

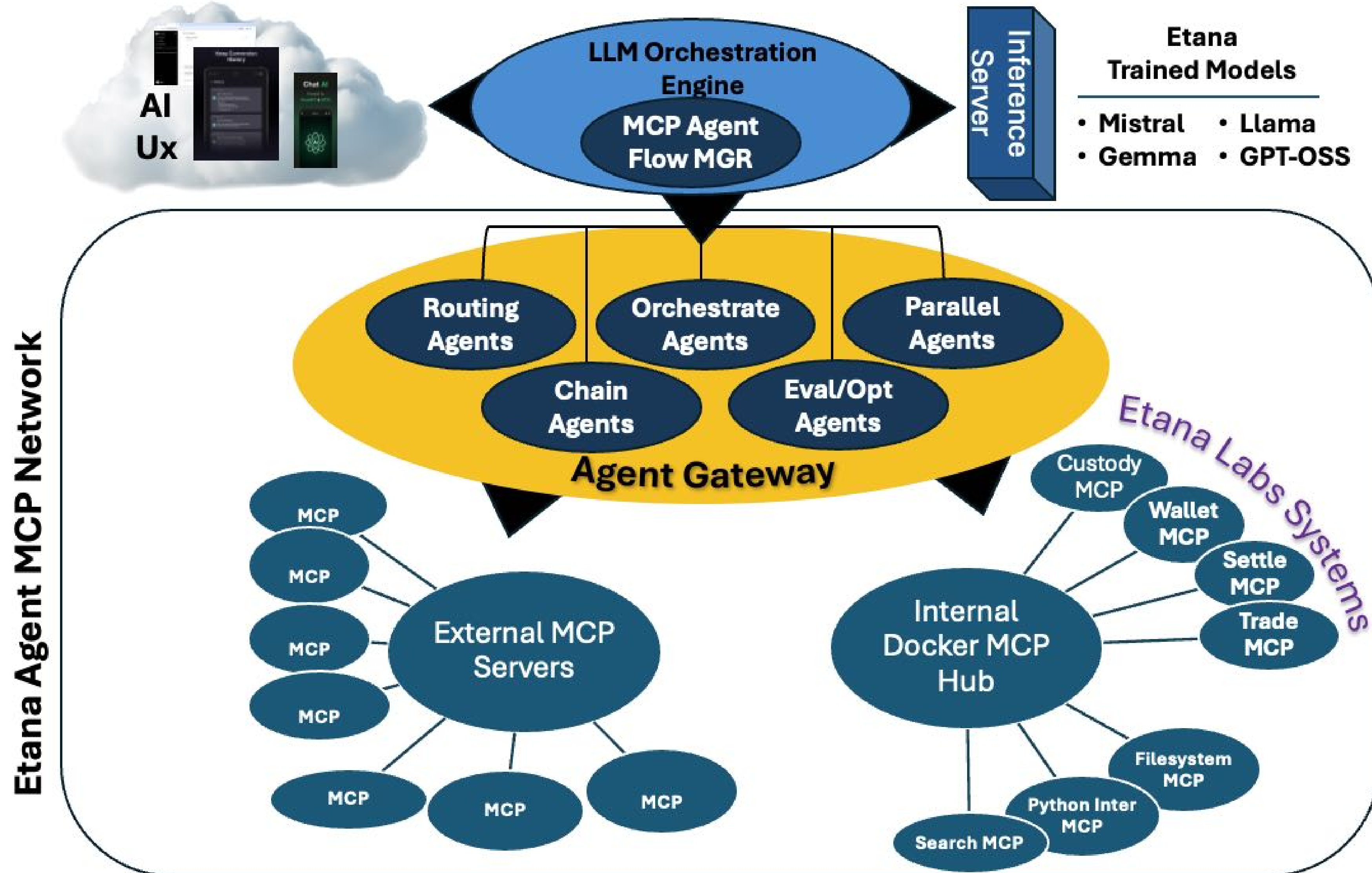
Application, Infrastructure, and Database Architecture Through the Years

Author

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2025

GENAI/Agent Architecture PAAS



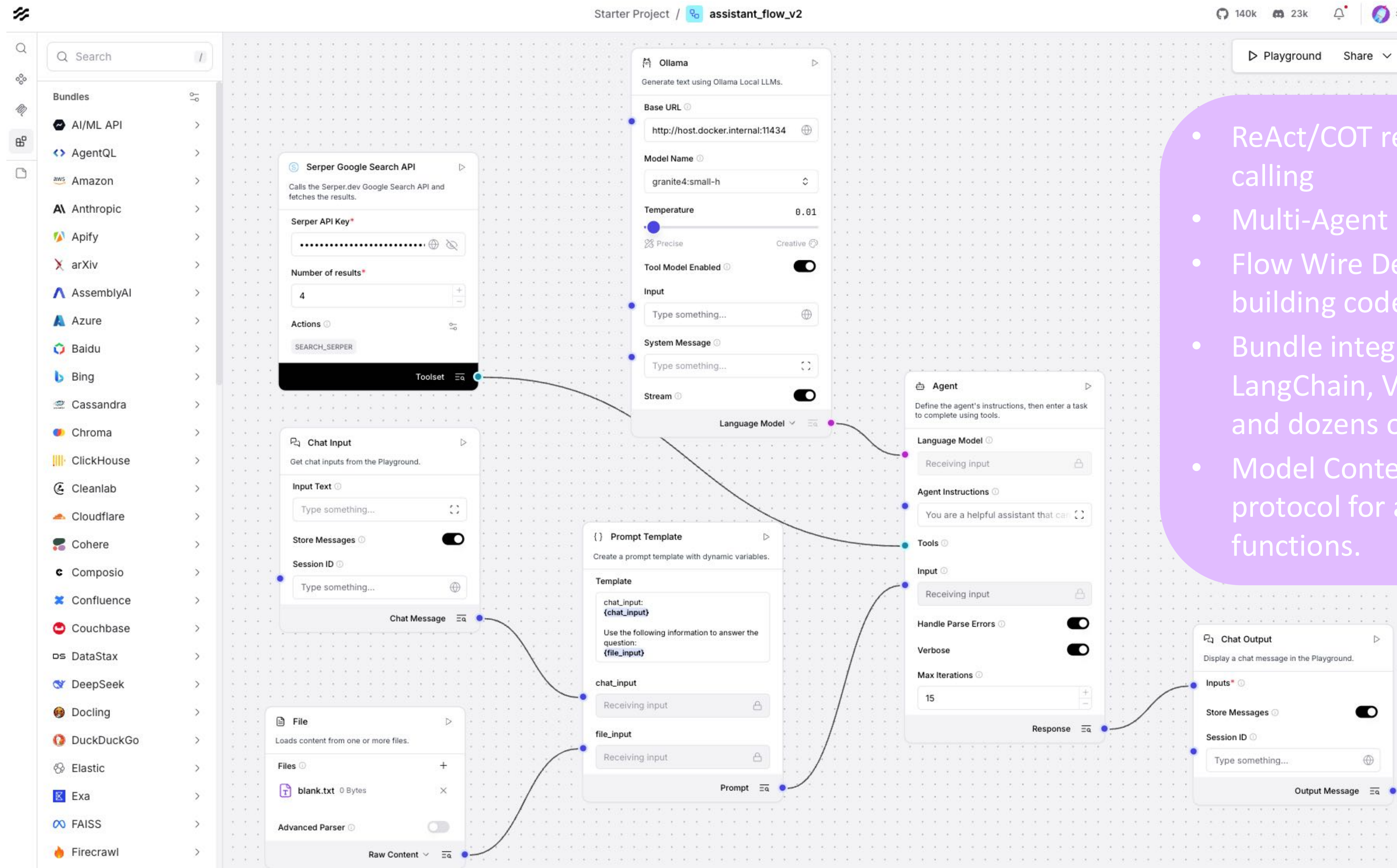
AI Purpose built in our AWS Infrastructure

- No dependence on commercial models
- Data stays with us
- Applications integrated into clients and internal departments conversations
- Agents crafted to automate operations, compliance, support, and user tasks
- The new UI for apps, **"Look no web dashboard needed!"** Just talk to your systems!
- Docker driven and Kubernetes

Etana Labs White Label Solution

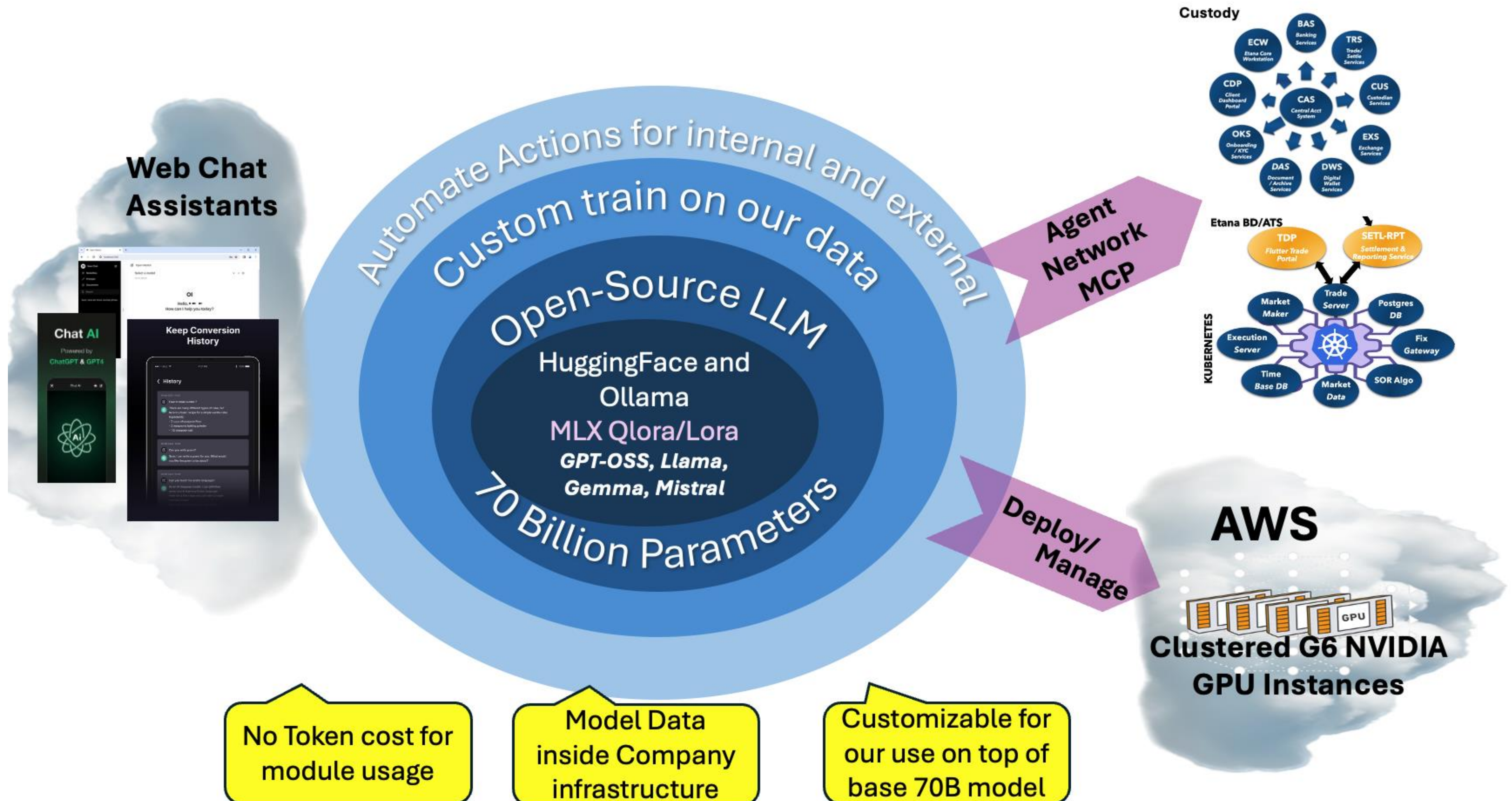
- We build for any Financial services company
- Your own MCP servers wired to your application APIs
- Custom Agents, Systems Prompts, and workflow
- We host in your own Kubernetes cluster.
- It's your own dedicated, secure, AI platform as a service

