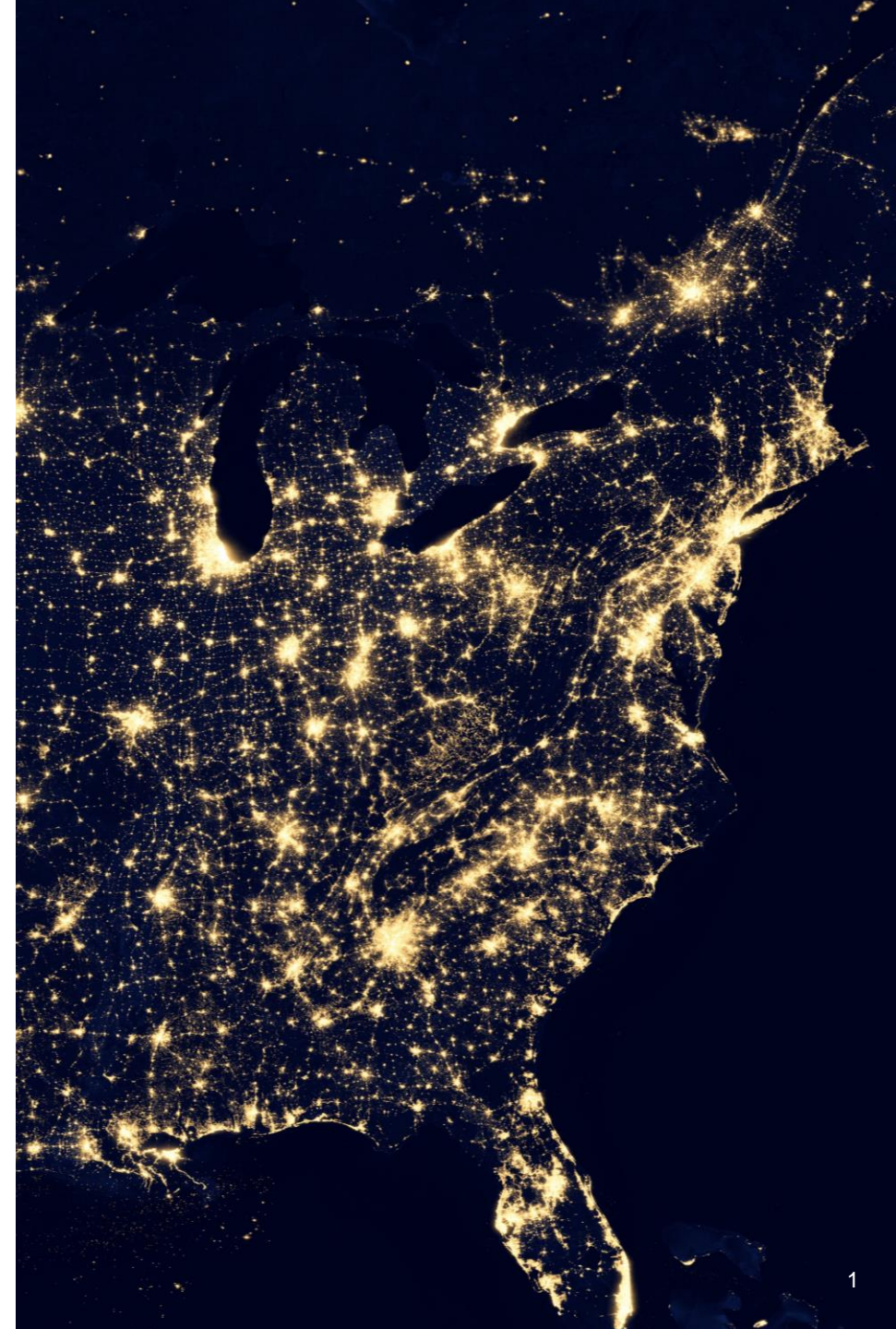


Mission-Critical On  
Microsoft Azure:

*A Pathway to Always On.*



# Always On

Engineering Reliable Services

It begins at the infrastructure, progresses to the data, shapes application design and extends to the people and the culture.

