

PAYMENTS SIGNAL REFERENCE ARCHITECTURE

SYNTHETIC / TRAINING ONLY

Clearing, RTGS, deferred-net settlement, liquidity, queues, and finality architecture

Separates payment admission, clearing, queueing, liquidity, settlement-asset posting, finality, participant posting, and reconciliation across gross and net models.

Version: Payments Signal reference architecture v1

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REFERENCE POSTURE

This blueprint contrasts logical settlement models. It does not reproduce a scheme's queue algorithm, liquidity-saving mechanism, legal finality rule, participant contract, or operating schedule. The selected rail overlay and current official documentation determine those details.

COMPONENTS

01 Sending participant and payment queue [application]

Owner: Participant payment operations and treasury

Validates, prioritises, funds, and submits payments from the sending institution.

02 Infrastructure access gateway [gateway]

Owner: Financial market infrastructure operator

Authenticates the participant, validates the service envelope, and protects the settlement boundary.

03 Clearing and eligibility engine [control]

Owner: Financial market infrastructure operator

Applies participant, message, timing, limit, and service rules before settlement.

04 Central queue and liquidity-saving logic [service]

Owner: Settlement service operator

Orders unsettled instructions and may offset or release them under documented liquidity-saving rules.

05 Central-bank or settlement-asset ledger [ledger]

Owner: Central bank or designated settlement institution

Makes the final debit and credit in the settlement asset under the infrastructure's legal and operational rules.

06 Deferred-net clearing cycle [service]

Owner: Clearing-system operator

Calculates participant obligations for a defined cycle before those obligations settle.

07 Receiving participant and beneficiary posting [application]

Owner: Receiving participant payment operations

Receives confirmed outcome, updates internal books, and makes funds available under the service rules.

08 Liquidity, settlement, and reconciliation operations [operations]

Owner: Infrastructure and participant operations

Monitors queues, balances, cycles, settlement evidence, and participant incidents.

INTERFACES

01 Settlement submission

clear-participant-a -> clear-access | message | asynchronous

02 Admitted instruction

clear-access -> clear-rule-engine | control | synchronous

- 03 Eligible gross instruction
 - clear-rule-engine -> clear-queue | settlement | asynchronous
- 04 Funded RTGS release
 - clear-queue -> clear-settlement-ledger | settlement | synchronous
- 05 Cleared cycle item
 - clear-rule-engine -> clear-net-cycle | file | batch
- 06 Net settlement obligation
 - clear-net-cycle -> clear-settlement-ledger | settlement | batch
- 07 Settlement confirmation
 - clear-settlement-ledger -> clear-participant-b | event | asynchronous
- 08 Queue and liquidity telemetry
 - clear-queue -> clear-operations | operator | asynchronous
- 09 Ledger and finality evidence
 - clear-settlement-ledger -> clear-operations | operator | asynchronous

TRACES AND STRESS CASES

TRACE: One funded RTGS payment

1. Participant releases a funded payment - Participant released
2. Infrastructure authenticates the submission - Technically admitted
3. Scheme eligibility passes - Eligible for settlement
4. Queue releases against liquidity - Funded and released
5. Settlement books debit and credit - Settled final
6. Receiver posts the beneficiary - Beneficiary posted
7. Positions reconcile - Reconciled

STRESS: Insufficient settlement liquidity

Settlement: No final settlement has occurred.

Funds: The participant's customer and internal reservation follow its own pre-settlement policy; the receiving participant has no settled funds.

Owner: Participant treasury and settlement operations

Safe action: Keep the payment queued, fund or reprioritise under the applicable rules, and do not report settlement early.

STRESS: Settlement ledger unavailable

Settlement: Unknown or not settled until the ledger's authoritative state is recovered.

Funds: Participant funds must not be double-debited and receiving participants must not infer finality.

Owner: Settlement service incident command

Safe action: Stop further release, recover the authoritative ledger state, and reconcile every in-flight instruction before reopening.

STRESS: Final settlement, delayed beneficiary posting

Settlement: Final settlement has occurred and must not be casually reversed.

Funds: Receiving participant holds the settled position; beneficiary funds await internal posting.

Owner: Receiving participant payment and core-banking operations

Safe action: Repair the customer posting idempotently from final settlement evidence; do not resend the interbank payment.