Fenics | NDF

CREDIT RISK

MANAGEMENT SOLUTION

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1. INTRODUCTION

This document outlines the implementation of the pre-trade credit monitoring within the Fenics NDF framework. It also describes how a Fenics NDF client (operator) or an operator's Prime Broker (PB) can monitor credit utilization and control credit limits for each counterparty via the Fenics NDF user interface (UI). Any questions regarding this document should be addressed directly to NDF_liquidity@fenicsfx.com.

2. CREDIT RISK MANAGEMENT SPECIFICATIONS

2.1. RISK ENTITY

The operator (or its PB) defines risk entities for which credit can be assigned. Credit monitoring and checks will be based on a per-entity configuration. The operator can assign one or several trading connections to each entity. A trading connection is one of the following:

1. Financial Information exchange (FIX) liquidity taking session
2. FIX liquidity providing session
3. Specific account on a FIX-taking session

A trading connection can only be assigned to one entity, however, a risk entity can have a parent entity **(see Section 3)**.

Each entity has the following main attributes:

- Current NET, DSL and GROSS exposure **(see Section 2.2)**
- Allowed NET, DSL and GROSS exposure **(see Section 2.6)**
- Current status **(see Section 2.7)**
- Alert thresholds and alert email distribution list **(see Section 2.10)**
- Parent entity (optional); if an entity has a parent entity, each order is also checked against the parent entity's exposure and limit **(see Section 3)**.

Creating new entities and allocating FIX session and/ or account tags to an entity is currently not available through the user interface (UI). In a future release, the operator will be able to create new entities and assign FIX sessions/accounts to an entity via the UI.

Creating new risk entities can be done at any time, but deleting risk entities is only possible if the gross credit utilization for that entity is 0. Adding a new FIX session/account to an entity will be possible intraday, as long as there has been no trading activity on that FIX session/account for that trading day. Removing or changing the entity for a FIX session/account, which has trading activity for that day, will only be possible during the End of Day (EOD) roll window (17:00 EST/ 22:00 UTC or 17:00 EDT/ 21:00 UTC cut-off time).

2.2. NET, DSL, AND GROSS EXPOSURE

Fenics NDF tracks the realized NET (per trade day), Daily Settlement Limit (DSL (net open position per value date) and realized GROSS risk exposure for each entity for all unsettled FX transactions. These risk exposures are monitored based on USD normalized values (see **Section 2.3** for details on the USD conversion). The UI displays realized exposure for each individual currency, but the risk limits and alerts are only on the aggregated value (this is aggregated across currencies).

In a future release, the operator will be able to set maximum exposures for individual currencies as well.

The GROSS risk exposure is the entire realized and open exposure in the dealt currency amount (normalized to USD), without any netting.

The NET risk exposure takes into account the side of a trade and nets out a position in the same currency. The NET exposure is the sum of all (USD-normalized) short positions after netting (long positions are ignored). The NET value is calculated for all trades executed on a given trade date (ignoring value dates).

The DSL risk exposure takes into account the side of a trade and nets out positions in the same currency for the same settlement day (no netting across settlement dates). The limit check is done for each value date separately. The DSL exposure is the sum of all (USD-normalized) short positions for a given value date.

See Appendix A for detailed formulas for NET, DSL and GROSS.

2.3. FLOATING AND PRE-TRADE CONVERSION RATES

For each traded currency, two conversion rates, a floating conversion rate and a pre-trade conversion rate, are tracked.

The floating conversion rate is the mid-point rate of the currency versus USD (CCY/USD) from an aggregated book of pre-selected benchmark liquidity providers. The operator (or its PB) can choose which benchmark liquidity providers should be used to determine the floating rate. The floating rate will be updated on a 1-minute pulsed feed. At the beginning of a trading day, the pre-trade conversion rate will be set equal to the floating conversion rate at a pre-defined time of the previous trading day (e.g., 4:45 pm). The pre-trade rate stays constant unless it deviates too much from the floating rate. We suggest a 1% difference between the floating and pre-trade rate as acceptable (the operator should determine this in their discretion), this threshold can be reduced or increased by the operator. Once the pre-trade rate breaks out of the acceptable band, it will be updated to the floating rate at the time of the breakout. It will then stay constant unless the rate breaks through the allowed band again.

The pre-trade conversion rate is used for the pre-trade credit check on incoming and outgoing orders, as well as for calculating the current exposure that is displayed in the UI. Furthermore, the pre-trade conversion rate is displayed in the UI.

2.4. OPEN ORDERS

Open orders (orders the in active matching process) do count towards the credit exposure, however, open orders are not allowed for netting of realized or open positions.

Resting orders do not count towards the credit exposure and will only be checked for available credit, once a match has been identified, or if the resting order is posted to an outside venue.

If a credit limit is breached, then any open orders for this entity will be cancelled on a best-effort basis. For instance, Fenics NDF will send out cancel requests for all open orders immediately following a breach of the limit, however, Immediate-or-Cancel and Fill-or-Kill orders in general cannot be cancelled and might still lead to additional exposure.

2.5. CREDIT LIMITS

For each entity, the operator can set three USD credit limits, one on the NET, one of the DSL and one on the GROSS exposure. These limits are set only for the USD-normalized and aggregated exposure (not per currency) and can be adjusted in the UI at any time.

2.6. STATUS OF EACH RISK ENTITY

The operator can select the expected status of a risk entity. The following 4 statuses are available as options:

- RUNNING: Pre-trade credit checks are running for this entity based on configured NET, DSL and GROSS limits.
- STOPPED: Open orders for this risk entity will be cancelled on a best-effort basis. Any new incoming order will be rejected immediately with the message: “No credit available.” This option will prevent any trading for this entity (kill switch).
- CLOSING: Only trades that reduce the NET and DSL exposure will be accepted. Trades that would increase NET or DSL exposure will be rejected with the message: “Entity is in CLOSING mode, only risk-reducing trades are accepted”. If the gross limit is reached, then also NET and DSL decreasing orders will get rejected.
- BYPASS: No credit check will be done for this risk entity.

