Line Whitepaper

On-demand credit for cross-border payments

Raphael Doukhan
Line

August 2026

Abstract

Line is a credit facility for cross-border payment institutions, built on Morpho Midnight, a non-custodial fixed-rate lending protocol for the Ethereum Virtual Machine. Payment institutions pre-fund the destination side of every corridor they serve, so that payouts can be made before customer funds settle; this float scales linearly with volume and sits idle most of the time. Line replaces it with short-dated stablecoin credit, drawn on demand and secured by the institution's in-flight settlement receivables. Each draw is a fixed-rate, fixed-term, zero-coupon loan in an isolated, access-controlled Midnight market. Capital is supplied through a permissionless vault and earns variable yield in Morpho Blue until a draw consumes it. Credit quality comes from offchain work: receivables verification, underwriting, bankruptcy-remote legal structures, and controlled collection accounts. The protocol handles settlement, exposure accounting, and the enforcement of limits. This paper describes the mechanism and its risk framework.

Disclaimer

This paper is published for general information purposes only and describes an intended system design at a technical level. It does not constitute, and must not be relied on as, investment, financial, tax, accounting or legal advice, nor as any recommendation or solicitation to buy, sell, supply, lend, borrow against, or otherwise transact in any digital asset, token, or smart contract position. Nothing in this paper should be construed as an offer of securities or of any other financial instrument, or of participation in any lending facility or fund.

The terminology used throughout this paper is used solely in a descriptive and functional sense, to explain the mechanical behaviour of smart contracts and operational services. In particular, terms such as "loan", "credit", "debt", "lender", "borrower", "note", "market", "offer", "liquidation", "collateral", "vault", "share", "deposit" and cognate terms refer to the mechanical behaviour of the described systems, and none of them is intended to denote, or should be construed as denoting, a regulated financial instrument, a security, a deposit, or any regulated product, activity or status under any applicable law.

Parameters, rates, yields, and figures referenced in this paper are design targets or illustrative examples; they are not guaranteed, are subject to verification against the deployed protocol, and are subject to change without notice. The legal structures described, including special purpose vehicles, sales of receivables, and account control arrangements, are jurisdiction-dependent and subject to legal and regulatory analysis in each market in which the system operates. Use of the underlying protocols may be restricted in certain jurisdictions, and users are solely responsible for compliance with the laws and regulations applicable to them.

"Morpho", "Morpho Blue" and "Morpho Midnight" refer to protocols developed by the Morpho Association. This paper is an independent publication and has not been reviewed or endorsed by the Morpho Association.

To the maximum extent permitted by applicable law, the author disclaims any and all liability for any direct, indirect, incidental, consequential or special losses, damages, costs or claims arising from or in connection with any reliance on this paper.

1 Introduction

When a payment institution moves money across borders, the payout usually happens before the money arrives. A customer in Paris hands euros to their provider; minutes later, a recipient in Manila is paid in pesos. No money crossed a border in those minutes: the institution paid from a balance it had positioned in the Philippines in advance, and it will be made whole only days later, when the customer leg settles and the corridor nets out. That advance positioning is *pre-funding*: nostro balances at correspondent banks, and floats held with local payout partners, in every corridor the institution serves.

Holding the float is expensive: it must be sized to peak flow plus weekend and holiday gaps, financed at the institution's cost of capital, and held in every corridor at once. On a typical day the bulk of it sits idle. Aggregate pre-funded liquidity across the industry is estimated in the trillions of US dollars [5], and the burden is concentrated in emerging-market corridors, where payment growth is fastest, settlement tails are long, and correspondent coverage is thinning [3]. Pre-funding also caps growth, since entering a corridor means funding it first. Reducing the cost and friction of cross-border payments has been an explicit G20 policy objective since 2020 [4].

Stablecoins compressed the settlement leg of this problem. A dollar balance can now move between two institutions in seconds, at any hour, with finality. Settlement speed does not, however, remove the funding gap: the payout still precedes the receipt, and in practice pre-funding migrates from correspondent accounts into stablecoin balances rather than disappearing. What remains is a credit problem: financing the interval, from hours to a few days, between a payout and the settlement that reimburses it.

The credit this calls for is short, one to fourteen days, and self-liquidating: each draw is repaid from an identified receivable already in flight, not from the borrower's general cash flows. It recurs with settlement cycles, a few times a day per corridor, and its cost must be fixed at the moment of the draw, because financing cost is an input to the price the institution quotes its own customers. Existing supply fits this shape poorly: banks are not positioned to provide such credit across dozens of jurisdictions on payment-industry timelines, and specialty lenders provide it expensively and opaquely. Onchain variable-rate lending pools hold the right asset but mismatch the need: rates float with pool utilization, capital idles between draws, there is no access control on either side, and liquidation is open to any caller, which is unworkable for collateral that represents a legal claim rather than a liquid asset.

