



Mojaloop releases & Core

PI-18 Community event

Mojaloop Core team

PI-18 Contributors

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Agenda



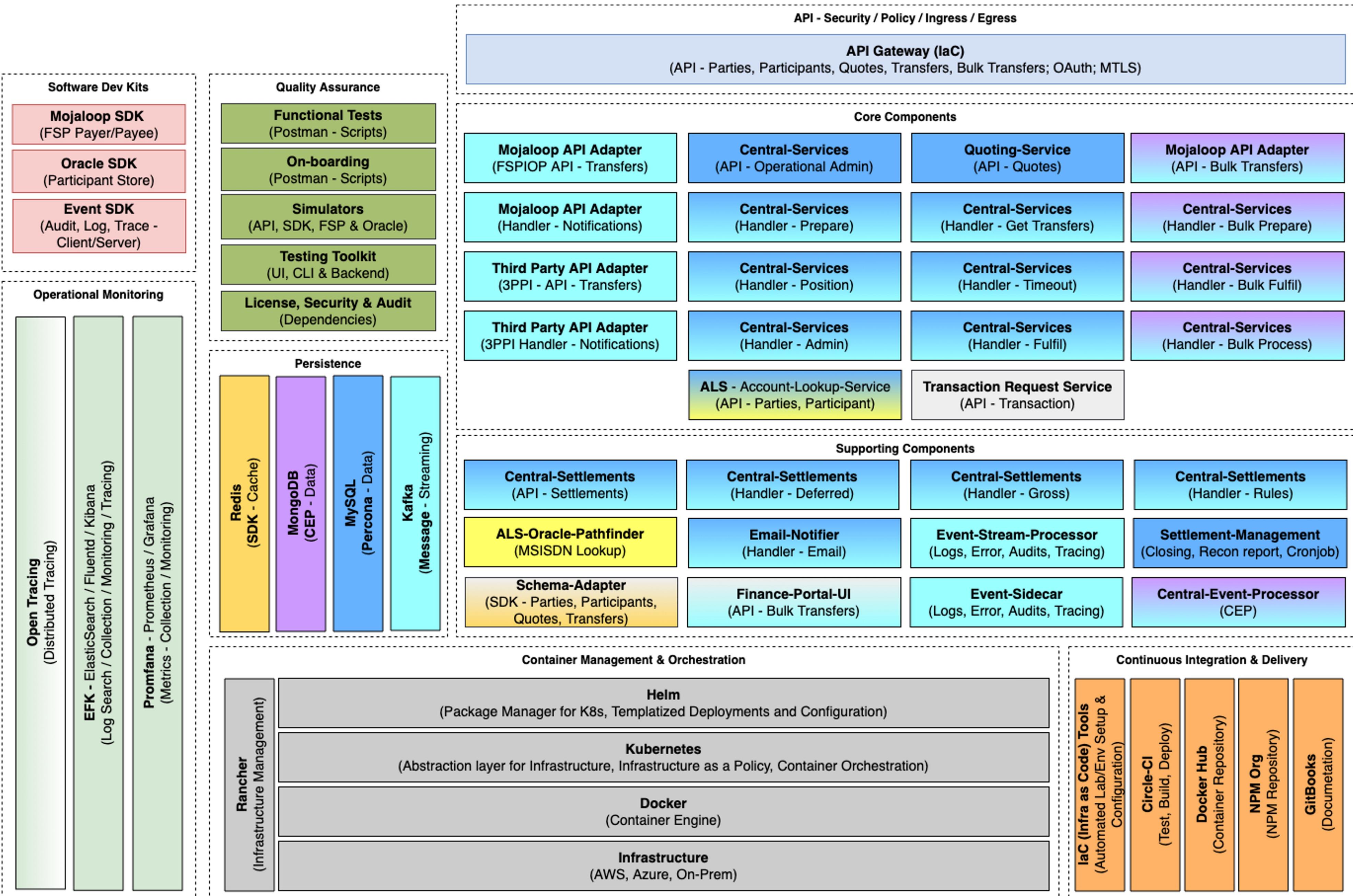
1. Mojaloop PI-17 overview and background
2. Mojaloop releases (**v13.1.0**) update
3. Testing Toolkit (TTK) Update
4. Infrastructure as Code (IaC) update
5. Mojaloop v14 and other charts improvements
6. Roadmap, PI-18 goals