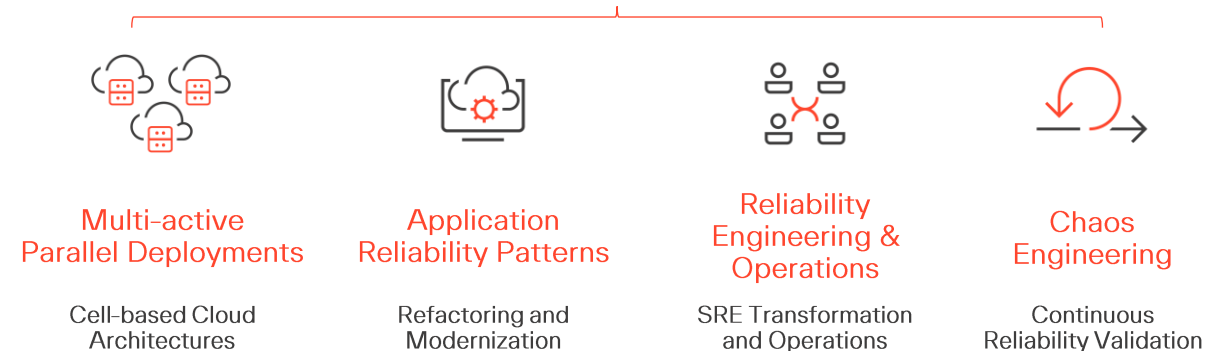
The Always On Center of Excellence ensures 99.999%+ uptime SLA from an end-to-end service perspective guaranteeing uninterrupted and dependable service on Microsoft Azure.

We deliver continuous availability, consistent reliability and optimal performance for high volume and highly public-facing mission-critical services.

Over the span of 20 years, our team has achieved an impressive track record, limiting downtime to just 7 minutes for the services under our management.



Always On Services



# Always On

Engineering Reliable Services

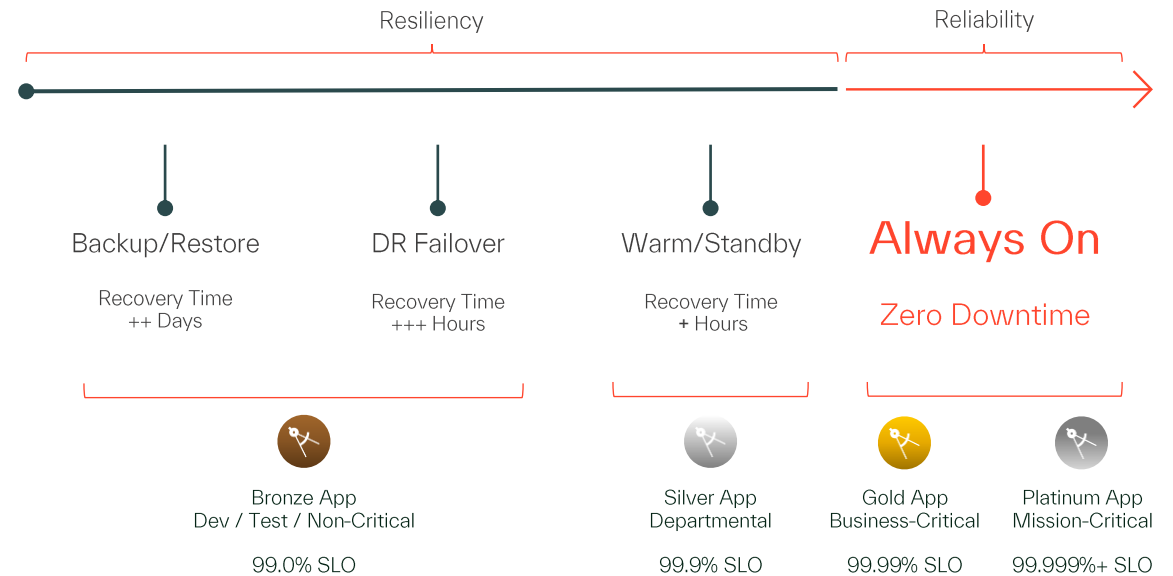
Recovery just doesn't cut it anymore.

## Resiliency (Re • sil • ien • cy)

The ability of a system to quickly recover from disruptions or failures. Fundamentally, resiliency is how swiftly we can bring the operation of a service back to its normal state.

## Reliability (Re • li • abil • I • ty)

The ability of a system to dependably perform its intended function. In essence, reliability refers to the ability of an online service to perform its intended function consistently and without interruption.



