DealerFlow Cloud™ — Software Architecture Document (SAD)

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# 1. Architecture Overview

Microservices on Kubernetes (managed), event-driven backbone (Kafka), API Gateway (REST & GraphQL), and a unified identity service (OIDC/OAuth2). Multi-tenant, organization/rooftop isolation.

# 2. Core Services

* Identity & Access: OIDC, SSO (SAML/OAuth), RBAC, audit logs.
* Customer & Vehicle: golden records, VIN decode, data quality.
* Sales & F&I: quoting, desking, contracting, eSign, doc vault.
* Service: appointments, RO, technician time, parts integration.
* Parts & Inventory: catalogs, pricing matrices, supplier adapters.
* Accounting: GL, AP/AR, OEM statements, bank reconciliation.
* Messaging & Notifications: email/SMS/voice, templates, webhooks.
* Analytics: event capture, ELT to data lake, semantic layer, BI.

# 3. Data Architecture

* OLTP databases per service (PostgreSQL) with read replicas.
* Object storage for documents & media; virus scanning.
* Data Lakehouse (Parquet) for analytics; CDC from OLTP to lake.
* PII tokenization, field-level encryption, KMS-managed keys.

# 4. Integration & Extensibility

* OEM adapters (REST/SOAP/SFTP) via Integration Hub.
* Partner Marketplace with vetted apps; sandbox and certification.
* Public APIs (REST/GraphQL), webhooks, and event topics.
* SDKs: JavaScript/TypeScript and Python for quick start.

# 5. Security & Compliance

* SOC 2 Type II; ISO 27001 roadmap; annual pen tests.
* Zero Trust network access; mutual TLS between services.
* Secret management via vault; least-privilege IAM roles.
* Audit, retention, and legal hold; regional data residency.

# 6. SRE & Observability

* SLIs/SLOs per service; error budgets and automated rollbacks.
* Distributed tracing, metrics, logs; on-call runbooks and playbooks.
* Blue/green & canary deployments; feature flags; chaos tests.