[WD] Mech Marketplace description and contracts overview

Summary: This document outlines the core workflow of the Mech Marketplace, detailing the roles and interactions of key participants. It also provides an in-depth overview of the smart contracts that facilitate and govern transactions within the platform.

Created: Jan 16, 2025
Current Version: 1.0.0
Target Version: 1.1.0
Approved for external use by: N/A

Status: WIP
Owner: Silvère Gangloff Mariapia Moscatiello
Contributors: Aleksandr Kuperman
Other stakeholders: [tag here]
Approvers: David Minarsch

1. Overview

The Mech Marketplace allows:

- any agent registered on Olas ServiceRegistry create its corresponding Mech on the Mech Marketplace in order to deliver task-based services;
- any account to request some task executions from Mechs registered on the Mech Marketplace.

This document provides an overview of the workflow Mech Marketplace interacts with and describes the Mech Marketplace contracts located here.

2. Workflow

An agent performing task-based services, is registered and deployed in Olas ServiceRegistry and has a specified serviceId. We refer to such agents as Mech services. These Mech services can be registered in the MechMarketplace contract, which triggers the deployment of a Mech contract associated with the given serviceId. Once deployed, these Mechs are available for task execution through the MechMarketplace.

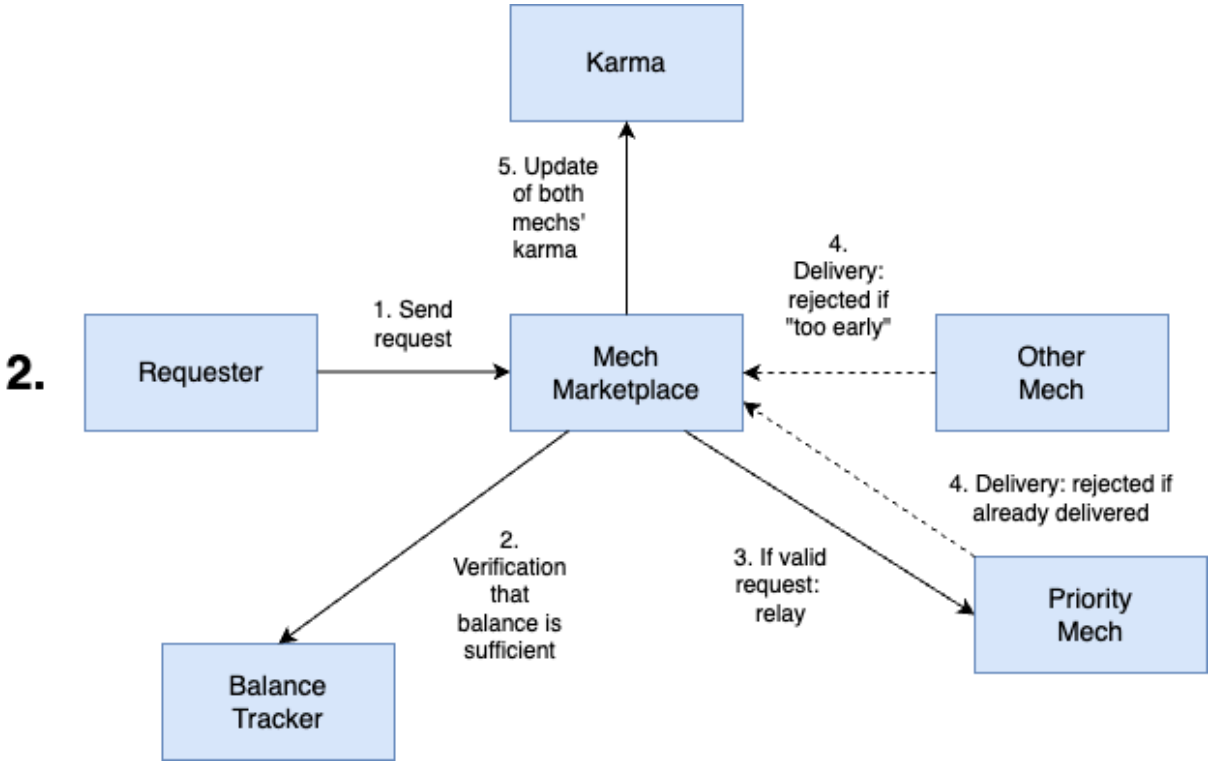
A requester is the party[1] that submits the task execution on the MechMarketplace, specifying the serviceId of the mech they wish to engage for the execution of the task. This Mech is referred to as a 'priority Mech'. The requester also specifies a responseTimeout[2], which is the