The UI will show the expected status, as well as the current confirmed status. When the markets are closed or the risk server is not running, the status of the risk entities is INITIAL (all orders will be rejected in the INITIAL state).

2.7. PRE-TRADE CREDIT CHECK

For every newly matched order and any new resting order, the Fenics NDF pre-trade credit component will check if the order would exceed any of the credit limits, assuming the order would get filled at the limit price (or top-of-book price for market orders).

If a parent entity is specified for the involved risk entity, then the same checks are done against the exposure of the parent entity (see Section 3).

All checks are based on the pre-trade conversion rate for the entire requested amount.

If an order passes the pre-trade credit check, then both sides of the trade will be assigned as open positions for this entity. If the order gets filled, then this order will be moved from the open to the realized position. If the order gets cancelled/ rejected, then the order will be removed from the open exposure.

If a limit is exceeded, then the entire deal will immediately be rejected with the reject message: “Not enough credit available.” All associated trading connections will get auto-paused and all open orders will get cancelled on a best-effort basis. In addition, an alert is sent to the Fenics NDF operator and an entity- specific email distribution list. See Section 2.9 for more details on alerting.

If the NET/DSL limit is reached, then orders that allow reduction of the NET/DSL exposure are still allowed, as long as the GROSS limit is not breached. In the first implementation, quotes on both sides of the book will still be shown, but only orders on one side will be accepted (orders on the other side will be rejected with the reject message: “Not enough credit available”).

If the GROSS limit is reached, then any FIX sessions that are assigned to this entity will be paused automatically and any outstanding orders will be cancelled on a best-effort basis. The FIX session will only resume at end-of-day when enough credit frees up, or when the operator manually resumes the FIX session. In this case, it is strongly advised to increase the credit limit to avoid another automated pausing of the session.

2.8. LAST LOOK QUOTES

Some liquidity pools will allow for last-look quotes. There will be no credit check deletion on incoming and outgoing quotes that allow a last look. These quotes also don’t account towards open exposure. Credit checks are only done on firm liquidity orders.

2.9. CREDIT ALERTS

The Fenics NDF operator will be notified by email alert if a credit limit is reached. In addition, system alerts will be sent out if there is a breach of configurable pre-set percentage levels of allowed credit (for example, at 70%, 90% and 95%). Alerts are generated on a per-entity basis. Entity-specific email distribution and alert thresholds can be configured via the UI.

Threshold alerting will only be reset if the exposure decreases by at least 5%. For example, if the alert for 70% were triggered, then another 70% would only be sent out if the exposure drops to below 65% and then again breaches the 70% limit.

2.10. RISK SERVER FAILURE AND RECOVERY SCENARIO

In the case of a failure of the risk server, all FIX connections will automatically be paused by the system and an alert will be sent out to the Fenics NDF operator.

Trade data is saved in at least three different locations and this data will then be used to restore the risk server. Different recovery times are expected depending on the data source from which the recovery is performed. In the fastest method, we expect the risk server to be back up and functional within minutes. In rare cases, recovery of the risk server might require more time. Once the risk server is fully restored, the Fenics NDF team will notify the operator and the operator can resume trading at their discretion.

3. CREDIT TREE STRUCTURE

The Fenics NDF flexible credit tree structure allows the operator to allocate available credit to various child entities and still satisfy the overall credit limit for the parent risk entity.

Each risk entity can have a parent entity. If a parent entity is specified, then the risk check is done against the trading entity as well as the parent entity. This structure allows for several levels of introducing PBs, as well as assigning credit on a granular level, such as a specific trader.

3.1. INTRODUCING PB OR PRIME OF PRIMES

Each risk entity can have directly associated trading connections as well as child entities. The tree structure allows for credit monitoring on all available levels. **Figure 1** shows a schematic setup of the credit tree structure. The breadth and depth of the credit tree is unlimited. Each trading connection can only be assigned to one risk entity.

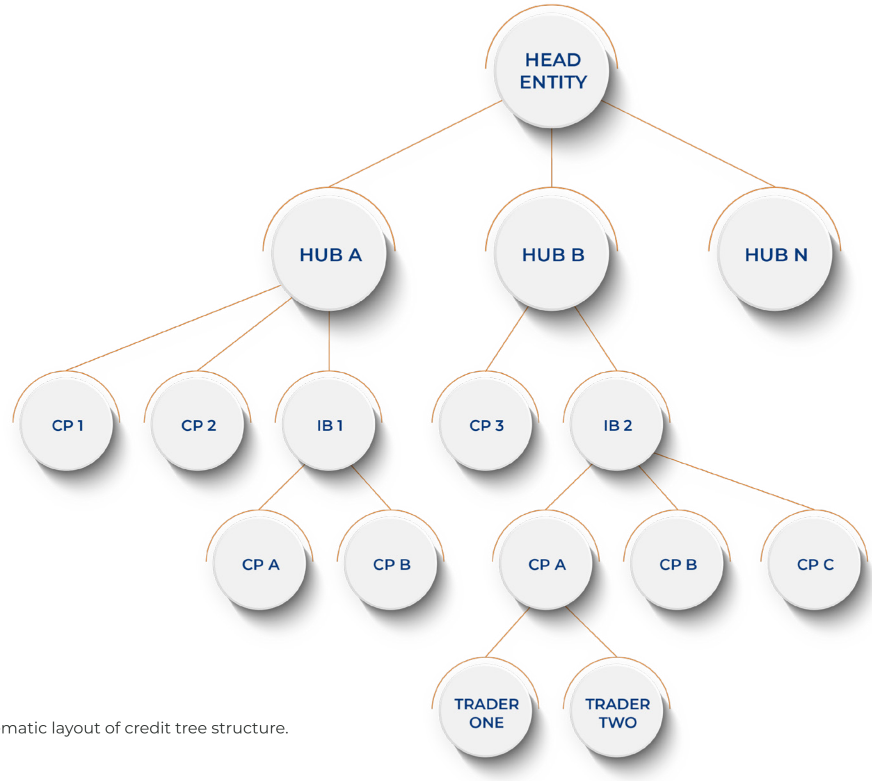


Figure 1: Schematic layout of credit tree structure.

