Clearing and Settlement in the Secured Financing Transaction Market

Working Draft - Trade Flow Mapping

November 2021
## Map Legend

<table>
<thead>
<tr>
<th>Flows</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>← → ←</td>
<td>Two Way Information Flow (Trade Messaging, Confirmation, Matching, etc.)</td>
</tr>
<tr>
<td>← → ←</td>
<td>One Way Information Flow (Delivery/Receive instructions, Settlement confirms, etc.)</td>
</tr>
<tr>
<td>→</td>
<td>Security Movement (Movements across the Fedwire Securities Service or as a transfer on the books of a bank)*</td>
</tr>
<tr>
<td></td>
<td>Cash Movement (Movements of cash)</td>
</tr>
<tr>
<td>⬇️</td>
<td>Movement of Securities versus Cash (Movement of securities against movements of cash)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk Event</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counterparty Credit Risk</td>
<td>(Risk of Counterparty nonperformance. Encompasses replacement risk, including associated market risk)</td>
</tr>
<tr>
<td>Centrally Cleared Credit Risk</td>
<td>(Risk Central Clearing Counterparty assumes in becoming principal to the trade)</td>
</tr>
<tr>
<td>CCP Counterparty Risk</td>
<td>(Buyer/Seller's risk of CCP nonperformance. Encompasses replacement risk, including associated market risk)</td>
</tr>
<tr>
<td>Credit Extension Risk</td>
<td>(Risk assumed by parties advancing cash upon receipt of Treasuries on behalf of underlying Buyer. In the event of Buyer's default, extended party must liquidate Treasuries and absorb credit and market risk)</td>
</tr>
</tbody>
</table>

For clearing and settlement on a **bilateral basis**, over the **triparty repo settlement platform** and for **securities lending transactions** the numbered quadrants denote the following stages of the transaction lifecycle:

1. Execution
2. Affirmation/Matching
3. Clearing/Settlement
4. Final Settlement

For clearing and settlement **with a CCP** the numbered quadrants denote the following stages of the transaction lifecycle:

1. Execution
2. Affirmation/Matching
3. Clearing/Settlement of Start Leg
4. Final Settlement of Start Leg
5. Clearing/Settlement of End Leg
6. Final Settlement of End Leg

Colored regions denote parties exposed to risk during corresponding lifecycle stage.

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**Fedwire** is a registered service mark of the Federal Reserve Banks
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   b. Tri-Party repo flow overnight

3. Clearing and settlement with a CCP
   a. Non-sponsored flows
      i. GCF overnight repo
      ii. GCF term repo
      iii. DVP overnight repo
      iv. DVP overnight repo with IDB
      v. DVP forward start overnight repo
      vi. DVP term repo
   b. Sponsored Delivery-versus-Payment (DVP)
      i. DVP repo sourced securities
      ii. Sponsored member sourced securities
   c. Sponsored GC
      i. DVP repo sourced securities
      ii. GCF repo sourced securities
      iii. Sponsored GC term repo: GCF repo sourced securities
      iv. Sponsored GC term repo: Sponsored member sourced securities

4. Clearing and settlement of securities lending transactions
   a. Tri-party Flow – Stock Loan Transaction DVP vs DVP
   b. Tri-party Flow – Stock Loan Transaction Free-of-Payment (FOP) vs FOP
   c. Bilateral Flow – Stock Loan Transaction FOP vs FOP
1. Clearing and Settlement on a Bilateral Basis
### Figure 1a. Bilateral Repo Flow – On-Leg of Repo T+0

<table>
<thead>
<tr>
<th>Entity</th>
<th>T+0</th>
<th>Final Settlement &amp; Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Execution</td>
<td>Affirmation/Confirmation</td>
</tr>
<tr>
<td></td>
<td>6:00AM – 8:00AM</td>
<td>8:30AM – 3:30PM</td>
</tr>
<tr>
<td>Counterparty / Seller</td>
<td>Trade Execution/Booking</td>
<td>DVP Instructions sent to Clearing Bank</td>
</tr>
<tr>
<td></td>
<td>- Counterparty validates collateral pricing and margin</td>
<td></td>
</tr>
<tr>
<td>Clearing Bank</td>
<td>Settlement instructions are received from clients and/or vendors</td>
<td>Transaction and Position Reporting sent to clients</td>
</tr>
<tr>
<td></td>
<td>Individual Seller’s Clearing Account</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Cash credited to Seller’s account</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Security delivered into Buyer’s Custody Bank account</td>
<td></td>
</tr>
<tr>
<td>Fedwire®</td>
<td>Fedwire Processing</td>
<td></td>
</tr>
<tr>
<td>Custody Bank</td>
<td>Settlement instructions are received from clients and/or vendors</td>
<td>Transaction and Position Reporting sent to clients</td>
</tr>
<tr>
<td></td>
<td>CB Fedwire Omnibus Account</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Cash debited from Buyer’s account</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Security settled into Buyer’s account</td>
<td></td>
</tr>
<tr>
<td>Counterparty / Buyer</td>
<td>Trade Execution/Booking</td>
<td>RVP Instructions sent to Custody Bank</td>
</tr>
<tr>
<td></td>
<td>- Counterparty validates collateral pricing and margin</td>
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</tbody>
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### Exposure

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
<th>Indicator</th>
<th>Description</th>
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<tr>
<td>Circle</td>
<td>Counterparty Credit Risk</td>
<td>Circle</td>
<td>Centrally Cleared Credit Risk</td>
</tr>
<tr>
<td>Circle</td>
<td>CCP Counterparty Risk</td>
<td>Circle</td>
<td>Credit Extension Risk</td>
</tr>
<tr>
<td>Line</td>
<td>Two Way Information Flow</td>
<td>Line</td>
<td>One Way Information Flow</td>
</tr>
<tr>
<td>Line</td>
<td>Security Movement</td>
<td>Line</td>
<td>Cash Movement</td>
</tr>
<tr>
<td>Line</td>
<td>Movement of Cash versus Collateral</td>
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</tbody>
</table>
### Figure 1b. Bilateral Repo Flow – On-Leg of Repo T+N

<table>
<thead>
<tr>
<th>Entity</th>
<th>T+0 (Execution)</th>
<th>T+0 (Affirmation/Confirmation)</th>
<th>T+1 (Clearing &amp; Settlement)</th>
<th>Final Settlement &amp; Reporting</th>
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<tbody>
<tr>
<td><strong>Time</strong></td>
<td>12:00AM – 8:00AM</td>
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<td>8:30AM – 3:30PM</td>
<td>3:30PM - Close</td>
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<tr>
<td><strong>Counterparty / Seller</strong></td>
<td>Counterparty validates collateral pricing and margin</td>
<td>Buyer Holds O/N Risk</td>
<td>Monitor settlement activity</td>
<td></td>
</tr>
<tr>
<td><strong>Clearing Bank</strong></td>
<td>DVP Instructions O/N</td>
<td>Individual Seller’s Clearing Account</td>
<td></td>
<td>Transaction and Position Reporting sent to clients</td>
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<td><strong>Fedwire</strong></td>
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<td>Fedwire Processing</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Custody Bank</strong></td>
<td>RVP Instructions O/N</td>
<td>Security delivered to Buyer’s Custody Bank</td>
<td>Cash credited to Seller’s account</td>
<td>Transaction and Position Reporting sent to clients</td>
</tr>
<tr>
<td><strong>Counterparty / Buyer</strong></td>
<td>Counterparty validates collateral pricing and margin</td>
<td>Buyer Holds O/N Risk</td>
<td>Monitor settlement activity</td>
<td></td>
</tr>
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### Exposure

- **Buyer/Seller:** Has counterparty replacement risk to other party
- **Custody Bank:** Intraday secured credit risk (discretionary)

### Indicators

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<tr>
<th>Indicator</th>
<th>Description</th>
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<th>Description</th>
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<td><strong>Centrally Cleared Credit Risk</strong></td>
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<td><strong>CCP Counterparty Risk</strong></td>
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<td><strong>Credit Extension Risk</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Two Way Information Flow</strong></td>
<td><strong>One Way Information Flow</strong></td>
<td><strong>Security Movement</strong></td>
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<tr>
<td></td>
<td><strong>Cash Movement</strong></td>
<td></td>
<td><strong>Movement of Cash versus Collateral</strong></td>
</tr>
</tbody>
</table>
Bilateral Repo Flow – On-Leg of Repo Details

Execution & Affirmation/Confirmation

<table>
<thead>
<tr>
<th>Buyer Actions</th>
<th>Seller Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>DVP Repo Trade is executed over phone or electronic platform</td>
<td>DVP Repo Trade is executed over phone or electronic platform</td>
</tr>
<tr>
<td>Buyer enters trade into their trading system</td>
<td>Seller enters trade into their trading system</td>
</tr>
<tr>
<td>Buyer receives details of the trade and collateral information from Seller</td>
<td>Seller sends trade and collateral details to buyer for review and confirmation</td>
</tr>
<tr>
<td>Buyer uploads collateral into their system and prices the collateral using a vendor for pricing service</td>
<td>Trade Support uses this file as a confirmation and compares the details of the file to the trading system</td>
</tr>
<tr>
<td>Any pricing differences can be double checked using a third-party pricing source</td>
<td></td>
</tr>
</tbody>
</table>

Clearing and Settlement

- **Buyer Actions**
  - Once trade and collateral details are agreed to, Buyer’s Trade Support notifies the Seller
  - RVP Instructions for approved collateral are sent to Custody Bank
    - Custody Bank can receive directly from Buyer, or from a vendor on behalf of the Buyer
  - Seller Actions
    - Seller sends DVP Instructions to Clearing Bank to deliver collateral to Buyer
      - Clearing Bank can receive directly from Seller, or from a vendor on behalf of the Seller

- **Term Trades**
  - Mark to Market – will be handled between buyer and seller via a cash wire or pairing off the repos and rebooking based on the new collateral value

- **8:30AM – 3:30PM**
  - Majority of trades are booked or agreed to prior to 12:00PM noon
    - 11:00AM – Approximately 80% of trades are settled by this time
  - Overnight trades are completely unwound the following day – cash and collateral are reversed out after the opening of Fedwire Securities*
    - RVP/DVP Instructions sent via Messaging by both counterparties to their respective Clearing or Custody banks throughout the day
      - Upon settlement, there is an immediate exchange of cash and collateral between the Buyer and Seller
    - Clearing/Custody Banks may provide intraday credit to their customers to facilitate settlement at their discretion

*Settlement can occur on T+0 or T+N
## Figure 1c. Bilateral Repo Flow – Off-Leg of Repo T+0 or T+N

<table>
<thead>
<tr>
<th>Entity</th>
<th>T+1</th>
<th>T+2</th>
<th>Final Settlement &amp; Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>12:00AM – 8:00AM</td>
<td>8:30AM – 3:30PM</td>
<td>3:30PM - Close</td>
</tr>
<tr>
<td>Clearing &amp; Settlement</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Counterparty / Seller</td>
<td>Seller Holds O/N Risk</td>
<td>Monitor settlement activity</td>
<td></td>
</tr>
<tr>
<td>Clearing Bank</td>
<td>RVP Instructions O/N*</td>
<td>Individual Seller’s Clearing Account</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Cash debited from Seller’s account</td>
<td>- Security settled into Seller’s account</td>
<td></td>
</tr>
<tr>
<td>Fedwire</td>
<td></td>
<td>Fedwire Processing</td>
<td></td>
</tr>
<tr>
<td>Custody Bank</td>
<td>DVP Instructions O/N*</td>
<td>CB Fedwire Omnibus Account</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Security delivered to Seller’s Clearing Bank</td>
<td>- Cash credited to Buyer’s account</td>
<td></td>
</tr>
<tr>
<td>Counterparty / Buyer</td>
<td>Buyer Holds O/N Risk</td>
<td>Monitor settlement activity</td>
<td></td>
</tr>
</tbody>
</table>

### Exposure
- **Buyer/Seller**: Has counterparty replacement risk to other party
- **Clearing Bank**: Intraday secured credit risk (discretionary)

### Table

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buyer/Seller</td>
<td>Counterparty Credit Risk</td>
</tr>
<tr>
<td></td>
<td>Centrally Cleared Credit Risk</td>
</tr>
<tr>
<td></td>
<td>CCP Counterparty Risk</td>
</tr>
<tr>
<td></td>
<td>Credit Extension Risk</td>
</tr>
<tr>
<td></td>
<td>Two Way Information Flow</td>
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<tr>
<td></td>
<td>One Way Information Flow</td>
</tr>
<tr>
<td></td>
<td>Security Movement</td>
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<tr>
<td></td>
<td>Cash Movement</td>
</tr>
<tr>
<td></td>
<td>Movement of Cash versus Collateral</td>
</tr>
</tbody>
</table>

*Instructions can be sent prior to settlement date*
Bilateral Repo Flow – Off-Leg of Repo T+0 or T+N Details

**Clearing and Settlement**

- **Rolling vs Non-rolling**
  - Rolling repo involves the buyer and seller agreeing to similar terms as the day prior and netting the pricing and mark to market amounts via a net payment obligation between the two parties. The benefit of this is that it avoids the potential credit needs and operational settlement work involved in gross unwinds of the maturing repo in the morning followed by the creation of a new repo shortly thereafter.
  - Non-rolling repo assumes each trade is separate and distinct and restarts each day, even if the counterparty, collateral and terms are very similar.

- **Term Trades**
  - Between the on-leg and off-leg settlement days, mark to market adjustments are processed between buyer and seller via a cash wire or pairing off the repos and rebooking based on the new collateral value.

- **12:00AM – 3:30PM**
  - **Buyer Actions**
    - Buyer’s Trade Support notifies the Seller and instructs their Custody bank to return the approved collateral.
    - Custody Bank can receive directly from Buyer, or from a vendor on behalf of the Buyer.
  - **Seller Actions**
    - Seller sends RVP Instructions to Clearing Bank.
    - Clearing Bank can receive directly from Seller, or from a vendor on behalf of the Seller.