Morpho Midnight [1] is a non-custodial fixed-rate lending protocol for the Ethereum Virtual Machine, organized around isolated, immutable, permissionlessly created markets with fixed maturities, in which lending and borrowing are implemented as the purchase and sale of zero-coupon *units*. This maps well onto payment finance. A settlement receivable is a zero-coupon instrument, a known amount on a known date, sold today at a discount; Midnight units have the same payoff, so a draw against a receivable is a single primitive operation, selling units at the discount that encodes the rate. Offers lock no capital, so a lender can quote continuously across every borrower and tenor while its funds earn elsewhere. Gates provide access control without custody risk, since exits can never be blocked. Liquidation,

together with the realization of losses, can be restricted to a designated liquidator, so that defaults resolve as a legal process instead of a public liquidation race.

Line composes this primitive into a credit facility for payment institutions. The protocol enforces settlement atomicity, limits, and loss isolation, and keeps the exposure accounting. Title to receivables, control of collection accounts, and priority in bankruptcy are legal matters, handled through the structure described in §4.2. Underwriting, verification, and pricing stay with the facility. Line's own onchain footprint is five small contracts; everything else is the canonical, audited Morpho deployment. The remainder of the paper covers the funding problem (§2), the properties of Midnight that Line relies on (§3), the architecture (§4), the life of a position (§5), the risk framework (§6), the economics (§7), and the vault through which capital enters (§8).

2 The funding problem

2.1 Pre-funded settlement

Consider an institution clearing $500 million a year through a single corridor. Average daily flow is roughly $1.4 million, but peak days run at a multiple of that, and settlement gaps span weekends and local holidays. In practice the institution holds a float of several million dollars for that corridor alone, and a mid-sized institution serves dozens of corridors. The aggregate float is financed with equity or corporate credit lines, typically at a double-digit cost of capital, and it earns little or nothing while it waits.

The float also constrains growth. Volume cannot exceed what the float can absorb on a peak day, so growing a corridor, or entering a new one, begins with parking more capital in it; institutions end up rationing their own growth by treasury capacity. A financing instrument that converts this fixed capital requirement into a variable cost, paid only when flow occurs, changes the economics of operating a corridor.

2.2 The settlement receivable

An institution that pays out ahead of settlement holds a claim for the gap. Customer funds have been collected and are in transit through the banking system, or a reimbursement is due from a counterparty under a netting arrangement. This claim, the *settlement receivable*, makes good collateral. It is short-dated and self-extinguishing, its amount is known at origination, its obligors are identifiable payment counterparties, and, when the receivable is genuine, historical loss rates in payment settlement are low.

The main underwriting risk is that the receivable is not genuine. Receivables finance has a long history of failures rooted in fabricated, double-pledged, or diluted receivables rather than in obligor default;[1] the underwriting problem is verification. This is also why the asset remains expensive to finance relative to its realized behavior. A facility that makes the

[1] Most prominently Greensill Capital (2021) and Stenn (2024), both of which collapsed after questions about the authenticity of the receivables they financed. *Dilution* refers to the reduction of a receivable's collectible amount through refunds, chargebacks, offsets, or disputes.

receivable verifiable, and that can act within hours when verification fails, can finance it at a price closer to its actual risk. Section 6.1 describes how Line does this.

2.3 Design requirements

This analysis reduces to seven requirements.

1. **Fixed cost at execution.** The full cost of a draw must be known in the transaction that creates it.
2. **Atomic draw-to-payout.** Borrowed funds should reach the payout partner in the same transaction that creates the loan, without resting on the borrower's balance in between.
3. **No idle capital.** The borrower draws on demand, and the lender's capital earns until it is lent.
4. **Isolation per name.** Exposure to each borrower must be individually accounted, priced, and contained: a loss on one name must not touch positions on another.
5. **Access control without custody.** Both sides of the market must be restricted to known, vetted institutions, but the restriction must be structurally incapable of trapping funds.
6. **Default as legal process.** Late payment and default must resolve through decisions made by the facility, on legal timelines.
7. **Small verifiable surface.** The bespoke code securing the facility must be small enough to audit exhaustively.

3 Morpho Midnight

This section summarizes the properties of Midnight that Line relies on; the Midnight whitepaper [1] is the reference for the full design. Midnight is deployed as a single immutable contract; markets on it are created permissionlessly and cannot be altered after creation.[2]

3.1 Markets and units

A Midnight market is defined by a loan token, a maturity date, a set of accepted collateral assets, each with its own oracle and liquidation loan-to-value ratio (LLTV), and two optional gate contracts. Within a market, positions are accounted in *units*: one debt unit is an obligation to repay one loan token before maturity, and one credit unit is a claim on those repaid tokens. Buying units increases credit, selling units increases debt, and a debt unit can be discharged at any time by repaying one loan token.

