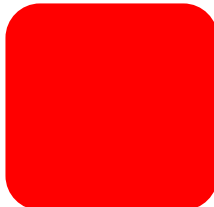
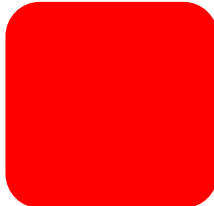
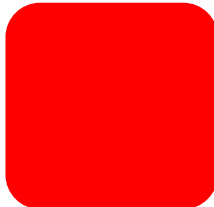


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BURSA TRADE SECURITIES

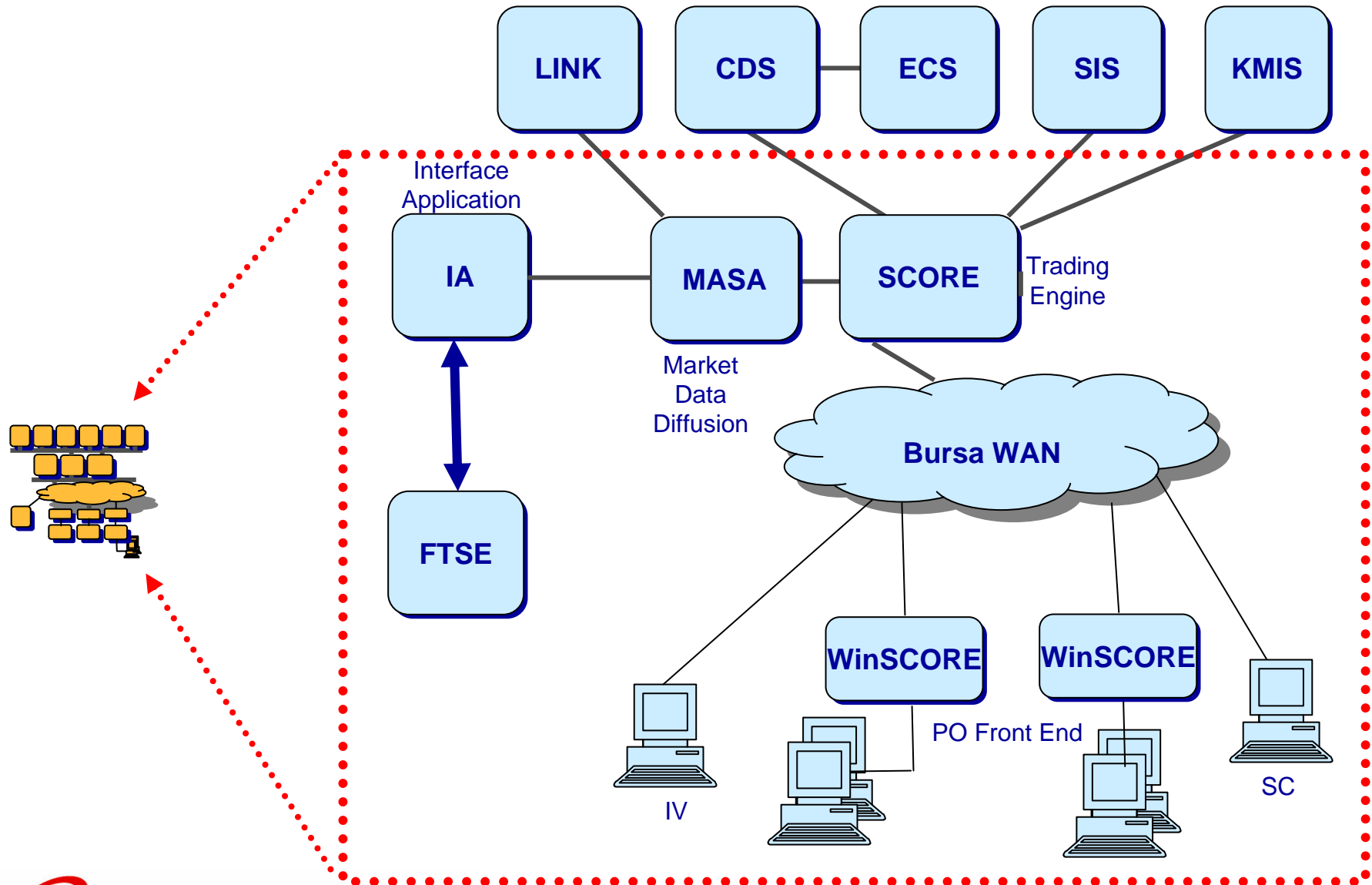
Appendix



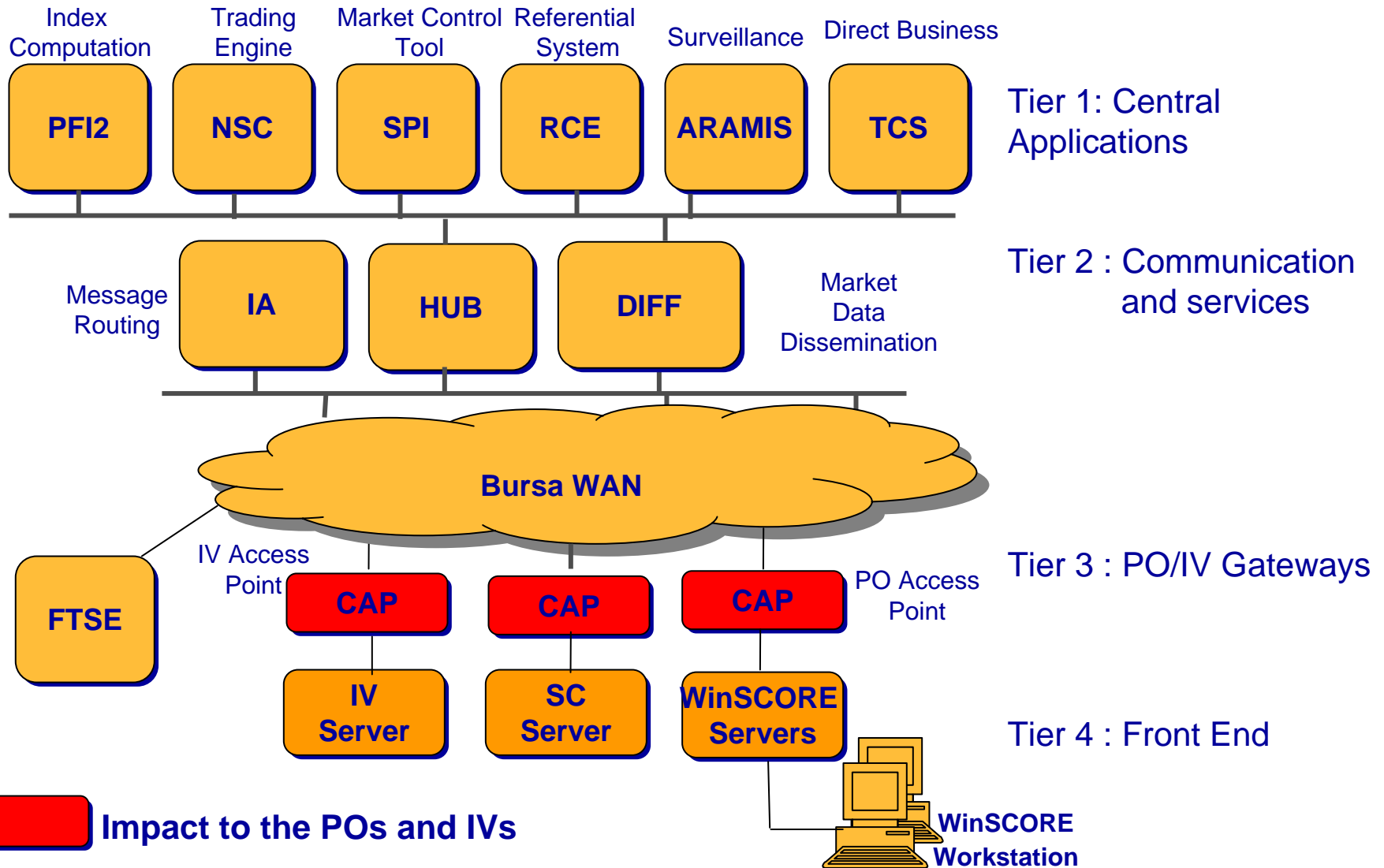
Presentation to Participating Organisations (POs)
5th July 2007

Section 1: Trading System Architecture

Overview of Current Securities Trading System



Overview of New BT Securities Trading System



Section 2: Trading Phases & Timing

Trading Phases & Market Segments

Trading Phases	Normal Market	Odd Lot	Buying In
Pre Opening	8:30am	8:30am	7:30am
*Opening Auction	9:00am	9:00am	8:30am
Continuous Trading	9:00am	9:00am	8:30am - 12:30pm
Pre Closing	12:15pm	12:15pm	
*Closing Auction	12:20pm	12:20pm	
Trading At Last	12:20pm to 12:30pm	12:20pm to 12:30pm	
Lunch	Lunch	Lunch	Lunch
Pre Opening	2:00pm	2:00pm	1:30pm
*Opening Auction	2:30pm	2:30pm	2:00pm
Continuous Trading	2:30pm	2:30pm	2:00pm - 5:00pm
Pre Closing	4:45pm	4:45pm	
*Closing Auction	4:50pm	4:50pm	
Trading At Last	4:50pm - 5:00pm	4:50pm - 5:00pm	

*Switch over to next phase is instantaneous upon completion of this phase

Not applicable to Direct Business Trades as these are off market transaction.

Pre Opening Phase

- Orders can be entered, modified and deleted.
- No matching of orders & quotes.
- Theoretical opening price (TOP) of each instrument is dynamically calculated.
- Information is broadcast to market based on orders & quotes in order book



BENEFITS OF TOP DURING PRE OPENING

- Allows market to understand demand & supply conditions.
- Allows market to find natural price level as opposed to last trading session's price as a reference to start trading.
- Allows investor to gauge market and price to be traded at opening.
- Useful for IPOs

Pre - Opening	Opening Auction	Continuous Trading	Pre - Closing	Closing Auction	Trading At Last	Lunch	Pre - Opening	Opening Auction	Continuous Trading	Pre - Closing	Closing Auction	Trading At Last
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Opening Auction Phase

- Opening price is last TOP calculated before matching.
- Opening price & quantity of contract matched are broadcast.
- At end of Opening Auction period, system will automatically move to Continuous Trading.
- If no matching can be done at opening, price of first trade occurring in main trading session is designated as the opening price.