GENAI/Agent LangFlow Orchestration



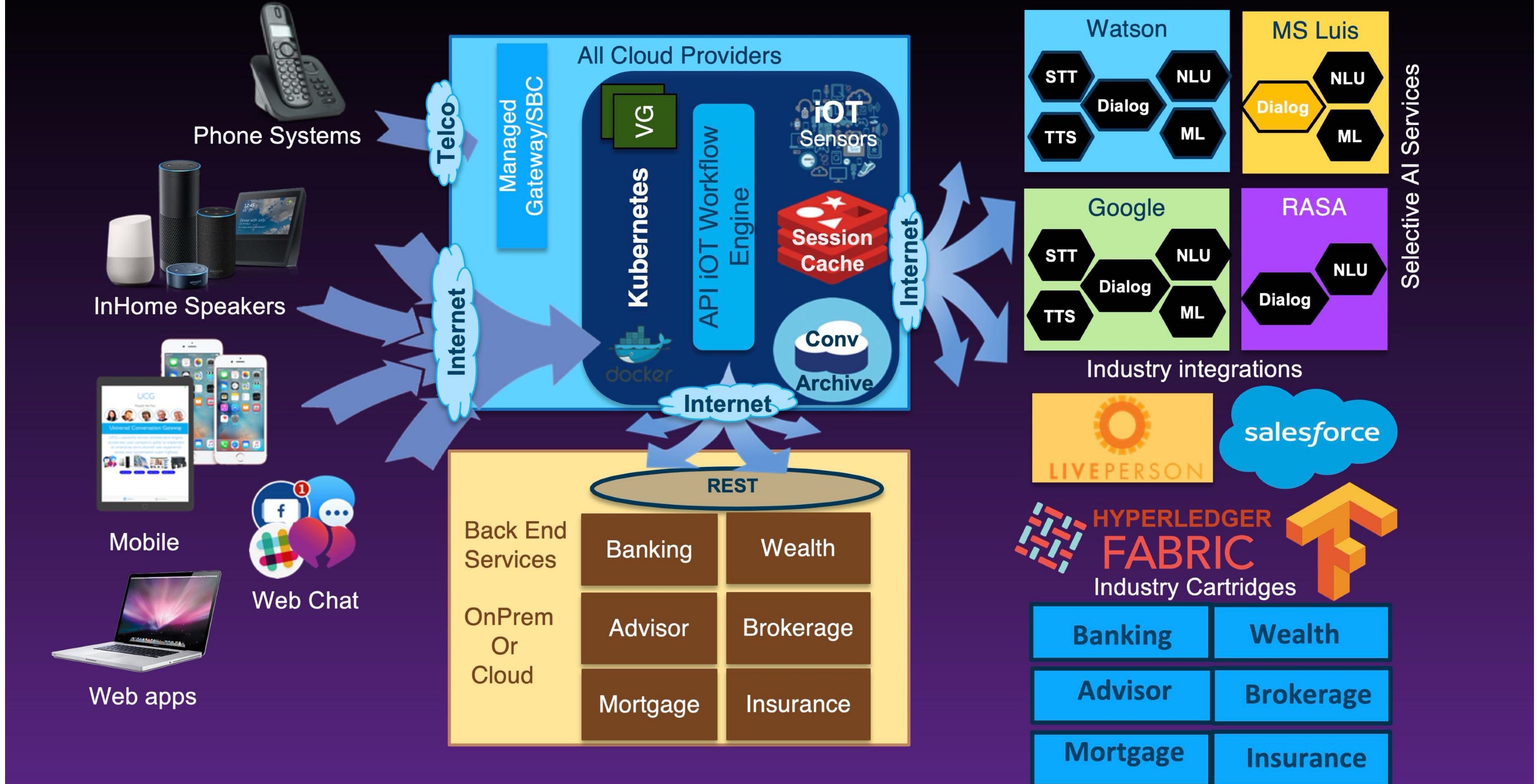
- ReAct/COT reasoning for Tool calling
- Multi-Agent Flow management
- Flow Wire Designer for building code documentation
- Bundle integrations into LangChain, Vector stores, DBs, and dozens of AI frameworks
- Model Content/Agent 2 Agent protocol for action server functions.

GENAI LLM Model Training on Company Datasets



AI/ML Architecture Designed for IBM

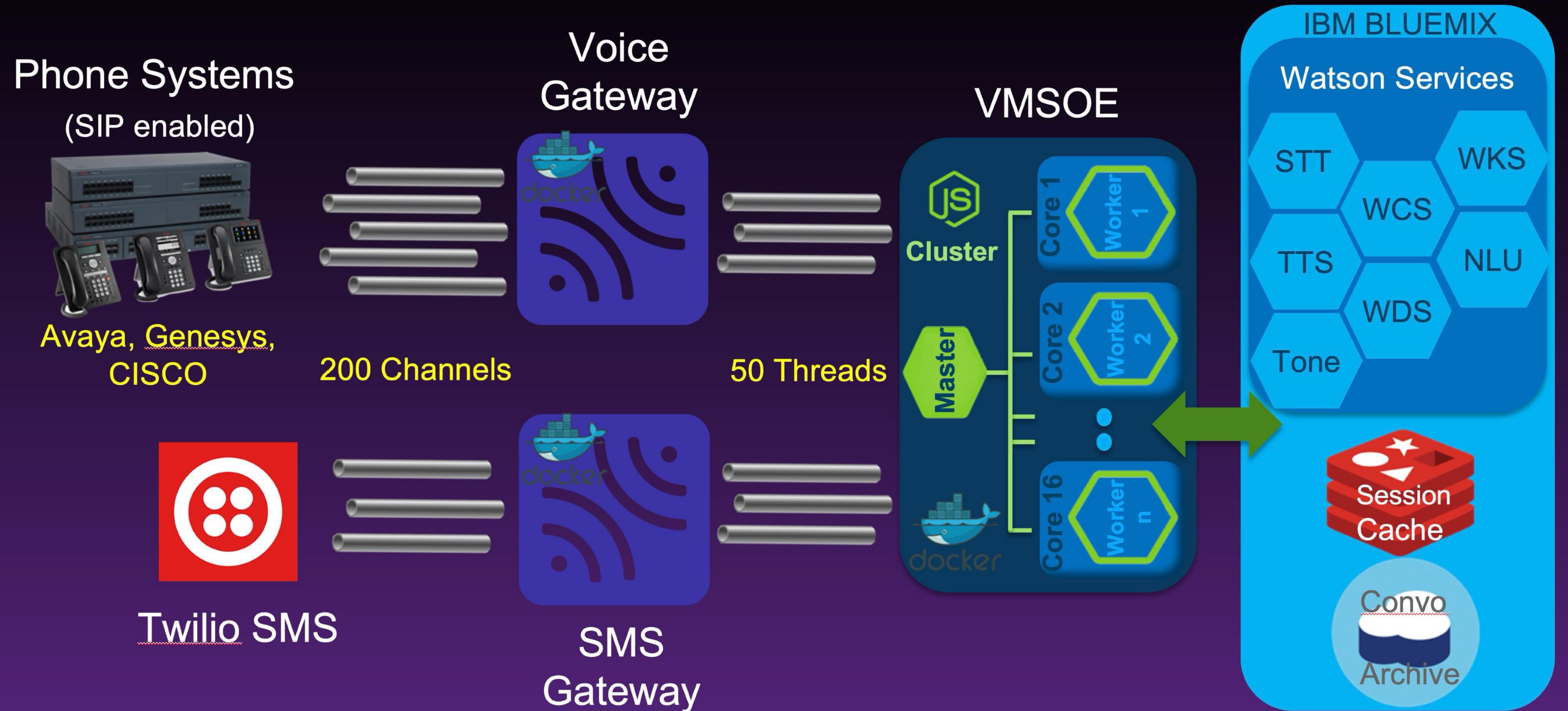
Omnichannel Conversation AI Gateway



Just finished V2 - code name: "Valari" - <http://notovision.com>

AI Voice Gateways Designed for IBM

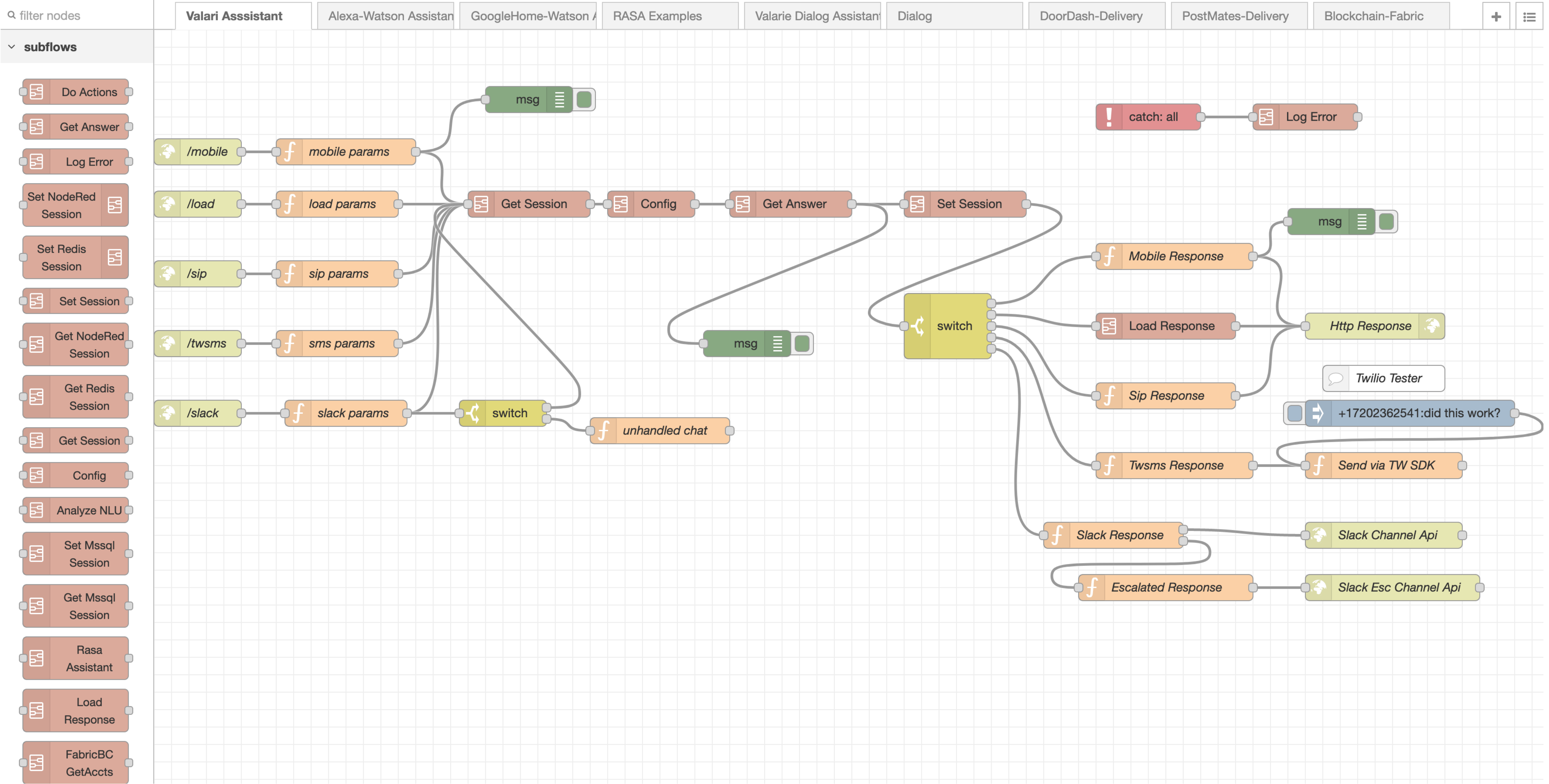
IBM Voice/SMS Gateway Integration



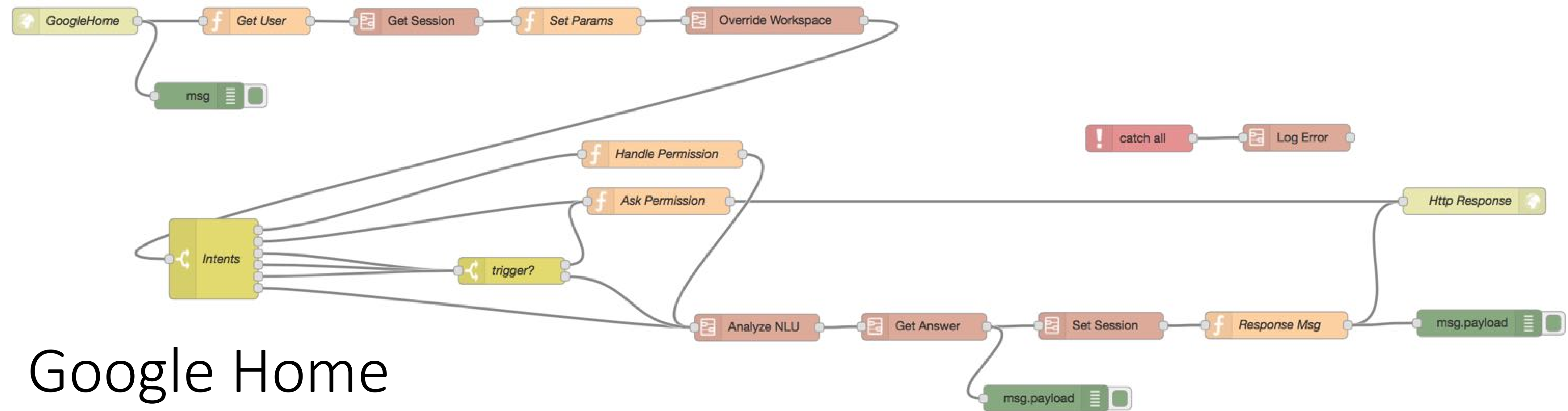
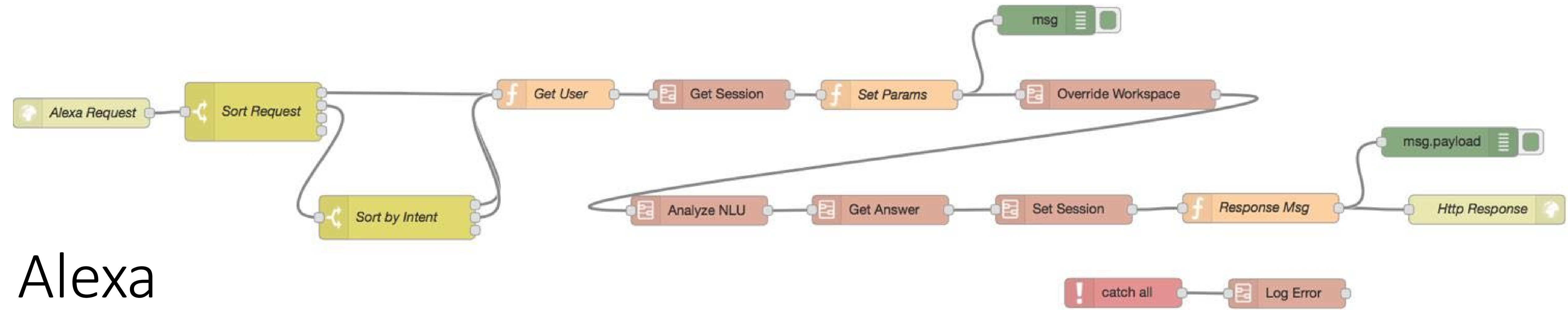
Only 1 Container pictured, scale by adding containers