Mojaloop PIs Overview



Timeline	Summary
Phase-1 (2016 - 17)	<p>Level One Project</p> <ul style="list-style-type: none"> • Reference Implementation • 6 Program Increments (PIs)
Phase-2 (2018)	<p>Road To Productionization</p> <ul style="list-style-type: none"> • 1 – 4 Program Increments
Phase-3 (2019 Jan - Dec)	<p>Supporting Adoption & Deployment</p> <ul style="list-style-type: none"> • PI-5 (Feb – April): Account lookup, QA Framework, Streamlined CI, Release process, Error endpoints, Documentation, Node Upgrade, Bug Fixes & Community support, Bulk Transfers Design • PI-6 Event handling framework, Bulk Transfers PoC, API Gateway, OSS Settlements API, Quoting Service, ALS • PI-7 Event & Error Handling framework, Packaging, OSS Settlements, Performance testing capabilities, QA • PI-8 Consolidation, Performance, Community Support
Phase-4 (2020 Jan - Dec)	<p>Going Live!</p> <ul style="list-style-type: none"> • PI-9: Performance Testing & Improvements, Merchant Request to Pay, Operational Monitoring, Testing toolkit, Settlement v2 • PI-10: Performance PoC, Standardizing Bulk Transfers, Testing toolkit, Settlement v2, Adopting FSPIOP API v1.1, Versioning • PI-11: Performance PoC, Standardizing designs, code & QA, Adopting FSPIOP API v1.1, Versioning, PISP support, Code quality • PI-12: Hardening, Packaging, Releases and prep for Phase-5 (October 2020 – January 2021)
Phase-5 (2021 Jan - Dec)	<ul style="list-style-type: none"> • PI-13: Removing friction, Understanding & addressing (feature) gaps, Cost reduction, Increasing Trust & confidence in Mojaloop (February 2021 – April 2021) • PI-14: Reference Architecture, Supporting existing implementers; ISO messaging, FX support; Bulk Payments, Merchant QR enhancements (May – July 2021) • PI-15: Ref Architecture, BizOps, Supporting existing implementers; ISO messaging, FX support; Bulk, Merchant extensions; CQS, Infra (Aug – Oct 2021) • PI-16: Ref Architecture, BizOps, Supporting existing implementers; 3PPI, ISO messaging, FX support; Bulk, Merchant extensions; CQS, Infra (Oct'21 – Jan 2022)
Phase-6 (2022 Jan - Dec)	<p>One Loop for All: Mojaloop in Motion!</p> <ul style="list-style-type: none"> • PI-17: Community, BizOps, vNext, 3PPI, Core maintenance; ISO, FX support; Bulk, Merchant extensions, FRMS, CQS, IaC/Infra (Jan – Apr 2022) • PI-18: Community, BizOps, vNext, 3PPI, Core maintenance; ISO, FX support; Bulk, Merchant extensions, FRMS, CQS, IaC/Infra and TBD on planning day (May – Jul 2022)