- **8:30AM – 3:30PM**
  - Overnight trades are completely unwound the following day – cash and collateral are reversed out at the opening of Fedwire Securities.
  - Upon settlement, there is an immediate exchange of cash and collateral between the Buyer and Seller.
  - Clearing/Custody Banks may provide intraday credit to their customers to facilitate settlement at their discretion.

**Final Settlement and Reporting**

- **3:30PM – Close**
  - Clearing Bank sends transaction and position reporting to clients.
  - Clients are expected to fund their accounts accordingly by end of day (debits or credits position).
2. Clearing and Settlement on the Tri-party Repo Settlement Platform
### Figure 2a. Tri-Party Workflow: Trade and Settlement Date

<table>
<thead>
<tr>
<th>Time*</th>
<th>Execution (1)</th>
<th>Affirmation/Confirmation (2)</th>
<th>Settlement (3a) Collateralization and Funding</th>
<th>Settlement (3b) Collateral and Cash Exchanged</th>
<th>Reporting (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00AM – 9:00AM</td>
<td>Agree to the trade Principal Tenor Start and End Date Rate Collateral Type(s)</td>
<td>Advise Tri-Party Agent of trade details</td>
<td>Collateral is allocated to the Tri-Party Repo settlement platform</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10:00AM - 3:00PM</td>
<td>Match Trade Instructions upon receipt System creates Trade</td>
<td></td>
<td>System screens for eligibility, prices and margins collateral</td>
<td>Cash is transferred to Seller’s account; Collateral is transferred to Buyer’s account.</td>
<td></td>
</tr>
<tr>
<td>3:30PM – 6:00PM</td>
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</tr>
<tr>
<td>Post 8:00PM</td>
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</table>

### Tri-party Exposure

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counterparty Credit Risk</td>
<td>Buyer/Seller: Has counterparty replacement risk to other party</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centrally Cleared Credit Risk</td>
<td>Tri-Party Agent: Potential need to finance/lend</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCP Counterparty Risk</td>
<td>Buyer/Seller: Opportunity Cost should trade not match</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Credit Extension Risk</td>
<td>Tri-Party Agent: Potential need to finance/lend</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two Way Information Flow</td>
<td>Buyer/Seller: Inability to reconcile if reports are not received</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One Way Information Flow</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Security Movement</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Cash Movement</td>
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<td></td>
<td></td>
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<tr>
<td>Movement of Cash versus Collateral</td>
<td></td>
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</tbody>
</table>
Tri-Party Workflow: Risk Highlights & Mitigants

10:00AM – 3:00PM – Trade Instruction Matching Process
- Between 10:00AM and 3:00PM the Seller(s) and Buyer(s) transmit their trade instructions to the tri-party agent’s deal matching system. These instructions can be transmitted via files or entered directly onto the Collateral Management system. There are two types of trade instructions that require matching (1) a maturing trade the buyer & seller would like to extend or (2) a new trade being booked. Should the tri-party agent not receive matched instructions by the 3:00PM deadline (though deals can match up to 3:30pm when unmatched triparty deals will unwind), at 3:30PM the maturing deal will unwind. The risk for the Seller could be the Seller holding collateral they cannot finance, which would require internal financing or, if unavailable, a bank loan. Risk for the Buyer could be that they would hold cash they cannot invest overnight and could be held with their custodian bank overnight.
- The potential reasons for a deal being unmatched intra-day:
  - Timing – Buyer & Seller may send instructions at different times
  - Operational – Client may fail to send a specific trade instruction or may input trade details incorrectly
  - Technology – Could impact multiple counterparties; the tri-party agent would identify the issue and contact the impacted buyer(s) and/or seller(s)
  - Credit/Liquidity – one counterparty cannot honor its obligation(s) or has concerns about their counterparty and does not match the trade
- Solutions/Workarounds for potential issue(s)
  - Timing – the seller can request the tri-party agent delay the running of the settlement algorithm to allow additional time for instructions to be matched
  - Operational or Technology – the tri-party agent provides a bulk upload tool allowing buyer/seller to provide trade instructions which will be automatically uploaded into the collateral management system. For limited issues, the buyer/seller can enter the trade instructions directly into the system. If a trade instruction is entered incorrectly, that party would either modify the trade instructions, or if agreed to by both parties, the trade could be cancelled and resubmitted. If it is the seller’s issue, the buyer can affirm the modified or new instruction.

3:30PM – 6:00PM – Eligibility screening, Trade Collateralization
- Incorrect pricing or discrepancy in collateral pricing
  - Collateral may be a bad mix, requiring additional collateral, Cash or potentially a Bank Loan
- Mis-allocation of Seller’s collateral
  - Allocation logic can be driven by automatic allocation, Allocation Optimization, or directed allocations via the seller’s allocation algorithm
- Buyer may wire insufficient cash or fail to wire any cash

Post 8:00PM – Collateral Reports sent to parties
- Delayed Reports or failure to transmit reports can lead to reconciliation issues for both Seller(s) and Buyer(s) and potential impact to downstream systems/processes
**Figure 2b. Tri-Party Workflow: T+1 Actions and Maturity**

<table>
<thead>
<tr>
<th>Time</th>
<th>Mark to Market (1)</th>
<th>Allocations and Substitutions (2)</th>
<th>Return of Cash and Collateral (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:00AM</td>
<td></td>
<td></td>
<td>3:30PM</td>
</tr>
<tr>
<td>6:00AM</td>
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<td></td>
<td>4:00PM – 6:00PM</td>
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<tr>
<td>7:00AM – 9:00AM</td>
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<tr>
<td>8:30AM – 11:00AM</td>
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<td>12:00PM</td>
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<td>12:45PM</td>
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<td>1:00PM – 3:00PM</td>
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<td>3:30PM</td>
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<tr>
<td>4:00PM – 6:00PM</td>
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</tbody>
</table>

**Vendor**
- Pricing files (with prior day pricing for all securities) sent to Tri-Party Agent*

**Counterparty**
- Seller (Collateral Provider): Initiates collateral allocation to ensure trade remains fully collateralized
- Initiates collateral allocation to ensure trade remains fully collateralized
- Provides sufficient liquidity for trade maturity

**Tri-Party Agent**
- Initiates collateral allocation to ensure trade remains fully collateralized
- Raises liquidity to facilitate maturing trades as well as principal decreases
- Verify trade is collateralized throughout the day
- Can contact tri-party agent with price challenges

**Buyer**
- Buyer/Seller: If Seller doesn’t have liquidity, trade can’t be unwound; Buyer won’t be able to get cash back (but will remain collateralized)

**Tri-party Exposure**
- Buyer: Risk of being under collateralized
- Seller: Potential inability to substitute collateral if there is insufficient liquidity
- Tri-Party Agent: Credit extended against replacement collateral until such time it’s allocated

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*Prices are from prior day closing
**Updated prices are for a subset of securities (Treasuries and Agency debentures)
*Indicates this action is occurring at or has a “set deadline”

**Table:**

<table>
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<tr>
<th>Indicator</th>
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**Legend:**
- **Buyer/Seller**
- **Tri-Party Agent**
Tri-Party Workflow: Risk Highlights & Mitigants

2:00AM and 12:30PM – Vendor Pricing Files sent to Tri-Party Agent
- Triparty agent doesn't receive pricing files
  - Can lead to stale pricing in the system, which could lead to inaccurate collateral pricing, possibly exposing one of the parties to under/over collateralization
    - Technology monitors to ensure receipt of daily files and will contact the Vendor if a file is not received within a specified time frame. Alternative workarounds are in place with alternative Vendors.
  - Vendor may send incomplete pricing files
    - Similar impact, uncertainty of what is correct vs incorrect
    - Technology will identify an incomplete file by record count or file size and contact the Vendor.
  - Triparty agent receives invalid or inaccurate pricing files
    - Exposes the Triparty Agent, Seller and Buyer to possible financial or reputational risk.
    - Triparty Agent has numerous validation and audit procedures designed to identify incorrect pricing. Triparty Agent validates and authorizes certain pricing on a daily basis. When such issues are encountered, triparty agent will engage the vendor. In many cases the vendor will also send out notifications of incorrect pricing.

7:00AM – 9:00AM – Collateral Allocation
- Triparty Agent identifies and monitors trades that are undercollateralized.
- At this time, the Buyer can potentially be exposed to the Seller (if shortage exceeds the margin).
- Seller allocates collateral to ensure trades are fully collateralized.

8:30AM – 3:30PM – Intraday Collateral Substitution
- Seller must have sufficient liquidity in order to process collateral substitution
  - When security is delivered versus payment, cash from delivery is used to replace substituted collateral.
  - If security is delivered free of payment, Seller must have liquidity to replace substituted collateral in order to process the free of payment delivery
  - If Seller doesn’t purchase new replacement collateral, Buyer will be holding cash instead of collateral
    - Until replacement collateral is allocated, the Tri-Party agent is extending credit against the newly purchased collateral
      - If at 12:00PM the Seller has not allocated replacement collateral to triparty trade, the collateral management system will automatically move collateral from Seller’s account and allocate to triparty trade, replacing the substitution cash and extinguishing the bank’s extension of credit
    - If Triparty Agent has a system issue preventing the substitution process from occurring, the Seller could fail on a delivery(s) and could be subject to fail charges.

3:30PM – Unwind/Maturity of Deal*
- Insufficient Liquidity – If Seller doesn’t have sufficient liquidity, trade does not unwind. If liquidity is not obtained by close of Fedwire, Buyer will have margined collateral in their possession. Buyer must then decide if they want to extend the trade or modify the deal. Alternatively, if Buyer is concerned, they could issue a notice of Default.
  - It’s important to note that the Buyer is always secured with either cash or collateral.
  - If notice of default is issued, there is an operational risk of delivering collateral in a timely manner.
- Bank’s exposure to a Seller’s inability to unwind (due to insufficient liquidity) could cause financial exposure for the Bank.

4:00PM – 6:00PM – Wiring Principal + Interest to Buyer
- Automated creation of wire(s) to custodian bank; affirmation from Buyer to Custodian Bank on amount of P+I is a manual process
  - Fed Cutoff of 6:00PM could lead to failed wire(s), resulting in Buyer's cash remaining with Tri-Party Agent
  - Any delays from issues in the previous steps in the day can lead to a tightened window for settlement ahead of the 6:00PM deadline
- Workarounds include increased automation in payment processes and possible market extensions, if necessary, to avoid large fail(s)

*On average, <10% of the U.S. tri-party book unwinds daily
3. Clearing and Settlement with a CCP
CCP Risk Management Practices*

• CCP manages market risk for a Member’s repo trade activity via two tools – collection of Clearing Fund margin and Mark to Market pass-through

• Clearing Fund margin:
  • Margin requirement is composed of two calculated components - Value at Risk and repo rate volatility
  • Margin is collected twice daily, through an Intraday and End of Day cycle**

• Mark to Market Pass-through
  • Mark to Market pass-through adjustments are collected/paid twice daily, through an Intraday and End of Day cycle

*CCP’s risk management practices as they relate to the DVP Repo, GCF Repo, and Sponsored Repo transaction scenarios depicted

**Although Clearing Fund collects margin from CCP Members twice daily through the Intraday and EOD cycles, CCP Member positions and margin components are recalculated on an hourly basis – CCP reserves the right to issue ad-hoc margin calls
Figure 3a.i. GCF Overnight Repo

<table>
<thead>
<tr>
<th>Entities</th>
<th>T+0</th>
<th>Overnight</th>
<th>T+1</th>
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</thead>
<tbody>
<tr>
<td>CCP Member 2 (Reverse)</td>
<td>Trade Booking</td>
<td>Trade Details Submission</td>
<td>Wire Instructions</td>
</tr>
<tr>
<td>CCP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triparty Agent Platform</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDB</td>
<td>Execution</td>
<td>Trade Details Submission</td>
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</tr>
<tr>
<td>CCP</td>
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<tr>
<td>CCP</td>
<td>Matching, Novation, Netting</td>
<td></td>
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<td>Triparty Agent Platform</td>
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<tr>
<td>CCP</td>
<td>CCP Account</td>
<td>Simultaneous Exchange of Cash and Securities</td>
<td>No Credit Extension</td>
</tr>
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<td></td>
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<td>CCP</td>
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<tr>
<td>Triparty Agent Clearing Bank</td>
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<tr>
<td>CCP</td>
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</tr>
<tr>
<td>CCP Member 1 (Repo)</td>
<td>Trade Booking</td>
<td>Trade Details Submission</td>
<td></td>
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</tbody>
</table>

**Indicators**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counterparty Credit Risk</td>
<td></td>
</tr>
<tr>
<td>Centrally Cleared Credit Risk</td>
<td></td>
</tr>
<tr>
<td>CCP Counterparty Risk</td>
<td></td>
</tr>
<tr>
<td>Credit Extension Risk</td>
<td></td>
</tr>
<tr>
<td>Two Way Information Flow</td>
<td></td>
</tr>
<tr>
<td>One Way Information Flow</td>
<td></td>
</tr>
</tbody>
</table>

**Interactive Elements**

- IDB
- CCP Members
- CCP
GCF Overnight Repo

Repo Start Date - T+0

- Trade is brokered by Inter-Dealer Broker (IDB), two trades are submitted to CCP by IDB on each CCP Member’s behalf
  - At the point of trade execution Counterparty Credit Risk exists between CCP Member 1 and the IDB, and CCP Member 2 and the IDB
  - CCP Members have visibility of the trade submitted on their behalf facing the IDB, and are required to Affirm IDB’s trade submission
  - Trades are deemed to be Compared & Novated at the time of receipt by CCP from IDB

