Amadeus Cloud Migration

Secure the migration using Quality Engineering

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06/12/2022
Soirée du Test Logiciel - Sophia

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Agenda

- ☁ Amadeus

- ☁ Migration Test Strategy

- ☁ Quality Engineering Transformation

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Amadeus

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Amadeus

In a few words

One of the world's leading software companies

646+ million
Total bookings processed in 2019 using the Amadeus distribution platform

1.9+ billion
Passengers boarded in 2019 with Amadeus and Navitaire solutions

9th consecutive year included in the Dow Jones Sustainability Index (DJSI). Recognized as world leader in the Software & Services industry sector in the DJSI in 2020

Our commitment to innovation

€8.3 billion invested in R&D since 2004

50+ technology sites and 9800+ people across the world

In 2021 we processed **over 75,000 tps (>1 Mio tps** at peak time) in our main data center

Scalable technology built on open systems and a service-oriented architecture

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Our customers

travel agencies, online travel agencies, tour operators and corporations worldwide
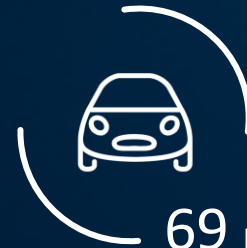
474 airlines

132 airport operators

133 ground handlers

1M+ hotel properties

90 rail operators

69 mobility providers

21 insurance provider groups

29 cruise and ferry lines

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Our technology journey

Microsoft Azure

2000
16 TPF Mainframes

2001
First OBE (open system)
Few tps
HP-UX Superdome

2009
255 App Servers
27 ktps
Linux
Pizza box

2019
2779 App Servers
1003 ktps

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Why the cloud?

Data sovereignty

Improving Latency and Response Time

Energy Efficiency (e.g. PUE)

Keeping an Edge

Proximity
Better performance, lower latency

Flexibility
For unplanned traffic peaks

Security
Higher standards

Innovation
Continuous integration & development

Faster time-to-market
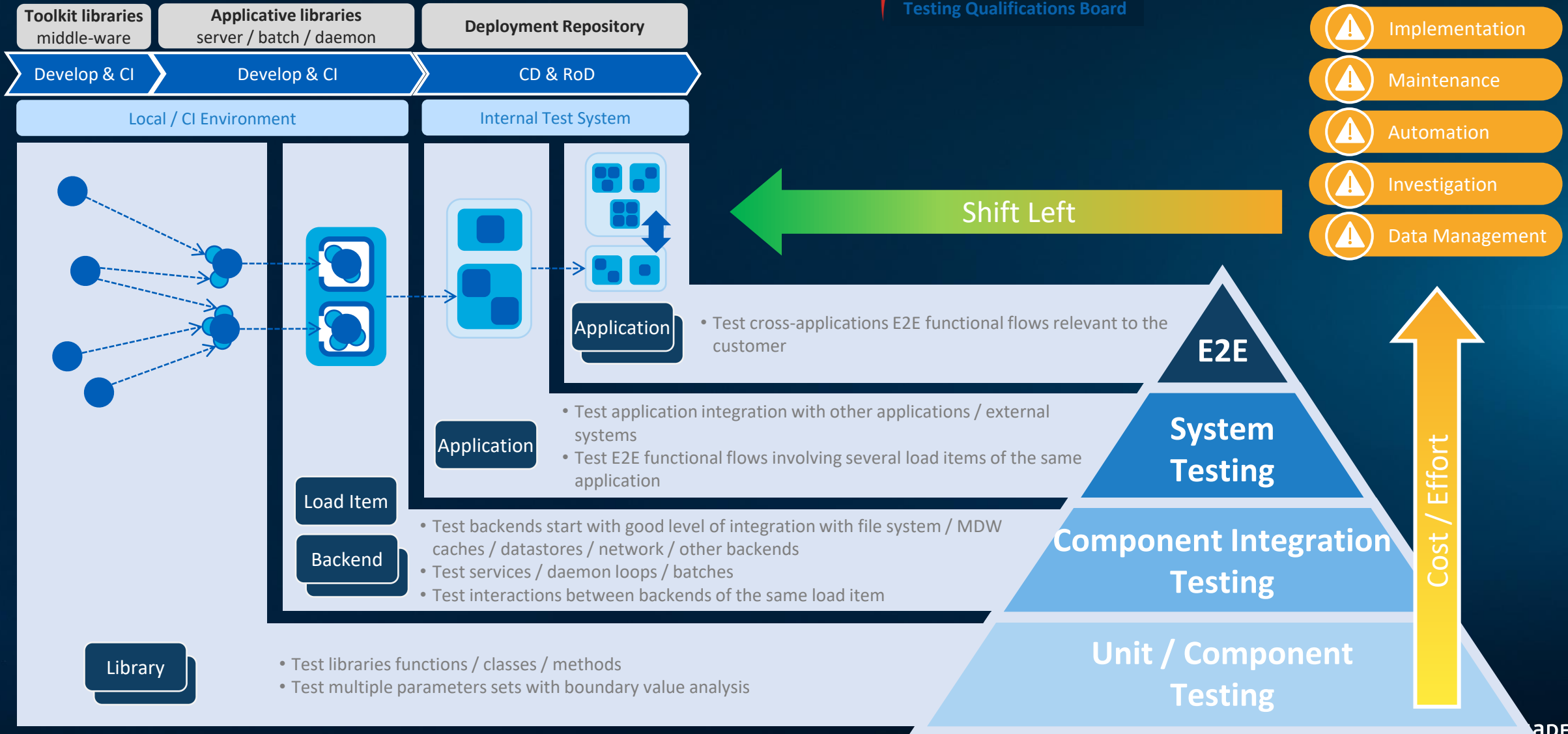Respond & innovate quicker

