

# CFTC Technology Advisory Committee

## Sub-Committee on Automated and High Frequency Trading – Working Group 1

### Participants

- Joan Manley, George Pullen – CFTC
- Sean Castette – Getco LLC
- Colin Clark – NYSE Euronext
- Chris Concannon – Virtu Financial LLC
- Joseph Saluzzi – Themis Trading
- Larry Tabb – Tabb Group
- Greg Wood – Deutsche Bank Securities Inc

## Key Points Regarding the HFT Definition

- Utilizes carefully chosen language that has recognized **legal** interpretation.
- Emphasizes a **mechanical** description of high frequency trading that is deliberately neutral regarding types of trading strategies and how they interact with the marketplace.
  - This recognizes that there are many types of market activity that can be potentially labeled as HFT.
  - This provides the basis for a regulatory definition as opposed to a popular definition of HFT.
  - This allows for inclusion of future practice as well as current practice.
- Utilizes **cumulative** criteria, so that only a trading system that meets all 4 criteria can be defined as “high frequency”.
- Provides a **broad** basis for other working groups to build upon.
  - A narrower definition of HFT may lead to regulatory arbitrage.

# What is the definition of high frequency trading within the context of automated trading systems (ATS)?

## **Draft Definition, May 2012:**

High frequency trading is a form of automated trading that employs:

- (a) algorithms for decision making, order initiation, generation, routing, or execution, for each individual transaction without human direction;
- (b) low-latency technology that is designed to minimize response times, including proximity and co-location services;
- (c) high speed connections to markets for order entry; and
- (d) high rates of orders or quotes submitted.

***However how do you quantify high rates of orders so that the definition is not too broad ?***

# What is the definition of high frequency trading within the context of automated trading systems (ATS)?

## **Draft Definition, October 2012:**

High frequency trading is a form of automated trading that employs:

- (a) algorithms for decision making, order initiation, generation, routing, or execution, for each individual transaction without human direction;
- (b) low-latency technology that is designed to minimize response times, including proximity and co-location services;
- (c) high speed connections to markets for order entry; and
- (d) recurring high message rates (orders, quotes or cancellations) determined using one or more objective forms of measurement\*, including:
  - (i) cancel-to-fill ratios;
  - (ii) participant-to-market message ratios; or
  - (iii) participant-to-market trade volume ratios.

# What is the definition of high frequency trading within the context of automated trading systems (ATS)?

## **Draft Definition, October 2012 (cont):**

High frequency trading is a mechanism utilized by a variety of trading strategies [including - but not limited to - liquidity provision and statistical arbitrage].

\* Objective forms of measurement are determined by a regulator for specific financial instruments or classes of instruments and provide a benchmark for comparing activity that is higher than normal. Such benchmarks should be published on a periodic basis and applied for a specified time period following publication. These measurements should be applied to the participant responsible for the recurring high message rates.

## Rationale for Changes to Part (d)

*(d) recurring high message rates (orders, quotes or cancellations) determined using one or more objective forms of measurement\*, including:*