The rate is implied by the price. For units traded at price P, the simple rate over the remaining term is

$$r = \frac{1}{P} - 1.$$

[2] Canonical deployment addresses are published in the Morpho documentation. Midnight launched on Base in July 2026, after multiple independent audits and formal verification of the core contract.

Because markets mature on fixed calendar dates rather than on rolling tenors, positions created at different times but with the same maturity are fungible with one another. Trades net against existing positions: a borrower who buys units reduces its debt before accumulating credit, which allows a position to be exited early at market price instead of held to term.

3.2 Offers and just-in-time liquidity

Liquidity on Midnight is expressed through *offers*: signed statements of the price and maximum size at which a maker is willing to trade on a given market. Offers are distributed off-protocol and lock no capital; a *ratifier* contract validates them at execution time, and ratifiers can validate a Merkle root of an entire offer set, so that a single signature covers thousands of offers across many markets. Offers can be assigned to a common *consumption group* sharing one fill budget, which bounds the maker's exposure by the budget rather than by the sum of all signed offers.

Offers may carry a callback that executes at settlement, so the maker sources funds only when an offer is actually filled. In particular, a lender can keep its capital deployed in a Morpho Blue [2] market and have the callback withdraw it inside the settlement transaction. Midnight also provides free multi-token flash loans, which Line uses to move positions between maturities atomically (§5.4).

3.3 Gates

A market may specify two gate contracts, fixed at creation. The *enter gate* restricts who may increase credit or debt; the *liquidator gate* restricts who may liquidate. Gates apply only to entry: a participant can always exit by withdrawing credit, repaying debt, or withdrawing collateral, even if the gate contract reverts.

3.4 Liquidations and losses

A position is healthy while its debt remains below the value of its collateral weighted by the applicable LLTVs. Unhealthy positions may be liquidated, before or after maturity, with an incentive capped by an immutable market parameter; a *recovery close factor* caps each liquidation at the amount needed to restore health, so a minor breach cannot trigger full seizure. After maturity, any outstanding debt becomes liquidatable regardless of health, so that lenders can be made liquid; the incentive ramps linearly from zero to its maximum over sixty minutes, in the manner of a Dutch auction, to avoid transferring excess value from a merely late borrower to the liquidator.

If a full liquidation cannot cover a position's debt, the shortfall is *bad debt*, socialized proportionally among that market's lenders at the moment of liquidation. For Line, the relevant properties are that losses stay in the market where they arise and that, in a gated market, only the designated liquidator can crystallize them.

3.5 Fees

Midnight can charge two protocol fees, both bounded by immutable caps. A settlement fee applies at trade time as a function of time to maturity, with caps calibrated so that the implied annualized rate never exceeds 50 basis points (an absolute charge of at most 0.14 basis points at the shortest tenor). A continuous fee of at most 1% annualized accrues on outstanding credit and is borne by lenders, who crystallize their fee terms when entering a position; each offer also carries its own continuous-fee cap, so a maker's quotes cannot be repriced by a later fee change. Because the caps are immutable, the worst-case protocol cost is known in advance and can be priced into rates (§7.2).

4 The Line facility

4.1 Overview

Four parties interact with the facility. *Payment institutions* are the borrowers, each acting through a dedicated legal vehicle. *Capital providers* supply the loan token, a fiat-backed dollar stablecoin,[3] as permissionless depositors in the vault that is the facility's sole lender of record (§8). *Payout partners* are the whitelisted destinations to which drawn funds are delivered. *Line operations* runs the offchain services and co-signs onchain actions. Receivables sit in a legal layer, credit settles and is accounted onchain, and verification, pricing, and collections run offchain. Figure 1 shows the structure around a single market.

