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RET301

Core elements of digital transformation

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tapestry



Established 1941

Authentic, courageous, inclusive



Established 1986

Stylish, confident, sophisticated



Established 1993

Joyful, optimistic, colorful

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Agenda

What is digital transformation and why it is important?

A little history

Why is it difficult?

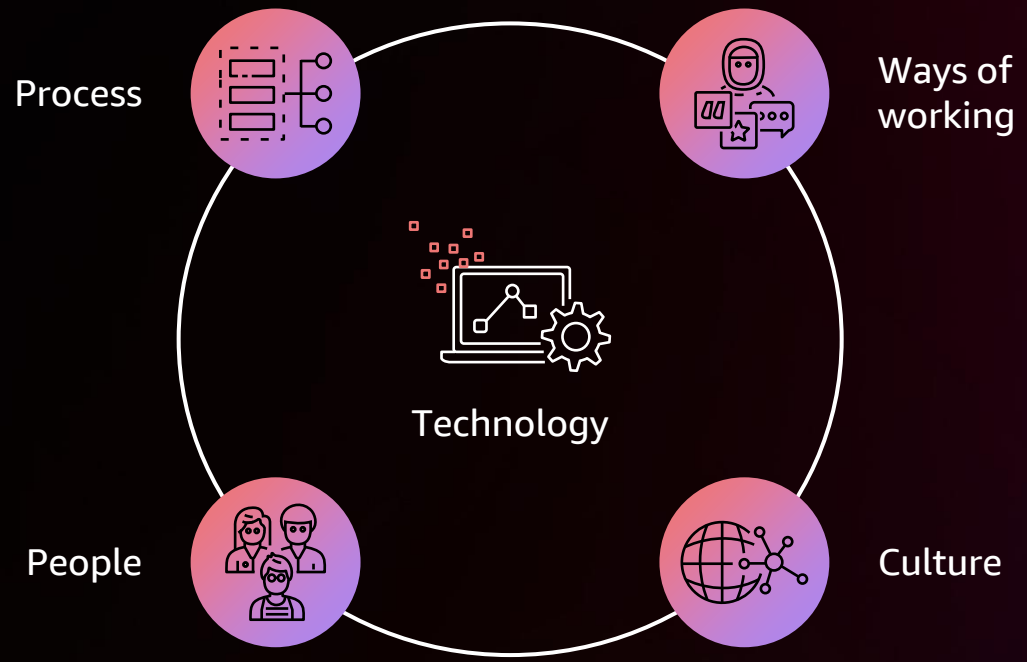
Our reality – The retail and fashion business

The foundations

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What is it?

Digital transformation is about reimagining how we do business with digital technology at the core of business strategy



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Why it is important?



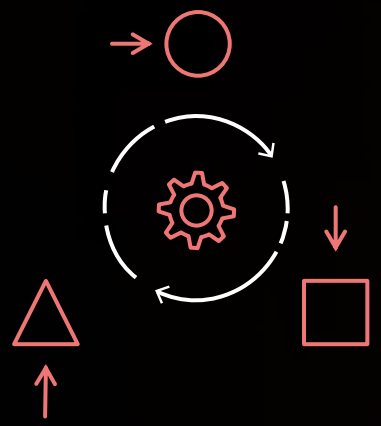
The benefits of a well-thought-out digital strategy are well documented

Improved visibility of resources and better resource management, enhanced flexibility and organization agility, lower costs, smoother supply chain management, better customer experience, improved productivity, faster product development, and superior human resource planning [Harvard Business Review]

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How did we get here?



Digitization – From analog to digital

We stopped using paper and started using computers

Digitalization – Using digital data to simplify work

But we kept our files in folders

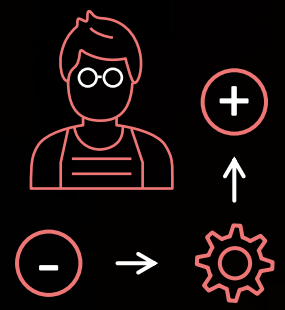
Digital transformation

We are not just doing the same old things faster, let’s transform

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Why is it difficult?



People change management

Digital transformation affects all aspects of business. For it to work, the digital foundation, digital operations, and a digitally skilled workforce collectively need the backing of leaders and a culture that is aligned on which new technologies to adopt and how best to integrate them into daily life

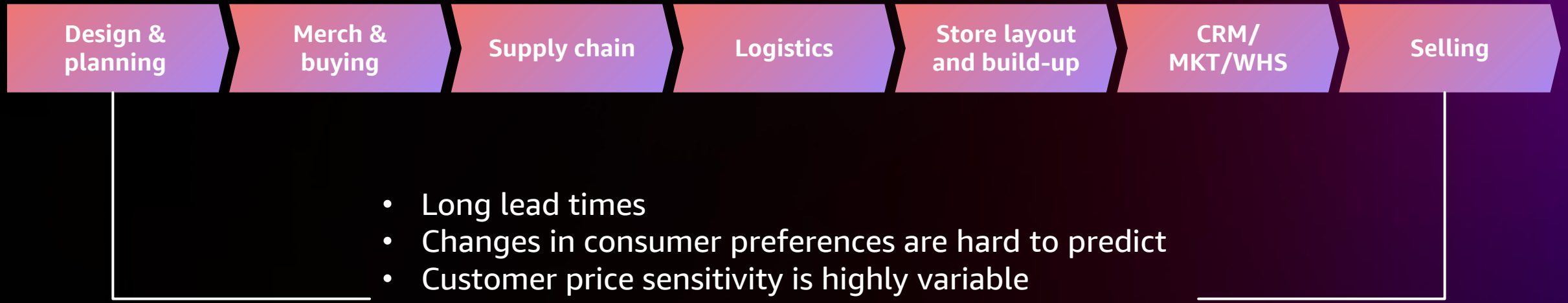
- What should the future of work look like?
- How should roles and responsibilities evolve?
- In what ways can technology facilitate better knowledge sharing and collaboration?
- How can leaders be trained to communicate better?

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Retail fashion is a complex business

The value chain



- Long lead times
- Changes in consumer preferences are hard to predict
- Customer price sensitivity is highly variable
- Customer acquisition and loyalty
- Highly competitive environment
- Sensitive to changes in macroeconomic environment

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Transformation begins and ends with how we think about, and engage with, customers

The value chain

Design & planning	Merch & buying	Supply chain	Logistics	Store layout and build-up	CRM/ MKT/WHS	Selling
Trend detection + real-time customer feedback	Customer centric assortment and buying Optimizing demand forecast		Customer centric allocation and replenishment		WHS assortment	Optimized markdowns
	Digital samples	End-2-end supply chain and inventory optimization across network		Customer centric store network and build up	Personalized clienteling & CRM	Optimized and personalized promos
AI guided design	Optimized assortment and planning					Outlet pricing
Product pre-testing	Buying adjustment based on early detection			Ideal store layout	Precision marketing	E-Com/Online sales

Digital enablers

Support processes

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The foundations



What is the smallest, most discrete unit of digital transformation?