On a match the NET and DSL only need to be checked until the common node of the two involved counterparties has been reached – once there is a common node, the NET and DSL no longer need checking. For example, if CP1 and CP2 match in the above schema, then the NET/DSL for Hub A do not need to be checked as the two sides of the trade offset each other.

An operator can create a limited operator; this is a UI user type that only has access to a specific risk entity and all its children. For example, a limited operator user can have access to the IB 1 risk entity. This user will then see the credit utilization from IB 1, and how this credit is split between CP A and CP B. Responding to this information, it could change those limits, however, the limited operator will not see any credit utilization in the remainder of the tree. See **Section 4.2** for more details regarding different UI user types.

3.2. PB TO PB MATCHING

If two counterparties fall under separate Hubs it is not sufficient to check the credit exposure against each PB. The operator must also ensure that both PBs have enough credit with each other. **Figure 2** shows an example.

In this example, let's assume CP1 (under Hub A) matches against CP3 (under Hub B) in this case the following credit checks are done:

For CP1 leg:

1. CP1 versus Hub A
2. Hub A versus Head Entity (if this check is enforced)
3. Hub B versus Hub A

For CP3 leg:

1. CP3 versus Hub B
2. Hub B versus Head Entity (if this check is enforced)
3. Hub A versus Hub B

Once all six checks pass, the match will be allowed.