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Migration
Test Strategy
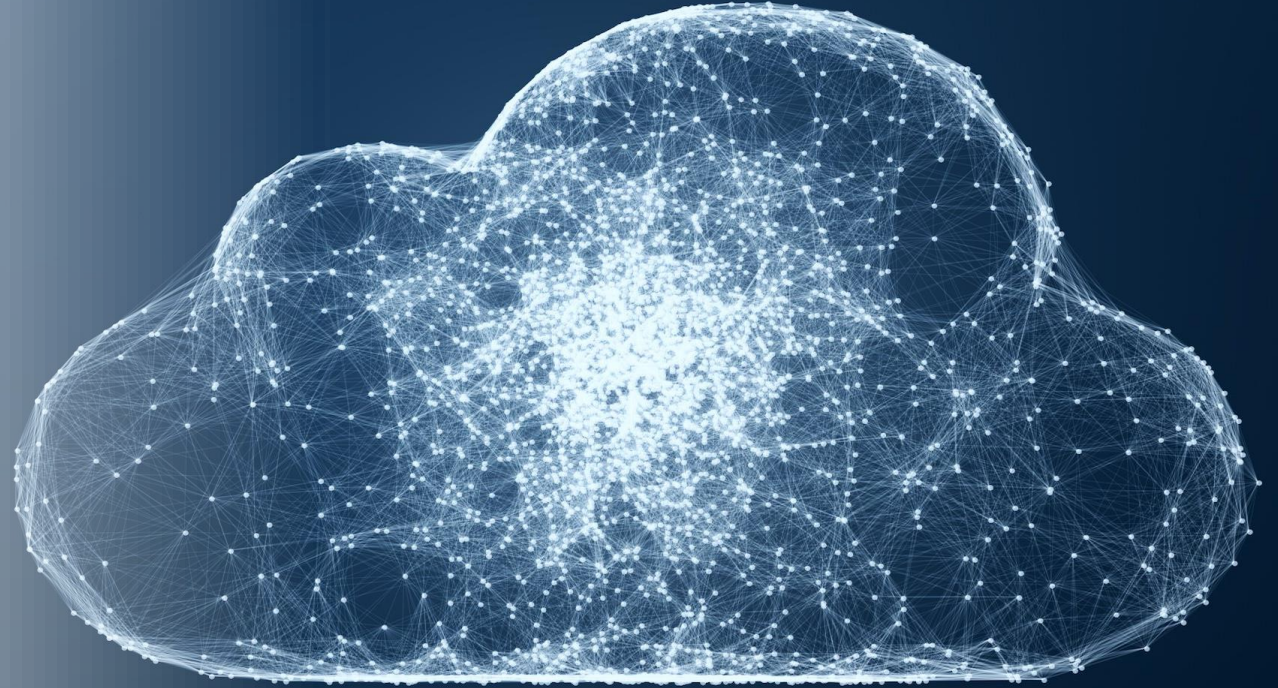
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Migration Test Strategy

Releasing Test Strategy

Migration Test Strategy

What is different?