Data

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The foundations



Any digital process involves the exchange of information across two or more endpoints

To facilitate digital transformation, we need a headless ecosystem that provides data –

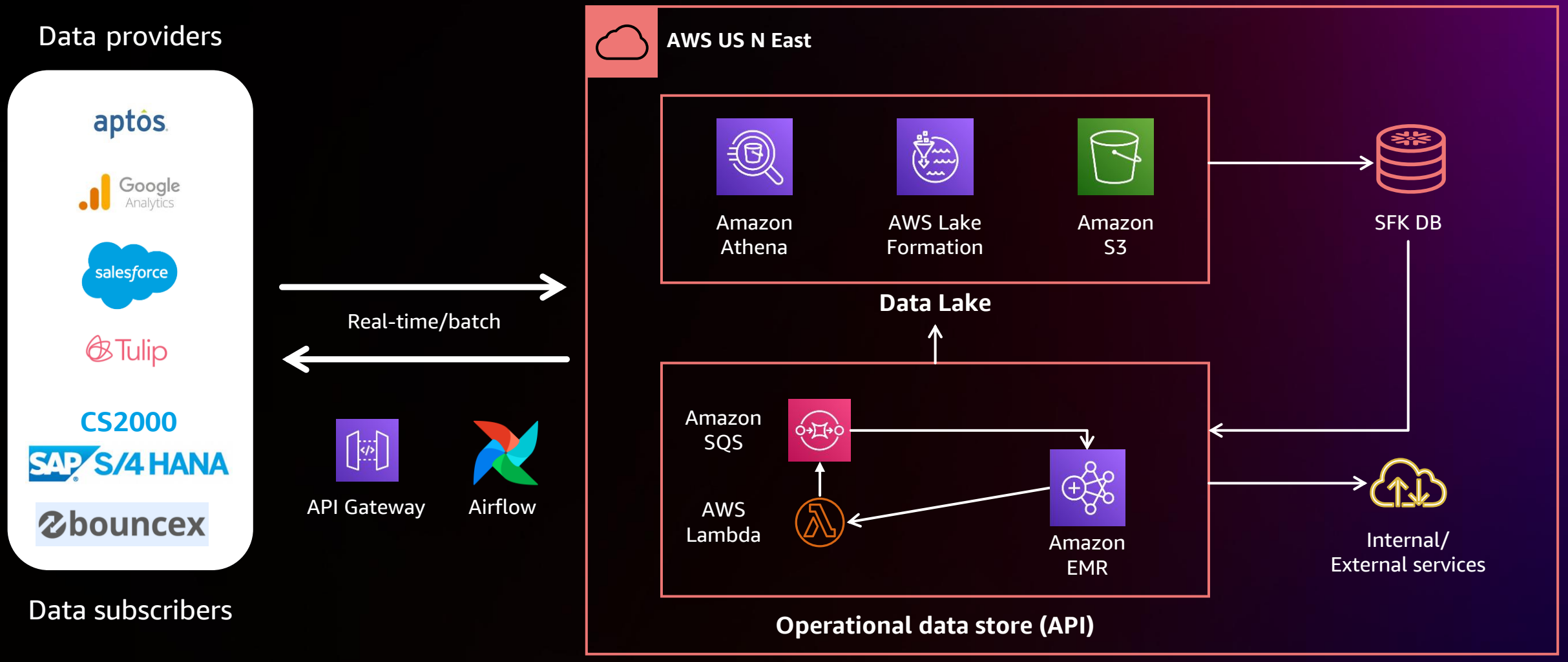
- In any shape or form
- When needed
- Anywhere

A data ecosystem that can integrate and scale seamlessly

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Tapestry data exchange



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Tapestry data exchange – Design principles

1 Snowflake

- Move all backend processing and logic to Snowflake (heavy lifting)
- Flattened-out backend schema
- True data-exchange with minimal logic (it gives us scale and ease of integration)

2 Serverless

- Keep the API platform as serverless as possible (there may be exceptions)
- Follow BaaS (backend as a service) Model
- Services not servers

3 Microservices-driven architecture

- Monolithic applications are hard to scale
- Decentralized microservices based architecture reduces CI/CD friction allowing for faster delivery of features
- It also makes scaling easier
- Stay focused on building loosely coupled services

4 Stateless

- Stateless services scale better horizontally
- Industry-standard for modern application architecture
- There are minimal use cases for stateful services within Tapestry

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Tapestry data exchange – Empowering the business

250 TB of data
100+ data sources
200 integrations
Peaks of 2M API calls per day
(vs. 20K 3 years ago)
Powering 50+ enterprise
level applications*



*Transforming the allocation process alone helped us reduce inefficiency by 40% and improved our KPI (level of stock-outs) by 34%

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Background

Where did we begin?



Multiple data centers as a result of mergers



Aging infrastructure due to lack of investment



Disparate disaster recovery approaches



Lack of agility and scale

Where are we now?



Enterprise-scale AWS landing zone capable of securely hosting workloads across three continents



Fully redundant and scalable network connectivity for cloud hosting



Infrastructure as code for provisioning of cloud resources to achieve consistency, increase security, and improve deployment speed



Harmonized disaster recovery across all three brands (Coach, Kate Spade, Stuart Weitzman) with better RTO and RPO

What did we accomplish?

9

data center closures

Eliminated or consolidated

40%

of Tapestry's server footprint

Eliminated or upgraded

65%

of our legacy operating systems

Tapestry business applications in the cloud –

48%

(beats industry average of ~38%)

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Post-migration technical and business challenges

- Unable to take advantage of cloud native services
- Steep learning curve for transitioning from legacy to modernized workloads
- Showstopper for enterprise digital transformation

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Need for a platform

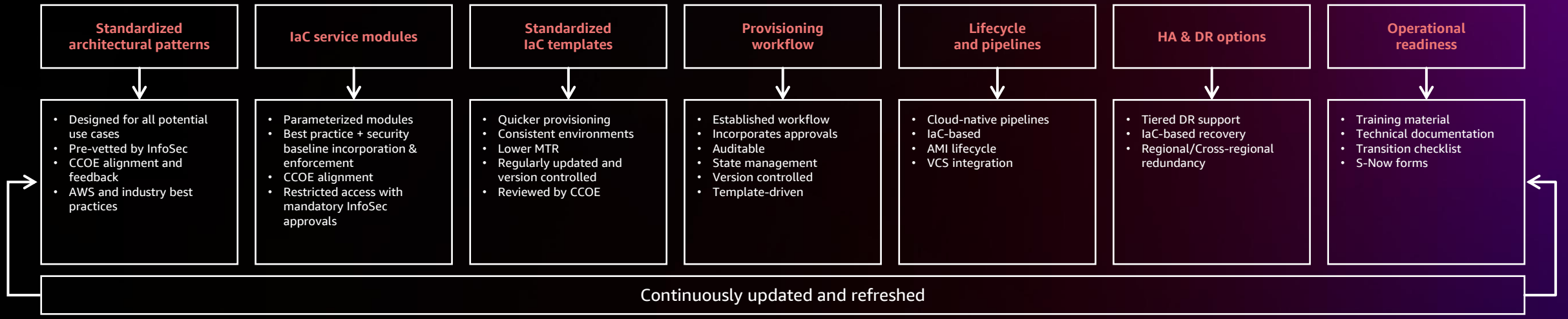
- IaC driven platform which provides –
  - Fleet, consistent, and repeatable deployments
  - Quicker adoption and reduced learning curve
  - Seamless provisioning with built-in security and governance controls
  - Based on best practices
  - Fully IaC driven

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Platform components and provisioning process

