ARCHITECTURE DECISION / EXAMPLE 03

03

ILLUSTRATIVE CONTENT · NOT AN ACTUAL CLIENT REPORT

Architecture Decision Record

A compact, evidence-based decision note: context, options, selected approach, trade-offs, review triggers and accountable approval.

PREPARED BY
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DOCUMENT REFERENCE
EX-ADR-007

VERSION / DATE
1.0 · 14 October 2026

CONTEXT
Aster Sync (fictional service) · Illustrative example

01

DOCUMENT SECTION

Decision and status

An ADR begins with one specific choice

ADR-007 / Architecture

Local-first durable event outbox

Proposed · Example

Decision: Each device will persist outbound events in a local durable outbox before attempting synchronization. The central API will deduplicate by event ID and reconcile events using explicit domain rules.

DECISION BOUNDARY

This design ensures retryable delivery. It does not guarantee that two conflicting offline decisions can both be applied, nor does it provide global event ordering.

02

DOCUMENT SECTION

Context and drivers

What problem are we solving?

Field applications must record operator actions while disconnected. A transport-only retry scheme cannot guarantee that an action survives an application restart, and network acknowledgement may be lost after the server has already accepted an event.

- Network interruptions are expected and cannot be treated as exceptional.
- Duplicate delivery is preferable to silent data loss if consumers are idempotent.
- Users must see whether a recorded action is pending, accepted or rejected.
- Conflict resolution is a domain responsibility, not a transport timestamp rule.

03

DOCUMENT SECTION

Options considered

Show why the decision was made

Option	Advantage	Cost / risk
A · Direct API request	Simple online-only path.	Fails to capture reliably during outages; weak restart recovery.
B · Local durable outbox	Survives restarts; explicit delivery state; repeatable tests.	Requires storage lifecycle, idempotency and reconciliation logic.
C · Peer-to-peer replication	Can share data without central access.	Additional discovery, security and conflict complexity.

04

DOCUMENT SECTION

Consequences and trade-offs

State the downside as clearly as the upside

BENEFITS

What improves

- Durability during disconnection.
- Visible queue health and delivery status.
- Deterministic replay and incident review.

COSTS

What must be built

- Local storage migration and pruning.
- Server-side idempotency store.
- Operator conflict and rejection handling.

REJECTED SHORTCUT

Do not use last-write-wins for safety or access decisions without approved domain rules and an explicit causal model. Timestamps alone are insufficient evidence of authority.

05

DOCUMENT SECTION

Verification and review triggers

The decision is only complete when testable

- Client restart does not lose a queued event.
- Repeated sends do not repeat the business action.
- Conflict outcomes carry stable identifiers and reasons.
- Queue growth and permanent failures raise alerts.

Review this ADR if the requirements change to demand near-instant cross-device consensus, strongly ordered offline writes, or independently authoritative peer nodes.

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DOCUMENT SECTION

Decision ownership and history

Keep the final authorization distinct from the author

Attribute	Value
Decision owner	Platform Architect (example role)
Prepared by	Carlo Hennsa
Reference	EX-ADR-007
Status	Proposed / illustrative
Reviewed	Not reviewed
Issued	14 October 2026
Supersedes	None