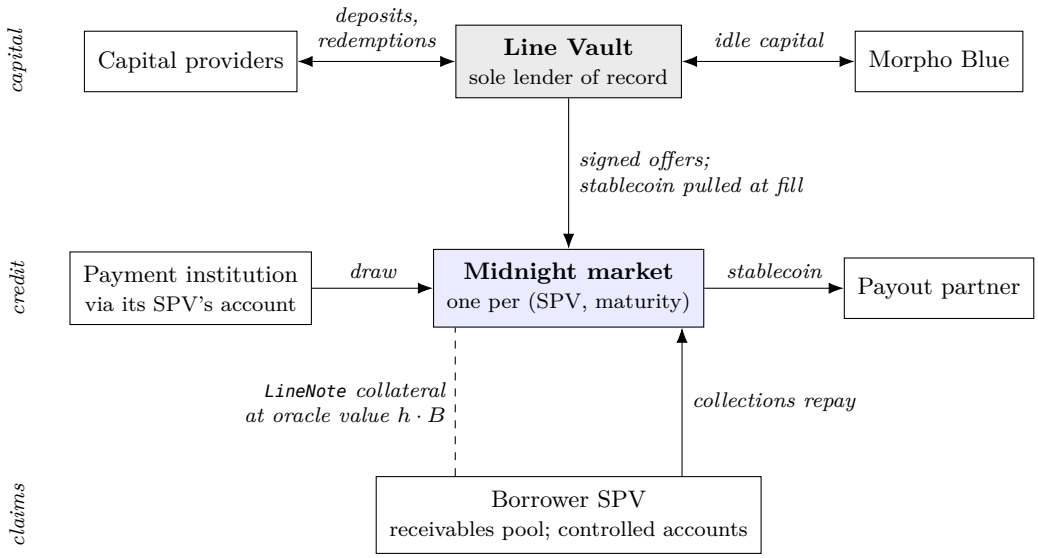

Figure 1: The facility around one market. The vault's deposit side is permissionless; both market gates are set, so the vault is the only lender and the recovery contract the only liquidator. Midnight, Morpho Blue, and the vault standard are canonical Morpho deployments; verification, valuation, rate-setting, and collections run offchain (§4.8).

[3]The specific stablecoin is selected at deployment; the design is invariant to the choice, and this paper refers to it simply as the stablecoin.

4.2 Legal structure

Each borrower borrows through a dedicated bankruptcy-remote special purpose vehicle (SPV). The institution sells or assigns its eligible settlement receivables to its SPV under a true-sale structure,[4] the facility takes a perfected security interest in the SPV's assets, and collections flow into deposit accounts under control agreements (DACAs), so that repayment cash reaches facility-controlled accounts whether or not the borrower cooperates.

The chain sees this structure through `LineNote`, a transfer-restricted token per SPV representing the senior claim on that SPV's receivables pool. Notes are minted and burned by the SPV trustee and can only move between the SPV's borrower account, the Midnight contract, and the recovery contract (§4.5). A note is an onchain handle on a legal claim, not a tradable instrument: liquidation transfers the claim to the recovery contract, and recovery itself proceeds through legal process (§5.5).

4.3 Collateral and valuation

The value behind a note is the SPV's *borrowing base* B: the receivables that pass verification, weighted by eligibility rules covering obligor concentration, aging, and dilution assumptions. A per-SPV oracle, `LineNAVOracle`, prices the note so that the collateral is worth $h \cdot B$, where h is a haircut. Since Midnight caps debt at collateral value times the LLTV, the *advance rate*, the fraction of the borrowing base a borrower can actually draw, is

$$A = h \times \text{LLTV}.$$

Line selects the LLTV from among the tiers Morpho has enabled and adjusts h to the chosen tier so that $h \times \text{LLTV} \approx 0.85$: against a tier of 0.86, $h \approx 0.99$; against a tier of 1, the haircut alone carries the advance rate. The un-advanced remainder, roughly fifteen percent of the base, is the borrower's equity in its own SPV and absorbs losses first.

The oracle's update rules are asymmetric. Upward moves are bounded per update and rate-limited, which caps how fast a compromised signer could inflate the base; downward moves are unbounded and instant, so writedowns take effect without delay. If the oracle is not updated for twenty-six hours, against an hourly heartbeat, it reverts on read. Midnight's semantics make this failure mode safe: a reverting oracle blocks new draws and collateral withdrawals but never blocks repayment or lender withdrawals; an oracle outage cannot trap funds. It also blocks liquidation; a guardian quorum can restore a price before recovery actions proceed.

4.4 One market per borrower and maturity

Line creates one Midnight market per pair of borrower SPV and maturity date, with the stablecoin as the loan token and that SPV's note as the sole collateral. Maturities lie on a daily grid from one to fourteen days ahead, anchored at a fixed hour aligned with corridor settlement cycles. Isolation at this granularity satisfies requirement 4: exposure to each

[4] A *true sale* transfers ownership of the receivables to the SPV in a way designed to survive the originator's bankruptcy: the receivables belong to the SPV, they are not merely pledged by the institution.

name can be read directly from the chain, priced individually in the rate curve, and, in the worst case, loss socialization is confined to the market of the borrower that caused it. The market count stays modest, on the order of a few hundred live markets for fifty borrowers; creation is permissionless, cheap, and automated as the grid rolls forward each day.