Platform core components



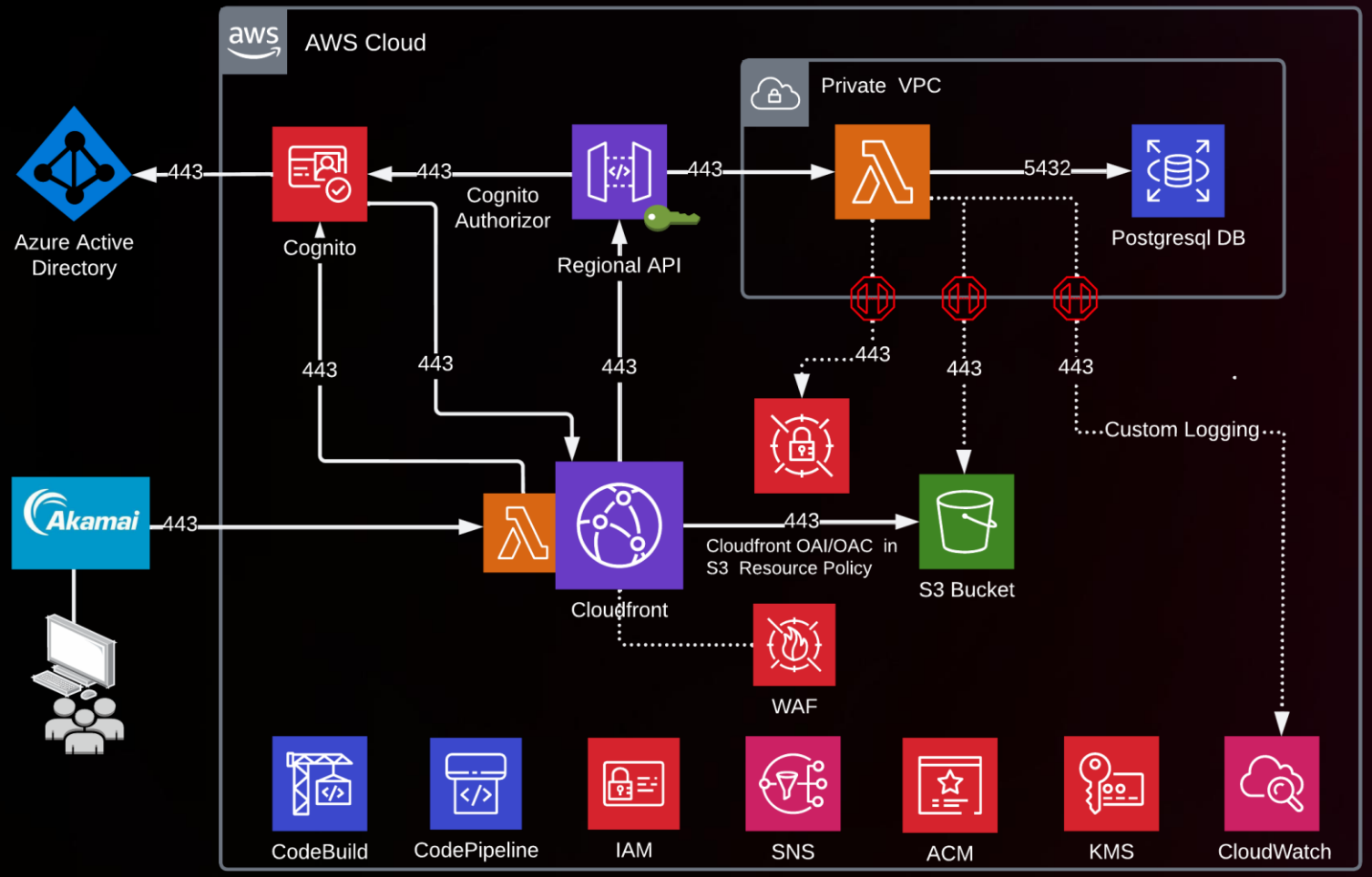
Provisioning process



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Standardized architectural patterns