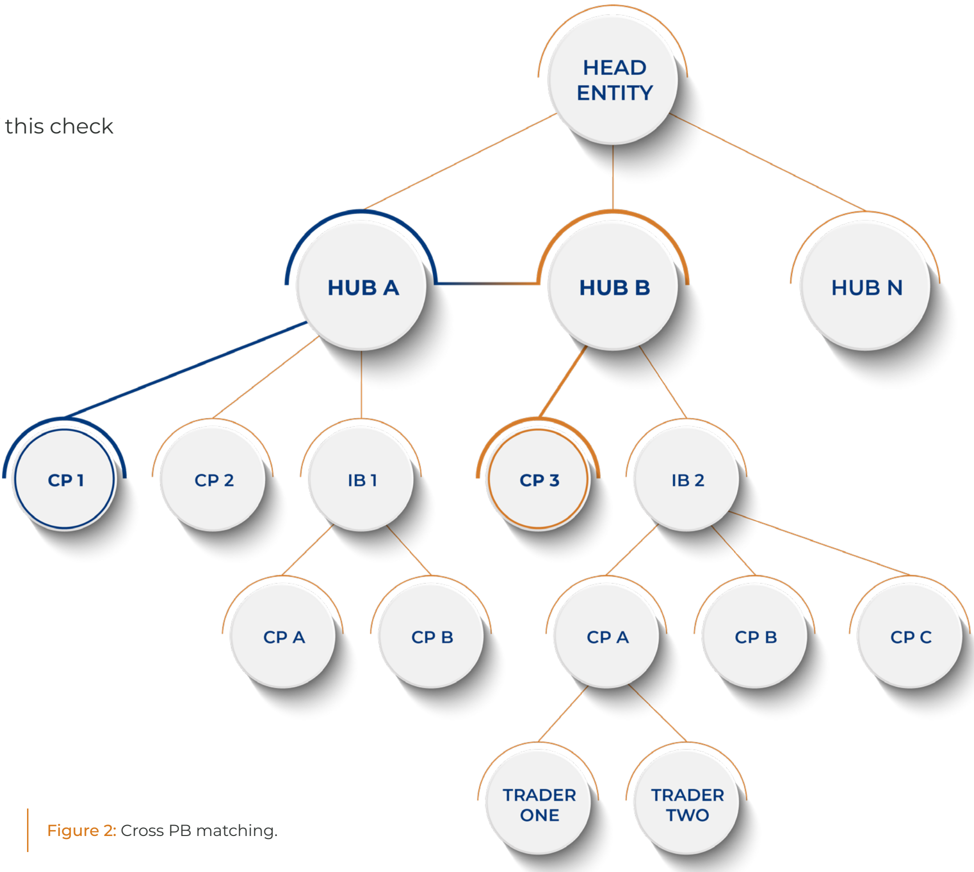


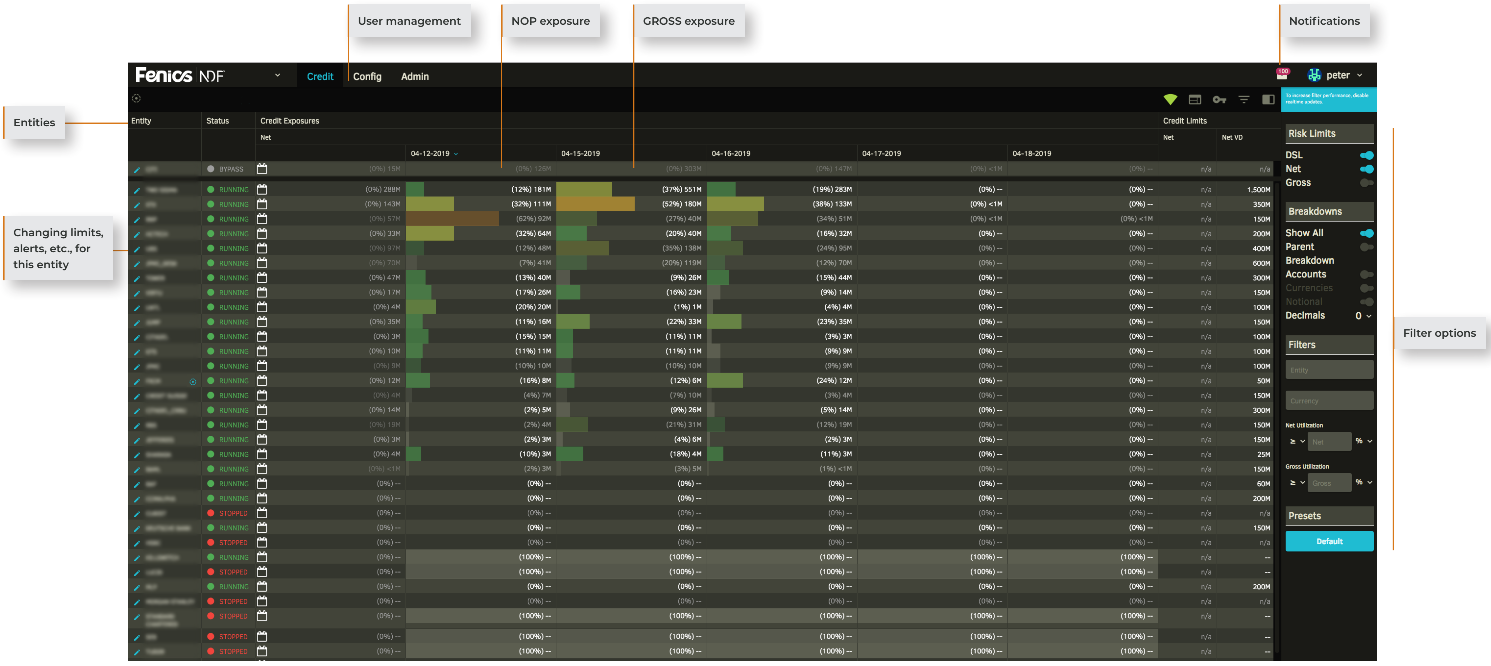
Figure 2: Cross PB matching.

4. USER INTERFACE

4.1. CREDIT MONITORING

Fenics NDF offers a user interface (UI) where the exposure of each risk entity can be monitored and credit limits can be configured at the level of entity.

In the initial view, the NET exposure, the GROSS exposure, and the corresponding utilizations are shown for each risk entity. Filters can display the exposure for each value date, each currency, and each underlying account. **Figure 3** shows a screenshot of the UI and explains the basic functionalities.



To increase filter performance, disable realtime updates.

Entity	Status	Credit Exposures						Credit Limits	
		Net						Net	Net VD
			04-12-2019	04-15-2019	04-16-2019	04-17-2019	04-18-2019		
[redacted]	● BYPASS	(0%) 15M	(0%) 126M	(0%) 303M	(0%) 147M	(0%) <1M	(0%) --	n/a	n/a
[redacted]	● RUNNING	(0%) 288M	(12%) 181M	(37%) 551M	(19%) 283M	(0%) --	(0%) --	n/a	1,500M
[redacted]	● RUNNING	(0%) 143M	(32%) 111M	(52%) 180M	(38%) 133M	(0%) <1M	(0%) --	n/a	350M
[redacted]	● RUNNING	(0%) 57M	(62%) 92M	(27%) 40M	(34%) 51M	(0%) <1M	(0%) <1M	n/a	150M
[redacted]	● RUNNING	(0%) 33M	(32%) 64M	(20%) 40M	(16%) 32M	(0%) --	(0%) --	n/a	200M
[redacted]	● RUNNING	(0%) 97M	(12%) 48M	(35%) 138M	(24%) 95M	(0%) --	(0%) --	n/a	400M
[redacted]	● RUNNING	(0%) 70M	(7%) 41M	(20%) 119M	(12%) 70M	(0%) --	(0%) --	n/a	600M
[redacted]	● RUNNING	(0%) 47M	(13%) 40M	(9%) 26M	(15%) 44M	(0%) --	(0%) --	n/a	300M
[redacted]	● RUNNING	(0%) 17M	(17%) 26M	(16%) 23M	(9%) 14M	(0%) --	(0%) --	n/a	150M
[redacted]	● RUNNING	(0%) 4M	(20%) 20M	(1%) 1M	(4%) 4M	(0%) --	(0%) --	n/a	100M
[redacted]	● RUNNING	(0%) 35M	(11%) 16M	(22%) 33M	(23%) 35M	(0%) --	(0%) --	n/a	150M
[redacted]	● RUNNING	(0%) 3M	(15%) 15M	(11%) 11M	(3%) 3M	(0%) --	(0%) --	n/a	100M
[redacted]	● RUNNING	(0%) 10M	(11%) 11M	(11%) 11M	(9%) 9M	(0%) --	(0%) --	n/a	100M
[redacted]	● RUNNING	(0%) 9M	(10%) 10M	(10%) 10M	(9%) 9M	(0%) --	(0%) --	n/a	100M
[redacted]	● RUNNING	(0%) 12M	(16%) 8M	(12%) 6M	(24%) 12M	(0%) --	(0%) --	n/a	50M
[redacted]	● RUNNING	(0%) 4M	(4%) 7M	(7%) 10M	(3%) 4M	(0%) --	(0%) --	n/a	150M
[redacted]	● RUNNING	(0%) 14M	(2%) 5M	(9%) 26M	(5%) 14M	(0%) --	(0%) --	n/a	300M
[redacted]	● RUNNING	(0%) 19M	(2%) 4M	(21%) 31M	(12%) 19M	(0%) --	(0%) --	n/a	150M
[redacted]	● RUNNING	(0%) 3M	(2%) 3M	(4%) 6M	(2%) 3M	(0%) --	(0%) --	n/a	150M
[redacted]	● RUNNING	(0%) 4M	(10%) 3M	(18%) 4M	(11%) 3M	(0%) --	(0%) --	n/a	25M
[redacted]	● RUNNING	(0%) <1M	(2%) 3M	(3%) 5M	(1%) <1M	(0%) --	(0%) --	n/a	150M
[redacted]	● RUNNING	(0%) --	(0%) --	(0%) --	(0%) --	(0%) --	(0%) --	n/a	60M
[redacted]	● RUNNING	(0%) --	(0%) --	(0%) --	(0%) --	(0%) --	(0%) --	n/a	200M
[redacted]	● STOPPED	(0%) --	(0%) --	(0%) --	(0%) --	(0%) --	(0%) --	n/a	n/a
[redacted]	● RUNNING	(0%) --	(0%) --	(0%) --	(0%) --	(0%) --	(0%) --	n/a	150M
[redacted]	● STOPPED	(0%) --	(0%) --	(0%) --	(0%) --	(0%) --	(0%) --	n/a	n/a
[redacted]	● RUNNING	(0%) --	(100%) --	(100%) --	(100%) --	(100%) --	(100%) --	n/a	--
[redacted]	● STOPPED	(0%) --	(100%) --	(100%) --	(100%) --	(100%) --	(100%) --	n/a	--
[redacted]	● RUNNING	(0%) --	(0%) --	(0%) --	(0%) --	(0%) --	(0%) --	n/a	200M
[redacted]	● STOPPED	(0%) --	(0%) --	(0%) --	(0%) --	(0%) --	(0%) --	n/a	n/a
[redacted]	● STOPPED	(0%) --	(100%) --	(100%) --	(100%) --	(100%) --	(100%) --	n/a	--
[redacted]	● STOPPED	(0%) --	(100%) --	(100%) --	(100%) --	(100%) --	(100%) --	n/a	--
[redacted]	● STOPPED	(0%) --	(100%) --	(100%) --	(100%) --	(100%) --	(100%) --	n/a	--