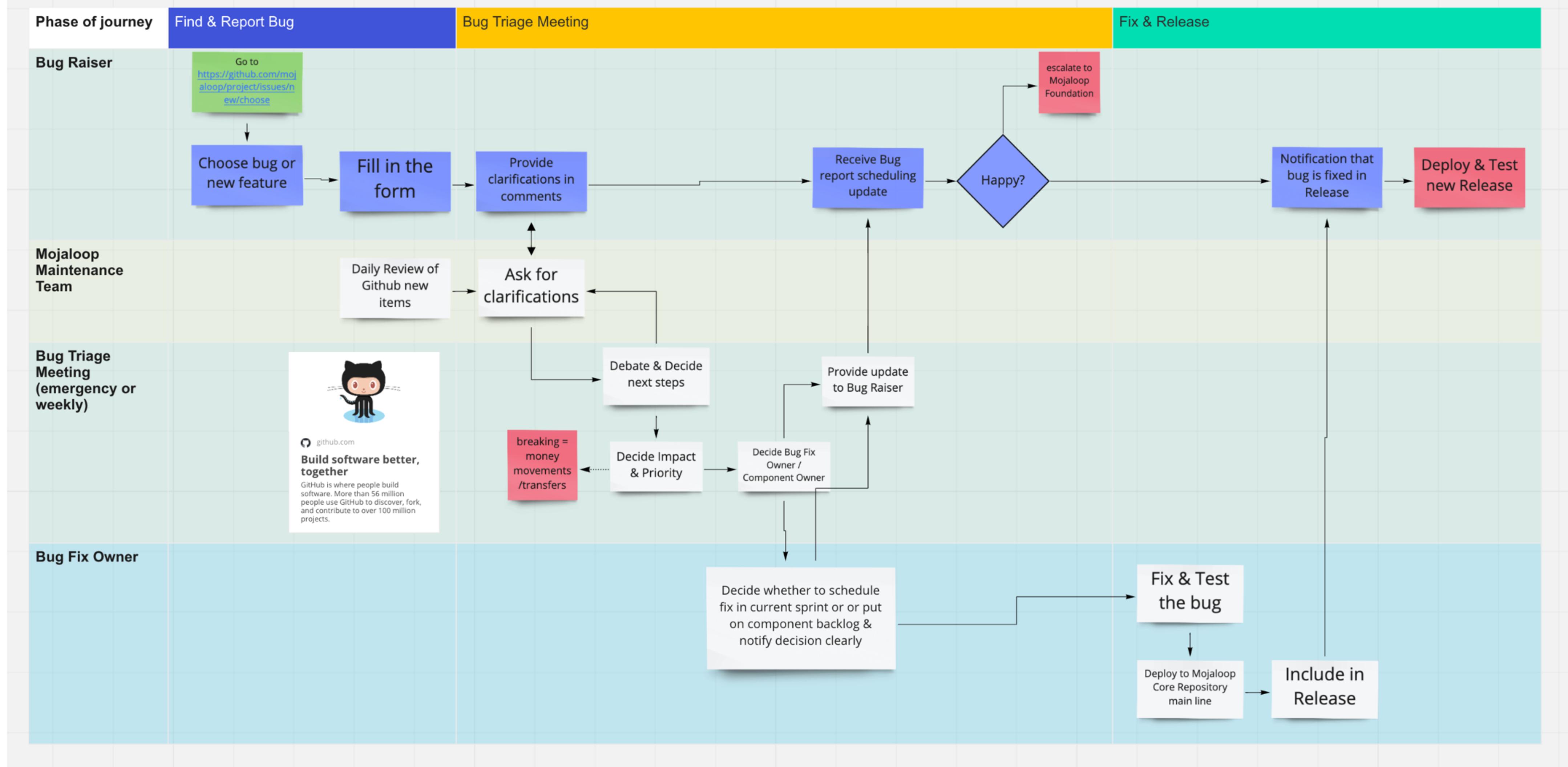
Mojaloop Component diagram PI-17



Maintenance & Bug Fixes



Bug Process



*Thank you to Lesley-Ann for the diagram

PI 18: Mojaloop releases & core maintenance update



Goal	Publish Mojaloop releases v13.1.0 and v14.0.0 with major changes packaged; Support contributions into Mojaloop	
Key Epics Objectives	<ol style="list-style-type: none">1. Mojalop v13.1.0 is published; In addition to release notes, publish migration guide and regression test plan. Document upgrade scenarios and deployment options to support v1.0 and v1.1 by Schemes 2. Mojaloop v14 published for adoption as a major, stable release & external dependencies separated out of Mojaloop helm charts to reduce future maintenance.3. Define release cadence. Document upgrade and migration strategy to ensure adopters can upgrade to latest Mojaloop releases and are able to run regression tests at use case level end to end	
Issues, constraints	<ol style="list-style-type: none">1. Limited resourcing / funding2. Lack of dedicated team members on IaC	
Success Defined How?	<ol style="list-style-type: none">1. A mojaloop release v14 is published and closely integrated with IaC1. Mojaloop release v14 is accepted for testing by at least one implementer	

PI-17 Updates



1. Mojaloop [**v13.1.1**](#) release - <https://bit.ly/3ExXxpw>
 - a. Disabling Finance Portal deployments via `finance-portal.enabled=false` setting in the majaloop/values.yaml now works as intended.
2. Mojaloop [**v13.1.0**](#) released - <https://bit.ly/3rlBib0>
 - a. 'patch' notifications to FSPs for failure scenarios supported
 - b. 3PPI charts validated
 - c. 3PPI services validated with ML TTK tests
 - d. Bulk services validated with ML TTK tests
 - e. CGS tests are now included as part of the Golden Path ML TTK tests
 - f. Bug fixes
3. Support current adopters/implementers
4. Reference Architecture stream support
5. Supporting progress on Mojaloop [**v14**](#)

