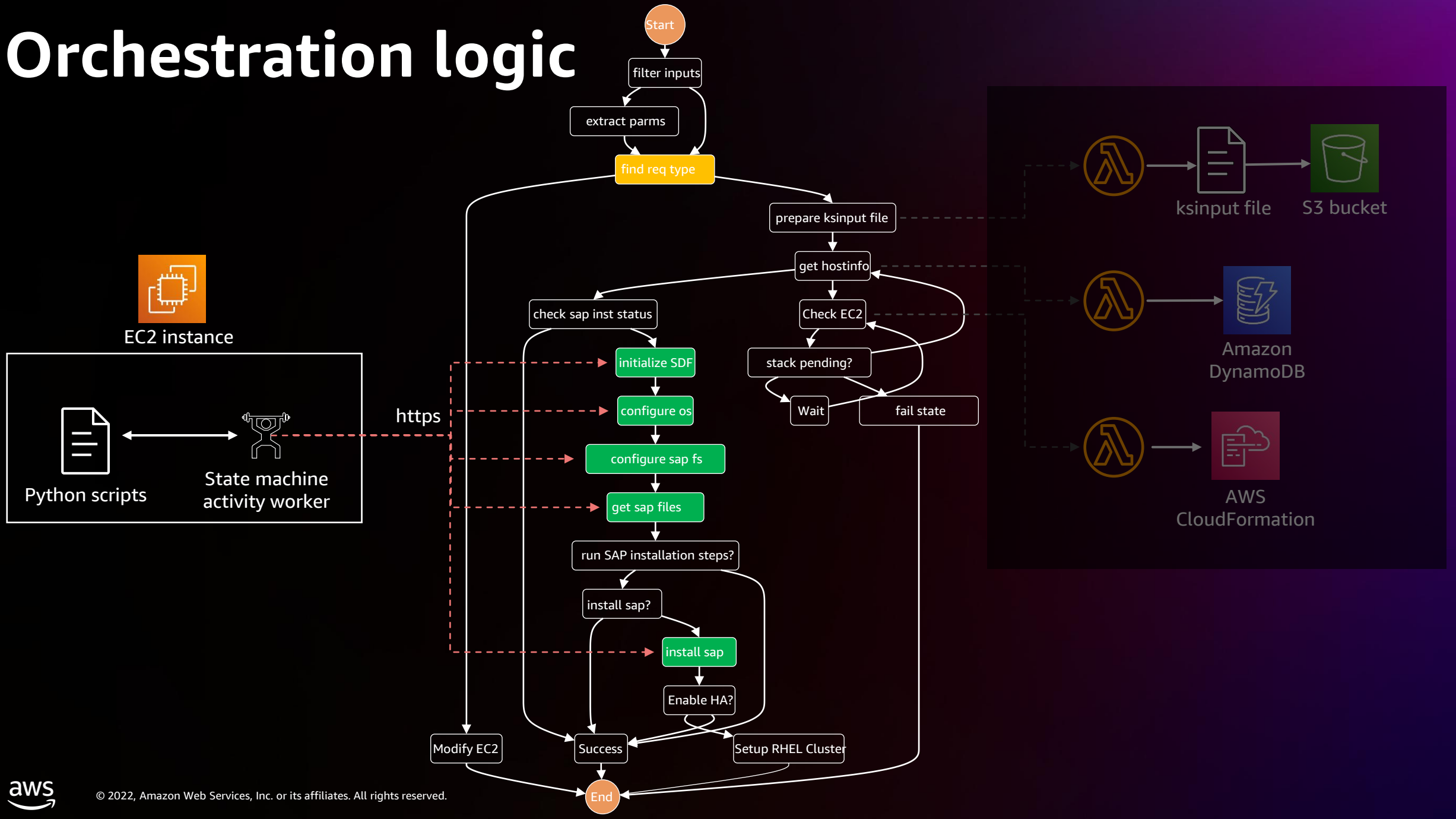
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Orchestration logic



