

Corvil Analytics for Crypto Market Makers

KEY CAPABILITIES

Transparency

Full decoding of traffic to and from a venue is critical to measuring latency for order response times and market data delivery

Network Analytics

Insight into the underlying network is essential to understanding how it supports trading applications – especially in dynamic cloud environments

Decryption

All trading interfaces are encrypted in cloud – so there's no visibility unless that traffic be decrypted. Corvil TLS Agent allows decryption for all TLS versions and cipher suites

Visibility

Getting the full picture means taking data from multiple sources. Corvil offers rich APIs for all metric data and export from Corvil's complete record of packets and decoded messages

CHALLENGES

For traditional equities and derivatives venues, latency sensitive trading is colocated in data centers using networks with high reliability and performance. With Binance, everything moves to public cloud infrastructure. It is easier and faster to deploy trading strategies, but predictable and reliable performance is harder to achieve or even to measure.

- There can be high variability in order response times and market data latency. But is this due to client application overload? Or Binance server overload? Or changes in the underlying network connecting the trading instance to Binance?
- All traffic is encrypted – it's essential to get visibility but not at the cost of introducing extra latency (stunnet, verbose app logging etc).
- Compared to a colocation deployment with known switch hops and cable lengths, AWS networking is visualized and opaque – underlying routing changes can cause intermittent stalls in TCP connections.
- AWS technology is constantly evolving – so you need a flexible approach to getting data. Port mirrors might be preferred but are not available across all instance types.
- Teams need a clear undisputed record of what happened: timestamped packets – decrypted and decoded.

CASE STUDY

Our client was a traditional market maker that was extending into the crypto market - trading on Binance and a handful of other markets. Their focus was on understanding latency of the Binance market data and order flow and correlating that with trading performance. They were also seeking arbitrage opportunities with venues hosted in other AWS locations – so it was important to manage the latency to and from other venues as well.

Binance offers a REST API for order management and a websockets API to streams both public market data and private updates about orders (trade executions etc). Our client had observed that Binance might deliver successful REST response significantly after the order book was updated. So the important order-response latency was between the request and when the private status update appeared on the websockets stream – at that point they had confirmation the order book had been updated.

They also had concerns about delays in the market data reaching their algo – delays caused by TCP retransmissions or buffering in the local TCP stack while their application handled a microburst.

Any issues they identified might come from within their own trading instance, or from the AWS network, or even within Binance itself. But any problems were intermittent – they needed continuous monitoring to find them, and detailed packet and message records to diagnose them.

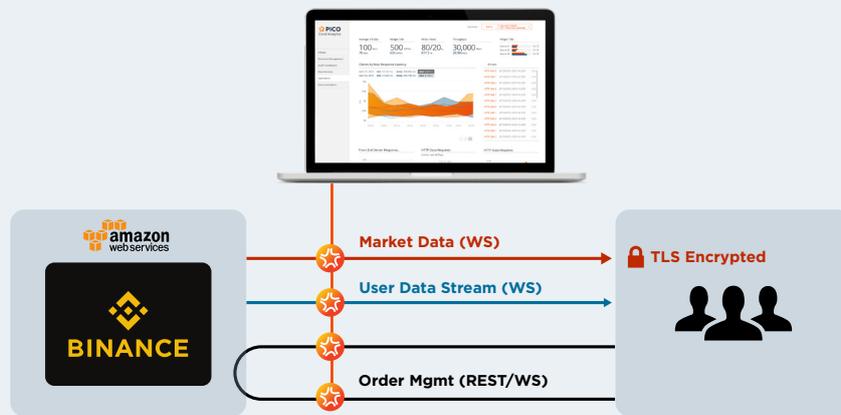
SOLUTION

The client deployed Corvil Cloud Analytics and configured an AWS port mirror to send a copy of their Binance traffic to the Corvil instance. With this minimal instrumentation, Corvil can report on the health of all the TCP connections – in terms of retransmissions, terminations, restarts, and zero-windows.

However, all the traffic is encrypted and so it was not possible to reliably distinguish between spot and futures trading, or between streaming websockets and REST connections. It certainly wasn't possible to trace an observed TCP issue back to a specific order, trade or price update.

The next step was to deploy the Corvil TLS Agent. The Agent is a software library, which integrates into the application and communicates decryption keys in real-time to the Corvil appliance. Corvil's Binance decoder then fully decodes the decrypted data into messages – orders, rejects, cancels, price updates, etc.

Corvil reporting automatically breaks down the results by API (REST versus websockets), Binance market and order gateway. Order response latency was measured continuously between the order request and the streaming private update. From anomalous results, a drilldown to the underlying packets and messages provides information about underlying TCP problems, microbursts and impacted APIs.



BENEFITS OF CORVIL ANALYTICS

Manage Speed Variability

Corvil Cloud Analytics identifies the fastest trading sessions and provides real-time alerts due to re-routes in the cloud infrastructure, ensuring optimal performance.

Identify Causes of Stalled Trading Sessions

Corvil Cloud Analytics pinpoints the cause of any trading session stalls, removing uncertainty and enabling deterministic root causes.

Remove Ambiguity in Data Session Interruptions

Corvil Analytics removes ambiguity behind terminated market data sessions, offering visibility and definitive insights whether the root cause lies with the cloud provider, client application or exchange.

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