Mojaloop Core & Releases #PI-28

MojaCom28 Online meetings

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Agenda

1. Mojaloop Release v17.1.0
   a. Features
   b. Release process
2. Platform quality and security
3. Roadmap

Mojaloop

PI-27

** Version numbers guided by SemVer*

Mojaloop Platform

1. Mojaloop Core
   Transactional hub components and settlement i.e. API layer, central ledger (including bulk), settlement, ALS, quoting, trx req, Admin
2. Mojaloop Connector(s)
   Best practice Mojaloop connectors. I.e. Third-party services, sdk adapter/ml-connectors
3. Supporting services
   Interop: Connect with settlement banks, Onboarding FSPs, integrations (connection management)
4. Mojaloop Toolkit (TTK), ITK instances, Simulators, ALS support, CEP, Events processing
   Oracles - MSISDN or Merchant Registries
5. Finance portal (RBAC), Reporting
   Hub operator UI & API experience layer that is Implemented by business operations framework.
6. Monitoring support (Operational support)
   Operational support & tracing (e.g. EFK / Prometheus, Grafana, Loki, etc) [IaC: Grafana, Prometheus & Loki]
7. API Gateway
   IP filtering, Ingress/Egress, Firewalls, Security support (JWS, mTLS) [IaC provides this via Istio (older versions used WSO2)]
   Adds in the rules and enforces the Mojaloop Security design
8. Infrastructure
   Kubernetes, Infrastructure as Code, Automated deployments (IaC)
   Deployment artifacts - Helm Charts, Docker Containers, npm packages

Mojaloop v17.1.0

Mojaloop Release: Core

1. Base use-cases
    1. P2P, R2P, Bulk, PISP
    2. FX, Inter-scheme
    3. ISO 20022 messaging
    4. *Nodejs upgrade to v22*
2. Settlement: Deferred-net, Continuous Gross, FX support
3. Admin: Participant Lifecycle API
4. Third-party payments v1

Mojaloop IaC bundle

Bundled Mojaloop IaC Release (Mojaloop IaC Release 5.x.x / 6.x.x)

1. Gateway & Load Balancers
2. RBAC via Istio and Ory Stack
3. Mojaloop Security (mTLS, JWS, ILP)
4. Finance Portal – support for FX and inter-scheme
5. Reporting
6. Control Plane for CI/CD (GitLab) – CC v2
7. Technical Operational Dashboards
8. Participant Onboarding Support (Connection Manager)

Mojaloop Switch Functionality – FSPIOP Use Cases (PI-27)

Mojaloop FSPIOP API v1.1, v2.0 Use cases

Payer-Initiated Transaction

[●] P2P Transfers
[●] Customer-Initiated Merchant Payment
[●] Customer-Initiated Cash-out - Receive Amount
[●] Customer-Initiated Cash-out - Send Amount
[●] ATM-Initiated Cash-out
[●] Refund
[●] ***Foreign Exchange and Inter-scheme***

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
[●] Supported with functional tests
[●] Supported
[●] Proof of Concept
[●] Not implemented
[○] Out of Scope

Switch Functionality: Mojaloop End-points (PI-27)

FSPIOP API v1.1, v2.0 Specification

Transfers*
[●] POST - Prepare
[●] PUT - Response
[●] PUT – Error
[●] PATCH – Notification
[●] 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

fxQuotes*
[●] POST - Create
[●] PUT - Response
[●] GET - Query
[●] PUT - Error

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

*Enhancements in PI-25

Key
[●] Supported with functional tests
[●] Supported
[●] Proof of Concept
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[○] Out of Scope

Switch Functionality – Administration (PI-27)

Admin API v1.0 Specification

Participants

[●] Manage Participants
- [●] Create Initial Values
- [●] Query
- [●] Update

[●] Manage positions, limits
- [●] Create Initial Value
- [●] Query
- [●] Update

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

Settlement Models

[●] Settlement models
- [●] Configure
- [●] Query

Participant Accounts

[●] Manage accounts
- [●] Create
- [●] Query
- [●] Update
- [●] Funds In/Out

Transactions

[●] Transactions
- [●] Query

* Enhancements in PI-25

ALS Oracle API v1.0 Specification

Oracles (ALS)