# Always On

Engineering Reliable Services

Principles of Always On  
Applications  
with



## Designing for Failure. Operating for Reliability.



### Platform and Deployment

#### Cell-based Architecture

- Azure Virtual Machine Scale Sets
- Azure Kubernetes Service (AKS)
- Azure Functions
- Azure Automation

#### Location Scopes

- Azure Regions/AZs
- Azure Front Door
- Azure CDN
- Azure Health Checks

#### Service Parallelism

- Azure Traffic Manager
- Azure Route Traffic
- +
- Cross-Region A/P
- Cross-Region A/A



### Applications and Data

#### Awareness

- Azure Kubernetes Service (AKS)
- Azure Functions
- Azure Monitor
- Azure SMI
- +
- Resilience4j
- Spring Cloud Circuit Breaker
- Istio/Envoy

#### Messaging Flow

- Azure Service Bus
- Azure Event Grid
- Azure Logic Apps
- Azure Data Factory
- Azure Durable Functions

#### State and Data Consistency

- Azure Cosmos DB with Multi-Region Writes
- +
- Cross-Region Zero RPO Failover
- Mongo Atlas



### People and Culture

#### Reliability Engineering

- Azure Resource Manager
- Azure DevOps
- Azure Automation
- Azure Pipelines

#### Observability

- Azure Monitor
- Azure Application Insights
- Azure Log Analytics
- +
- Dynatrace
- DataDog

#### Reliability Validation

- Azure Chaos Studio
- Azure Advisor
- +
- Gremlin
- SteadyBit

# Always On

Engineering Reliable Services

Kyndryl Always On Centre of Excellence

Consulting Approach for Delivery Onboarding

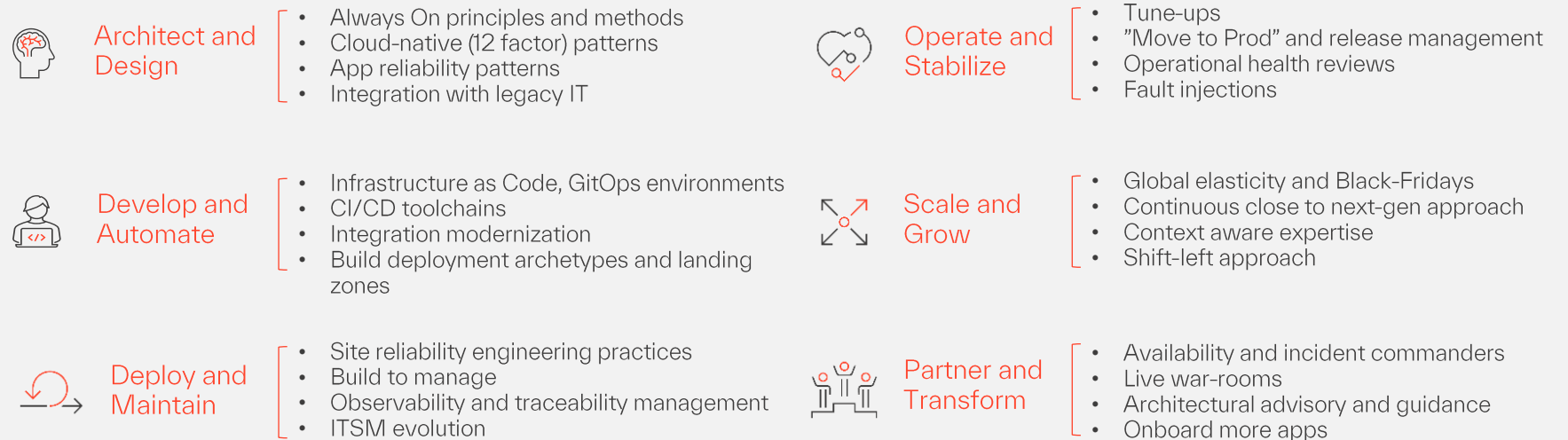


**Consult**  
Engaging with you on a journey toward readiness.

Duration ~6 Weeks



**Execution and Onboarding**  
Partnering with you to deliver reliable and dependable services.



# Always On

## Engineering Reliable Services

### Rapid Assessment Approach and Timeline (~6/~8 weeks)

#### Stakeholders to prepare prerequisites

- Previous resiliency studies
- Business impact analysis
- Landscape and grouping of applications and workloads

#### Inform Workshops

- Always On methods and patterns
- Part 1: Infrastructure and platforms
- Part 2: Applications and integration
- Part 3: Databases

#### Always On Discovery & Assessment Sessions

- Application/Business service landscape
- Mission critical requirements
- SLO / SLAs and application categorization
- Architectural discovery deep dives