BENEFITS

- Matching is based on price and time priority.
- Time priority instead of randomised algorithm.
- Time priority is a fairer method.
Derivatives also uses time priority.
- Streamline Securities and Derivatives matching methods.

Pre - Opening	Opening Auction	Continuous Trading	Pre - Closing	Closing Auction	Trading At Last	Lunch	Pre - Opening	Opening Auction	Continuous Trading	Pre - Closing	Closing Auction	Trading At Last
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Continuous Trading Phase

- Orders can be entered, modified and deleted.
- Trading takes place on a continuous basis.
- Each incoming order are checked immediately for possible execution.
- Unexecuted portion of such order is added to the order book.
- Matched trades can be viewed on Broker Front End.
- Matching will be based on Price and Time Priority.



BENEFITS

- Increase liquidity
- Align with the practices of other major markets.
- Streamline Securities and Derivatives trading mechanisms.

Pre - Opening	Opening Auction	Continuous Trading	Pre - Closing	Closing Auction	Trading At Last	Lunch	Pre - Opening	Opening Auction	Continuous Trading	Pre - Closing	Closing Auction	Trading At Last
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Pre Closing Phase

- Starts immediately after end of continuous trading phase.
- Order entry performed by members-automatically updated in order book without giving rise to trades.
- Theoretical closing price (TCP) is calculated each time a new order is entered into the order book.
- TCP is published.



BENEFITS

- Allows market to find natural closing price at end of day when trading activities tend to surge.
- When combined with closing price auction (ie the next phase), this will mitigate price manipulation of last done price.

Pre - Opening	Opening Auction	Continuous Trading	Pre - Closing	Closing Auction	Trading At Last	Lunch	Pre - Opening	Opening Auction	Continuous Trading	Pre - Closing	Closing Auction	Trading At Last
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Closing Auction Phase

- Same as Opening Auction.
- Closing price for securities traded for day is defined in this phase. If no price is issued in this phase, closing price shall be last traded price during main trading session.
- In event of no trading quotation during Trading Day, closing price is last known traded price.



BENEFIT

Closing price will not be easily manipulated.

Pre - Opening	Opening Auction	Continuous Trading	Pre - Closing	Closing Auction	Trading At Last	Lunch	Pre - Opening	Opening Auction	Continuous Trading	Pre - Closing	Closing Auction	Trading At Last
---------------	-----------------	--------------------	---------------	-----------------	-----------------	-------	---------------	-----------------	--------------------	---------------	-----------------	-----------------

Trading At Last Phase

- Only applicable to Securities Market.
- Orders can be entered & matched at closing price only.



BENEFITS

- Increase liquidity.
- Provides a last call opportunity for traders to close positions.
- Gives credibility to last done price (as opposed to current practice where last done price could be based on one or two trades.)
- Positive step towards after-hour trading.

Pre - Opening	Opening Auction	Continuous Trading	Pre - Closing	Closing Auction	Trading At Last	Lunch	Pre - Opening	Opening Auction	Continuous Trading	Pre - Closing	Closing Auction	Trading At Last
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Section 3: Matching Mechanism

Matching Mechanism: TOP/TCP Algorithm

Theoretical Pricing algorithm for Pre Opening and Pre Closing:

Rules	1. Maximizes the number of shares traded (executable volume).	Rules
	2. Minimizes the number of unfilled shares (minimum surplus)	
	3(i) If imbalance of unfilled shares is on the buy side, the TOP/TCP will be the highest price therein.	
	3(ii) If imbalance of unfilled shares is on the sell side, the TOP/TCP will be the lowest price therein.	
	4. Otherwise the TOP/TCP used is the price closest to the reference price	

Scenario: TOP Algorithm

The market for XYZ immediately before the market opens is:

BUY			SELL		
Order	Qty	Price	Price	Qty	Order
A	4,500	3.10	2.98	6,600	K
B	25,000	3.08	2.98	5,000	L
C	3,200	3.08	2.99	3,600	M
D	1,900	3.04	3.00	17,500	N
E	49,700	3.00	3.06	1,900	O
F	8,000	2.99	3.08	16,900	P
G	16,400	2.98	3.10	8,500	Q
H	5,400	2.97	3.12	21,650	R
I	900	2.96	3.14	11,420	S
J	4,575	2.95	3.16	290	T

TOP Algorithm (cont'd)

R1 : Determining the Maximum Executable Volume

The principle establishes the price(s) at which maximum volume will be executed

The Cumulative buy quantity at any price is the buy quantity at that price plus the sum of the buy quantities at all highest Price.

