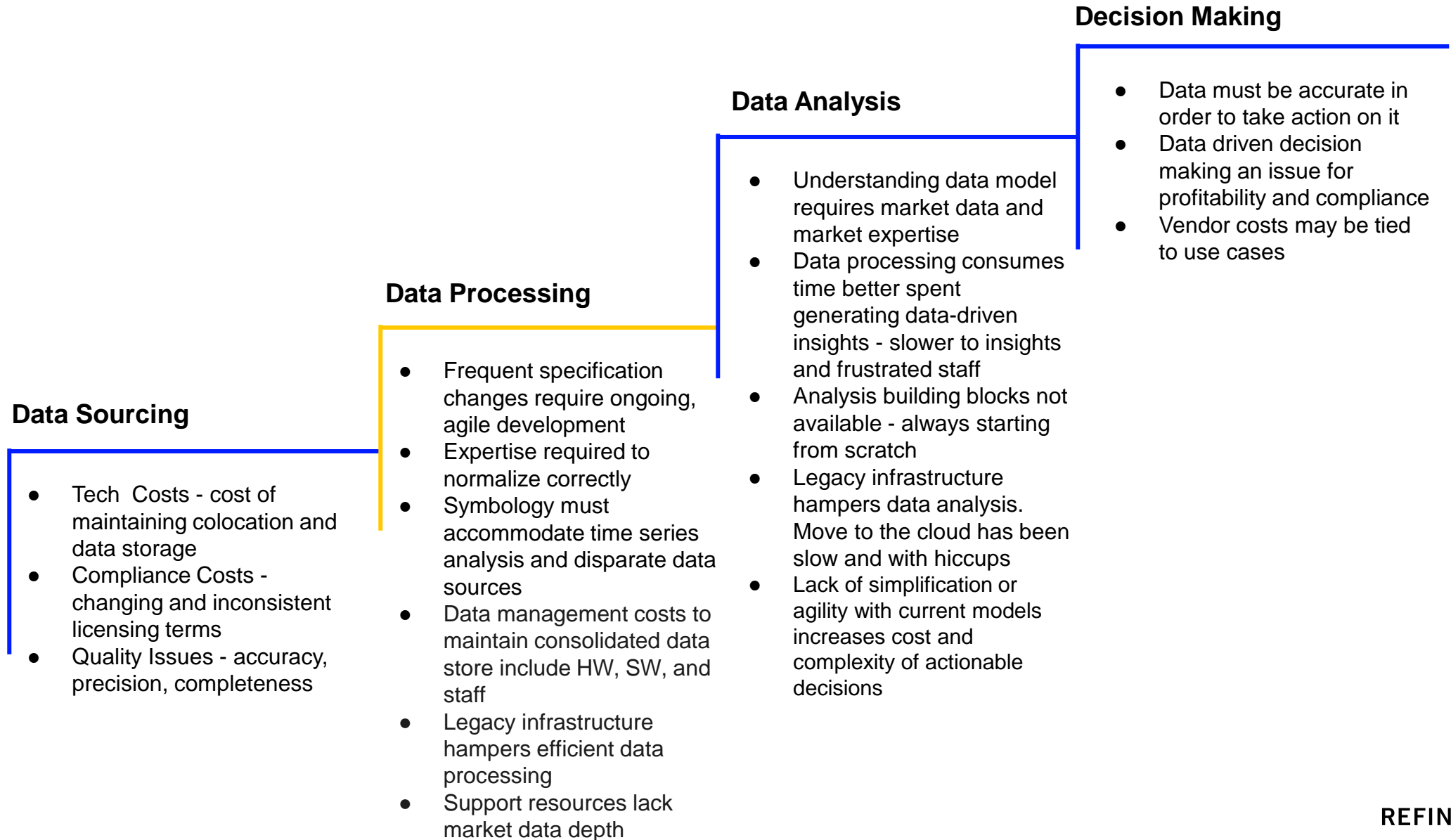


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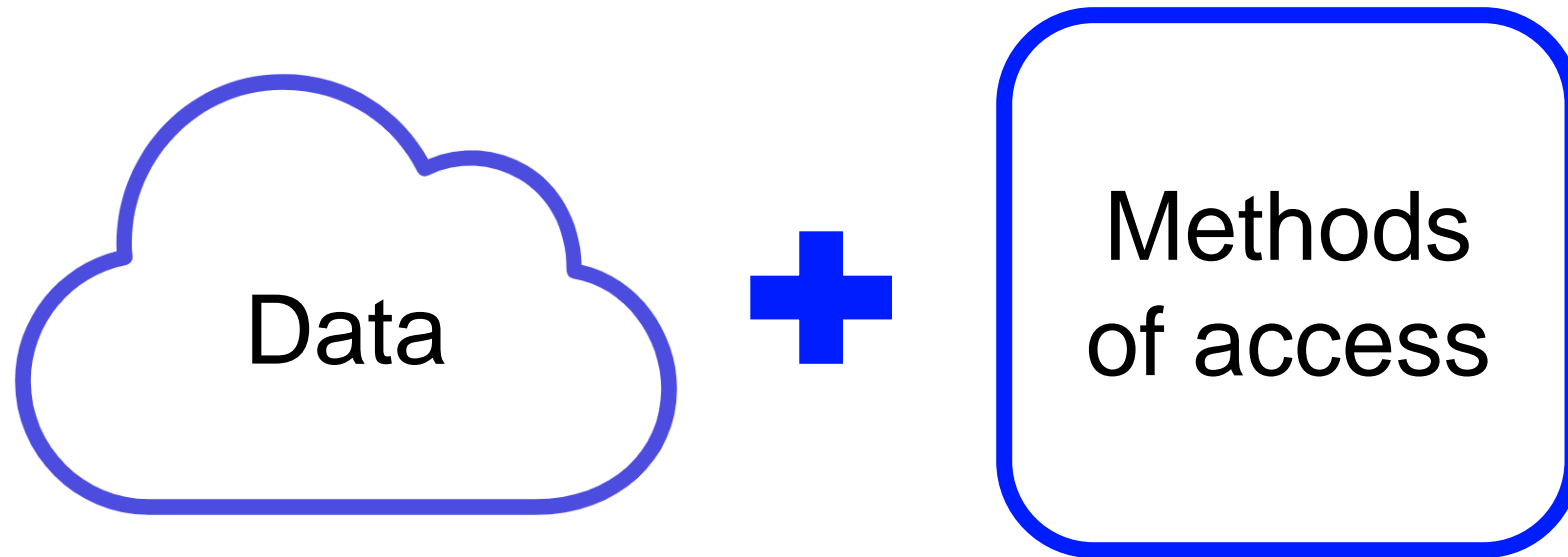
Unleashing the value of market data