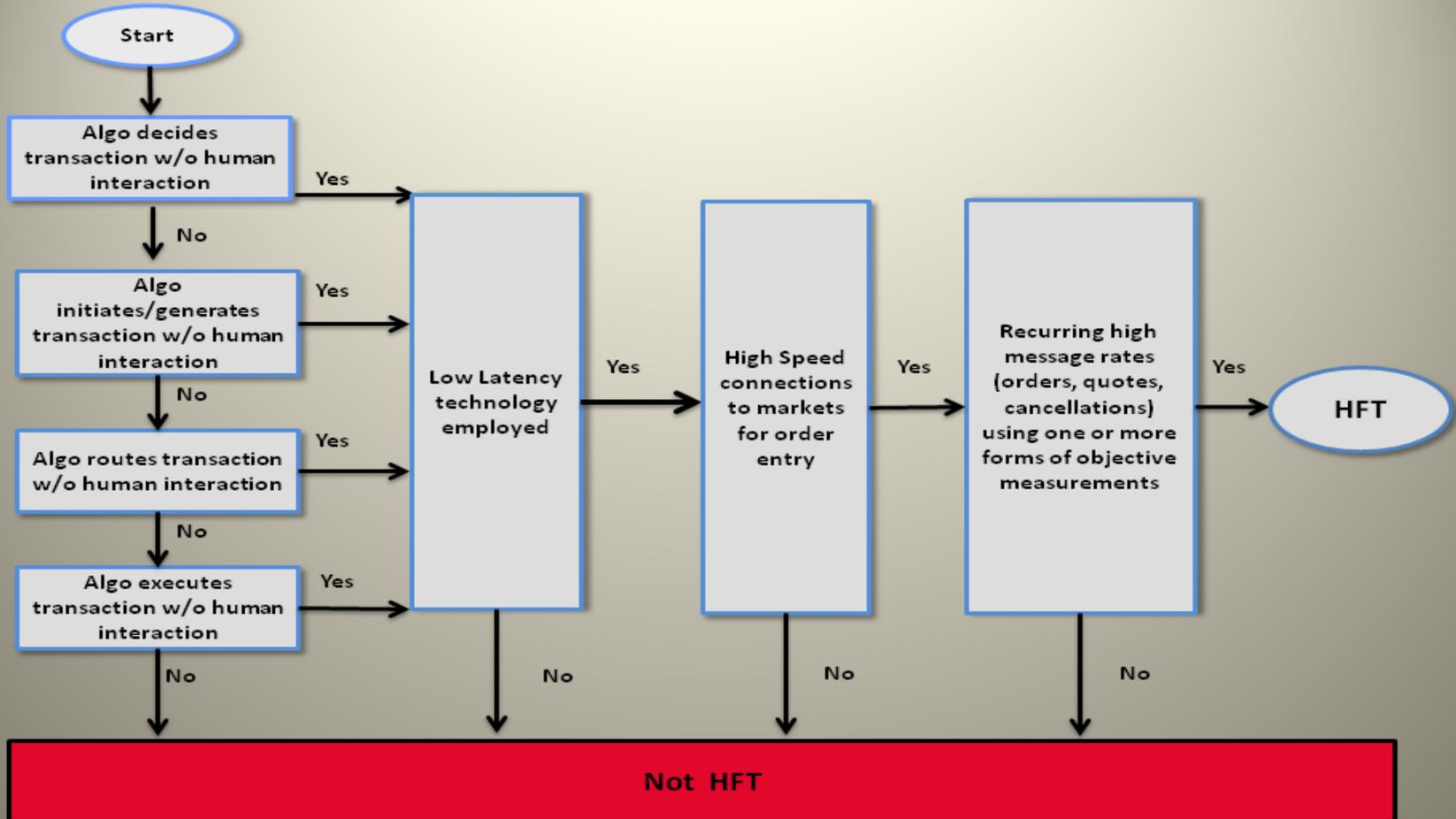
*(i) cancel-to-fill ratios;*

*(ii) participant-to-market message ratios; or*

*(iii) participant-to-market trade volume ratios.*

- Extended the definition to cover all messages including cancellations.
- Extended the definition to reflect that activity has to regularly recur to be considered HFT, as opposed to a one-off burst of activity.
- Extended to include how the activity can be quantified, although the definition deliberately avoids its own quantification.
- The forms of measurement chosen are intended to allow a regulator to measure activity without direct access to the trading algorithms employed to generate the high message rates.
- After discussion and some dissent, holding periods and portfolio turnover frequency were deliberately left out of the definition.