Buy		Price	Sell	
Cumulative Buy Quantity	Buy Quantity at Price		Sell Quantity at Price	Cumulative Sell Quantity
4,500	4,500	3.10	8,500	60,000
32,700	28,200	3.08	16,900	51,500
32,700	0	3.06	1,900	34,600
34,600	1,900	3.04	0	32,700
34,600	0	3.02	0	32,700
34,300	49,700	3.00	17,500	32,700
92,300	8,000	2.99	3,600	15,200
106,700	16,400	2.98	11,600	11,600

The Cumulative sell quantity at any price is the sell quantity at that price plus the sum of the sell quantities at all lower Price.

TOP Algorithm (cont'd)

Cumulative Buy Quantity	Price	Cumulative Sell Quantity	Maximum Executable Volume
4,500	3.10	60,000	4,500
32,700	3.08	51,500	32,700
32,700	3.06	34,600,	32,700
34,600	3.04	32,700	32,700
34,600	3.02	32,700	32,700
34,300	3.00	32,700	32,700
92,300	2.99	15,200	15,200
106,700	2.98	11,600	11,600

The Executable volume at each price Is the maximum Quantity which may Be traded at that Price .The Maximum Executable volume Overall is highest Number in this Column. In this Example 32,700 is The Maximum Executable Volume

TOP Algorithm (cont'd)

R2 : Establishing the Minimum Surplus

The second principle ascertains the eligible price levels at which the unfilled or unmatched quantity is a minimum. The quantity of shares left in the market at the auction price should always be the lowest possible.

Cumulative Buy Quantity	Price	Cumulative Sell Quantity	Maximum Executable Volume	Minimum Surplus (CBQ-CSQ)
4,500	3.10	60,000	4,500	
32,700	3.08	51,500	32,700	(-)18,800
32,700	3.06	34,600,	32,700	(-)1,900
34,600	3.04	32,700	32,700	(+)1,900
34,600	3.02	32,700	32,700	(+)1,900
34,300	3.00	32,700	32,700	(+)51,600
92,300	2.99	15,200	15,200	
106,700	2.98	11,600	11,600	

Ignoring the Positive and Negative signs
The lowest Amount
Displayed in this Column is 1,900,
There are the Minimum
Surplus is 1,900.

TOP Algorithm (cont'd)

R3 : Ascertaining where the Market Pressure exists

The third principle involves ascertaining where the market pressure of the potential auction prices exists: on the buy or the sell side. A positive sign (+) indicates a surplus will be left on the buy side, demonstrating buy side pressure at the conclusion of the auction. A negative sign (-) indicates a surplus will remain on the sell side, demonstrating sell side pressure at the conclusion of the auction.

Cumulative Buy Quantity	Price	Cumulative Sell Quantity	Maximum Executable Volume	Minimum Surplus (BQ-SQ)
4,500	3.10	60,000	4,500	
32,700	3.08	51,500	32,700	(-)18,800
32,700	3.06	34,600	32,700	(-)1,900
34,600	3.04	32,700	32,700	(+)1,900
34,600	3.02	32,700	32,700	(+)1,900
34,300	3.00	32,700	32,700	(+)51,600
92,300	2.99	15,200	15,200	
106,700	2.98	11,600	11,600	

A negative sign (-) indicates the Surplus will Exit on the sell Side

A positive sign (+) indicates the Surplus will Exit on the buy side

TOP Algorithm (cont'd)

R4: Consulting the Reference Price

The fourth and final principle determines an auction price from the range of prices established in Principle 3 on the basis of their proximity to a reference price

In our example, if the algorithm was being used to determine the morning auction price for XYZ, and the previous trading day's closing price was RM3.04 or lower, then the official auction price for XYZ would be established at RM3.04. If the previous trading day's closing price was RM3.06 or higher, then the official auction price for XYZ would be RM3.06. For this example, we will assume the previous trading day's closing price was RM3.04, therefore, the official auction price is RM3.04.