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

Services

[○] Services FXP*
- [○] Get (Query)
- [○] PUT

Key
[ ] Supported with functional tests
[●] Supported
[●] Proof of Concept
[●] Not implemented
[○] Out of Scope

Switch Functionality – Settlement (PI-27)

Settlement API v2.0 Specification

Settlements v**1.0** [Deferred, Multilateral Net]

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

Settlements v**2**

[●] Settlement models
[●] Designs
[●] Settlement by Currency
[●] Interchange Fees
[●] Continuous Gross Settlement

Key
[ ] Supported with functional tests
[●] Supported
[●] Proof of Concept
[●] Not implemented
[○] Out of Scope

Switch – Third-party (3p) API v1.0 (PI-27)

Third-party API v1.0 Specification

Linking

[●] Pre-Linking
[●] Discovery
[●] Request consent
[●] Authentication
[●] Grant consent
[●] Credential registration

Un-Linking

[●] Un-linking

Third-party (3p) Transfers

[●] Discovery
[●] Agreement
  [●] 3p transaction request
  [●] 3p authorization
  [●] Signed authorization
  [●] Validate authorization
[●] 3p Transfer
[●] Query trxreq status

Key
[ ] Supported with functional tests
[●] Supported
[●] Proof of Concept
[●] Not implemented
[○] Out of Scope

Mojaloop Release Process - overview

Feature

A feature or high level topic is identified during Program Increment(PI) planning

Refining

Stories are refined and Acceptance Criteria finalized

Implementation

Design, Development, PR, Merging to main, CI process, Testing

QA

QA is performed on a deployment with the RC using various test collections.. Bugs are logged for issues found & triaged, fixed

Epics, Stories

Epics and Stories based on features are accepted at PI/Sprint level.

List items for the Release Candidate - Features, fixes, maintenance

Sprint Planning

Stories are prioritized and added to specific Sprint Milestones

Bug Fixes, Hot Fixes

Bug Fixes, HotFixes, Priority Features added mid-pi

Individual services released, deployed

A release for a repo/service/library is made on GitHub & package/image pushed to npmjs or dockerhub. It is then deployed on Dev environment (on AWS). This happens multiple times.

Release to Community

If there are no priority issues, and all criteria for a public release are met, this is released to Community and announcements made with detailed release notes.

Note: This depicts a single iteration that may happen multiple times

* SemVer x.y.z. Moved to pure Semver starting PI-11 (11.x.x)

ML Releases: PI-24/26 update for reference

v15.0.0 (PI-20/21)	v15.1.0 (PI-21)	Acacia v15.2.0 (PI-22/23)	Congo **v16.0.0** (PI-23)
1. Separations of external backend dependencies from Mojaloop Helm charts 2. Utilise externalised secrets for password management (#3082) 3. Bulk SDK functionality support out-of-the box 4. IaC v4.0.x with support for Mojaloop v15.0.0 & passwords with Special Characters managed by HashiCorp-Vault 5. Finance Portal v3 (BoF v3.0.0) fixes for passwords with Special Characters	1. Test against upgraded QA/Dev with K8s v1.26/1.27 2. Refactored QA/Dev env ease of maintenance with EKS 3. Enhanced SDK support for Request-to-Pay (R2P) 4. Follow-up bug-fixes 5. IaC v4.1.0 with support for Mojaloop v15.1.0	1. Upgraded QA/Dev env & Tested against K8s v1.28 2. General maintenance 3. Node upgrade (v18 LTS) 4. Performance setup, profiling and document bottlenecks (perf workstream) 5. Performance Stream improvements (enhancements, fixes, instrumentation, & contribs) 6. Automated, CI tests on ML releases with Helm snapshot support	1. General maintenance 2. Node upgrade for supporting services not updated in v15.2.0 3. Performance enhancements done by perf-workstream included 4. Automated CI steps on Mojaloop releases 5. IaC changes - new and refactored version

