

IRS Netting and Blending

Compression Overview

Q4 2019

CLEARING THE WAYFORWARD



Contents

- **Netting**
 - Introduction and Overview
 - Account Settings
 - Full Offset
 - Partial Offset
 - Netting/Blending IDs

- **Coupon Blending**
 - Overview
 - Process
 - Enhancement – Configurable Fixed Rates

Introduction

Unilateral Compression

- Innovative methods to reduce gross notional outstanding and line items
- Automated and scalable solutions that are not dependent on a trade counterparty
- Flexibility to utilize daily, on an automated basis as part of the existing EOD workflows, or selectively, as an ad-hoc process
- Reduces notional outstanding and line items **without changing cash flows**

Netting Overview

Netting is a method of terminating and compressing cleared IRS trades

- In this process CME will offset or combine trades in order to reduce line items or notional

Criteria / Restrictions

- The netting process will consider swaps with exactly the same economics, except notional and direction
- Swaps must be in the same PositionAccount
- Netting cycles are run once per business day

Account Settings

Clearing Member Firms will specify whether a client account is eligible for gross, net or selective net:

- **Gross** – If this option is selected on the account, then trades will **not** net
- **Net** – This option will automatically net eligible trades based solely on trade attributes.
- **Selective Net** – This option will automatically net eligible trades based on trade attributes (same as option 2) and matching Client Reference ID. This option provides clients with more control over the netting process to address operational and tax concerns.

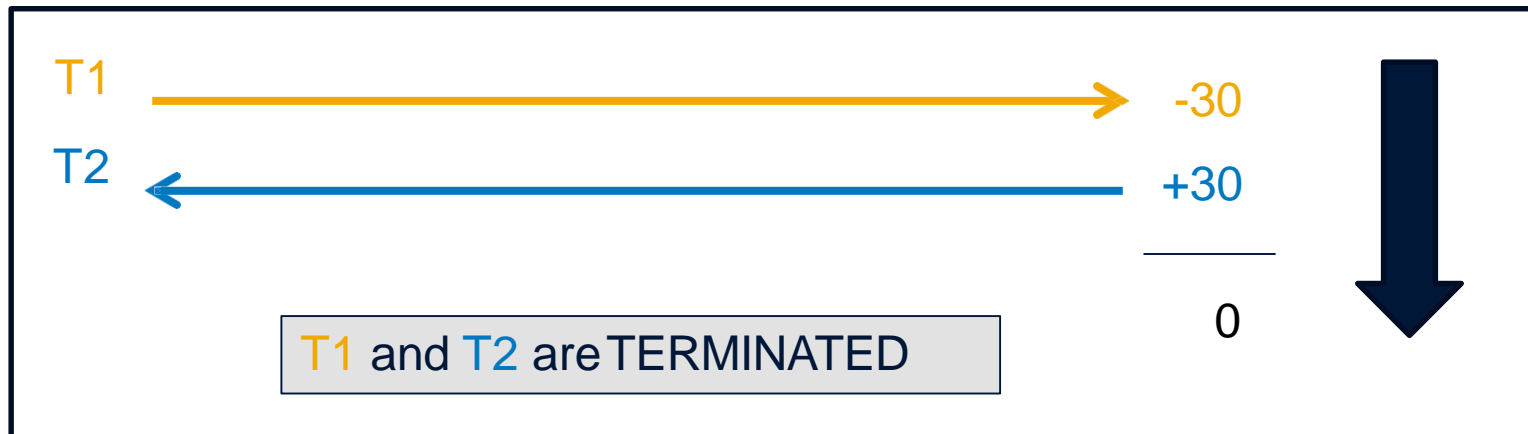
Manual Process:

- **Explicit Netting** – This functionality is applicable for all account settings. Deal Management System (DMS) users can select individual trades to net.