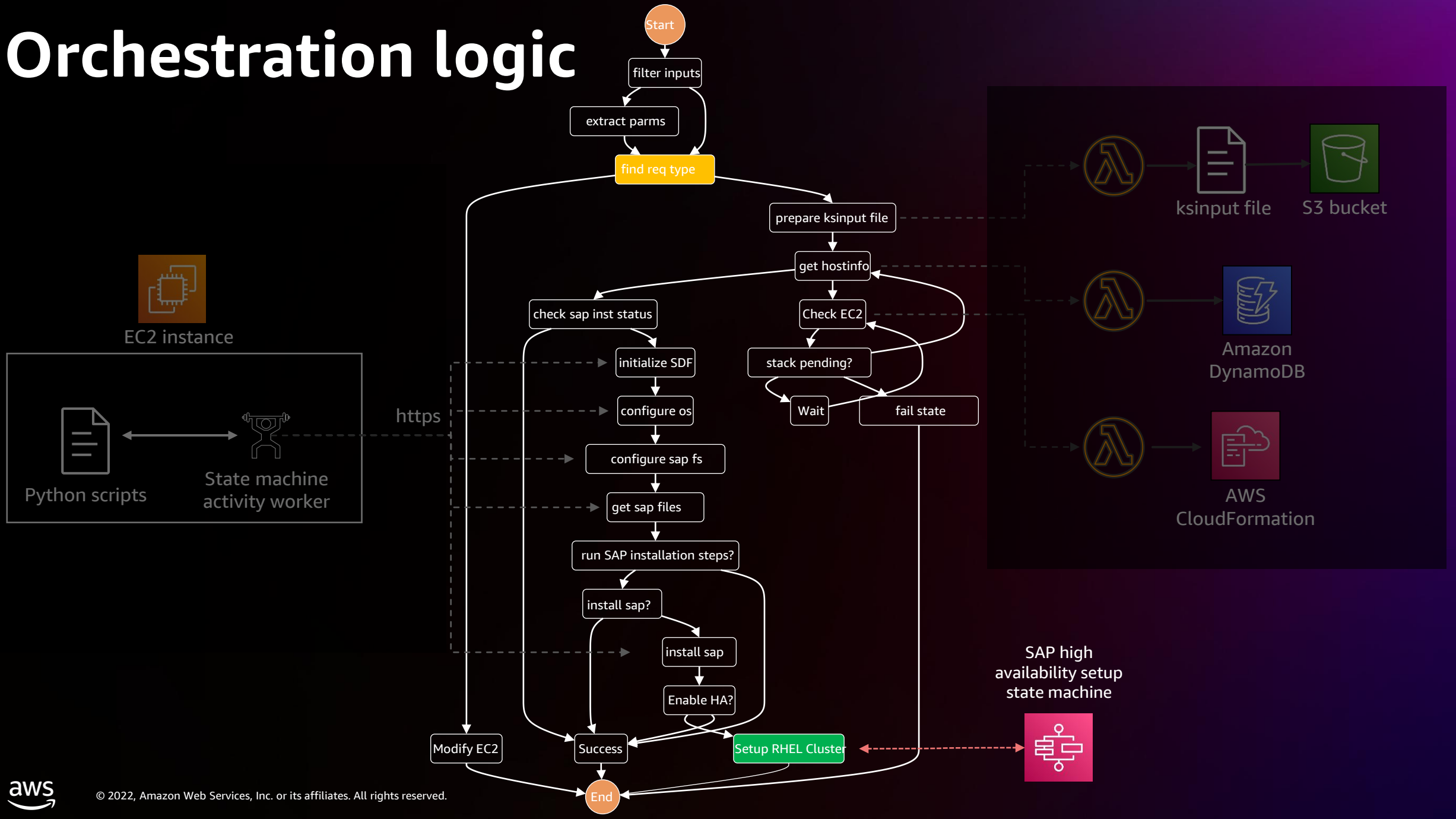
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Orchestration logic



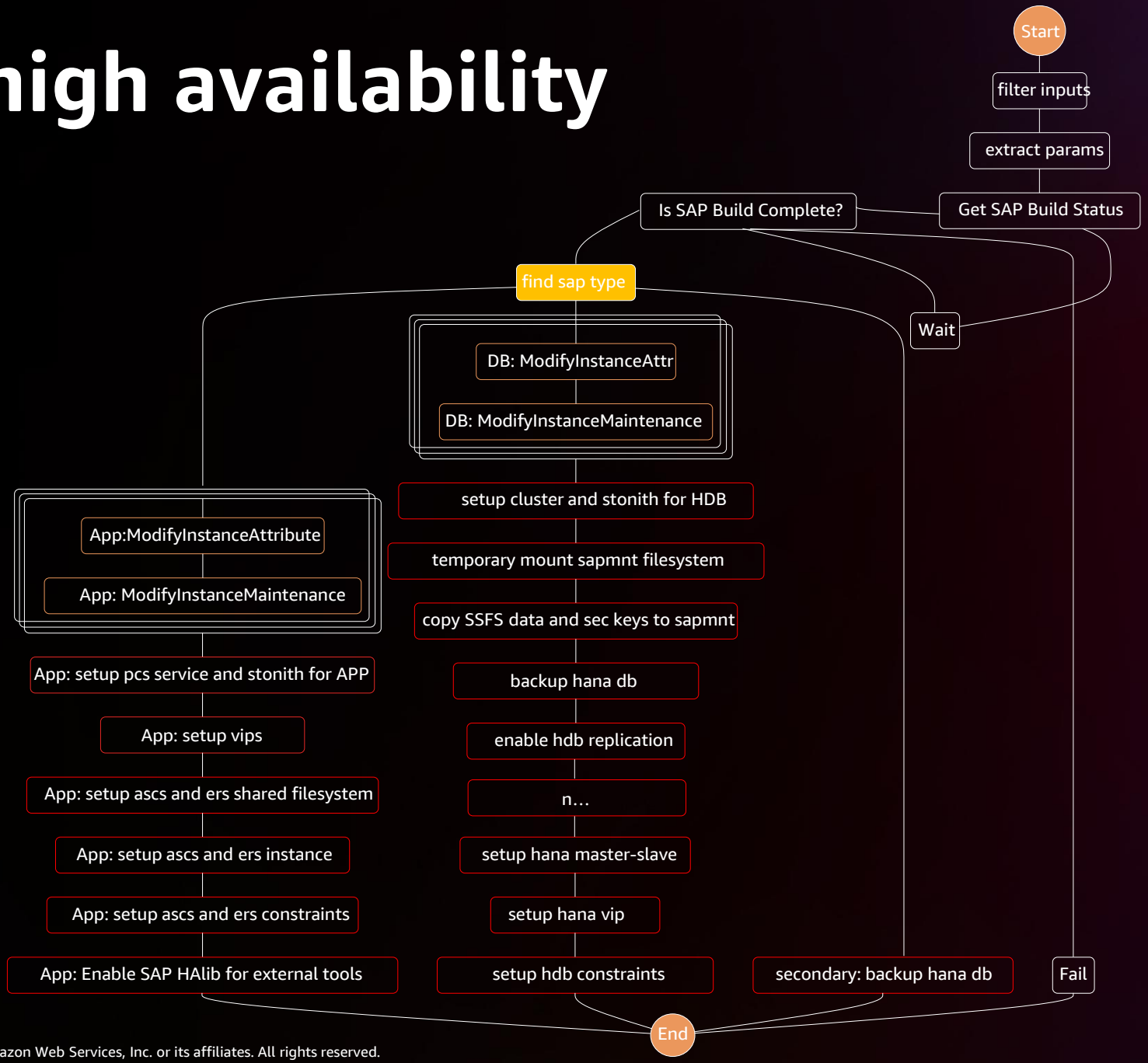
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Orchestration logic



