Introduction to Cloud Computing

Adopting Cloud

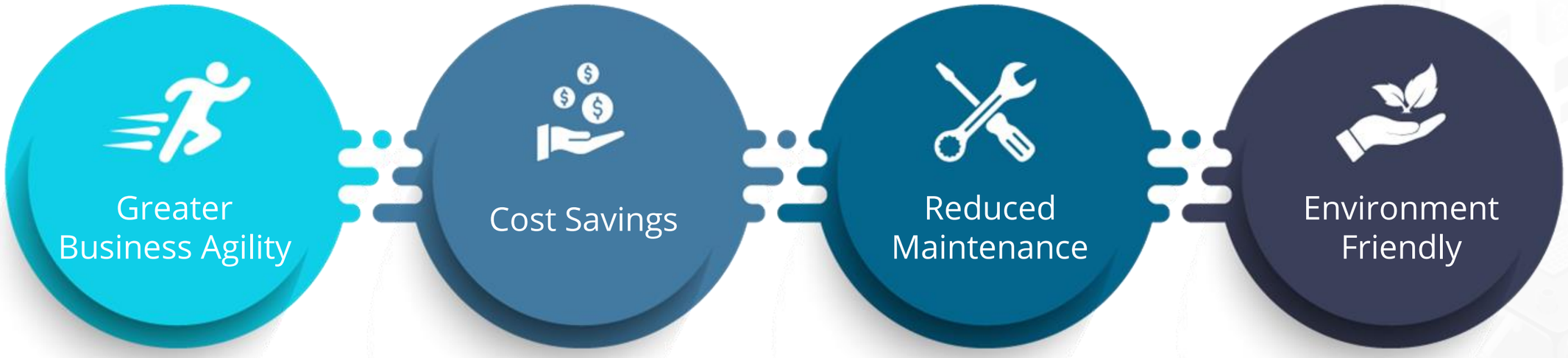
Learning Objectives

By the end of this lesson, you will be able to:

- List the benefits and challenges of migrating to the cloud
- Explain the five options of migrating to the cloud
- Describe the four steps of the cloud migration plan
- List the activities and resources that should move to the cloud
- Explain how the features of cloud can help preserve business continuity
- Discover how cloud migration helps businesses

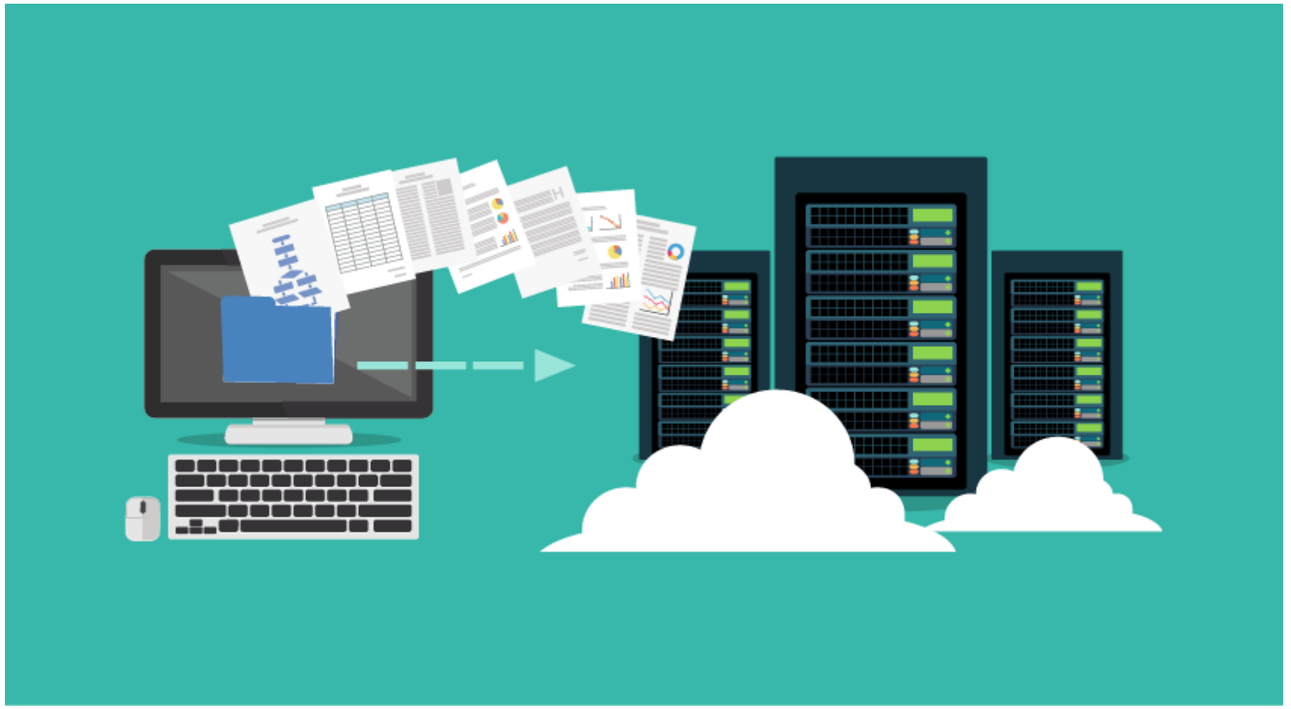
Cloud Migration

Why Cloud Adoption?



What Is Cloud Migration?