Price Determination - Continuous Trading

• Scenario 1

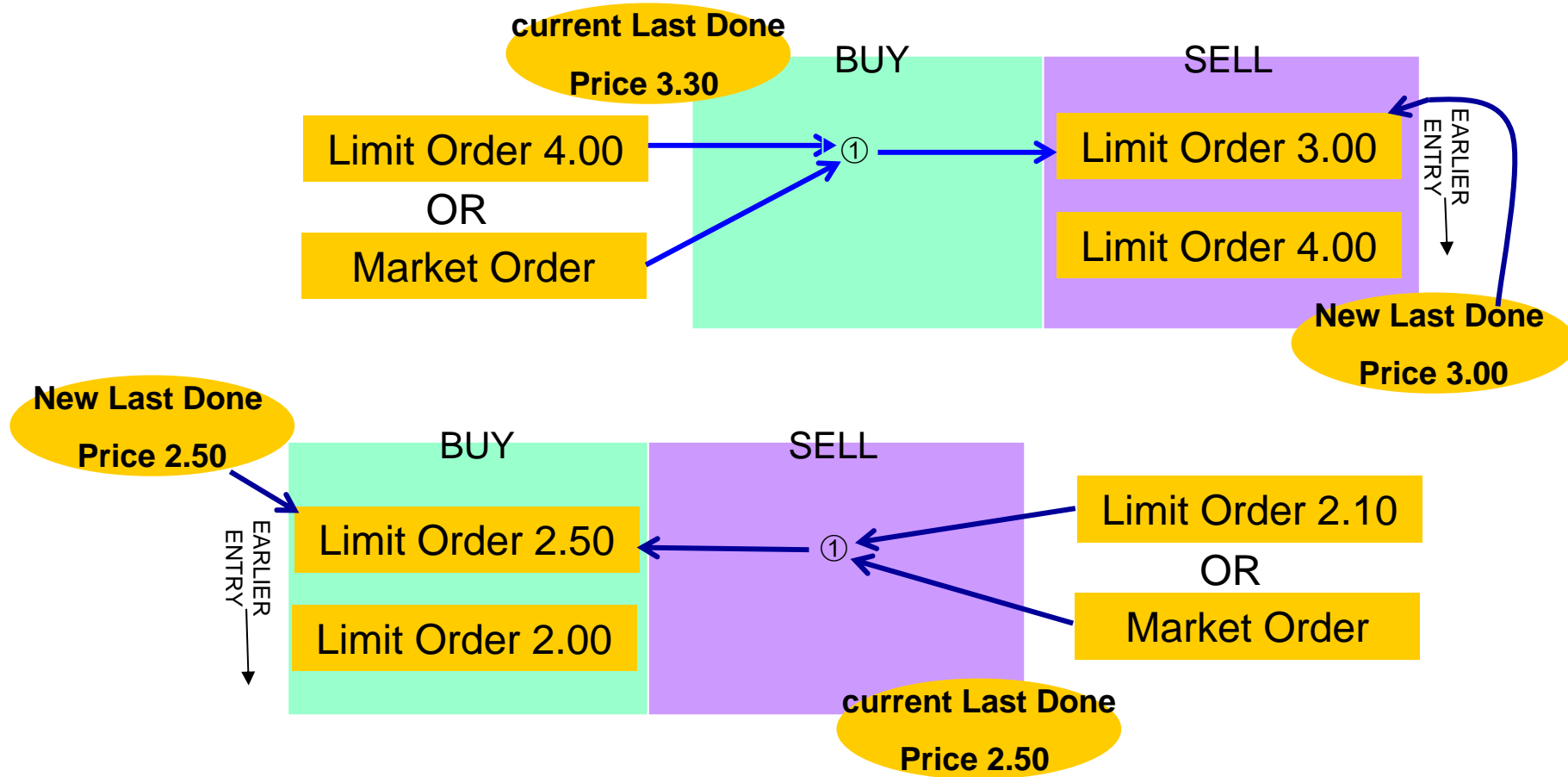
Price Determination Rules in Continuous Trading (in addition to the price/time priority rules):

If an incoming Market Order or Limit Order meets an order book in which there are only Limit Orders on the other side, then the incoming Order is executed :

- With respect to non-executed sell orders - at the lowest sell limit.
- With respect to non-executed buy orders - at the highest buy limit.

Price Determination - Continuous Trading

- Scenario 1 (cont'd)



