Google Distributed Cloud: Edge Appliances

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go/edge-appliance-customer-deck

Google can run in your environment, any way you choose
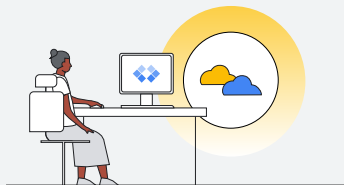
Google Cloud

Empowers faster solution development, smarter business decisions, and connects people anywhere

Google Distributed Cloud

Extends Google Cloud's infrastructure and services to the edge and into your data centers

common control plane | container orchestration and management | policy and security automation | operations and services management

Powered by Anthos

Google Cloud

Google Distributed Cloud

Offers designed for greater choice and customization based on your unique needs

Edge

Google-managed hardware and software solution designed for low latency, data residency, and hybrid workloads

Manufacturing needs visual-inspection anomaly detection with private MEC

Virtual

Software only based extension of Google Cloud delivered anywhere, running on your existing infrastructure

Retail store wants to leverage unique or existing hardware investments

Hosted

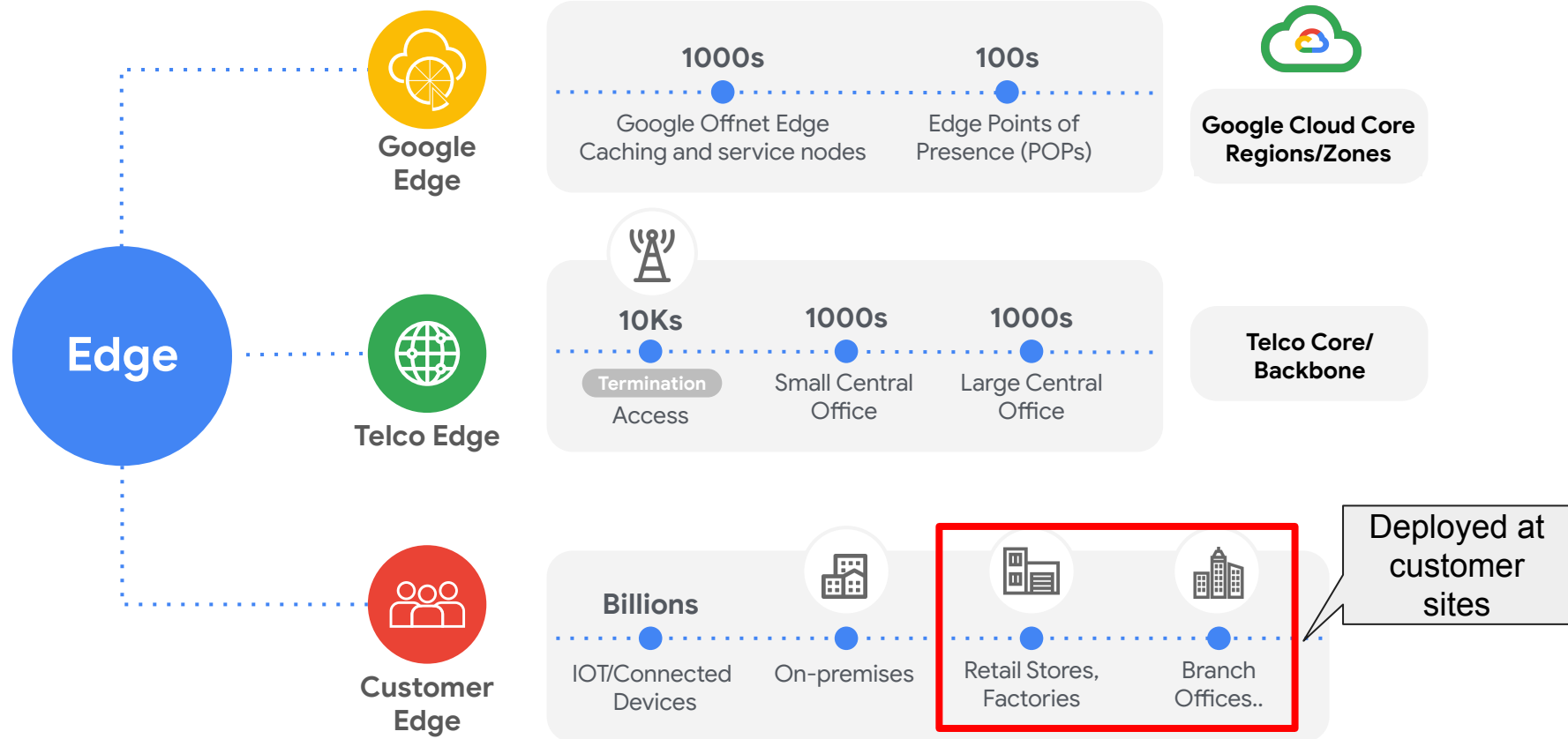Air-gapped hardware and software solution, managed by Google or a trusted partner, for the most sensitive workloads