Currently deployed at First Data, MetLife, Quicken Loans, Regions Bank

AI VA Rest API Flow Via NodeRed for WatsonAI



In-home Speaker WatsonAI Orchestration Flows



Blockchain Reference Architecture

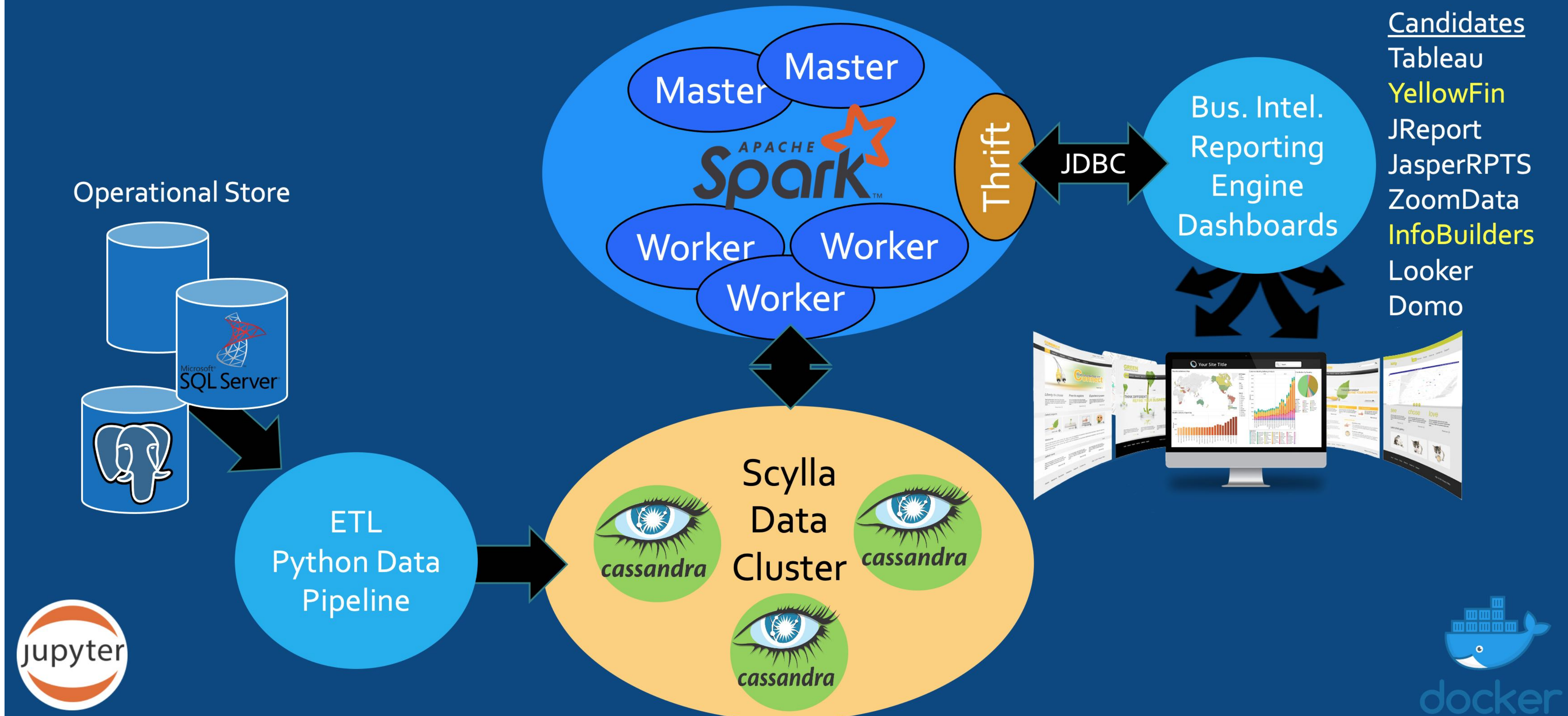
Blockchain Application Component Architecture



Designed for a startup

Startup Spark driven NoSQL BI Architecture

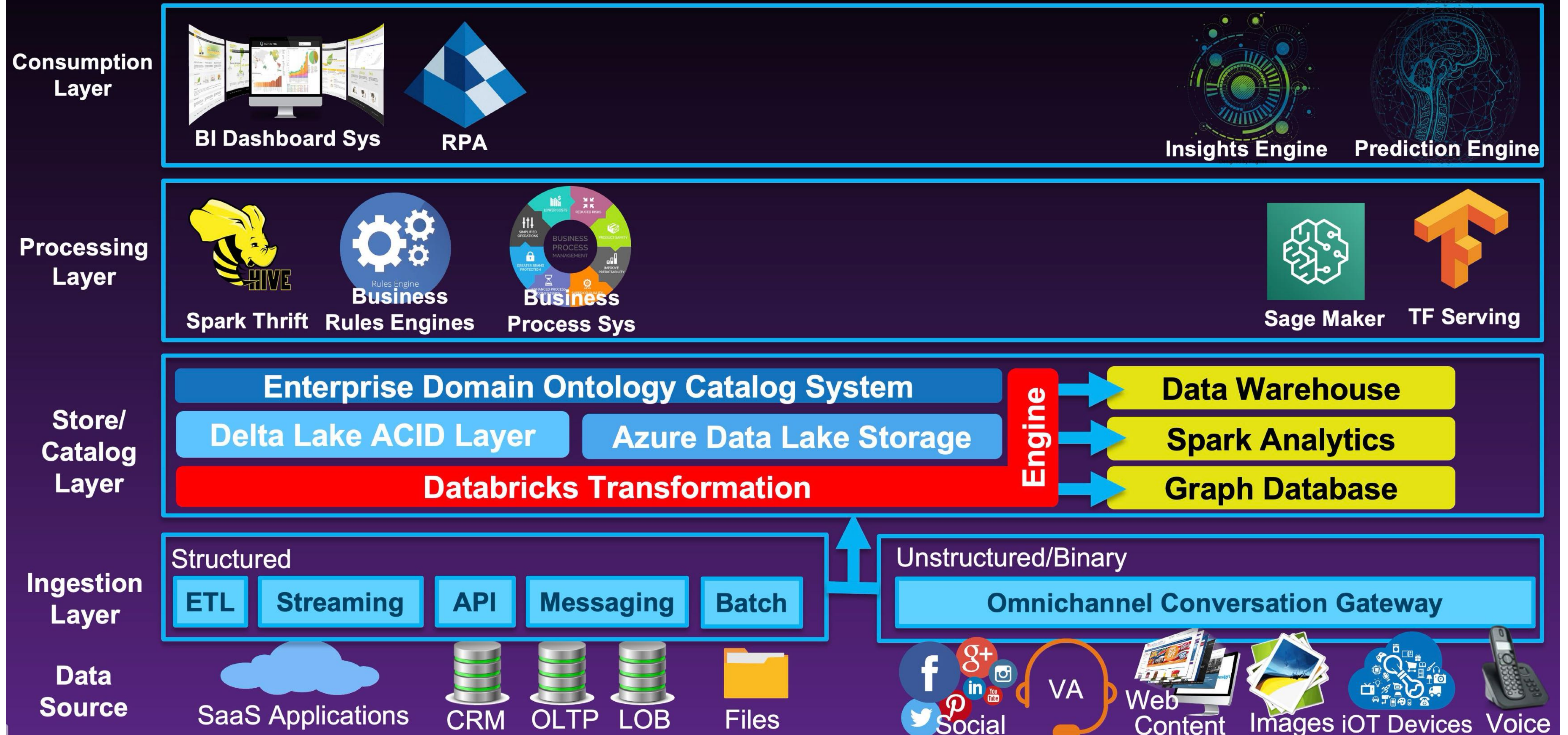
GetSwift Analytics and Reporting



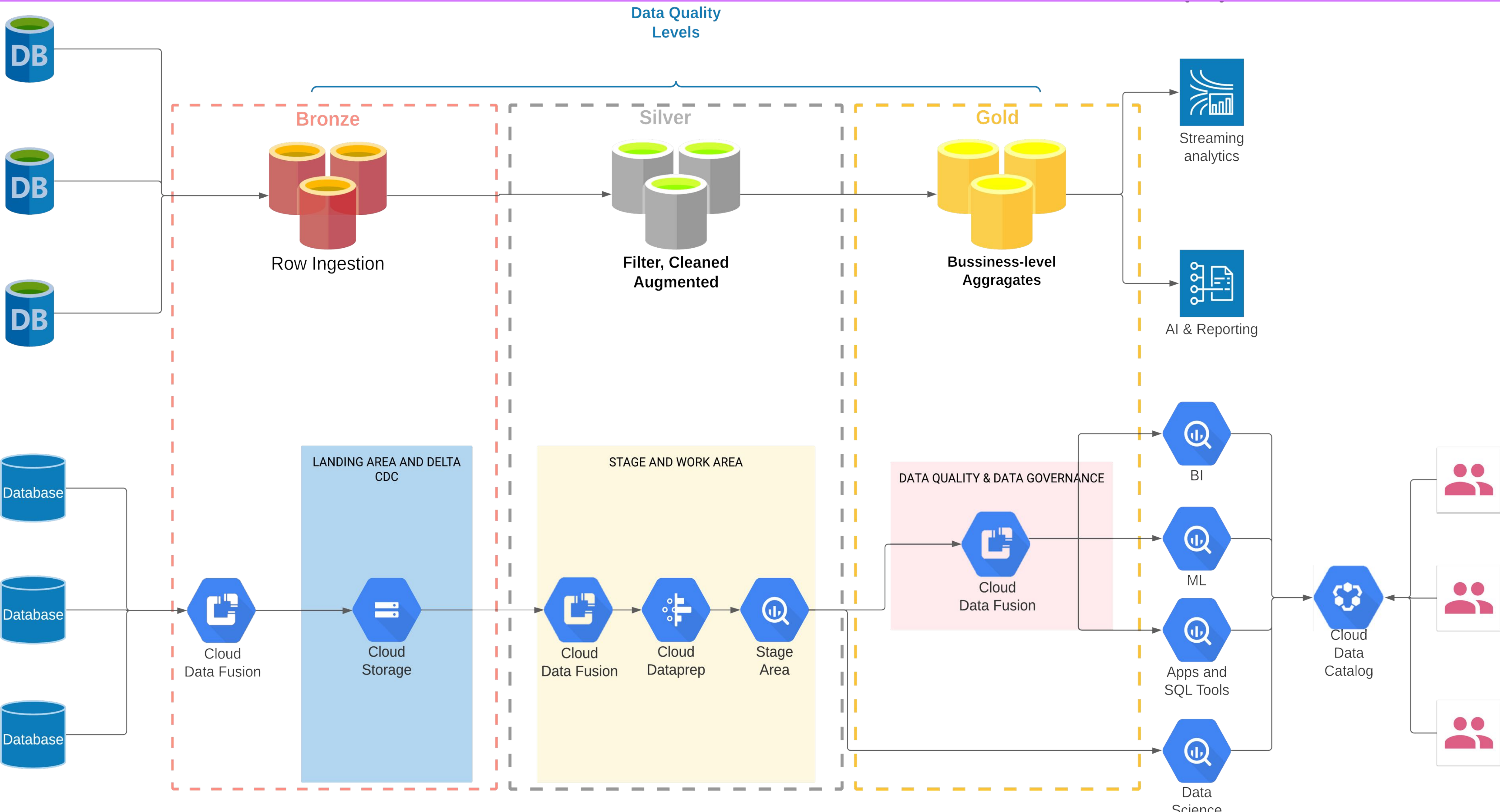
After completing POC work, DB group built first deploy in 6 months