New scale

Pace

No code change

Tooling

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Migration Test Strategy

Amadeus Ecosystem

My Constellation

Constellation 4

APP 2

APP 16

APP 3

Constellation 3

APP 14

APP 4

APP 15

My APP

APP 13

APP 12

APP 5

APP 11

Constellation 2

APP 10

APP 6

APP 9

APP 7

APP 8

UI or Ext. system 1   UI or Ext. system 2

UI or Ext. system 3   UI or Ext. system 4   UI or Ext. system 5   UI or Ext. system 6

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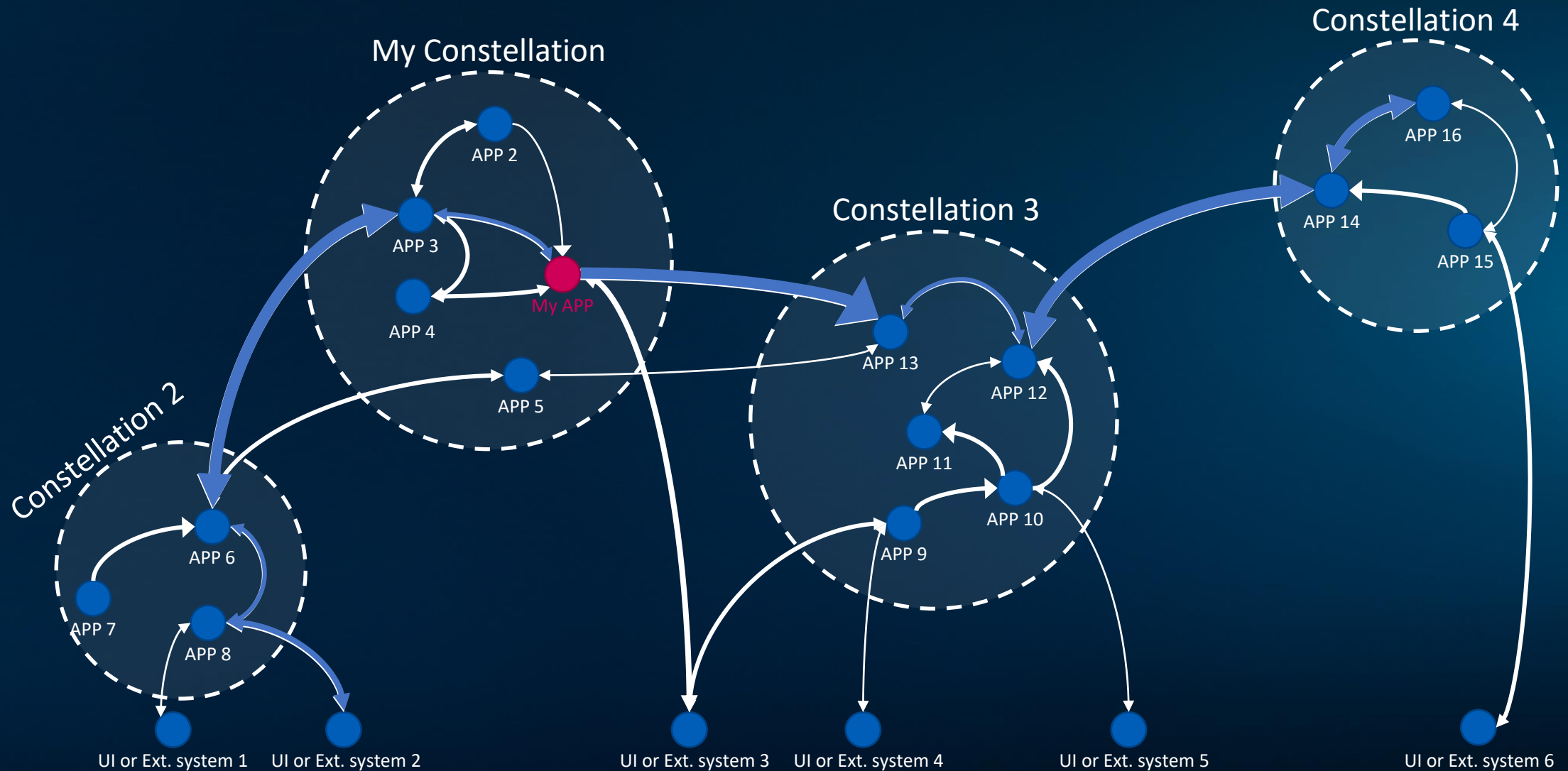
Migration Test Strategy

Diversity

Application Characteristics

UI Server Datastore Middleware Dependencies

Implementation Strategy

Lift & Shift Step-by-step Redesign Private Cloud

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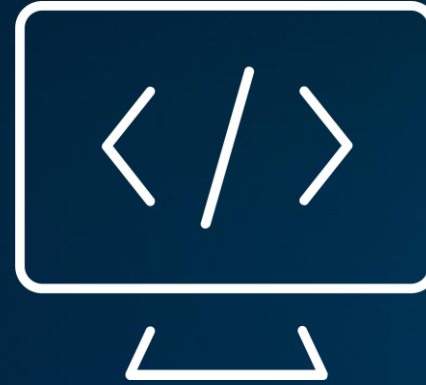
Migration Test Strategy
What is different?

