

<Project Name> Testing Strategy

(ADH, ULM, CES9.2 Cloud upgrade, Brite:Bill, UXF1.5)



Amdocs Quality Engineering



Objective

-  Project & Testing Scope
-  Testing Assembly Set-up
-  Test Approach
-  Quality Measures & Gating Criterias
-  Commutation & Testing Deliverables
-  Needs from Astro
-  Roles & Responsibilities



Projects Scope Key Testing Focus

01 ADH

Amdocs Data Hub

- Deployment of Amdocs Data Hub as operational data store

Commission Mgt. - Leverage Amdocs Data Hub as single data source for Amdocs and Non-Amdocs application data and APRM reporting



16-Jun-19 : CES Modules
14-Jul-19 : Feed to APRM

Data related testing to be carried out with New and Production data

02 ULM

Digital ID - Enable Astro Digital ID via ULM

Lifecycle Management - Implement the self-care user initiated processes using best practices and out of box processes as per ULM product documentation.



11-Aug-19

Testing focused on User Life Cycle Management, Customer On-boarding Experience on Digital platforms.

03

Brite:Bill, CES CLOUD, UXF

Replace AMDD - A billing communications platform enabling personalized eBill.

New UXF & Widgets – MCSS Replacement with upgraded Digital Experience solution (UXF, Widgets).

CES 9.2 AWS Edition – PMX upgrade for the existing CES Stack with “Lift & Shift” to AWS Cloud Infrastructure.



19-Jan-20

Bill verification w.r.t. Revenue assurance and Customer Experience.
Cloud Specific testing (Functional, NFT)

Testing Governance

ONE TEST GOVERNANCE

TEST PLANNING & CONTROL

Test Strategy and Plan

Risks & Issues Management

Test Management and coordination

3rd Party & Communication Management

Interdependencies Management

'ONE' TEST TEAM

Distribution of testers across different phases

Combined and Increased knowledge

Testing pool with apt skills and knowledge across phases

EVOLUTION ONE DESIGN & AUTOMATION

One Design – PT to E2E testing

Utilizing automation suite across all phases

Early testing in Cloud environment (from PT testing)