All-inclusive Data Fabric Design

Data Fabric Network Reference Architecture



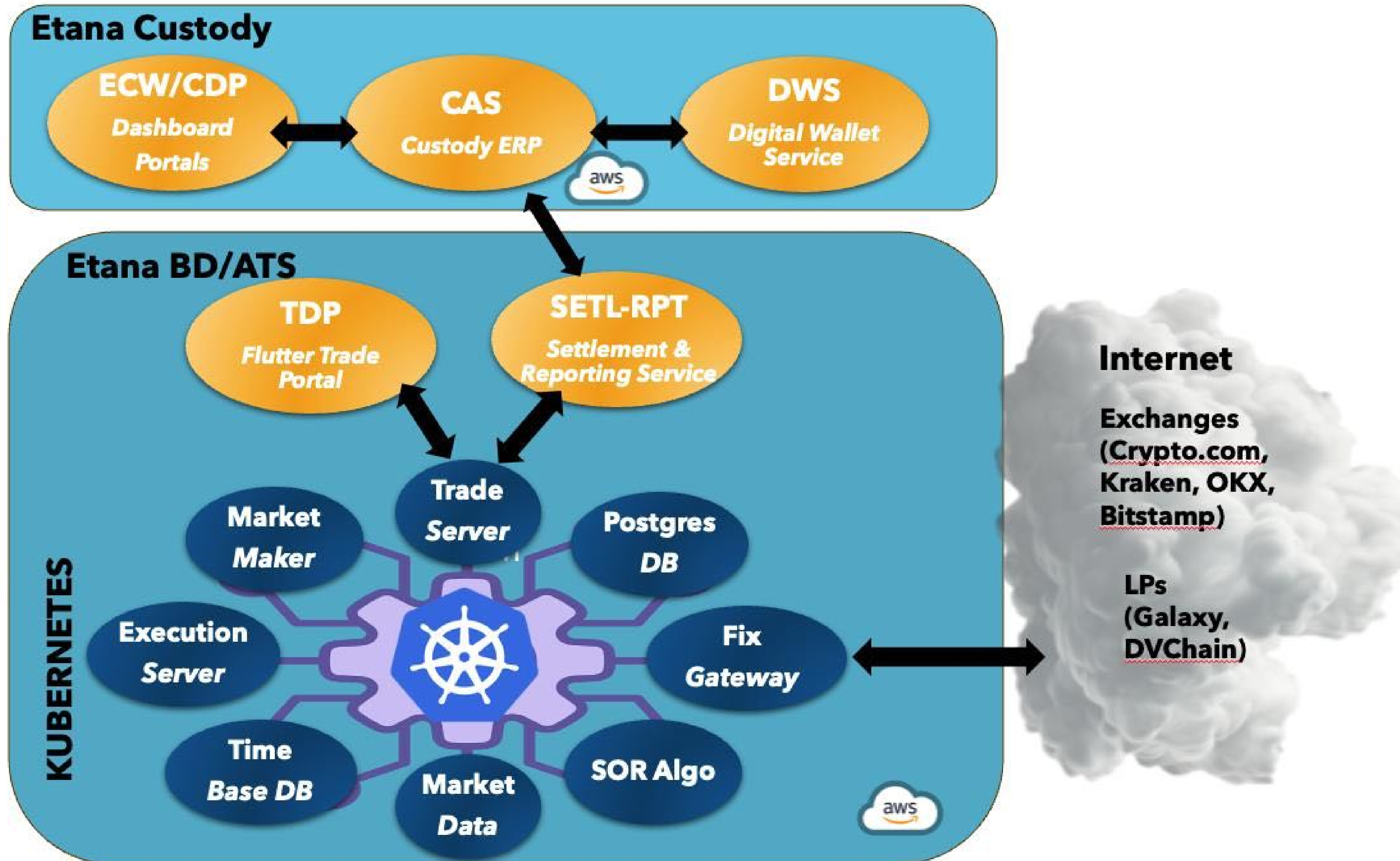
Delta Data Lake Architecture on GCP for Tupperware



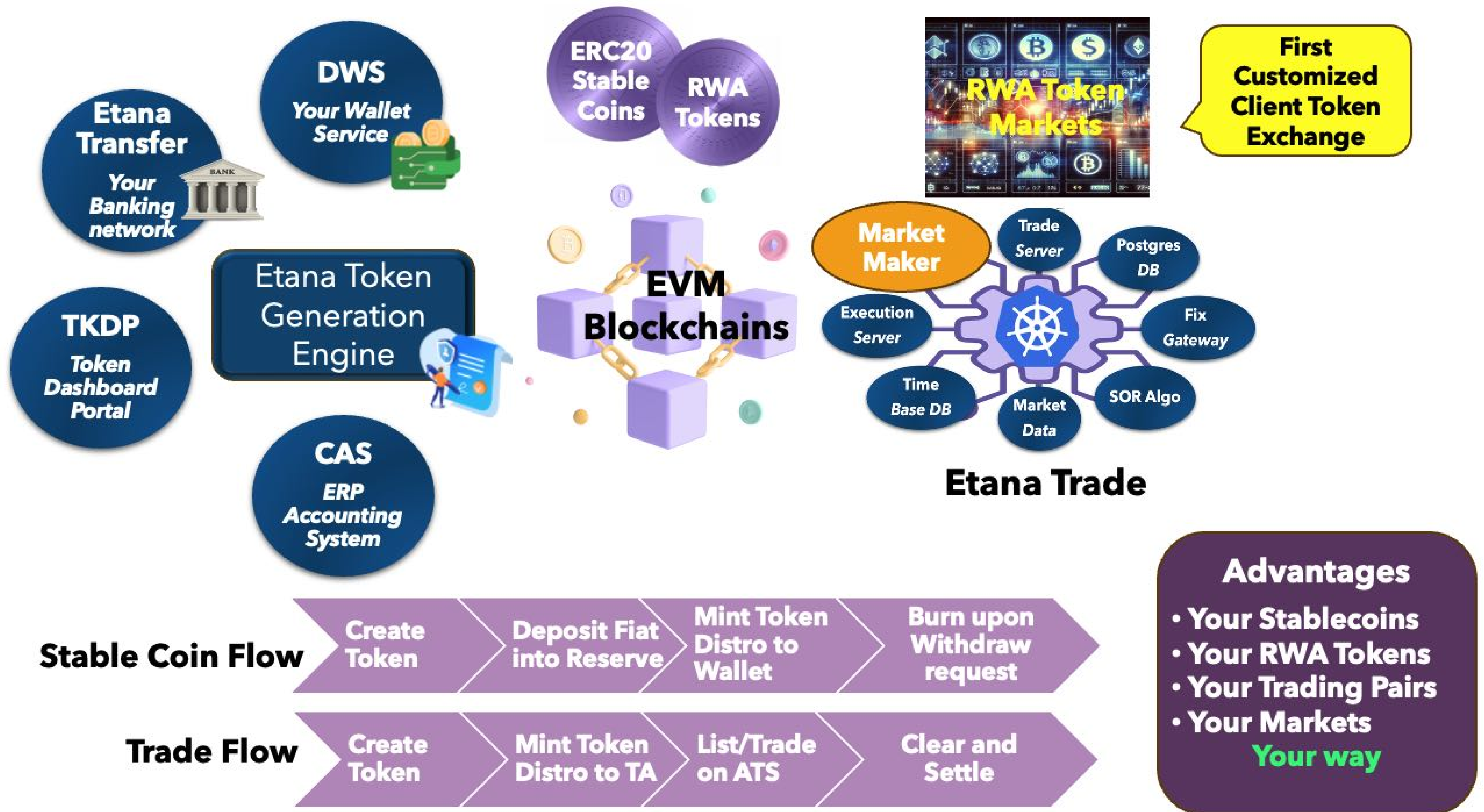
BD/ATS Crypto/FX Trading System

Objectives

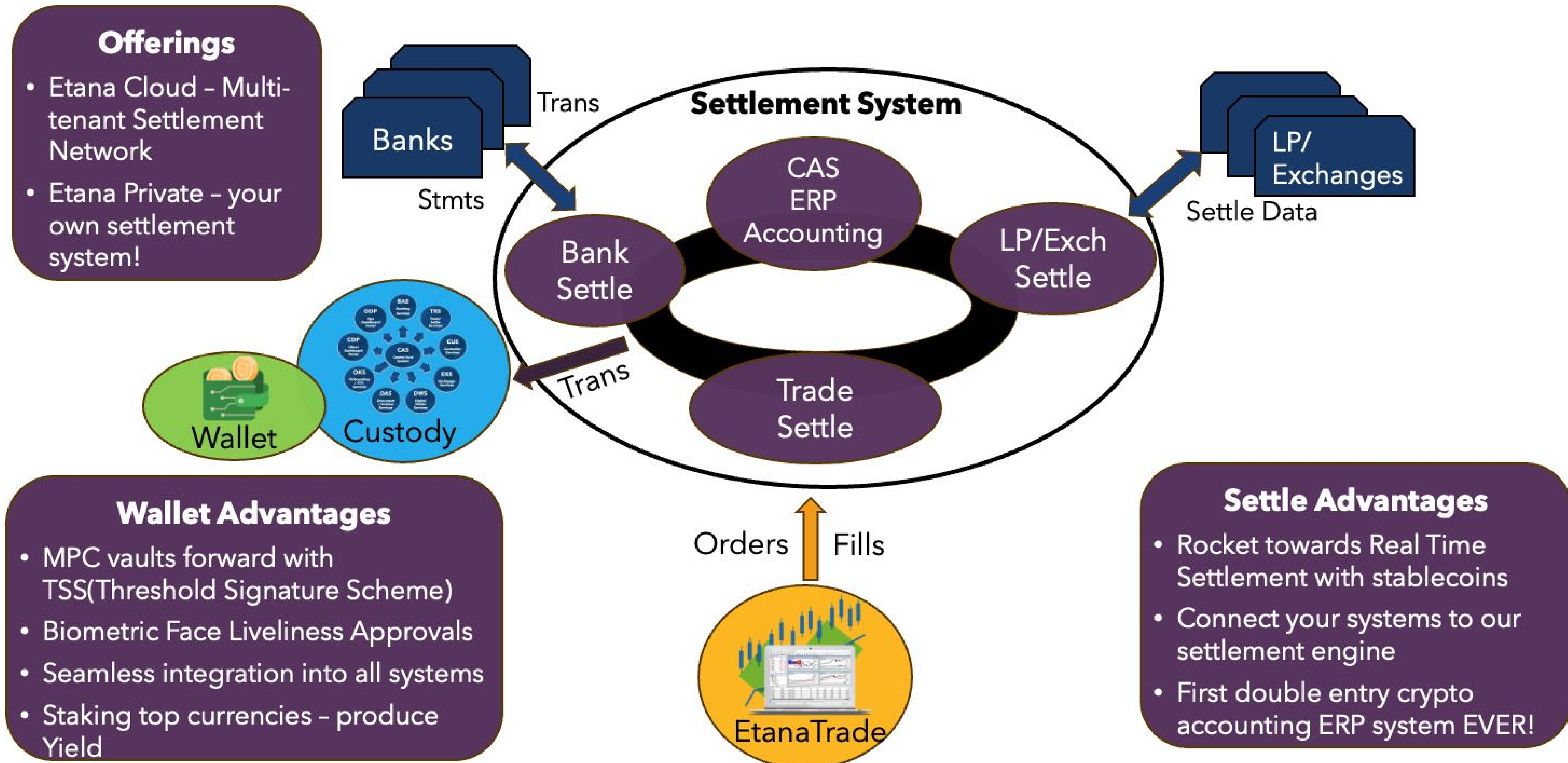
- Global central order book with microsecond updates.
- Personalized trading experience
- SOR, Iceberg, TWAP, VWAP algorithms
- Kubernetes microservices, vertical and horizontal scaling
- Time series DB for high-speed market data
- Settlement service to send trade info and settle with Etana Custody