#### Co-Creation Recommendations & To-be architectures

- Next-gen architectural patterns
- Recommendations and roadmaps

#### Always On Summary & Playback

- Always On pattern
- Always On roll-out summary
- Executive summary

#### Prepare

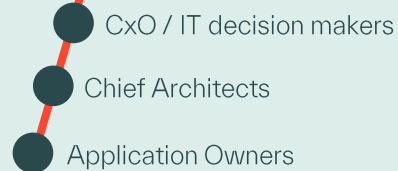


PREP

#### Inform



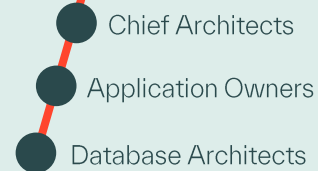
WEEK 1



#### Discover



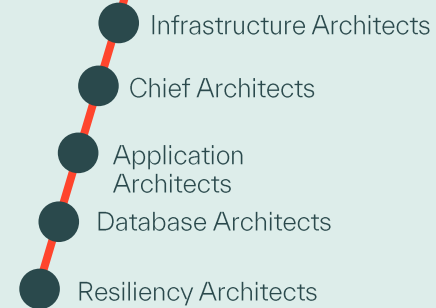
WEEK 2



#### Discover



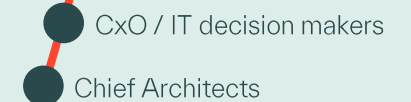
WEEK 3-4



#### Present



WEEK 5-6



Mobilize

What?

Why and how?

# Always On

Engineering Reliable Services

## What Kyndryl is Offering to Improve Application Reliability on Microsoft Azure

Consult Deliverables:

1. Overview of Key Findings
2. Macro next-gen end-to-end architecture (based on co-creation with LH teams against 'Always On' principles and methods) and implementation roadmap.
3. Recommended Infrastructure updates for Always On on Microsoft Azure.
4. Application and Data Pattern recommendations for 'Always On'.
5. Recommended automation, orchestration, observability and operational capabilities to manage Always On applications.



**Findings**

- Continuous Availability**
  - will be a multi-year journey from current state
  - Interdependencies between ground stop apps and upstream dependent services hinder movement outside of ACCRCC
- Application Modernization**
  - Many of the 22+4 applications can be continuously available without rewrite to Cloud Native Apps
  - Mainframe SQR dependencies inhibit making the entire application stack continuously available

**Recommendations**

- Enhance "Green Button" estate until mission critical services can be updated to support active-active across ACCRCC and ATL1
- Establish new Availability Zones (Gold) in RCC and ATL1 to host

**Target Architecture**

**Measure and Roadmap**

#	State	Initiative	Problem Addressed	Benefits	Size / Complexity
S1	New	Infrastructure consistency for GOLD AZs	Network and storage infrastructure is a mix of technologies, version with varying capabilities, resulting in unpredictable behavior and management across AZs	Enables transition from current state to Architecture and future state partitions while minimizing risk to existing workloads	Med
S2	In-Flight	Equip WAN connectivity to each datacenter	All internet and WAN connectivity terminates at one datacenter	Redundancy can avoid outages due to single faults	Low
S3	New	Network Macro-segmentation	Mission Critical networks are exposed to accidental or malicious activity	Automated fail-over for state; IP endpoints reduce endpoint downtime	Low
S4	En-Flight	Security / Privileged Access Management	Default administrative privileges provide an attack surface that could impact availability	Separates users from production	Low
S5	In-Flight	Improve IT & Facilities Demand Management	Lack of maturity in managing/forecasting demand and planning for future capacity	Separates different types of workloads	Low
S6	In-Flight	Optimize M3 risk environment	Multiple apps are impacted in the event of a Cause Manager outage	Reduces risk of unauthorized system changes, improving overall availability	Med
S7	En-Flight	Implement Continuous Operations Organizational Change Management	Steps in talent, governance, technology, processes, methods & tools, solutions & facilities, KPIs, the IT supply chain & IT finance model	Limit impact of a cause manager outage to a single application	Med
S8	En-Flight	Implement Continuous Operations Organizational Change Management	Steps in talent, governance, technology, processes, methods & tools, solutions & facilities, KPIs, the IT supply chain & IT finance model	Improved value of IT to the business	Med

Sample for illustration only

Thank you!

kyndryl