Netting: Full Offset

Full Netting

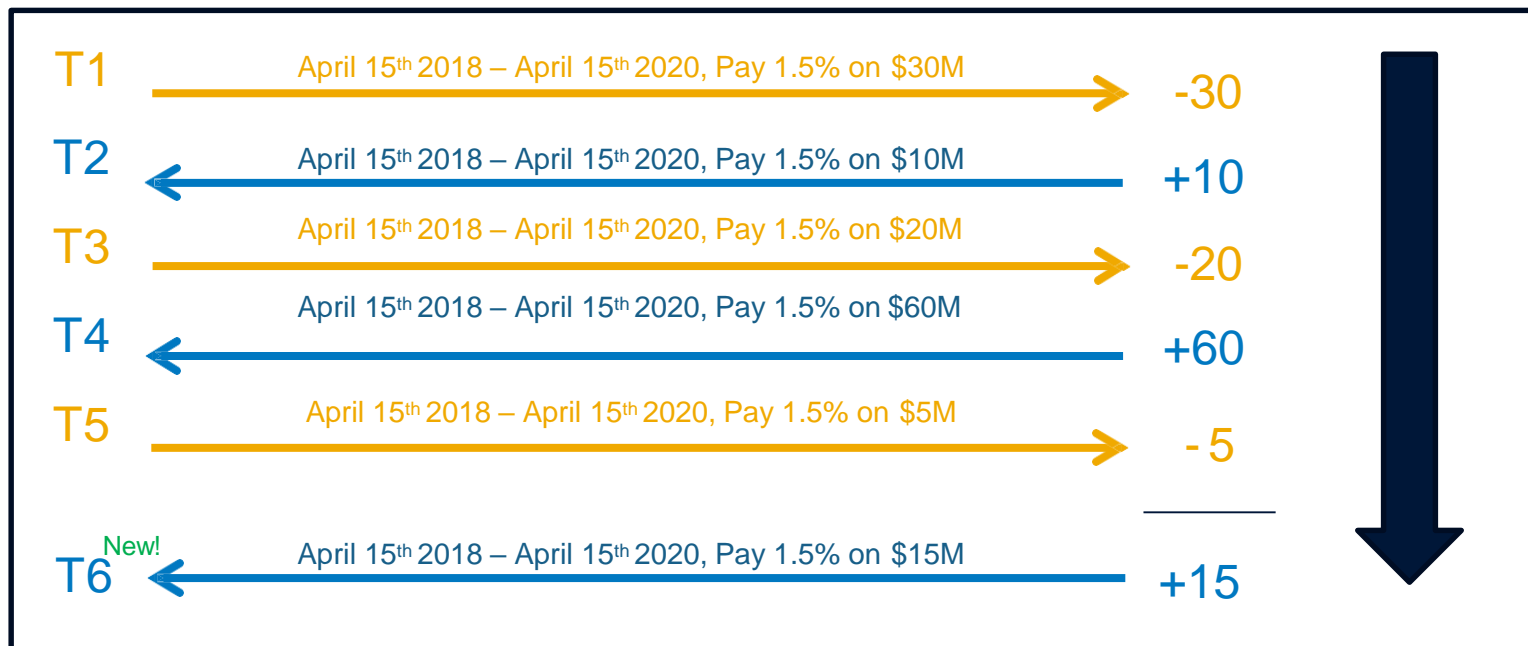
- The swaps eligible for netting fully offset each other
- All of the swaps are **terminated**
 - CME sends confirm messages for terminated trades
 - The trade status updates to terminated on the Trade Register report



Netting: Partial Offset

Partial Netting

- The swaps eligible for netting do not fully offset each other, and there is remaining notional
- CME sends confirm messages for terminations and netting remnant reflecting remaining notional
- The Trade Register updates the terminated trades status as terminated and the netting remnant as cleared



T1, T2, T3, T4, and T5 are terminated. Netting remnant trade T6 is created.

Explicit Netting and Blending

- Clearing Members can select specific trades for ad hoc compression using the “Netting Blending” tab in DMS
- Explicit Netting and Blending selections will apply to the current business day only
- A **Compression Group ID** may be specified in DMS to separate trades into specific compression groups
- Two types of Compression Group ID:
 1. CLIENT_COMPRESSION_GROUP_ID is specified by a DMS user in bulk upload to control compression groups
 2. COMPRESSION_GROUP_ID is a unique identifier that CME includes on clearing firm API to identify and link the group together
- Only trades with the same Compression Group ID can compress together

Explicit Netting and Blending - Functionality

1. Bulk Upload

- Trades can be uploaded in DMS via Excel template
- Multiple compression groups can be specified in a single upload

2. DMS GUI

- Select trades using checkboxes and compression type using dropdown:

Check All	Cleared ID	Netting ID	Blending ID	Template	Firm	Origin	Account	Effective	End	Side	Rate	Notional	Compression Type	Action
<input checked="" type="checkbox"/>	7029016	9FE95E00D279905898D5FB8E6BA3FFC2	FFE082F30AE3F68E31978FEF0C2BB443	USD3L	010	C	YANDONGA	12/15/2016	12/15/2066	R	2.90729	2,800,000,000.00	B ▾	Schedule ▾
<input checked="" type="checkbox"/>	7028996	9FE95E00D279905898D5FB8E6BA3FFC2	FFE082F30AE3F68E31978FEF0C2BB443	USD3L	010	C	YANDONGA	12/15/2016	12/15/2066	R	2.90729	2,800,000,000.00	B ▾	Schedule ▾
<input type="checkbox"/>	7028829	1FFC21D3418CAABEF3F2D932248818BA	D3AA04A9D47780F6591401BDDEC66706	USD3L	010	C	TESTCUST	06/15/2016	06/15/2023	P	2	4,000,000.00	B ▾	Schedule ▾
<input type="checkbox"/>	7028536	756CC71193680AF200F83E579D7E934A	57443D44AE3A73442E2D06C31CA95D54	USD3L	010	C	010S3	12/15/2016	12/15/2017	R	0.31	68,180,000.00	B ▾	Schedule ▾
<input type="checkbox"/>	7028535	756CC71193680AF200F83E579D7E934A	57443D44AE3A73442E2D06C31CA95D54	USD3L	010	C	010S3	12/15/2016	12/15/2017	P	0.31	68,180,000.00	B ▾	Schedule ▾

- For both methods, a full preview is available prior to compression.

Netting and Blending Preview																				
	Compression Group ID	Cleared ID	Netting ID	Blending ID	Firm	Origin	Account	Effective Date	End Date	Rate	Currency	Compression Type	Action	Side	Original Notional	Remaining Notional	Trades Before	Trades After	Compression Scheduled Date	Status
	2016-12-13-EOD-244386														5,600,000,000.00	5,600,000,000.00	2	1	12/13/2016	
												<input type="button" value="Submit"/>	<input type="button" value="Export"/>							

Netting IDs

- Netting IDs provides the ability to identify the OTC IRS that will net prior to the end-of-day netting cycle
- These Netting IDs are displayed in the Trade Register report, which allows clearing firms to know with certainty that the trades will net at the EOD cycle

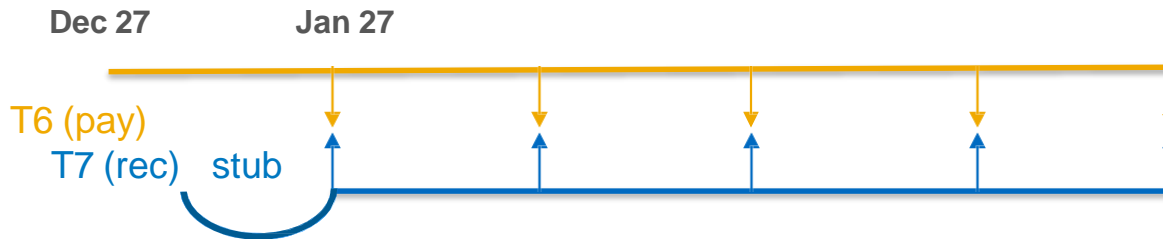
How Netting IDs work:

- Trades that are eligible for netting are assigned Netting IDs, which are then displayed in the Trade Register
 - These IDs will automatically update as trades become economically equivalent
 - Although the NPVs on two swaps may be offsetting, it is possible that these do not net due to different adjustment conventions
 - The Netting ID may also change on T+n for trades which experience a change in future cash flows, settled upfront fees, etc.
- ✓ **Blending IDs** are now available and fulfill the same functionality for Coupon Blending

Netting IDs – Example

1. Trades **T1** and **T2** are identical swaps with the exception of an initial stub period on **T2**. Before and during the stub period their Netting IDs will be different.
2. After the initial stub coupon on Trade **T2** is paid, these two trades will become eligible for netting and their Netting IDs will match.

ClientA cleared Trades 6 & 7 in the same position account.



Once the stub payment occurs on January 27, all of the future cash flows are exactly offsetting. On January 27 the Netting IDs will adjust and match on the Trade Register to indicate that the trades eligible for netting.

