PAYMENTS SIGNAL REFERENCE ARCHITECTURE
SYNTHETIC / TRAINING ONLY

Card issuing, acquiring, authorisation, clearing, settlement, and chargeback architecture

Separate the real-time decision to approve a card purchase from later presentment, settlement, merchant funding, and dispute work.

Version: Payments Signal reference architecture v1
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REFERENCE POSTURE

This reference architecture shows common issuer, acquirer, network, clearing, settlement, merchant-funding, and dispute responsibilities. It omits scheme-specific message layouts, fees, interchange, stand-in rules, regional regulation, and precise dispute rights, all of which require current authorised material.

COMPONENTS

01 Cardholder and acceptance channel [channel]
Owner: Merchant or wallet acceptance owner
Captures card or token credentials, amount, merchant, device, and authentication context.

02 Merchant commerce and order service [application]
Owner: Merchant commerce team
Owns the order, creates one payment attempt, and separates order state from card-scheme state.

03 Acquirer gateway and merchant processor [gateway]
Owner: Acquirer processing
Validates the merchant, routes authorisation and presentment, and maintains acquiring records.

04 Card network and switch [external-network]
Owner: Card scheme or domestic switch
Routes authorisation and clearing records between acquirer and issuer and calculates scheme positions.

05 Issuer authorisation and card-control service [control]
Owner: Issuer cards and fraud operations
Checks account, credential, available funds, fraud, limits, and card controls before approving or declining.

06 Issuer, acquirer, and merchant books [ledger]
Owner: Issuer, acquirer, and finance teams
Records holds, clearing postings, scheme settlement, fees, and merchant funding without treating authorisation as final settlement.

07 Clearing, settlement, and merchant funding [service]
Owner: Scheme settlement and acquirer treasury
Matches presentments, calculates participant positions, settles, and funds the merchant according to the network and acquiring agreement.

08 Dispute and chargeback case management [operations]
Owner: Issuer and acquirer dispute operations
Tracks retrieval, representment, arbitration, evidence, reason codes, deadlines, and financial adjustments.

INTERFACES

01 Checkout payment attempt
card-holder-channel -> card-merchant | api | synchronous
02 Authorisation request
card-merchant -> card-acquirer | message | synchronous
03 Network authorisation
card-acquirer -> card-network | message | synchronous
04 Issuer authorisation
card-network -> card-issuer | message | synchronous
05 Authorisation hold
card-issuer -> card-ledgers | posting | synchronous
06 Presentment and clearing batch
card-acquirer -> card-clearing | file | batch
07 Network positions
card-network -> card-clearing | settlement | batch
08 Settlement and merchant funding
card-clearing -> card-ledgers | posting | batch
09 Dispute financial state
card-ledgers -> card-disputes | operator | operator
10 Chargeback and response
card-disputes -> card-network | message | asynchronous

TRACES AND STRESS CASES

TRACE: Purchase to merchant funding

1. Capture the payment - Customer intent captured
2. Create one attempt - Order awaiting authorisation
3. Route through the acquirer - Authorisation routed
4. Reach the issuer - Issuer decision requested
5. Approve and hold - Approved, not settled
6. Clear and settle - Presentment settled
7. Fund and reconcile - Merchant funding recorded

STRESS: Authorisation times out
Settlement: No clearing or settlement has occurred.
Funds: An issuer hold may or may not exist.
Owner: Acquirer payment operations
Safe action: Return an uncertain outcome and query or reverse under network rules; do not create a fresh customer charge blindly.

STRESS: Late or mismatched presentment
Settlement: Settlement depends on scheme treatment.
Funds: The hold and booked transaction may differ.
Owner: Issuer clearing operations
Safe action: Apply the current scheme rule; do not force-match unlike records.

STRESS: Chargeback evidence is incomplete
Settlement: Settlement is not undone merely by opening a dispute.
Funds: Any provisional credit must remain linked to the case.
Owner: Dispute operations
Safe action: Escalate the case and make only rule-supported provisional or final adjustments.