GOOGLE CLOUD PLATFORM (GCP): POWERING AI & CLOUD INNOVATION

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WHAT IS GCP?

GCP is Google’s suite of cloud computing services. It offers IaaS (infrastructure), PaaS (platforms), and SaaS (software solutions).
It provides on-demand compute, storage, AI tools, and databases without requiring upfront server investments.
GCP is built on the same infra that powers Gmail, YouTube, and Search → ensuring scalability and reliability.
Global footprint: data centers across North America, Europe, Asia-Pacific.

CORE SERVICES

WHY BUSINESSES EMBRACE CLOUD TECHNOLOGY

Compute → Compute Engine for VMs, Kubernetes Engine for container orchestration, Cloud Functions for serverless apps.

Storage & Databases → Cloud Storage for object storage, BigQuery for analytics, Spanner for global databases, Firestore for NoSQL apps.

Networking → Google's private fiber backbone → sub-second latency across continents. Services like Cloud CDN speed up delivery.

Security & IAM → Identity management, end-to-end encryption, compliance certifications (HIPAA, GDPR).

GCP IN AI

- Vertex AI: End-to-end ML lifecycle (data prep → training → deployment → monitoring).
- TPUs: Specialized hardware for deep learning; faster than GPUs for matrix-heavy AI workloads.
- BigQuery ML: Train models directly on SQL queries — democratizes ML.
- AI APIs: Plug-and-play AI (translation, speech-to-text, OCR).
- Gemini Models: Google's GenAI family for chatbots, summarization, multimodal AI.

CLOUD STORAGE & DATA MANAGEMENT

ENHANCING DATA SECURITY & ACCESSIBILITY

Scalability & Flexibility

Cloud storage enables organizations to expand or reduce storage needs based on demand, optimizing costs and enhancing efficiency without requiring additional physical infrastructure.

Data Security & Compliance

Cloud providers implement encryption, access controls, and compliance measures to protect sensitive data and adhere to regulatory standards, ensuring data integrity and privacy.

PRACTICAL CASE STUDIES

Spotify: Uses GCP for recommendations (BigQuery + Vertex AI + Kubernetes).

PayPal: Fraud detection at scale with Vertex AI & TPUs.

Carrefour: Retail personalization and demand forecasting via BigQuery.

NASA FDL: Space data processed with BigQuery + TPUs → accelerates discovery.

HOW TO LEVERAGE GCP FOR AI

Data Storage: Use BigQuery / Cloud Storage.

Processing: Dataflow for batch & streaming pipelines.

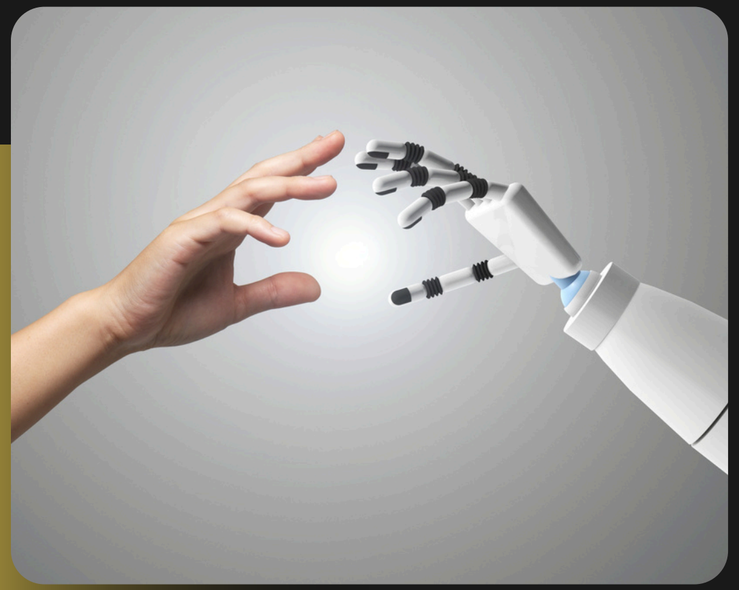
Training: Vertex AI with GPUs/TPUs.

Deployment: Serve models as APIs via Cloud Run.

Monitoring: Vertex AI Explainability + dashboards ensure fairness, drift detection.

WHAT LIES AHEAD IN CLOUD INNOVATION

FUTURE OF GCP



- Generative AI: Gemini models powering enterprise use cases.
- Industry-specific solutions: Finance (fraud detection), healthcare (diagnosis), retail (supply chains).
- Sustainability: First major provider aiming for 24/7 carbon-free operations by 2030.

THANK YOU

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