Value Date	Cleared ID	Notional	Status	P/R	Netting ID
Thu Jan 26	T6	3,000,000	Cleared	P	AA35435B-1111-0000-R1SR-311111133333333
Thu Jan 26	T7	3,000,000	Cleared	R	E71818CC-0000-1111-A1SA-711111177777777
Fri Jan 27	T6	3,000,000	Terminated	P	AA35435B-1111-0000-R1SR-311111133333333
Fri Jan 27	T7	3,000,000	Terminated	R	AA35435B-1111-0000-R1SR-311111133333333

Netting on Variable Notional Swaps (VNS)

- CME has been supporting full netting on Variable Notional Swaps considering the full notional schedule, including past periods.
- This has been enhanced to support full netting on VNS where current and future payment periods are considered to determine economic eligibility for netting.

Criteria / Restrictions

- CME will support only full netting of VNS
- Partial netting on VNS is not supported due to reconciliation issues
- CME's standard netting/blending trade level criteria will be applicable for netting of VNS.
- Trade's present and future cashflows must match/fully offset in order to net
- LEG_MAT Date economics must match on all trades in order for them to match the future cashflows

Scope

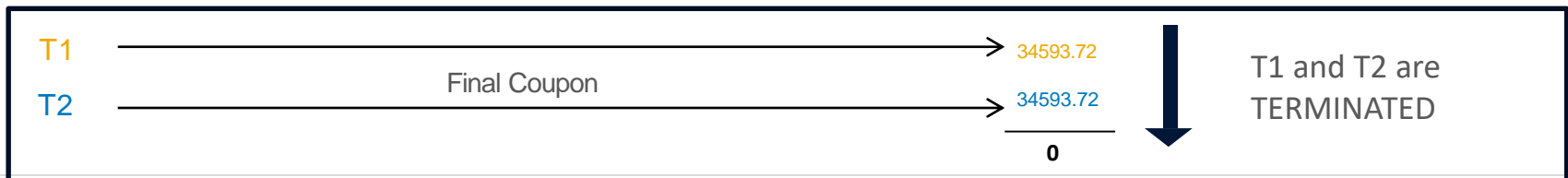
- Variable notional is only supported for IRS and Basis Swaps, not for OIS or FRA

VNS Netting example

❖ Principal notional on VNS varies periodically to mimic predictably variable cashflows

Swap	Start_Date	End_Date	Rate	Pay Date	Notional	Future Cashflows			
						183	365	548	731
Swap 1	06/01/2018	06/01/2020	4.5	12/01/18	\$ 1,587,199.00	\$ 36,307.18	-	-	-
				06/01/19	\$ 1,562,921.80	-	\$ 35,556.47	-	-
				12/01/19	\$ 1,537,702.10	-	-	\$ 35,174.94	-
				06/01/20	\$ 1,512,293.90	-	-	-	\$ 34,593.72
Swap 2	12/01/2018	06/01/2020	4.5	06/01/19	\$ 1,562,921.80	-	\$ 35,556.47	-	-
				12/01/19	\$ 1,537,702.10	-	-	\$ 35,174.94	-
				06/01/20	\$ 1,512,293.90	-	-	-	\$ 34,593.72
Difference in Cashflows :						-	\$ 0.0	\$ 0.0	\$ 0.0

- Above trades start on different date but end on same date with matching/offset future cash flows.
- Swaps are now eligible for full netting
- Both trades will be terminated with terminating reason as 'Full_Netting'