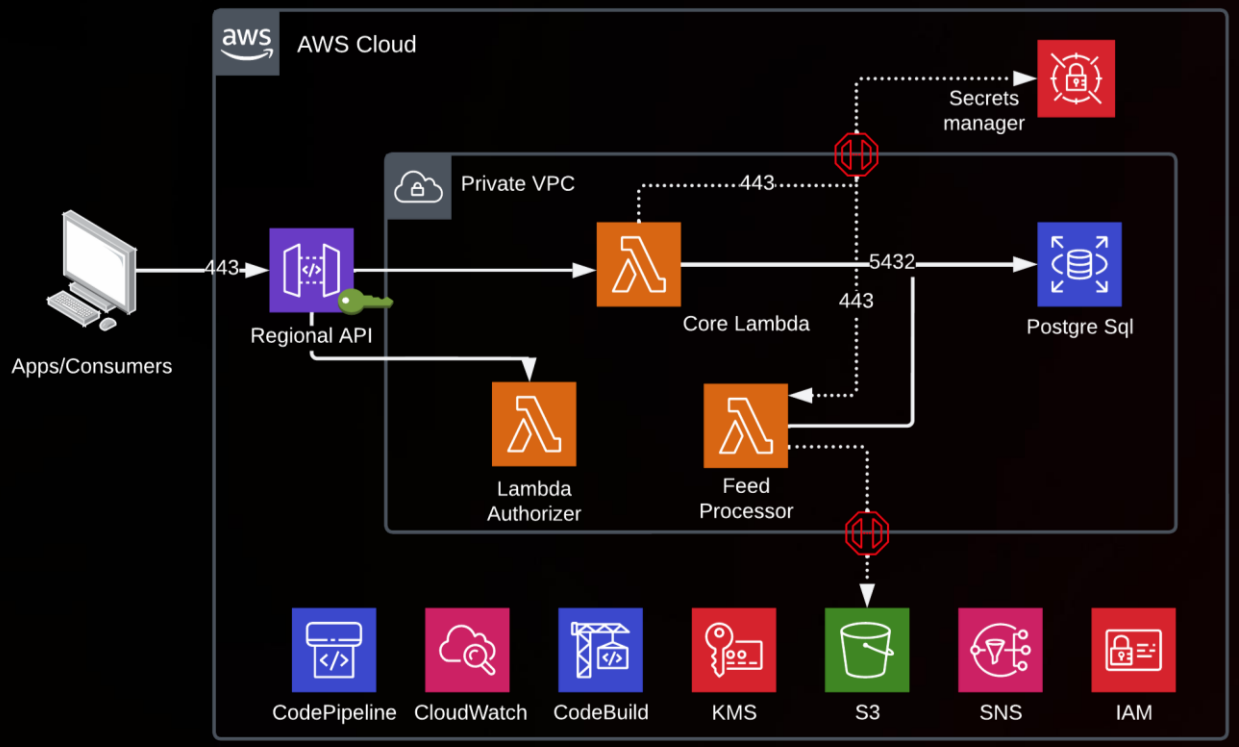


Serverless architecture

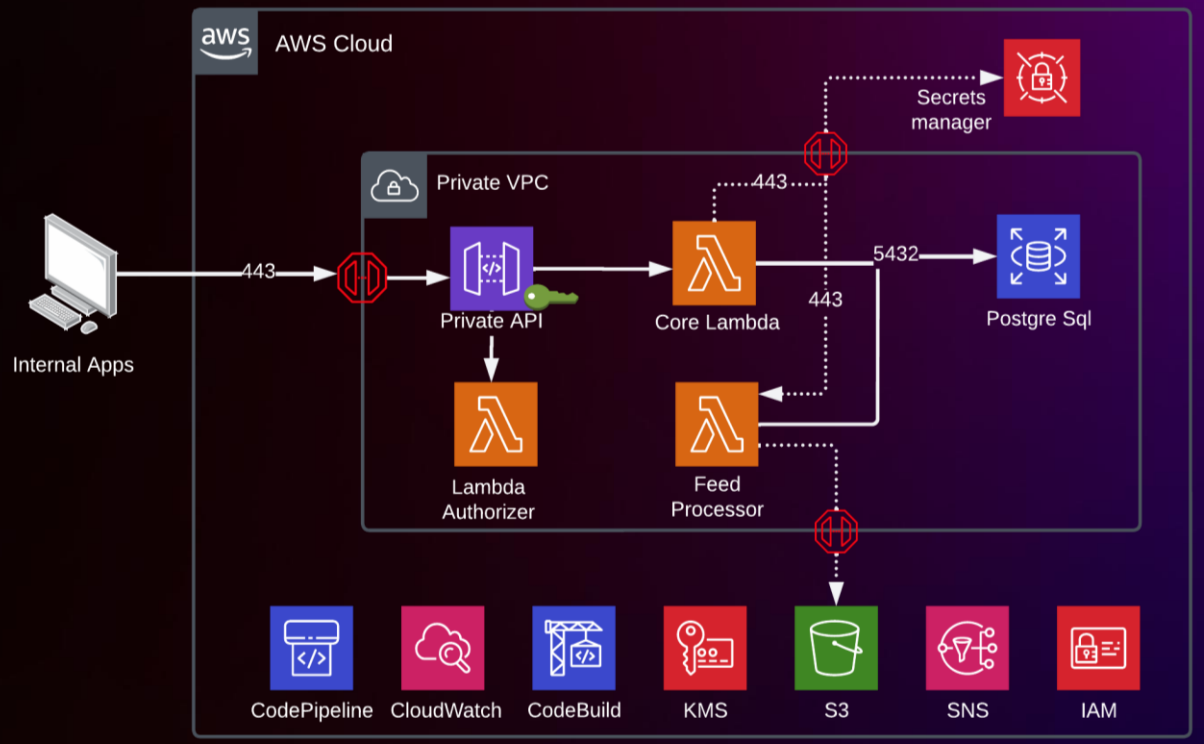
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Standardized architectural patterns