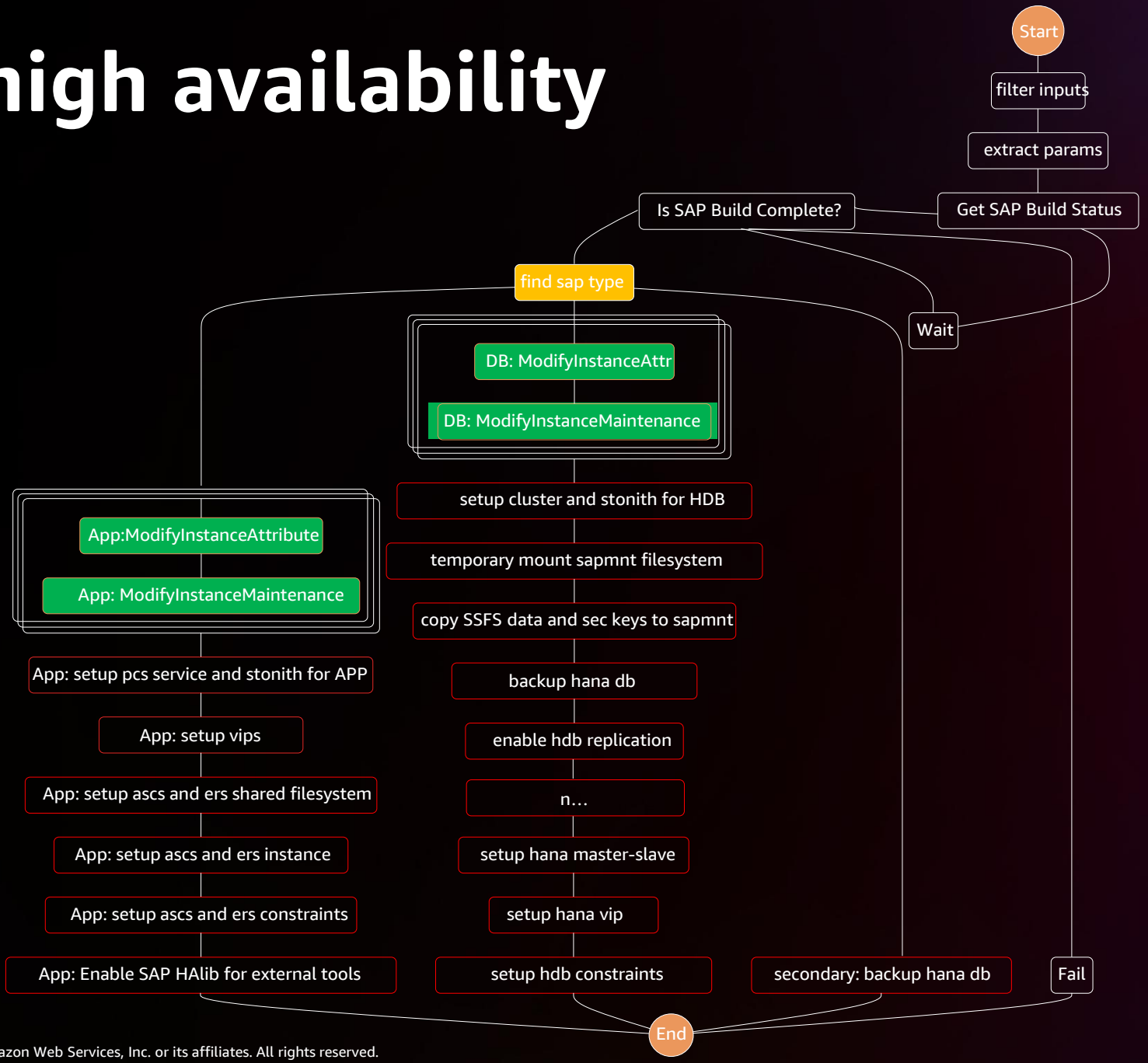
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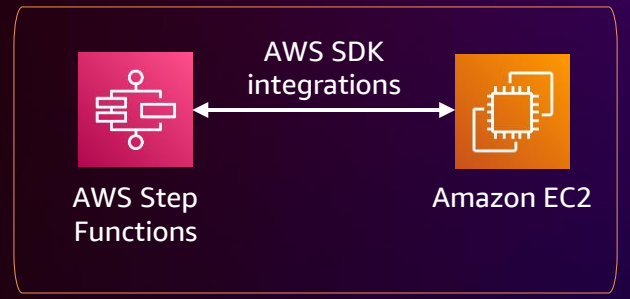
SAP high availability