Government agency must meet data and operational sovereignty requirements

Connected

Air-gapped

Choice in hardware form factor

Google Cloud

Defining the Edge

Edge

Google Edge

	1000s	**100s**	
	Google Offnet Edge Caching and service nodes	Edge Points of Presence (POPs)	

Google Cloud Core Regions/Zones

Telco Edge

10Ks	**1000s**	**1000s**
Termination		
Access	Small Central Office	Large Central Office

Telco Core/ Backbone

Customer Edge

Billions			
IOT/Connected Devices	On-premises	Retail Stores, Factories	Branch Offices..

Deployed at customer sites

Solutions & Requirements

Healthcare	Device data capture	Vision & sensor inference	Provider efficiency improvements
Telematics	Autonomous driving data	Object detection	Advanced Driver Assistance System
Manufacturing	Drive innovation in R&D & engineering	Improve operational efficiency	Modernize products & services
Media	Enable collaboration & efficient content creation	Simplify video processing and distribution	Effectively manage & monetize media assets
Public Sector	Smart city sensor data capture	Image based incident detection	Regulatory compliance for workloads

Requirements	**Local data store and transfer**			**ML Inference**		**Edge compute**		
	Security	Connectivity	Offline	GPU/TPU	Ruggedization	Consistency	Maintenance	OpEx

Google Cloud   5

GDCE Hardware configurations available today

Config-1

General purpose
compute Rack

6 servers

2 ToR Switches

Rack, cabling

Available in **AC** or **DC**

EA-GPU-T4

ML/AI Inference
Appliance

Single Node

RJ45 NICs w/ 10G/1G

Rugged: Tamper Resistant

Dual power supply + RAID

NVIDIA Tesla T4 GPU

Google Cloud

GDC Edge Appliance

Simple, secure and performant appliance for local storage, ML inference, data transformation and export for customer edge locations that is managed from the cloud.

➔ Fully managed (hardware, software, support)
➔ Occasionally connected
➔ GPU (T4/A2) or Storage (7TB) SKUs
➔ Anthos - GKE Hub connects to standalone K8s cluster
➔ Rip-and-replace (no on-site repairs)
➔ Monthly subscription (or 1-year / 3-year commit)

External Resources:
• Edge Appliance User Guide
• Blog post w/ announcement

Name	Config-1	Config-2	EA-STORAGE	EA-GPU
Compute	6 x 96 vCPU	6 x 96 vCPU	16 vCPU	16 vCPU
Memory	6 x 256 GB	6 x 256 GB	64 GB	64 GB
Storage	6 x 4 TB	6 x 4 TB	7.2 TB	3.6 TB
GPU	N/A	6 x 2 NVIDIA T4s	N/A	1 NVIDIA T4 or A2
Pricing (US)	From $11,200/month	From $12,900/month	From $500/month	From $500/month