4.5 Access control

Every market sets both gates to Line's gate contract. On the borrow side, only registered SPV accounts of vetted institutions may take on debt. The lend side is gated too. An open lend side would let third parties undercut the facility's quotes on names whose credit they cannot see, race the facility for repaid funds, and lend outside the per-name caps. More fundamentally, losses in a gated market are crystallized only by the facility's recovery contract, against valuations produced by the facility's oracle; a third-party lender at market level would bear outcomes it can neither observe nor influence, with no liquidation rights and, because notes cannot be transferred to it, no claim on the underlying receivables. The lend side therefore never opens; external capital enters one layer up, as shares in the facility's vault (§8), where participation can be disclosed and priced.

The liquidator gate admits only `LineRecovery`, operated by the operations quorum. Because no external liquidator can touch a position, a borrower that is late for operational reasons, say a banking cutoff or a public holiday, faces no automatic seizure; the facility decides whether to forbear, and only it can crystallize a loss. Exits, as everywhere on Midnight, are never gated: the facility controls who enters and how defaults resolve, but it cannot stop anyone from leaving. The allowlist is managed by a compliance quorum, with additions behind a timelock and removals immediate.

4.6 Lending without idle capital

The facility lends as a Midnight *maker*. A rate engine builds, several times an hour, a ladder of buy offers for every pair of borrower and maturity, from a base curve plus a per-name spread and a utilization adjustment (§7.1). The entire ladder is published as one Merkle tree ratified by a single hardware-secured signature, and every offer expires within fifteen minutes, so the quoted curve can never be stale by more than that. In normal operation nothing is canceled; offers simply lapse.

Offer parameters double as enforced policy. Each offer's consumption group is the borrower's identifier, and its budget is that borrower's remaining limit, so per-name caps are enforced by the protocol at execution time. Offers in the main ladder also carry a callback into Morpho's audited Blue-callback periphery: the vault's capital sits in Morpho Blue earning variable yield and is withdrawn just-in-time, inside the transaction that lends it (requirement 3). A second tranche of offers with no callback draws on a small buffer held directly in the stablecoin, sized around a fifth of peak hourly draw volume, for moments when Blue liquidity is tight.

Offers are the facility's only standing commitment, and any one of five shutdown layers stops new lending: stop signing, and all quotes lapse within fifteen minutes; exhaust a consumption group, and draws for that name stop immediately; cancel a Merkle root, and

the whole tree is invalid; revoke the signer's authorization on Midnight, and no offer can validate; or withdraw the Blue position, after which callbacks fail and any take reverts.

4.7 Borrower accounts

Each SPV holds its position through a `LineBorrowerAccount`, a minimal smart account enforcing dual control. The payment institution signs a typed draw instruction, specifying corridor, amount, tenor, and destination; Line operations executes it. The account verifies the institution's signature, checks the destination against a whitelist of payout partners, enforces per-instruction nonces and limits, and only then calls the protocol. Neither party alone can move money: the institution cannot direct funds to an arbitrary address, and operations cannot originate a draw the institution did not sign.

The draw path uses a Midnight feature that delivers requirement 2 directly: the taker of an offer may name a third-party receiver for the proceeds. The same transaction that sells units, creates the debt, and checks collateral health also delivers the stablecoin to the payout partner; drawn funds never rest with the borrower.

4.8 Offchain services and reconciliation

Seven services surround the chain: the draw API, the risk engine, receivables verification and the NAV pipeline, the rate engine, collections and reconciliation, chain operations, and treasury. They share an event-sourced ledger, and every chain write passes through a policy engine over multi-party keys, with named policies and quorums per transaction type. Draws are made at treasury level: the institution nets its own payment flow and finances net corridor liquidity a few times a day. The system therefore executes tens of transactions a day, and underwriting operates at the level of settlement cycles.

The central offchain task is verification. Every receivable in the borrowing base is triangulated against both endpoints of its corridor, the institution's processor ledger on one side and the payout partner's ledger on the other, so a fabricated receivable would have to be fabricated consistently inside independent companies' systems. The reconciliation service continuously computes four invariants (the checks a securitization trustee performs periodically), attested daily:

1. onchain debt per SPV equals the servicer ledger's outstanding balance per borrower;
2. each oracle price equals an independently recomputed $h \cdot B$, from a second pipeline;
3. bank collections, plus stablecoin in transit, plus onchain claims, equal expected settlements;
4. vault net asset value, the basis of the share price, equals the Blue position, plus the buffer, plus units at accreted value, minus loss provisions.