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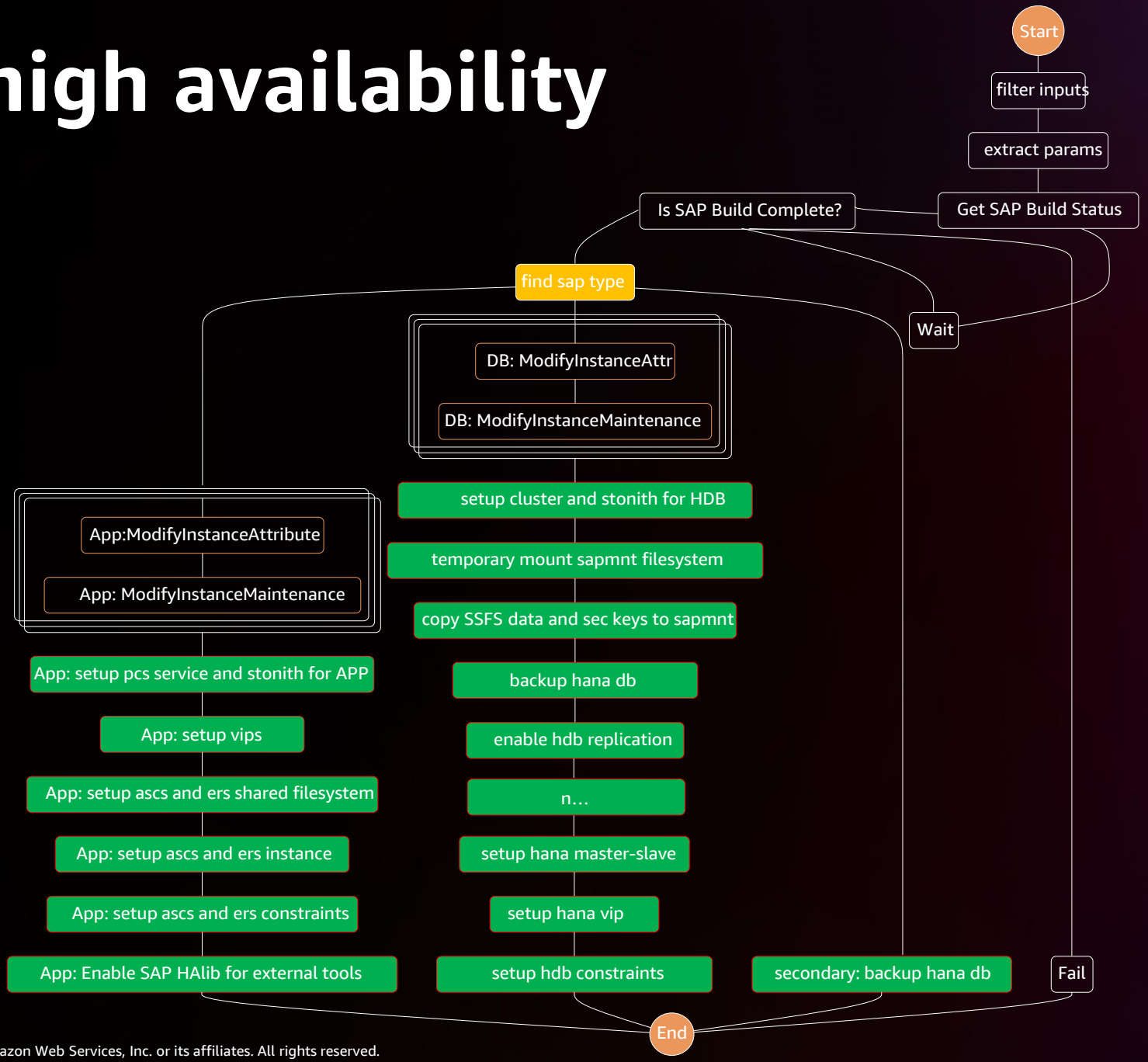
SAP high availability

