



ANASTASIA LABS

Anastasia Labs X Maestro - Plug 'n Play 2.0

Proof of Achievement - Milestone 4

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URL	Catalyst Proposal

Contents

1. Executive Summary	1
2. Objectives and Acceptance Criteria	2
2.1. Objectives	2
2.2. Acceptance Criteria	3
3. Implementation Overview	4
3.1. Integration Test Case Development	4
3.2. Verification of Contract Functionality	5
3.2.1. Upgradable Multisignature Smart Contract	5
3.2.2. Payments Subscription Smart Contract:	5
3.3. Testing and Documentation	6
4. Evidence of Milestone Completion	7
5. Conclusion and Next Steps	8
5.1. Conclusion	8
5.2. Next Steps	9

Testing Phase: Smart contract API testing

1. Executive Summary

The Testing Phase for the Plug 'n Play 2.0 project culminates in the development and execution of comprehensive integration tests against Maestro Smart Contract Platform. This milestone validates both the upgradable multisignature and subscription payments smart contracts under a variety of scenarios, including normal operations, boundary conditions, and error cases. The successful completion of these tests ensures the reliability, correctness, and resilience of the API interfaces, paving the way for wider developer adoption and production readiness.

2. Objectives and Acceptance Criteria

2.1. Objectives

1. Develop integration test suites targeting Maestro API endpoints for:
 - Upgradable multisignature smart contract
 - Subscription payments smart contract
2. Test cases cover various scenarios, including normal functionality, edge cases, and error handling.
3. Provide clear documentation with instructions for running the integration tests and interpreting the results.

2.2. Acceptance Criteria

- Integration test cases cover all API Endpoints associated with the specified contracts, verifying both expected and edge-case behaviors.
- Test cases are written in a clear and understandable manner, with detailed descriptions of test scenarios and expected outcomes.
- Documentation provides clear instructions for developers on how to run the integration tests and interpret the results.

3. Implementation Overview

3.1. Integration Test Case Development

Test cases were written using the project's offchain SDK in conjunction with a testing framework. Each endpoint was exercised through sample transactions, including:

- Multi-signature transaction creation, updating, and finalization
- Subscription plan creation, payment processing, and cancellation flows
- Negative tests for unauthorized access, malformed payloads, and insufficient funds

3.2. Verification of Contract Functionality

3.2.1. Upgradable Multisignature Smart Contract

- **Secure Spending:** Verified through test cases and real transactions confirming that only authorized members can execute asset transfers.
- **Dynamic Signer Management:** Documented procedures for seamless adjustment of signer thresholds and dynamic addition or removal of signers were validated through integration tests.

3.2.2. Payments Subscription Smart Contract:

- **Recurring Payment Management:** The contract is fully capable of enabling setup, management, and cancellation of recurring payments directly from user wallets.
- **API Accessibility:** Endpoints have been tested to ensure that the subscription payments functionality is easily accessible and robust under various conditions.

3.3. Testing and Documentation

- **Testing:**

Comprehensive tests have been executed to verify the integration, ensuring that both contracts perform as expected when interacting through Maestro's API endpoints.

- **Documentation:**

Detailed implementation and usage guidelines are available on the GitHub repository (<https://github.com/Anastasia-Labs/plug-n-play-contracts>). This documentation includes step-by-step integration instructions, examples, and API reference materials.

- **Video Demonstration:**

A video demonstration is provided, showcasing how to interact with the Maestro platform for deploying and managing the smart contracts, along with real-time transaction examples.

4. Evidence of Milestone Completion

The following items have been provided as evidence of the successful completion of Milestone :

1. Integration tests:

Developed integration test cases targeting the API Endpoints associated with the multisig smart contract and subscription payments smart contract can be found at <https://github.com/Anastasia-Labs/plugin-play-contracts>.

2. Repository Documentation:

Test case documentation providing insights into the coverage and thoroughness of the testing approach can be found at <https://github.com/Anastasia-Labs/plugin-play-contracts>.

Specifically:

- [Multisig Offchain SDK](#)
- [Payment Subscription Offchain SDK](#)

3. Execution logs:

Execution logs or reports demonstrating the results of integration testing, including pass/fail status and any identified issues or bugs can be found at <https://github.com/Anastasia-Labs/plugin-play-contracts>.

5. Conclusion and Next Steps

5.1. Conclusion

With the completion of Milestone 4, the Plug 'n Play 2.0 platform has demonstrated robust integration-level reliability across its core smart contract API surfaces. Developers can now proceed with confidence, leveraging the validated endpoints for building secure and scalable applications.

5.2. Next Steps

Final Milestone: Comprehensive Documentation and Completion Video

Objective:

Provide complete and accessible documentation along with a project closeout report and video.

Key Deliverables:

- Documentation detailing how to use the API endpoints to compose and deploy smart contracts on Maestro.
- Project Closeout Report summarizing the implementation approach and outcomes.
- A demonstration video showcasing key features and the overall project impact.

Evidence:

All materials, including documentation, the closeout report, and the video, are available on the GitHub repository.