INTRODUCTION

The amount of market risk assumed by banks has important impact the proportion of their capital ratios, hence this level of exposure is a critical aspect in the banking business, and an area that is tightly regulated worldwide.

Banks are immersed in an important transformation process – this represents an especially good opportunity to provide them with a radical new technology based on Xilinx most advanced hardware and software stack to help them undertake this task.

Market risk management (MRM) is a pipeline composed of a set of clearly defined activities:

KEY BENEFITS

- **Accelerate the calculations** for options, equity and bonds providing a significant improvement vs current CPU based solutions.
- **Provide an extensible and flexible test bed for Xilinx® Vitis™** framework and libraries, and a showcase of fintech capabilities.
- **Provide a modular solution architecture** that can be flexibly deployed in on premise and cloud Xilinx-enabled platforms.

SOLUTION OVERVIEW

This platform will deploy computationally intensive quantitative risk management mechanisms such as variance-covariance, Monte Carlo, and others to calculate various risk metrics such as VaR and ES, etc.

The platform will include three stages, and associated building blocks:

- a **data loading component** which prepares the data to be processed
- an **analytics component** which performs the calculations
- a **front-end application** to show the results of calculations and acceleration metrics in a user-friendly manner.
Accelerated Market Risk
High speed, scalable and modular risk processing pipeline

SOLUTION DETAILS

• The platform includes **re-usable user interface components** to be able to configure data set ingestion, load imposed on the analytics stage, and presentation of results for demo purposes.

• As the main objective of this platform is present is to visually support FPGA-based acceleration capabilities within the market risk management context, the data sets fed into the analytics stage will be a **mix of real market data, and synthetically generated data**.

• Runtime architecture is split between GUI and control execution API, which is implemented as a **lightweight service-based application**, and the **processing pipelines** (workers) which are managed using an event queue.

• The solution has been tested both in **on premises hardware** with **Alveo™ U200 Cards**, and **cloud based infrastructure** including **Nimbix** and **AWS**.

• **Modular integration architecture** enable both **scalability in deployment** and **simplicity of integration** with customer infrastructures for testing with real production data.

RESULTS

• From the testing performed so far, the acceleration of VaR portfolio calculation provides **15x** baseline improvement vs traditional solutions.

• Current testing of Monte Carlo calculations for generation of simulated portfolios using Vitis new fintech libraries suggest very promising improvements in calculation acceleration.

As a summary, Market Risk Management can benefit greatly from the implementation of adaptive acceleration technologies from Xilinx.

A hybrid acceleration strategy is a must, since core calculations can benefit from leveraging low level acceleration techniques, but a great improvement can be achieved by re-using existing high level building blocks from Vitis.

TAKE THE NEXT STEP

Learn more about Xilinx **Alveo accelerator cards**
Learn more about NTT Disruption: **https://disruption.global.ntt/**
Reach out to NTT Disruption – **helloxilinx@nttdisruption.com**