For the Electronic Stock Exchange we chose the Kappa architecture approach, with a Kafka bus containing topics interfaced by both the external app, as well as the internal microservices.

The Kafka stream needed to be able to handle two key topics as per the design specifications: one for handling orders and one for handling trades i.e. matched orders. Primarily, the external entities to the stock exchange would generate orders, and an internal matchmaking service would connect buy and sell orders in order to make trades.

All subsequent analytics systems would be driven using the trades, hence necessitating it as a topic. Using a moving window analytics pipeline to generate moving averages and optimal profits over time, secondary topics to hold this data in the stream to be consumed by external entities was also conceived.

A further design consideration was orders that were left unmatched in the system and needed to be offered priority when making trades. As such, a secondary orders topic was created in order to hold orders that were left unmatched after a pass through the matchmaker.