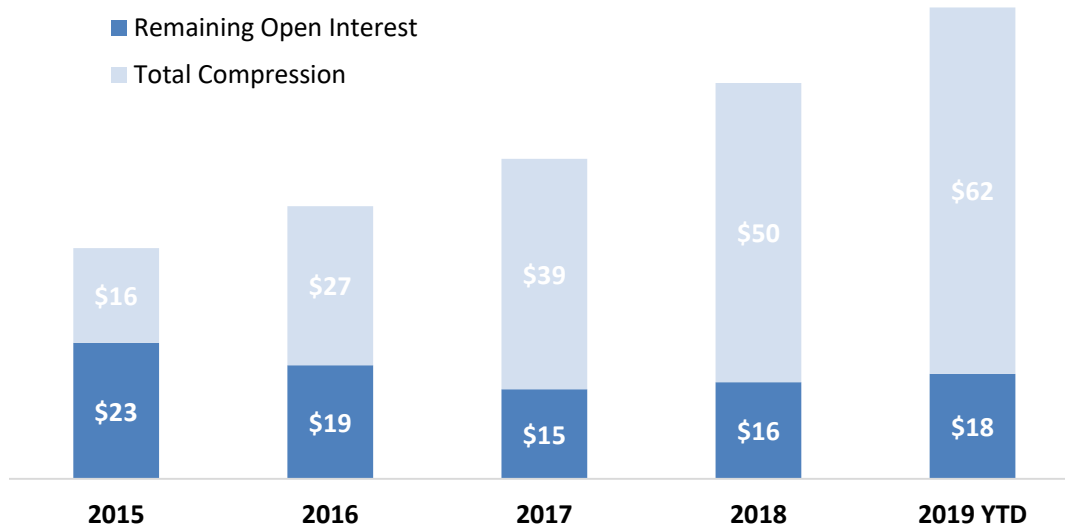


Interest Rate Swap Compression at CME Group







- **Creating Capital Efficiencies for Participants:** Over 1.3 million line items and \$62 trillion in notional reduced to date, and helping decrease open interest by over 30%.
- **Client Compression:** CME conducted our first multilateral non-member compression cycle in 2017, and now have 6 non-members have participated in triReduce cycles along with 19 non-members utilizing coupon blending.
- **Blending Enhancement:** Launched configurable fixed rate blending in 2018, further growing compression efficiency.

Interest Rate Swap Compression at CME Group

Cumulative Trillions USD Equivalent



TriOptima
 \$30 Trillion & 877k Lines
 + **Coupon Blending**
 \$31 Trillion & 385k Lines
 = **Total Reduction**
 \$62 Trillion & 1.3M Lines

TriOptima Compression Cycles						
Notional Reduced	\$22.6T	\$4.1T	\$1.9T	\$1.5T	\$291B	\$118B
Lines Items Reduced	437k	285k	78k	55k	14k	7k
Number of Cycles	22	12	7	7	1	1

Coupon Blending Overview

Coupon blending is a form of compression that reduces notional amounts and line items for trades with varying fixed rates, notional amounts and direction but otherwise contain matching attributes. The net cash flows of the resulting positions will remain the same as the original portfolio.

CME's **existing** coupon blending process is as follows:

- ✓ **Select** trades to be included in the process via the blending identifier found on the trade register
- ✓ **Identify** the highest and lowest fixed rates in the original portfolio
- ✓ **Solve** for the notional of Remnant 1 (R1) and Remnant 2 (R2) such that the cash flows match those of the original portfolio
- ✓ **Terminate** the original trades which have been replaced by R1 and R2

Account Settings

Clearing Member Firms will specify whether a client account is eligible for gross, coupon blend, or selective coupon blend:

- **Gross** – If this option is selected on the account, then trades will **not** coupon blend
- **Coupon Blending** - All trades with matching blending IDs will automatically blend
- **Selective Coupon Blending** - All trades with matching blending IDs and matching client IDs will blend. Provides clients flexibility to manage which trades will compress.

Eligible Products

- IRS, OIS, ZCS, FRAs & Basis Swaps
- All currencies

Coupon Blending Example

Step 1: Calculate the net weighted notional amount

- Weighted notional is the product of the fixed rate and notional amount.
- Net weighted notional is the sum of the weighted notional amount

$$\text{Net Weighted Notional} = \sum_{i=1}^n \text{Fixed Rate}_i \times \text{Notional}_i$$

	Fixed Rate	Notional	Weighted Notional
Swap 1	2.575	-200,000,000	-515,000,000
Swap 2	3.27	105,000,000	343,350,000
Swap 3	2.95	-15,000,000	-44,250,000
Swap 4	3.125	25,000,000	78,125,000
Swap 5	2.025	-50,000,000	-101,250,000
Swap 6	3.1345	37,500,000	117,543,750
Swap 7	2.925	-55,000,000	-160,875,000
Swap 8	3.1875	300,000,000	956,250,000
Swap 9	3.325	-111,500,000	-370,737,500
Swap 10	3.425	145,000,000	496,625,000
<i>Lowest FixedRate</i>	<i>Highest Fixed Rate</i>	Net Notional	Net Weighted Notional
2.025	3.42500	181,000,000	799,781,250

*Please note the calculation steps differs for BRL only due to Future Value Notional. Please contact Onboarding_Clearing@cmegroup.com for details.