Pramod Nayak: Director – Product Management, Low Latency, LSEG

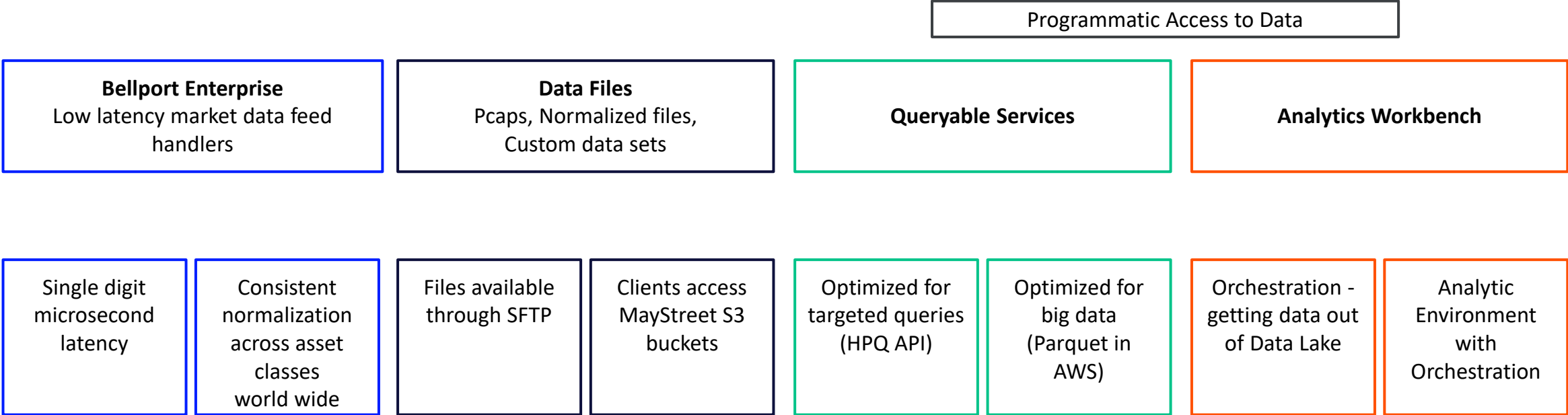
Unleashing the Value of Market Data is Difficult & Costly



What do we offer ?