- Trade submission takes place between 7AM – 3PM EST, shortly after 3PM CCP’s GCF Repo® service net takes places, netting GCF trade activity and establishing net long or short position per GCF Generic CUSIP per CCP Member
  - Trades included in GCF net include same day starting GCF Repo trades, forward starting trades due to start on current business day, and term repo trades that have started
  - CCP generates obligations to settle the position and communicates settlement obligations to Triparty Agent and CCP Members – GCF trades do not settle on a trade-for-trade basis, obligation is a net obligation

- Triparty settlements begins at 3:30PM EST – collateral providers allocate collateral to Triparty platform of Triparty Clearing Agent Bank, while cash lenders deliver funds to Triparty Agent to pay for purchase of collateral
  - Triparty Agent allocates collateral to cash lenders and cash to collateral providers through its allocation process to settle the start leg
  - Triparty Agent bank does not extend credit to CCP to facilitate settlement - in its allocation process, the Triparty Agent performs a look-through to the ultimate buyer prior to settling securities and cash

- Once GCF Repo settlement is complete, the Triparty Agent communicates the details of the collateral allocation to the CCP
  - CCP uses the details of the underlying securities allocated to generate Clearing Fund margin requirement based on the security positions due to be settled on T+1 (VAR only)
GCF Overnight Repo

Repo Start Date – T+0 Continued

- Risk Management practices as applicable to this scenario:
  - **Intraday**: If trade is novated to CCP prior to noon, at intraday Clearing Fund margin requirement will be calculated based on repo rate volatility component, and collected from both CCP Members
  - **End of Day**: Clearing Fund margin requirement calculated based on VAR component
    - Repo rate volatility component ceases to be assessed as repos end date is next business day

- Interest for the GCF Repo is calculated end of day on T+0, and settled start of day on T+1 via CCP’s Funds-Only Settlement service

Repo End Date - T+1

- Collateral Mark to Market is processed by the Triparty Agent on behalf of the CCP at **Start of Day** and **Intraday** – if security re-pricing results in under collateralization, collateral providers are required to top up

- Collateral substitutions may occur throughout T+1 up until unwind of repo trade – Triparty Agent communicates updated collateral allocation details to CCP on an hourly basis

- At **Intraday**, Clearing Fund margin requirement will be calculated for the CCP Members based on the VAR component
  - Security positions due to be settled post-3:30PM

- Triparty settlement begins at 3:30PM EST – collateral provider will now deliver funds to Triparty Agent to complete the purchase back of collateral
  - Triparty Agent allocates cash to cash lenders and collateral to collateral providers through its allocation process to settle the end leg
Figure 3a.ii. GCF Term Repo

<table>
<thead>
<tr>
<th>Entities</th>
<th>T+0</th>
<th>T+1</th>
<th>T+2</th>
<th>T+3</th>
<th>T+4</th>
<th>T+N</th>
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<tbody>
<tr>
<td>CCP Member 2 (Reverse)</td>
<td>Trade Booking</td>
<td>Trade Details Submission</td>
<td>Wire Instructions</td>
<td>Member 2 Account Receives Security Delivers Cash</td>
<td>Security Settled into Member 2’s Account</td>
<td>Collateral Allocation</td>
</tr>
<tr>
<td>Triparty Agent Clearing Bank</td>
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<tr>
<td>Triparty Agent Platform</td>
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<td>CCP</td>
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<tr>
<td>IDB</td>
<td>Execution</td>
<td>Trade Details Submission</td>
<td>Wire Instructions</td>
<td>Member 1 Account Receives Security Delivers Cash</td>
<td>Cash Settled into Member 1’s Account</td>
<td>Security Settled into Member 1’s Account</td>
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<tr>
<td>CCP</td>
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<td>Triparty Agent Clearing Bank</td>
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<td>Triparty Agent Platform</td>
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<tr>
<td>CCP Member 1 (Repo)</td>
<td>Trade Booking</td>
<td>Trade Details Submission</td>
<td>Collateral Allocation</td>
<td>Wire Instructions</td>
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Collateral Substitutions processed by Triparty Agent

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<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
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<tbody>
<tr>
<td>Red</td>
<td>Counterparty Credit Risk</td>
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<tr>
<td>Green</td>
<td>Centrally Cleared Credit Risk</td>
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<tr>
<td>Yellow</td>
<td>CCP Counterparty Risk</td>
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<tr>
<td>Blue</td>
<td>Credit Extension Risk</td>
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<tr>
<td>Green</td>
<td>Two Way Information Flow</td>
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<tr>
<td>Yellow</td>
<td>One Way Information Flow</td>
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<tr>
<td>Green</td>
<td>Security Movement</td>
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<tr>
<td>Yellow</td>
<td>Cash Movement</td>
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<tr>
<td>Green</td>
<td>Movement of Cash versus Collateral</td>
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</table>
GCF Term Repo

- In terms of trade execution, submission to CCP, and settlement the lifecycle remains the same as the overnight GCF Repo trade scenario
  - Key difference will be the number of days of the term repo as opposed to the overnight trade, and the extension of the CCP's risk management practices over the term of the trade

**Repo Start Date - T+0**

- If the GCF Repo trade is submitted and novated to the CCP prior to noon, at **Intraday** a margin requirement will be calculated based on the repo rate volatility component of the Clearing Fund calculation for the trade
  - As the Start Leg of the trade has yet to settle, there is no securities position market risk to be managed via the VAR component

- **At End of Day** the Clearing Fund margin requirement will be calculated based on both the VAR of the collateral positions communicated to the CCP by the Triparty Agent, and the repo rate volatility component of the calculation

- **At End of Day** the CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service
GCF Term Repo

**Full Repo Term Day (T+1 to T+N – 2)**
- Collateral Mark to Market is processed by the Triparty Agent on behalf of the CCP at **Start of Day** and **Intraday** – if security re-pricing results in under collateralization, collateral providers are required to top up

- Collateral substitutions may occur throughout T+1/2/3/etc. up until unwind of repo trade on end date
  - Triparty Agent communicates updated collateral allocation details on an hourly basis to the CCP

- Clearing Fund margin requirement is calculated and collected from CCP Members at **Intraday** and **End of Day**, requirement is calculated based on both the VAR and repo rate volatility components

- At **End of Day** the CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service
GCF Term Repo

Term Day Prior to Repo End Date (T+N – 1)

- Collateral Mark to Market is processed by the Triparty Agent on behalf of the CCP at Start of Day and Intraday – if security re-pricing results in under collateralization, collateral providers are required to top up

- Collateral substitutions may occur up until unwind of repo trade
  - Triparty Agent communicates updated collateral allocation details on an hourly basis to the CCP

- Clearing Fund margin requirement is calculated and collected from CCP Members at Intraday and End of Day
  - Intraday requirement is calculated based on both the VAR and repo rate volatility components
  - End of Day margin requirement is calculated based only on VAR component, repo rate volatility component ceases to be assessed as of the End of Day cycle prior to repo end date

- CCP ceases to assess mark to market as of the End of Day cycle prior to repo end date

- Interest for the GCF Repo is calculated end of day on term date prior to repo end date, and settled start of day on repo end date via CCP’s Funds-Only Settlement service
GCF Term Repo

**Repo End Date – T+N**
- Collateral Mark to Market is processed by the Triparty Agent on behalf of the CCP at [Start of Day](#) and [Intraday](#) – if security re-pricing results in under collateralization, collateral providers are required to top up
- Collateral substitutions may occur up until unwind of repo trade
  - Triparty Agent communicates updated collateral allocation details on an hourly basis to the CCP
- At [Intraday](#), Clearing Fund margin requirement will be calculated for the CCP Members based on the VAR component - security positions due to be settled post-3:30PM EST
- Trade end-leg is settled post-3:30 PM EST

*T+N represents the repo end date for a term GCF Repo of any tenor up to 735 days*
Figure 3a.iii. Same Day Start Overnight Repo

Same Day Start Overnight DVP Repo

<table>
<thead>
<tr>
<th>Entities</th>
<th>T+0</th>
<th>Overview</th>
<th>T+1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearing Bank 2</td>
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<tr>
<td>Fedwire</td>
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<tr>
<td>CCP</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Clearing Bank 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCP Member 1 (Repo)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>CCP Member 2 (Reverse)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Entities**
- Clearing Bank 1
- Clearing Bank 2
- CCP
- CCP Member 1 (Repo)
- CCP Member 2 (Reverse)

**Events**
- Execution (1)
- Affirmation/Confirmation (2)
- Clearing/Settlement of Start-Leg (3)
- Final Settlement of Start-Leg (4)
- Clearing/Settlement of End-Leg (5)
- Final Settlement of End-Leg (6)

**Measures**
- CCP Members
- CCP
- Clearing Banks

**Indicators**
- Counterparty Credit Risk
- Centrally Cleared Credit Risk
- CCP Counterparty Risk
- Credit Extension Risk
- Two Way Information Flow
- One Way Information Flow
- Security Movement
- Cash Movement
- Movement of Cash versus Collateral

**Figures**
- T+0
- T+1
- T+0 → T+1

**Activities**
- Trade Booking
- Trade Details Submission
- DVP Instructions
- RVP Instructions
- Fedwire Processing
- Matching, Novation
- Security Settled into Member 2's Account
- Security Settled into Member 1's Account
- Cash Settled into Member 2's Account
- Cash Settled into Member 1's Account
- CCP Account Receives/Delivers Security
- CCP Account Receives/Cash
- CCP Account Delivers/Cash
- CCP Account Delivers/Delivers Security
- Member 2 Account Receives Security
- Member 2 Account Delivers Cash
- Member 2 Account Delivers Security
- Member 2 Account Receives Cash
- Member 1 Account Receives Security
- Member 1 Account Delivers Cash
- Member 1 Account Delivers Security
- Member 1 Account Receives Cash

**Notes**
- Netting of End Leg, CCP Holds Credit Risk Until Settlement of End Leg
Same Day Start Overnight Repo

Repo Start Date - T+0
• Repo trade is executed and submitted to the CCP on a bilateral comparison basis – both CCP Members must submit their side of the trade to affect a match
  • Once trade details are matched by CCP the trade is deemed Compared and Novated
• CCP will generate settlement obligations to settle the start leg of the repo on a trade-for-trade basis through the CCP, at repo start money
  • Settlement obligations are bound - repo side will deliver securities to CCP, CCP redelivers securities to the reverse side
  • As DVP repos settle on delivery vs payment basis, credit extensions to the CCP by the clearing bank exist for very short periods of time until the subsequent matched deliveries are made. The CCP operates on a matched book basis and always has a receive and deliver obligation which are bound to one another for settlement purposes. Each receipt of securities by the CCP is automatically redelivered to a contra in a long position.

• If the repo trade is compared and novated prior to noon, at Intraday:
  • Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components – if the start leg has not settled at noon, positions to be settled for the start leg and end leg net out the VAR component
  • CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service

• At End of Day, Clearing Fund margin requirement will be calculated based on end leg open position to be settled on T+1 – repo rate volatility ceases to be assessed as of the End of Day cycle prior to repo end date

• At End of Day, mark to market is not assessed as trade is due to settle next business day
Same Day Start Overnight Repo

Repo Start Date - T+0 Continued

- End leg of the repo trade will be included in the CCP’s DVP net, CCP will establish a net long or short position per CUSIP per CCP Member due to be settled on next business day
  - Trades included in DVP net are DVP buy/sell trades, forward repo start legs, and repo end legs due to settle the next business day
  - Once net position is established, CCP will generate settlement obligations to be settled the next day at CCP’s market price for the security
  - The difference between the CCP’s market price and repo end money will be settled via Start of Day Funds-Only Settlement on repo end date

Repo End Date - T+1

- If the settlement obligation is open (unsettled) as of noon, at Intraday:
  - Clearing Fund margin requirement will be calculated based on VAR component for the open position that is unsettled
  - CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service

- Securities are delivered by Reverse side to CCP, CCP redelivers securities to Repo side to settle the end leg of the trade
Figure 3a.iv. Same Day Start IDB Overnight Repo

<table>
<thead>
<tr>
<th>Entities</th>
<th>T+0</th>
<th>T+1</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCP Member 2 (Reverse)</td>
<td>Trade Booking</td>
<td>Trade Details Submission</td>
</tr>
<tr>
<td>Clearing Bank 2</td>
<td>Fedwire</td>
<td>Fedwire Processing</td>
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<tr>
<td>CCP</td>
<td>Matching, Novation</td>
<td>Fedwire Processing</td>
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<tr>
<td>IDB</td>
<td>Execution</td>
<td>Trade Details Submission</td>
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<tr>
<td>CCP</td>
<td>Matching, Novation</td>
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</tr>
<tr>
<td>Clearing Bank 1</td>
<td>CCP Member 1 (Repo)</td>
<td>Trade Booking</td>
</tr>
</tbody>
</table>

**Indicators**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counterparty Credit Risk</td>
<td>Centrally Cleared Credit Risk</td>
</tr>
</tbody>
</table>
Same Day Start IDB Overnight Repo

- In terms of repo trade settlement and risk management the lifecycle remains the same as the Same Day Start Overnight Repo trade scenario
  - Key difference will be the execution of the repo trade via Inter-Dealer Broker (IDB) and its subsequent submission to the CCP

- Trade is executed on an IDB’s platform, and will be submitted to the CCP by the IDB on behalf of the two CCP Members
  - At the point of trade execution Counterparty Credit Risk exists between CCP Member 1 and the IDB, and CCP Member 2 and the IDB
  - Two trades are submitted by the IDB on a Demand trade submission basis, with one trade submission being the IDB facing the repo-side CCP Member and the second trade submission being the IDB facing the reverse-side CCP Member
  - Both trade are deemed to be Compared and Novated at the time of submission to the CCP by the IDB
  - CCP Members have visibility of the trade submitted on their behalf facing the IDB, and are required to submit their side of the trade to compare to the IDB’s submission to ensure accuracy of trade details

