**Financial Risk Management (FRM) Application on AWS using Microsoft HPC (High Performance Computing) ( 2016-2019)**

Financial Risk management application is an income forecasting, Asset-Liability Management & Market Risk Analysis application which enables clients to model the assets, liabilities, and off-balance-sheet instruments. It measures the Risk of a Balance Sheet under Any Economic Scenario. It creates reports that effectively and concisely deliver the management needs to make profitable financial decisions.

In the federal financial organization, I have worked for, the FRM applications’ quarterly/annual balance sheet jobs have been running over 200 on-prem data center parallel servers and it took approximately a month to complete the jobs. It is due to a lot of financial calculations and it uses Monte Carlo method.

The management is decided to optimize the balance sheet job execution and save the analyst time by moving to Cloud to utilize the features like scalability, Reduction in costs, Improved performance, Secure and Speedy disaster recovery, Greener, Time-Saving on maintenance. We evaluated various cloud providers and decided to go with AWS cloud and Microsoft HPC (high performance computing) as it meets our requirement.

Microsoft High Performance Computing (HPC) allows FRM Users to solve complex, compute-intensive problems. FRM applications require high network performance, fast storage, large amounts of memory, very high compute capabilities, or all of these. AWS enables you to increase the speed of FRM runs and reduce time-to-results by running HPC in the cloud and scaling to larger numbers of parallel tasks. AWS helps to reduce costs by providing CPU servers on-demand (Spot Instances), optimized for specific applications, and without the need for large capital investments. We are automated provisioning EC2 instances, SQL Server databases backup/restore, attach and detach db’s, compute nodes for patching and restore databases using PowerShell Scripting

The Financial Risk Management application (FRM) is deployed to AWS using cloud formation templates with auto scaling of hundreds of compute cores using Microsoft HPC (high performance clustering). HPC uses parallel computing features in Windows HPC Server 2012.The term HPC (High Performance Computing) is virtually synonymous with super computers and parallel computing.

After implementing this project, the balance sheet job took only 24 hours to complete. By moving to cloud, the ROI (Return on investment) of the project over the next five years is estimated to be $20M. It includes labor costs, data center cost and server maintenance.

I am a senior VP @ WELLS FARGO, working in the IT industry for the past 20 years. I have experience working in larger organizations like Wal-Mart, Cisco, Lam Research, JDSU, WELLS FARGO and Federal Home loan bank of San Francisco. I have worked on many important projects throughout my career. One of the most interesting projects I have had the pleasure of working on, was FRM application deployed on AWS using Microsoft HPC (High Performance Computing) from proof of concept to Production.