Muthukrishnan Bommiah

Staff Engineer, Data and Analytics

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My background in engineering and approach to technical leadership is *fueled* by my broad technical domain knowledge with more than 20 years of experience, engineering instinct, problem solving, creativity, and communication. I believe the key to engineering success is the ability to see, understand, and communicate the big picture, and be effective in helping others develop a big picture view. I have worked across several organizational and discipline boundaries to impact non-engineering functions such as the Data Science Community, Developer Community, Enterprise Security Group, Lines of Business, and HR. I have excellent written and verbal communication skills as well as exceptional presentation skills enabling me to articulate strategy, objectives, and technical concepts at every level.

Areas of Expertise include:

- Machine Learning Operations
- Cloud Native and Distributed Systems
- Product Strategy/Integration

- Data Infrastructure Platforms
- AWS ML, Compute, Storage, Containers
- Risk Mitigation and Solution Delivery

- Enterprise/Solution Architecture
- ML Life Cycle and SDLC
- Cross Functional Supervision

Professional Experience

USAA • San Antonio, TX • 2012 to Present

Staff Engineer, Data and Analytics Platform (April 2020 – Present)
Key Accomplishments:

- Defined and assimilated principles for modern, cloud-native architecture, translated those principles into achievable strategies and tactics, then evangelized those strategies and tactics across USAA Data and Analytics Organization and Lines of Businesses.
- Proactively managed stakeholder needs and concerns through ongoing engagement; served as a trusted advisor for Data and Analytics Platforms executives and business leaders by building strong working relationships, mitigating risks and issues, and managing expectations related to enhancements and changes requests.
- As the System Engineer for Cloud Data COE, safelanded AWS Sagemaker for Discovery Analytics and Machine Learning Operations, AWS Elastic Map Reduce for data processing engine in a controlled data movement to Cloud, AWS MLaaS Textract, Rekognition, Comprehend for insight acceleration, AWS Macie for Sensitive Data Management, and AWS Kinesis Data Firehose for Data Acquisition.
- In my role as System Engineer, I am responsible for writing, reviewing, and providing final approval for several technical architecture specifications including IAM, Data protection, financial management, Infrastructure Security, Detective controls, product requirements for several AWS Services, and negotiating dependencies with business and technology teams across USAA.
- Served as Cloud Data Liaison for several working groups including safelanding working group; assisted with several compliance and UCRC requirements/implementations, helped with the alignment of technology standards, architectural patterns and practices across Unified Data Platforms, Machine Learning and Modeling Platform teams across USAA to ensure reuse, reliability, performance, sustainability and other non-functional requirements.
- Created an ML Platform which manages the entire life cycle of analytical models including heterogeneity (Python, R, SAS, H20), Devops, scaled compute, auditability, and governance. Accelerated release and research cycles by enabling continuous delivery approach to code, data, and model to deliver insights that are both explainable and predictable.
- Implemented continuous delivery principles and practices to machine learning deployment pipelines (code, model, and data) in order to bring a software engineering approach to the release of small and safe increments of reproducible and reliable software with short adaption cycles. Deployment time was reduced from an average of 8 weeks to less than 1 week.
    - On-Demand Scoring Pipeline – a restful microservices architecture for Python and H20 models.
    - Small Batch Scoring Pipeline – repeatable managed use of Python, R and H20 for scheduled jobs.
    - Event Chain Scoring Pipeline – event-driven architecture based on Kafka to create flows of processing.
    - Automated Model Retraining Pipeline – continual learning to optimize models for accuracy and performance.
- Designed and Implemented configuration driven data movement pipeline for controlled data ingestion of on-prem and cloud data sources into foundation layers; AWS S3 for raw conformed and Snowflake for raw query enabled layer. This application supports batch and event sources in multiple file formats, sensitive data protection, data governance controls with information stewardship engagement in workflow and integration with data catalog and automated lineage. This tools processes about 15 – 18 billion records per day, 800k files per day and has moved more than 250 TB conformed data to AWS S3.
- Designed and implemented next version of controlled data movement pipeline with priority-based quality of service, serverless data acquisition pipeline, enhanced business application controls and improved scalability and extensibility. Achieved 20X improved scalability, reduced latency by 10X, reduced exception rate to .01%, improved end to end observability with datadog, elk and implemented rule based automated reprocessing of failed assets to meet 99.9% SLO.
- Recognized for excellence in continuous research and development of new tools and techniques for designing, building, and operating data and analytics platforms.
- Demonstrated flexibility and diversity of skills by filling in, at various times, as Domain Architect, Delivery Manager, Product Manager, Developer, and Client Relationship Manager Roles.