- Demand trade submission takes place between 7AM – 4PM EST, post 4PM trades submitted by IDBs will be subject to bilateral comparison versus the original execution parties (CCP Member 1 and 2) for Novation
Figure 3a.v. Forward Start Overnight Repo

<table>
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<tr>
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<th>T+0</th>
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<th>T+2</th>
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<td>Trade Details Submission</td>
<td>RVP Instructions</td>
<td>DVP Instructions</td>
</tr>
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<td>Clearing Bank 2</td>
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<tr>
<td>Fedwire</td>
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<td>CCP</td>
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<tr>
<td>Clearing Bank 1</td>
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</tr>
<tr>
<td>CCP Member 1 (Repo)</td>
<td>Trade Booking</td>
<td>Trade Details Submission</td>
<td>DVP Instructions</td>
<td>RVP Instructions</td>
</tr>
</tbody>
</table>

**Indicator** | **Description**
---|---
Counterparty Credit Risk | Centrally Cleared Credit Risk | CCP Counterparty Risk | Credit Extension Risk
Two Way Information Flow | One Way Information Flow | Security Movement | Cash Movement
| Movement of Cash versus Collateral
Forward Start Overnight Repo

Trade Execution Date – T+0
- Trade is executed bilaterally between two CCP Members, with both sides needing to submit their side of the trade to affect bilateral comparison
  - Once both sides trade details are submitted to the CCP and matched, the trade is deemed Compared and Novated

- If the trade is Compared and Novated prior to noon, then at Intraday:
  - Clearing Fund margin requirement will be calculated based on repo rate volatility component – the open positions to be settled for the start leg and end leg net out the VAR component at this time
  - CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service

- At End of Day:
  - Clearing Fund margin requirement will be calculated based on repo rate volatility component – the open positions to be settled for the start leg and end leg net out the VAR component at this time
  - CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service
Forward Start Overnight Repo

**Trade Execution Date – T+0 Continued**

- Start leg of the repo is included in the CCP’s DVP service net, netting DVP trade activity and establishing net long or short position per CUSIP per CCP Member
  - Trades included in DVP net are DVP buy/sell trades, forward repo start legs, and repo end legs due to settle the next business day
  - CCP generates obligations to settle the position on T+1 and communicates settlement obligations to CCP Members – repo start leg will not settle on a trade-for-trade basis, obligation is a net obligation
  - Settlement obligation is priced to settle at CCP’s market price for the security
    - The difference between the CCP’s market price and repo end money will be settled via Start of Day Funds-Only Settlement on repo end date
Forward Start Overnight Repo

Repo Start Date – T+1
- Start leg is settled as part of net obligation – CCP Member 1 delivers securities to CCP, upon receipt CCP delivers securities to CCP Member 2
- As DVP repos settle on delivery vs payment basis, credit extensions to the CCP by the clearing bank exist for very short periods of time until the subsequent matched deliveries are made. The CCP operates on a matched book basis and always has a receive and deliver obligation which are bound to one another for settlement purposes. Each receipt of securities by the CCP is automatically redelivered to a contra in a long position.

- At Intraday:
  - Clearing Fund margin requirement will be calculated based both on VAR and repo rate volatility components – if the start leg has not settled at noon, positions to be settled for the start leg and end leg net out the VAR component at this time
  - CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service

- At End of Day:
  - Clearing Fund margin requirement will be calculated based on VAR component – repo rate volatility component ceases to be assessed as of the End of Day cycle prior to repo end date
  - Mark to market is not assessed as trade is due to settle next business day
  - End Leg of the repo is included in the CCP’s DVP service net, netting DVP trade activity and establishing net long or short position per CUSIP per CCP Member
    - CCP generates obligations to settle the position on T+2 and communicates settlement obligations to CCP Members – repo end leg will not settle on a trade-for-trade basis, obligation is a net obligation
    - Settlement obligation is priced to settle at CCP’s market price for the security
      - The difference between the CCP’s market price and repo end money will be settled via Start of Day Funds-Only Settlement on repo end date (T+2)
Forward Start Overnight Repo

Repo End Date – T+2
• If the settlement obligation is open (unsettled) as of noon, at **Intraday**:  
  • Clearing Fund margin requirement will be calculated based on VAR component for the open position that is unsettled  
  • CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service

• Securities are delivered by Reverse side to CCP, CCP redelivers securities to Repo side to settle the end leg of the trade
Figure 3a.vi. Same Day Start Term Repo

**Same Day Start DVP Term Repo**

<table>
<thead>
<tr>
<th>Entities</th>
<th>T-0</th>
<th>T+1</th>
<th>T+2</th>
<th>T+3</th>
<th>T+N</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCP Member 2 (Reverse)</td>
<td>Trade Booking</td>
<td>Trade Details Submission</td>
<td>RVP Instructions</td>
<td>DVP Instructions</td>
<td>Final Settlement of End Leg</td>
</tr>
<tr>
<td>Clearing Bank 2</td>
<td>Fedwire Processing</td>
<td>Match, Novation</td>
<td>CCP Account Receives/Delivers Security Delivers/Cash</td>
<td>Member 2 Account Delivers Security Receives Cash</td>
<td>Member 2 Account Delivers Security Receives Cash</td>
</tr>
<tr>
<td>Fedwire</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clearing Bank 1</td>
<td>Trade Booking</td>
<td>Trade Details Submission</td>
<td>DVP Instructions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCP Member 1 (Repo)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Indicators**

- **Counterparty Credit Risk**
- **Centrally Cleared Credit Risk**
- **CCP Counterparty Risk**
- **Credit Extension Risk**
- **Two Way Information Flow**
- **One Way Information Flow**
- **Security Movement**
- **Cash Movement**
- **Movement of Cash versus Collateral**

**Netting of End Leg on Night Prior to End Date, CCP Holds Credit Risk Until Settlement of End Leg**
Same Day Start Term Repo

- In terms of trade execution, submission to CCP, and settlement the lifecycle remains the same as the overnight Same Day Start Repo trade scenario
  - Key difference will be the number of days of the term repo as opposed to the overnight trade, and the extension of the CCP’s risk management practices over the term of the trade

Repo Start Date - T+0

- If the repo trade is compared and novated prior to noon, at Intraday:
  - Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components – if the start leg has not settled at noon, positions to be settled for the start leg and end leg net out the VAR component at this time
  - CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service

- At End of Day:
  - Clearing Fund margin requirement will be calculated based on both VAR and repo rate volatility components
  - CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service
Same Day Start Term Repo

Full Repo Term Day (T+1 to T+N – 2)

• At Intraday:
  • Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components
  • CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service

• At End of Day:
  • Clearing Fund margin requirement will be calculated based on both VAR and repo rate volatility components
  • CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service

Term Day Prior to Repo End Date (T+N – 1)

• At Intraday:
  • Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components
  • CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service

• At End of Day:
  • Clearing Fund margin requirement will be calculated based only on VAR - repo rate volatility component ceases to be assessed as of the end of day cycle prior to repo end date
  • Mark to market is **not** assessed as trade is due to settle next business day
Same Day Start Term Repo

**Repo End Date – T+N**
- If the settlement obligation is open (unsettled) as of noon, at **Intraday**:
  - Clearing Fund margin requirement will be calculated based on VAR component for the open position that is unsettled
  - CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service

*T+N represents the repo end date for a term DVP Repo of any tenor up to 735 days*
**Figure 3b.i. Sponsored DVP Repo – DVP Repo Sourced Securities**

**Entities**

<table>
<thead>
<tr>
<th>T+0</th>
<th>Overnight</th>
<th>T+1</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCP Sponsored Member</td>
<td></td>
<td>RVP Instructions</td>
</tr>
<tr>
<td>Custody Bank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fedwire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCP Sponsoring Member Omnibus (Reverse)</td>
<td>Trade Booking</td>
<td></td>
</tr>
<tr>
<td>Clearing Bank 2</td>
<td>Trade Details Submission on behalf of Sponsoring Member</td>
<td></td>
</tr>
<tr>
<td>CCP</td>
<td>Trade Booking</td>
<td>Trade Details Submission</td>
</tr>
<tr>
<td>CCP Sponsoring Member (Repo)</td>
<td>Trade Booking</td>
<td></td>
</tr>
<tr>
<td>Clearing Bank 2</td>
<td>Trade Booking</td>
<td>Trade Details Submission</td>
</tr>
<tr>
<td>CCP</td>
<td>Trade Booking</td>
<td>Trade Details Submission</td>
</tr>
<tr>
<td>Clearing Bank 1</td>
<td>Trade Booking</td>
<td>Trade Details Submission</td>
</tr>
<tr>
<td>CCP Member (Repo)</td>
<td>Trade Booking</td>
<td>Trade Details Submission</td>
</tr>
</tbody>
</table>

**The exposure to risk sundial diagram depicts lifecycle risk as it relates to the Sponsored DVP Repo trade only**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCP Sponsored Member</td>
<td>Counterparty Credit Risk</td>
</tr>
<tr>
<td>CCP Sponsoring Member</td>
<td>Centrally Cleared Credit Risk</td>
</tr>
<tr>
<td>CCP Counterparty Risk</td>
<td>CCP Counterparty Risk</td>
</tr>
<tr>
<td>Credit Extension Risk</td>
<td>Credit Extension Risk</td>
</tr>
<tr>
<td>Two Way Information Flow</td>
<td>Security Movement</td>
</tr>
<tr>
<td>One Way Information Flow</td>
<td>Cash Movement</td>
</tr>
<tr>
<td>Security Movement</td>
<td>Movement of Cash versus Collateral</td>
</tr>
</tbody>
</table>

**Legend**

- CCP Sponsored Member
- CCP Sponsoring Member
- CCP
- Custody Bank

*The exposure to risk sundial diagram depicts lifecycle risk as it relates to the Sponsored DVP Repo trade only.*
Sponsored DVP Repo – DVP Repo Sourced Securities

### Repo Start Date - T+0

- Both the **Dealer to Sponsor DVP Repo** and the **Sponsored DVP Repo** trades are submitted to the CCP on a bilateral comparison basis – each side to a trade must submit to affect a match
  - Sponsoring Member’s Omnibus account submits, clears and settles the trade on behalf of the Sponsored Member (Limited Member of the CCP) with the CCP
  - Once trade details are matched by CCP, the trades are deemed Compared and Novated
    - For the Sponsored DVP Repo:
      - The end leg of the repo trade is Novated to the CCP
      - Centrally Cleared Credit Risk exposure is between CCP and Sponsoring Member by virtue of Sponsoring Member Guaranty, in which Sponsor guarantees the settlement of all funds and securities obligations of its Sponsored Members
  - For the **Dealer to Sponsor DVP Repo**:
    - CCP will generate settlement obligations to settle the start leg of the repo on a trade-for-trade basis through the CCP, at repo start money
    - Repo side will deliver securities to CCP, CCP redelivers securities to the reverse side
    - As DVP repos settle on delivery vs payment basis, credit extensions to the CCP by the clearing bank exist for very short periods of time until the subsequent matched deliveries are made. The CCP operates on a matched book basis and always has a receive and deliver obligation which are bound to one another for settlement purposes. Each receipt of securities by the CCP is automatically redelivered to a contra in a long position.

- If the repo trade is compared and novated **prior to noon**, at **Intraday**:
  - Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components – if the start leg has not settled at noon, positions to be settled for the start leg and end leg net out the VAR component at this time
  - CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service
- **At End of Day**, Clearing Fund margin requirement will be calculated based on end leg open position to be settled on T+1 – repo rate volatility ceases to be assessed as of the End of Day cycle prior to repo end date
- **At End of Day**, mark to market is **not** assessed as trade is due to settle next business day
Sponsored DVP Repo – DVP Repo Sourced Securities

**Repo Start Date - T+0 Continued**

- For the **Sponsored DVP** repo:
  - The start leg of the repo settles on a bilateral basis, away from the CCP

- If the repo trade is compared and novated **prior to noon**, at **Intraday**:
  - Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components for the Sponsoring Member and Sponsored Members (margin calculated at the Sponsored Member level, but settled on a gross basis via Sponsoring Member Omnibus account)
  - CCP will assess a pass-through mark to market adjustment between the Sponsoring Member’s main and Omnibus accounts and settle via CCP’s Funds-Only Settlement service

- At **End of Day**, Clearing Fund margin requirement will be calculated based on end leg open position to be settled on T+1 – repo rate volatility ceases to be assessed as of the End of Day cycle prior to repo end date

- At **End of Day**, mark to market is **not** assessed as trade is due to settle next business day
Sponsored DVP Repo – DVP Repo Sourced Securities

Repo Start Date – T+0 Continued
• At **End of Day**, end leg of both repo trades will be included in the CCP’s DVP net, CCP will establish a net long or short position per CUSIP per **full service** CCP Member
  • Trades included in DVP net are DVP buy/sell trades, forward repo start legs, and repo end legs due to settle the next business day
  • Once net position is established, CCP will generate settlement obligations to be settled the next day at CCP’s market price for the security
    • Sponsoring Member’s main account is netted out of settlement with the CCP
    • The difference between the CCP’s market price and repo end money will be settled via **Start of Day Funds-Only Settlement on repo end date**

Repo End Date - T+1
• If the settlement obligation is open (unsettled) as of noon, at **Intraday:**
  • Clearing Fund margin requirement will be calculated based on VAR component for the open position that is unsettled
  • CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service

• Securities are delivered by Sponsoring Member Omnibus account to CCP, CCP redelivers securities to CCP Member side to complete settlement of the net obligations generated from the two trades
### Figure 3b.ii. Sponsored DVP Repo – Sponsored Member Sourced Securities