4.9 Protocol surface

Line builds no lending logic of its own. The facility's entire bespoke surface is five contracts:

Contract	Role
`LineGate`	Enter- and liquidator-gate allowlist under the compliance quorum
`LineNote`	Transfer-restricted senior claim on one SPV's receivables pool
`LineNAVOracle`	Signed valuations; bounded up-moves, instant down-moves, staleness reverts
`LineBorrowerAccount`	Dual-controlled account for draws, repayments, and rolls
`LineRecovery`	Gated liquidator holding the first-loss reserve

Everything else is reused as deployed and audited by Morpho: the Midnight singleton, the offer ratifier, the Blue callback periphery, Morpho Blue, and the vault standard on which §8 is built.[5] The five Line contracts undergo independent audits and invariant fuzzing against the live Midnight deployment before the facility holds outside capital. The surface is small enough to be audited line by line (requirement 7).

5 The life of a position

5.1 Draws

A draw begins with an API call from the institution: corridor, amount, tenor, destination. The risk engine checks the name's limits, covenants, and verified flow; chain operations selects the market for the requested maturity, picks the offers to fill against, and executes the signed instruction through the borrower account. Inside the single resulting transaction, the callback pulls the stablecoin from Morpho Blue, the protocol routes it to the payout partner, the SPV's debt increases by the units sold, and the position's health is checked against the note's oracle value. End to end, the target is under ten seconds.

The cost is locked at the same time. The draw sells units at the price that encodes the quoted rate for that name and tenor (§7.1): the borrower receives the amount now and owes the face value at maturity, and the difference, the financing cost, is fixed at execution whatever happens to rates afterwards (requirement 1).

5.2 Repayment

Receivables settle into the controlled collection accounts; the collections service converts fiat to the stablecoin and repays the SPV's debt onchain. Repayment is never gated, works before or after maturity, and can be partial. The borrower never touches the repayment path: cash flows from obligors to controlled accounts to the protocol. As positions mature and repay, the facility withdraws its credit and re-supplies Morpho Blue.

[5] The Midnight core was audited by multiple independent firms in 2026 and is accompanied by formal verification of its central invariants. The lending engine is the component that has absorbed years of adversarial review; rebuilding it would replace that history with new code.

5.3 Early repayment

Because trades net against existing positions, a borrower whose receivables settle early can buy back its own units at the prevailing discount and extinguish debt at fair value rather than face value. The facility supports this by publishing reduce-only sell offers alongside its buy ladder.

5.4 Rolls

When a receivable is late for operational reasons, the facility can extend instead of recovering. Collateral in Midnight is per-market, so moving a position to a later maturity involves several steps, which Line executes atomically using the protocol's free flash loans: borrow the debt amount, repay the old market, move the note to the new market, sell units there at the current offer, and repay the flash loan. A roll is priced as a fresh draw at the new maturity's rate, and eligibility is a credit decision made case by case by the risk engine.

5.5 Late payment and default

When a maturity passes unpaid, the position enters Midnight's post-maturity mode and becomes liquidatable, but the liquidator gate admits only the recovery contract, so no liquidation occurs until the facility initiates it. Operational lateness is met with forbearance or a roll. A declared default follows a fixed sequence: `LineRecovery` liquidates the position, spends the facility's first-loss reserve to repay units, and seizes the SPV's notes. The reserve protects lender principal up to its size; seizing the notes moves the senior claim on the receivables pool to the recovery contract. From there, recovery is a legal process: collecting the receivables and enforcing the security interest, including over the controlled accounts.

If losses exceed the reserve, the protocol's loss socialization applies, confined to that borrower's market. The vault is that market's sole lender, so the residual loss lands on the vault, per name, and is borne by share net asset value (§8.3).

5.6 Writedowns

If verification detects fabricated or diluted receivables, the NAV pipeline writes the borrowing base down immediately; unbounded downward moves exist for this purpose. The writedown makes the position unhealthy and opens normal-mode liquidation to the recovery contract at once, before maturity. New draws for the name are already halted by then, through the shutdown layers of §4.6. The interval between detection and containment is designed to be minutes, well inside the hours §2.2 called for.

6 Risk framework

6.1 Fraudulent receivables

Fabricated collateral is the failure mode that has ended receivables lenders (§2.2), and the framework treats it as the primary threat. Verification is triangulated against both

corridor endpoints (§4.8). Draw capacity is capped to verified flow, so even a verified name cannot draw ahead of its real activity. Dilution and delinquency covenants carry automatic limit consequences, advance rates are staged for young names and increase with observed settlement history, and obligor concentration caps apply inside the borrowing base. Section 5.6 describes the writedown path once fraud is detected.

The residual risk is collusion spanning both endpoints of a corridor, which would defeat triangulation and cannot be fully eliminated. Limits for a new name therefore start small and grow with settlement history, partner due diligence is part of onboarding, and anomaly detection watches flow patterns, though it has no production history yet.