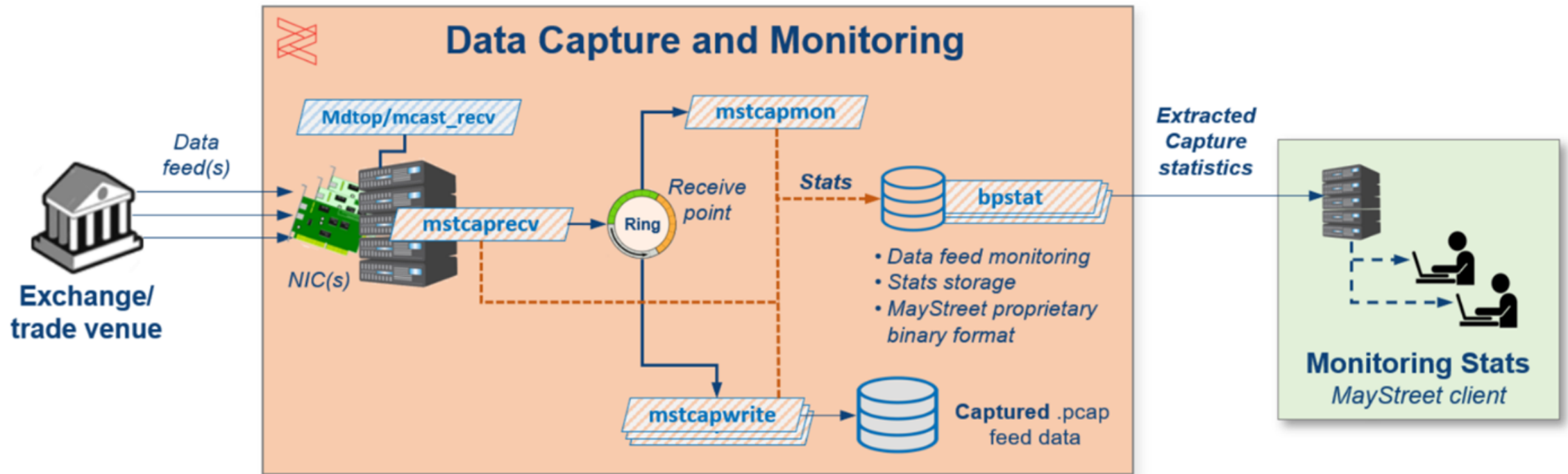


How we make it easy



Market Data Capture Process

Receiving and storing an incoming data feed, and monitoring the overall capture process