Risk Limits
DSL ●
Net ●
Gross ○

Breakdowns
Show All ●
Parent Breakdown ○
Accounts ○
Currencies ○
Notional ○
Decimals 0

Filters
Entity
Currency
Net Utilization ≥ Net %
Gross Utilization ≥ Gross %

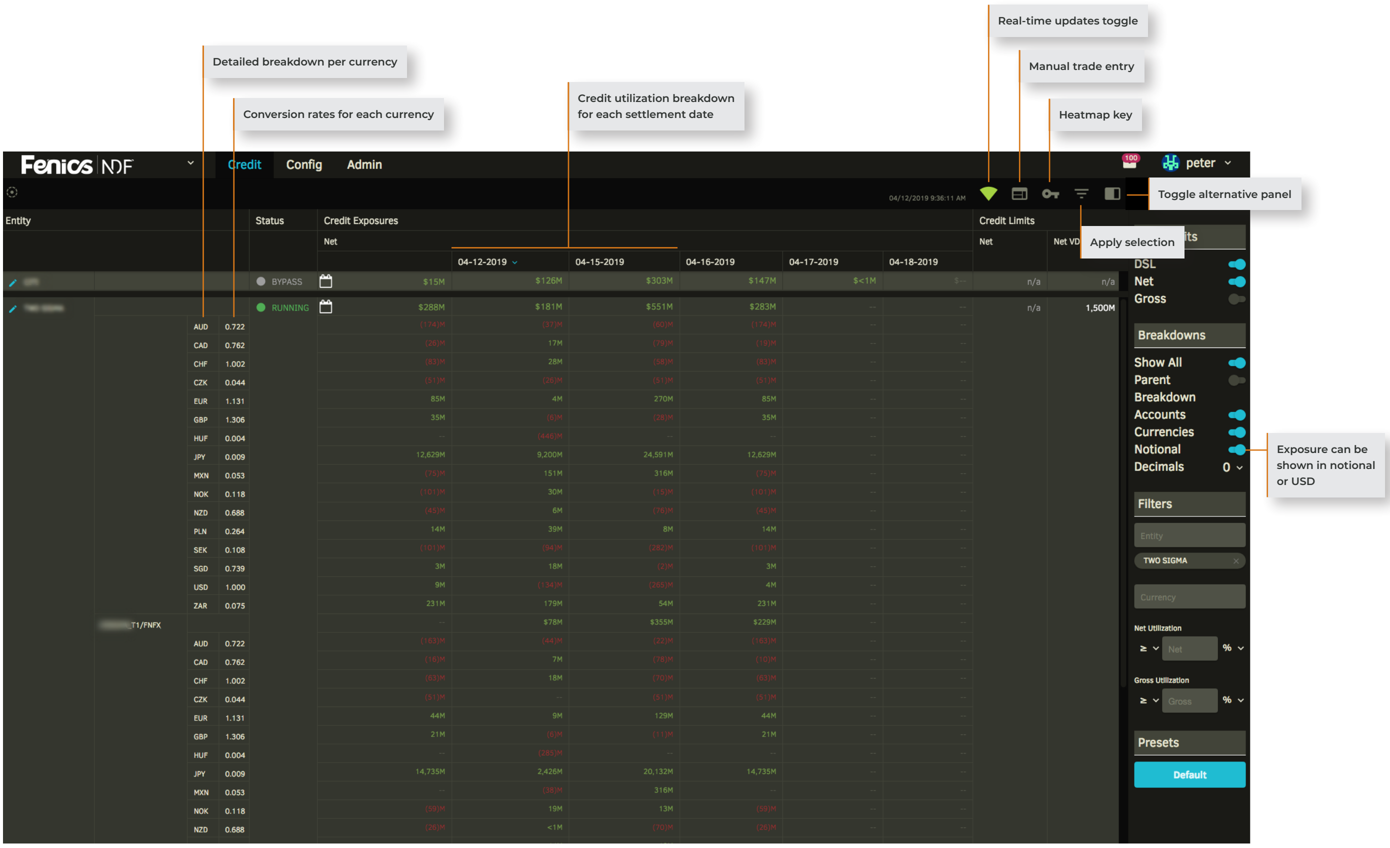
Presets
Default

Figure 3: Fenics NDF basic functionalities.