Mojaloop v13.1.0 / v13.1.1

v13.1.0 release notes:

<https://github.com/mojaloop/helm/releases/tag/v13.1.0>

v13.1.0 Release Latest

mdebarros released this 2 days ago · 2 commits to master since this release · v13.1.0 · d9e9fe1

Helm release notes

- GitHub issue: [mojaloop/project#2528](#)
- For breaking changes, please review the section #7 "Breaking Changes" below.
- Revisions:

Date	Revision	Description
2022-03-14	0	Release
2021-10-01	0	Initial draft

1. Maintenance updates

- Change endpoint types to line up with enums ([#863](#))
- Added Helm Tests for Thirdparty Provisioning and Verification Collections ([#2650](#))

2. New Features

- [mojaloop/#2314](#): Add CGS default settlement test cases in testing toolkit test collection ([testing-toolkit-test-cases/pull/#54](#), ([testing-toolkit-test-cases/pull/#57](#)) [<https://github.com/mojaloop/testing-toolkit-test-cases/pull/57>], [mojaloop/helm/pull/#458](#), closes [mojaloop/#2314](#))
- [mojaloop/#2505](#): als-subid-error-callback-endpoint-not-implemented ([account-lookup-service/issues/#429](#)), closes [mojaloop/#2505](#))
- [mojaloop/#2450](#): feat(thirdparty): add tp-api-svc and round out thirdparty sub-chart ([helm/pull/#454](#), closes [mojaloop/#2450](#))
- [mojaloop/#2532](#): feat(thirdparty): add thirdparty support to mojaloop-simulator chart ([helm/pull/#456](#), closes [mojaloop/#2532](#))
- [mojaloop/#2556](#): Implement patch notification for failure scenarios (following v1.1 update) ([central-services-shared/pull/321](#), [central-ledger/pull/874](#), [ml-api-adapter/pull/492](#), closes [mojaloop/#2556](#))

6. Testing Toolkit:

- Moved object store init config to system config ([ml-testing-toolkit/pull/189](#))
- Added labels functionality to test cases ([ml-testing-toolkit/pull/193](#), [ml-testing-toolkit-ui/pull/122](#), [ml-testing-toolkit-ui/pull/123](#) and [ml-testing-toolkit-ui/pull/124](#)), closes [mojaloop/#2161](#)
- Added thirdparty-sdk outbound API ([ml-testing-toolkit/pull/195](#)), closes [mojaloop/#2533](#)
- New feature: Test cases definition report with grouping ([ml-testing-toolkit/pull/196](#)), closes [mojaloop/#2348](#)

7. Added Timeout Configuration to the centralledger-handler-timeout chart, and associated values files

8. [mojaloop/#2589](#): Added resource versions configuration parameter for all outbound requests from sdk-scheme-adapter ([sdk-scheme-adapter/pull/288](#), closes [mojaloop/#2589](#))

9. [mojaloop/#2704](#): Core-services support for non-breaking backward API compatibility for PROTOCOL_VERSION configs ([central-services-shared/pull/325](#), [ml-api-adapter/pull/496](#), [quoting-service/pull/295](#), [account-lookup-service/pull/436](#), [account-lookup-service/pull/438](#), [quoting-service/pull/297](#), [bulk-api-adapter/pull/74](#), [bulk-api-adapter/pull/77](#), [transaction-requests-service/pull/85](#), [central-ledger/pull/884](#), [testing-toolkit-test-cases/pull/66](#), closes [mojaloop/#2704](#))



v13.1.1 release notes:

<https://github.com/mojaloop/helm/releases/tag/v13.1.1>

v13.1.1 Release Latest

vijayg10 released this 22 days ago · v13.1.1 · 602c5a9

Fixes:

- Spelling mistake in requirements file of mojaloop chart ([#473](#)) - Setting the value `finance-portal.enabled=false` in the [majaloop/values.yaml](#) now works as intended.