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Migration Test Strategy

Scope
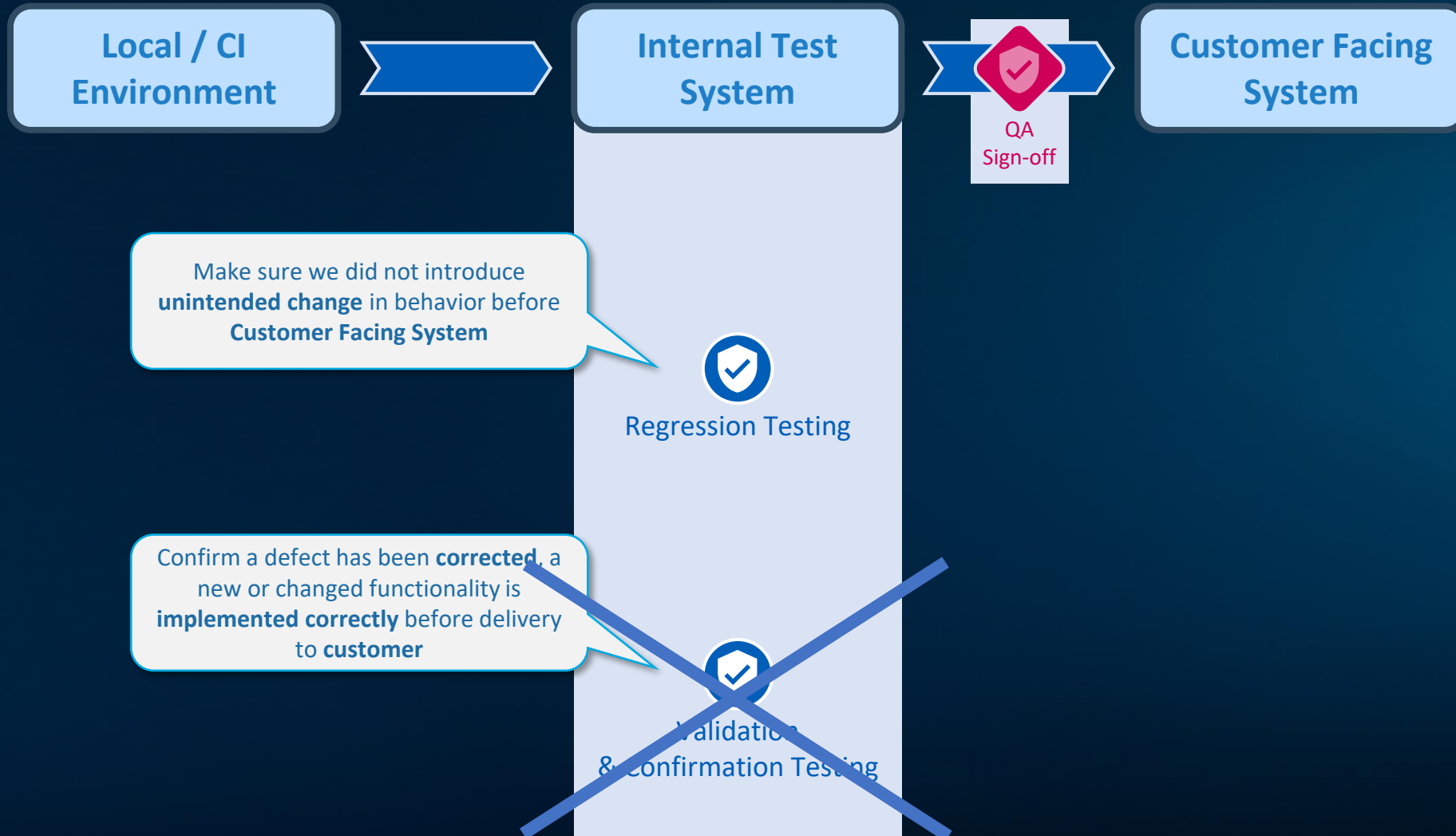
```
┌─────────────────┐        ┌─────────────────┐              ┌─────────────────┐
│   Local / CI    │  ───▶  │  Internal Test  │   ◆ QA       │ Customer Facing │
│   Environment   │        │     System      │   Sign-off   │     System      │
└─────────────────┘        └─────────────────┘              └─────────────────┘
```

