



# Tracking multi-hop performance

## The inherent difficulty in tracking multi-hop performance

In this article we explore the inherent difficulty in performing multi-hop performance measurement across highly distributed trading plants and how xMetrics® easily deals with what is still a fundamental limitation of legacy trade monitoring systems.

Understanding the link between trading performance and technology efficiency and hence being able to determine why execution quality is diminishing or how it can be optimized is critical to achieving a competitive advantage. By analysing orders across their lifecycle as they are transformed by each hop in a highly distributed trading plant it is possible to analyse the impact of each tier on end-to-end performance and identify where issues are occurring and - more importantly - where to concentrate effort to achieve the greatest ROI.

The first step in achieving multi-hop performance measurement is being able to correlate messages across the network, infrastructure and application tiers to the execution Venue and back again. Fundamental to this is the ability to manage the multiple protocol changes that naturally occur as the orders traverse components such as the Order Management System (OMS), Smart Order Router (SOR) and Market Gateway. At the simplest level there are two tiers – “client-side” and “market-side” - that make up a typical trading infrastructure. On the client-side customers will usually introduce orders using the FIX protocol, whereas on the market-side the bank or broker will introduce orders in a native exchange protocol such as Euronext Optiq for example.

This is where the problems begin to arise, as when attempting to match orders and acknowledgments across the client-side and market-side tiers, the formats of the individual fields differ, even though they represent the same values. This is critical where the client order ID is not carried through between tiers – and more importantly, the different message types - and hence cannot be used to uniquely identify the order in both tiers.

In this example, the symbol may well be presented as a RIC (a sequence of characters) on the client-side, whilst on the market-side the “symbol index” is represented as an integer (a whole number). Without the ability to perform a “lookup” based on the number in order to return the symbol it is not possible to use a common symbol identifier to match the order across the two tiers. Furthermore, the representation of the price field often suffers from an even worse problem – the format on the client side will likely be a floating-point number, whilst on the market side the representation will again be an integer. In this case it is necessary to perform a mathematical operation on the client-side in order to return an integer representation of the price in order to further assist in identifying the order.

Since several fields are required in order to achieve a unique “signature” for the order, these operations need to be performed, in real-time, on a significant number of fields in order to reliably match the order with its acknowledgment and fills. The scale of this problem is of course magnified when dealing with child orders where the user attempts to match amendments, fills and cancellations to track the full lifecycle of an order.

xMetrics® was developed by senior trading technologists with years of experience in electronic markets and does not suffer from the limitations inherent in legacy performance monitoring systems. As a result, xMetrics® is delivered out-of-the-box with the ability to transform any field – in a multitude of ways, and at multiple points in the matching process - to ensure that an infinite number of hops can be matched together for precise execution performance measurement. This means that with xMetrics® it is possible to not only very easily analyse, in real-time, multi-hop performance across tiers, but also to provide full life cycle trade reconstruction and alerting in order to see immediately not only which symbols, but more importantly which clients have been affected by latency events.

xMetrics® is the most powerful and flexible trade plant performance monitoring solution available today, and – critically - is easily integrated with legacy appliance-based packet capture and decode solutions. This power and flexibility allows users to continue to leverage their existing trade plant monitoring solutions well past the point at which they would otherwise cease to deliver value when measured against today’s more stringent requirements. The end result delivers increased actionable insight, a dramatic improvement in analytics capability, reduces operational spend, and increases ROI.

Click on the link below to request a demo and learn more about how Instrumentix help clients achieve complete edge.

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