ML TTK update



TTK PI-17 updates

1. MTP TTK course ✓ [Feedback welcome]
2. TTK GP collections support CGS, DMLNS ✓ (*used to be separate*)
3. TTK variables parameterized ✓
4. TTK 3PPI tests - validated ✓
5. Support for teams that have adopted TTK (or in the process of adopting) ✓
6. Feature to support 'async' APIs to be onboarded through UI ✓
7. Minor issues in callbacks, UI fixed ✓
8. Option to break a test-case in case of error ✓
9. Check-box to disable requests ✓



ML IaC update

Infrastructure Purposes



Infrastructure for Mojaloop has different use cases

1. **Dev** who wants to quickly kick the tires - TTK mocking the switch and other participants - can run standalone on docker
2. Potential switch **operator** whose development team needs to experiment with a full dev env - **miniloop version**
3. **Sandbox** for hackathon, etc - either **IaC from mojaloop or vendor specific quick start**
4. **PoC** for country wide switch - either **IaC from mojaloop or vendor specific quick start**
5. **Production** Grade switch - Consult vendors to provide production capabilities for fault-tolerance, security and throughput.

IaC History



Sandbox Infrastructure for Mojaloop has evolved over the years

1. Initial Mojaloop Infrastructure efforts started on AWS
2. We leveraged this as starting point so base IaC has been implemented on AWS.
3. We have also made use of early adopters' choice of components but we have gradually been replacing these with best of breed open source components.

IaC Principles



Core principles guiding the development of the IaC effort

- Open Source and standards based components ✓
- Cloud Provider Agnostic (striving for this, not quite there)
- Fit for purpose:
 - Sandbox ✓
 - Fake Money/Fake Rails ✓
- Striving for pluggable architecture to achieve multi-cloud capability including bare-metal
- Support lower resource requirements
- Elimination of all manual steps (scripts/etc) to provision switch, rely on idempotent operations to reach desired infrastructure state. (pretty close to 95%)
- Provide upgrade path for most components

These principles provide the following benefits:

1. All capabilities can be tested without reliance on licensed components
2. Anyone can use as a starting point for their infrastructure without licensing issues.