# Flow Chart Representation of October HFT Definition



# High Frequency Trading is a form of Automated Trading

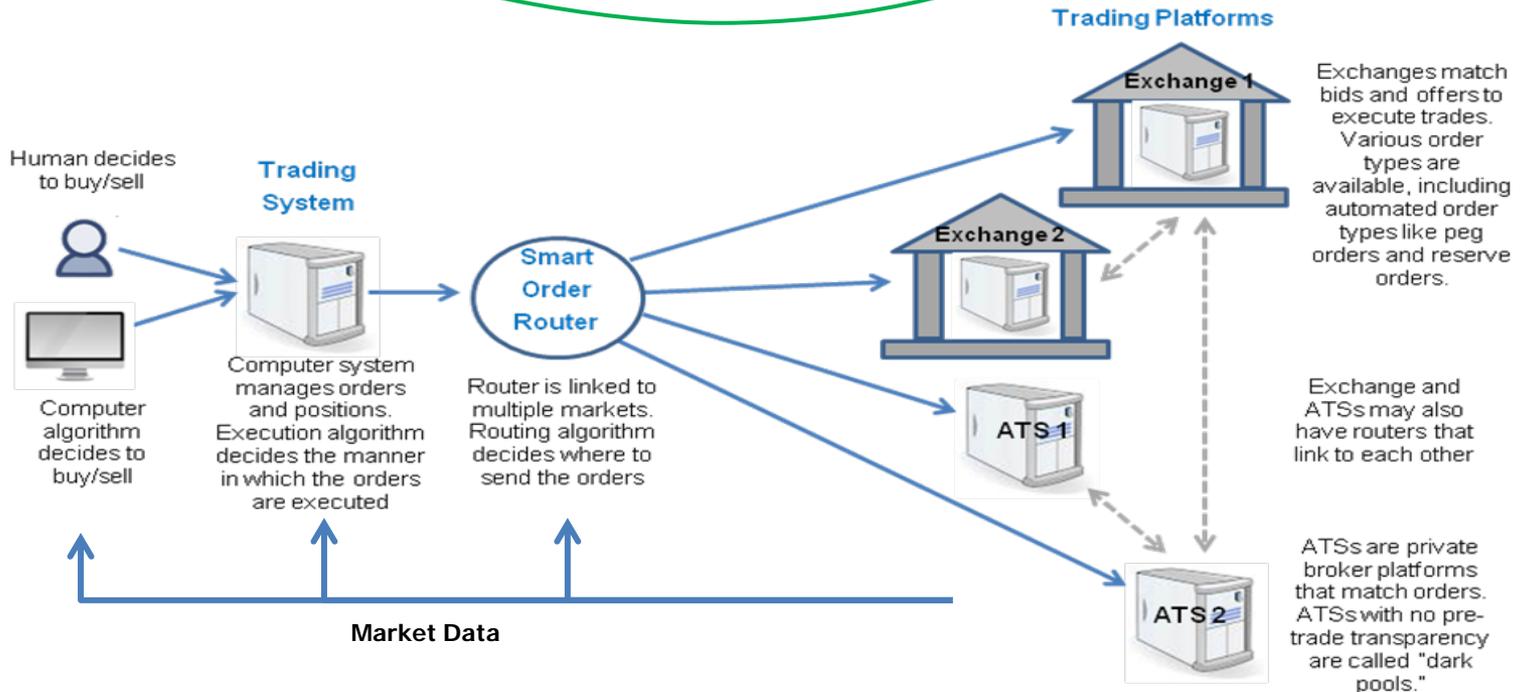
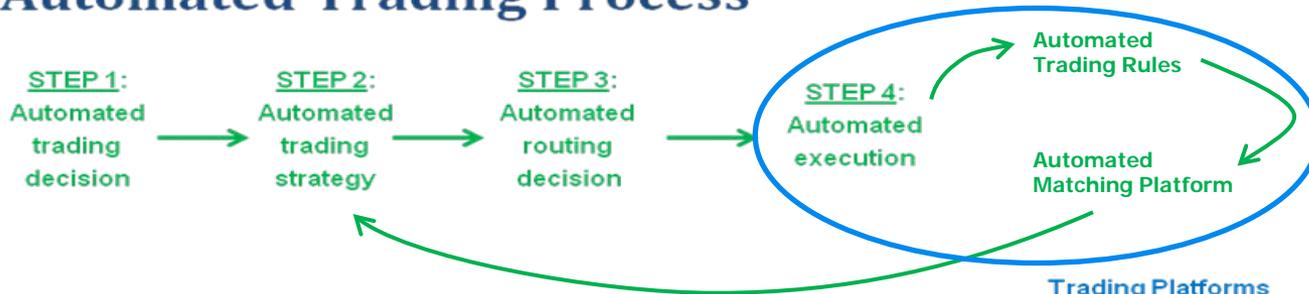
- **Automated Trading:**
  - Covers systems employed in the decision-making, routing and/or execution of an investment or trading decision, which utilizes a range of technologies including software, hardware, and network components to facilitate efficient access to the financial markets via electronic trading platforms<sup>1</sup>.
  - It is important to note that the automated trading process can be initiated by either a human or a machine making the decision which financial instrument to buy or sell.
- **HFT is a subset of Automated Trading:**
  - All high frequency trading is a component of automated trading.
  - Not all automated trading is high frequency.