Release timeline PI27: MLF Product& work-streams

v17.0.0	v17.1.0 RC	Future *v17.x.x / v18.0.0*
1. FX, Inter-scheme support 2. Support for ISO 20022 messaging 3. Merchant payments features 4. PQS updates - security patches and upgrades 5. Performance enhancements 6. General maintenance	1. Nodejs upgrade to v22 2. PQS - security patches, SBOM & vulnerability management 3. Mysql2 upgrade (SSL support); DA issue #131 4. Cleanup unused charts 5. Documentation - release automation 6. General maintenance, bug fixes (knex)	1. Settlements improvements 2. Deployment improvements - Helm and IaC 3. TigerBeetle integration into Mojaloop Core 4. PISP Bulk API support (#107) 5. PISP v2 support 6. Enhance tracing components to use latest open-tracing standards 7. Automated CI testing on Helm PRs & Releases - completed 8. Migrate Charts (i.e. BoF) to Helm 9. Patch notification support for failures

Mojaloop Releases - Ongoing activities

1. RC testing for v17.1.0 in progress; GP tests passing
2. Vulnerabilities related updates - PQS
3. Performance whitepaper workstream support
4. Testing of Finance Portal deployment on Mojaloop Dev/QA environments
5. Facilitate Mojaloop deployment enhancements, documentation updates and related testing

Workstream progress can be tracked on Mojaloop project repo

Mojaloop Releases - Enhancements

1. Release cycle cadence, Support discussion (LTS)
2. Performance profiling releases
3. Closer integration with downstream tooling – Finance Portal, IaC, Test cases
4. Deployment enhancements (helm, IaC)
5. Documentation updates

Workstream progress can be tracked on Mojaloop project repo

Roadmap PI-27

1. v17.1.0 post-release activities
   a. Performance profiling
   b. IaC support
   c. Finance portal enhancements
2. Mojaloop v17.x.y / v18.0.0 release planning and support for incoming changes
3. Vulnerabilities related updates - PQS
4. Performance whitepaper workstream support
5. Facilitate Mojaloop deployment enhancements
6. Documentation updates and related testing

Mojaloop
Platform Quality & Security (PQS) PI-27

Mojaloop PQS: In addition to CI steps

1. GitHub tools – CodeQL, Dependabots, Synk, Co-pilot secret scans
2. Peer reviews of contributions
3. Sonarcloud scanning
4. Security audits every PI
5. Review security, quality processes during releases
6. Test coverage standards
7. End-to-end test suites
8. Deployment validation
9. Release checklist

Mojaloop CI pipeline

Mojaloop PQS: Mojaloop release v17.1.0

Review core and related repositories released with Mojaloop for

1. Dependabot alerts are addressed (moderate, high and critical)
2. *SBOMs created, published for all repositories published with a Mojaloop release*
3. *Aggregated SBOM for Mojaloop Helm attached to release notes*
4. *Provenance of Mojaloop helm charts*
5. Ensure main branch is protected and collaborator list is up-to-date
6. Ensure open PRs are addressed, closing stale PRs
7. Update audit exceptions json file to remove exceptions
8. Ensure codeowners file is current
9. Licensing issues fixed

Reviewing updates and vulnerabilities (GitHub, NVD, other related media) constantly

1. Take necessary action for Mojaloop services as required
2. Provide guidance and mitigate exposure to Mojaloop following the Mojaloop CVD and Cybersecurity policies

Mojaloop PQS: artefacts provenance

Provenance for helm charts

1. Helm charts signed during publishing
2. Signed charts can be verified during install or pre-install steps
3. Helm charts commands tested and verified
4. Options to include in scripts / CI tested
5. Available for both standard releases and dev releases
6. Introduction with the v17.1.0

PQS Workstream Mojaloop slack channel: https://mojaloop.slack.com/archives/C06UW0E2KBN