Solution Example: Hazard Detection
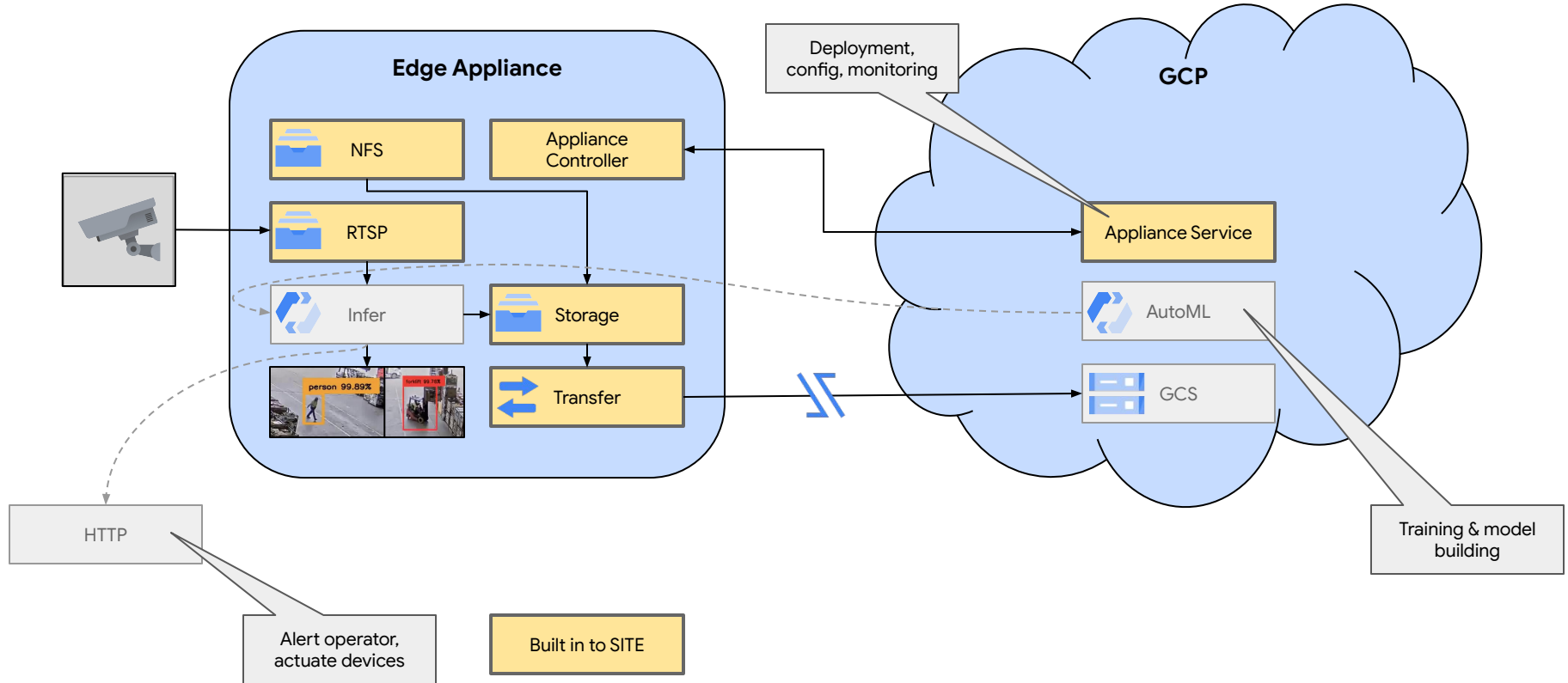
Customer POCs

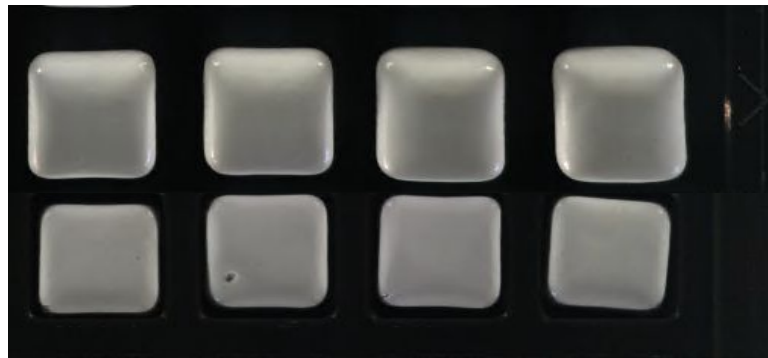## Warehouse

Run **ML inference on video feeds** to **detect hazardous conditions** in warehouses. **Upload flagged events** to Cloud Storage.
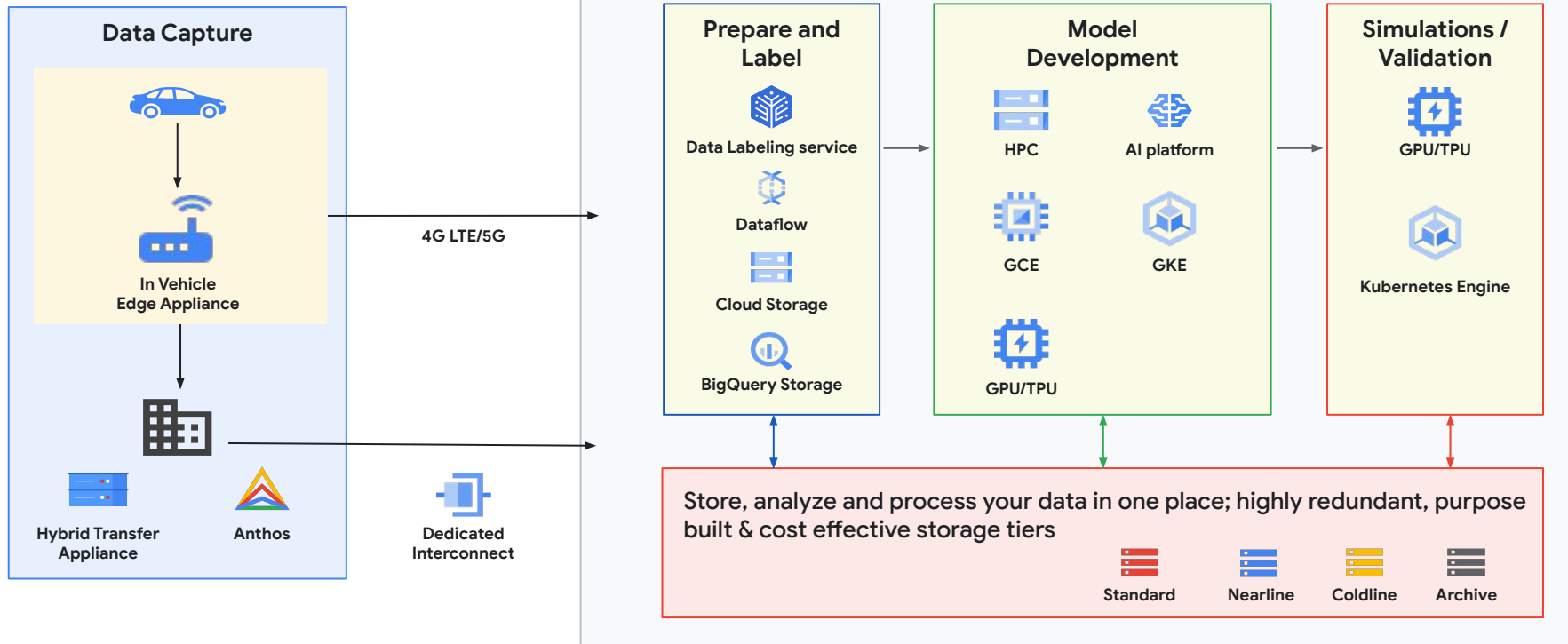
Manufacturing

