

Principal Data and Application Engineer

Position Description

Directorate	Digital Innovation and Technology	Department	Digital and Data
Reports To	Manager Digital and Data	Direct Reports	No
Queensland Local Government Industry Award - State 2017 - Stream	Stream A - Division 2, Section 1 - Administrative, clerical, technical, professional, community service, supervisory and managerial services	City of Moreton Bay EBA6 Certified Agreement 2025 Wage Level	Schedule 1, Level 7

Position Purpose

The Principal Data & Application Engineer is a senior technical leader responsible for architecting, building, and optimizing the cloud-native applications, APIs, and data platforms that power the strategic City Brain initiative. This role leads the design and delivery of scalable, low-latency systems for ingesting, processing, and serving data across a hybrid cloud model (AWS and Microsoft Fabric). This role leads the design and implementation of scalable, secure, and high-performance AWS-native data solutions to enable real-time insights, advanced analytics, application integrations and machine learning. A core focus is on mastering Microsoft Fabric in future to enable Copilot, AI Foundry, and scalable, real-time personalization engines, ensuring that data is securely and efficiently transformed into actionable insights via robust application interfaces and feature rich GIS integrations. In addition to core data engineering, this role owns data-centric API and microservice integration so that curated datasets can be securely consumed by applications.

Key Responsibilities and Outcomes

As a Principal Data and Application Engineer and member of the Digital and Data Department you will:

Strategic Data Platform Architecture

- Lead the architecture and design of large-scale data platforms and pipelines across the AWS and Microsoft Fabric ecosystems, ensuring data quality, observability, security, and compliance.
- Define and champion best practices for data modeling, storage, governance, ingestion, and usage, driving a high bar for technical excellence across all data assets.
- Serve as the technical authority for seamless cross-cloud data integration and defining the strategic path for adopting new features within the Microsoft Fabric Lakehouse and Real-Time Analytics services.
- Drive architectural decisions, balancing performance, governance, and cost across diverse technologies (e.g., AWS Kinesis/MSK, AWS Glue, and Fabric Data Engineering).
- Architect and implement scalable solutions for high-volume, real-time data acquisition from IoT sensors and urban systems, leveraging AWS IoT Core, API Gateways, MQTT and Fabric streaming services.
- Develop and maintain a comprehensive Data Catalogue, including data sources, models, diagrams, and metadata to represent, secure, and communicate data assets and ownership.

Application & API Layer Enablement

- Architect and implement scalable, low-latency systems for serving data and derived insights to internal and external applications.
- Lead the design and implementation of secure REST and GraphQL APIs with clear data contracts, versioning, and caching mechanisms using services like Amazon API Gateway and Lambda/containers (EKS/ECS).
- Design and evolve event-driven microservice architectures using services like Amazon EventBridge and SQS/SNS to enable real-time data flow and decision-making applications.
- Oversee the architecture for the data consumption layer, ensuring data is translated efficiently for modern user experiences (e.g., web portals, mobile apps, and geospatial applications). Be able to implement services in cross cloud environment on both AWS and Microsoft Fabric platforms.
- Champion best practices for Infrastructure-as-Code (Terraform/CloudFormation/CDK) and Git-based SDLC for platform and API deployments; automate tests and environment promotion.

Hybrid Governance & MLOps Integration

- Implement secure cross-cloud integration patterns to Microsoft Fabric, preserving data lineage and contracts, and ensuring secure connection between the AWS S3 Data Lake and Fabric.
- Lead data quality and lineage initiatives, leveraging tools like Microsoft Purview and Lake formation to advance governance maturity and auditing across the hybrid ecosystem.
- Define and implement the necessary data-to-action architectures, integrating application services with AI/ML model endpoints and event-driven designs to enable automated decision-making and predictive analytics.

Cross-Cloud & Modernisation

- Lead the design of secure and efficient cross-cloud data transfer mechanisms from the AWS S3 Data Lake to the Microsoft Fabric environment (e.g., using S3 shortcuts, secure connectors, or custom APIs), ensuring data quality, lineage, and cost efficiency.
- Support the decommissioning of legacy data platforms and migration to AWS-native solutions as part of City Brain's modernization roadmap.
- Collaborate with the Principal Data Engineer (Microsoft Fabric) to ensure seamless integration, data quality, and governance across cloud platforms, supporting City Brain's vision for a modular, AI-ready urban data platform.

Technical Leadership, DevOps & Stakeholder Management

- Own the orchestration, monitoring, and robust DevOps strategy for critical data and application workflows.
- Lead the implementation of CI/CD pipelines (GitHub Actions/CodeBuild) and Infrastructure-as-Code (IaC) using Terraform or CloudFormation/CDK.
- Provide advanced technical support and troubleshooting for production issues, including business-critical emergency scenarios, setting the standard for operational excellence.
- Actively mentor and guide other engineers and analysts, setting technical standards and driving architectural consensus across multi-functional teams.
- Work with external 3rd party partners in delivering timely and quality outcomes with a combination of internal and partner capabilities.
- The role is more than data engineering responsibilities and will have a part to play in stakeholder management, vendor management, solution architecture and end-to-end application design.

Our Values

Our values:
guiding how we
work and shaping
our future.



SEE THE PERSON.
SEE THE CITY.



OWN THE SOLUTION.
FOR TODAY AND
TOMORROW.



FALL, LEARN, RISE.
TOGETHER
WE GROW.



THINK BIGGER.
LET'S GO.

Decision Making

Budget

N/A

Delegations

Delegations under the Local Government Act 2009 and as directed and published in Council's Delegation Register

Knowledge & Experience

- Extensive progressive technical engineering experience, with significant capacity in a Lead or Principal role.
- Deep hands-on expertise building scalable applications and data services in cloud environments (AWS mandatory).
- Proven experience architecting and scaling production data systems handling large workloads with deep modeling, schema design, and performance optimization.
- Experience with technologies such as Kafka, Spark, Airflow, and containerization (Docker/Kubernetes).
- Expert-level proficiency in multiple AWS services including API Gateway, Lambda/containers (EKS/ECS), EventBridge, S3, Glue/Lake Formation, and Kinesis/MSK.
- Hands-on experience with Microsoft Fabric (Lakehouse, Synapse/SQL Endpoints, Real-Time Analytics) and Microsoft Purview for data governance is highly valued.
- Strong experience designing and building REST/GraphQL API serving layers over data platforms.
- Expert-level coding proficiency in multiple programming languages including Python and/or TypeScript/Java for building production systems.
- Demonstrated ability to lead with influence, driving architectural consensus and setting technical strategies across engineering, data science, and product teams.
- Direct experience working with AI platforms, MLOps frameworks, and model serving APIs is valuable.
- Ability to identify, analyze, and resolve complex technical issues, ensuring optimal performance, scalability, and user experience.
- Experience with geospatial data integration and analytics on AWS is highly desirable.
- Strong team leadership and mentoring skills are highly desirable. This role can have direct people management responsibilities.
- Sound experience working within DevOps and agile delivery environments.
- Domain experience in Smart City applications, IoT, Financial and spend datasets, Mobility and people movement datasets, Microsoft Fabric and related areas is highly desirable.
- Design, management, technical oversight and delivery of solutions through 3rd party partners will be valuable for success in this role.

Note: This position description reflects a summary of the key accountabilities of the position, it is not intended to be an all-inclusive list of duties, steps and tasks. Leaders may direct team members to perform other duties at their discretion.