Engagement of Automation Architect to stabilize automation suite from PT

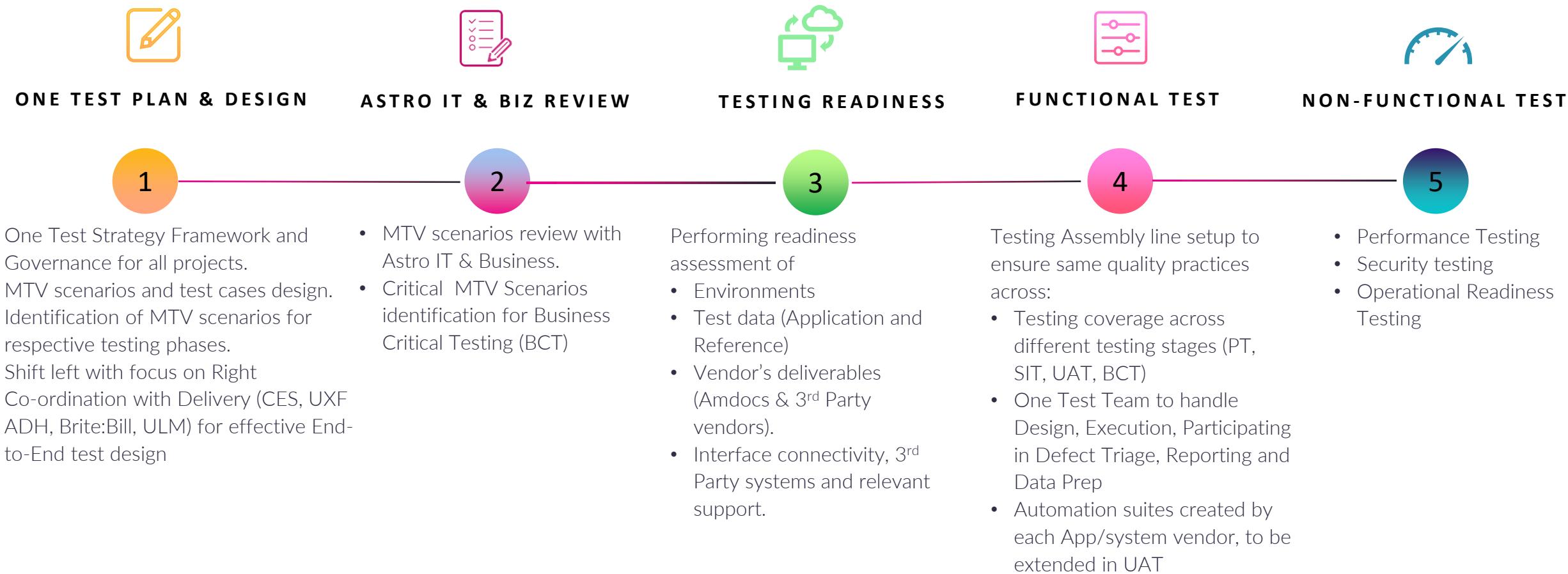
QUALITY MANAGEMENT

Methodology

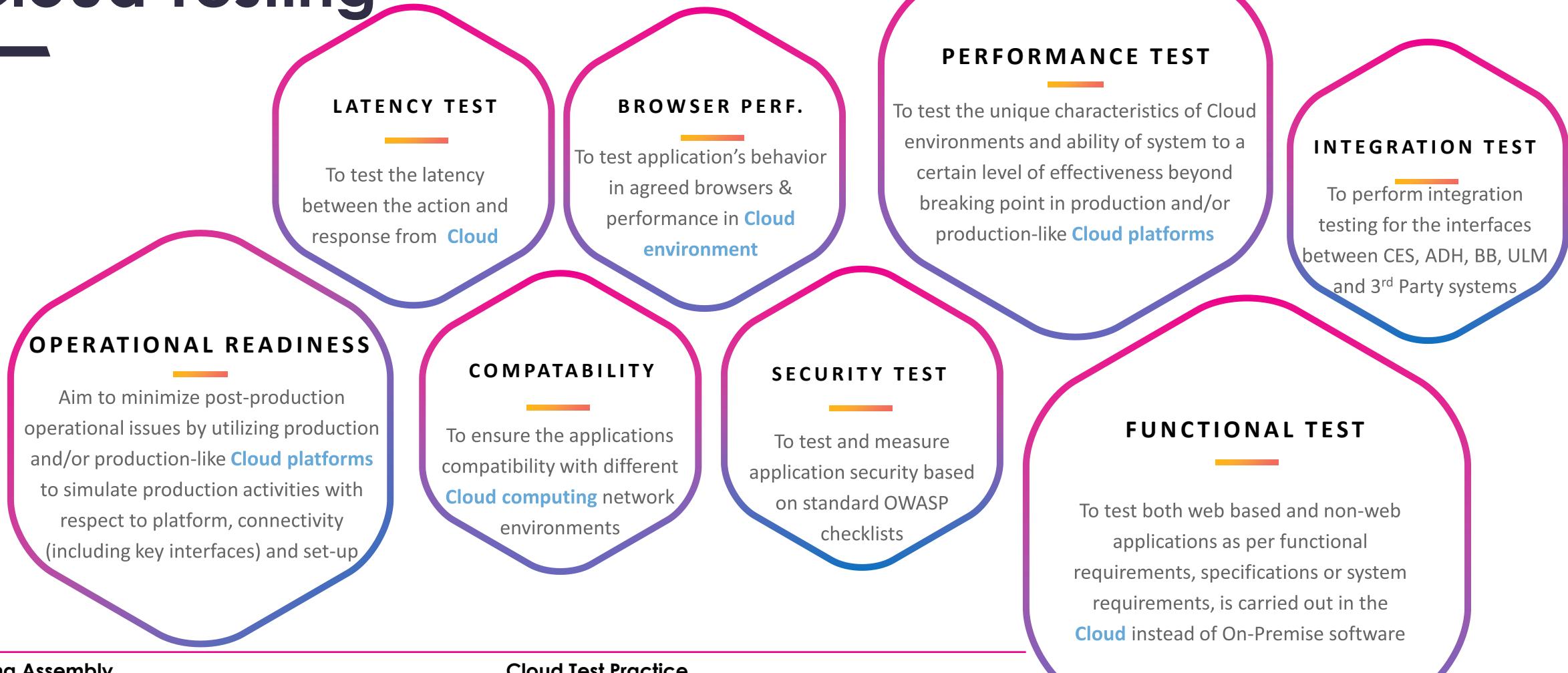
RCA

Corrective and Preventive Actions

Testing Assembly PT, SIT, UAT, BCT, NFT



Cloud Testing



Testing Assembly

Cloud Test Practice

Portfolio Testing Functional Test (MTV Level)

System Integration Testing Integration Test (Interfaces)

Non- Functional Testing Operational Readiness, Latency Test, Security Test, Performance, Browser performance

UAT+BCT Compatibility Test, End-to-End business use cases

NFT Focus Area

Performance Testing forms a key aspect where the application has to be tested for accessibility, availability, while being hosted on the Cloud.

LOAD TEST

Validate Multi-Tenancy Test
Ensure no Impact on SLA, Transactions Per Second (TPS) while moving from On premises to cloud

STRESS TEST

Test focus is to validate capacity and scalability of the virtual environment

SOAK TEST

Ensure Business continuity, monitoring memory, system response over the period

RESILIENCE & FAILOVER

System availability, consistency, Load distribution post recovery

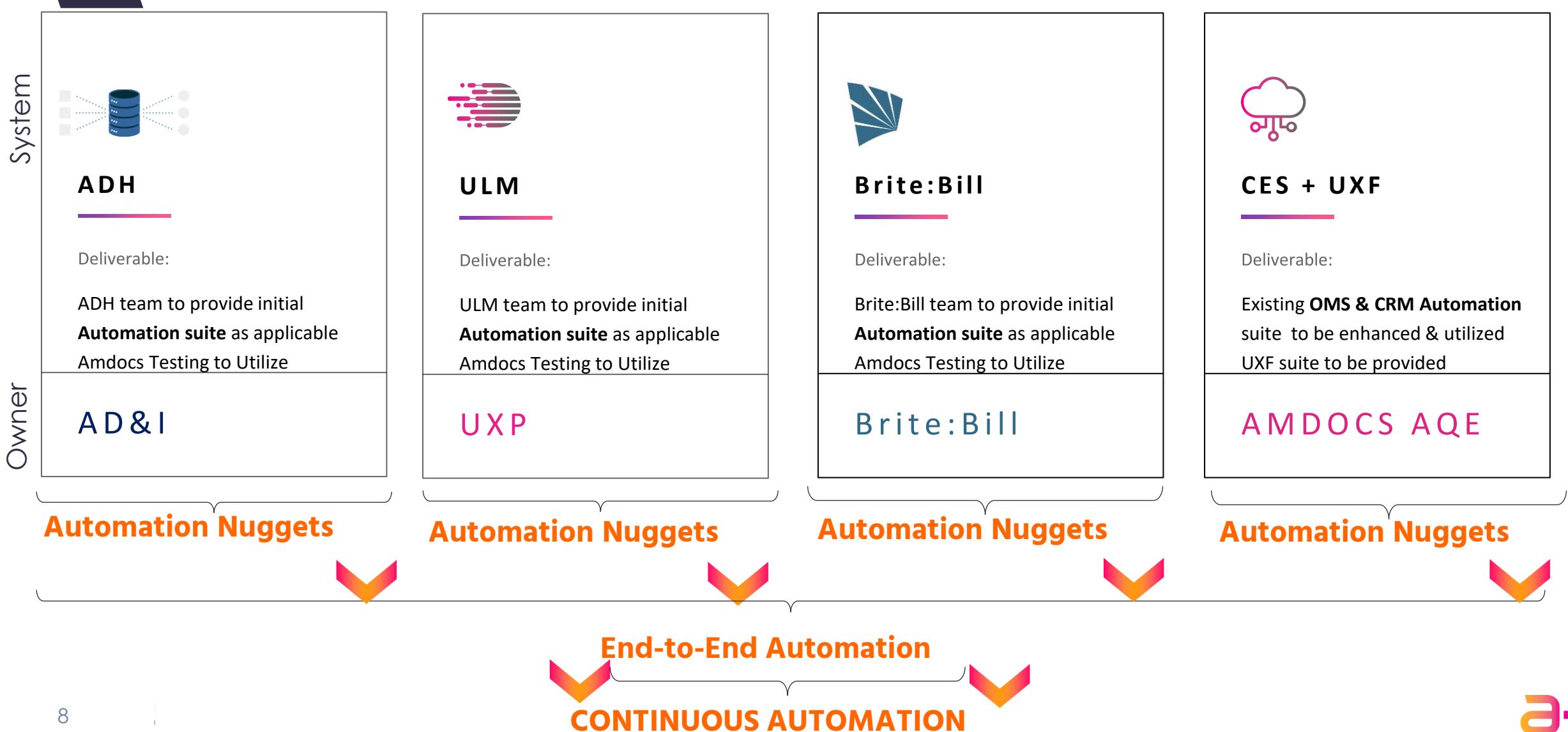
END USER TEST

End User Response time validation. Content Test-Performance validation

AWS ENABLERS IN CES

Performance-Response time validation focus on OMS, Collection module for APM changes to Unicast. Performance validation is must during PMX upgrade to ensure no deterioration in system

