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CME Solution Architecture Career Phase Activity

Activities in this section are illustrative highlights from the last 11 years as a solution architect at CME Group.

CME Google Market Migration

- Doing Confidential design work relating to [CME Google Market transformation](#)
- Advising Google on technical requirements for operating low latency markets in cloud
 - iLink / FIX order entry and market data.
 - Trade matching
 - Regulatory message capture considerations

CME NEX market integration for FX Spot NDF, and Treasury Actives products

- Expanded high throughput low microsecond latency EBS Direct platform architecture to include global hard credit enforcement and high throughput reliable quote capture
 - high resiliency design
 - Credit and quote stream observable designs for operational support
- EBS Market CLOB redevelopment architecture on CME Group matching platform
 - Adapt futures and options technology for FX Spot markets
 - Converge customer and product referential.
 - Market operational scheduling for fixing based markets (Patent Applied for)

Embedded In Line Credit control architecture

- Developed Credit enforcement architecture required to help CME customers meet regulatory obligations.
 - Distributed limit enforcement
 - Limit setting and reporting Data integration / messaging architecture from user front end to embedded low latency enforcement.

Market data publishing architectures

- [Settlement / Valuation channel](#)
- Term SOFR calculation and publishing architecture

FX Link.

- Order entry, credit, matching, clearing, STP, Market operations enhancements CME's innovative Future and FX Spot spread.

Overall Globex / Exchange Architecture.

- General duties in the Markets Architecture department include providing roadmaps and technical solutions for projects affecting all facets of [Globex](#).
 - Including detailed component Java software and data structure design.
 - Solving problems unique to all asset classes
 - Security considerations across all facets of all projects
- Large cross exchange technical solutions integrating with clearing, post trade messaging price generation referential data.

CMEGroup.com Amazon Web Services migration

- Rearchitected cmegroup.com web site from on premise datacenter to cloud native services at AWS.

CME System and Software Engineering Career Phase Activity

This section highlights some software developments and production system and network engineering work at CME Group 2002 through 2011.

Low latency multicast deployment and configuration

- Configure CME Globex multicast messaging (Tibco FTL and Rendezvous reliable multicast).
- Architecture and development (Java) of

Electronic Trading Production Assurance (ETPA) Development tech lead and architect

- Vision, delivery, and coding (Java) of Customer iLink / FIX onboarding application.
 - First use of web services at CME Group.
 - First team to adopt Scrum method at CME Group.
- Configuration system design and implementation
- Data / schema design for configuration applications (SQL / relational).
- CME standard launch and monitoring shell scripts (Unix / Linux shells)

Recent Coding / Software Engineering Activity

The activities in this section reflect the last 6 years of personal technology exploration and a refresh of engineering and implementation capabilities, including a second MS degree DePaul Computer science Systems Concentration to complete June 2023, professional, and open source projects.

Optimized C++

- Top in class speed up for Memory heap implementation in Optimized C++
- Cache efficient Data Structures, code optimization, SIMD

Python / Mongo

- Data Science / Data analysis problems, Cryptology problems (Python).
- CME FTP migration to data validation tool (Python).
- Personal projects Task Logger, Columnar Object index library. (Python, MongoDB)

Java / Mobile / Cryptology

- *Mobile Application Development in Android and Advanced Android* (Java).
- Cryptology - Baby step, giant step cipher attack problem (Java).

Front end development

- Personal Task / Scrum Kanban application (React JS).
- *Web Applications* (Angular, Javascript)
- *Website Design* (HTML5/CSS)

Cloud / Virtualization.

- Docker C++ assignment environment
- Google Firebase DB Web client applications.
- Terraform / Infrastructure as Code Masters research.

System and Network Phase Career Activity

Activities in this section reflect professional work at Computer Sciences Corporation and Brandenburg Industrial Service Co.

Hyatt Booking Engine System and network implementation

- Server Hardware Spec / configuration (HPUX)
- Java Container run environment (Weblogic / J2EE, Unix scripts.)

Hyatt DNS and E-mail environment

- Secure DMZ network and operating system configuration. (Sendmail, DNS, HPUX)
- Routing and name service configuration

Hyatt Reservation system Unix system engineering and performance configuration

- C middle tier and Informix database system performance optimization
- NUMA and SMP System / CPU performance tuning
- IP and Ethernet layer network configuration and troubleshooting

Unix application and network migration

- LAN / WAN configuration
- Unix system implementations
- Disk system implementation

Early Development Phase Career Experiences

The Activities In this section reflect application and network development activities including DePaul MS Computer science Telecommunications Design.

Nursing health care application development

- C and Basic application development
- In memory database development

Computer Network / Programming

- *Computer Architecture* (Processor / hardware concepts)
- *Operating Systems*
- *Object Oriented Programming* (C++)
- *Component based Enterprise Computing* (Java)
- *Distributed Computing* (C)
- *Design and Analysis of Algorithms* (C)
- *Database Technologies* (SQL)
- *Data communications*
- *Local Area Networks* (MAC layer)
- *Data Analysis*