The user can display the credit exposure in a more detailed breakdown:

- By currency (this will also show the conversion rate)
- By FIX session/account
- By settlement date

Figure 4 shows an example where for a specific entity the breakdown is shown for each settlement date and currency. This allows the operator to see the exact exposure for a specific currency, and when the credit settles.


Real-time updates toggle
Manual trade entry
Heatmap key
Detailed breakdown per currency
Conversion rates for each currency
Credit utilization breakdown for each settlement date
Toggle alternative panel
Apply selection
Exposure can be shown in notional or USD
Credit
Config
Admin
100
peter
04/12/2019 9:36:11 AM

Entity				Status	Credit Exposures						Credit Limits	
					Net						Net	Net VD
						04-12-2019	04-15-2019	04-16-2019	04-17-2019	04-18-2019		
[redacted]				● BYPASS	$15M	$126M	$303M	$147M	$<1M	$--	n/a	n/a
[redacted]				● RUNNING	$288M	$181M	$551M	$283M	--	--	n/a	1,500M
		AUD	0.722		(174)M	(37)M	(60)M	(174)M	--	--		
		CAD	0.762		(26)M	17M	(79)M	(19)M	--	--		
		CHF	1.002		(83)M	28M	(58)M	(83)M	--	--		
		CZK	0.044		(51)M	(26)M	(51)M	(51)M	--	--		
		EUR	1.131		85M	4M	270M	85M	--	--		
		GBP	1.306		35M	(6)M	(28)M	35M	--	--		
		HUF	0.004		--	(446)M	--	--	--	--		
		JPY	0.009		12,629M	9,200M	24,591M	12,629M	--	--		
		MXN	0.053		(75)M	151M	316M	(75)M	--	--		
		NOK	0.118		(101)M	30M	(15)M	(101)M	--	--		
		NZD	0.688		(45)M	6M	(76)M	(45)M	--	--		
		PLN	0.264		14M	39M	8M	14M	--	--		
		SEK	0.108		(101)M	(94)M	(282)M	(101)M	--	--		
		SGD	0.739		3M	18M	(2)M	3M	--	--		
		USD	1.000		9M	(134)M	(265)M	4M	--	--		
		ZAR	0.075		231M	179M	54M	231M	--	--		
	[redacted]_T1/FNFX				--	$78M	$355M	$229M	--	--		
		AUD	0.722		(163)M	(44)M	(22)M	(163)M	--	--		
		CAD	0.762		(16)M	7M	(78)M	(10)M	--	--		
		CHF	1.002		(63)M	18M	(70)M	(63)M	--	--		
		CZK	0.044		(51)M	--	(51)M	(51)M	--	--		
		EUR	1.131		44M	9M	129M	44M	--	--		
		GBP	1.306		21M	(6)M	(11)M	21M	--	--		
		HUF	0.004		--	(285)M	--	--	--	--		
		JPY	0.009		14,735M	2,426M	20,132M	14,735M	--	--		
		MXN	0.053		--	(38)M	316M	--	--	--		
		NOK	0.118		(59)M	19M	13M	(59)M	--	--		
		NZD	0.688		(26)M	<1M	(70)M	(26)M	--	--		

its

DSL ☑
Net ☑
Gross ☐

Breakdowns

Show All ☑
Parent Breakdown ☐
Accounts ☑
Currencies ☑
Notional ☑
Decimals 0

Filters

Entity
TWO SIGMA ×
Currency

Net Utilization
≥ Net %

Gross Utilization
≥ Gross %

Presets

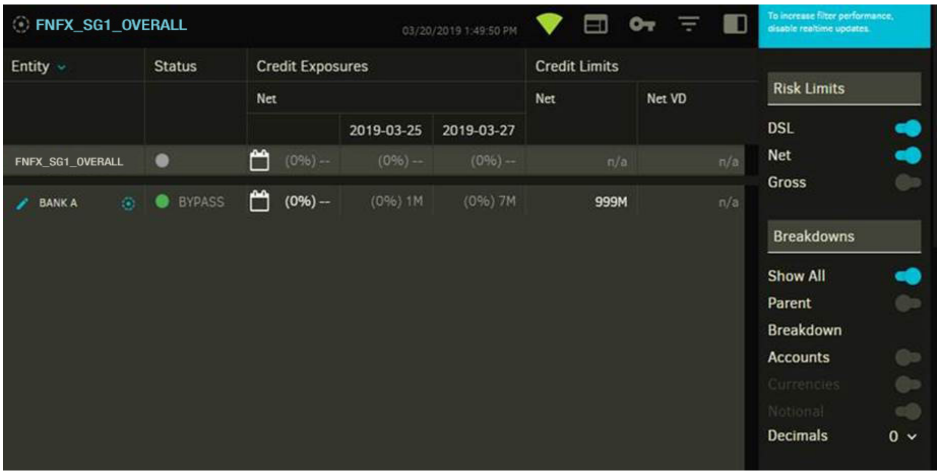
Default

Figure 4: Credit utilization breakdown for each currency and value date.