Token Engine Integrated with Custody and Banking Systems

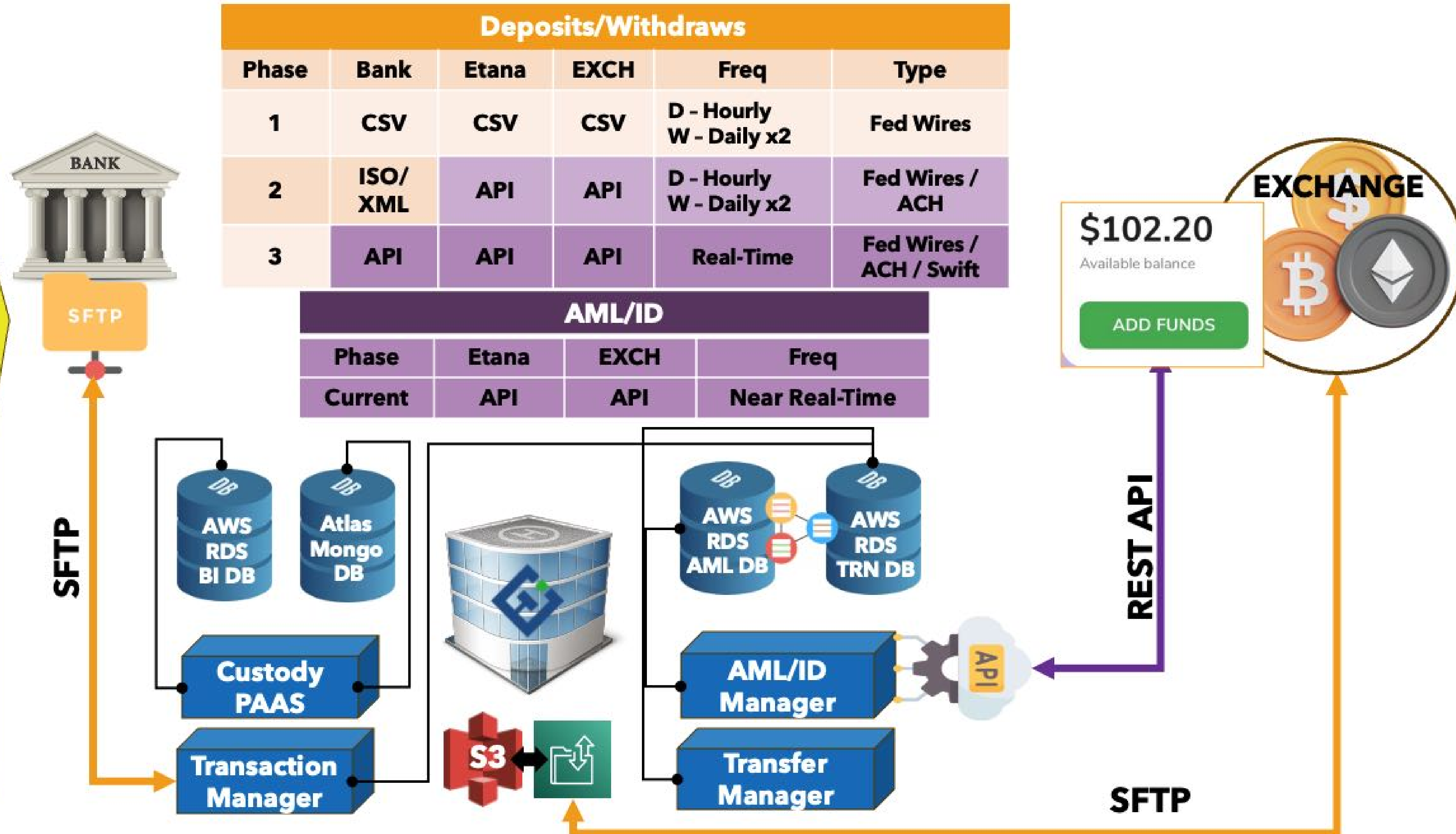


Stand-alone Wallet and Settlement System



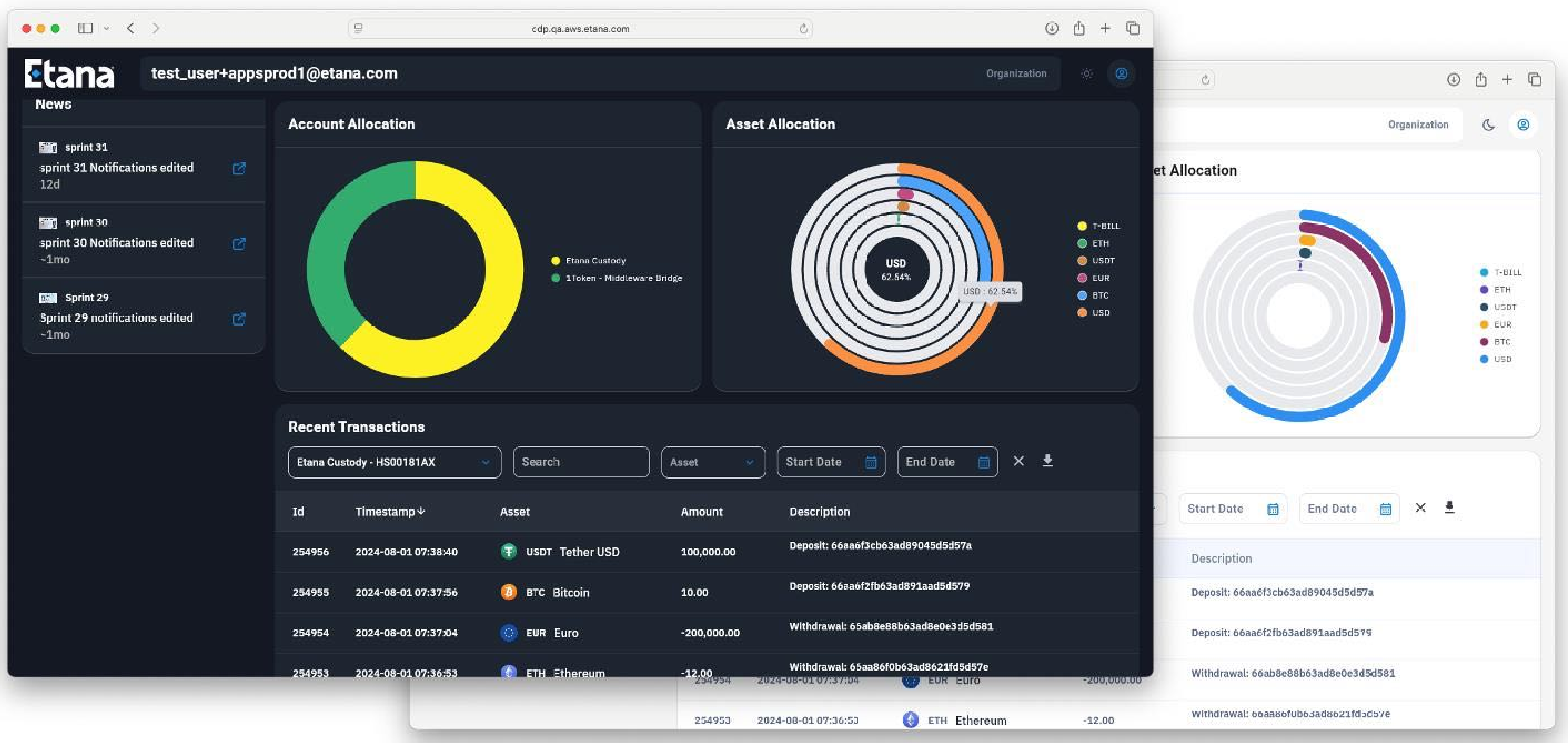
Automated Banking Transfer System

- Embed white labeled API to capture customer info for near real time AML/ID check.
- Multi-phase process to ramp up quickly with scale.
- Handle bank updates with AML/ID checking at point of execution.
- Continuous screening for next gen compliance
- Scalable infrastructure services to meet volume needs.



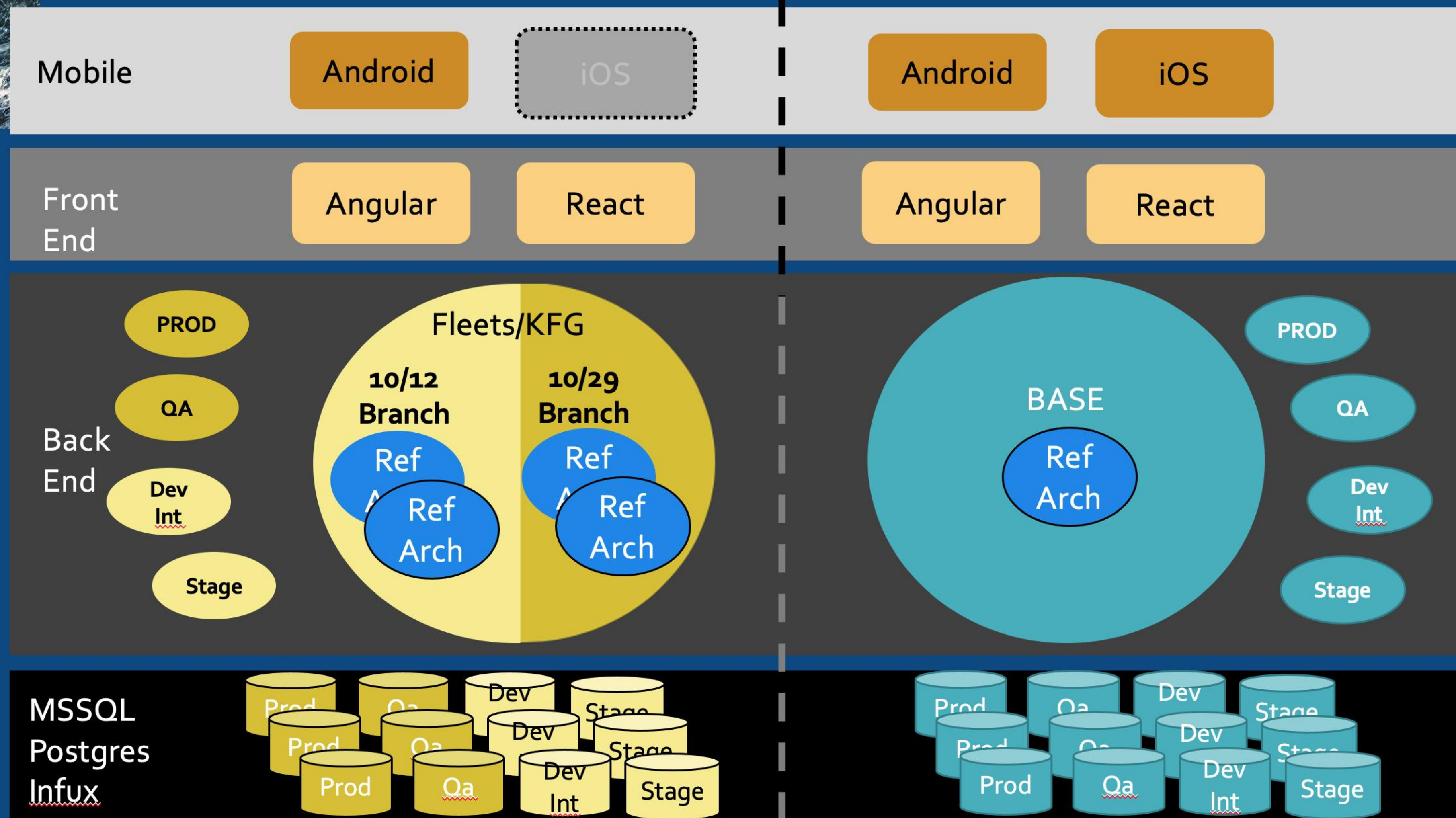
Flutter Apps for Web/Mobile/Tablet

(One code base for any device)



Startup Beginning Architecture upon Arrival

Current Development Challenge (The Perfect Storm)



Perfect Storm = ((2 code bases + 2 release branches + 3 Ref Architectures + 2 Ui's + 3 datasources) * 4 environments) * 3 mobile

Justification for Architecture Redesign

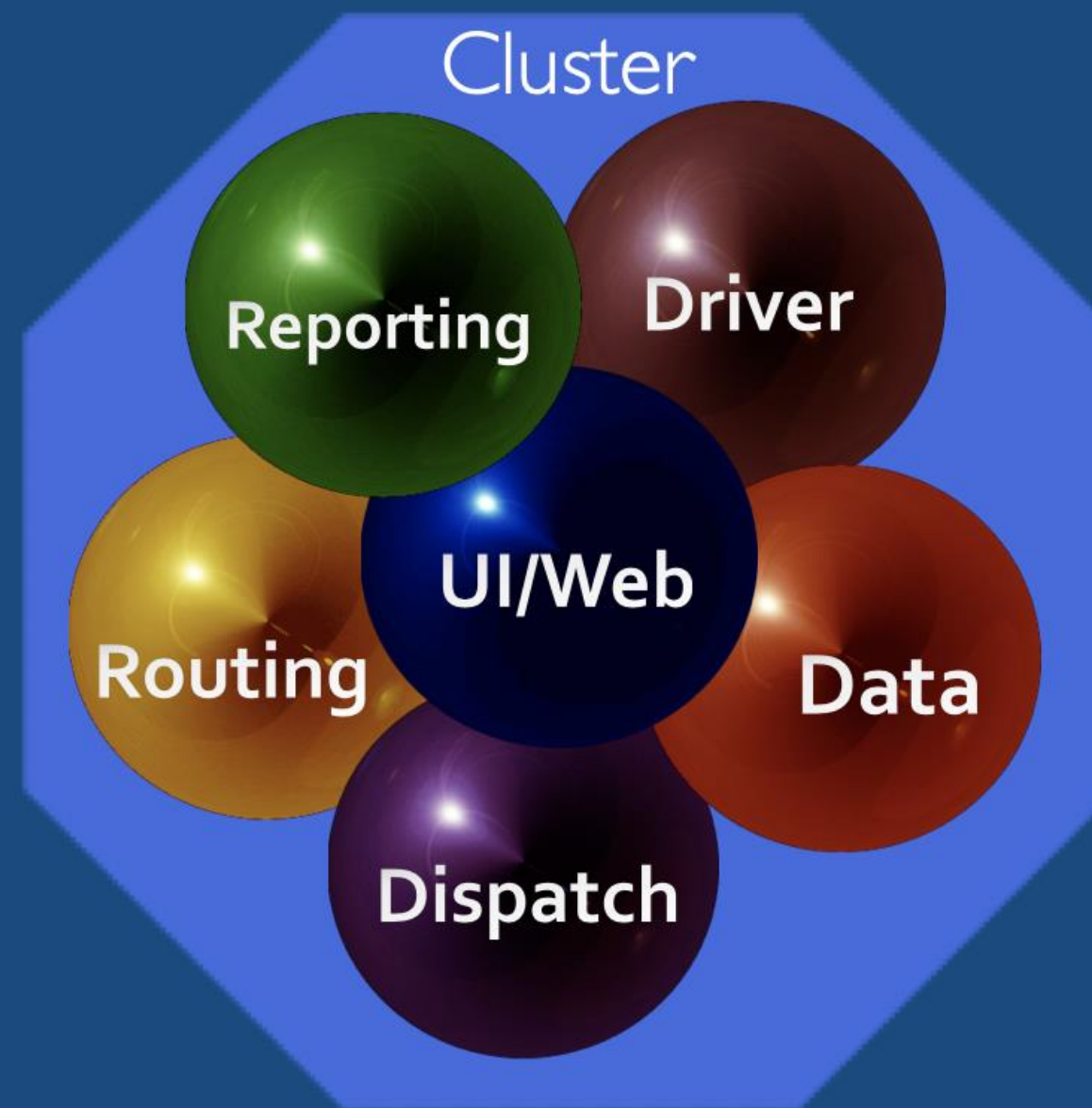
Enterprise Global Kubernetes Architecture Today