IaC Current Components

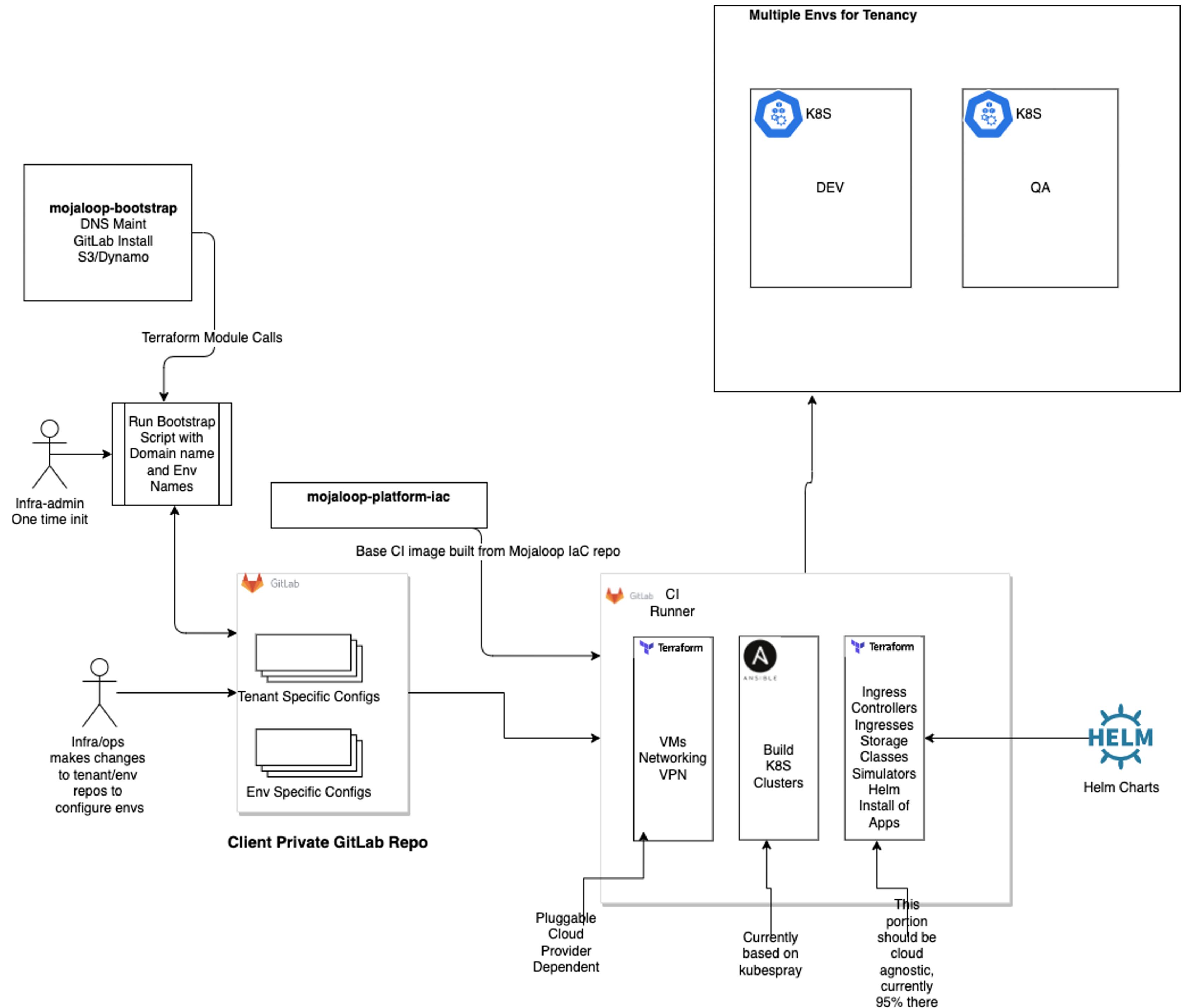


Bootstrap provides tenancy components for base networking (VPC, subnets, DNS, CI, configuration management and VPN). This is highly cloud provider specific.

Environment IaC is layered terraform modules that first builds VMs (cloud provider specific) after which the rest of the architecture is built in a mostly cloud agnostic fashion.

These cloud agnostic components include:

- Hashicorp Vault
- Certificate Manager
- External DNS
- WSO2 ISKM (moving to keycloak)
- WSO2 API Manager (moving to ambassador/ORY)
- Nginx Ingress Controller
- HAProxy (for forward proxying requests to DFSP callbacks)
- Connection Manager
- Bizops Framework (leveraging ORY)





IaC PI-17 status summary

Currently working on finalizing release of

1. Creation of Stateful Resources separate from the helm releases that make use of them.
 - a. Kafka
 - b. MySQL
 - c. MongoDB
2. Full removal of manual certificate and DNS provisioning, completed move to
 - a. External DNS
 - b. Cert Manager (using LetsEncrypt and Vault issuers)
3. Moved off of EFK to use Loki along with Grafana stack

Next Steps

1. Make cloud provider choice pluggable
2. Move from WSO2 ISKM to Keycloak
3. Move from WSO2 APIM to Ambassador
4. Convert ESP to make use of grafana stack