Coupon Blending Example

Step 2: Derive *Remnant Trade 1 (T1)* notional to minimize gross notional

- **Highest fixed rate** among the blended trades is **fixed rate on Remnant Trade 1 (T1)**
- **Lowest fixed rate** among the blended trades is fixed rate on **Remnant Trade 2 (T2)**
- Given the two fixed rates, we calculate notional for T1 (rounded to two decimal places)

$$T1 \text{ Notional} = \frac{(\text{Net Weighted Notional} - \text{Net Notional} \times \text{Lowest Fixed Rate})}{(\text{Highest Fixed Rate} - \text{Lowest Fixed Rate})}$$

$$T1 \text{ Notional} = \frac{(799,781,250 - 181,000,000 \times 2.025)}{(3.425 - 2.025)} = 309,468,750.00$$

Step 3: Create *Remnant Trade 2 (T2)* so that the cash flows of the fixed and floating legs match those of the original portfolio

- Notional amount on Remnant Trade 2 is calculated as follows:

$$T2 \text{ Notional} = \text{Net Notional} - T1 \text{ notional}$$

$$T2 \text{ Notional} = 181,000,000 - 309,468,750 = -128,468,750.00$$

Coupon Blending Example – Fixed and Float Legs

Fixed Leg: Cash Flows on **Remnant Trade 1 (T1)** match those of the original portfolio.

			Fixed Coupon Cash Flows of Original Portfolio			
Swap	Rate	Notional	91	182	271	364
Swap 1	2.575	-200,000,000	\$ (1,301,806)	\$ (1,301,806)	\$(1,273,194)	\$ (1,330,417)
....
Swap 10	3.425	145,000,000	\$ 1,255,357	\$ (393,472)	\$(384,824)	\$ (402,120)
		Sum of Portfolio	\$ 2,021,669	\$ 2,021,669	\$ 1,977,237	\$ 2,066,102

Fixed Coupon Cash Flows of Remnant T1

Swap	Rate	Notional	91	182	271	364
T1	3.425	309,468,750	\$ 2,679,268	\$ 2,679,268	\$ 2,620,384	\$ 2,738,154
T2	2.025	-128,468,750	\$ (657,599)	\$ (657,599)	\$ (643,147)	\$ (672,052)
		Sum of Remnants	\$ 2,021,669	\$ 2,021,669	\$ 1,977,237	\$ 2,066,102

Float Leg: Notional amount of **Remnant Trade 1 (T1) + Remnant Trade (2)** matches net notional of original portfolio. *The floating rate payments also match those of the original portfolio.*

Trade	Notional
Remnant Trade 1	309,468,750
Remnant Trade 2	(128,468,750)
Net Notional	181,000,000

Coupon Blending Enhancement – Configurable Fixed Rates

CME's coupon blending enhancement allows a DMS user to explicitly **specify the high and low fixed rates** used in the blending process. Rates can be set directly within DMS.

Benefits of using rates outside of the range of the compression group include:

- ✓ A significant increase in gross notional reduction
- ✓ Gross notional reduction of two swaps that otherwise would not couponblend

Fixed Rate Validation

The user-specified high and low fixed rates will be validated to ensure:

- The **high rate** is not more than 50% greater than highest rate in the compression group
- The **low rate** is not lower than 50% below the lowest rate in the compressiongroup

Configurable Rates Upload & Enhanced Blending

There are two ways in which clients can use the Enhanced Blending functionality;

1. Configurable Fixed Rates Upload – Specify Explicit Rate
2. Enhanced Blending – Maximize Notional Reduction Rate

Configurable Fixed Rates Upload – Specify Explicit Rate

Currently, DMS users can specify fixed rates 50% above the highest fixed rate and 50% below the lowest fixed rate when selecting blending eligible trades in the GUI. With this enhancement, DMS users will additionally be able to upload explicit rates to avoid blending group size limitations within the GUI.