Local / CI Environment

Internal Test System

QA Sign-off

Customer Facing System

> Make sure we did not introduce **unintended change** in behavior before **Customer Facing System**

Regression Testing

> Confirm a defect has been **corrected**, a new or changed functionality is **implemented correctly** before delivery to **customer**

Validation & Confirmation Testing
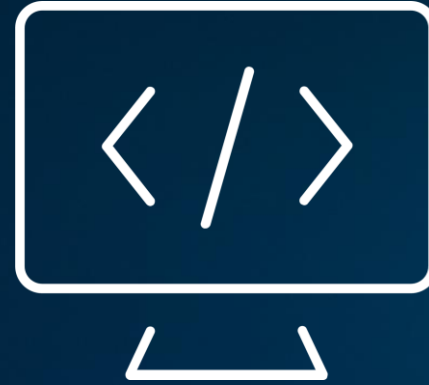
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Migration Test Strategy

What is different?

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Migration Test Strategy

Tailored Testing – Risk Based Approach

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Migration Test Strategy

Tailored Testing – Risk Based Approach

Example 1:

- No DB
- Use of credit cards
- Not latency sensitive

Tools & Methodologies

E2E tests

Datastore

Testability

Containerisation

Chaos

Resilience

QUALITY CHARACTERISTICS

Topology

E2E tests

Security

Performance

Business Continuity

Encryption

Delivery strategy

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Migration Test Strategy
Tailored Testing – Risk Based Approach

Replication tests

Tools & Methodologies

E2E tests

Datastore

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Resilience

QUALITY CHARACTERISTICS

Topology

E2E tests

Security

Performance

Business Continuity

Delivery strategy

Perf tests

Example 2:

- DB custom replication
- Low response time
- Resilient by design

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Migration Test Strategy

Testing Layers

Cross-Application System Testing

Critical customer flow testing

My constellation
My APP
My UI

1A applicative eco-system consistency

~40 cross-application E2E tests coordinated by a dedicated QA team with co-ownership model

Integration & System Testing

Functional E2E testing

API testing Smart pinger

Monitoring

My constellation
My APP
My UI

Risk-based targeted system testing

Application owners identify, assess and mitigate the risks for their own application with targeted testing (E2E, NFRs, monitoring, hybrid mode…)

Unit & Component Testing

My constellation
My APP
My UI

Limited impact on applicative code

Developers run unit & component tests as usual in the legacy environment

APPLICATION LAYER

PLATFORM LAYER

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Quality Engineering Transformation

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Quality Engineering Transformation
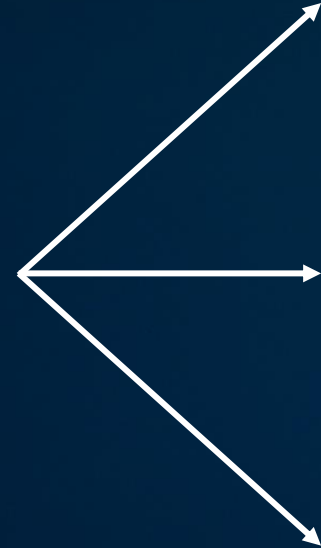
Onboarding

MIP

Comprehensive guide for the cloud journey

+

Cloud academy

Step-by-step

Gate keepers

Cloud expert support

+

Master Test Plan

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Quality Engineering Transformation
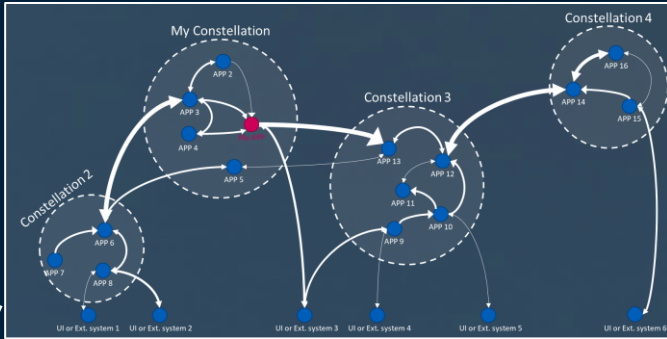## Continuous Improvement

Improvement

Actions

Feedback

Adjustment
needs

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Key Take Away
Our move to the Cloud

My Constellation

Constellation 4

Constellation 3

Constellation 2

APP 2
APP 3
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UI or Ext. system 1
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UI or Ext. system 4
UI or Ext. system 5
UI or Ext. system 6

QUALITY CHARACTERISTICS

Testability
Datastore
Containerisation
Resilience
Topology
Security
Performance
Business Continuity

MIP

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