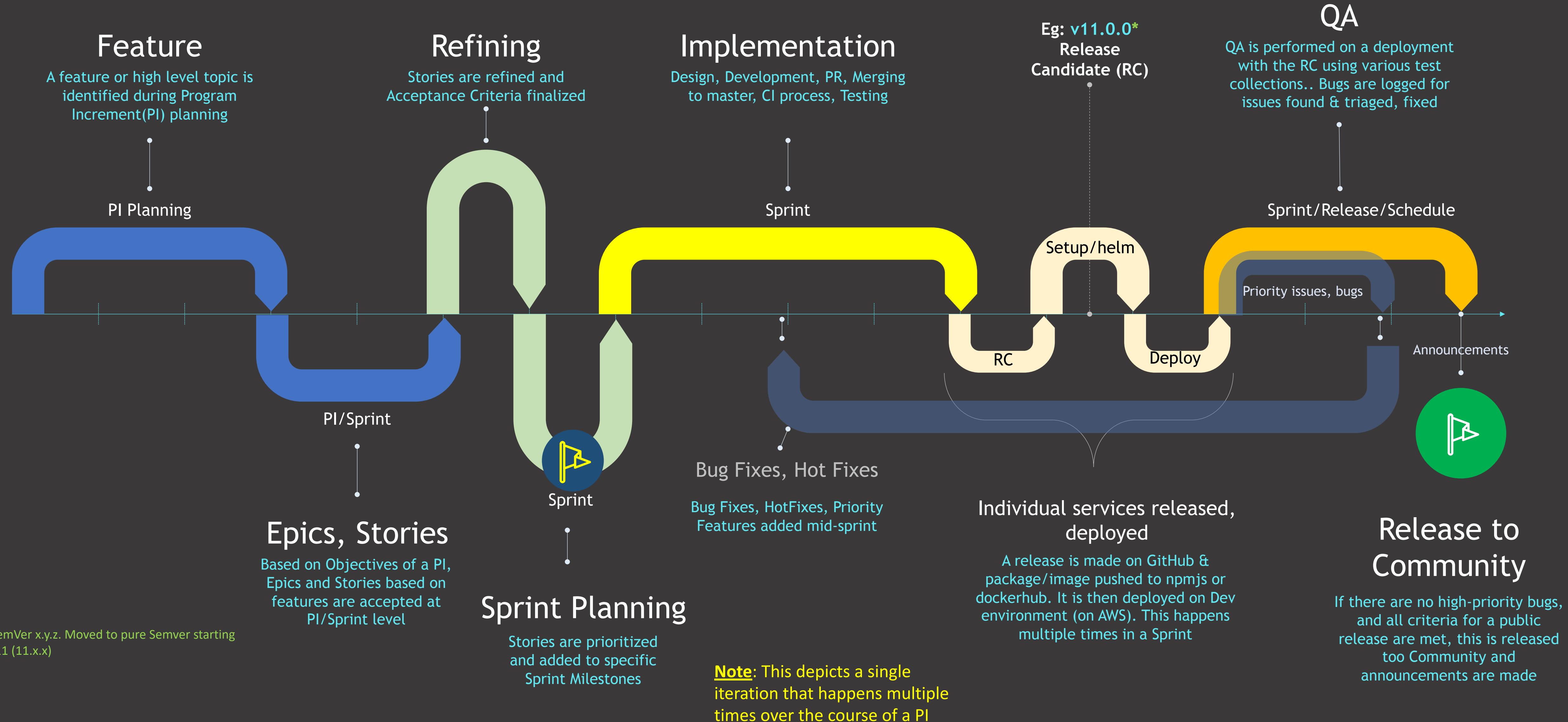


ML v14 & related enhancements, fixes



Thank you!

ML OSS: (Helm) Release Mechanism



Switch Functionality – Mojaloop (PI-17)

Payer-Initiated Transaction*

- [●] P2P Transfers
- [●] Prepares, Fulfils, Query
- [●] Rejections, Timeouts
- [●] Error Endpoints

Payee-Initiated Transaction*

- [●] MIMP Transfers
- [●] Transaction Requests
- [●] Prepares, Fulfils, Query
- [●] Rejections, Timeouts
- [●] Error Endpoints

Mojaloop: Focus Use-cases

1. P2P
2. Merchant ‘Request to Pay’
3. Bulk Payments
4. PISP payments

Bulk Payments

- [●] Bulk Transfers
- [●] Prepares, Fulfils, Query
- [●] Rejections, Timeouts
- [●] Error Endpoints

PISP Payments*

- [●] PISP
- [●] Transfers
- [●] Account Linking
- [●] Un-linking
- [●] Error scenarios

Key

- [●] Fully implemented
- [●] PoC / Initial Version
- [●] Partially implemented
- [●] Not implemented
- [○] Out of Scope

Switch FSPIOP Functionality – Mojaloop (PI-17)

Mojaloop v1.1: Use-cases

Payer-Initiated Transaction*

- [●] P2P Transfers
- [●] Prepares, Fulfils
- [●] Rejections, Timeouts
- [●] Error Endpoints

Payee-Initiated Transaction

- [●] MIMP Transfers
- [●] Transaction Requests
- [●] Prepares, Fulfils
- [●] Rejections, Timeouts
- [●] Error Endpoints