**Overview of Sponsored DVP Repo between Sponsored Members**

<table>
<thead>
<tr>
<th>Entities</th>
<th>T-0</th>
<th>T+1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clearing Bank 1</td>
<td>Fedwire Processing</td>
<td>Fedwire Processing</td>
</tr>
<tr>
<td>CCP Sponsored Member 2</td>
<td>Trade Booking</td>
<td>Trade Booking</td>
</tr>
<tr>
<td>CCP</td>
<td>Trade Details Submission on behalf of Sponsored Member 2</td>
<td>Trade Details Submission on behalf of Sponsored Member 1</td>
</tr>
<tr>
<td>CCP Sponsoring Member (Reverse)</td>
<td>Matching, Novation</td>
<td>Matching, Novation</td>
</tr>
<tr>
<td>CCP Sponsoring Member 1</td>
<td>Trade Booking</td>
<td>Trade Booking</td>
</tr>
<tr>
<td>CCP</td>
<td>Trade Details Submission</td>
<td>Trade Details Submission</td>
</tr>
<tr>
<td>Custody Bank 1</td>
<td>Trade Booking</td>
<td>Trade Booking</td>
</tr>
<tr>
<td>CCP Sponsored Member 1</td>
<td>DVP Instructions</td>
<td>DVP Instructions</td>
</tr>
</tbody>
</table>

*The exposure to risk sundial diagram depicts lifecycle risk as it relates to the Sponsored DVP Repo trade only.*

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
<th>Indicator</th>
<th>Description</th>
<th>Indicator</th>
<th>Description</th>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counterparty Credit Risk</td>
<td>Centrally Cleared Credit Risk</td>
<td>CCP Counterparty Risk</td>
<td>Credit Extension Risk</td>
<td>Two Way Information Flow</td>
<td>One Way Information Flow</td>
<td>Security Movement</td>
<td>Cash Movement</td>
</tr>
</tbody>
</table>
Sponsored DVP Repo – Sponsored Member Sourced Securities

Repo Start Date - T+0

- Both Sponsored DVP Repo Trades are submitted to the CCP on a bilateral comparison basis – each side to a trade must be submitted to effect a match
  - Sponsoring Member’s Omnibus account submits, clears and settles the trade on behalf of the Sponsored Member (Limited Member of the CCP) with the CCP
  - Once trade details are matched by CCP, the trades are deemed Compared, and the end leg of the repos are Novated to CCP
  - Centrally Cleared Credit Risk exposure is between CCP and Sponsoring Member by virtue of Sponsoring Member Guaranty, in which Sponsor guarantees the settlement of all funds and securities obligations of its Sponsored Members

- Start leg of both repos settle bilaterally, away from CCP

- If the repo trades are compared and novated prior to noon, at Intraday:
  - Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components for the Sponsoring Member and Sponsored Members separately for each trade (margin calculated at the Sponsored Member level, but settled on a gross basis via Sponsoring Member Omnibus account)
  - CCP will assess a pass-through mark to market adjustment between the Sponsoring Member’s main and Omnibus accounts and settle via CCP’s Funds-Only Settlement service
Sponsored DVP Repo – Sponsored Member Sourced Securities

Repo Start Date - T+0 Continued

- At End of Day, Clearing Fund margin requirement will be calculated based on end leg open positions to be settled on T+1 – repo rate volatility ceases to be assessed as of the End of Day cycle prior to repo end date
- At End of Day, mark to market is not assessed as trades are due to settle next business day

End leg of both repo trades will be included in the CCP’s DVP net, CCP will establish a net long or short position per CUSIP per full service CCP Member

  - Trades included in DVP net are DVP buy/sell trades, forward repo start legs, and repo end legs due to settle the next business day
  - Once net position is established, CCP will generate settlement obligations to be settled the next day at CCP’s market price for the security
    - Offsetting trades result in the Sponsoring Member’s main and Omnibus accounts netting out of settlement via CCP, end leg will be settled bilaterally
    - Sponsoring Member main and Omnibus accounts are adjusted for any difference in repo end monies via Funds-only Settlement to be settled at Start of Day on repo end date

Repo End Date - T+1

- Securities are delivered by Reverse Sponsored Member to the Sponsoring Member, Sponsoring Member redelivers securities to Repo Sponsored Member side to complete settlement of the two trades
Figure 3c.i. Sponsored GC Repo – DVP Repo Sourced Securities

| Entities | T+0 | | T+1 | | Overnight | |
|---|---|---|---|---|---|
| CCP Sponsored Member | Trade Booking | Trade Details Submission | Wire Instructions | | |
| Triparty Agent Clearing Bank | Matching | | | |
| CCP Sponsoring Member (Repo) | Trade Booking | Trade Details Submission | | | |
| CCP Sponsoring Member (Reverse) | Matching | | | |
| Triparty Agent Clearing Bank | | | | |
| Clearing Bank 2* | Matching, Novation | | | |
| Fedwire | | | | |
| CCP | | | | |
| Clearing Bank 1 | Trade Booking | Trade Details Submission | DVP Instructions | | |

**Overnight Sponsored GC Repo with collateral sourced from DVP Repo Transaction**

- **Execution (1)**: CCP Sponsored Member
- **Affirmation/Confirmation (2)**: Triparty Agent Clearing Bank
- **Clearing/Settlement of Start-Leg (3)**: CCP Sponsoring Member (Repo)
- **Clearing/Settlement of End-Leg (5)**: CCP Sponsoring Member (Reverse)
- **Final Settlement of Start-Leg (4)**: Clearing Bank 2*
- **Final Settlement of End-Leg (6)**: Fedwire
- **Security Movement**: CCP Sponsoring Member (Repo)
- **Cash Movement**: Clearing Bank 1

**Indicators**

- **Counterparty Credit Risk**
- **Centrally Cleared Credit Risk**
- **CCP Counterparty Risk**
- **Credit Extension Risk**
- **Two Way Information Flow**
- **One Way Information Flow**
- **Security Movement**
- **Cash Movement**
- **Movement of Cash versus Collateral**
Sponsored GC Repo – DVP Repo Sourced Securities

Repo Start Date - T+0

- Both the Dealer to Sponsor DVP Repo and the Sponsored GC Repo trades are submitted to the CCP on a bilateral comparison basis – each side to a trade must submit to affect a match
  - For the **Sponsored GC Repo**:  
    - Sponsoring Member’s Omnibus account submits and clears the Sponsored GC trade on behalf of the Sponsored Member (Limited Member of the CCP) to the CCP  
    - Centrally Cleared Credit Risk exposure is between CCP and Sponsoring Member by virtue of Sponsoring Member Guaranty, in which Sponsor guarantees the settlement of all funds and securities obligations of its Sponsored Members  
    - Sponsored GC Repo trade must also be submitted directly to the Triparty Agent by the Sponsoring Member and Sponsored Member for trade matching and settlement  
    - Upon settlement of the start leg, Triparty Agent communicates that the trade is fully settled and the details of the collateral allocation to CCP - the end leg of the repo trade is Novated to the CCP at this time
  
  - For **Dealer to Sponsor DVP Repo**:  
    - Once trade details are matched by CCP the trades are deemed Compared and Novated
Sponsored GC Repo – DVP Repo Sourced Securities

Repo Start Date - T+0 Continued

- For the **Dealer to Sponsor DVP Repo**, once Compared and Novated:
  - CCP will generate settlement obligations to settle the start leg of the repo on a trade-for-trade basis through the CCP, at repo start money
  - Settlement obligations are bound - repo side will deliver securities to CCP, CCP redelivers securities to the reverse side
  - As DVP repos settle on delivery vs payment basis, credit extensions to the CCP by the clearing bank exist for very short periods of time until the subsequent matched deliveries are made. The CCP operates on a matched book basis and always has a receive and deliver obligation which are bound to one another for settlement purposes. Each receipt of securities by the CCP is automatically redelivered to a contra in a long position.

- If the repo trade is compared and novated **prior to noon**, at **Intraday**:
  - Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components – if the start leg has not settled at noon, positions to be settled for the start leg and end leg net out the VAR component at this time
  - CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service

- At **End of Day**, Clearing Fund margin requirement will be calculated based on end leg open position to be settled on T+1 – repo rate volatility ceases to be assessed as of the End of Day cycle prior to repo end date

- At **End of Day**, mark to market is **not** assessed as trade is due to settle next business day

- End leg of the repo trade will be included in the CCP’s DVP net, CCP will establish a net long or short position per CUSIP per CCP Member due to be settled on next business day
  - Trades included in DVP net are DVP buy/sell trades, forward repo start legs, and repo end legs due to settle the next business day
  - Once net position is established, CCP will generate settlement obligations to be settled the next day at CCP’s market price for the security
  - The difference between the CCP’s market price and repo end money will be settled via Start of Day Funds-Only Settlement on repo end date
Sponsored GC Repo – DVP Repo Sourced Securities

Repo Start Date - T+0 Continued
• For the Sponsored GC Repo trade:
  • Repo start leg settles via Triparty Agent’s allocation process on a trade-for-trade basis, with settlement taking place up until 5:30 PM EST
  • If trade is Novated to CCP prior to noon, then at Intraday:
    • Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components for the Sponsoring Member and Sponsored Member (margin calculated at the Sponsored Member level, but settled on a gross basis via Sponsoring Member Omnibus account)
    • Collateral mark to market is processed by Triparty Agent on behalf of CCP – if security re-pricing results in under collateralization, collateral providers are required to top up
    • CCP will assess a pass-through mark to market adjustment between the Sponsoring Member’s main and Omnibus accounts and settle via CCP’s Funds-Only Settlement service
  • At End of Day, Clearing Fund margin requirement will be calculated based on end leg open position to be settled on T+1 – repo rate volatility ceases to be assessed as of the End of Day cycle prior to repo end date
    • Clearing Fund margin requirement will be calculated for the Sponsoring Member and Sponsored Member (margin calculated at the Sponsored Member level, but settled on a gross basis via Sponsoring Member Omnibus account)
• At End of Day, mark to market is not assessed by CCP as trade is due to settle next business day
Sponsored GC Repo – DVP Repo Sourced Securities

Repo End Date - T+1

• For the Sponsored GC Repo trade:
  • At Start of Day and Intraday, collateral mark to market is processed by Triparty Agent on behalf of CCP
    • If mark to market results in under collateralization, collateral providers are required to top up by 9 AM EST and following the Intraday repricing
  • Collateral substitution will be processed by Sponsoring Member at Triparty Agent so that they can receive the securities used as collateral to deliver back to the CCP for the offsetting DVP Repo trade
    • Triparty Agent communicates updated collateral position data hourly to the CCP, CCP risk manages most up-to-date positions
  • At Intraday, Clearing Fund margin requirement is calculated based on end leg positions to be settled for the Sponsoring Member and Sponsored Member (margin calculated at the Sponsored Member level, but settled on a gross basis via Sponsoring Member Omnibus account)
  • Beginning at 3:30 PM EST, settlement of end leg will take place on a trade-for-trade basis via triparty allocation process, settling the repo trade’s principal value and interest via the Triparty Agent
Sponsored GC Repo – DVP Repo Sourced Securities

**Repo End Date - T+1 Continued**

- For the **Dealer to Sponsor DVP Repo** trade:
  - If the settlement obligation is open (unsettled) as of noon, at **Intraday**:
    - Clearing Fund margin requirement will be calculated based on VAR component for the open position that is unsettled
    - CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service
  - Securities are delivered by Sponsoring Member to CCP, CCP redelivers securities to CCP Member side to complete settlement of the net obligations generated for the two Members
Figure 3c.ii. Sponsored GC Repo – GCF Repo Sourced Securities

**Entities**

- **T+0**:
  - Execution (1)
  - Affirmation/Confirmation (2)
  - Clearing/Settlement of Start-Leg (3)
  - Final Settlement of Start-Leg (4)
- **Overnight**
  - Clearing/Settlement of End-Leg (5)
  - Final Settlement of End-Leg (6)

**CCP Sponsored Member**
- Trade Booking
- Trade Details Submission
- Wire Instructions
- Sponsored Member Account
- Receives Security
- Delivers Cash
- Security Settled into Sponsored Member's Account
- Collateral Allocation
- Sponsored Member Account
- Delivers Security
- Receives Cash

**CCP Sponsoring Member Omnibus (Reverse)**
- Trade Booking
- Trade Details Submission on behalf of Sponsored Member
- Wire Instructions/Collateral Allocation
- Sponsoring Member Account
- Receives Security
- Delivers Cash
- Collateral Allocation
- Sponsoring Member Account
- Delivers Security
- Receives Cash

**CCP Sponsoring Member (Repo)**
- Trade Booking
- Trade Details Submission
- Wire Instructions/Collateral Allocation
- Sponsoring Member Account
- Receives Security
- Delivers Cash
- Collateral Allocation
- Sponsoring Member Account
- Delivers Security
- Receives Cash

**Triparty Agent**
- Matching
- Triparty Allocation Process
- Matching, Novation, Netting

**Clearing Bank**
- Matching
- Triparty Allocation Process
- Matching, Novation, Netting

**CCP**
- Matching
- Triparty Allocation Process
- Matching, Novation, Netting

**IDB**
- Execution
- Trade Details Submission

**Dispatcher**
- Execution
- Trade Details Submission

**Sponsoring Member Account**
- Receives Security
- Delivers Cash

**Member Account**
- Receives Security
- Delivers Cash

**CCP Account**
- Simultaneous Exchange of Cash and Securities
- No Credit Extension

**Triparty Account**
- Matching, Novation, Netting

**CCP Sponsored Member (Repo)**
- Trade Booking
- Trade Details Submission
- Collateral Allocation
- Wire Instructions

**Indicator**
- Counterparty Credit Risk
- Centrally Cleared Credit Risk
- CCP Counterparty Risk
- Credit Extension Risk

**Description**
- Two Way Information Flow
- One Way Information Flow
- Security Movement
- Cash Movement

*The exposure to risk sundial diagram depicts lifecycle risk as it relates to the Sponsored GC Repo trade only.*

Collateral Substitutions processed by Triparty Agent
Sponsored GC Repo – GCF Repo Sourced Securities