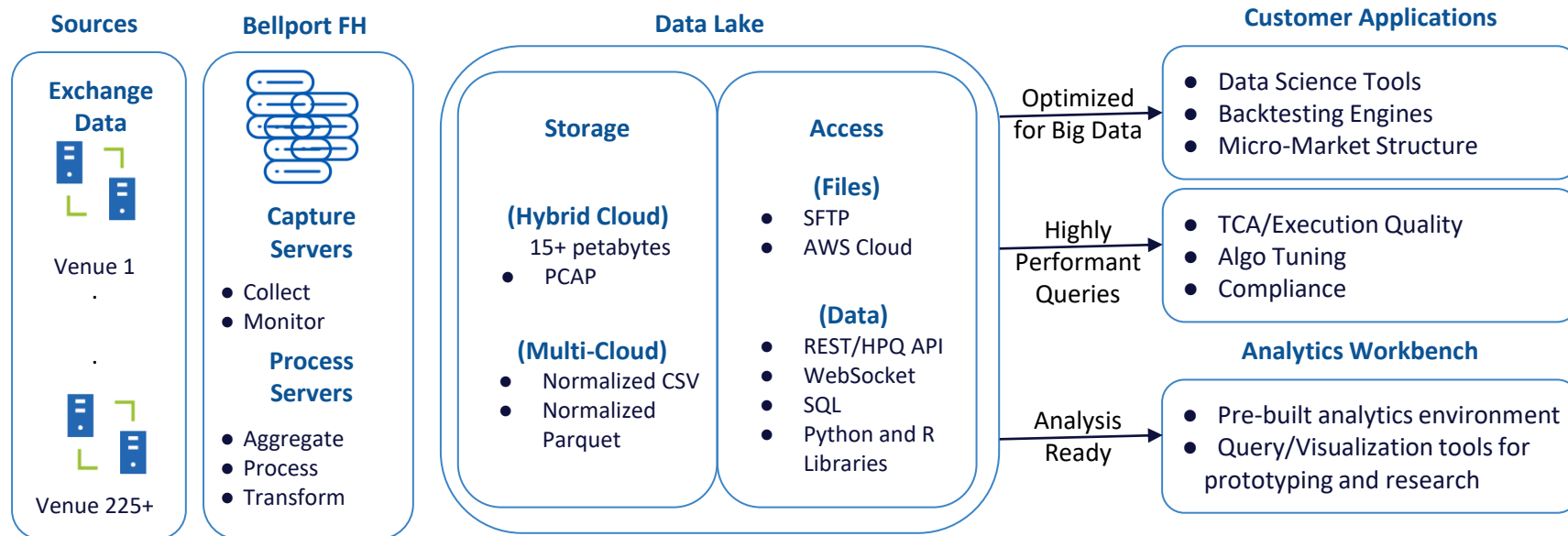
Market Data Lake

MayStreet data store built off of raw PCAP data.

Market data from all major trading venues is captured on performance network hardware with 4-way redundancy. A|B tapes are arbitrated for completeness.

GPS PTP signals ensure highest quality nanosecond-level timestamping.

- Multiple data delivery configurations - To meet user need, data is available in real-time, near-time, delayed and/or end-of day scheduling - as well as historical data.
- Multiple formats - PCAPs, Normalized (Parquet / CSV), Queryable access (HPQ and Workbench)
- Flexible delivery - SFTP, Cloud (AWS)



Analytics Workbench

Queryable access to MayStreet and LSEG Data Lake using Python and SQL in an interactive IDE

Interactively analyse market data in Jupyter notebooks

Easily spin up Dask clusters and schedule cloud-based Dask jobs to execute processor-heavy data queries.

Build custom services - Using EngineRoom, build custom services/apps running on user-defined servers that can be accessed outside of the Analytics Workbench desktop.

MayStreet high-integrity data - All Analytics Workbench data is sourced from MayStreet's Market Data Lake datasets, renown for nanosecond accuracy and best-in-class integrity algorithms.

Allows you to query the order book for AAPL on NASDAQ at "09:45:00.458398903" on 2022-10-18

The screenshot shows the Analytics Workbench interface. On the left, a SQL query is displayed in a code editor:

```
1 SELECT *
2 FROM
3     "prod_lake"."p_mst_data_lake"."mt_aggregated_price_update
4 WHERE
5     dt = '2022-07-05' AND
6     f = 'total_view' AND
7     product = 'AMZN'
```

On the right, a table of results is shown with the following columns: bidprice_1, bidquantity_1, bidnumorders_1, bidprice_2, bidquantity_2, and bidnumorders_2. The table contains 10 rows of data.

bidprice_1	bidquantity_1	bidnumorders_1	bidprice_2	bidquantity_2	bidnumorders_2
108.77	51	2	108.6	302	2
108.77	51	2	108.62	100	1
108.77	51	2	108.63	100	1
108.77	51	2	108.6	2	1
108.77	51	2	108.6	2	1
108.77	51	2	108.62	100	1
108.77	51	2	108.62	100	1
108.77	51	2	108.6	2	1

Bellport Enterprise

Feed handler library providing low-latency, in-process data ingest, transform and delivery