GetSwift Target Architecture

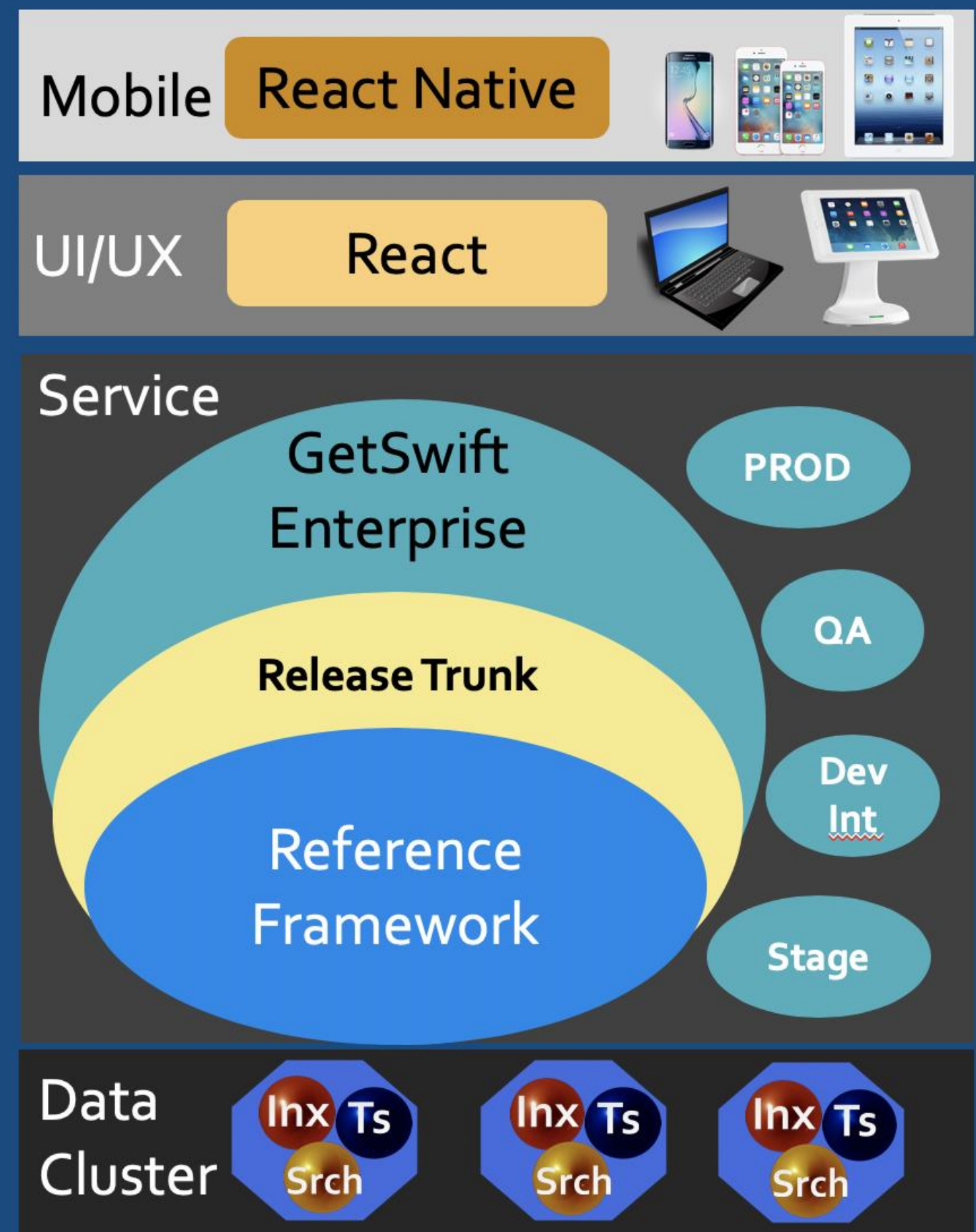
World Wide
Routable Clusters



Micro Services
Scalable/Self-Healing



Enterprise Technology
Service Oriented Architecture



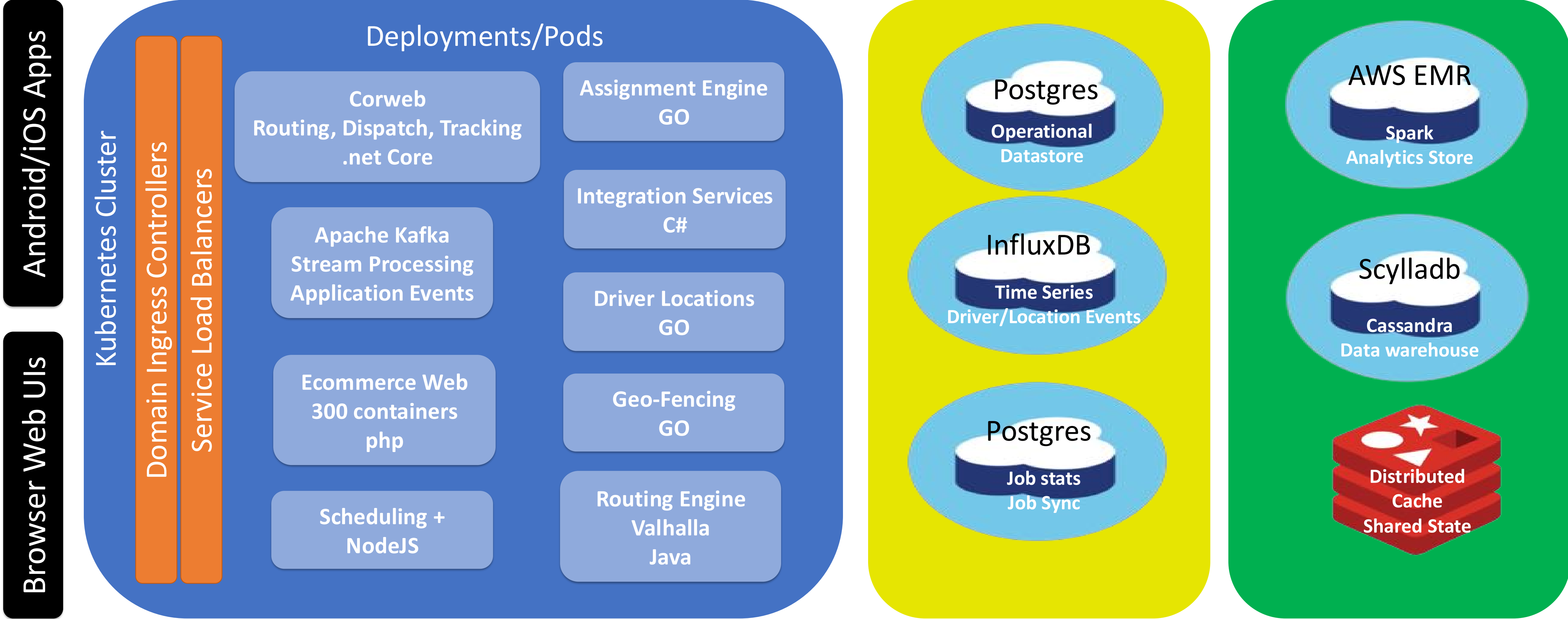
Completed in 1.5 years

Startup Infrastructure Overview

AWS EKS Kubernetes Regional Clusters

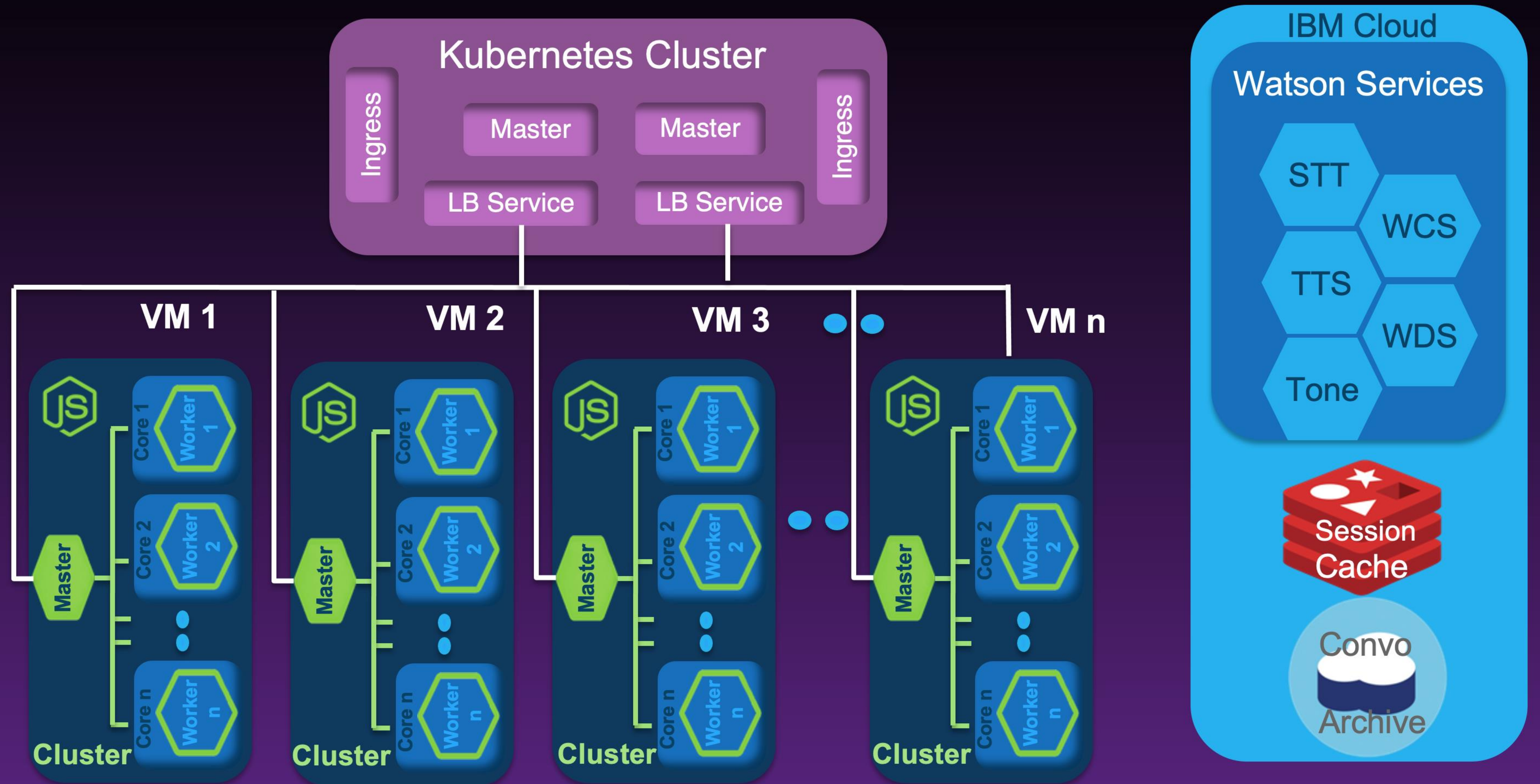
AWS RDS DB Regional Services

Other Cloud Services



NodeRed API/IoT Orchestration for IBM

Vertical and Horizontal Scaling



Jmeter Kubernetes Orchestration Load Test

Jmeter Test

New User Rate : 50/sec

Rate : 80/Sec

Concurrent
Scenarios: 20,000

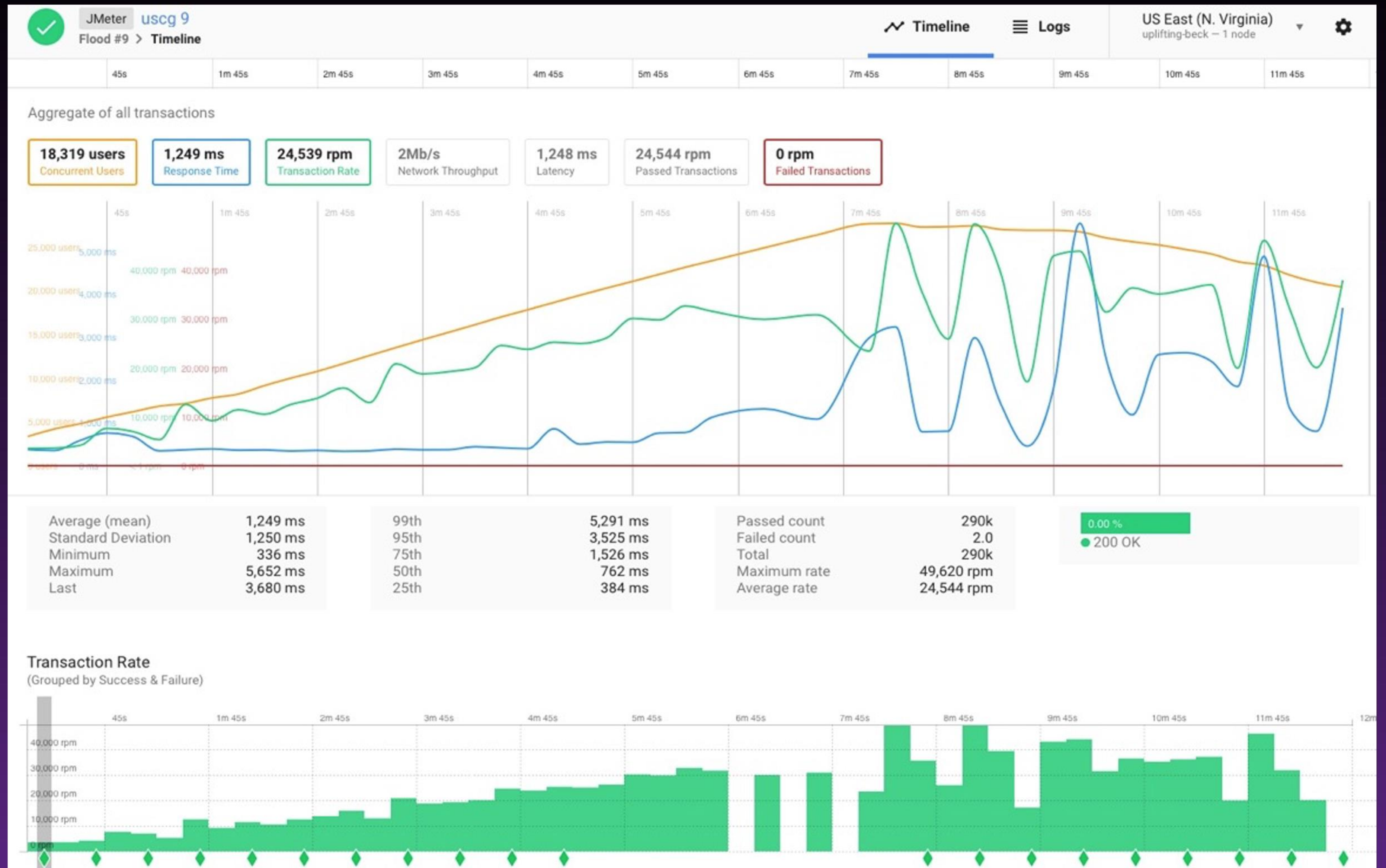
Duration : 10 minutes

Achieved 20,000
concurrent Convos
with 8 WCS turns