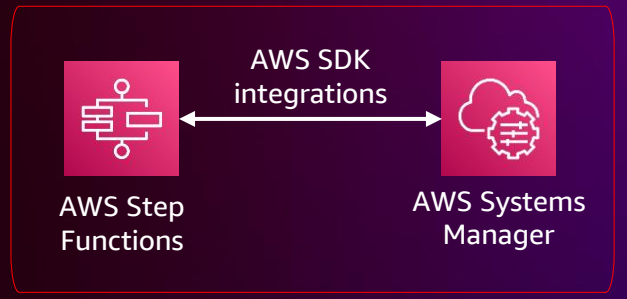


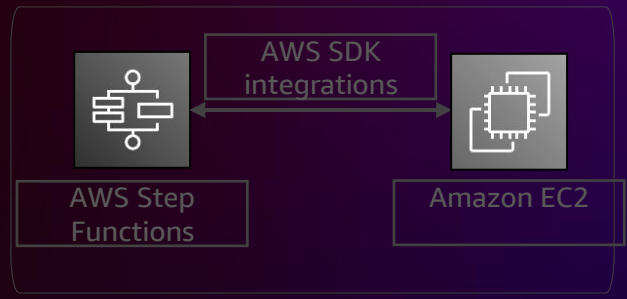


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SAP high availability





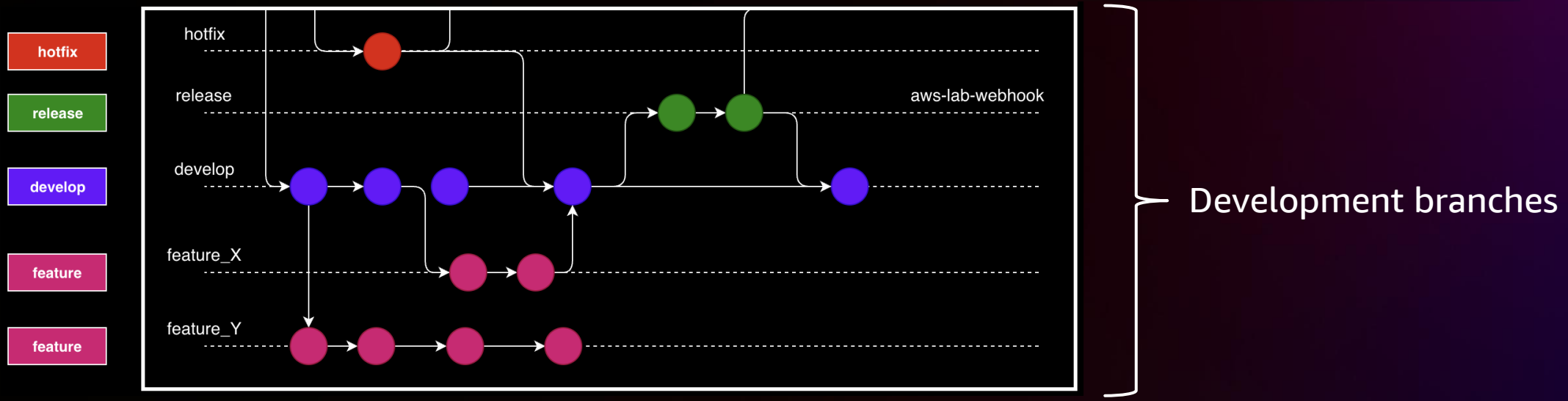


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Git branching and merging design for ERP systems

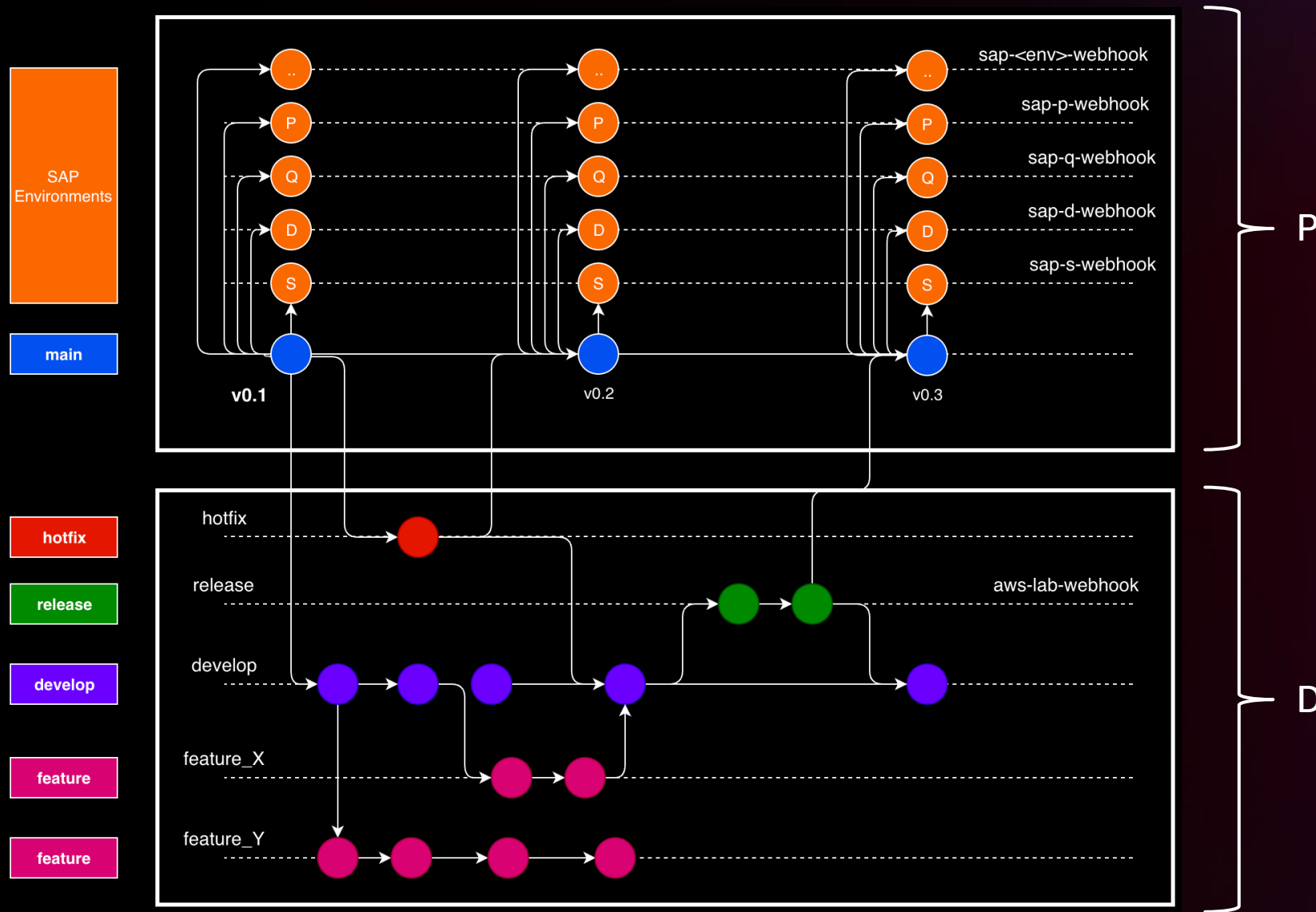
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SAP git branching and merging design



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SAP git branching and merging design



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Automated continuous compliance solution (ACC)