Test Automation



Test Approach



- | | | | | | | | |
|-----------|---|-----------|--|-----------|---|-----------|--|
| 01 | SCRUM TEST
Critical scenarios execution to ensure system stability and usability | 02 | PORTFOLIO TEST
On Premise Stabilization with 20% of testing and then remaining 80% on cloud
Component level testing | 03 | SIT
Interfaces testing as per IML with real connectivity. | 04 | APP SECURITY
Security testing is done based on the OWASP Top 10 standards including Session management, Business Logic validation, Authentication etc. |
| 05 | UAT (Intg. Cloud Environment)
Targeting all critical business use cases to be tested E2E (CES9.2 base scope) | 06 | BUSINESS CRITICAL
Critical business processes covering RA, finance and various BUs
Out of the box flows which CSR's and Dealers perform
RBA – Role Based Authority verification | 07 | ORT
Operational Critical Daily Activities (EOD, Bill Run, AR, RPL, SCM, OMS batch etc.,) | 08 | PERFORMANCE
Verify performance for CRM, OMS , ABP under peak hour load on cloud against KPI.
Certifying load capacity during upper and lower limit. |

Test Approach



- | | | | | | | | |
|-----------|--|-----------|--|-----------|--|-----------|---|
| 01 | SCRUM TEST
Validation at each MTV/
feature level for each
scrum.

Component level testing
using automation and E2E
flows | 02 | PORTFOLIO TEST
MTV level functional
testing

Integration for different
internal module

First level of responsive
screen verification | 03 | SIT
Integration testing with
various Amdocs and 3 rd
party interfaces

To validate the request
and response of each
interface level calls | 04 | APP SECURITY
Testing based on OWASP
checklist including
Cryptography, Input
validation, Authorization
etc. |
| 05 | UAT (Integrated Environment)

E2E self-service scenarios
(including flows greenfield,
brownfield, ordering, payments
etc.,)

E2E with BSS systems and
3rd party systems

User experience (UI level
& responsiveness)

Comparison of data
between UXF and MCSS
for sample accounts | 06 | BUSINESS CRITICAL
Mainly focused on
Customer experience (UI
& UX) and dealer | 07 | ORT
Critical business flows
verification on production
like environment | 08 | PERFORMANCE
Measuring UXF
performance against fixed
SLA, and focusing on end
user experience

REST based load test for
early issue findings
followed by GUI scenarios.
Improving end user
experience with HAR
analysis |

Test Approach



01	SCRUM TEST Functional Testing of BB outputs (Paper & Digital Bill) Testing of BB Product (core functionality) component level Automation on Brite:Bill level to verify paper and digital bill verification UAT (Intg. Cloud Environment)	02	PORTFOLIO TEST Testing with existing data Integration with CES systems verification Verify Brite:Bill outputs	03	SIT Interface testing as per IML Notification and other communication flows	04	APP SECURITY Testing performed based on OWASP checklist covering Security mis-configuration, Business logic validation, cryptography etc.
05	06	BUSINESS CRITICAL Finance charges, bill invoice layout and data correctness verification (RA, Finance and BMD team)	07	ORT Daily Pre-Bill Run Scripts Before and after Bill Extract verification (Prepared Bill, bill image, report, bill count On-Premise Vs Cloud) Full Volume Bill Generation, QA & Full Bill Generation Bill Undo & Reprocess Test.	08	PERFORMANCE Performance validation for full volume bill generation. Performance tuning for DB queries, application and server side. Performance measurement is based on throughput and latency.	

Test Approach



- | | | | | | | | |
|-----------|---|-----------|---|-----------|--|-----------|--|
| 01 | SCRUM TEST
Validation at each MTV/
feature level for each
scrum.

Component level testing
integration verification | 02 | PORTFOLIO TEST
System level end-to-end
test (System testing)

Integration for different
internal module

Backend level data
verification | 03 | SIT
ULM to 3rd party interface
testing

Integration verification

To be performed in cloud
environment | 04 | APP SECURITY
Testing based on
OWASP checklist which
includes Authentication,
session management
and client side attacks |
| 05 | UAT

E2E customer journey (user
onboarding, Lifecycle, Profile
management, password
reset/recovery etc.,)

E2E with BSS systems and
3rd party systems

Migration related
verification | 06 | BUSINESS CRITICAL

User experience (UI level
& responsiveness)
verification by Customer
Experience team | 07 | ORT

Data migration related
verification (on-demand
OR one time) | 08 | PERFORMANCE

Measure ULM
performance with scalable
production infrastructure,
volume and against
production SLA's

Identify performance
bottleneck, memory leak,
DB tuning, deadlocks |

Test Approach



- | | | | | | | | |
|-----------|--|-----------|---|-----------|---|-----------|--|
| 01 | SCRUM TEST

Business validation based on individual Entity level.
Alignment with ALDM data model.
Code integration for the build | 02 | PORTFOLIO TEST

Continuous integration & validation
Integrated validation of the ADH entities in the iteration using recon framework. | 03 | SIT

Connectivity check with Attinuity and 3rd Party systems
Run collector & RTP jobs and check data in Kafka2 | 04 | APP SECURITY

Security testing is done based on the OWASP Top 10 standards including security mis-configuration |
| 05 | UAT

BSS integrated data from test environment.
Primary Key & Not Null Validation
Check for Key Columns like Amount , Subscribers
3.Data Integrity across multiple sources | 06 | BUSINESS CRITICAL