Regional standalone API

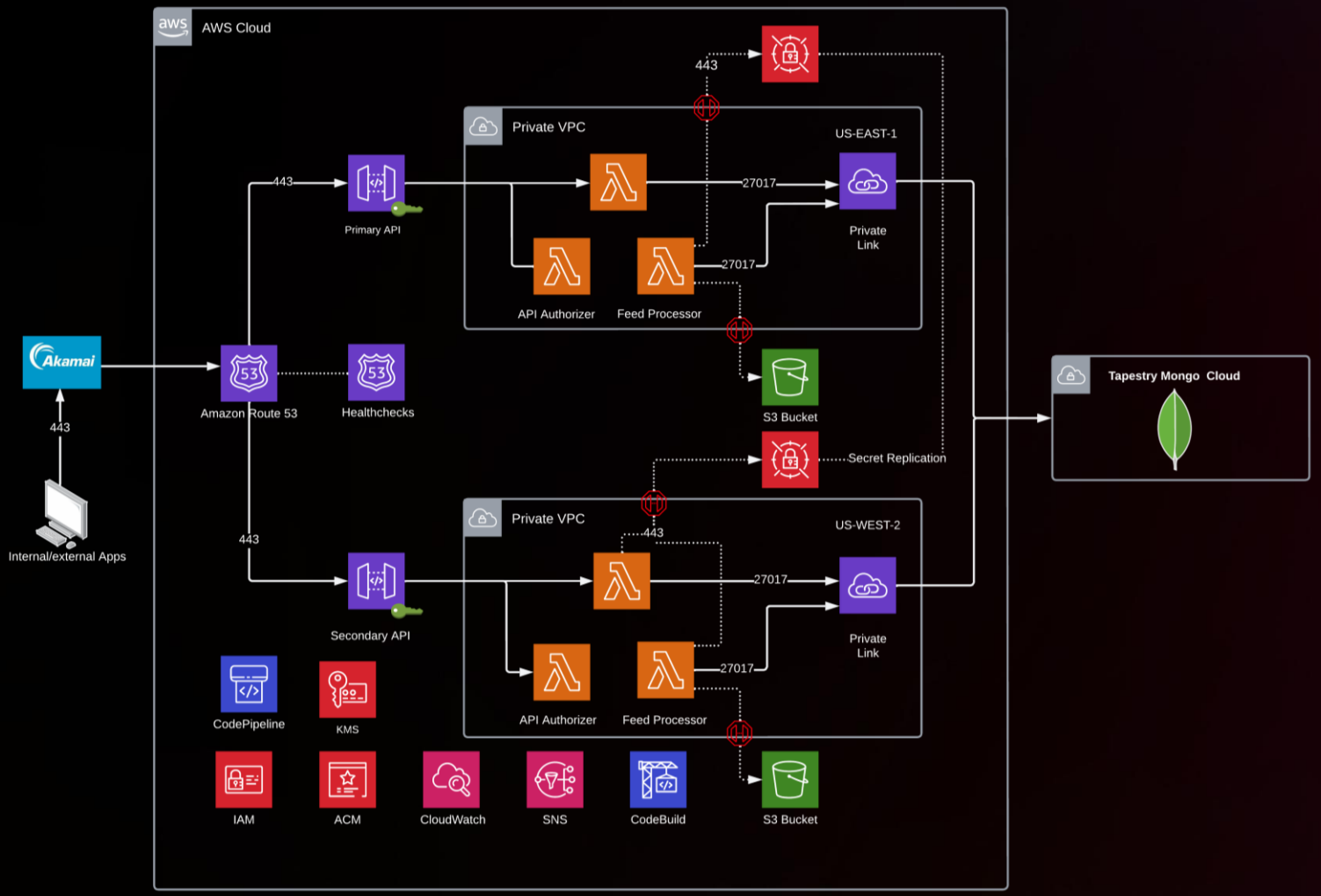


Private standalone API



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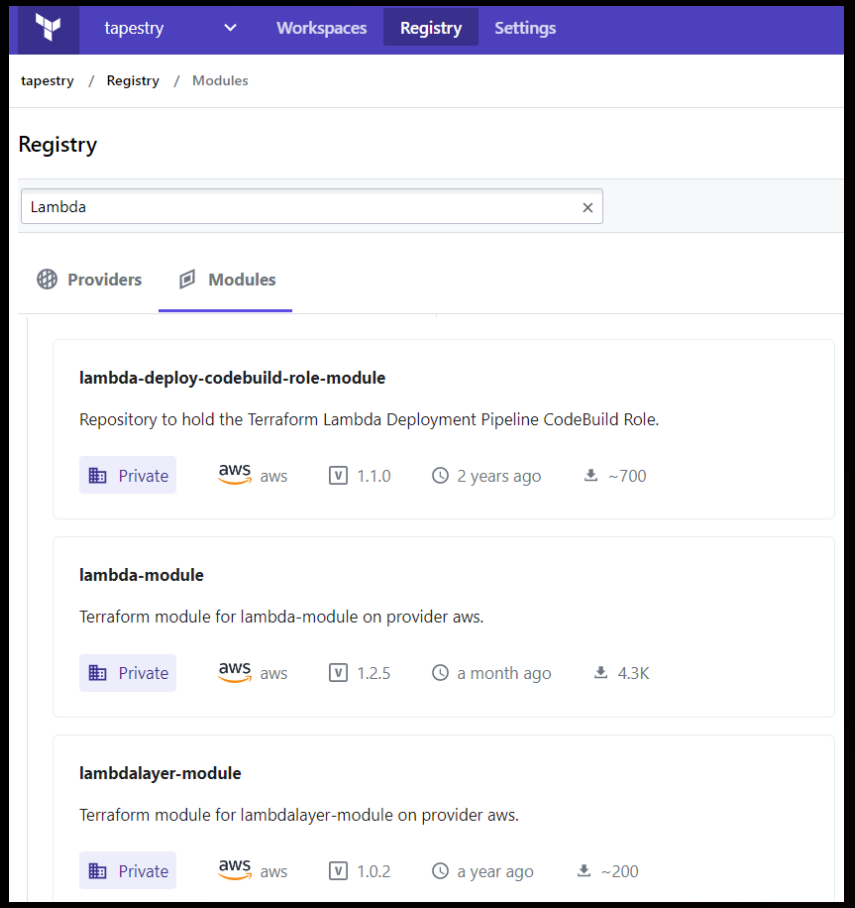
Standardized architectural patterns

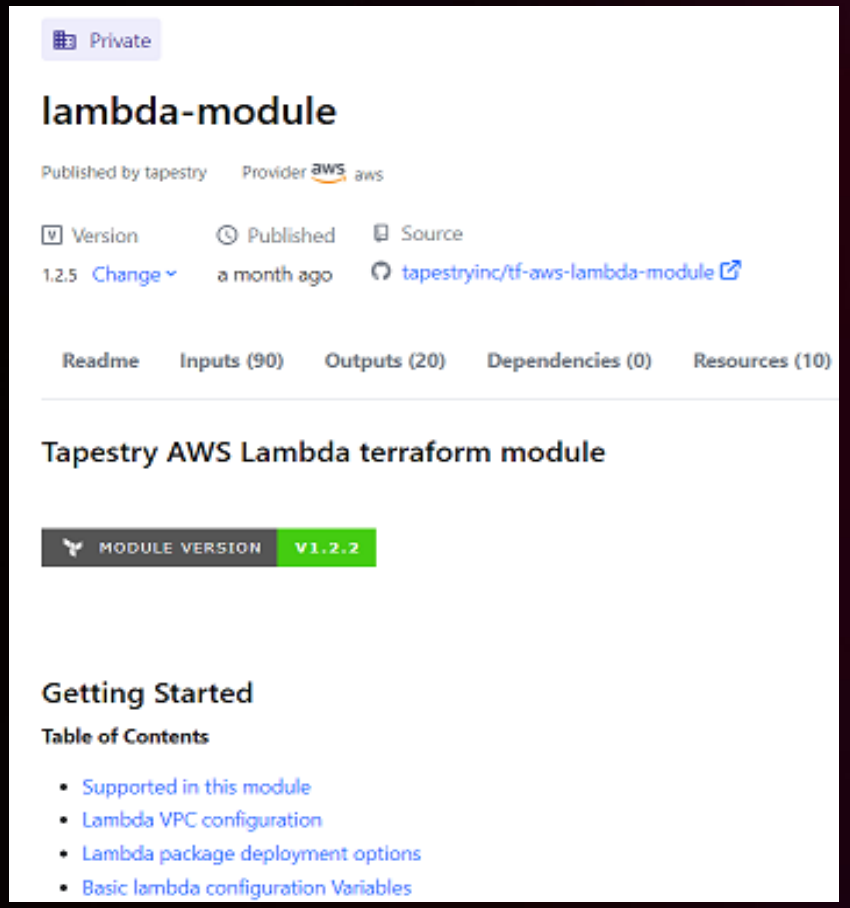


Regional standalone API (cross-region)

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IaC service modules





Enterprise Terraform private module registry

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IaC service modules

```
resource "aws_lambda_function" "this"{
    #create_lambda_function will decide whether to create a function , set create_lambda_function to true
    #when you dont want a function to be created
    count                          = var.create_lambda_function ? 1 : 0
    description                    = var.lambda_description
    function_name                  = var.lambda_function_name
    handler                        = var.lambda_handler
    memory_size                    = var.lambda_memory
    architectures                  = var.lambda_architectures
    #whether to publish the lambda function or just deploy in $LATEST.
    publish                        = var.lambda_publish
    reserved_concurrent_executions = var.lambda_concurrency
    #Arn of the execution role for the lambda function.
    role                           = var.lambda_iam_role_arn
    runtime                        = var.lambda_run_time
    filename                       = local.lambda_filename
    image_uri                      = var.lambda_ecr_image_uri
    package_type                   = var.lambda_package_type
    source_code_hash               = local.lambda_filename == null ? null :  filebase64sha256(local.lambda_filename)
    s3_bucket                      = var.lambda_build_tool_for_package ? data.aws_s3_bucket_object.this[0].bucket : local.lambda_s3_bucket
    s3_key                         = var.lambda_build_tool_for_package ? data.aws_s3_bucket_object.this[0].key : local.lambda_s3_key
    s3_object_version              = var.lambda_build_tool_for_package ? data.aws_s3_bucket_object.this[0].version_id : local.lambda_s3_object_version
    tags                           = var.lambda_tags
    timeout                        = var.lambda_timeout
    #specify layer arns to attach to the lambda function. maximum of 5 allowed.
    layers                         = var.lambda_layers_arn
```