**Repos Start Date - T+0**

- **For the Dealer to Sponsor GCF Repo trade:**
  - Trade is brokered by Inter-Dealer Broker (IDB), two trades are submitted to CCP by IDB on each CCP Member’s behalf
  - At the point of trade execution Counterparty Credit Risk exists between CCP Member 1 and the IDB, and CCP Member 2 and the IDB
  - CCP Members have visibility of the trade submitted on their behalf facing the IDB, and are required to Affirm IDB’s trade submission
  - Trades are deemed to be Compared and Novated at the time of receipt by CCP from IDB
  - Trade submission takes place between 7AM – 3PM EST, shortly after 3PM CCP’s GCF service net takes places, netting GCF trade activity and establishing net long or short position per GCF CUSIP per CCP Member
  - Trades included in GCF net include same day starting GCF Repo trades, forward starting trades due to start on current business day, and term repo trades that have started
  - CCP generates obligations to settle the position and communicates settlement obligations to Triparty Agent and CCP Members – GCF trades do not settle on a trade-for-trade basis, obligation is a net obligation

- Triparty settlements begins at 3:30PM EST – collateral providers allocate collateral to Triparty platform of Triparty Clearing Agent Bank, while cash lenders deliver funds to Triparty Agent to pay for purchase of collateral
  - Triparty Agent allocates collateral to cash lenders and cash to collateral providers through its allocation process, settling the repo start leg
  - Triparty Agent bank does not extend credit to CCP to facilitate settlement - in its allocation process, the Triparty Agent performs a look-through to the ultimate buyer prior to settling securities and cash

- Once GCF Repo settlement is complete, the Triparty Agent communicates the details of the collateral allocation to the CCP
  - CCP uses the details of the underlying securities allocated to generate Clearing Fund margin requirement based on the security positions due to be settled on T+1 (VAR only)
Sponsored GC Repo – GCF Repo Sourced Securities

Repo Start Date - T+0 Continued

For the Dealer to Sponsor GCF Repo trade:

- Risk Management Practices as applicable to this scenario:
  - Intraday: If trade is novated to CCP prior to noon, at Intraday Clearing Fund margin requirement will be calculated based on repo rate volatility component, and collected from both CCP Members
  - End of Day: Clearing Fund margin requirement calculated based on VAR component
    - Repo rate volatility component ceases to be assessed as repos end date is next business day
  - Interest for the GCF Repo is calculated at end of day on T+0, and settled start of day on T+1 via CCP’s Funds-Only Settlement service

For the Sponsored GC Repo trade:

- Trade is submitted to the CCP on a bilateral comparison basis – each side to a trade must submit to affect a match
  - Sponsoring Member’s Omnibus account submits the Sponsored GC trade on behalf of the Sponsored Member (limited Member of the CCP) to the CCP
  - Centrally Cleared Credit Risk exposure is between CCP and Sponsoring Member by virtue of Sponsoring Member Guaranty, in which Sponsor guarantees the settlement of all funds and securities obligations of its Sponsored Members
  - Sponsored GC Repo trade must also be submitted directly to the Triparty Agent by the Sponsoring Member and Sponsored Member for trade matching and settlement
  - Upon settlement of the start leg, Triparty Agent communicates that the trade is fully settled and the details of the collateral allocation to CCP - the end leg of the repo trade is Novated to the CCP at this time
Sponsored GC Repo – GCF Repo Sourced Securities

Repo Start Date - T+0 Continued
- For the **Sponsored GC Repo** trade:
  - Repo start leg settles via Triparty Agent’s allocation process on a trade-for-trade basis, with settlement taking place up until 5:30 PM EST
  - At **End of Day**, Clearing Fund margin requirement will be calculated based on end leg open position to be settled on T+1 – repo rate volatility ceases to be assessed as of the End of Day cycle prior to repo end date
  - Clearing Fund margin requirement will be calculated for the Sponsoring Member and Sponsored Member (margin calculated at the Sponsored Member level, but settled on a gross basis via Sponsoring Member Omnibus account)
  - At **End of Day**, mark to market is not assessed by CCP as trade is due to settle next business day
Sponsored GC Repo – GCF Repo Sourced Securities

**Repo End Date - T+1**

- For both the **Sponsored GC Repo** and the **Dealer to Sponsor GCF Repo** trades:
  - At **Start of Day** and **Intraday**, collateral mark to market is processed by Triparty Agent on behalf of CCP
    - If mark to market results in under collateralization, collateral providers are required to top up by 9 AM EST and following the Intraday repricing
  - Collateral substitutions may be processed by Triparty Agent on behalf of collateral providers
    - Triparty Agent communicates updated collateral position data hourly to the CCP, CCP risk manages most up-to-date positions
  - At **Intraday**, Clearing Fund margin requirement is calculated based on end leg positions to be settled for each repo trade separately and collected from the entities party to each trade
  - Beginning at 3:30 PM EST, settlement of the **Sponsored GC Repo** end leg will take place on a trade-for-trade basis via triparty allocation process, settling the repo trade and passing interest to the cash lender via the Triparty Agent
  - Thereafter, the **Dealer to Sponsor GCF Repo** end leg will be settled as part of the net obligation calculated for the two Members via the triparty allocation process
Figure 3c.iii. Sponsored GC Term Repo – GCF Repo Sourced Securities

<table>
<thead>
<tr>
<th>Term Sponsored GC Repo with collateral sourced from GCF Repo Transaction</th>
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<tbody>
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<td><strong>Entities</strong></td>
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<td>Triparty Agent (Reversed)</td>
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<td>Triparty Agent Platform</td>
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<td>CCP</td>
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<tr>
<td><strong>Note:</strong> The exposure to risk sundial diagram depicts lifecycle risk as it relates to the Sponsored GC Repo trade only.</td>
</tr>
</tbody>
</table>

**Table: Indicators**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counterparty Credit Risk</td>
<td>Centrally Cleared Credit Risk</td>
</tr>
<tr>
<td>Two Way Information Flow</td>
<td>One Way Information Flow</td>
</tr>
</tbody>
</table>
Sponsored GC Term Repo – GCF Repo Sourced Securities

**Repo Start Date - T+0**

- For the **Dealer to Sponsor GCF Repo** trade:
  - Trade is brokered by Inter-Dealer Broker (IDB), two trades are submitted to CCP by IDB on each CCP Member’s behalf
  - At the point of trade execution Counterparty Credit Risk exists between CCP Member 1 and the IDB, and CCP Member 2 and the IDB
  - CCP Members have visibility of the trade submitted on their behalf facing the IDB, and are required to Affirm IDB’s trade submission
  - Trades are deemed to be Compared & Novated at the time of receipt by CCP from IDB
  - Trade submission takes place between 7AM – 3PM EST, shortly after 3PM CCP’s GCF service net takes places, netting GCF trade activity and establishing net long or short position per GCF CUSIP per CCP Member
    - Trades included in GCF net include same day starting GCF Repo trades, forward starting trades due to start on current business day, and term repo trades that have started
  - CCP generates obligations to settle the position and communicates settlement obligations to Triparty Agent and CCP Members – GCF trades do not settle on a trade-for-trade basis, obligation is a net obligation
  - Triparty settlements begins at 3:30PM EST – collateral providers allocate collateral to Triparty platform of Triparty Agent, while cash lenders deliver funds to Triparty Agent to pay for purchase of collateral
    - Triparty Agent allocates collateral to cash lenders and cash to collateral providers through its allocation process, settling the repo start leg
    - Triparty Agent bank does **not** extend credit to CCP to facilitate settlement - in its allocation process, the Triparty Agent performs a look-through to the ultimate buyer prior to settling securities and cash
  - Once GCF Repo settlement is complete, the Triparty Agent communicates the details of the collateral allocation to the CCP
    - CCP uses the details of the underlying securities allocated to generate Clearing Fund margin requirement based on the security positions due to be settled on T+N (VAR only)
Sponsored GC Term Repo – GCF Repo Sourced Securities

**Repo Start Date - T+0 Continued**

- For the **Dealer to Sponsor GCF Repo** trade:
  - Risk Management Practices as applicable to this scenario:
    - **At Intraday**, a Clearing Fund margin requirement will be calculated based on the repo rate volatility component of the Clearing Fund calculation for the trade
      - As the Start Leg of the trade has yet to settle, there is no securities position market risk to be managed via the VAR component
    - **At End of Day**, the Clearing Fund margin requirement will be calculated based on both the VAR of the collateral positions communicated to the CCP by the Triparty Agent, and the repo rate volatility component of the calculation
    - **At End of Day**, the CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service
Sponsored GC Term Repo – GCF Repo Sourced Securities

Repo Start Date - T+0 Continued

• For the Sponsored GC Repo trade:
  • Trade is submitted to the CCP on a bilateral comparison basis – each side to a trade must submit to affect a match
  • Sponsoring Member’s Omnibus account submits the Sponsored GC trade on behalf of the Sponsored Member (limited Member of the CCP) to the CCP
  • Centrally Cleared Credit Risk exposure is between CCP and Sponsoring Member by virtue of Sponsoring Member Guaranty, in which Sponsor guarantees the settlement of all funds and securities obligations of its Sponsored Members
  • Sponsored GC Repo trade must also be submitted directly to the Triparty Agent by the Sponsoring Member and Sponsored Member for trade matching and settlement
  • Upon settlement of the start leg, Triparty Agent communicates that the trade is fully settled and the details of the collateral allocation to CCP - the end leg of the repo trade is Novated to the CCP at this time
  • Repo start leg settles via Triparty Agent’s allocation process on a trade-for-trade basis, with settlement taking place up until 5:30 PM EST
  • At End of Day, Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components for the Sponsoring Member and Sponsored Member (margin calculated at the Sponsored Member level, but settled on a gross basis via Sponsoring Member Omnibus account)
  • At End of Day, CCP will assess a pass-through mark to market adjustment between the Sponsoring Member’s main and Omnibus accounts and settle via CCP’s Funds-Only Settlement service
Sponsored GC Term Repo – GCF Repo Sourced Securities

Full Repo Term Day (T+1 to T+N – 2)

• For both the Sponsored GC Repo and the Dealer to Sponsor GCF Repo trades:
  • At Start of Day and Intraday, collateral mark to market is processed by Triparty Agent on behalf of CCP
    • If mark to market results in under collateralization, collateral providers are required to top up by 9 AM EST and following the Intraday repricing
    • Collateral substitutions may be processed by Triparty Agent on behalf of collateral providers
      • Triparty Agent communicates updated collateral position data hourly to the CCP, CCP risk manages most up-to-date positions

• For the Sponsored GC Repo, at Intraday daily accrued interest is settled between the Sponsoring Member and Sponsored Member via Triparty Agent

• At Intraday and End of Day for the Sponsored GC Repo:
  • CCP will assess a pass-through mark to market adjustment between the Sponsoring Member’s main and Omnibus accounts and settle via CCP’s Funds-Only Settlement service
  • Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components for the Sponsoring Member and Sponsored Member (margin calculated at the Sponsored Member level, but settled on a gross basis via Sponsoring Member Omnibus account)

• At Intraday and End of Day for the Dealer to Sponsor GCF Repo:
  • Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components and collected from the two Members

• At End of Day for the Dealer to Sponsor GCF Repo, the CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service
Sponsored GC Term Repo – GCF Repo Sourced Securities

**Term Day Prior to Repo End Date (T+N – 1)**

- For both the **Sponsored GC Repo** and the **Dealer to Sponsor GCF Repo** trades:
  - At **Start of Day** and **Intraday**, collateral mark to market is processed by Triparty Agent on behalf of CCP
    - If mark to market results in under collateralization, collateral providers are required to top up by 9 AM EST and following the Intraday repricing
    - Collateral substitutions may be processed by Triparty Agent on behalf of collateral providers
      - Triparty Agent communicates updated collateral position data hourly to the CCP, CCP risk manages most up-to-date positions
  - At **Intraday** for the **Sponsored GC Repo**:
    - Daily accrued interest is settled between the Sponsoring Member and Sponsored Member via Triparty Agent
    - CCP will assess a pass-through mark to market adjustment between the Sponsoring Member’s main and Omnibus accounts and settle via CCP’s Funds-Only Settlement service
    - Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components for the Sponsoring Member and Sponsored Member (margin calculated at the Sponsoring Member level, but settled on a gross basis via Sponsoring Member Omnibus account)
  - At **End of Day** for the **Sponsored GC Repo**, Clearing Fund margin requirement will be calculated based on end leg open position to be settled on T+N – repo rate volatility ceases to be assessed as of the End of Day cycle prior to repo end date
  - At **Intraday** for the **Dealer to Sponsor GCF Repo**, Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components and collected from the two Members
  - At **End of Day** for the **Dealer to Sponsor GCF Repo**, Clearing Fund margin requirement will be calculated based on end leg open position to be settled on T+N – repo rate volatility ceases to be assessed as of the End of Day cycle prior to repo end date
  - Interest for the **Dealer to Sponsor GCF Repo** is calculated end of day on term date prior to repo end date, and settled start of day on repo end date via CCP’s Funds-Only Settlement service
Sponsored GC Term Repo – GCF Repo Sourced Securities

**Repo End Date - T+N**

- For both the **Sponsored GC Repo** and the **Dealer to Sponsor GCF Repo** trades:
  - At **Start of Day** and **Intraday**, collateral mark to market is processed by Triparty Agent on behalf of CCP
    - If mark to market results in under collateralization, collateral providers are required to top up by 9 AM EST and following the **Intraday** repricing
  - Collateral substitutions may be processed by Triparty Agent on behalf of collateral providers
    - Triparty Agent communicates updated collateral position data hourly to the CCP, CCP risk manages most up-to-date positions

- **At Intraday**, Clearing Fund margin requirement is calculated based on end leg positions to be settled for each repo trade separately and collected from the entities party to each trade