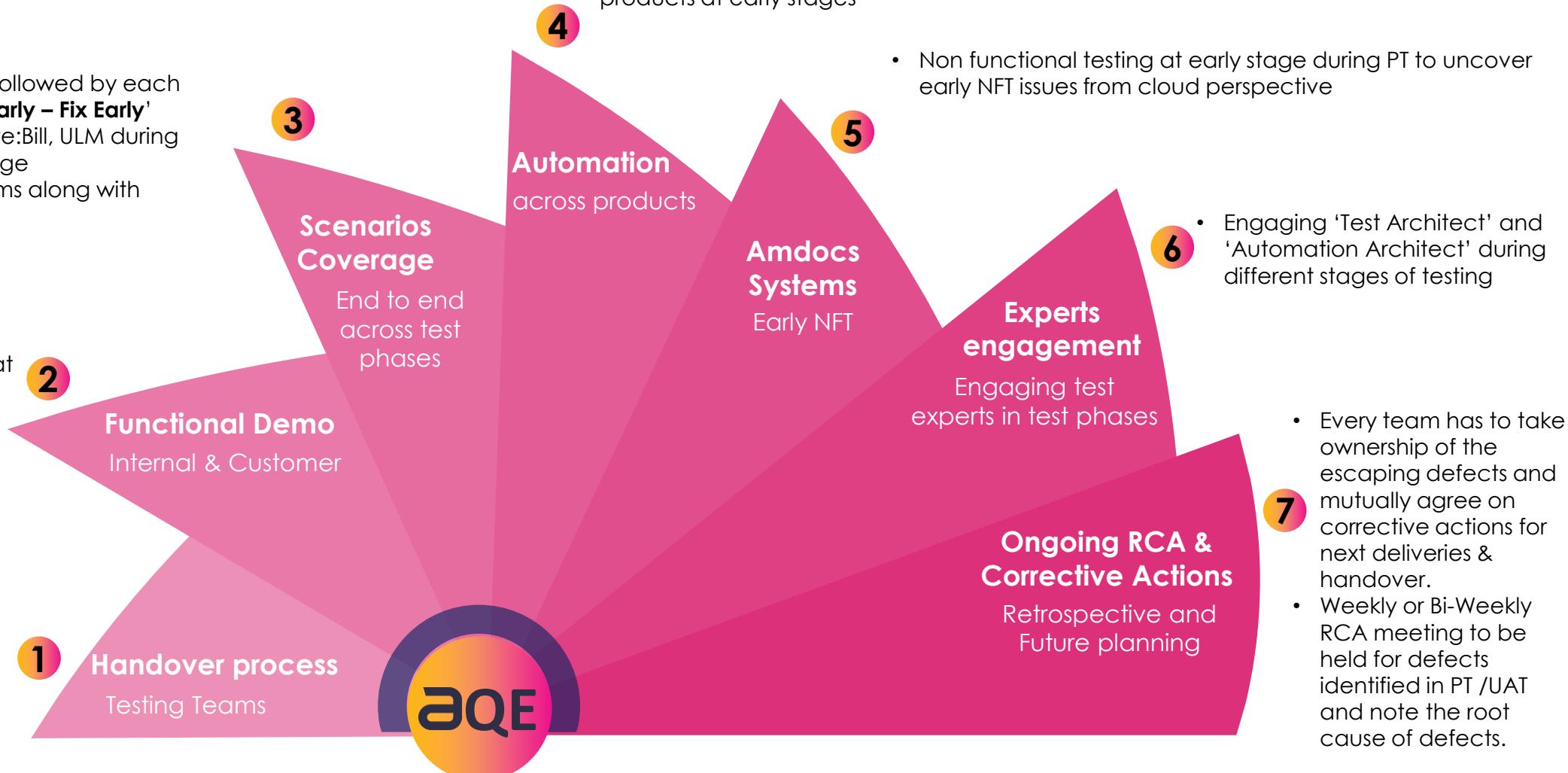
Data correctness & Completeness from business perspective | 07 | ORT

Implementation of DMAP steps to ensure no failures.
ADH Loads are executed to ensure the PROD readiness | 08 | PERFORMANCE

Measure ADH performance with scalable production infrastructure, volume and against production SLA's |

Quality Measures

- End-to-End test coverage followed by each test stage, adapting '**Fail Early – Fix Early**'
- Coordination with ADH, Brite:Bill, ULM during test design & execution stage
- Peer review by various teams along with Customer and Business
- Demo needs to be given at early stages by Product Owner
- Each testing phase will adhere to a Handover process from one phase to next subsequent phase.



Gating Criteria

SIT + UAT



Entry

- Scrum/MTV Testing is completed for specific MTVs
- Acceptance Testing Plan approved
- All Severity 1, Severity 2 Scrum/MTV Testing Defects of the Amdocs Integrated Solution and Third-Party Products have been resolved.
- BPT data approved and configured. Test data requirement is defined and ready. Acceptance Testing environment is configured & ready.
- Required Third Party Provider systems have been developed and integrated with the Amdocs Integrated Solution.
- MTV Test Design is completed and reviewed in order for the scope to be tested



Exit

- 100% execution of test cases
- 100% of Severity 1, Severity 2 and Severity 3 Defects from Acceptance Testing have been resolved and retested
- Severity 4 Defects of Amdocs Integrated Solution and Third Party Products have been resolved as per the applicable Defect SLAs
- Remediation plan to be provided for any unresolved Acceptance Testing Defects.

BCT

- Minimum 75% execution of test cases for specific MTVs in Acceptance Test phase have been completed.
- Business critical scenarios have been identified, designed and agreed by the Parties.
- 60% Severity 1, Severity 2 and Severity 3 severity Defects from Acceptance Testing phase have been resolved and retested.

- 100% Execution of Acceptance Testing and Business Critical Testing
- 100% of Severity 1, Severity 2 and Severity 3 severity Defects from both Acceptance Test and Business Critical Testing have been resolved and retested
- Severity 4 Defects of Amdocs Integrated Solution and Third Party Products have been resolved as per the applicable Defect SLAs
- Remediation plan to be provided for any unresolved Acceptance Test and Business Critical Test defects.

Gating Criteria

Performance Test



Entry

- Performance testing test plan approved.
- Performance testing data requirements defined.
- Performance testing test schedule approved.
- Performance testing test scenarios reviewed.
- Performance testing environment available.
- Representative dump of test data is available



Exit

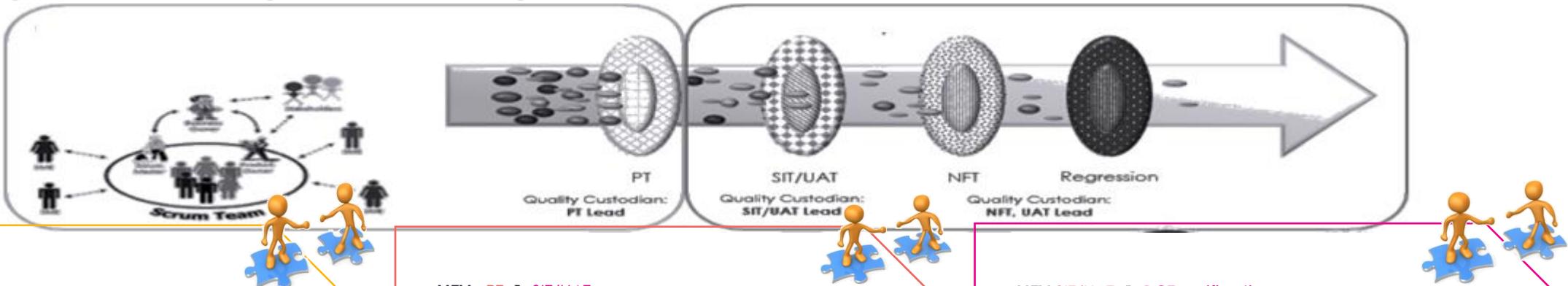
- 100% Execution of Performance test cases
- No open Severity 1 Severity Defects
- Open Severity 2 Severity Defects have approved workaround
- List of unresolved Defects has been documented and approved by Astro.