Response Time
1-2 Secs

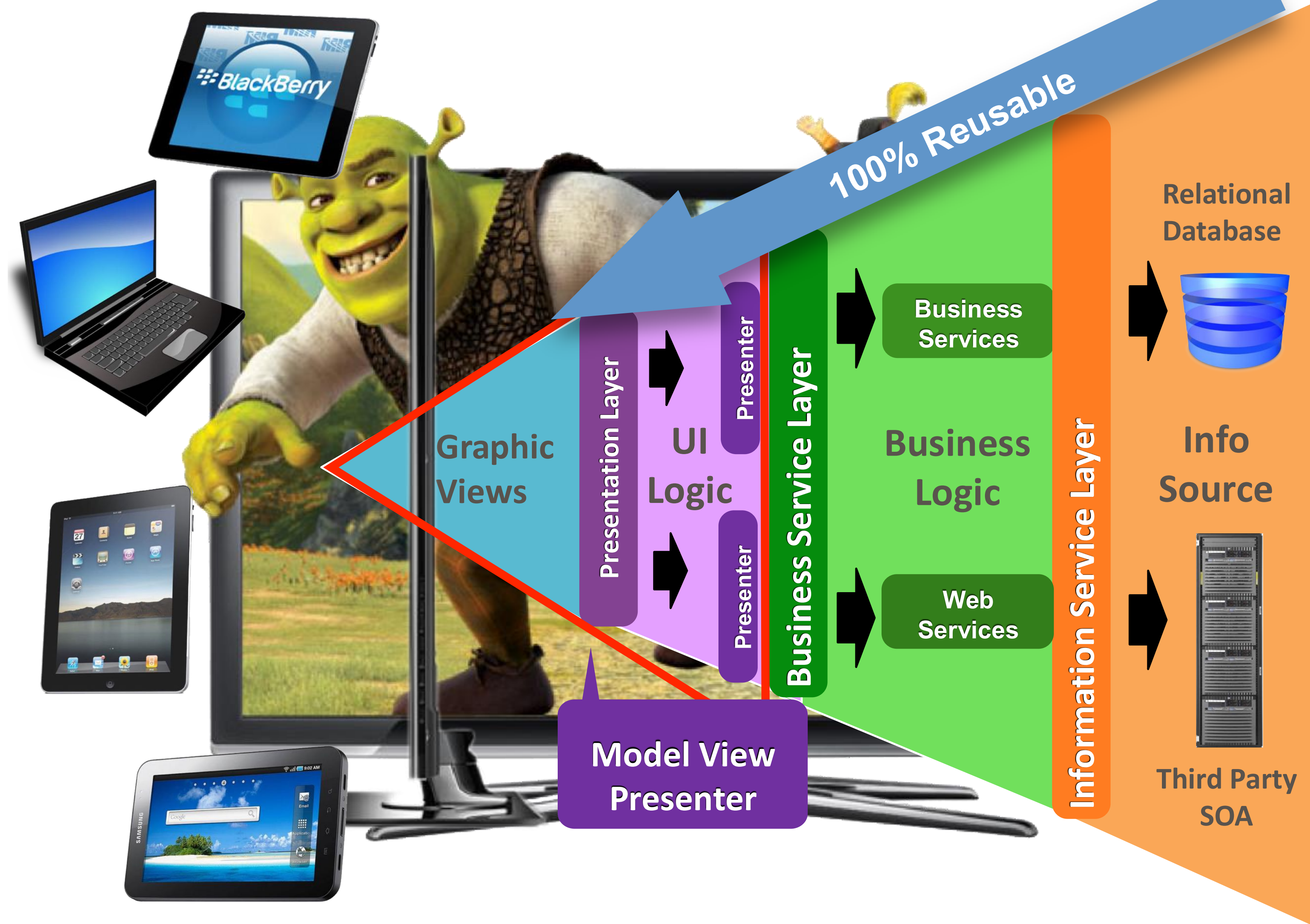
Load Balanced on 20
NodeRed Containers

Achieved 150
requests/sec



Blew up IBM Tone & NLU microservices – How demonstrated IBM Watson Scaling issues

TCA "Just Before the Glass" Mobile/Web UI Architecture

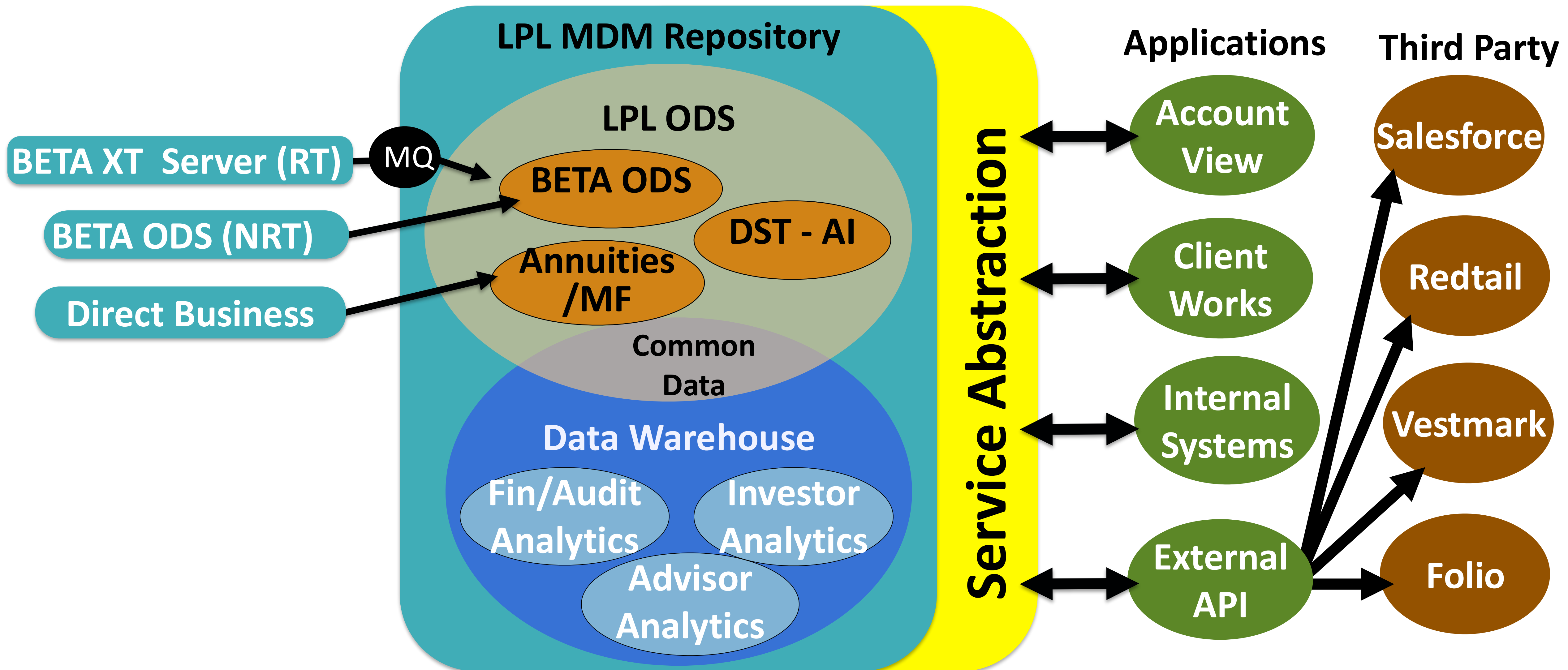


150 Apps in Customer
Apps Store

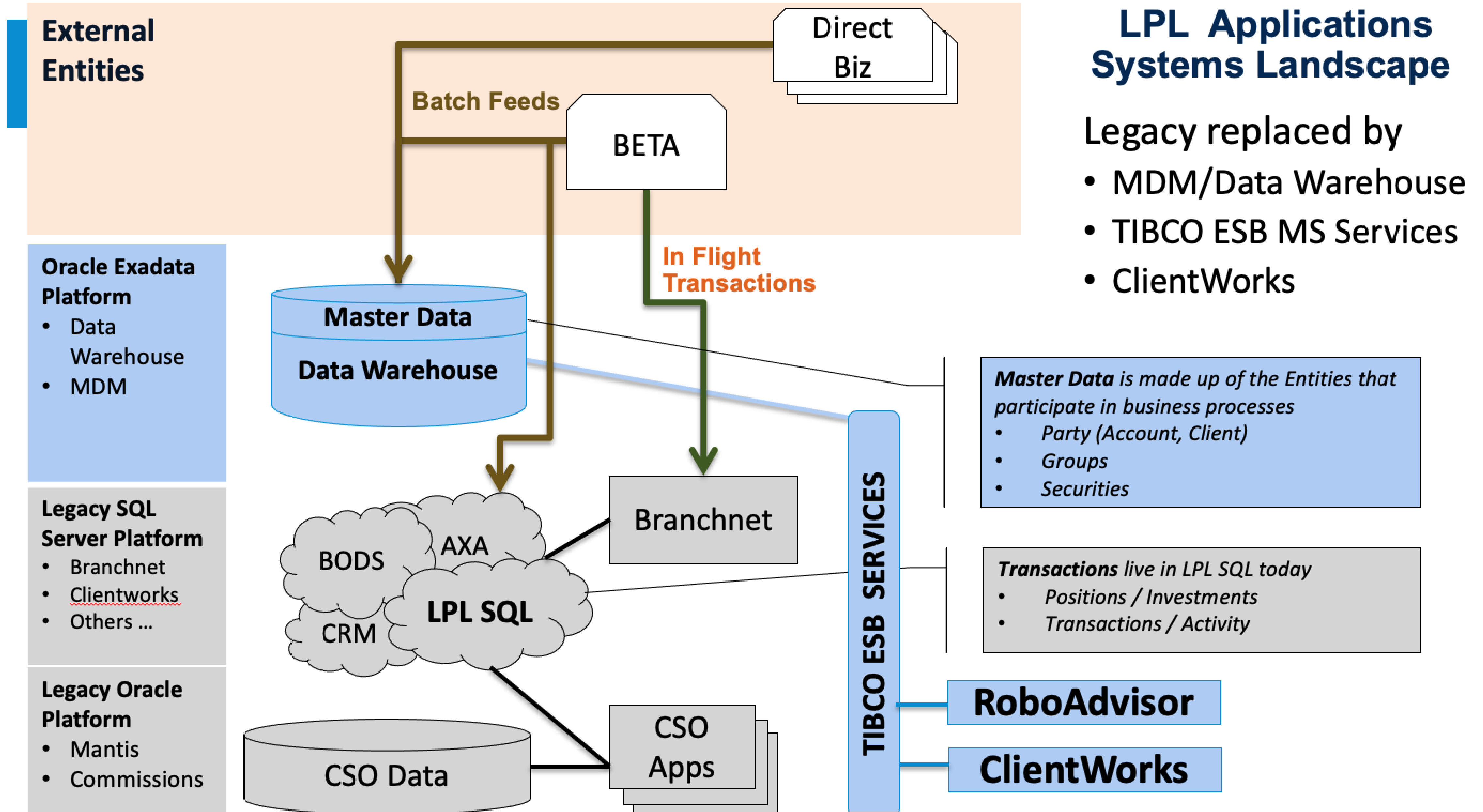


White Label Mobile Apps
- CIO Magazine Award

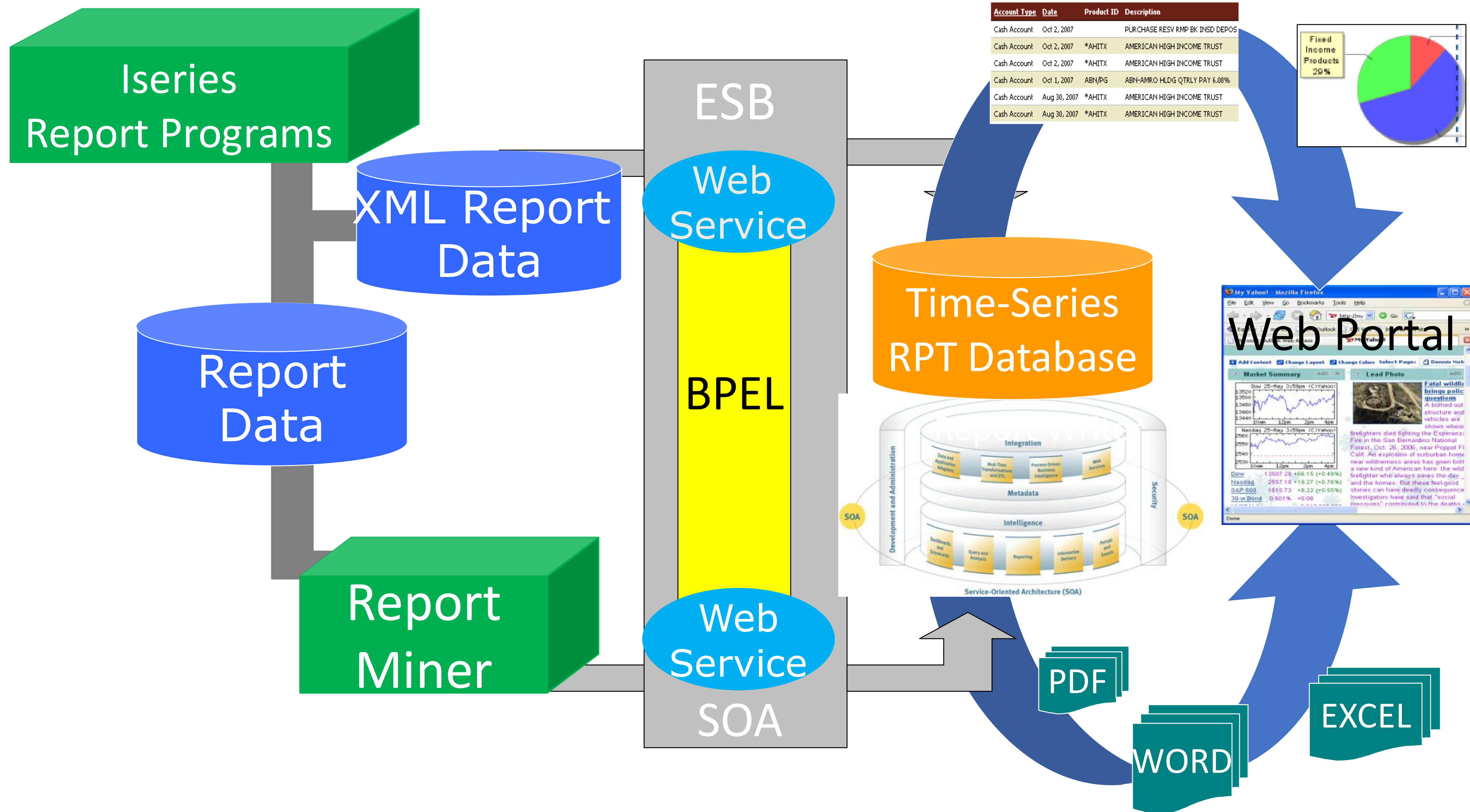
LPL Data Model Conceptual Overview



LPL ESB Microservice Redesign



Scottrade XML Report System Reference Architecture



Scottrade Re-Architecture IO Switch and SOA microservices

Isolation Modernization Layers

Three core areas to isolate code.