Price Determination - Continuous Trading

• Scenario 2

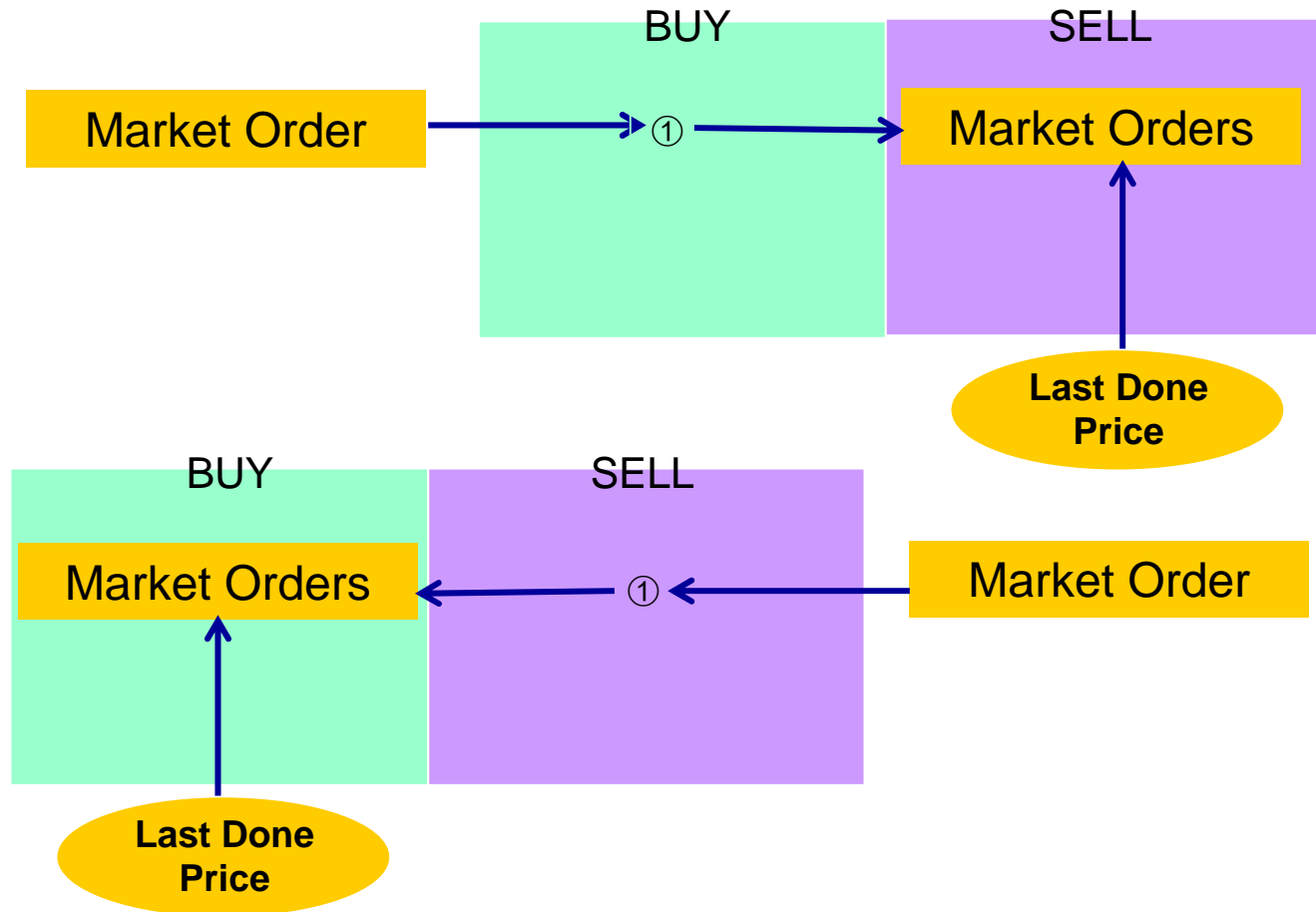
Price Determination Rules in Continuous Trading (in addition to the price/time priority rules):

If an incoming Market Order meets an order book in which there are only Market Orders on the other side, then the incoming Market Order is executed :

- at the reference price = as general rule, reference price is the last automated trade. If this is not available (e.g. due to a long period of suspension), Bursa Malaysia will determine it.

Price Determination - Continuous Trading

- Scenario 2 (cont'd)



If no trade, Last Done Price = Last Adjusted Closing Price

Price Determination - Continuous Trading

• Scenario 3

Price Determination Rules in Continuous Trading (in addition to the price/time priority rules):

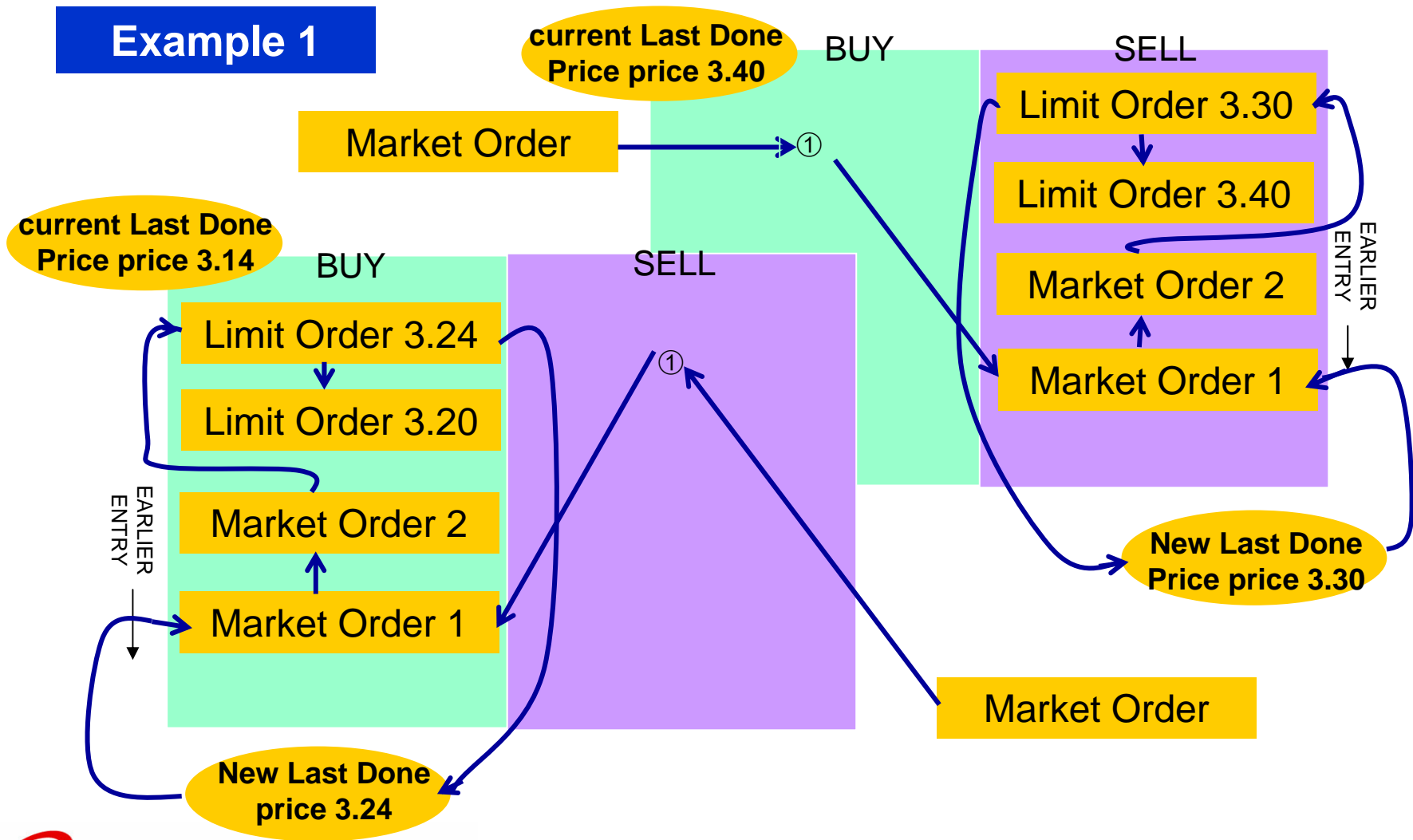
If an incoming Market Order meets an order book in which there are Market Orders and Limit Orders on the other side, then the incoming Market Order is executed against the Markets Orders in accordance with the Price/Time Priority:

- With respect to non-executed sell orders - at the Reference Price or lower (at the lowest limit of the executable orders).
- With respect to non-executed buy orders - at the Reference Price or higher (at the highest limit of the executable orders).

Price Determination - Continuous Trading

- Scenario 3 (cont'd)

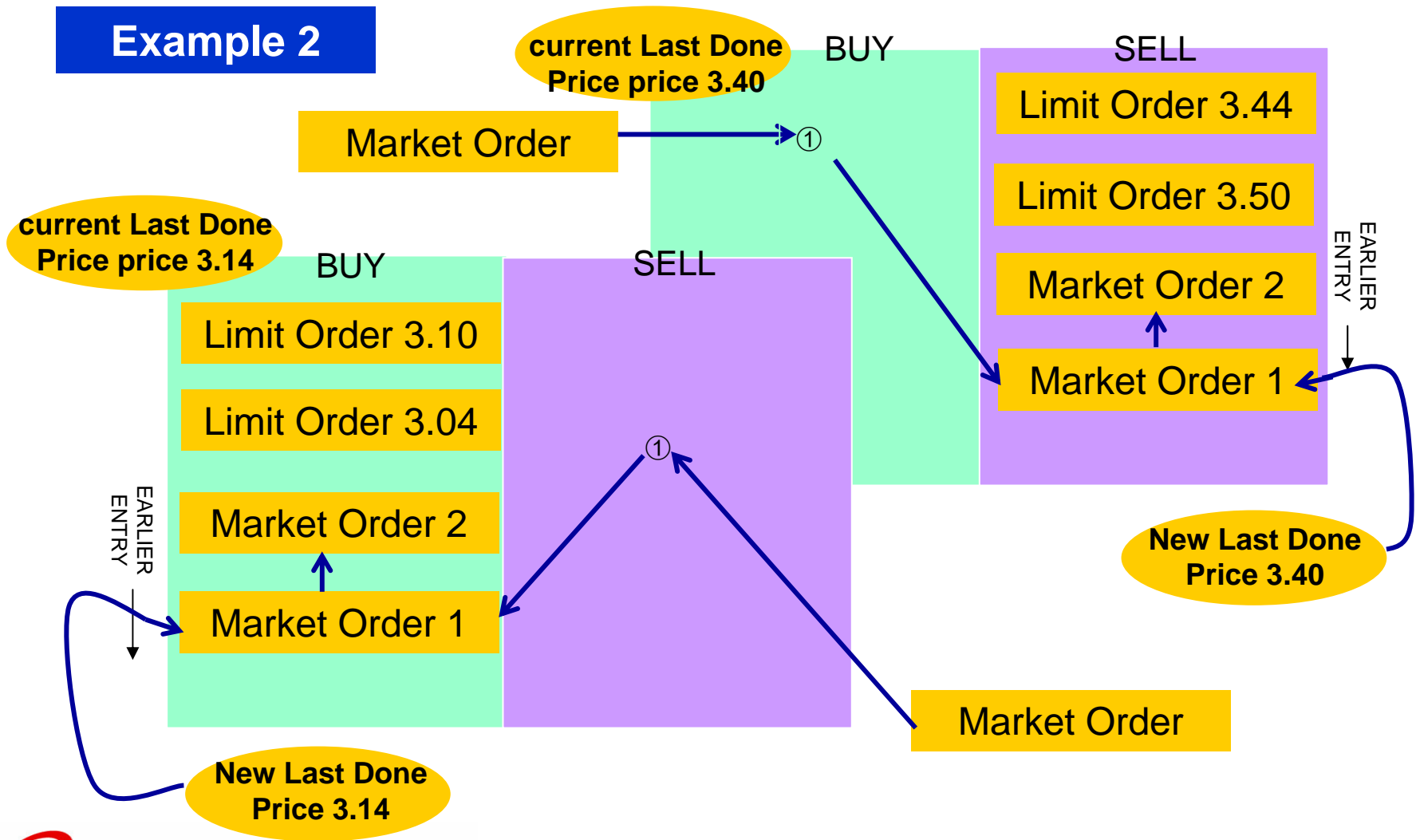
Example 1



Price Determination - Continuous Trading

- Scenario 3 (cont'd)