ORT

- Operational testing test plan approved.
- Operational testing data requirements defined.
- Operational testing Test schedule approved.
- Test environments available.
- Acceptance test completed and approved.
- Operational testing test scenarios reviewed.

- 100% Operational testing test cases run.
- Zero S1 (Severity 1) Defects.
- Any open S2 (Severity 2) Defects have approved workarounds.
- List of unresolved

Strengthening Gating Criteria



- MTV : Scrum → Portfolio Test
- Responsible: [Scrum Master, PO] → [PT Lead]
- Define Exit Criteria / Approvers: PO, Test Architect(s), PT Lead/Manager

- Checklist for each MTV by **Scrum Master**
 - ✓ Verification of Testing Considerations given by PT team, Test Architect
 - ✓ Signed off Design Documents (IDD, MTV document, IML, HLD/IA)
 - ✓ Signed off verified Business Requirements
 - ✓ Signed off verified BPT & MEC Data
 - ✓ Production Data
 - ✓ Code Inspection
 - ✓ Code Scan for security & Performance Aspect
 - ✓ If HFs – List of verified HFs (PMX upgrade)
 - ✓ Results against **Gating Criteria:**
 - **S1+ S2 Defects = Zero**
 - **S3 Defects < 5**
 - ✓ Mutual agreement on the Open Defects
 - ✓ Actionable Items completed, identified as part of RCA
- Demo (Internal)
- In case of rejection of MTV delivery, plan needs to be agreed and reflected in delivery/program plan

- MTV : PT → SIT/UAT
- Responsible: [PT Lead] → [SIT/UAT Lead]
- Define Exit Criteria / Approvers: Test Architect(s), SIT/UAT Lead

- Checklist for each MTV by **PT Lead**
 - ✓ PT Test Design reviewed by SIT (*Review to be done before starting MTV execution*)
 - ✓ PT results verified by SIT
 - ✓ Verified Design Documents (IDD, HLD/IA)
 - ✓ Verified Business Requirements
 - ✓ Verified BPT & MEC
 - ✓ Verified Production Data/Scripts
 - ✓ Verified list of HF
 - ✓ Automations developed & used
 - ✓ Various system readiness (ADH, ULM, CES, BB))
 - ✓ Results against **Gating Criteria:**
 - **Execution: 100%**
 - **Pass Rate > 95%**
 - **S1+ S2 Defects = Zero**
 - **S3 Defects < 5**

- Mutual agreement on the Open Defects
- Actionable Items completed, identified as part of RCA
- Demo (Internal & External – IT & Biz)
- Automation Package
- In case of rejection of MTV delivery, plan needs to be agreed and reflected in delivery/program plan

- MTV SIT/UAT → BCT verification
- Responsible:[SIT/UAT Lead] → [UAT and OBS Lead]
- Define Exit Criteria / Approvers: UAT Lead and OBS team

- Checklist for each MTV by **SIT/UAT Lead**
 - ✓ Test Design reviewed by OBS/Business (*Review to be done before starting MTV execution*)
 - ✓ UAT results verified by OBS/Business
 - ✓ Verified Design Documents (IDD, HLD/IA)
 - ✓ Verified Business Requirements
 - ✓ Verified BPT & MEC
 - ✓ Verified Production Data/Scripts
 - ✓ Verified list of HF
 - ✓ Automations developed & used
 - ✓ Amdocs systems (ADH, Brite:Bill, ULM, UXP)
 - ✓ Results against **Gating Criteria:**
 - **Execution: 100%**
 - **Pass Rate > 95%**
 - **S1+ S2 + S3 Defects = Zero**
 - Severity 4 Defects of Amdocs Integrated Solution and Third Party Products have been resolved as per the applicable Defect SLAs
 - ✓ Mutual agreement on the Open Defects
 - ✓ Actionable Items completed, identified as part of RCA
- Demo (Internal & External – IT & Biz)
- Automation Package
- In case of rejection of MTV delivery, plan needs to be agreed and reflected in delivery/program plan

Test Communication & Escalation

Communication

Escalation

TEST DEVIATION

Any Test Deviation in test deliverables will be communicated during Daily Program call and/or weekly meetings.



TEST PROGRESS

Daily and Weekly progress will be shared with all Internal and External stakeholders. Medium of test reporting will be decided on later stage.

RISK & ISSUES

Escalation for any major risks and issues that will cause delay or may impact PI release to production shall be escalated immediately to Program team



TEST IMPACT

Any communication regarding, Test blockers, impacts and delay to be reported as and when occurred and needed.



DEFECTS

Daily defect management and triage meeting will happen for open defects
On going RCA and improvement to be handled by all relevant stake holders



Test Deliverables



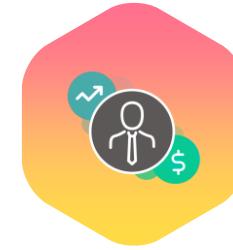
TEST DESIGN

- MTV Test scenarios and Test-cases



TEST EXECUTION

- Test plan
- Daily Execution Report
- Daily Defects Details & Summary



TEST MANAGEMENT

- Test Strategy
- Weekly Testing Report
- Test Summary Report

Needs from Astro

Astro Test Manager & Business Support Focal

Astro Test manager to manage test deliverables and support from Astro side(Business users, 3rd Parties, logistics, escalation etc.)
Business coordinator from Astro business team to manage Business users from different business units during various testing stages (Scheduling, access for business users, coordination with business teams etc.)