6.2 Borrower and obligor credit

The advance rate near 85% leaves the borrower's equity as the first roughly fifteen points of loss absorption on its own pool. The facility's first-loss reserve, targeted at no less than ten percent of outstanding credit, ranks next, ahead of lender principal. Concentration limits apply at every level: per obligor within a borrowing base, per name through onchain consumption groups, and per corridor in the risk engine.

6.3 Oracle integrity

The oracle design assumes the signer can be compromised and the valuation pipeline can be wrong. Up-moves are bounded and rate-limited (§4.3); a second, independent pipeline recomputes every valuation and raises an immediate alert on any divergence (invariant 2 of §4.8); staleness fails safe, blocking new credit but not exits; and a guardian quorum can restore a price when recovery actions require one.

6.4 Liquidity

Just-in-time sourcing means a draw can fail if Blue liquidity is momentarily insufficient, but it fails atomically: the protocol checks the callback's proceeds in the same transaction, so a draw either completes whole or reverts. The buffer tranche of §4.6 absorbs such moments, idle capital is spread across at least two deep Blue markets, and utilization alerts fire well before either source thins. On the liability side, redemptions from the vault (§8) are an onchain obligation from the outset. Share pricing inherits the oracle's instant writedowns, so an informed depositor finds no stale price to exit at, and the fourteen-day maturity grid bounds any redemption queue (§8.4).

6.5 Infrastructure

A sequencer outage halts draws, and the system fails closed: no new credit is created, no external liquidator can act, and borrowers whose repayments the outage delayed are given forbearance. Settlement-asset risk is confined to a single stablecoin, held against a direct redemption line with its issuer, with a depeg monitor that halts new draws beyond a threshold.

6.6 Protocol governance

Line's exposure to Morpho governance is bounded by the protocol's own immutability. Markets cannot be altered after creation; the singleton is not upgradeable; enabled LLTV tiers and liquidation parameters are append-only lists, so the tier a market uses cannot be disabled retroactively; exits can never be gated; and both protocol fees are bounded by immutable caps, with each offer carrying its own continuous-fee cap on top. The worst case, fees rising to their caps, is a priced input (§7.2), and fee-setting events are monitored.

6.7 Keys and operations

No single key can move principal to an address outside the whitelisted set. Offer signing lives in a hardware security module whose authorization on Midnight is revocable in one transaction; the facility account is a multi-party quorum, not an externally owned account; the oracle signer can only post bounded valuations; gate additions sit with a compliance quorum behind a timelock, with removals immediate; restoring a stale oracle price requires the guardian quorum; and recovery execution requires the operations quorum. Monitoring raises alerts on oracle staleness, bad debt crystallized in any market, post-maturity positions, reconciliation breaks, per-name utilization, sequencer health, and the stablecoin's peg. The shutdown layers of §4.6 bound the facility's standing commitment at all times.

7 Economics

7.1 Pricing

Each draw is a zero-coupon loan: the borrower receives the amount today and repays a slightly larger face value at maturity. The difference is the cost of the loan,

$$\text{cost} \;=\; \text{amount} \times r \times \frac{d}{365},$$

where r is the annualized rate quoted for the borrower's name and tenor, and d is the number of days to maturity. On Midnight the quote is a unit price, $P = 1/(1 + r\,d/365)$, so that the term rate of §3.1 equals $r\,d/365$.

The rate is set as

$$r \;=\; \text{base curve} \;+\; \text{name spread} \;+\; \text{utilization adjustment}.$$

- **Base curve.** The facility's cost of funds at each tenor from one to fourteen days. It moves with the yield the facility's capital earns while idle in Morpho Blue, since every draw pulls capital out of that position (§4.6). The base curve is the same for every borrower.
- **Name spread.** The borrower's credit spread, set at onboarding and reviewed as settlement history accumulates. Its inputs are the quality of the verified receivables, dilution and delinquency history, obligor and corridor concentration, and time on the facility. New names start with a higher spread and lower limits; both improve with track record.

- **Utilization adjustment.** A small increment as a name approaches its limit, or when the facility as a whole is heavily drawn.

7.2 Borrower cost

A borrower's cost per draw is the discount of §7.1 plus the protocol's fees, all fixed at execution. The settlement fee is charged at trade time, and the continuous fee, borne by the lender, is passed through in the rate; both are bounded by the immutable caps of §3.5 and currently sit below them. Even at the caps, protocol cost is a known, bounded input to the rate.

The comparison that matters to a borrower is with the float the credit replaces. Pre-funding must be sized to the peak day and financed even when idle; a draw costs money only when it happens. An institution carrying a float pays for all of it every day, while the same corridor financed on demand pays only for the amount actually in flight and frees the rest.