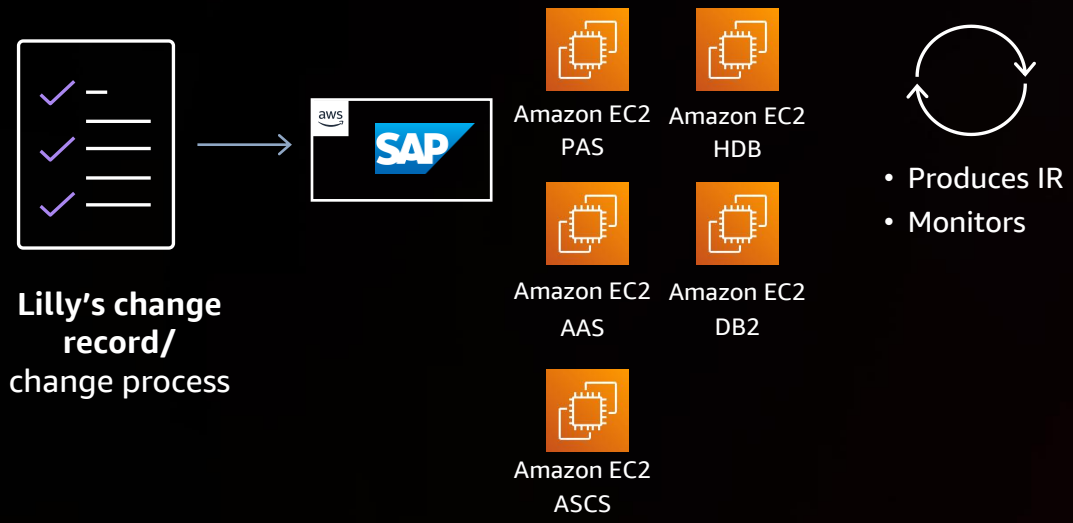
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Automated continuous compliance IR reporting and notification



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Automated continuous compliance IR reporting and notification



Produces version controlled IR for every instance created and continuously update document for every changes

Continuously monitor instances' attributes and operating system configurations

Benefits

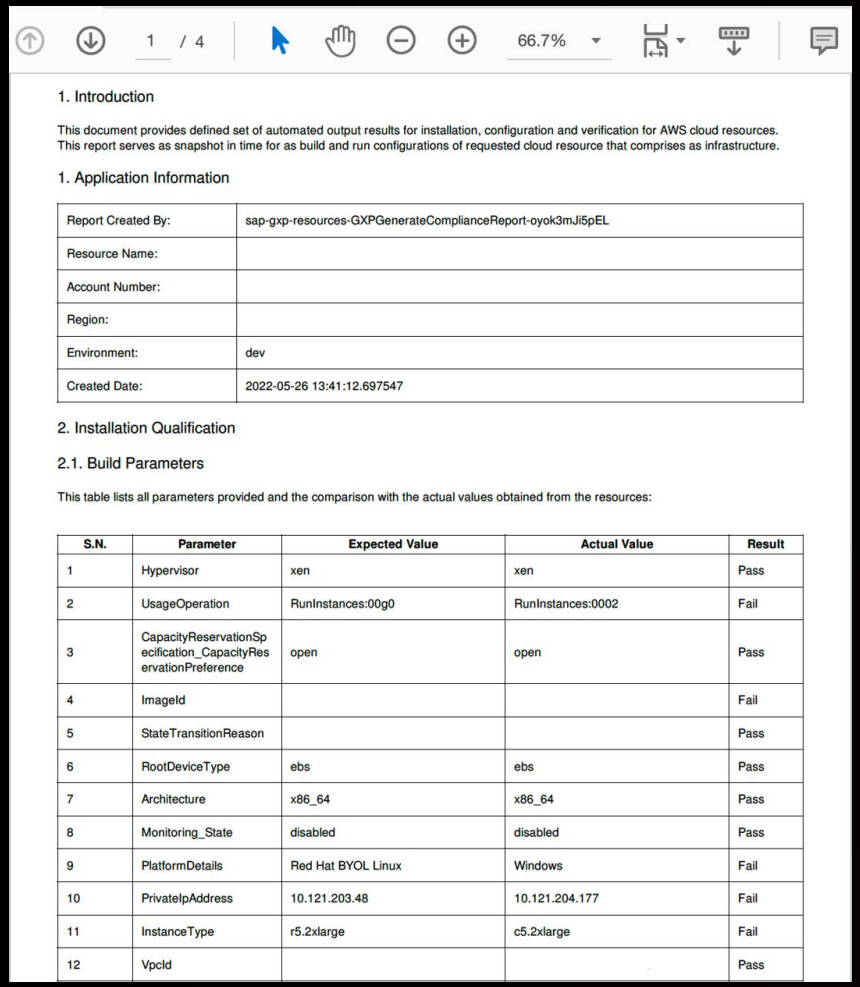
Save Time
Produces IR report of deployed resources with list of checks automatically

Consistency
Scripted automated tests of configurations/ attributes comparison ensures accuracy (no human error)

Compliance
Ensure compliance by continuously monitoring if changes deviate from baseline

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ACC: Installation record (IR) automation



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1. Introduction

This document provides defined set of automated output results for installation, configuration and verification for AWS cloud resources. This report serves as snapshot in time for as build and run configurations of requested cloud resource that comprises as infrastructure.