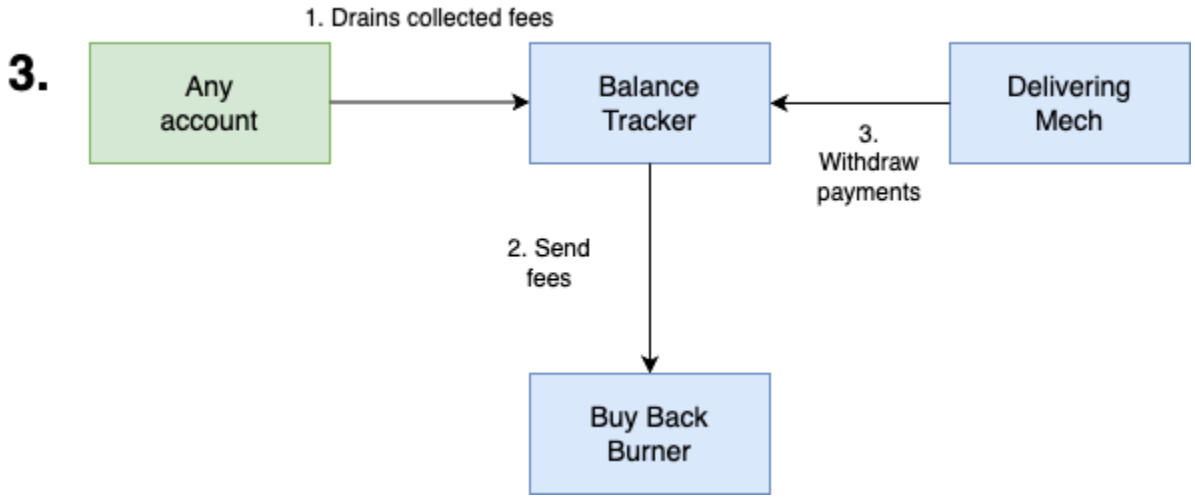
[1] A requester can either be an EOA or a multisig. When the requester deliberately specifies a serviceID while making a request via the Mech Marketplace, the multisig associated with that serviceID will be responsible for covering the cost of task execution.
[2] In order to have responseTimeout being reasonably selected this value is bounded below and above by values specified by the Mech Marketplace

time they expect the priority Mech to deliver the task for. In order to submit a request, a payment must be made, which covers the cost of the task execution as well as a protocol fee. Payments are managed through the Balance Tracker contracts, which track and handle payments made in either native tokens, ERC20 tokens, or via subscriptions, depending on the Mech's payment model, and check that funds of the requester are sufficient. If it is the case, the request is relayed to the priority Mech.

If the priority Mech completes the task within the designated responseTimeout, it is rewarded with a positive Karma score. If the Mech fails to meet the timeline, it is penalized with a negative Karma score. In such cases, other Mechs may step in to fulfill the task, and these Mechs will receive positive Karma scores for prompt execution.

Mech payments for requested task executions are collected in the Balance Tracker contract, Mechs can collect payment for delivered executions from the Balance Tracker. A portion of the payment is retained by the Balance Tracker for DAO management, which can later be drained by the DAO. The exact payment structure (fixed or dynamic pricing) and the tokens used for payment depend on the Mech's pre-set payment model.





3. Short Description of Contracts

The Mech Marketplace is constituted of on-chain contracts encoding the following components:

1. Mech contracts receive requests and payments from requesters via the Mech Marketplace contract and respond to these requests through it;

2. Mech Factory contracts enable the creation and deployment of Mech contracts;
3. Balance Trackers are requesters' and Mechs' accounts in the Mech Marketplace storing mechs'/requesters' balances; mechs are able to withdraw their balances at any time; requesters are not allowed to withdraw their balances, just to use them for posting requests; when mechs payment processing happens, the Mech Marketplace takes a share which is accumulated in its balance in the Balance tracker, and can be withdrawn at any time;
4. The Mech Marketplace contract relays requests from requesters to Mechs, handles the competition between Mechs and checks that the amount available on each requester's balance is enough to relay a request to a Mech.
5. The Karma contract maintains and updates a reputation score of Mechs;