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<sup>1</sup> An electronic trading platform may be supplied by an exchange or Designated contract markets (DCMs), electronic crossing networks (ECNs), alternative trading systems (ATS's), swap execution facilities (SEFs), etc.

# Overview of the Automated Trading Process

## Automated Trading Process



# Components of Automated Trading

- **Automated Trading Decision**
  - Initiation of an order for a financial transaction by either a human or a machine.
- **Automated Trading System**
  - A tool used to decide how the orders are executed in the market.
- **Automated/Smart Order Routing**
  - A tool used to decide where and how to route the order (if applicable to market structure).
- **Automated Execution**
  - **Electronic Trading Platform** - the system that matches buyers and sellers, operated by an Exchange/Designated Contract Market, Alternate Trading System, Electronic Crossing Network, Swap Execution Facility, etc.
  - **Automated Matching Rules** - instructions for an electronic trading platform on how orders are to be matched (including order types offering advanced functionality).
- **Market Data**
  - A key input into the automated decision making of any automated trading system.
- **Co-location or Proximity Services (optional)**
  - The ability to locate close to an electronic trading platform so as to minimize the latency in receiving market data and sending orders.

# Automated Trading Systems (ATS)

- **Automated Trading Systems utilize computer algorithms that have discretion over one or more of the following:**
  - The splitting of the order into multiple parts.
  - The timing of execution.
  - Whether the order adds or removes liquidity.
  - The execution price of the order.
  - The use of displayed or non-displayed orders.
  - Routing strategies that minimize trading fees (if applicable to market structure).
- **Automated Trading Systems can be deployed by the buy-side, proprietary trading firms, sell-side broker/dealers, or vendors:**
  - Buy-side or proprietary trading firms will often couple the decision making regarding *what* to trade with *how* to trade it.
  - Sell-side firms & vendors providing automated execution systems typically provide an API or GUI for the buy-side to enter orders.

# Automated/Smart Order Routers and Market Data

- **Automated/Smart Order Routing (SOR) technology is employed where market fragmentation exists.**
  - A routing algorithm outlines the rules used to make the routing decision.
  - Rules may include routing simultaneous orders to multiple markets or routing orders through several prices levels on a single marketplace.
  - Routing decisions are based on exchange, ECN or ATS characteristics such as price, liquidity, speed, fill rates, execution fees and other criteria.
- **Electronic market data is pricing information provided by matching platforms or service providers.**
  - Market data contains pre-trade information as well as post-trade information.
  - Feedback loops occur with trading platforms sending acknowledgments of order executions and cancellations back to the trading firm.
  - Supplementary market data is increasingly available in the form of machine-readable news feeds.

## Co-location and Proximity Services

- **Proximity and co-location services provided by an exchange, broker or vendor allow automated trading systems to be placed physically closer to an electronic matching platform:**
  - Co-location is typically provided by an Exchange/ DCM, Alternate Trading System or Electronic Crossing Network to allow market participants to host their systems in the same datacenter as their electronic trading platform.
  - Proximity services in a different datacenter are typically provided where co-location is either unavailable, not practicable, or where one trading systems needs to trade across multiple matching platforms.
  - Co-location with an electronic trading platform is an option that may be utilized to minimize network latency between receiving market data, decision making, and order placement.
  - This is particularly important where the automated trading system relies on speed for its efficiency.

# CFTC Technology Advisory Committee

## Sub-Committee on Automated and High Frequency Trading - Summary

- High Frequency Trading is a subset of Automated Trading.
- Any definition of HFT should acknowledge that various types of Automated Trading can exhibit mechanical characteristics of HFT.
- However, for automated trading to be considered HFT it needs to match the cumulative criteria that comprises the definition, including recurring high message rates determined using one or more objective forms of measurement.
- As per the June 20<sup>th</sup> TAC meeting, the emphasis of the definition remains intentionally mechanical and is intended to complement the following:
  - Further studies into types of trading strategies that rely on the mechanics of HFT, and;
  - Further studies into abusive practices that should be highlighted through increased surveillance and prohibited.