DOME

(Distributed Open Marketplace for Europe)

Interchain Event Distributor – Unit and Integration Test Plan

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This document defines the unit and integration testing plan for the Interchain Event Distributor (IED) component.
This component is aimed to validate the correct handling of event publication, replication, and subscription across multiple blockchain networks,
in coordination with the DLT Adapters and Redis-based cache system.

All tests described here will be executed in an environment where real DLT Adapters and Redis are deployed and interconnected with the IED. 6

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Acronyms

Acronym	Definition
Item 1	Description
Item 2	Description
…	Description

Item n	Description

1 Scope

This document defines the unit and integration testing plan for the Interchain Event Distributor (IED) component.
This component is aimed to validate the correct handling of event publication, replication, and subscription across multiple blockchain networks,
in coordination with the DLT Adapters and Redis-based cache system.

All tests described here will be executed in an environment where real DLT Adapters and Redis are deployed and interconnected with the IED.

2 Objectives

• Validate that the IED publishes, replicates, and subscribes to events as described in the IED specification.
• Ensure that the event cache mechanism correctly tracks replication and notification states per network.
• Confirm that the 15 s delay before replication effectively prevents premature propagation.
• Verify that Desmos subscriptions receive the correct events with the expected payloads.
• Ensure interoperability and consistent behavior between IED and the DLT Adapter components under real conditions.

3 Preconditions

• A running Redis instance accessible by the IED, supporting SET operations.
• At least two running DLT Adapter components (e.g. HashNET and Alastria T).
• The IED configured with connection parameters for all available DLT Adapters and Redis.
• Real blockchain networks reachable through each DLT Adapter.

4 Test Environment

Component	Description	Notes
IED	Component under test	Deployed with logging enabled for event lifecycle tracing
Redis	Cache for published and notified events	Keys: publishedEvents:<chainid>, notifiedEvents
DLT Adapters	Real adapters for connected networks	Publish and subscribe endpoints reachable
Desmos	Operator component publishing and subscribing to events	Used to trigger end-to-end flows. **API calls will be used in this tests prior to real integration to Desmos.**

5 Unit Tests

Although most logic involves integration with other systems, the following internal behaviors of the IED can be validated through unit testing.

5.1 Cache Management

ID	Description	Expected Result
U1	Add event global id to published set for a network	Event appears in publishedEvents:<chainid>
U2	Check existence of event in published set	Returns true if present
U3	Add global id to notifiedEvents set	Event appears in notifiedEvents
U4	Remove network tag from event payload	Function returns body without network parameter

5.2 Delay Handling

ID	Description	Expected Result
U5	Verify that replication delay is respected (15 s)	Event is not marked for replication before 15 s elapse
U6	Verify timer resets correctly when new events arrive	Each event gets independent timing

5.3 Payload Assembly

ID	Description	Expected Result
U7	Verify payload normalization before replication	Replicated payload matches direct publication structure. In particular metadata of the network used should be removed by the IED before republicating an event.

6 Integration Tests

Integration testing will use real DLT Adapters and Redis. Each test validates correct propagation and subscription behavior across networks.

6.1 Direct Publication Flow

Step	Action	Expected Result
I1	Desmos publishes an event through IED	Event published to every configured DLT Adapter.

6.2 Replication Publication Flow

Step	Action	Expected Result
I2	IED updates publishedEvents sets for all configured networks	Redis entries updated accordingly for each chainid
I3	Publication of same event does not trigger replication to networks where it is already present.	IED detects presence in cache for some of the registered chainid and skips republication on those while publishing them in the missing ones

6.3 Subscription to all events Flow (Replication)

Step	Action	Expected Result
I4	IED subscribes to all events from each DLT Adapter	Every published event of every configured DLT Adapter is received by the IED callback registered
I5	When a new event is received, IED adds it to publishedEvents of source network	Redis set of each network updated accordingly
I6	IED republishes it to other networks after 15 s delay	Replication of events only happens after 15s to every configured network missing them.

6.4 Subscription to events of interest Flow (Desmos)

Step	Action	Expected Result
I7	Desmos subscribes through IED to specific events	Events of interest are the only ones being received
I8	IED checks notifiedEvents set; not found	Event eligible for notification via callback to Desmos

I9	IED notifies Desmos with event body (without network)	Desmos receives correct event payload **which shall exactly match the one sent by the DLT Adapter but without the network env**
I10	IED marks global id as notified	Redis updated; repeated notifications prevented
I11	IED does not notify events already notified (i.e. in the notifiedEvents set)	No notification for already notified events
I12	IED shall subscribe to each configured DLT Adapter via the subscription to events of interest	IED shall receive each event of interest published on each and every configured DLT Adapter

6.5 Cross-Network Consistency

ID	Description	Expected Result
I13	Publish event on network A; verify replication to network B only once	One entry per network
I14	Publish identical event twice; verify no double replication	Cache prevents duplicate publication
I15	Receive replicated event from network B; verify IED ignores it as already known to the A network	No new propagation triggered

7 Performance and Reliability Tests

• Simulate network latency on one DLT Adapter.
• Restart IED while Redis retains data and confirm state consistency.

8 Success Criteria

• All unit tests pass with expected outputs.
• All integration tests confirm correct event flow, cache updates, and replication timing.
• No duplicated or missing events observed across networks.
• 15 s rule strictly enforced.

Desmos receives events exactly once per global id.

9 Reporting

A SonarQube coverage report should be generated to verify good coverage of the code by the tests.