- Beginning at 3:30 PM EST, settlement of **Sponsored GC** end leg will take place on a trade-for-trade basis via triparty allocation process, settling the repo trade and passing the remaining daily accrued interest to the cash lender via the Triparty Agent as part of final settlement

- Thereafter, the **Dealer to Sponsor GCF Repo** end leg will be settled as part of the net obligation calculated for the two Members via the triparty allocation process

*T+N represents the repo end date for a term repo of any tenor up to 735 days*
Figure 3c.iv. Sponsored GC Term Repo – Sponsored Member Sourced Securities

Term Sponsored GC Repo with collateral sourced from Sponsored DVP Repo Transaction

**Entities**

- CCP Sponsored Member
- CCP Sponsoring Member
- CCP
- Clearing Bank
- Triparty Agent

**Execution (1)**

- CCP Sponsored Member 2
  - Trade Booking
  - Trade Details Submission
  - CCP Sponsoring Member (Repo)
    - Trade Booking
    - Trade Details Submission

**T+0**

- Clearing/Settlement of Start-Leg (3)
  - Wire Instructions
  - Trade Details Submission on behalf of Sponsored Member
  - Matching
  - CCP
    - Trade Booking
    - Trade Details Submission

**Affirmation/Confirmation (2)**

- Triparty Agent Clearing Bank
  - Matching
  - CCP
    - Trade Booking
    - Trade Details Submission

**Clearing/Netting of Start Leg (4)**

- Security Settled into Sponsored Member 2’s Account
  - Security Delivered
  - Delivers Cash
  - Receives Security
  - Delivers Cash

**T+1**

- Clearing/Settlement of End Leg (5)
  - Collateral Allocation
    - CCP
      - Matching
      - CCP
        - Trade Booking
        - Trade Details Submission

**T+2**

- Clearing/Settlement of End Leg (5)
  - Collateral Mark to Market
    - CCP
      - Matching
      - CCP
        - Trade Booking
        - Trade Details Submission

**T+N**

- Clearing/Settlement of End Leg (5)
  - CCP
    - Matching
    - CCP
      - Trade Booking
      - Trade Details Submission

**Collateral Substitutions processed by Triparty Agent**

- Cash Settled into Sponsored Member 2’s Account
- Security Settled into Sponsored Member 2’s Account

**Exposure to Risk Sundial Diagram**

- The exposure to risk sundial diagram depicts lifecycle risk as it relates to the Sponsored GC Repo trade only

**Legend**

- CCP Sponsored Member
- CCP Sponsoring Member
- CCP
- Clearing Bank
- Triparty Agent

**Indicators**

- Counterparty Credit Risk
- Centrally Cleared Credit Risk
- CCP Counterparty Risk
- Credit Extension Risk
- Two Way Information Flow
- One Way Information Flow
- Security Movement
- Cash Movement
- Movement of Cash versus Collateral
**Sponsored GC Term Repo – Sponsored DVP Repo Sourced Securities**

**Repo Start Date - T+0**

- Both the **Sponsored DVP Repo** and the **Sponsored GC Repo** trades are submitted to the CCP on a bilateral comparison basis – each side to a trade must submit to affect a match
  - Sponsoring Member’s Omnibus account submits the trade on behalf of the Sponsored Members (limited Members of the CCP)
  - Once trade details are matched by CCP the trades are deemed Compared
    - **Sponsored DVP Repo** – once trade is Compared, the end leg of the repo trade is Novated to CCP
    - **Sponsored GC Repo** trade must also be submitted directly to the Triparty Agent by the Sponsoring Member and Sponsored Member for trade matching and settlement
      - Upon settlement of the start leg, Triparty Agent communicates that the trade is fully settled and the details of the collateral allocation to CCP - the end leg of the repo trade is Novated to the CCP at this time
  - Centrally Cleared Credit Risk exposure is between CCP and Sponsoring Member by virtue of Sponsoring Member Guaranty, in which Sponsor guarantees the settlement of all funds and securities obligations of its Sponsored Members

- For the **Sponsored DVP Repo**:
  - The start leg of the repo settles on a bilateral basis, away from the CCP
  - If the repo trade is compared and novated prior to noon, at **Intraday**:
    - Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components for the Sponsoring Member and Sponsored Member 1 (margin calculated at the Sponsoring Member level, but settled on a gross basis via Sponsoring Member Omnibus account)
    - CCP will assess a pass-through mark to market adjustment between the Sponsoring Member’s main and Omnibus accounts settle via CCP’s Funds-Only Settlement service
  - At **End of Day**, Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components for the Sponsoring Member and Sponsored Member (margin calculated at the Sponsoring Member level, but settled on a gross basis via Sponsoring Member Omnibus account)
  - At **End of Day**, CCP will assess a pass-through mark to market adjustment between the Sponsoring Member’s main and Omnibus accounts and settle via CCP's Funds-Only Settlement service
**Sponsored GC Term Repo – Sponsored DVP Repo Sourced Securities**

**Repo Start Date - T+0 Continued**

- For the **Sponsored GC Repo** trade:
  - Repo start leg settles via Triparty Agent’s allocation process on a trade-for-trade basis, with settlement taking place up until 5:30 PM EST
  - If the repo trade is Novated prior to noon, at **Intraday**:
    - Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components for the Sponsoring Member and Sponsored Member 2 (margin calculated at the Sponsored Member level, but settled on a gross basis via Sponsoring Member Omnibus account)
    - CCP will assess a pass-through mark to market adjustment between the Sponsoring Member’s main and Omnibus accounts and settle via CCP’s Funds-Only Settlement service
    - Collateral mark to market is processed by Triparty Agent on behalf of CCP
      - If mark to market results in under collateralization, collateral providers are required to top up
  - At **End of Day**, Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components for the Sponsoring Member and Sponsored Member (margin calculated at the Sponsored Member level, but settled on a gross basis via Sponsoring Member Omnibus account)
  - At **End of Day**, CCP will assess a pass-through mark to market adjustment between the Sponsoring Member’s main and Omnibus accounts and settle via CCP’s Funds-Only Settlement service
Sponsored GC Term Repo – Sponsored DVP Repo Sourced Securities

Full Repo Term Day (T+1 to T+N – 2)

- For the **Sponsored GC Repo** trade:
  - At **Start of Day** and **Intraday**, collateral mark to market is processed by Triparty Agent on behalf of CCP
    - If mark to market results in under collateralization, collateral providers are required to top up by 9 AM EST and following the Intraday repricing
  - Collateral substitutions may be processed by Triparty Agent on behalf of collateral providers
    - Triparty Agent communicates updated collateral position data hourly to the CCP, CCP risk manages most up-to-date positions
  - At **Intraday**, daily accrued interest is settled between the Sponsoring Member and Sponsored Member 2 via Triparty Agent
  - At **Intraday**, Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components for the Sponsoring Member and Sponsored Member 2 (margin calculated at the Sponsored Member level, but settled on a gross basis via Sponsoring Member Omnibus account)
  - At **Intraday**, CCP will assess a pass-through mark to market adjustment between the Sponsoring Member’s main and Omnibus accounts and settle via CCP’s Funds-Only Settlement service
  - At **End of Day**, Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components for the Sponsoring Member and Sponsored Member 2 (margin calculated at the Sponsored Member level, but settled on a gross basis via Sponsoring Member Omnibus account via Omnibus account)
  - At **End of Day**, CCP will assess a pass-through mark to market adjustment between the Sponsoring Member’s main and Omnibus accounts and settle via CCP’s Funds-Only Settlement service
Sponsored GC Term Repo – Sponsored DVP Repo Sourced Securities

Full Repo Term Day (T+1 to T+N – 2) Continued

- For the **Sponsored DVP Repo** trade:
  - At *Intraday*, Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components for the Sponsoring Member and Sponsored Member 1 (margin calculated at the Sponsored Member level, but settled on a gross basis via Sponsoring Member Omnibus account)
  - At *Intraday*, CCP will assess a pass-through mark to market adjustment between the Sponsoring Member’s main and Omnibus accounts and settle via CCP’s Funds-Only Settlement service
  - At *End of Day*, Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components for the Sponsoring Member and Sponsored Member 1 (margin calculated at the Sponsored Member level, but settled on a gross basis via Sponsoring Member Omnibus account)
  - At *End of Day*, CCP will assess a pass-through mark to market adjustment between the Sponsoring Member’s main and Omnibus accounts and settle via CCP’s Funds-Only Settlement service
Sponsored GC Term Repo – Sponsored DVP Repo Sourced Securities

Term Day Prior to Repo End Date (T+N – 1)

- For the **Sponsored GC Repo** trade:
  - At **Start of Day** and **Intraday**, collateral mark to market is processed by Triparty Agent on behalf of CCP
    - If mark to market results in under collateralization, collateral providers are required to top up by 9 AM EST and following the Intraday repricing
  - Collateral substitutions may be processed by Triparty Agent on behalf of collateral providers
    - Triparty Agent communicates updated collateral position data hourly to the CCP, CCP risk manages most up-to-date positions
  - At **Intraday**, daily accrued interest is settled between the Sponsoring Member and Sponsored Member 2 via Triparty Agent
  - At **Intraday**, Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components for the Sponsoring Member and Sponsored Member 2 (margin calculated at the Sponsored Member level, but settled on a gross basis via Sponsoring Member Omnibus account)
  - At **Intraday**, CCP will assess a pass-through mark to market adjustment between the Sponsoring Member’s main and Omnibus accounts and settle via CCP’s Funds-Only Settlement service
  - At **End of Day**, Clearing Fund margin requirement will be calculated based on end leg open position to be settled on T+N – repo rate volatility ceases to be assessed as of the End of Day cycle prior to repo end date
  - At **End of Day**, mark to market is **not** assessed by CCP as trade is due to settle next business day
Sponsored GC Term Repo – Sponsored DVP Repo Sourced Securities

**Term Day Prior to Repo End Date (T+N – 1) Continued**

- For the **Sponsored DVP Repo** trade:
  - At **Intraday**, Clearing Fund margin requirement will be calculated based on VAR and repo rate volatility components for the Sponsoring Member and Sponsored Member 1 (margin calculated at the Sponsored Member level, but settled on a gross basis via Sponsoring Member Omnibus account).
  - At **Intraday**, CCP will assess a pass-through mark to market adjustment between the Sponsoring Member’s main and Omnibus accounts and settle via CCP’s Funds-Only Settlement service.
  - At **End of Day**, Clearing Fund margin requirement will be calculated based on end leg open position to be settled on T+N – repo rate volatility ceases to be assessed as of the End of Day cycle prior to repo end date.
  - At **End of Day**, mark to market is not assessed by CCP as trade is due to settle next business day.
  - At **End of Day** the end leg of the repo trade will be included in the CCP’s DVP net, CCP will establish a net long or short position per CUSIP per CCP Member due to be settled on next business day.
    - Trades included in DVP net are DVP buy/sell trades, forward repo start legs, and repo end legs due to settle the next business day.
    - Once net position is established, CCP will generate settlement obligations to be settled the next day at CCP’s market price for the security.
    - The difference between the CCP’s market price and repo end money will be settled via Start of Day Funds-Only Settlement on repo end date.
Sponsored GC Term Repo – Sponsored DVP Repo Sourced Securities

Repo End Date – T+N

For the **Sponsored GC Repo** trade:

- At **Start of Day** and **Intraday**, collateral mark to market is processed by Triparty Agent on behalf of CCP
  - If mark to market results in under collateralization, collateral providers are required to top up by 9 AM EST and following the Intraday repricing
- Collateral substitution will be processed by Sponsoring Member at Triparty Agent so that they can receive the securities used as collateral to deliver back to the CCP for the offsetting Sponsored DVP Repo trade
  - Triparty Agent communicates updated collateral position data hourly to the CCP, CCP risk manages most up-to-date positions
- At **Intraday**, Clearing Fund margin requirement will be calculated based on open end leg position still to be settled for the Sponsoring Member and Sponsored Member 2 (margin calculated at the Sponsored Member level, but settled on a gross basis via Sponsoring Member Omnibus account)
  - Beginning at 3:30 PM EST, settlement of Sponsored GC end leg will take place on a trade-for-trade basis via triparty allocation process, settling the repo trade and passing the remaining daily accrued interest to the cash lender via the Triparty Agent as part of final settlement

For the **Sponsored DVP Repo** trade:

- If the settlement obligation is open (unsettled) as of noon, at **Intraday**:
  - Clearing Fund margin requirement will be calculated based on VAR component for the open position that is unsettled
  - CCP will assess a pass-through mark to market adjustment between the CCP Members and settle via CCP’s Funds-Only Settlement service
- Securities are delivered by Sponsoring Member to CCP, CCP redelivers securities to Sponsoring Member Omnibus side to complete settlement of the net obligations generated for the two Members
  - Sponsoring Member Omnibus account delivers securities to Sponsored Member 1 away from the CCP, settling on a bilateral basis

*T+N represents the repo end date for a term repo of any tenor up to 735 days
4. Clearing and Settlement of Securities Lending Transactions
## 4a. Securities Lending Tri-party Flow – Stock Loan Transaction DVP vs DVP