1. Application Information

Report Created By:	sap-gxp-resources-GXPGenerateComplianceReport-oyok3mJi5pEL
Resource Name:	
Account Number:	
Region:	
Environment:	dev
Created Date:	2022-05-26 13:41:12.697547

2. Installation Qualification

2.1. Build Parameters

This table lists all parameters provided and the comparison with the actual values obtained from the resources:

S.N.	Parameter	Expected Value	Actual Value	Result
1	Hypervisor	xen	xen	Pass
2	UsageOperation	RunInstances:00g0	RunInstances:0002	Fail
3	CapacityReservationSpecification_CapacityReservationPreference	open	open	Pass
4	ImageId			Fail
5	StateTransitionReason			Pass
6	RootDeviceType	ebs	ebs	Pass
7	Architecture	x86_64	x86_64	Pass
8	Monitoring_State	disabled	disabled	Pass
9	PlatformDetails	Red Hat BYOL Linux	Windows	Fail
10	PrivateIpAddress	10.121.203.48	10.121.204.177	Fail
11	InstanceType	r5.2xlarge	c5.2xlarge	Fail
12	VpcId			Pass

An example of an IR document generated for a particular instance

Event-based

Automated

Versioning

Compliance checks

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SAP operations automation

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Operations automation on AWS

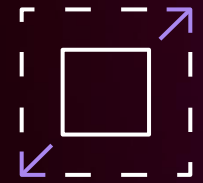
Processes we're automating

- HANA/DB2 backup management
- SAP start/stop
- Password rotation
- Amazon EC2, Amazon EBS, Amazon EFS backup/restore
- Enhanced monitoring using Amazon CloudWatch Application Insights

Benefits



Flexibility



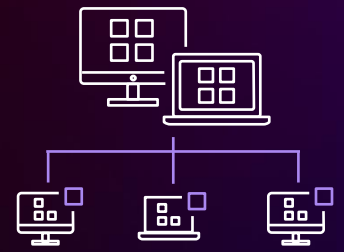
Resiliency



Transparency



Cost-optimization

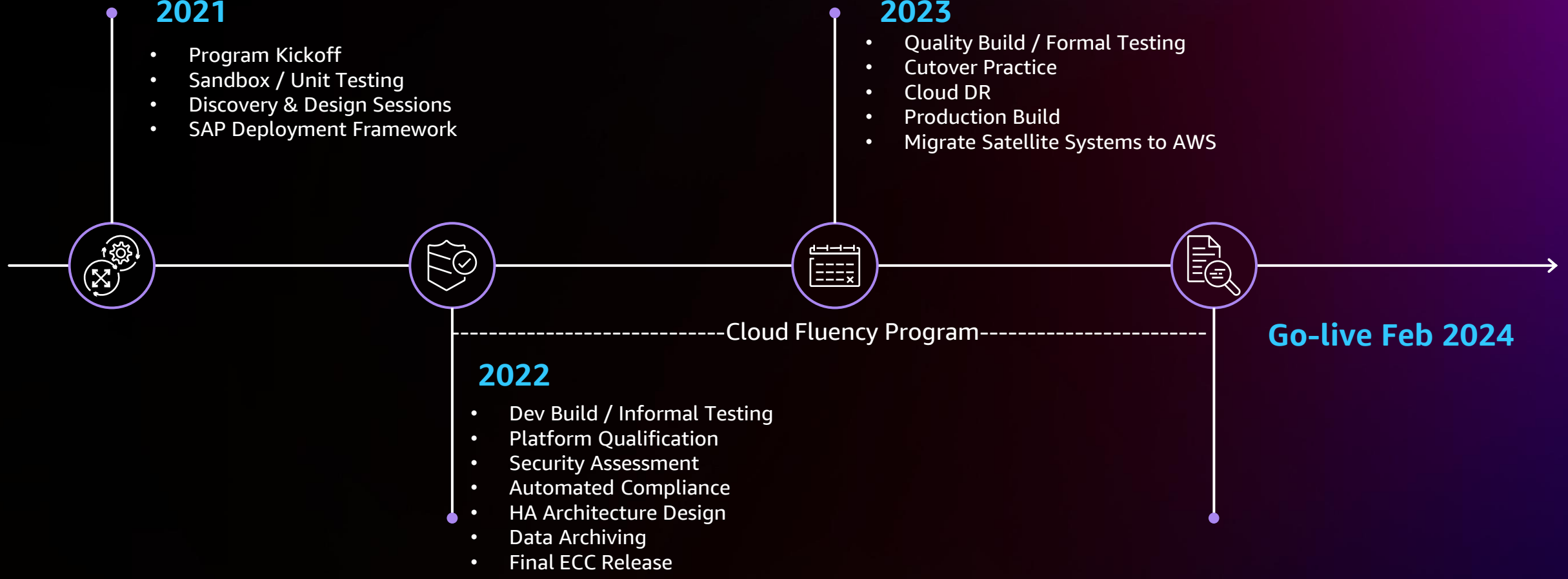


Operational efficiency

aws

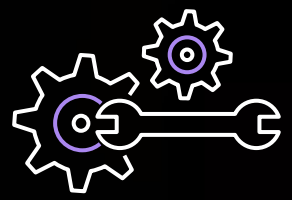
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SAP on AWS Journey



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Lessons learned



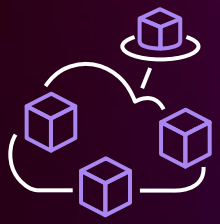
Don’t underestimate operating model changes



Engage compliance teams early in the process



Take advantage of savings plans



Consider dedicated accounts/VPCs for SAP workloads

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SAP on AWS updates

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What's new for SAP on AWS?