Mojaloop PQS PI-27: Vulnerability Management

1. Mojaloop vulnerability management processes published
   a. Documentation updates
   b. Mojaloop vulnerability management
      i. Vulnerabilities in dependencies
      ii. Vulnerabilities in application codebase
   c. Mitigation
2. Security practices in general (linking to CVD, cyber-security in Mojaloop)

Mojaloop PQS: SBOM updates

1. SBOM for components and Mojaloop platform
    - SBOM for individual repos published during release
    - Aggregated SBOM for Mojaloop (functional) published during Mojaloop release
2. Issues identified during SBOM documented, addressed
3. Included in CI tools (CI orb)
4. SBOM enhancements

Mojaloop PQS: Image scanning

1. Anchor-cli anchor-engine used until previous PI

2. Evaluated: Grype, Trivy – currently implemented Grype

3. Included in CI tools (CI orb) replacing anchor-engine

Mojaloop PQS: Roadmap

1. Support auditing capabilities
2. Hardening of Mojaloop releases - continuation
3. Vulnerability management in Mojaloop
4. Github *code scanning* - address issues
5. SonarCloud – analyze issues in detail
6. OpenSSF badge – self evaluation
7. Review tooling used in CI/CD - CI tools, license checkers
8. Blog posts and guidance to implementers and improve documentation
9. Provenance of Mojaloop artefacts (apart from helm charts)

Workstream progress can be tracked on Mojaloop project repo

Thank you!

Resources:

1. Mojaloop docs: https://docs.mojaloop.io
2. Mojaloop training program: https://learn.mojaloop.io/
3. Appendix following this

How we work

1. Messaging: Short-term - Slack; Community central - announcements
2. GitHub: Issues for longer form discussion; Issue tracking, Project
3. Documentation
   a. Markdown on GitHub for specifications and documents with long life.
   b. Sequence diagrams: Plant UML, DrawIO, etc…
4. Our Git process (forking/branching WF), the CLA
5. Quality gateways
6. Apache 2.0 License for code
7. API specifications: docs.mojaloop.io/api , Change requests, Solution Proposals
8. Scaled Agile Framework (SAFe)

Core & releases Mojaloop slack channel: https://mojaloop.slack.com/archives/C06VB2FHUER

Mojaloop

PHASES 1-2

2016	2016	2017	2018	2018	2018
JUNE	OCTOBER	OCTOBER	FEBRUARY	APRIL	SEPTEMBER
LevelOne Development project kickoff	API Specification project kick-off (PDP)	Mojaloop (branding) and OSS launch at SIBOS	Mojaloop API (FSPIOP) specification launch	First Mojaloop community event in Johannesburg	First Mojaloop official release v3.5.1 (pre-releases so far)

Mojaloop

PHASES 3-6

5.2.0

Sample release from February 2019 https://github.com/mojaloop/helm/releases/tag/v5.2.0

2019 Feb

10.1.0

Settlements enhancements

2020 May

10.4.0

FSPIOP v1.1 support for Mojaloop platform: https://github.com/mojaloop/helm/releases/tag/v10.4.0

2020 July

11.0.0

Semantic versioning standard adopted: https://github.com/mojaloop/helm/releases/tag/v11.0.0

2021 Jan

12.0.0

CGS, Interchange Fee supported: https://github.com/mojaloop/helm/releases/tag/v12.0.0

2021 Feb

13.1.0

Patch notifications, ALS, bulk fixes, enhancements, Testing enhancements

2022 Mar

14.0.0

Upgrade to node 16. Maintenance: Security, third-party, TTK, sdk updates

2022 Sep

Mojaloop

PI-25

Bulk payments enhancements

PI-19

14.1.0

14.1.1

PI-20

ML TTK enhancements, Rules UI enhancements

Separation of external dependencies, Bulk SDK support,

PIs 20/21

15.0.0

15.1.0

PI-21

SDK Support for RTP, DevOps; Move to EKS, **IaC v4.1.0**

Node upgrade to v18, Performance

PI-22

15.2.0

Acacia

16.0.0

Congo

PI-23-25

Performance improvements :Batching, logging. Release automation. IaC v5.0.0

- FX, Inter-scheme
- ISO 20022 support
- PQS Updates
- Performance improvements
- IaC upgrades