Astro IT & Business Users

Astro to arrange Business Users, DA who will participate
in MTV Test scenarios review and Critical scenarios identification.
In external Demos as needed
in the Business Critical Testing verification

3rd Party Support

Support from Vendors (connectivity, data, files, environment, credentials, defect fixes, defect triage participation)will be required for all impacted third-party systems to complete the execution
Dedicated third party environments required for LTEA2 projects (To avoid any collision with BAU environment)

Logistics

Computers with astro and 3rd party system access
Mobile phones (android & iOS) & tablets (android & iOS) configured with test environment, for responsive screen (UI/UX) verification
Prepaid recharge vouchers
Test applications and access, STBs etc.,

Key roles, Accountabilities and Responsibilities

R Responsible **C** Contribute
A Accountable **I** Inform



AMDOCS



ASTRO



ASTRO / 3RD PARTY

Test Strategy and Planning

R A

C I

Test Strategy Review

R A

C I

Test Case Designing and Scenarios

R A

C I

Data Loading

R A

C I

Maintenance of Daily/Weekly Dashboards & Reports

R A

C I

Defect Reporting

R A

C I

Test Data Availability – Dox

R A

C I

Test Data Availability – Non Dox

C I

C I

R A

Test Environment Availability and Maintenance – Dox

R A

C I

Test Environment Availability and Maintenance – Non Dox

C I

C I

R A

Test Validation and Signoff

R A

R A

The background image shows the Kuala Lumpur skyline at night, with the iconic Petronas Twin Towers standing prominently in the center. The towers are illuminated, reflecting off the surrounding buildings and the ground. The sky is dark blue with some wispy clouds. In the foreground, there's a large, modern building complex with many lit windows.

Thank you

Test Approach

NJOI DEALER PORTAL

01

SCRUM TEST

User story level testing.
Component level automation
Automating flows and triggering from Jenkins once the code is build

02

PORTFOLIO TEST

MFS APIs testing with Dealer portal and CES integration.
Testing to be conducted on Web & Mobile platforms

03

SIT

Impacted third party interfaces to be tested in integration with MFS system

04

UAT

Re-use scrum automation/Integration flows with CES and MFS/Portal (on AWS)
Testing of E2E functional flows on Web/Mobile emulator (Android and iOS) /iPad for dealer portal

05

BUSINESS CRITICAL

Customer experience based testing when using MFS on Web/Mobile platforms
Scenarios related to dealers, agent and RA

06

ORT

EOD reports & SAP extract
Bulk Voucher Tracking /Inventory Tracking jobs

Early Testing on Cloud

Exclusive prioritized key area to be tested early to ensure:

- ✓ Early Defect Deduction and Fix
- ✓ Fulfill Cloud Architecture Standards
- ✓ Improve System and Integration Quality
- ✓ Decrease Software Risk

Performance tuning with API load test and critical GUI scenarios (30% scope) on Cloud.
Identifying early architecture design flaws with load on cloud
HAR analysis for Digital application for optimizing end user experience.

FUNCTIONAL EARLY REGRESSION

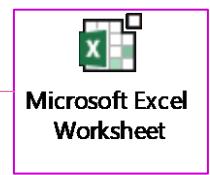
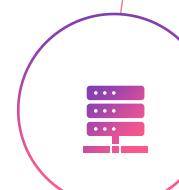
Functional verification to ensure system is qualified for further testing activities.



Microsoft Excel Worksheet

EARLY OPERATIONAL READINESS

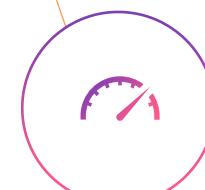
Achieve early operational readiness with regards to Batch job, Bulk files processing, inventory management & operational activities



Microsoft Excel Worksheet

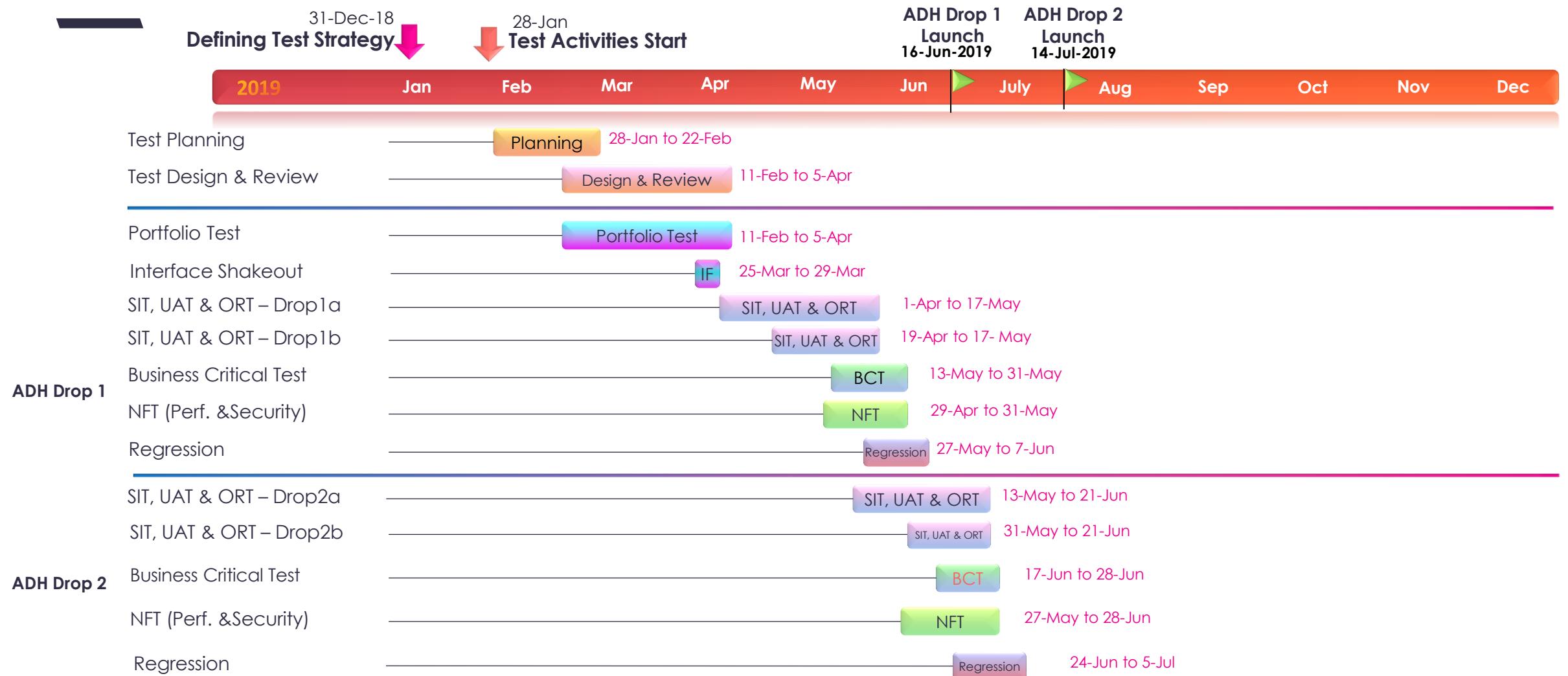
EARLY PERFORMANCE

Cloud.