In addition, a user can filter by "Entity" and "Currency" by using the filter option on the right-hand sidebar (image above). These filters have auto-complete and can include multiple selections.

4.2. SETTING LIMITS

On the first login to the credit admin tool, the user will see the following screen:



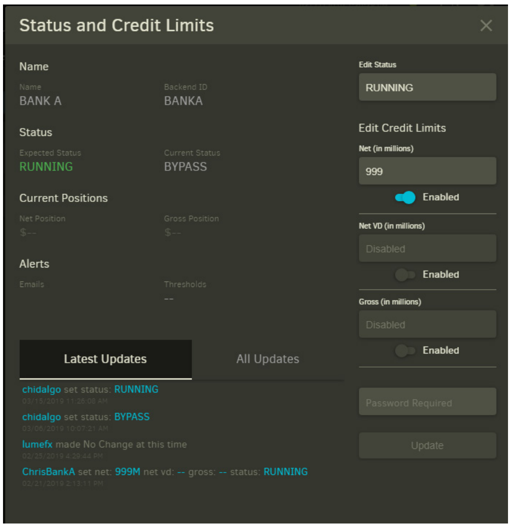
FNFX_SG1_OVERALL 03/20/2019 1:49:50 PM

To increase filter performance, disable realtime updates.

Entity	Status	Credit Exposures			Credit Limits	
		Net			Net	Net VD
			2019-03-25	2019-03-27		
FNFX_SG1_OVERALL	●	(0%) --	(0%) --	(0%) --	n/a	n/a
BANK A	● BYPASS	(0%) --	(0%) 1M	(0%) 7M	999M	n/a

Figure 5: Initial Login

Clicking on the pencil icon to the left of the entity name (e.g. "BANK A") will bring up the "Credit Limit" setting screen, as shown in **Figure 6**:



Status and Credit Limits

Name

Name: BANK A

Backend ID: BANKA

Status

Expected Status: RUNNING

Current Status: BYPASS

Current Positions

Net Position: $--

Gross Position: $--

Alerts

Emails:

Thresholds: --

Edit Status: RUNNING

Edit Credit Limits

Net (in millions): 999 — Enabled

Net VD (in millions): Disabled — Enabled

Gross (in millions): Disabled — Enabled

chidalgo set status: RUNNING
03/15/2019 11:26:08 AM

chidalgo set status: BYPASS
03/06/2019 10:07:21 AM

lumefx made No Change at this time
02/25/2019 4:29:44 PM

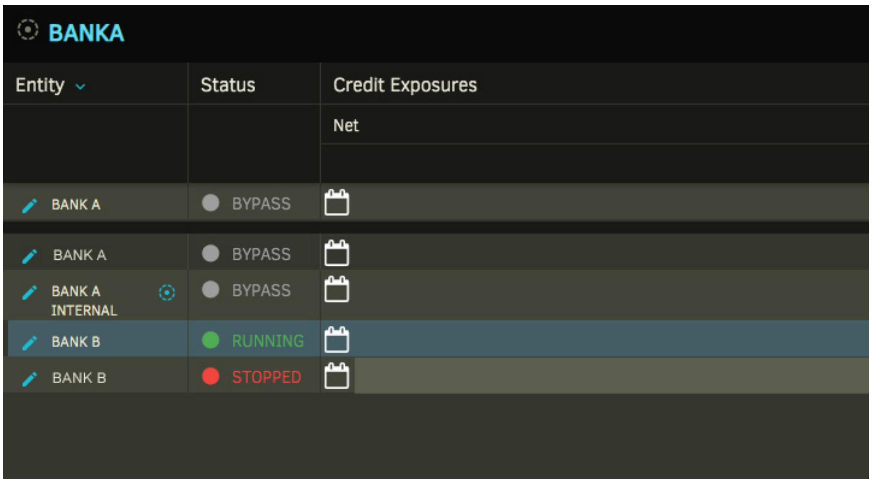
ChrisBankA set net: 999M net vd: -- gross: -- status: RUNNING
02/21/2019 2:13:11 PM

Figure 6: Status and Credit Limit Screen.

The first line of the screen – "Name" and "Backend ID" – informs the user which entity this screen is showing the limits for. In this case, it's for "BANK A". The status grouping shows the current and expected credit status of the entity in question (please review **Section 2.6** of this guide for an explanation of status). The "Current Positions" section shows the user the current NET and GROSS USD equivalent positions which the entity has in the system.

The “Alerts” section shows the email addresses and thresholds set for this entity, if different from the platform default. In addition, the “Latest Updates”, and “All Updates” tabs at the bottom show the historical changes to the credit for this entity.

The above screen represents the “BANK A” house credit limit. If you close this window and click the wheel to the right of the entity name, you will see the following:



BANKA

Entity	Status	Credit Exposures
		Net
BANK A	● BYPASS	
BANK A	● BYPASS	
BANK A INTERNAL	● BYPASS	
BANK B	● RUNNING	
BANK B	● STOPPED	