Cloud migration is the process of moving data, applications, and digital business operations into the cloud from an on-premise system. It could also mean moving from one cloud to another.



Benefits of Cloud Migration

Benefits of Cloud Migration

Higher Scalability

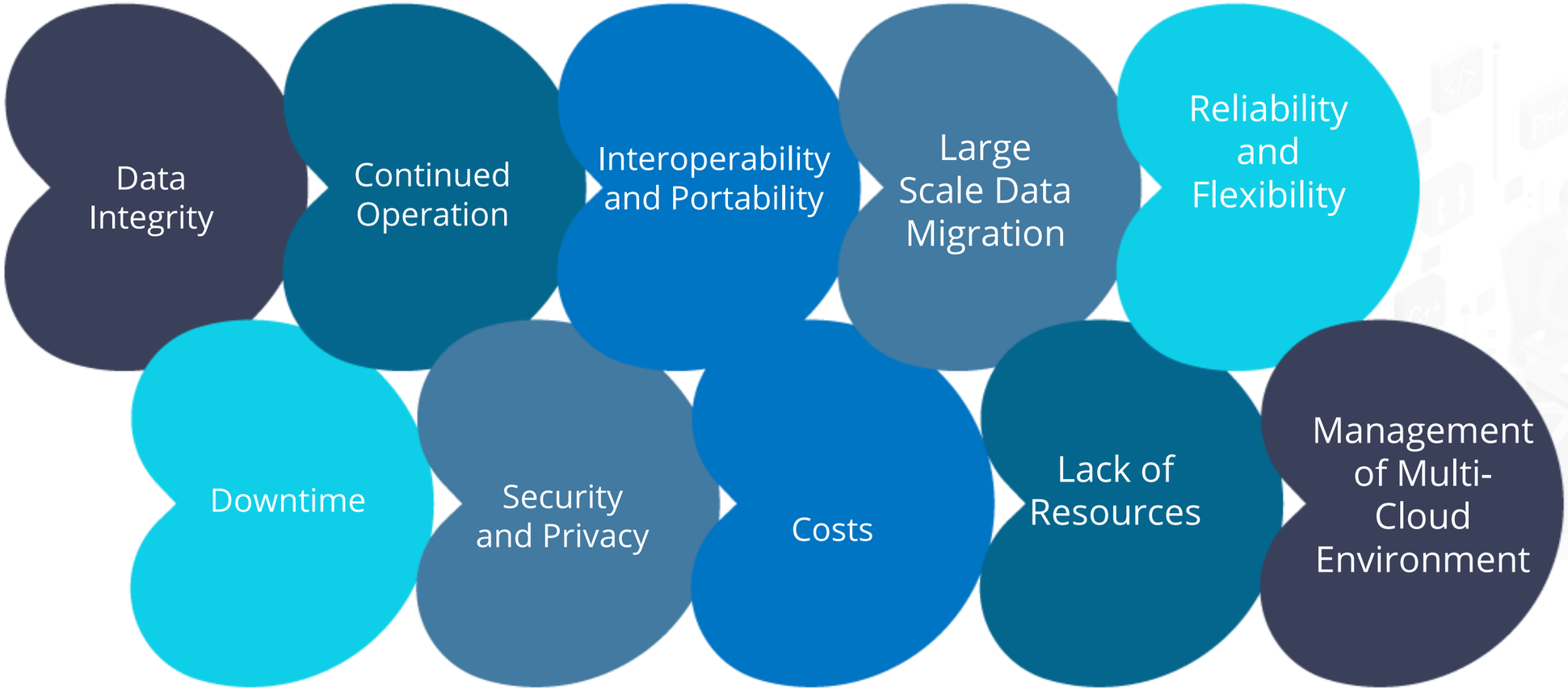
Increased Flexibility

Improved Performance

Reduced Costs

Challenges of Cloud Migration

Challenges of Cloud Migration



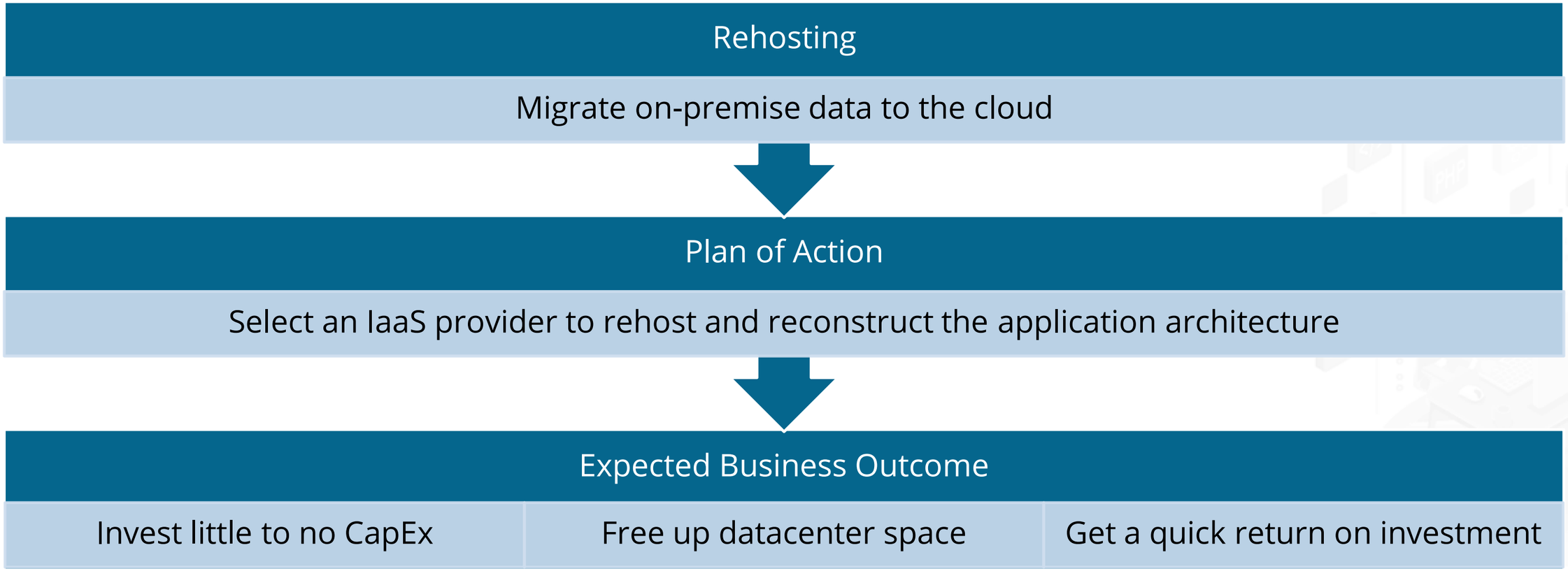
Cloud Migration Strategy

Five Rs of Cloud Migration Strategy

According to Gartner, the five options of cloud migration strategy are:

Five Rs of Cloud Migration Strategy

Rehost



Refactor

Refactoring

Reuse already existing code and frameworks

Plan of Action

Select a PaaS provider to run business applications on the provider's platform

Expected Business Outcome

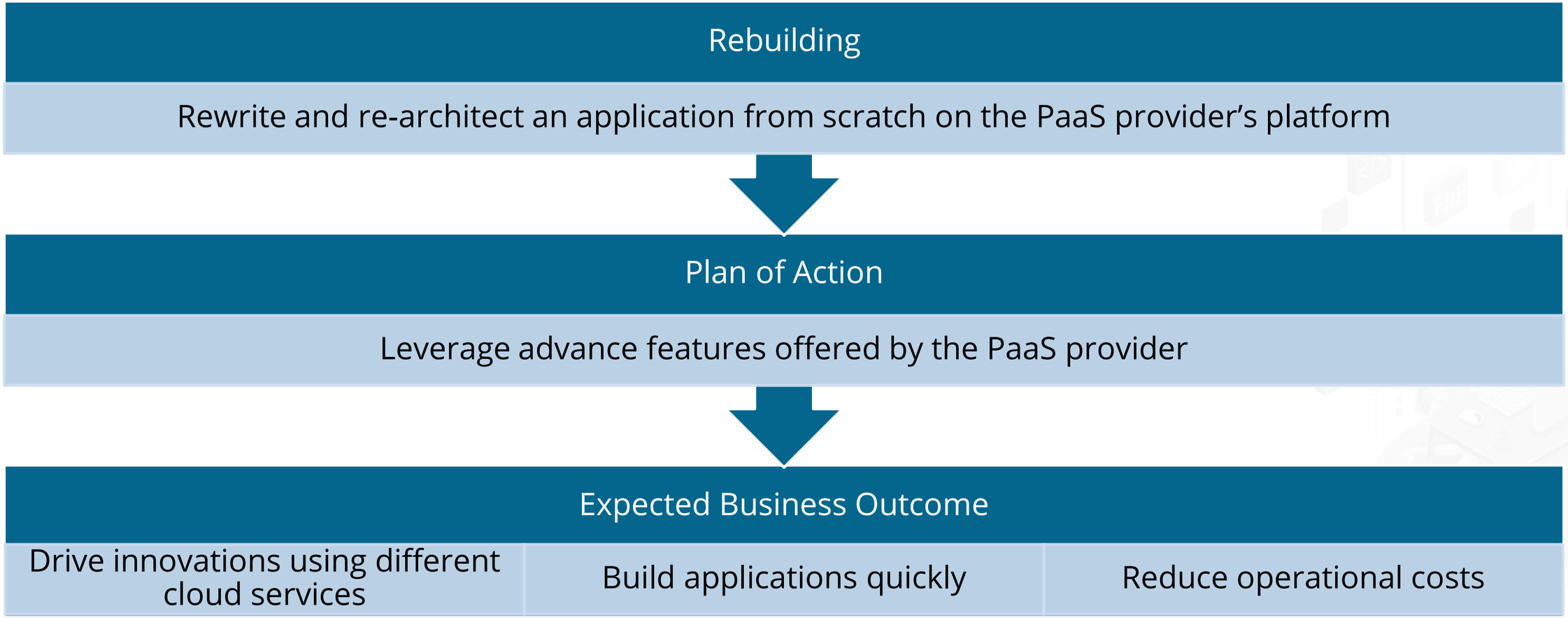
Roll out quick updates	Reduce time to market	Benefit from code portability	Achieve greater cloud efficiency

Revise

Revising
Rewrite or expand the code base partially and then deploy it by either rehosting or refactoring

Expected Business Outcome		
Achieve greater scalability and agility	Adopt new cloud capabilities more easily	Use different technology stacks