Microsoft Excel Worksheet

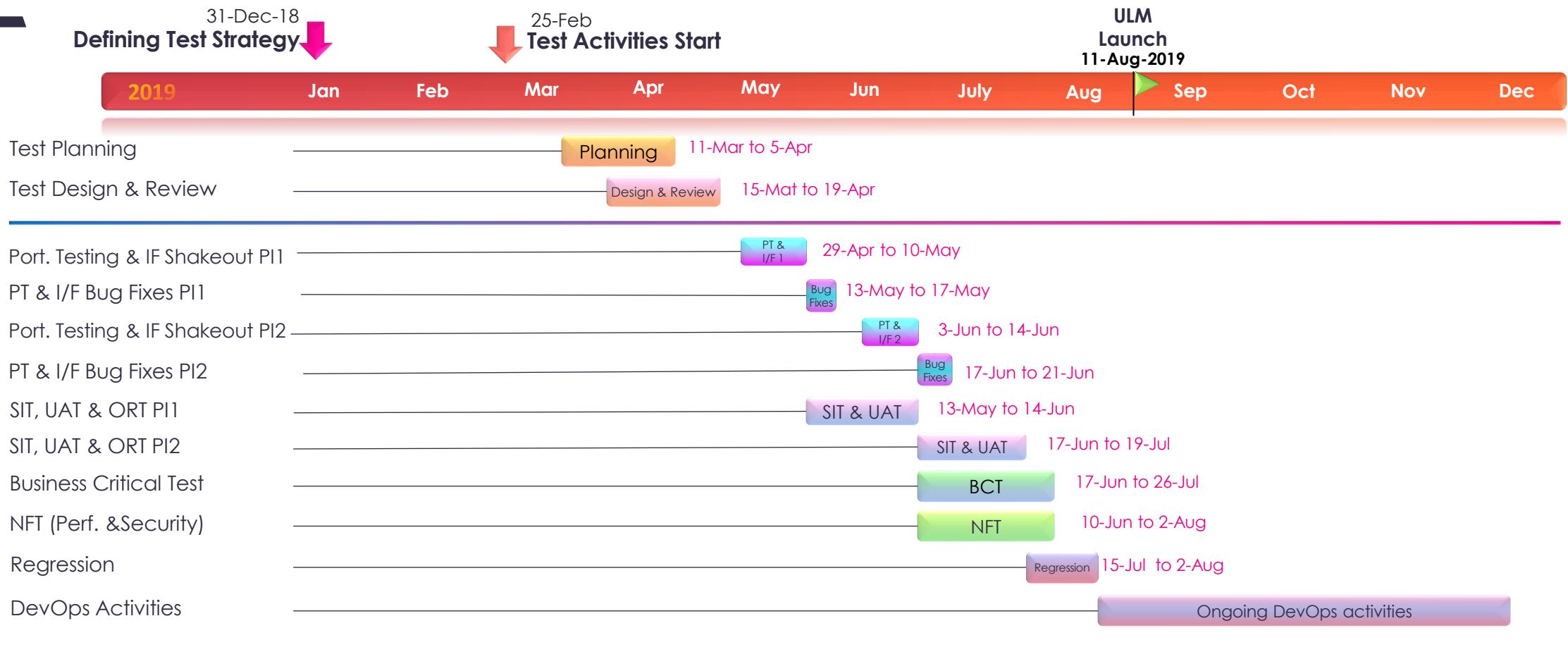
Timeline ADH



Testing timeline/approach to be refined based on Iteration deliveries, MTVs under each PI

Interface shakeout to be performed as part of dev to dev testing

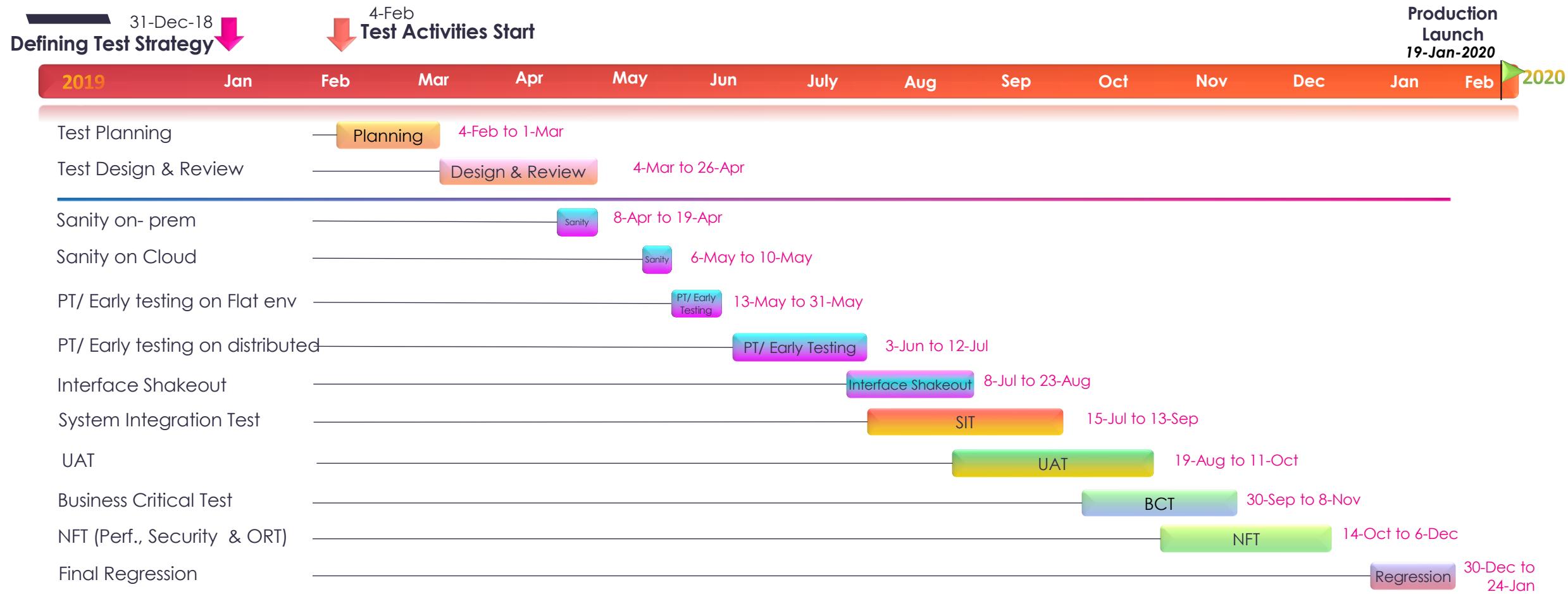
Timeline ULM



💡 **Testing timeline/approach to be refined based on Iteration deliveries, MTVs under each PI**

💡 Interface shakeout to be performed by respective application/Vendor

Timeline CES9.2



💡 **Testing timeline/approach to be refined based on Iteration deliveries, MTVs under each PI**