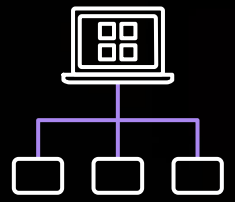
Migration

- Migration Hub Orchestrator
- Improvements to Migration Acceleration Program for SAP workloads



Innovation

- Bi-directional data flows with Amazon AppFlow
- Amazon AppFlow ODP support
- AWS SDK for SAP ABAP



Infrastructure

- Intel Ice Lake-based EC2 instances (X2i, R6i, M6i, and C6i)
- AMD Milan-based EC2 instances (R6a, M6a and C6a)
- Virtualized 18 TB and 24 TB High-Memory instances
- Amazon FSx for NetApp ONTAP (FSx for ONTAP)
- Support for SAP HANA host auto-failover with FSx for ONTAP



Management and operations

- Launch Wizard improvements
  - Scale deployments
  - Clone deployments
  - Solution Manager
- AWS Systems Manager support for SAP
- Observability for NetWeaver using AppInsights

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Introducing the AWS SDK for SAP ABAP

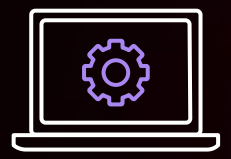


Makes it easy for ABAP developers to extend and transform SAP-based business processes by harnessing the power of AWS services natively using the SAP ABAP language



Accelerate business process innovation

by giving ABAP developers native access to all 300+ AWS services



Reduce architectural complexity

by eliminating the need to manually create complex integrations between SAP and AWS services



Maintain a strong security posture

by encrypting all payloads with HTTPS and enforcing SAP-level permissions



Upskill ABAP development teams

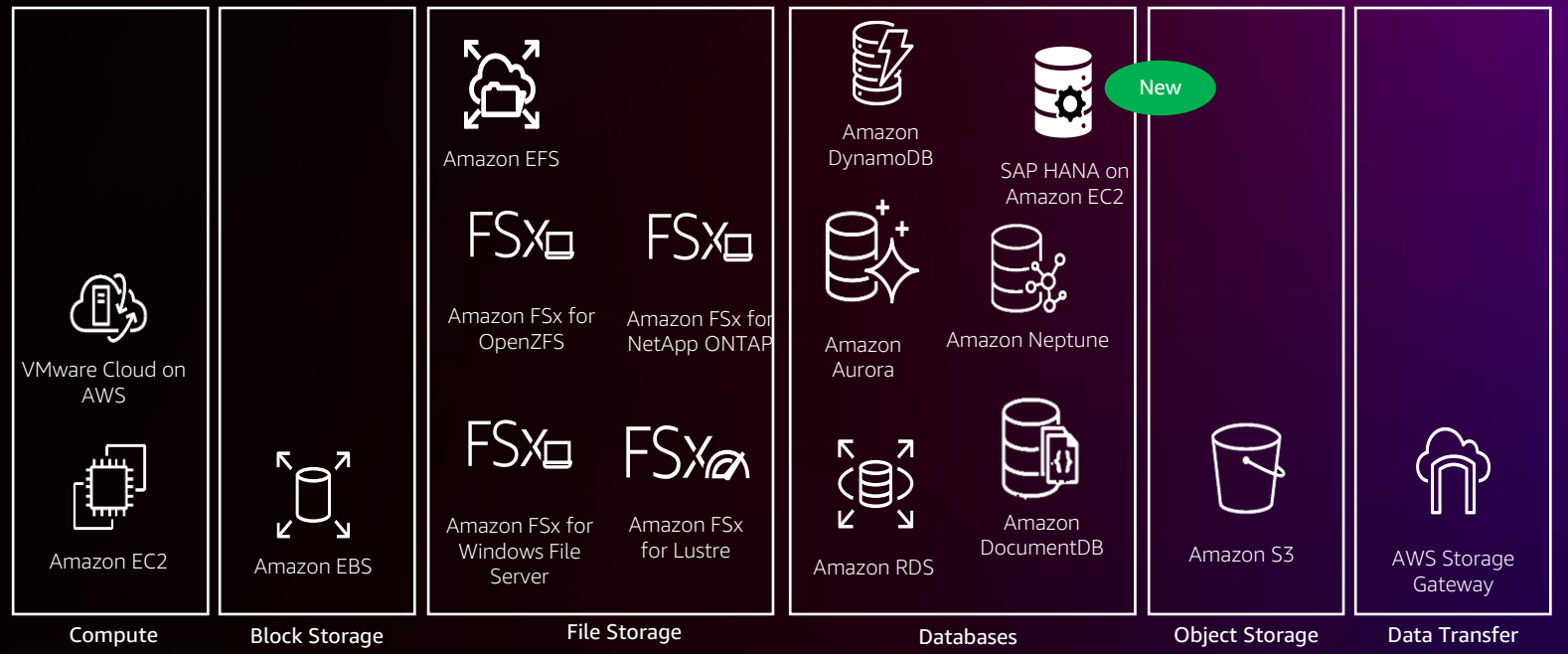
by making it easy to for them to build cloud-based solutions

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AWS Backup support for SAP HANA

- A fully managed, policy-based backup service that makes it easy to centrally manage and automate the backup of data across AWS services
- Provides application-consistent log and data backups of SAP HANA databases running on EC2
- Easily restore your SAP HANA applications to a per-second granularity
- Create immutable backups and simplify compliance monitoring



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Next steps to start your journey

Work with us



Complementary discovery workshops



Work with an AWS SAP Competency Partner



Work with AWS Professional Services SAP/ERP Specialty Practice



Explore the AWS Migration Acceleration Program

Explore SAP on AWS

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Thank you!

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