Written in C++, with Java bindings

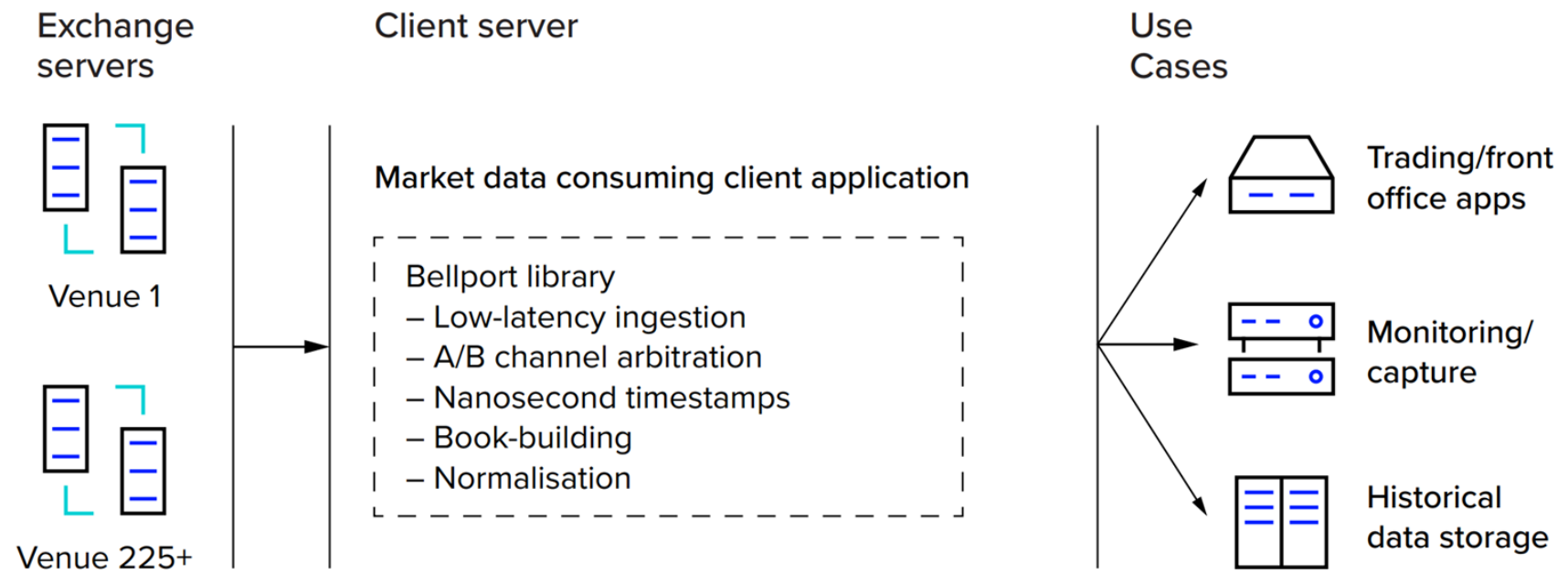
Single high-performance software solution for real-time and historical market data

Clear, transparent, extensible data model

A/B channel arbitration, book building, per-product subscription

Three data access levels: raw, normalized and aggregated

Support for kernel bypass NICs such as Solarflare, Exanic, Mellanox and Myricom. Direct integration with Solarflare EFVI for enhanced performance



MayStreet Makes it Easy

Simplify your data

Unlock value

Content

Enhancements

Innovation

Data Sourcing

- Over 225 feeds already provisioned in Market Data Lake
- Leverages Bellport Feed Handler for capture. For on-prem solutions,
- Meets required quality standards - lossless, nanosecond timestamps,

Data Processing

- Developers maintain feed handlers in accordance with exchange specs
- Data normalized across all data feeds offered
- Multiple formats (PCAP, Normalized, Parquet) to meet data analysis needs
- Firms can bring their queries to MayStreet or take all the data post-processing

Data Analysis

- Analytic Workbench provides a window into Market Data Lake with built-in Python libraries and book-building capabilities
- Pre-built analytics in Workbench
- For data science use cases using industry-standard tools, MayStreet supports Parquet file formats.
- Access to pre-built analytics like TWAP and VWAP are available via API. On-demand access to the state of the book at any period of time

Decision-Making

- MayStreet QAs its data not just for completeness but also for accuracy within expected parameters
- MayStreet supplies data to regulators and understands compliance use cases
- MayStreet customers can shift their focus from data processing to value-add activities associated with the analysis and monetization of data

Thank you