PI-26

17.0.0

Irrawaddy

Current latest – PI26

** Version numbers guided by SemVer*

Deployment Architecture: CI/CD Pipeline - circleci

Ref https://app.circleci.com/projects/project-dashboard/github/mojaloop

SUCCEEDED

v9.5.0-snapshot / build_and_test

Rerun

12 jobs in this workflow

Build & Publish Artifact
Docker or NPM build and publish to repository
Triggers: Tags

Deploy Artifact
Execute either helm install or upgrade (if existing deployment) with latest Artifacts
Triggers: Tags

Coverage Check
Executes Code Coverage checks. The results will be published to SonarQube if the branch is "Master".
(npm run test:coverage)
Triggers: PRs, Tags

Audit License Scan
Check NPM dependencies for License Issues
Triggers: PRs, Tags

Image Scan
Check Docker Image for Security Vulnerabilities
Triggers: Tags

setup	02:01	test-coverage	00:47	build	03:51	image-scan	08:43	publish	01:18
		audit-licens…	01:34			license-scan	00:55		
		test-unit	00:42						
		test-functio…	04:40						
		vulnerabilit…	00:27						
		test-integra…	05:24						

Setup
Setup initial OS and NPM dependency cache for tests, builds, and deployments.
Triggers: PRs, Tags

Unit Tests
(npm run test:unit)
Triggers: PRs, Tags

Execute Functional Tests
(npm run test:functional)
Triggers: PRs, Tags

License Scan
Check Docker Image for License Issues
Triggers: Tags

Vulnerability Scan
Check NPM dependencies for Security Vulnerabilities
Triggers: PRs, Tags

Execute Integration Tests
(npm run test:integration)
Triggers: PRs, Tags

Triggers:
- Pull-Requests (inc. from external Forks)
- Publishing tagged Releases
- Publishing tagged Snapshots

Mojaloop Transfers Architecture v1.1

Release Automation: validation, usage

1. Automated Update of Helm Chart Packages with **updatecli**
2. Detection of Breaking Changes - DB Migrations, Default Configuration Changes
3. Generation of Changelog
4. Determination of Next Release Version Number
5. Generation of Release Note
6. Deployment of RC to OSS Test Environment
7. Release Candidate Validation with TTK
8. Creation of Release Candidate Pull Request
9. Bug Fixes, PR Reviews, Github Release

The automation scripts can be found here:

https://github.com/mojaloop/helm/tree/main/.github/workflows

v16.0.0 - Congo

Latest

oderayi released this 2 weeks ago v16.0.0 e34bcf5

Helm Release Notes

Date	Revision	Description
2024-02-06	0	Initial draft
2024-03-13	0	Initial release

0. Summary

Enhancements and breaking changes to the v15.2.0 Release, which includes:

1. Performance improvement in Central Ledger via batching of position prepare and position filfill messages
2. Performance improvement in ALS with the addition of participant requests caching, and logging fixes
3. Refactoring of Quoting Service into an event-driven service to improve performance
4. Helm chart: external K8s secret are now used for JWS signing key source if present
5. General maintenance, bug fixes, and Nodejs upgrades

1. New Features

- **mojaloop/#3426** add participant req caching, enable cache metrics, log fixes (mojaloop/#465), closes mojaloop/#3426
- **mojaloop/#3427** add oracle endpoint db caching and oracle request caching (mojaloop/#467), closes mojaloop/#3427
- **mojaloop/#3441** nodejs upgrade (mojaloop/#252), closes mojaloop/#3441
- **mojaloop/#3636** batching implementation for position prepare messages (mojaloop/#968), closes mojaloop/#3636
- **mojaloop/#3524** add position fulfil to binprocessor (mojaloop/#990), closes mojaloop/#3524
- **mojaloop/#3524** add reserve action to fulfil logic (mojaloop/#992), closes mojaloop/#3524
- **mojaloop/#3666** refactor quoting service into an event driven solution to improve performance (mojaloop/#321), closes mojaloop/#3666