<table>
<thead>
<tr>
<th>Entity</th>
<th>Execution (1)</th>
<th>Affirmation/Confirmation (2)</th>
<th>T + 0 (Same Day)</th>
<th>Settlement (3a)</th>
<th>Settlement (3b)</th>
<th>Reporting (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Time*</td>
<td>Time*</td>
<td>Time*</td>
<td>Time*</td>
<td>Time*</td>
<td>Time*</td>
</tr>
<tr>
<td></td>
<td>7:00AM – 3:00PM</td>
<td>7:00AM – 3:00PM</td>
<td>7:00AM – 3:00PM</td>
<td>7:00AM – 3:00PM</td>
<td>Post 8:00PM</td>
<td></td>
</tr>
<tr>
<td>Borrower (Stock Loan Transaction)</td>
<td>Loan agreed (DVP)</td>
<td>Returns agreed (DVP)</td>
<td>Mark To Market (RQV)</td>
<td>Loan received/settled as DVP</td>
<td>Returns delivered/settled as DVP</td>
<td></td>
</tr>
<tr>
<td>Collateral Borrower</td>
<td>Agree to the Trade</td>
<td>- Principal</td>
<td>- Tenor</td>
<td>- Start and End Date</td>
<td>- Rate</td>
<td>- Collateral Type(s)</td>
</tr>
<tr>
<td>Tri-Party Agent</td>
<td>Match Trade Instructions upon receipt</td>
<td>System creates Trade (trade is typically open, so value is simply modified)</td>
<td>System screens for eligibility, prices and margins collateral</td>
<td>Trade is fully collateralized</td>
<td>Collateral Reports transmitted to Lender and Borrower</td>
<td></td>
</tr>
<tr>
<td>Collateral Lender</td>
<td>Agree to the Trade</td>
<td>- Principal</td>
<td>- Tenor</td>
<td>- Start and End Date</td>
<td>- Rate</td>
<td>- Collateral Type(s)</td>
</tr>
<tr>
<td>Lender (Stock Loan Transaction)</td>
<td>Loan agreed (DVP)</td>
<td>Returns agreed (DVP)</td>
<td>Mark To Market (RQV)</td>
<td>Loan delivered/settled as DVP</td>
<td>Returns received/settled as DVP</td>
<td></td>
</tr>
</tbody>
</table>

### Tri-party Exposure
- **Borrower/Lender:** Counterparty Credit Risk
- **Borrower/Lender:** Opportunity Cost should trade not match
- **Borrower/Lender:** Has Mark to Market risk
- **Borrower/Lender:** Opportunity cost should there be collateral/cash shortfall
- **Borrower/Lender:** Inability to reconcile if reports are not received
Securities Lending Tri-party Flow – Stock Loan Transaction DVP vs DVP: Risk Highlights & Mitigants

7:00AM – 3:00PM – Trade Instruction Matching Process

- The primary differentiator with securities lending transactions is that they are typically inclusive of many loans, while a tri-party repo transaction is representative of a singular trade

- Between 7:00AM and 3:00PM the Borrower(s) and Lender(s) transmit their trade instructions to the tri-party agent’s deal matching system. These instructions can be transmitted via files or entered directly onto the Collateral Management system.
  - There are three types of trade instructions that require matching:
    - (1) a revision of a trade already in the market (due to mark to market or changes in loan balances),
    - (2) a maturing trade the Lender & Borrower would like to extend or
    - (3) a new trade being booked.
  - Should the tri-party agent not receive matched instructions by the 3:00PM deadline (though deals can match up to 3:30pm when unmatched tri-party deals will unwind), the previous day’s matched instruction will remain valid.
  - The risk for the Borrower in a DVP settled loan could be the Borrower holding collateral they cannot finance, which would require internal financing or, if unavailable, a bank loan.
  - Risk for the Lender in a DVP settled loan could be that they would hold cash they cannot invest overnight and could be held with their custodian bank overnight

- Solutions/Workarounds for potential issue(s) – same as standard tri-party solutions
  - Timing – the Borrower can request the tri-party agent delay the running of the settlement algorithm to allow additional time for instructions to be matched
  - Operational or Technology – the tri-party agent provides an alternative trade loading solution allowing Lender/Borrower to provide trade instructions which will be automatically uploaded into the collateral management system. For limited issues, the Lender/Borrower can enter the trade instructions directly into the system. If a trade instruction is entered incorrectly, that party would either modify the trade instructions, or if agreed to by both parties, the trade could be cancelled and resubmitted. If it is the Borrower’s issue, the Lender can affirm the modified or new instruction.

3:30PM – 6:00PM – Eligibility screening, Trade Collateralization – same as standard tri-party solutions

- Incorrect pricing or discrepancy in collateral pricing
  - Collateral may be a bad mix, requiring additional collateral, cash or potentially a Bank Loan
- Mis-allocation of Borrower’s collateral
  - Allocation logic can be driven by automatic allocation, allocation optimization, or directed allocations via the Borrower’s allocation algorithm
  - Lender may wire insufficient cash or fail to wire any cash
- When the unwind occurs, there is the potential exposure risk that the borrower does not have sufficient funds, in which case the tri-party agent may need to finance/lend on behalf of the borrower in order to facilitate the unwind. In this situation, the tri-party agent maintains a lien on the securities until the borrower has sufficient funds.

Post 8:00PM – Collateral Reports sent to parties – same as standard tri-party solutions

- Delayed Reports or failure to transmit reports can lead to reconciliation issues for both Borrower(s) and Lender(s) and potential impact to downstream systems/processes
### 4b. Securities Lending Tri-party Flow – Stock Loan Transaction FOP vs FOP

<table>
<thead>
<tr>
<th>Time*</th>
<th>Borrower (Stock Loan Transaction)</th>
<th>Affirmation/Confirmation (2)</th>
<th>Settlement (3a) Collateralization and Funding</th>
<th>Settlement (3b) Collateral and Cash Exchange</th>
<th>Reporting (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00AM – 3:00PM</td>
<td>Loan agreed (FOP)</td>
<td>7:00AM – 3:00PM</td>
<td>Flags</td>
<td>Loan received/settled as FOP returns delivered/settled as FOP</td>
<td>Post 8:00PM</td>
</tr>
<tr>
<td>7:00AM – 3:00PM</td>
<td>Returns agreed (FOP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7:00AM – 3:00PM</td>
<td>Mark To Market (RQV)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post 8:00PM</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Collateral Borrower**
- **Agree to the Trade**
  - Principal
  - Tenor
  - Start and End Date
  - Rate
  - Collateral Type(s)
- Advise Tri-party Agent of trade details
  - Net collateral agreed between Borrower/Lender/Tri-party

**Tri-Party Agent**
- Match Trade Instructions upon receipt
- System creates Trade (trade is typically open, so value is simply modified)
- System screens for eligibility, prices and margins collateral
- Trade is fully collateralized
- Collateral Reports transmitted to Lender and Borrower

**Collateral Lender**
- **Agree to the Trade**
  - Principal
  - Tenor
  - Start and End Date
  - Rate
  - Collateral Type(s)
- Advise Tri-party Agent of trade details
  - Net collateral agreed between Borrower/Lender/Tri-party

**Lender (Stock Loan Transaction)**
- Loan agreed (FOP)
- Returns agreed (FOP)
- Mark To Market (RQV)
- Confirm collateral is allocated to Tri-party account
  - Loan delivered/settled as FOP
  - Returns received/settled as FOP

### Tri-party Exposure

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counterparty Credit Risk</td>
<td></td>
</tr>
<tr>
<td>Centrally Cleared Credit Risk</td>
<td></td>
</tr>
<tr>
<td>CCP Counterparty Risk</td>
<td></td>
</tr>
<tr>
<td>Credit Extension Risk</td>
<td></td>
</tr>
<tr>
<td>Two Way Information Flow</td>
<td></td>
</tr>
<tr>
<td>One Way Information Flow</td>
<td></td>
</tr>
<tr>
<td>Security Movement</td>
<td></td>
</tr>
<tr>
<td>Cash Movement</td>
<td></td>
</tr>
<tr>
<td>Movement of Cash versus Collateral</td>
<td></td>
</tr>
</tbody>
</table>
Securities Lending Tri-party Flow – Stock Loan Transaction FOP vs FOP: Risk Highlights & Mitigants

7:00AM – 3:00PM – Trade Instruction Matching Process

- The primary differentiator with securities lending transactions is that they are typically inclusive of many loans, while a tri-party repo transaction is representative of a singular trade.
- Between 7:00AM and 3:00PM the Borrower(s) and Lender(s) transmit their trade instructions to the tri-party agent's deal matching system. These instructions can be transmitted via files or entered directly onto the Collateral Management system.
  - There are three types of trade instructions that require matching:
    - (1) a revision of a trade already in the market (due to mark to market or changes in loan balances),
    - (2) a maturing trade the Lender & Borrower would like to extend or
    - (3) a new trade being booked.
- Should the tri-party agent not receive matched instructions by the 3:00PM deadline (though deals can match up to 3:30pm when unmatched tri-party deals will unwind), the previous day's matched instruction will remain valid.
- The risk for the Borrower in a FoP settled loan could be that the Borrower does not receive the securities that they sought to borrow.
- The risk for the Lender in a FoP settled loan could be that the Lender is unable to complete a loan and misses the opportunity to trade.

Solutions/Workarounds for potential issue(s) – same as standard tri-party solutions

- Timing – the Borrower can request the tri-party agent delay the running of the settlement algorithm to allow additional time for instructions to be matched
- Operational or Technology – the tri-party agent provides an alternative trade loading solution allowing Lender/Borrower to provide trade instructions which will be automatically uploaded into the collateral management system. For limited issues, the Lender/Borrower can enter the trade instructions directly into the system. If a trade instruction is entered incorrectly, that party would either modify the trade instructions, or if agreed to by both parties, the trade could be cancelled and resubmitted. If it is the Borrower’s issue, the Lender can affirm the modified or new instruction.

3:30PM – 6:00PM – Eligibility screening, Trade Collateralization – same as standard tri-party solutions

- Incorrect pricing or discrepancy in collateral pricing
- Collateral may be a bad mix, requiring additional collateral, cash or potentially a Bank Loan
- Mis-allocation of Borrower’s collateral
  - Allocation logic can be driven by automatic allocation, allocation optimization, or directed allocations via the Borrower’s allocation algorithm

Post 8:00PM – Collateral Reports sent to parties – same as standard tri-party solutions

- Delayed Reports or failure to transmit reports can lead to reconciliation issues for both Borrower(s) and Lender(s) and potential impact to downstream systems/processes
## 4c. Securities Lending Bilateral Flow – Stock Loan Transaction FOP vs FOP

<table>
<thead>
<tr>
<th>Entity</th>
<th>Execution</th>
<th>Affirmation/Confirmation</th>
<th>Clearing &amp; Settlement</th>
<th>Final Settlement &amp; Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time</strong></td>
<td><strong>Entity</strong></td>
<td><strong>T+0</strong></td>
<td><strong>Entity</strong></td>
<td><strong>T+0</strong></td>
</tr>
<tr>
<td>6:00AM – 8:00AM</td>
<td><strong>Borrower (Stock Loan Transaction)</strong></td>
<td><strong>Loan agreed (FOP)</strong>&lt;br&gt;<strong>Returns agreed (FOP)</strong>&lt;br&gt;<strong>Mark To Market (Collateral FOP)</strong></td>
<td><strong>Returns delivered/settled as FOP</strong></td>
<td><strong>After Lender confirms receipt of collateral…</strong>&lt;br&gt;<strong>Loan received/settled as FOP</strong></td>
</tr>
<tr>
<td>8:30AM – 3:30PM</td>
<td><strong>Collateral Borrower</strong>&lt;br&gt;<strong>Trade Execution/Booking</strong>&lt;br&gt;<strong>Net Collateral Matching</strong>&lt;br&gt;<strong>- Counterparty validates collateral pricing and margin</strong></td>
<td><strong>DVF Instructions sent to Clearing Bank</strong></td>
<td><strong>Clearing bank delivers collateral to custody bank</strong></td>
<td><strong>Collateral reporting is generated</strong></td>
</tr>
<tr>
<td>Post 8:00PM – Close</td>
<td><strong>Clearing Bank</strong>&lt;br&gt;<strong>Collateral Lender</strong>&lt;br&gt;<strong>Trade Execution/Booking</strong>&lt;br&gt;<strong>Net Collateral Matching</strong>&lt;br&gt;<strong>- Counterparty validates collateral pricing and margin</strong></td>
<td><strong>RVF Instructions sent to Custody Bank</strong>&lt;br&gt;<strong>Bonds are allocated to agency client on the lender’s books and records</strong></td>
<td><strong>Collateral securities are received into borrower’s collateral custody account</strong>&lt;br&gt;<strong>Confirm collateral is settled to Custody account, then…</strong>&lt;br&gt;<strong>Loan delivered/settled as FOP</strong></td>
<td><strong>Collateral reporting is generated</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Lender (Stock Loan Transaction)</strong>&lt;br&gt;<strong>Loan agreed (FOP)</strong>&lt;br&gt;<strong>Returns agreed (FOP)</strong>&lt;br&gt;<strong>Mark To Market (Collateral FOP)</strong></td>
<td><strong>Returns received/settled as FOP</strong></td>
<td><strong>After Lender confirms receipt of collateral…</strong>&lt;br&gt;<strong>Loan received/settled as FOP</strong></td>
<td><strong>Collateral reporting is generated</strong></td>
</tr>
</tbody>
</table>

### Exposure

<table>
<thead>
<tr>
<th>Borrower/ Lender: Has counterparty replacement risk to other party</th>
<th>Borrower/ Lender: Has Mark to Market risk</th>
<th>Borrower/ Lender: Inability to reconcile if reports are not received</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator Description</td>
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</tr>
<tr>
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Securities Lending Bilateral Flow – Stock Loan Transaction FOP vs FOP: Risk Highlights & Mitigants

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  - The risk for the Borrower in a FoP settled loan could be that the Borrower does not receive the securities that they sought to borrow.
  - The risk for the Lender in a FoP settled loan could be that the Lender is unable to complete a loan and misses the opportunity to trade, or releases the loan and is undercollateralized.

Solutions/Workarounds for potential issue(s) – same as standard tri-party solutions

- Timing – the Borrower can request the tri-party agent delay the running of the settlement algorithm to allow additional time for instructions to be matched
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- Mis-allocation of Borrower’s collateral
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Post 8:00PM – Collateral Reports sent to parties – same as standard tri-party solutions

- Delayed Reports or failure to transmit reports can lead to reconciliation issues for both Borrower(s) and Lender(s) and potential impact to downstream systems/processes