💡 Prioritized NFT and ORT critical scenarios will be executed along with portfolio testing PT/early testing phase

Timeline UXF Upgrade



Testing timeline/approach to be refined based on Iteration deliveries, MTVs under each PI

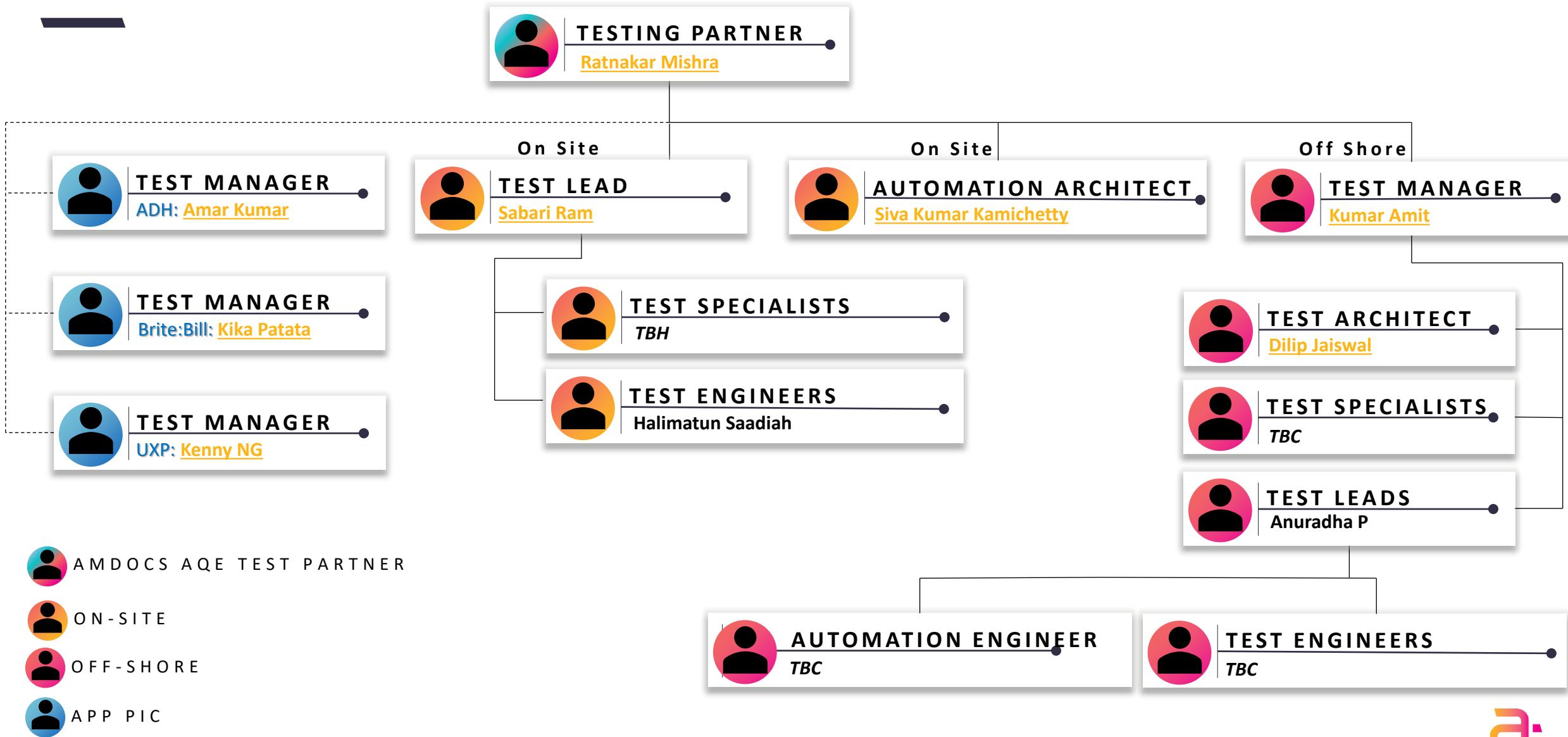
💡 Prioritized NFT and ORT critical scenarios will be executed along with portfolio testing PT/early testing phase

Timeline Brie:Bill



✍ Testing timeline/approach to be refined based on Iteration deliveries, MTVs under each PI

Testing – Organization Chart



Testing Ownership

Portfolio Testing

SIT+UAT+BCT

Performance Testing

Security Testing

Operational Testing

ADH Phase 1

AD & I

AQE

AD & I

AQE

AQE

ADH Drop2

AD & I

AQE

AD & I

AQE

AQE

ULM

UXP

AQE

AQE

AQE

AQE

CES9.2 Cloud +
UXF1.5

AQE/
DCC

AQE

AQE

AQE

AQE

MFS

MFS

AQE

TBD

TBD

AQE

Brite-bill

BB

AQE

AQE

AQE

AQE

Testing Critical Success Factor



OWNER



SUPPORTED BY



RECIPIENT

Training sessions to be provided for all new Products (ADH, ULM, Brite:Bill, UXF)	AQE, Training team	AQE, Program, Project Lead	AQE
Signed off Design & MTV Requirement documents (IDD, MTV document, IML, HLD/IA)	DA, Scoping	DA	Program, AQE
Scoping and deliverables to be clearly identified in respective iterations from end to end view (should not be planned in silos)	Program, Integration Manager	Program, AQE	AQE
Merges and HFs verification and comparison reports to be created and verified against Production before PT	Delivery (Amdocs)	Program, Infra	AQE
Automation Sanity suite to be created during scrum/PT and for respective PI	Delivery (ADH, ULM, Brite:Bill), AQE (UXF, CES)	Project Lead, AQE	AQE
Portfolio Testing to be performed on Integrated Cloud environment	Delivery (ADH, ULM, Brite:Bill), AQE (UXF, CES)	Delivery, Infra, Program	AQE
UAT tester to participate in portfolio testing (design and execution) and Portfolio tester to join during UAT (For ULM & Brite:Bill)	Delivery (ADH, ULM, Brite:Bill), AQE (UXF, CES)	Delivery (ADH, ULM, Brite:Bill), AQE (UXF, CES)	AQE
Interface shakeout (Dev to Dev testing) to be performed in parallel before SIT	Delivery, 3rd Party	Program, Integration Manager, Infra, AQE	AQE
Production data to be made available before Portfolio testing	Program & Delivery (Amdocs) , BPT	DCC, DA	AQE
Effective support from various teams (Delivery, Infra etc) required during various test execution stages due to different time zones (KL- Malaysia, India, Canada, Ireland)	All Stake holders	Program, AQE	AQE