Parameterized for all use cases

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IaC service modules

```
resource "aws_s3_bucket_logging" "this" {
  count  = local.s3_enabled_count
  bucket = aws_s3_bucket.this[0].id
  target_bucket = local.log_bucket_name
  target_prefix = "${local.bucket_name}/"
}


resource "aws_s3_bucket_server_side_encryption_configuration" "this" {
  count  = local.s3_enabled_count
  bucket = aws_s3_bucket.this[0].id
  rule {
     apply_server_side_encryption_by_default {
        sse_algorithm     = var.s3_kms_key_arn == "AES256" ? "AES256" : "aws:kms"
        kms_master_key_id = var.s3_kms_key_arn == "AES256" ? null : var.s3_kms_key_arn
     }
  }
}

resource "aws_s3_bucket_public_access_block" "this" {
  count  = local.s3_enabled_count
  bucket = aws_s3_bucket.this[0].id

  block_public_acls       = var.block_public_acls
  block_public_policy     = var.block_public_policy
  ignore_public_acls      = var.ignore_public_acls
  restrict_public_buckets = var.restrict_public_buckets

  depends_on = [ aws_s3_bucket_policy.this ]
}
```

```
// Construct the S3 Bucket Policy to deny the unencrypted transport of objects
data "aws_iam_policy_document" "encryption_in_transit_bucket_policy" {
  count = local.s3_enabled_count
  // Deny UnEncrypted Transport of Objects
  statement {
    sid = "DenyNonSecureTransport"

    effect = "Deny"

    actions = [
      "s3:*"
    ]

    resources = [
      aws_s3_bucket.this[0].arn,
      "${aws_s3_bucket.this[0].arn}/*",
    ]

    principals {
      type        = "AWS"
      identifiers = ["*"]
    }

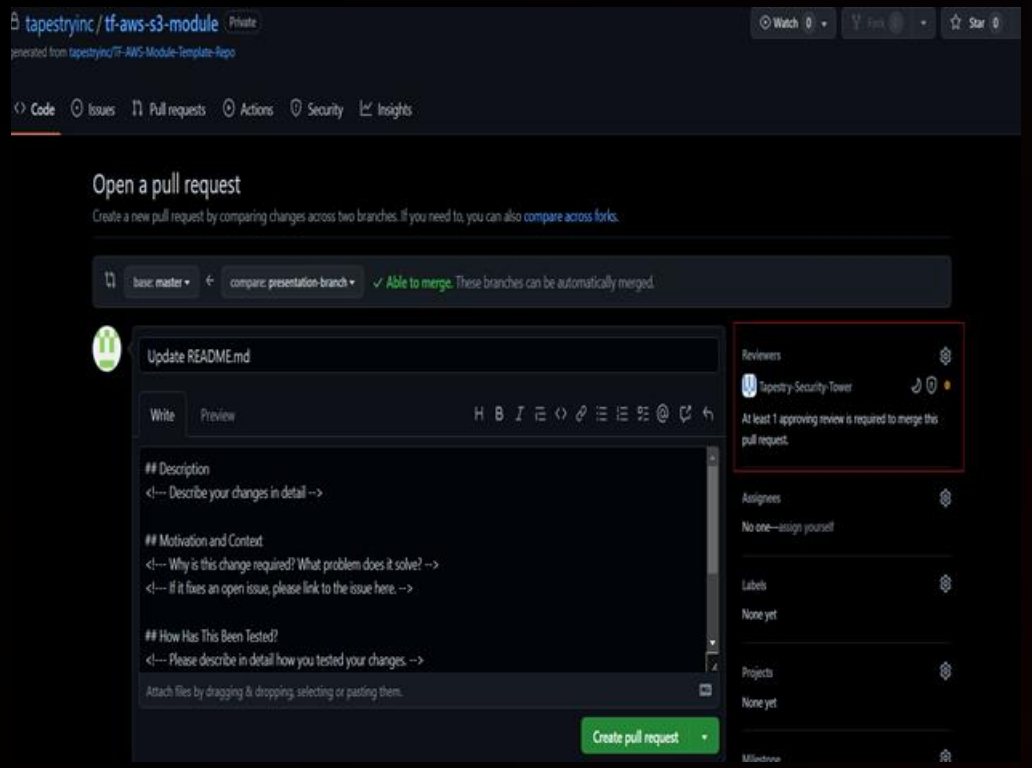
    condition {
      test     = "Bool"
      variable = "aws:SecureTransport"

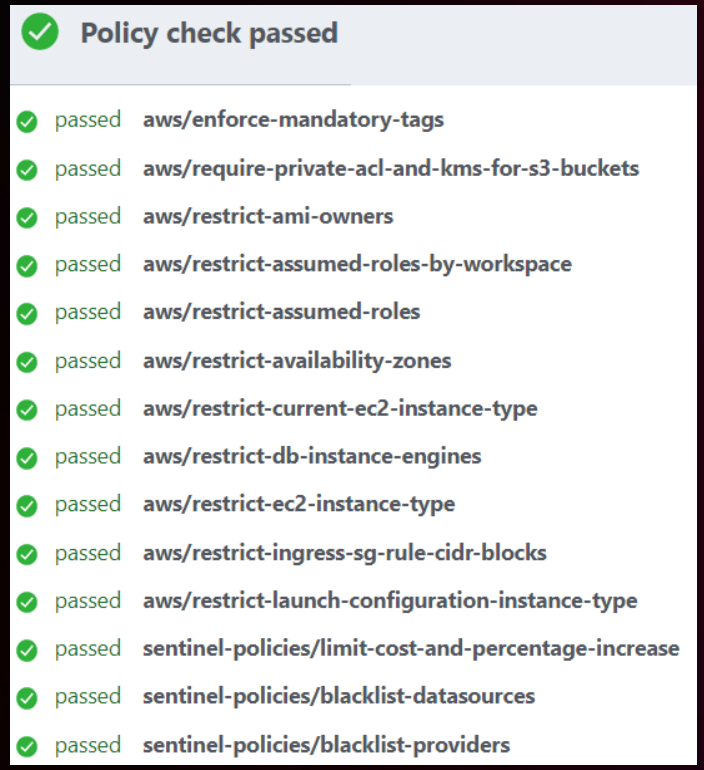
      values = [
        "false"
      ]
    }
```