Example 2



Price Determination - Continuous Trading

• Scenario 4

Price Determination Rules in Continuous Trading (in addition to the price/time priority rules):

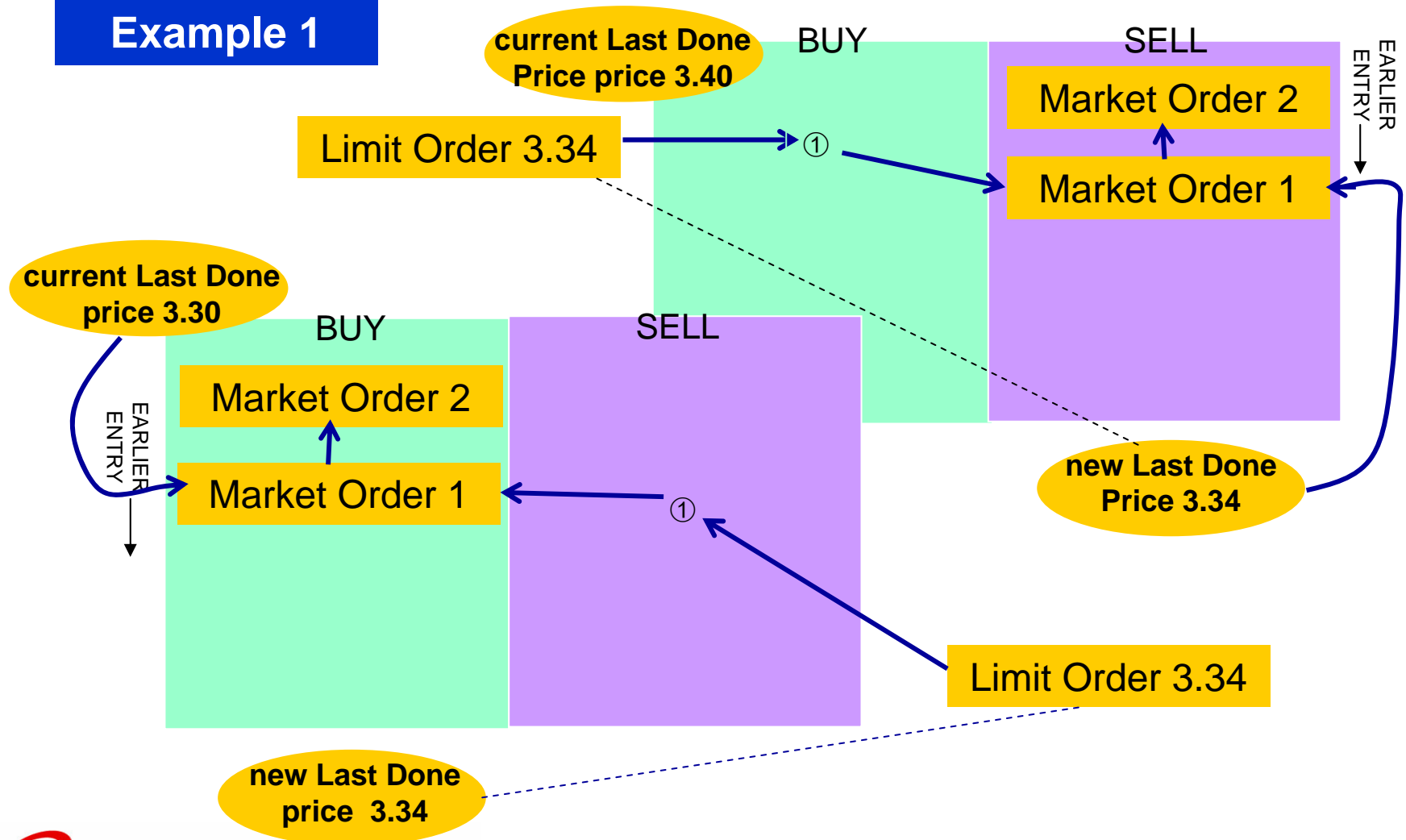
If an incoming Limit Order meets an order book in which there are Market Orders on the other side, then the incoming Limit Order is executed against the Markets Orders in accordance with the Price/Time Priority:

- With respect to non-executed sell orders - at the Reference Price or lower (at the lowest limit of the executable orders).
- With respect to non-executed buy orders - at the Reference Price or higher (at the highest limit of the executable orders).

Price Determination - Continuous Trading

- Scenario 4 (cont'd)

Example 1



Price Determination - Continuous Trading

- Scenario 4 (cont'd)

Example 2