Lead Software Engineer, Data and Analytics Platform (March 2017 – April 2020)
Key Accomplishments:

- Achieved technical excellence through a set of core Agile engineering practices, including emergent design, test driven development, test automation, collective code ownership, pair programming, continuous integration, and shared coding standards. Designed a model centric approach to enable uniform model deployment independent of data science workbenches and execution platforms to meet the needs of data scientists, IT, and business leaders.
- Designed and implemented a unified ML platform, offering data and analytics pipeline capabilities such as data access and ingestion, interactive exploration and visualization, self-service, and reusable ways of deployment of managed data science assets, cross-team collaborative model development with reproducibility and scaled compute using Domino Data Science Platform. This implementation accelerated research, improved model life cycle and reduced operations friction with Data Scientists, Data Engineers, and Model Risk Management Team.
- Designed and implemented machine learning systems in cloud native platforms to create loosely coupled sub systems, agnostic of ML frameworks and self-contained microservices providing the ability to run in highly distributed systems orchestrated by Cluster Orchestrator, Kubernetes.
- Designed and implemented the Model Deploy Console which provides single click model deployment from Domino development environment to OpenShift Container Platform for on-demand models and to Airflow/Domino for small batch deployments.
- Researched, designed, and implemented Apache Airflow for programmatic workflow management in a fault tolerant environment using Redis, Postgres and Celery workers in a containerized environment.
- Commoditized AWS Compute Deployments to provision cloud notebooks, enabling cloud hosted data discovery and model development for use by data scientists and modeling analysts across the enterprise.
- Designed, installed, and configured notebook servers in USAA datacenter hosting RStudio and Jupyter interfaces for data wrangling in a compliant and information lifecycle enforced environment to block the usage of R packages which have viral licenses and prevent UDAs in R Servers.
- Influenced enterprise decisions affecting entire analytics community, including the Modeling COE Core Team, the Enterprise Model Risk Management Committee, and the Machine Learning and Modeling Platforms Advisory Council in developing new standards, creating a first line model risk operating model, and setting the strategic direction for IT platforms for data science.
- Had technical ownership of the design and quality of the security, performance, availability, and operational aspects of the software built/supported by Machine Learning and Modeling Platforms.
- Served as Technical SME and application owner for several tools including Domino, SAS, Anaconda, Trifacta, RStudio, SPSS, Jupyter Hub, Dremio, Airflow, Redis, NIFI, Gitlab CI, Spark, H20 Flow, Discovery Zone, and Python, Java, Scala development paradigms.

Sr. Computer Systems Engineer, IT Operations (August 2012 – March 2017)
Key Accomplishments:

- Served as a core member of the team responsible for the USAA Container Strategy and led the evaluation for Redhat OpenShift Container Platform and Kubernetes. Presented in multiple forums to showcase OpenShift Container Platform including the CTO Architecture Forum. Served as Containers and OpenShift Container Platform evangelist by creating proof of concept environments/applications and showcasing capabilities to CTO and Executive Leadership across USAA.
- Designed and implemented Oracle Access Manager in an Active-Active configuration to enable authentication, web SSO, coarse-grained authorization, multi-factor authentication and fine-grained authorization for enterprise applications.
- Installed and configured Oracle Identity Manager to simplify access grants and review access by automatic provisioning of service accounts, AD groups, privileged access, roles, policy, and risk management.
- Created a predictive analytics environment that allows business users to visually model data and then deploy those models into production. Installed, configured, and upgraded SPSS and WebSphere infrastructure. Implemented batch scoring for SPSS using MQ, Control-M and DataStage.
- Served as technical lead for implementation and support of WebLogic Server, WebSphere Application Server, SPSS, Accurate, Kubernetes, Docker, OpenShift Container Platform, Isitio, Linkerd, Envoy, IBM MQ Series, and several other WebSphere one-off environments.