Security baseline incorporation & enforcement

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IaC service modules

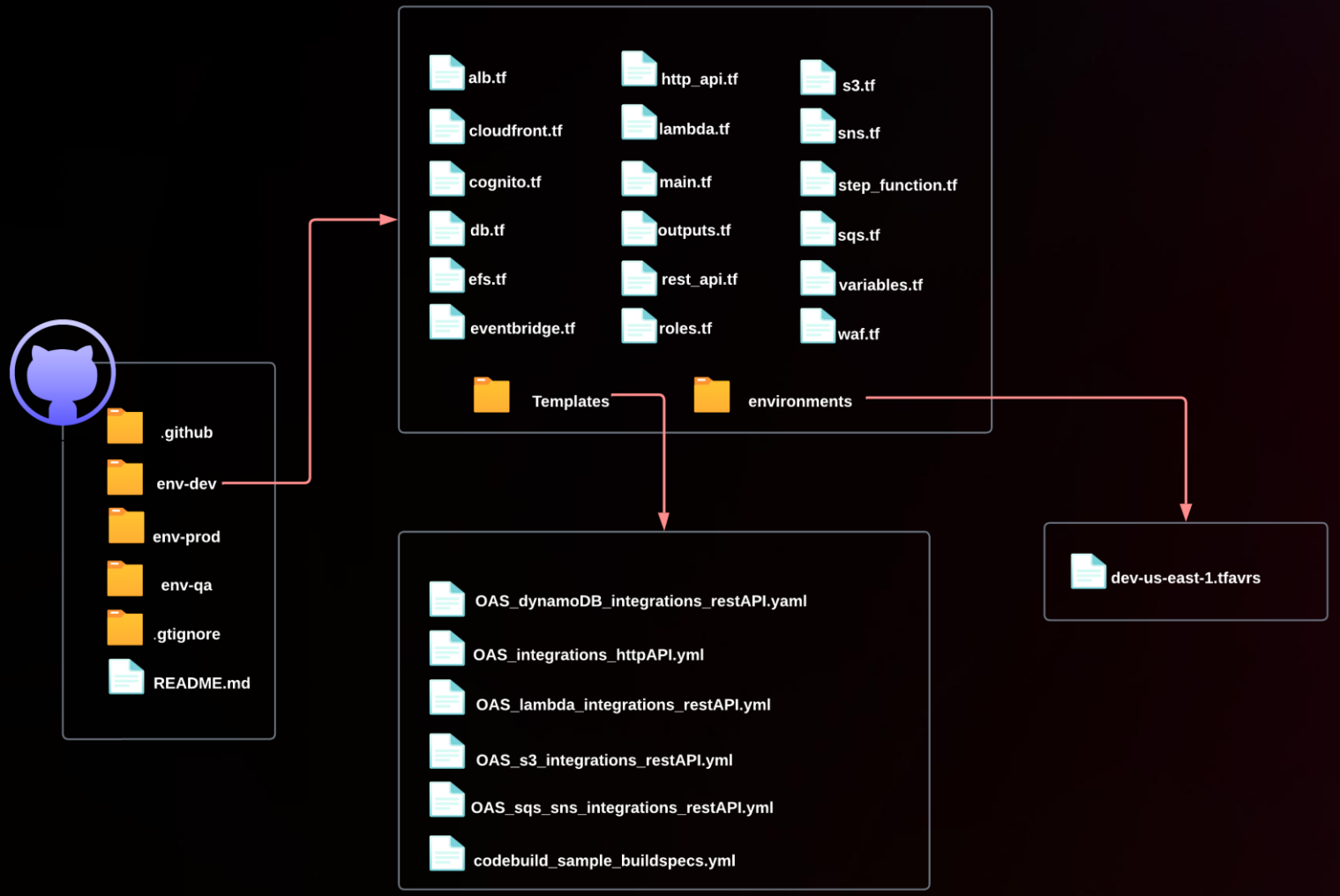




Mandatory InfoSec approvals for any module changes

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IaC service pre-vetted templates



Serverless template

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IaC service pre-vetted templates

```
module "cloudfront" {
 source                          = "tfe.tapestry.com/tapestry/cloudfront-module/aws"
  version                        = "~>x.x.x"
  ## OAI , only if its specified
  origin_access_identities = var.origin_access_identities

  #aws_cloudfront_distribution
  create_distribution             = var.create_distribution

  # to set the logging configuration set the below app_name and environemnt

  app_name                         =  var.app_name
  environment                      =  var.environment
  #if we want to create a cloudfront distribution alias , provide a list of alaises
  distribution_aliases             = var.distribution_aliases

  #if we want to set default root object , set the below value
  distribution_default_root_object = var.distribution_default_root_object

  distribution_enabled             = var.distribution_enabled
  distribution_http_version        = var.distribution_http_version
  distribution_ipv6_enabled        = var.distribution_ipv6_enabled
  # valid values are are One of PriceClass_All, PriceClass_200, PriceClass_100
  distribution_price_class         = var.distribution_price_class
  # whether we want to retain the distrbution after deletion in terraform
  distribution_retain_on_delete    = var.distribution_retain_on_delete

  distribution_wait_for_deployment = var.distribution_wait_for_deployment

  # to add a WAF to the cloudfront use the below varibale , provide the wafV2 ARN
  distribution_web_acl_id          = var.distribution_web_acl_id
  tags                             = merge({ "Name" = "${var.app_name}-${var.environment}-distribution"}, module.tags.tags)
```

Serverless template – CloudFront.tf example

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IaC service pre-vetted templates

```yaml
openapi: 3.0.1
# API Metadata
# note- update the template as per requirement and rename it as <api_name>.yml
info:
  title: "${api_name}"
  description: "API description - Application name and the purpose of the API"
  version: "X.X"

# API Validation
# Requestbody, Requestheader and Requestquerystring validation
x-amazon-apigateway-request-validators:
  Validate body:
    validateRequestParameters: false
    validateRequestBody: true
  Validate body, query string parameters and headers:
    validateRequestParameters: true
    validateRequestBody: true
  Validate query string parameters and headers:
    validateRequestParameters: true
    validateRequestBody: false

# API methods
# Lambda Proxy Method
paths:
  # /Path1 is the resource name. the operand is the placeholder for path variable, if the app has any , if not remove it and also remove it under parameters section for its m

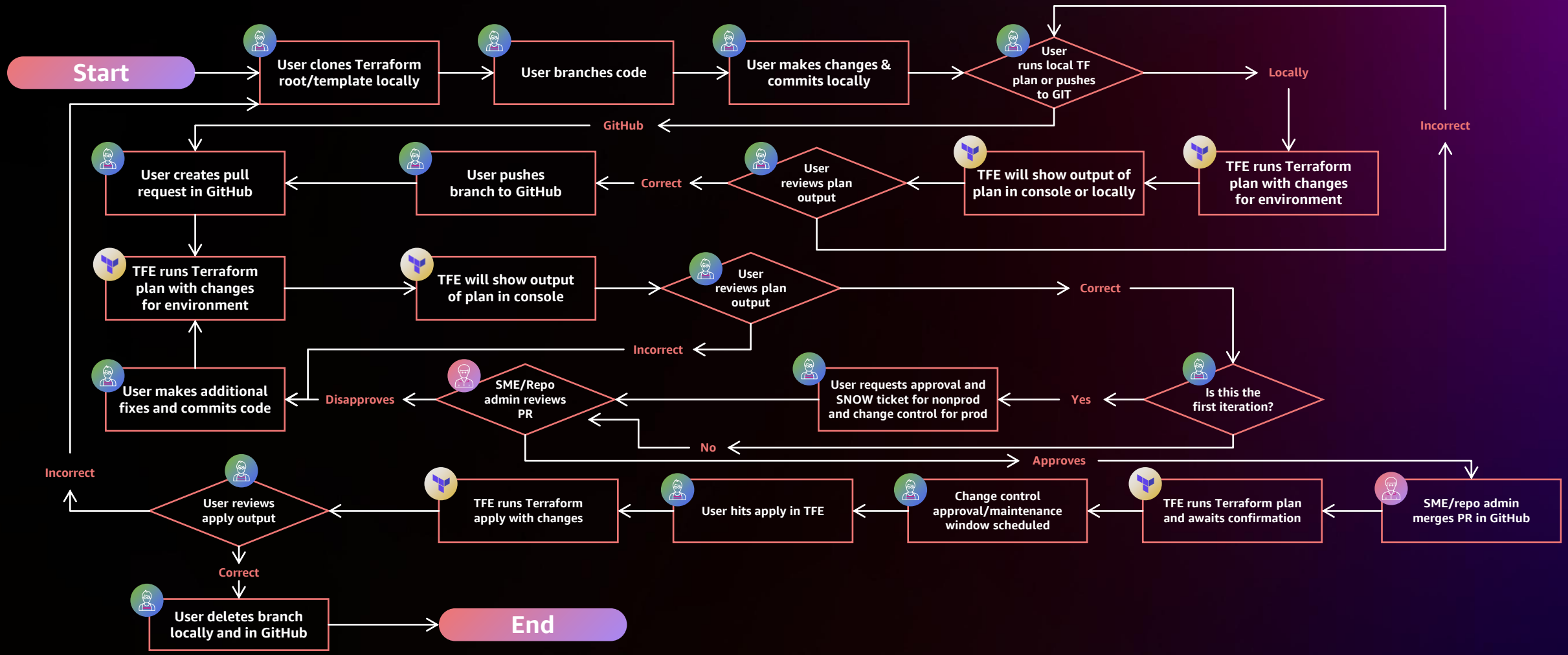

  /path1/{operand}:

  ##################################################################
    # get method with api_proxy (lambda proxy) integration
    get:
      # request parameter for validation
      parameters:
      - name: operand # operand1 is a place holder to be replaced with any value as required by the application
        in: path
```

