Linnet: Limit Order Books Within Switches
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What is Linnet?
High frequency trading requires both high-accuracy and low latency. Linnet builds and updates limit order books (LOBs) from market data feeds within programmable switches, providing both high-accuracy and low-latency stock market prediction.

The Architecture of Linnet
Stock Exchange(s)

Market by Order (MBO)

Time Type ID Side Size Price

Updating an LOB using MBO Feeds

Limit Order Book (LOB)

Linnet Solution
Traditional Solution
Linnet Data Path
Traditional Data Path

Standard Switch Program: Packet Forwarding
LOB Construction
Feature Extraction
ML Model Inference
Data Plane

MBO: An order-based market data feed.
LOB: A real-time record of unmatched orders for a certain security which are utilized to buy or sell that security at specific prices or better.

An LOB is implicitly derived from MBO.

Positioning and Scope of Linnet

Machine Learning
In-Network Machine Learning
Programmable Networking
Market Prediction
Trading Acceleration
Financial Trading

Preliminary Evaluation

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- Functionality - Evaluated
- ML performance - Evaluated
- Porting to hardware - In progress (switch-ASIC / DPU)

Dataset: NASDAQ’s Historical TotalView-ITCH sample data feeds, Implementation Framework: Planter

Linnet runs on a switch with a (L)imited size model. The benchmark runs on a server with an (U)nlimited size model.

Stocks: COST (Costco Wholesale Corporation), NVDA (NVIDIA Corporation), ASML (ASML Holding NV).