Bunge North America ● St. Louis, MO ● June 2003 - August 2012

IT Technical Manager, Middleware Platforms (April 2009 – August 2012)
Key Accomplishments:

- Managed a technical team of 10 members responsible for hosting and providing administration support for applications running on WebSphere Portal, WebSphere Application Server, SAS, Tibco, Webfocus, IBM Connections, Hyperion Financial Management, Tableau, SiteMinder and Linux Servers. Responsible for creating strategic vision for web application team. Manage and lead projects resources and reduce operational cost without affecting SLA's.
- Installed and Configured IBM Connections 3.0. Configured TDI scripts to populate profiles page with information from multiple directories and created multiple widgets to integrate external application like iNotes, Google Gadgets into connections. Served as a connections evangelist and involved in user adoption strategy and finding creative ways for successful roll out. Enabled Desktop SSO with SiteMinder and then moved to SPNEGO authentication later.

- Had strategic and tactical responsibility for Federated Single Sign on and Single Sign on for existing applications. Designed and developed Single sign-on solution across WebSphere Portal, WebSphere Application Server, Tableau, SAS, IBM Connections, Ruby on Rails and Hyperion Financial management module. Completed Proof of Concept using Ping federate with SAML 2.0.
- Managed Tibco upgrade including migration of Tibco BW engine to Tibco Active Matrix. Involved in consolidating Tibco applications to single domain and implemented Error reporting and Exception Handling. Implemented hawk monitoring for applications and auto pause during SAP Transports deployment.
- Managed and coordinated Hyperion Financial Management upgrade from 9.3 to 11.2. Successfully implemented Financial Data Management and Strategic Finance modules for 2000 users across the globe.
- Installed and configured Webfocus Reporting Server with WebSphere Application Server as servlet engine
- Installed and configured version control systems like cvsnt and subversion. Responsible for SSL and Digital Certificates for requesting, generating and implementation of the communication between webserver and the application server.
- Managed and supervised WebSphere Application Server Migration from WAS 6.1 to WAS 7.0. Performed operational readiness review for several WebSphere environments. Served as WebSphere subject matter expert.
- Designed and implemented infrastructure for SAS applications. Installed, upgraded, and administered SAS servers running on AIX.
- Managed and coordinated Tableau reports deployment. Successfully migrated Tableau Server from version 6.0 to
- 7.0.2. Designed and Implemented automated Tableau viewer install to Desktops using LAN Desk.
- Developed and implemented systems performance, availability measurements, and problem tracking methodologies using JIRA, Zabbix, Sitescope, Splunk, What's up Gold and Tableau reporting. Implemented quality assurance procedures within the technical support development and testing functions using Quality Center and JIRA.

Lead System Administrator, Middleware Platforms (September 2004 – March 2009)
Key Accomplishments:
- Installed and configured IBM WebSphere Application Server 5.x, 6.x (Base and ND) on RHEL AS 2.1, 3.0 for development, QA, staging and production environments.
- Installed and configured WebSphere Portal Server 5.1, Tibco TRA 5.2/5.3, BW, EMS, Administrator, and adapters for DB, R3, and LDAP.
- Involved in configuring IBM HTTP Server for SiteMinder web agent, WebSphere Application server, Tibco Administrator, Network Dispatcher. Installed and configured Apache with various configurations including reverse proxy, rewrite rules.
- Installed and configured monitoring tools like Zabbix, SiteScope to monitor the performance of Linux servers. Configured mercury application management tools to monitor application response time and availability. Installed and configured Mercury J2EE probe to monitor JVM performance.
- Involved with the customer care and deployment teams in trouble shooting and fixing day-to-day problems of the applications in production on 24/7 schedule
- Designed and implemented security infrastructure for Web applications. Implemented global security configured SiteMinder Trust Association interceptor and provided SSO with WebSphere portal applications, WebSphere applications, webfocus applications and Lotus Domino server.
- Designed and implemented internet access for all web applications. Involved in penetration testing, firewall rules and solving issues like QOS, Server-side attacks, and CSS attacks.
- Responsible for setting up Primavera group server for time sheets, Ruby on rails for script management systems, Aris for business modeling, quality center for automated QA testing, installed and configured proxy servers like Squid and paros for web applications.
- Installed and Configured SameTime Gateway to allow external communities yahoo, AOL, and Google to connect to Sametime Server.

Prior Work History

Williams Group ● Tulsa, OK ● November 2003 – September 2004
Norman Regional Hospital ● Norman, OK ● June 2003 – November 2003
Syntel India ● Chennai, India ● April 2000 – May 2001

Education

Years	Degree Earned	University
2001 - 2003	Master of Science in Computer Science	University of Oklahoma, Norman, Oklahoma
1996 - 2000	Bachelor of Engineering in Electronics and Communication	Kamaraj University, India