Mojaloop v1.1 – End Points for P2P

Transfers

- [●] POST - Prepare
- [●] PUT - Response
- [●] PUT – Error
- [●] GET - Query

Quotes

- [●] POST - Request
- [●] PUT - Response
- [●] PUT - Error
- [●] GET – Query

Authorizations*

- [●] GET - Query
- [●] PUT – Response
- [●] PUT - Error

Parties

- [●] GET - Request
- [●] PUT - Response
- [●] PUT - Error

Participants

- [●] POST - Create
- [●] PUT - Response

TransactionRequests*

- [●] POST - Request
- [●] PUT – Response
- [●] PUT - Error
- [●] GET - Query

Key

- [●] Fully implemented
- [●] Legacy Code
- [●] PoC / Initial Version
- [●] Partially implemented
- [●] Not implemented
- [○] Out of Scope

* Enhancements in PI-14

Mojaloop FSPIOP API v1.1 – Use-cases

Payer-Initiated Transaction

- [●] P2P Transfers
- [●] Prepares, Fulfils
- [●] Rejections, Timeouts
- [●] Error Endpoints
- [●] Customer-Initiated Merchant Payment
- [●] Customer-Initiated Cash-out - Receive Amount
- [●] Customer-Initiated Cash-out - Send Amount
- [●] ATM-Initiated Cash-out
- [●] Refund

Bulk Transactions

- [●] Bulk Payments

Payee-Initiated Transaction

- [●] Merchant-Initiated Merchant Payment
- [●] Agent-Initiated Cash-out
- [●] Agent-Initiated Cash-In – Send Amount
- [●] Agent-Initiated Cash-In – Receive Amount

Payee-Initiated Transaction using OTP

- [●] Merchant-Initiated Merchant Payment Authorized on POS
- [●] Agent-Initiated Cash-out Authorized on POS

Key

- [●] Fully implemented
- [●] Supported, not tested
- [●] Proof of Concept
- [●] Not implemented
- [○] Out of Scope

Switch Functionality – Mojaloop End-points (PI-17)

Mojaloop v1.1 – API Specification

Transfers

- [●] POST - Prepare
- [●] PUT - Response
- [●] PUT – Error
- [●] GET - Query

Parties*

- [●] GET - Request
- [●] PUT - Response
- [●] PUT - Error

Quotes*

- [●] POST - Request
- [●] PUT - Response
- [●] PUT - Error
- [●] GET - Query

Participants

- [●] POST - Create
- [●] PUT - Response
- [●] POST - Bulk Create
- [●] PUT - Error
- [○] DEL - Delete

Transactions

- [○] PUT - Response
- [○] GET - Query

TransactionRequests*

- [●] POST - Request
- [●] PUT - Response
- [●] PUT - Error
- [●] GET - Query

Authorizations*

- [●] GET - Request
- [●] PUT - Response
- [●] PUT - Error

BulkTransfers

- [●] POST - Request
- [●] PUT - Response
- [●] PUT - Error
- [○] GET - Query

BulkQuotes

- [●] POST - Request
- [●] PUT - Response
- [●] PUT - Error
- [○] GET - Query

Key

- [●] Fully implemented
- [●] Legacy
- [●] PoC / Initial Version
- [●] Partially implemented
- [●] Not implemented
- [○] Future Roadmap

Operational – Use Cases

Participants

- [●] Manage Participants
 - [●] Create Initial Value
 - [●] Query
 - [●] Update
- [●] Manage Participant Limits
 - [●] Create Initial Value
 - [●] Query
 - [●] Update
- [●] Manage Callback URLs
 - [●] Create Initial Value
 - [●] Query
 - [●] Update

Oracles

- [●] Manage Oracles
 - [●] Create
 - [●] Query
 - [●] Update
 - [●] Delete

Key

- [●] Fully implemented
- [●] Legacy Code
- [●] PoC / Initial Version
- [●] Partially implemented
- [●] Not implemented
- [○] Roadmap

Settlements v1.0 [Deferred Net]

- [●] Open, close Settlement Windows
- [●] Query Settlement Windows
- [●] Query Settlement Report
- [●] Create/Trigger Settlement (DMLNS) with Windows
- [●] Process successful Settlement Acknowledgements
- [●] Reconcile Positions based on successful Settlements
- [●] Process failed Settlement Acknowledgements

Positions

- [●] Query Positions
- [●] Manage Positions
 - [●] Create Initial Value
- [●] Query

Settlements v2*

- [●] Settlement models
- [●] Settlement by Currency
- [○→●] Interchange Fees
- [○→●] Continuous Gross Settlement (CGS)
- [○→●] Default Settlement Model
- [○→●] Simultaneous support for DMLNS, CGS