Rebuild



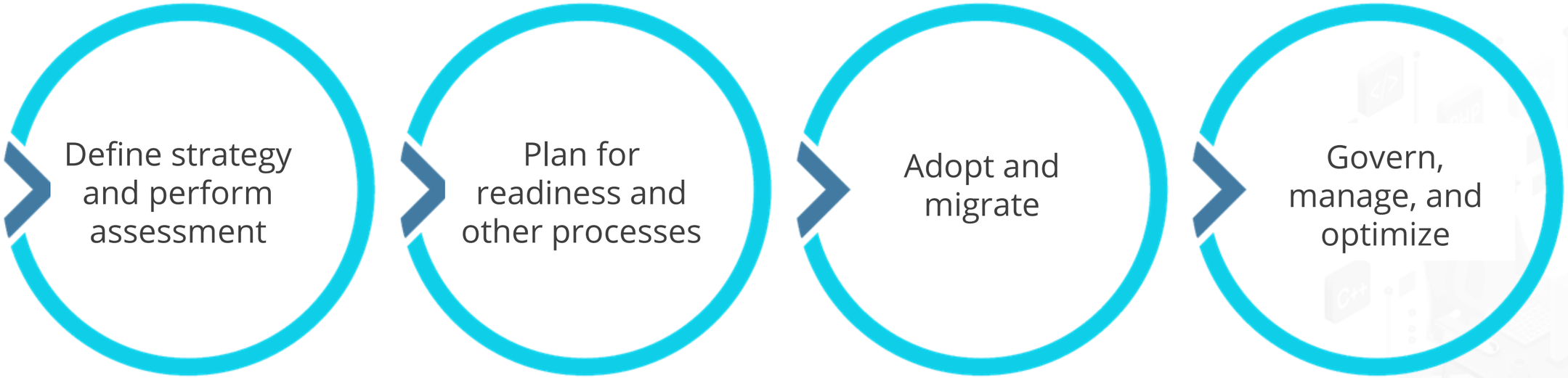
Replace

Replacing
Get rid of old applications and switch to available SaaS applications from third-party vendors

Expected Business Outcome		
Standardize and follow industry best practices	Adopt process-driven approaches more quickly	Invite more investments into innovative applications

Cloud Migration Plan

Four-Step Plan for Cloud Migration



Four-Step Plan for Cloud Migration

Step 1: Define Strategy and Perform Assessment

Set business strategy

- Establish clear business outcomes
- Define business justification

Use split approach for cloud implementation

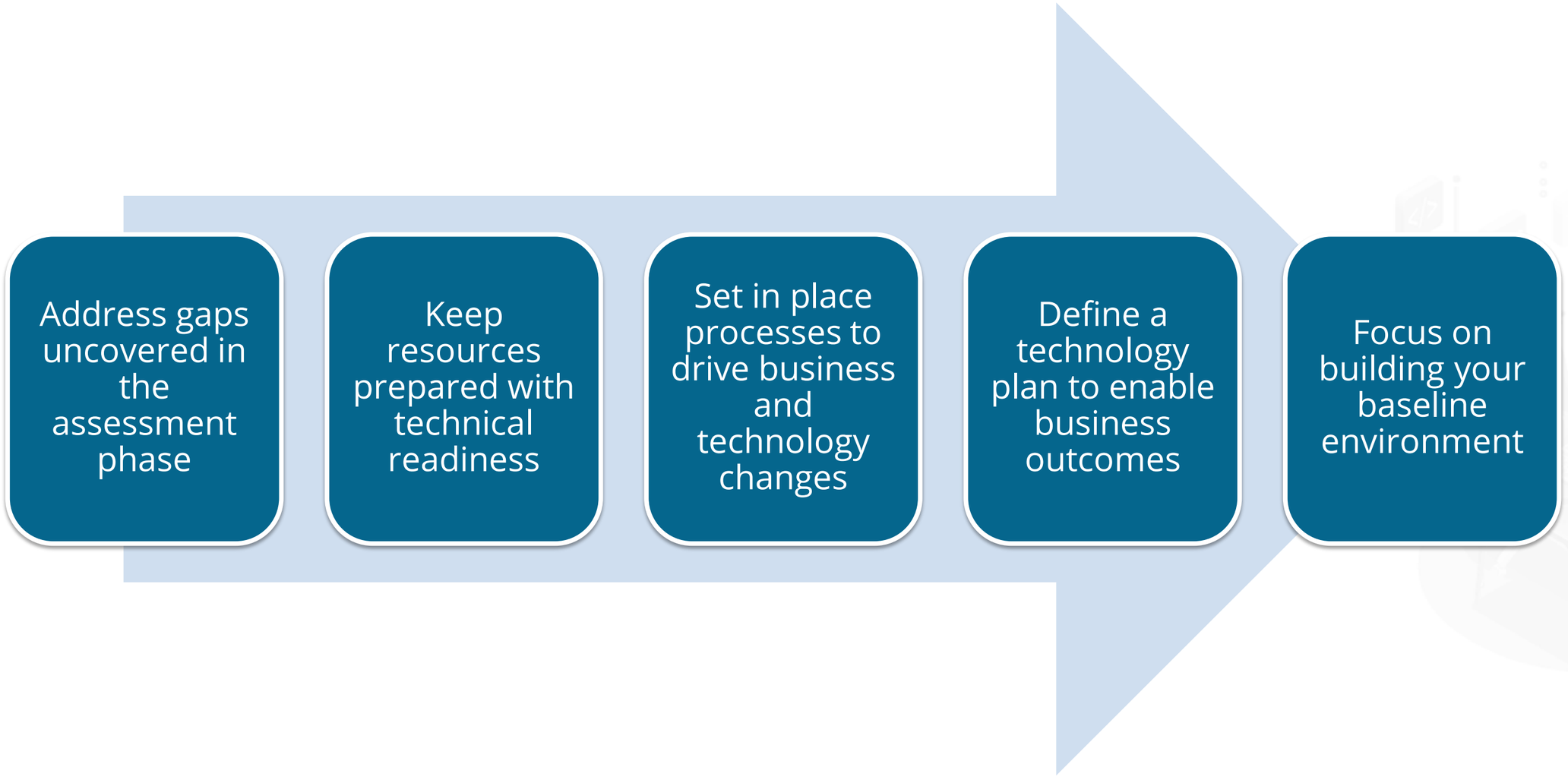
Perform a readiness assessment by:

- Identifying applications that need to move to the cloud
- Choosing applications with minimum dependencies and assets

Use tools to help you plan

- Cloud Adoption Readiness Tool (CART) from Amazon Web Services (AWS)
- Azure Total Cost of Ownership (TCO) Calculator
- Azure Pricing Calculator
- Azure Cost Management

Step 2: Plan for Readiness and Other Processes



Step 3: Adopt and Migrate

Preparation

- Set business objectives
- Prepare an estimate of the workloads to be migrated
- Define the team structure, access requirements, and separation of responsibilities
- Specify processes and documentation required to review and approve changes

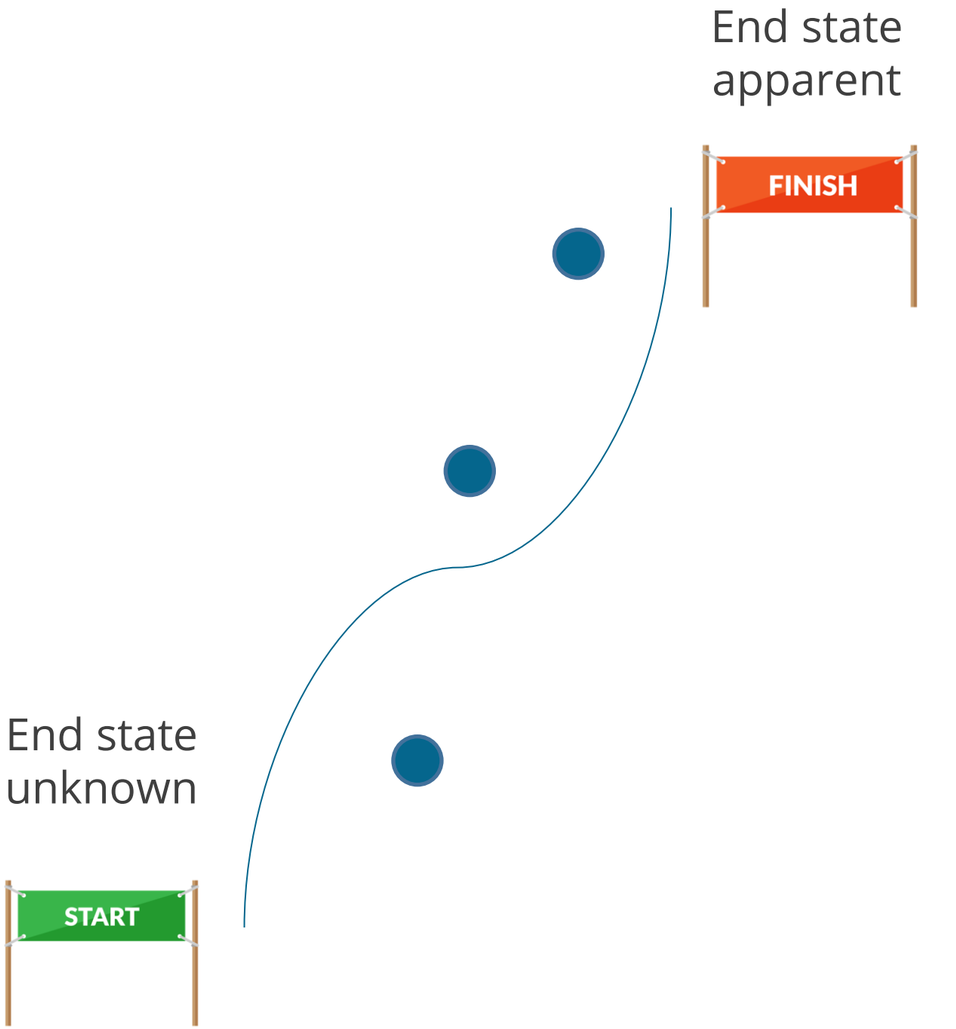
Adoption and Migration

- Design, migrate, and validate each application
- Replicate existing resources to the cloud with least changes
- Transition users from the existing solution to the cloud solution

Tools for Migration

- AWS Server Migration Service
- AWS Database Migration Service
- Azure Migrate
- Google Cloud Platform (GCP) - Migrate for Compute Engine

Step 4: Govern, Manage, and Optimize



To manage and operate a cloud platform, you must:

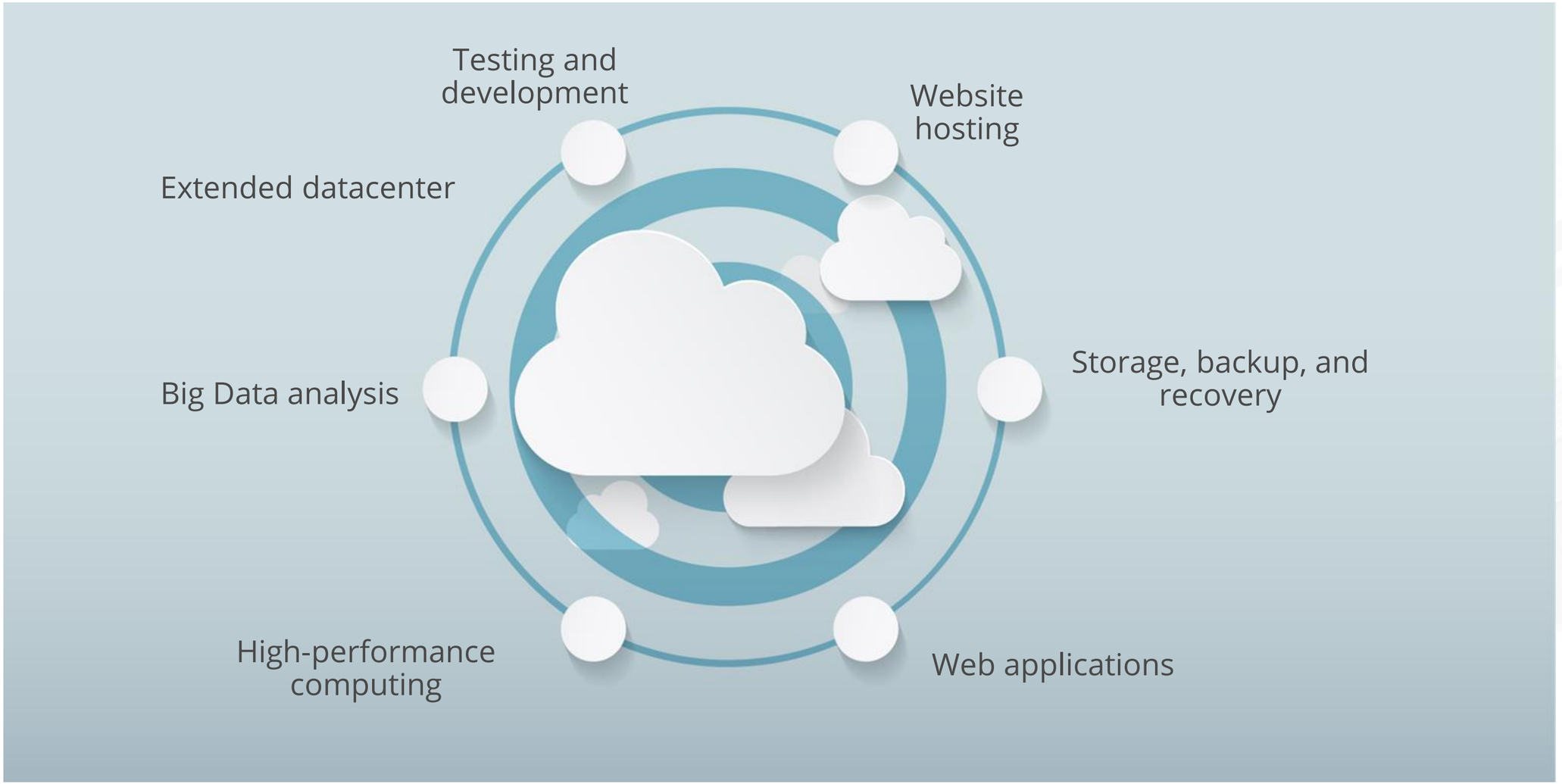
- Define governance solutions
- Help control risks
- Provide agility

You could use tools provided by:

- AWS
- Microsoft Azure
- GCP

Business Continuity Through Cloud

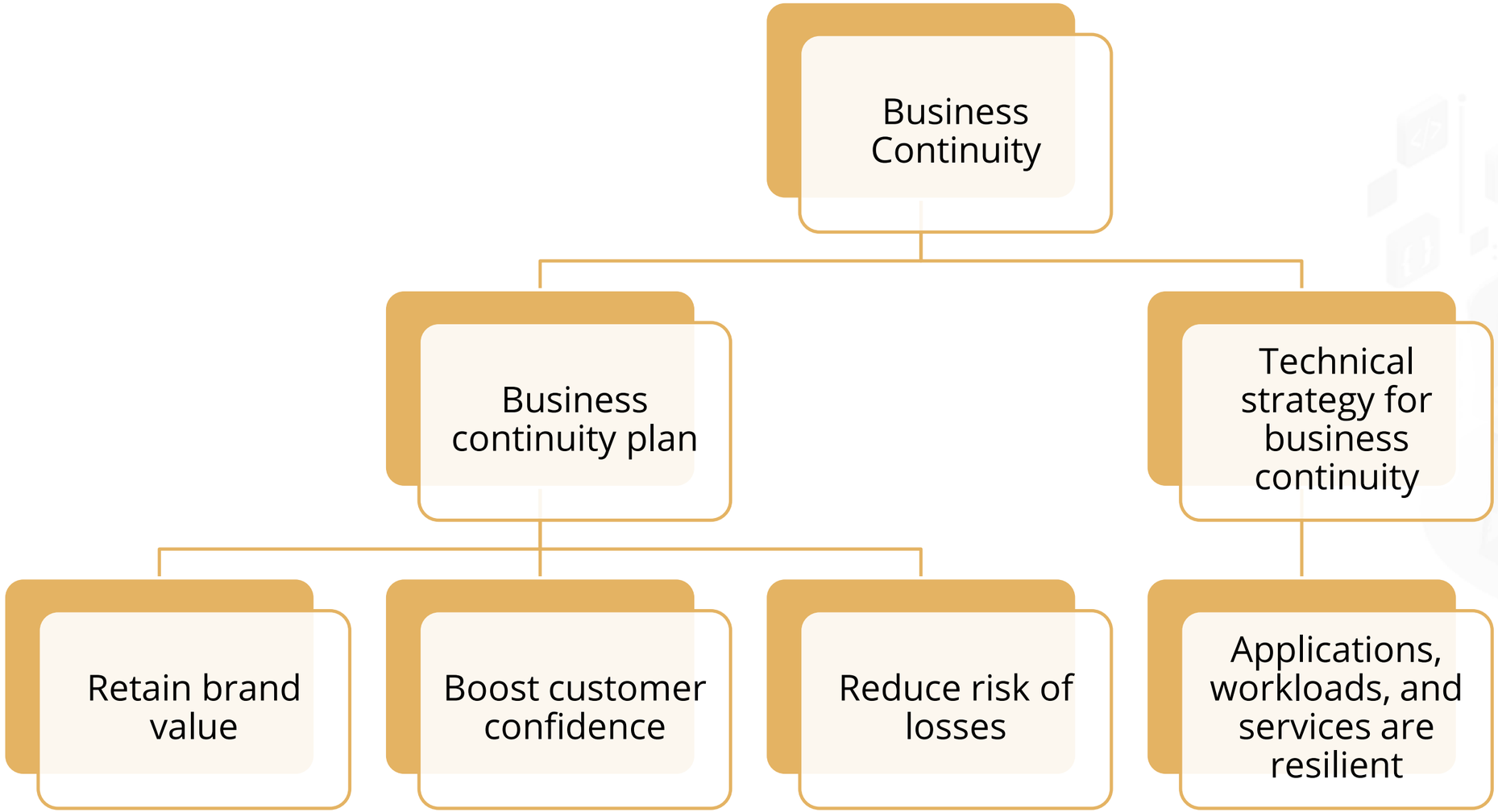
What Should You Move to the Cloud?



High Availability and Disaster Recovery

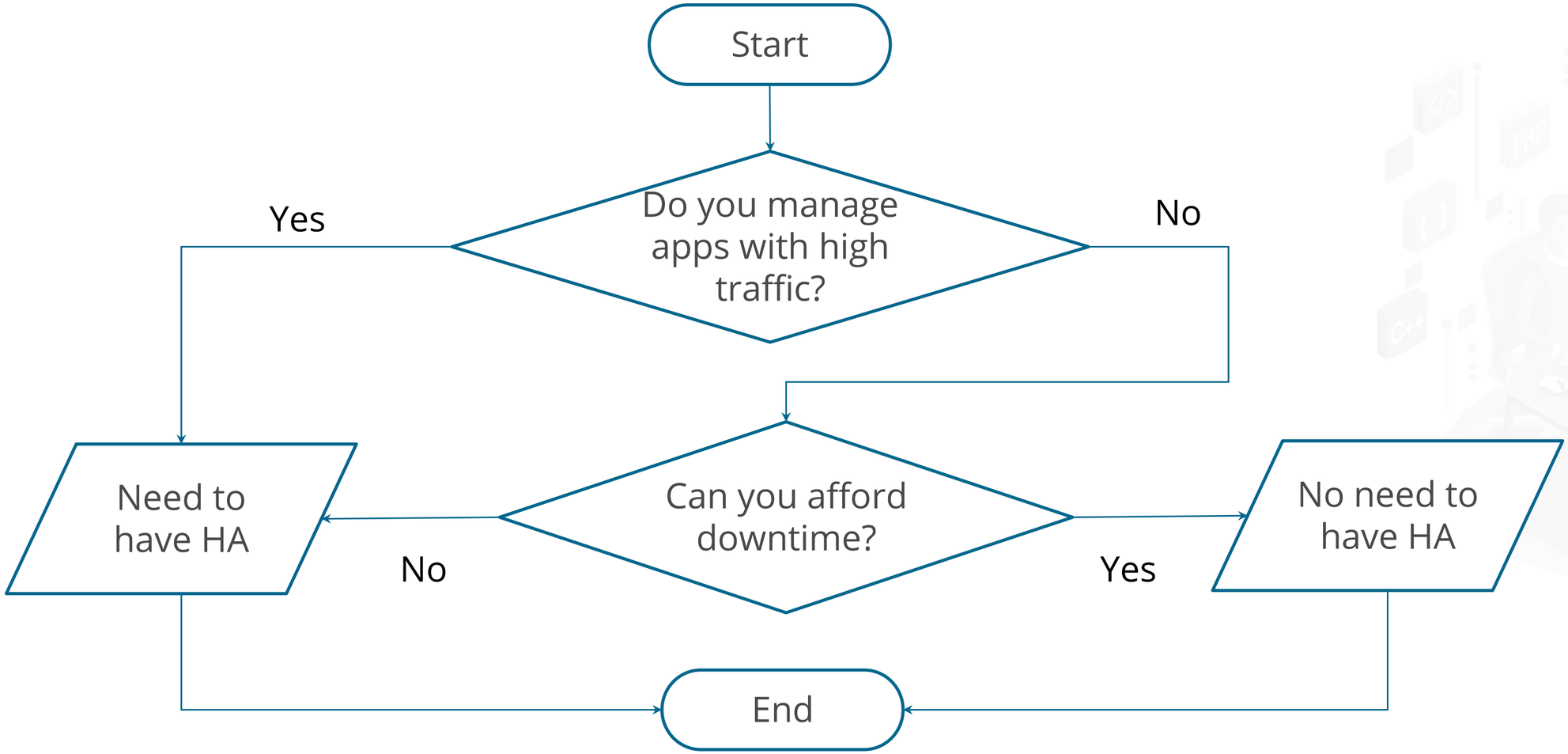
Preserving Business Continuity through the Cloud