Configurable Blending upload sample (sample file available on IntraLinks):

CLEARED_ID	CMF_ID	POSITION_ACCOUNT_ID	ORIGIN	COMPRESSION_TYPE	ACTION	CLIENT_COMPRESSION_GROUP_ID	REMNANT_FIXED_RATE
6227134	924	TEST123	CUST	EB	Schedule	CONFIGURABLEBLEND1	1.5
5438024	924	TEST123	CUST	EB	Schedule	CONFIGURABLEBLEND1	0.985

Enhanced Blending – Maximize Notional Reduction Rate

If a user has no preference on the resultant fixed rates on blending remnants, the user may select Enhanced Blending “EB” to apply fixed rates that maximize gross notional reduction. Users may select COMPRESSION_TYPE = EB in the DMS GUI or use the upload template. Users will also be able to preview the proposed fixed rates on the remnants before scheduling the blend.

Enhanced Blending upload sample:

CLEARED_ID	CMF_ID	POSITION_ACCOUNT_ID	ORIGIN	COMPRESSION_TYPE	ACTION	CLIENT_COMPRESSION_GROUP_ID	REMNANT_FIXED_RATE
6227134	924	TEST124	HOUS	EB	Schedule	ENHANCEDBLEND1	
5438024	924	TEST124	HOUS	EB	Schedule	ENHANCEDBLEND1	
6227144	924	TEST124	HOUS	EB	Schedule	ENHANCEDBLEND1	
5438618	924	TEST124	HOUS	EB	Schedule	ENHANCEDBLEND1	

Coupon Blending - Configurable Fixed Rates (continued)

- In DMS, select the trades for blending compression
- The Netting and Blending Preview screen shows all the trades within the compression and the two resultant remnants
- Update the high and low rate in the *New Rate* column on each the remnants:

Netting and Blending Preview

	Compression Group ID	Cleared ID	Firm	Origin	Account	Effective Date	End Date	Rate	New Rate	Currency	Compression Type	Action	Buy/Sell	Side	Original Notional	Remaining Notional	Trades Before	Trades After	Compression Scheduled Date	Status	
<input checked="" type="checkbox"/>	2018-07-18-EOD-521806															90,000,000.00	90,000,000.00	2	2	07/18/2018	
		9016473	992	HOUS	992S1	06/22/2018	06/22/2022	4.234		USD	B	Schedule		R	54,686,098.65					CLEARED	
		9016475	992	HOUS	992S1	06/22/2018	06/22/2022	2.45		USD	B	Schedule		R	35,313,901.35					CLEARED	
			992	HOUS	992S1	06/22/2018	06/22/2022	4.234	4.234	USD	B	Schedule		R		54,686,098.65			07/18/2018		
			992	HOUS	992S1	06/22/2018	06/22/2022	2.45	2.45	USD	B	Schedule		R		35,313,901.35			07/18/2018		

- Click *Preview* button to calculate the remaining notional of the remnants using the specified rates
- Click on *Submit* button which will schedule the blending
- A confirmation window will appear with new calculated notional:

Netting and Blending Confirmation

	Compression Group ID	Cleared ID	Firm	Origin	Account	Effective Date	End Date	Rate	Currency	Compression Type	Action	Buy/Sell	Side	Original Notional	Remaining Notional	Trades Before	Trades After	Compression Scheduled Date	Status		
<input checked="" type="checkbox"/>	2018-07-18-EOD-521806															90,000,000.00	90,000,000.00	2	2	07/18/2018	
		9016473	992	HOUS	992S1	06/22/2018	06/22/2022	4.234	USD	B	Schedule		R	54,686,098.65						CLEARED	
		9016475	992	HOUS	992S1	06/22/2018	06/22/2022	2.45	USD	B	Schedule		R	35,313,901.35						CLEARED	
			992	HOUS	992S1	06/22/2018	06/22/2022	4.862	USD	B	Schedule		R		48,063,157.89			07/18/2018			
			992	HOUS	992S1	06/22/2018	06/22/2022	2.012	USD	B	Schedule		R		41,936,842.11			07/18/2018			

Clearing of OTC Interest Rate Swaps

Key Contacts

Clearing House

Fateen Sharaby

+1 212-299-2828

fateen.sharaby@cmegroup.com

Products & Services

Steve Hurst

+1 312 930 1298

stephen.hurst@cmegroup.com