Cuts down business logic complexity and fosters re-use.

Leveraged PAAS/SAAS computing.

Re-engineered Data

Break data away from Bus Logic

Go Schema-less

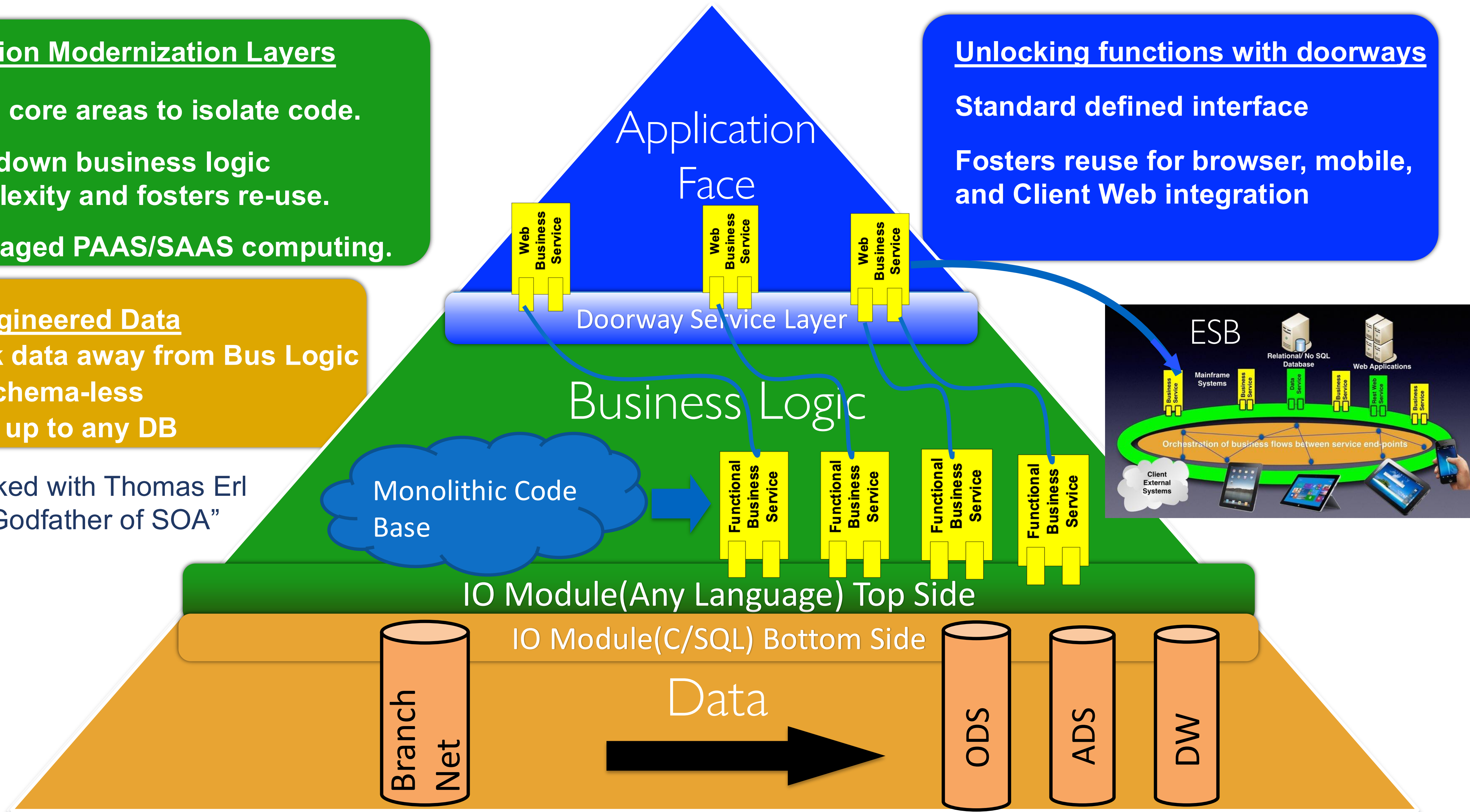
Open up to any DB

Worked with Thomas Erl
"Godfather of SOA"

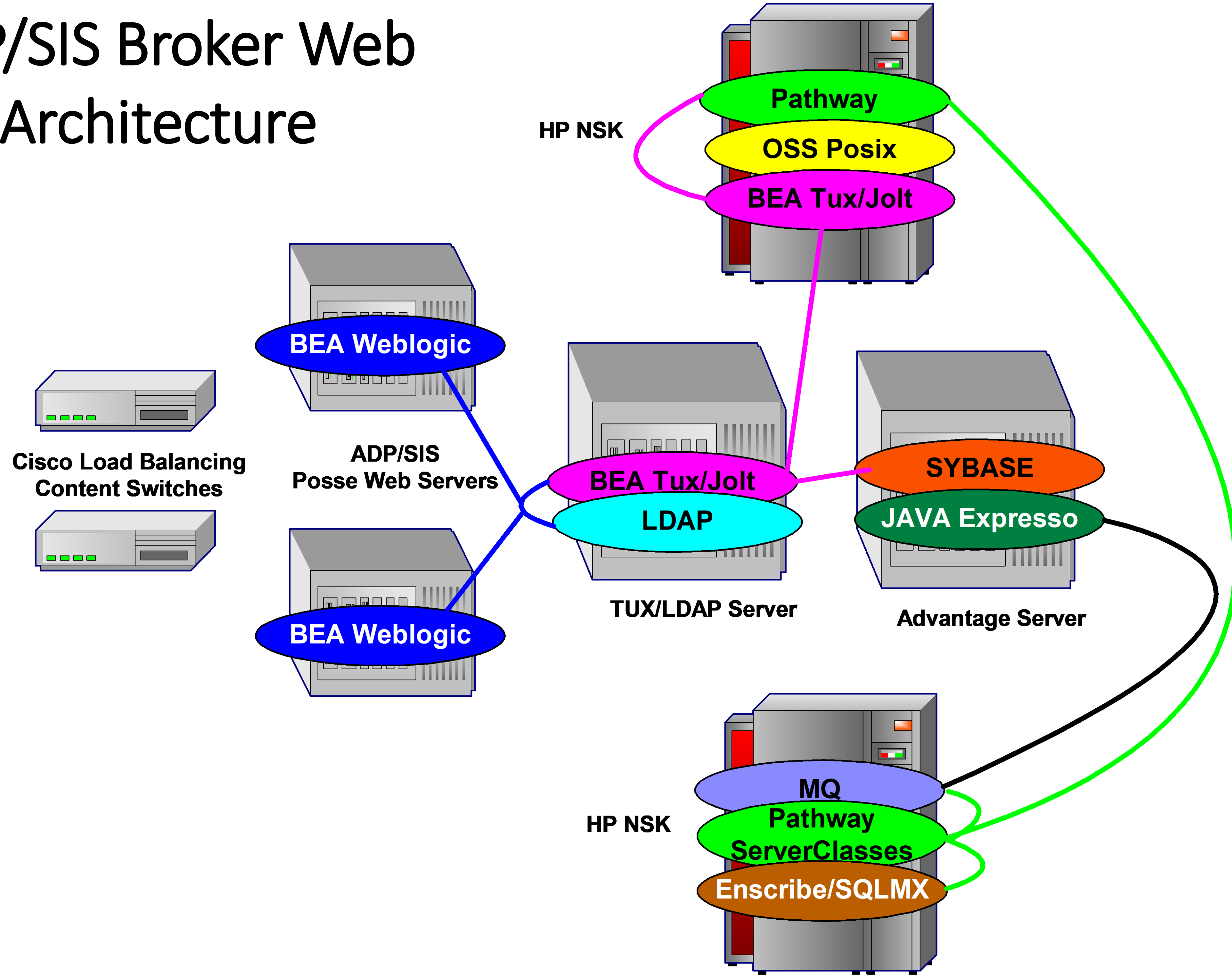
Unlocking functions with doorways

Standard defined interface

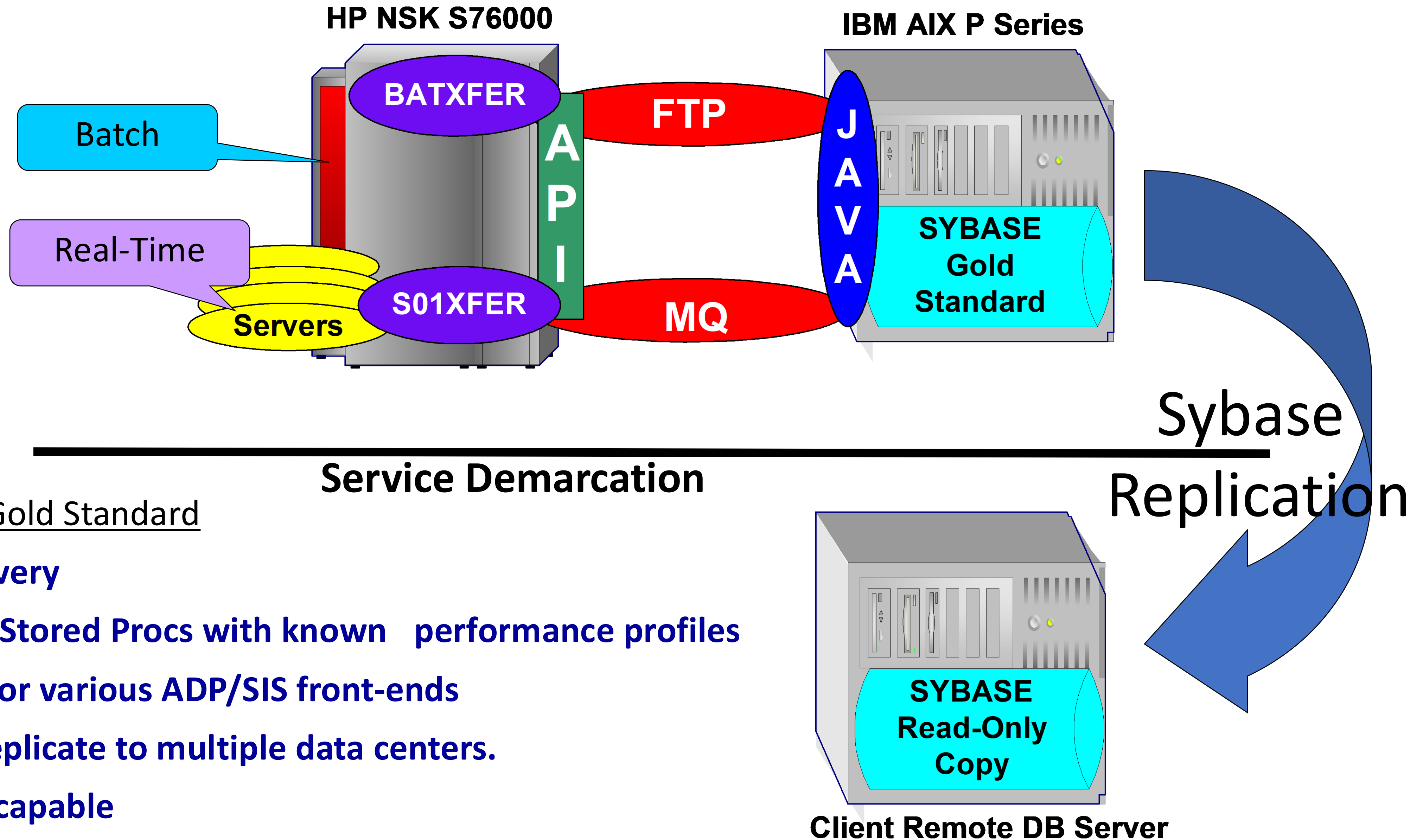
Fosters reuse for browser, mobile, and Client Web integration



ADP/SIS Broker Web Architecture



ADP ADVANTAGE Data Service Architecture



Reasons for the Gold Standard

- **Client DB Recovery**
- **Access only by Stored Procs with known performance profiles**
- **Provides data for various ADP/SIS front-ends**
- **Capability to replicate to multiple data centers.**
- **Reconciliation capable**