Business continuity represents the ability to perform essential business functions during and after any adverse condition.



High Availability

High availability (HA) is the ability of the application to continue running in a healthy state despite localized or transient failures.



Disaster Recovery

Disaster recovery (DR) is the process to recover from major incidents, such as service disruption that affects an entire region.

Data Backup and Resiliency

Data Backup and Recovery

Let’s look at what data backup and replication mean and offer:

Data Backup

1. Provides quick access to files
2. Allows data security in case of power failures or hardware malfunction
3. Saves money as it doesn’t require physical hardware to backup data and applications

Data Replication

1. Replicates data in near real-time
2. Allows systems to failover quickly to the replica
3. Helps reduce the time to recover from an outage
4. Is not a substitute for data backup

Resiliency

The goal of resiliency in a cloud is to restore applications to a fully functioning state following a failure.

The design for resiliency must:

- Avoid downtime or data loss
- Inform team members whom to contact to start the recovery process

Resiliency: Recovery Time Objective (RTO)

RTO

The maximum acceptable time an application can be unavailable after a failure.

Example

If the RTO is 70 minutes, then the duration to restore the application from the start of failure is 70 minutes.

Alternate Solution

Consider running an application on standby mode to initiate secondary deployment if the RTO is low.

Resiliency: Recovery Point Objective (RPO)

RPO

The maximum acceptable duration of data loss after a failure.

Example

Consider an inventory data stored on a single database with no backups on other databases. The inventory data is backed-up every hour.

In case of a failure, you might lose an hour's worth of data.

Business Case Studies: Netflix

Netflix

Who They Are

Netflix is the world's leading media service provider with more than 100 million subscribers worldwide.

It broadcasts over 125 million hours of TV shows and movies each day.

These shows include original series, feature films, and documentaries.

Netflix

What They Needed

- Application monitoring on a massive scale
- Real-time network monitoring to improve customer experience

Netflix

What They Achieved with Amazon Kinesis

- Sub-second response times for analytics queries, reducing downtime and increasing footfall
- Reduced cost when compared to other solutions
- Simplified data ingestion by using minimal APIs
- Increased capacity to handle loads

Business Case Studies: 3M

3M

Who They Are

3M is one of the major manufacturers in the world.

But they examine startup costs as closely as any new entrepreneur while introducing new businesses.

3M

What They Needed

- Efficient use of IT agility and cost effectiveness of new ventures
- A platform that would provide fast application response time

3M

What They Achieved with Microsoft Azure

- Grown their business instead of managing red tape
- Minimized their internal management time, cost, and hardware acquisition
- Witnessed a 50% increase in their revenue
- Improved application response time by 2-3 seconds
- Migrated easily to the cloud using Visual Studio

Business Case Studies: Adobe

Adobe

Who They Are

Adobe is known for its innovative creative software such as Adobe Photoshop, Acrobat Reader, and Creative Suite.

Adobe

What They Needed

A set of tools that helps businesses:

- Deliver tailored content to any audience
- Track the content from engagement to adaptation
- Use the data to produce insights and shape action

Adobe

What They Achieved with Microsoft Azure

- Operate a massive SaaS business from the cloud
- Increased business and recurring revenue by moving to a subscription-based model
- Moved focus to their core business by reallocating resources used by on-premise datacenter
- Protect their SaaS applications with a multilayered security

Business Case Studies: HSBC

HSBC

Who They Are

HSBC is a huge global financial institution.

It serves 39 million customers, both in-person and online, from consumers to businesses, in 66 countries.

HSBC

What They Needed

HSBC has over 169 petabytes of data on its servers.

They were spending more time managing data infrastructure instead of using the data to serve customer needs.

HSBC

What They Achieved with Multiple Cloud Services

- Distributed workloads across multiple clouds
- Used GCP to manage most Big Data, analytics, and machine learning processing
- Split new digital customer-facing app computing between GCP and AWS
- Distributed legacy applications across Microsoft Azure and other cloud providers

Key Takeaways

- Cloud migration helps increase business agility and performance while reducing costs, maintenance, and overall carbon footprint.
- Preserving data integrity and business continuity while managing unplanned costs are some of the major challenges of cloud migration.
- The five options of cloud migration are rehost, refactor, revise, rebuild, and replace.
- Before migrating to cloud, business outcomes should be defined and readiness should be planned
- It is important to govern, manage, and optimize your business on the cloud.