Figure 7: Entity Credit Allocation Screen

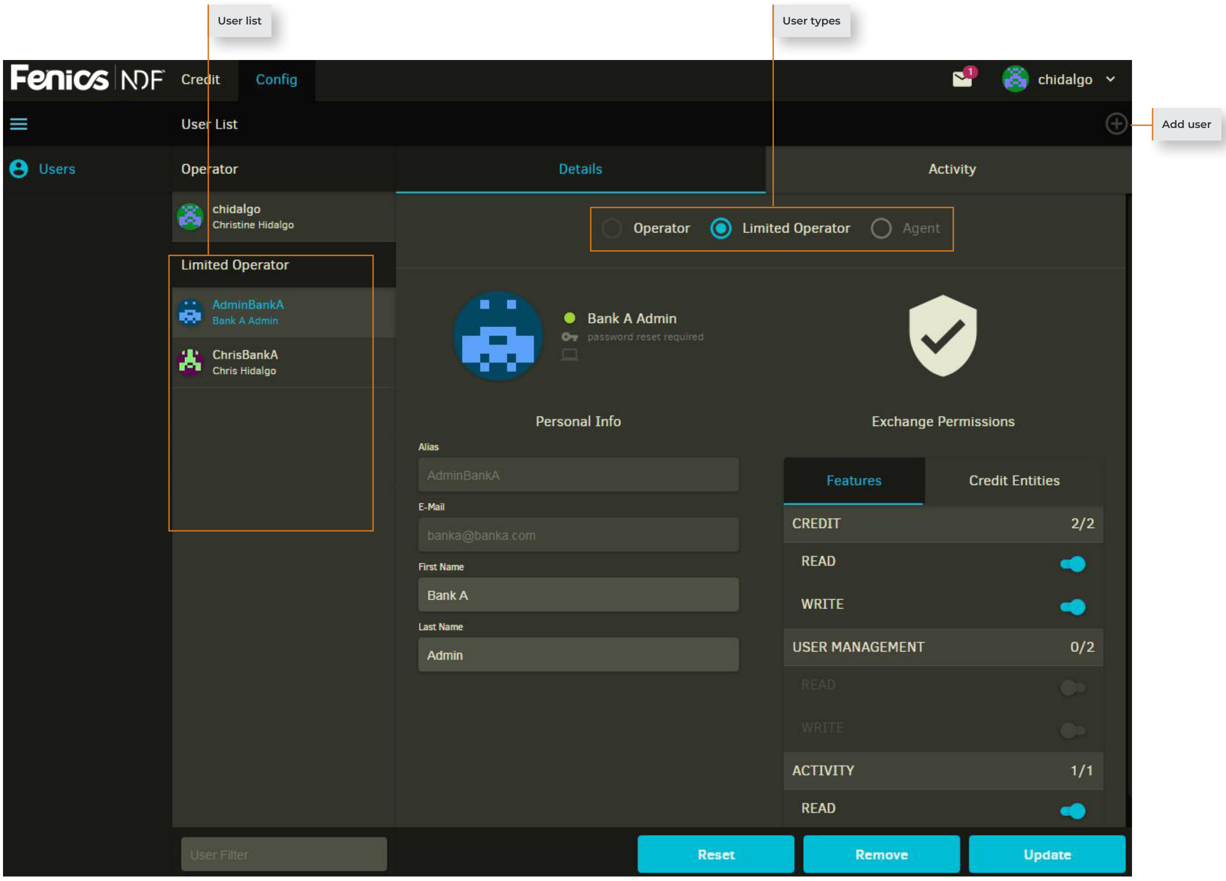
The top line shows the house credit. The remaining lines show the bilateral credit lines this entity has set up, along with the status of each one. As before, to allocate or view details of the credit assigned for a particular counterparty, a user clicks the Pencil icon to the left of the counterparty name. This pops up the same screen as in **Figure 6**, where the credit can be allocated for this counterparty. All limit changes are password protected, and for each limit change a new notification and email alert are triggered.

4.3. USER TYPES AND USER MANAGEMENT

There are four different user types for the UI:

1. Operator+:Full access to all the data and all write/read rights.
2. Operator: Limited rights (write/read rights)
3. Limited Operator: Access to certain risk entities and their child entities
4. Agent: Access only to one risk entity (no child entity access)

Each user can have read and write rights to Credit and/or User Management. They can also have read rights to the activity monitor tool. If a user has to write rights to the user management, this user can create new users with the same rights as the user itself, or more restrictive rights. User profiles can be reset, passwords reset, or removed via the User Management interface. See **Figure 8** for details.



Operator
- chidalgo — Christine Hidalgo

Limited Operator
- AdminBankA — Bank A Admin
- ChrisBankA — Chris Hidalgo

○ Operator ● Limited Operator ○ Agent

Bank A Admin
password reset required

Personal Info

Alias: AdminBankA
E-Mail: banka@banka.com
First Name: Bank A
Last Name: Admin

Exchange Permissions

Features | Credit Entities

CREDIT	2/2
READ	●
WRITE	●
USER MANAGEMENT	0/2
READ	○
WRITE	○
ACTIVITY	1/1
READ	●

Figure 8: User management.

APPENDIX A: SETTLEMENT RISK CALCULATIONS

1. OPTION: GROSS

Calculation:

GROSS = [∑ (all USD equivalent dealt amounts)**]**

2. OPTION: DSL (DAILY SETTLEMENT LIMIT) CALCULATION

1. For each currency and each value date a netted position is calculated.
2. For each value date, the DSL is the sum of all USD equivalent short positions that are settling on that value date, e.g.,

DSL (T+2) = ∑ (USD equivalent netted short position for value date T+2)

Purpose:

- Quantifies all deliveries of the counterparty (CP) for each value date

Potential risk impact:

- If the DSL limit is set to, 100M, the overall delivery risk from that CP can be a multiple of that limit, depending on how many unsettled valued dates.

Potential trading issue:

- Assume the limit is 100M.
  - at T, CP buys 100M EUR/USD for settling in T+2
  - at T+1 (when the settlement value changes to T+3), the CP buys another 100M EUR/USD.
  - at T+2 (when the settlement value changes to T+4), the CP cannot flatten its position, as it is not able to sell 200M EUR/USD. The maximum it can sell is 100M (reaching its DSL for T+4)

3. OPTION: NET (OVERALL NET POSITION FOR TRADE DAY) CALCULATION

1. For each currency, an overall netted position is calculated for a given trade day (ignoring value dates)
2. The NET position is the sum of all USD equivalent short positions (deliverables)

NET = ∑ (USD equivalent netted short positions)