Serverless template – open API YAML template example

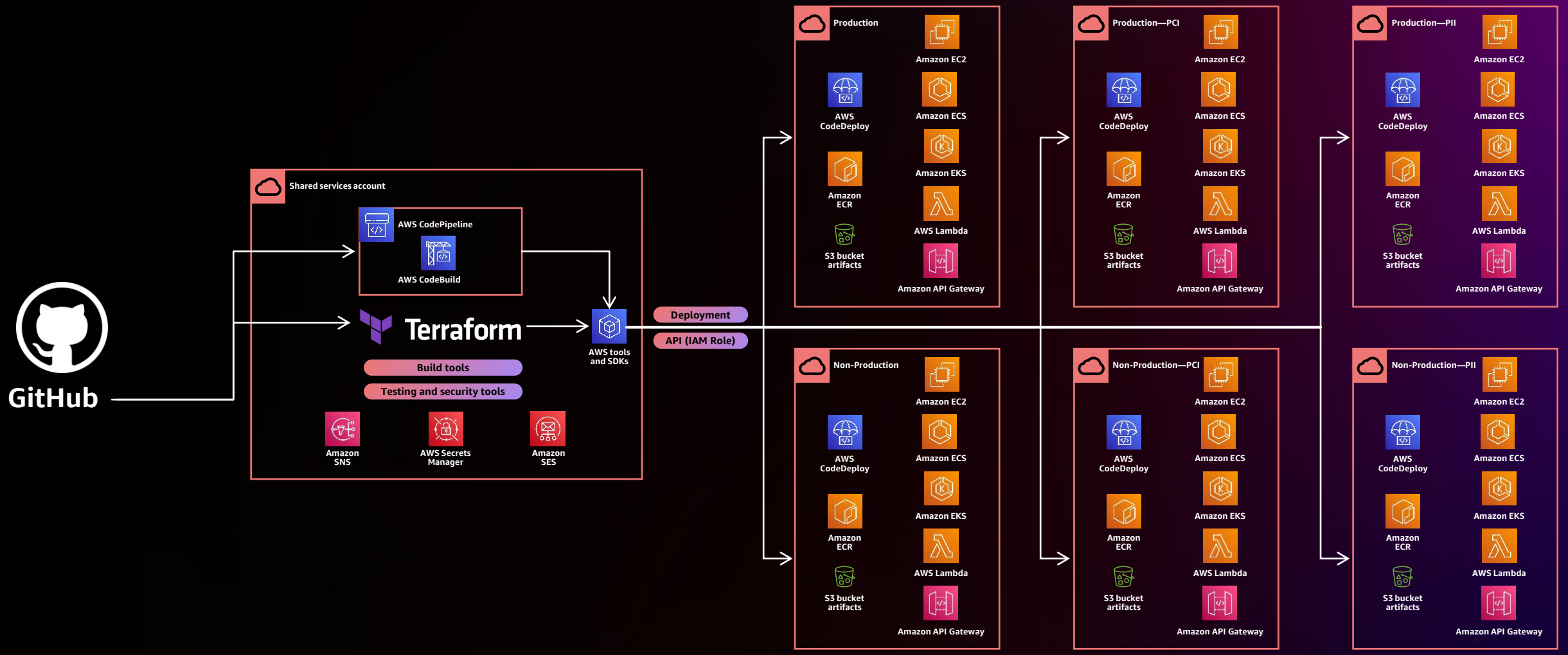
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IaC provisioning workflow



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IaC-based lifecycle and pipelines

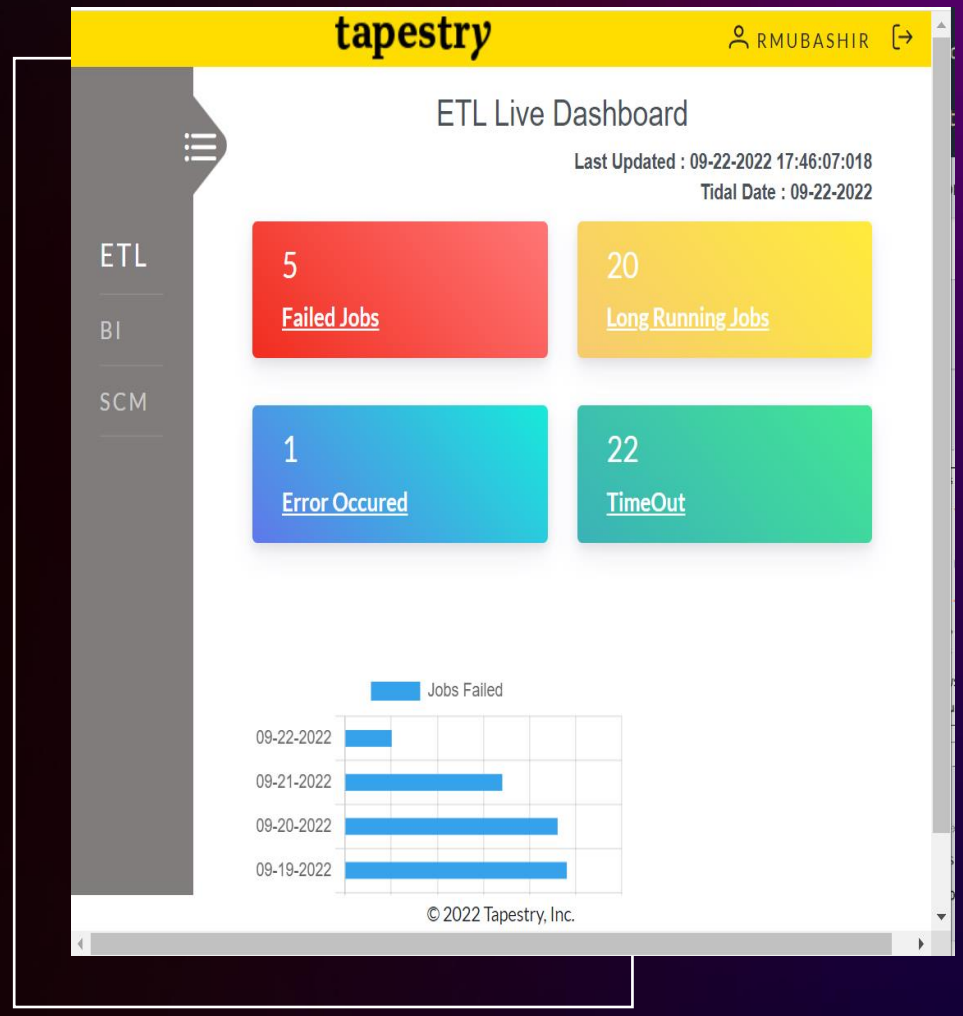


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Outcome

tapestry

- Acts as a catalyst for Tapestry's digital transformation journey
- Reduced the deployment time for modernized
apps from around a month to a few hours
- Reduction of MTTR with consistent environments
- Cost reduction leveraging native services
- Enhanced redundancy and quicker recovery options



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“Good intentions never work, you need good mechanisms to make anything happen.”

Jeff Bezos

Founder and Executive Chair of Amazon

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Thank you!

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