Ingest Data
Process Data
OLAP Analytics
OLTP Transactio

Pub/Sub
Dataflow stream - batch ✓
Bigquery → to gain insights
- User behaviour
- content consum pattern
- Data Warehouse (unified view for analytics & ML)

cloudSQL - limited scalability

Implement pipelines for safe releases → CICD
Cloud Build
Cloud Deploy } managed service
Cloud Run

Internet Access to Private resources → Cloud NAT
only ✓ exgress internet
↳ no inbound exposure

Serverless Autoscales
SQL Interface ← Bigquery
Log analytics →

Natural Lang Interaction 24/7 support → Conversational Agents (Dialogflow) → create virtual agents

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Summarization from media content
- Generic summary → Natural Lang API
- Domain Specific summary → Vertex AI (Build urown model)

Extract Rich metadata from media assets using NLP & computer vision → Video AI, Vision AI, Natural Lang AI
enrich content from text
I/p: video, Image, text
Product Catalog

Pretrained models for content extraction
identify trends
extract insights

Customer Interaction Data Analyzing to help in decision making
Conversational Insights
raw data is visualized using
Looker Studio — dashboards reports

AI powered detection for harmful content
↳ model Training, Juning
Vertex AI

Decisions of AI model → explained ↳ Vertex Explainable AI

Conversational (AI) Agents for personalized experience & content virality
call centre work → Chatbots building → to provide personalized assistance with Natural Lang understanding

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Enhance Search Relevance — Personalized Search's → Vertex AI Search } Product Discovery

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Supplier Data → extract relevant attributes → Document AI

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customization in Image Generation like bg, color, text etc → Vertex AI model
↓
Imagen Model is used for Image generation & editing tasks.

Vertex AI → to develop UI for content review for associates to ✓ allow ✗ reject modify

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Security Command Center, Assured Workloads, Sensitive Data Protection
↓ scan urenv for threats
enforce compliance controls
automatically discover, identify, classify sensitive data from SQL, GKE

→ modernize the invehicle experience, autonomous vehicle dev

SDWAN/Router Appliances → rural areas contentivity.

Leverage Google Threat Intelligence
Mandiant consulting service
Mandiant Incident Response Services. } Security & Risk Management

Static content (immutable) ideal for caching cloud storage + CDN

Dealer & customer self service → Conversational Agents
Step by step Guidance → Agent Assist
Analyze the interaction data → conversational Insights.

Cloud Armor → WAAP Web App API protection. → against DDOS attacks.

Apigee → Proxy layer

AI safety with Model Armor & Apigee → Proxy for Gen AI Agents
→ Gateway b/w LLM Appⁿ & models

IAP Identity Aware Proxy → verify user Authorization Policies @ App level (https)
both on cloud & on prem appⁿ.
→ Implement zero trust access model
uses context like IP, user activity → to approve / X reject Access.

Cloud Asset Inventory → GC's metadata inventory service
view search export monitor analyse → asset metadata
Filter by location, time → metadata Discovery
Identify over public exposured API's → to reduce attacks.
Audit Trails, Debugging & Compilance → Reports on resource changes.

IAC : Deployment Manager, Terraform (Infra Automation Framework)
reduce OpEx faster deployments, reduces human errors.

Guaranteed RPO & RTO → Cross Region Replication
→ Daily snapshots X

Cloud Run has native traffic splitting b/w Revisions
Built in Canary development
90% old revision → continuous to exist.
10% new revision
new version of app deployed creates

Database Migration Service fully managed serverless, Minimal Downtime, SSL encryption
onprem, other cloud database, self hosted.
Req: Transactions must remain online during migration with minimal downtime.

Cloud Endpoints	API Gateway	Apigee
Internal API (small teams)	Medium External	External partners
Cloud native	Cloud Native	Large enterprises
No analytics	Basic analytics	Cloud + Hybrid (onprem)
X	X	Advanced Analytics / Detailed Analytics
X	X	API monetization SLA's
Limited Policy Engine	Basic	Dev Portal
Lightweight cheap		Very Rich (OAuth2, threat protection, quotas, routing, rate limiting)
		Heavy & Expensive
← Basic Proxy		Basic Proxy + Extra logic
OPENAPI		Governance + Policy management.
gRPC spec support		

Bigquery (Partitioned tables to save cost) clustered table for query efficiency.

ZTA Identity First Network later.