7.3 Lender yield

The facility's yield is a blend of drawn and idle returns, net of fees:

$$y \;=\; u \cdot r_{\text{drawn}} \;+\; (1-u) \cdot r_{\text{idle}} \;-\; \varphi,$$

where u is utilization, r_{drawn} the fixed rate earned on outstanding draws, r_{idle} the Morpho Blue variable yield, and φ protocol fees plus loss-reserve accretion. Un-deployed capital is not a drag here: it earns the Morpho Blue rate until it is lent, so low utilization costs only the spread between the drawn and idle rates.

The resulting asset is short-duration senior credit against verified payment receivables: borrower equity absorbs the first losses on each pool, the facility's reserve ranks ahead of lender principal (§8.3), exposure reprices in days, and per-name isolation is enforced by the protocol.

8 The vault

Outside capital enters the facility in one place: a single vault, built on Morpho's audited vault standard, which is the sole gated lender on every Line market. Deposits are permissionless from the outset; the markets the vault funds remain gated.

8.1 The lender seat

Lending on Midnight is work passive capital cannot do: pricing a curve for every name and tenor, signing offer trees, sourcing funds at fill time, and standing behind the valuations against which position health is measured. The vault therefore separates the two roles: depositors supply the stablecoin, and the facility runs the credit operation.

The vault does not change market-level mechanics. The enter gate of every market admits the vault as its one lender of record, the rate engine signs the same offer ladders within the same per-name budgets, idle capital continues to earn in Morpho Blue until pulled at fill,

and the liquidator gate admits only the recovery contract, however widely the shares are held; the guarantees of §4 are unaffected.

8.2 The share

A share is a claim on the vault's net asset value: the Morpho Blue position, plus the buffer of §4.6, plus units held at accreted value, less loss provisions. This is the fourth reconciliation invariant of §4.8, recomputed continuously and attested daily, so shares are minted and redeemed at a price the facility already proves as part of its own accounting. Yield is realized as the change in net asset value per share. Its floor is the idle book: at zero utilization the vault is simply a Morpho Blue position, paying the variable rate from the first deposit. As draws consume capital, the fixed rates on outstanding units blend in and the yield converges to the composition of §7.3.

8.3 Seniority

Depositors hold the senior claim in a three-layer stack. A loss in a receivables pool strikes the borrower's own equity first, the roughly fifteen un-advanced points of its borrowing base. Next comes the facility's first-loss reserve, targeted at ten percent or more of outstanding credit and spent by the recovery contract before any loss reaches the lender of record. Only a loss that exhausts both layers reaches share value; it arrives per name, through the loss socialization of the single affected market (§5.5), and in the block in which it is recognized, since share pricing inherits the oracle's writedowns (§6.4). The reserve is funded from the facility's share of the yield (§7.3), so valuation and recovery errors cost the facility before they cost depositors.

8.4 Redemptions

Redemptions are served instantly from idle capital; beyond it they queue behind maturing positions. Every position matures within fourteen days, a bound known in advance, so the book self-liquidates at the pace of the maturity ladder and a queued redemption is funded by settlements already in flight; no assets need to be sold.

8.5 Aggregation

Shares are a standard vault position and compose accordingly: third-party curated vaults can allocate into the facility as they would into any other yield source, and their own depositors aggregate behind them. The deposit graph above the vault is therefore unbounded. Below it, each market keeps exactly one lender and one liquidator.

9 Conclusion

The remaining liquidity constraint in cross-border payments is fundamentally a financing problem. Stablecoins have reduced settlement time, but they do not eliminate the need for payment institutions to fund payouts before the corresponding receivables settle. Prefunding therefore remains a structural and capital-intensive requirement.

Line proposes to replace this static liquidity with a short-duration, self-liquidating credit facility. By financing verified settlement receivables on demand, the facility allows institutions to fund payment flows without maintaining equivalent balances across every corridor. Morpho Midnight provides the fixed-rate, isolated lending primitive required to execute this model, while verification, underwriting, legal control, and recovery remain offchain.

Line converts pre-funded corridor liquidity from a permanent capital requirement into a recurring financing activity, allowing payment institutions to scale settlement without proportionally increasing idle liquidity.

References

[1] B. N. Bhatt, P. Frambot, Q. Garchery, M. Gontier Delaunay, A. Husson, P.-A. Nicole, A. Laversanne-Finot, and M. Lesbre. *Morpho Midnight Whitepaper*. Morpho Association, May 2026.

[2] M. Gontier Delaunay, P. Frambot, Q. Garchery, and M. Lesbre. *Morpho Blue Whitepaper*. 2023.

[3] Committee on Payments and Market Infrastructures. *Correspondent Banking*. Bank for International Settlements, July 2016.

[4] Financial Stability Board. *Enhancing Cross-border Payments: Stage 3 Roadmap*. October 2020.

[5] McKinsey & Company. *The 2022 McKinsey Global Payments Report*. October 2022.