Run **ML inference on video feeds** to **detect manufacturing defects** in pieces of medicinal gum.

ADAS industry research

Data collection & processing pipeline

Data Capture

In Vehicle Edge Appliance

4G LTE/5G

Hybrid Transfer Appliance

Anthos

Dedicated Interconnect

Data Lake

Prepare and Label

Data Labeling service

Dataflow

Cloud Storage

BigQuery Storage

Model Development

HPC

AI platform

GCE

GKE

GPU/TPU

Simulations / Validation

GPU/TPU

Kubernetes Engine

Store, analyze and process your data in one place; highly redundant, purpose built & cost effective storage tiers

Standard

Nearline

Coldline

Archive

Google Cloud

Edge Appliance User Experience

		User	GCP Console/API	Operations
Hardware		Plan →	Order →	Provision
		Receive ←		Ship
		Attest →	Activate	
Platform	Anthos	Application →	Configure	
		Update ←	Deploy	
		Monitor →	Logs/Metric	
Support		Errors →	Failures ←	Replace
		Patches ←	Maintenance ←	Updates

Edge Appliance Hardware

Specification	EA-GPU-T4
Processor	NVIDIA T4 GPU, 16 core CPU, 64GB RAM
Storage	4x 2TB SSDs. Usable storage is 3.6 TB (using RAID).
Networking	2x 10GBASE-T RJ45, 2x 1GbE RJ45
Shipping weight	13.6 kg (30 lbs)
Dimensions	Height: 43 mm (1.7 in.), width: 209 mm (8.2 in.), depth: 376 mm (14.8 in.)
Mounting options	Horizontal or vertical orientation. Bookshelf mount (3 servers), DIN rail wall mount, ceiling mount, 1U rack mount (2 servers), 2U short-depth rack mount (2 servers). Available locking bezel with dust filter.
Appliance weight	3.75 kg (8.3 lb)
Power requirements	12V DC using one or two external AC power adapters with plugged inputs. Two adapters form a redundant pair in most configurations. Power source is 100-127 V AC (3.2A) or 200-240V AC (1.6A) for each adapter.

SE350 Mounting Options

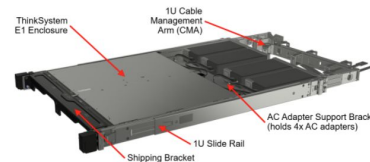DIN Rail Wall Mount Ceiling / Wall Mount Bookshelf Mount

Stand Alone Stacking Mount and more...

Lenovo

ThinkSystem E1 Enclosure
1U Cable Management Arm (CMA)
AC Adapter Support Bracket (holds 4x AC adapters)
1U Slide Rail
Shipping Bracket

Built In Capabilities

NFS share, Local storage

Automatic copy to GCS

Run containerized workloads w/ Anthos Bare Metal (local single node cluster)

Hardware accelerator for ML (current NVIDIA T4, future TPUs and A2)

Deploy, configure, monitor via cloud console

Run with occasional connectivity; set bandwidth limits; scheduled maintenance windows
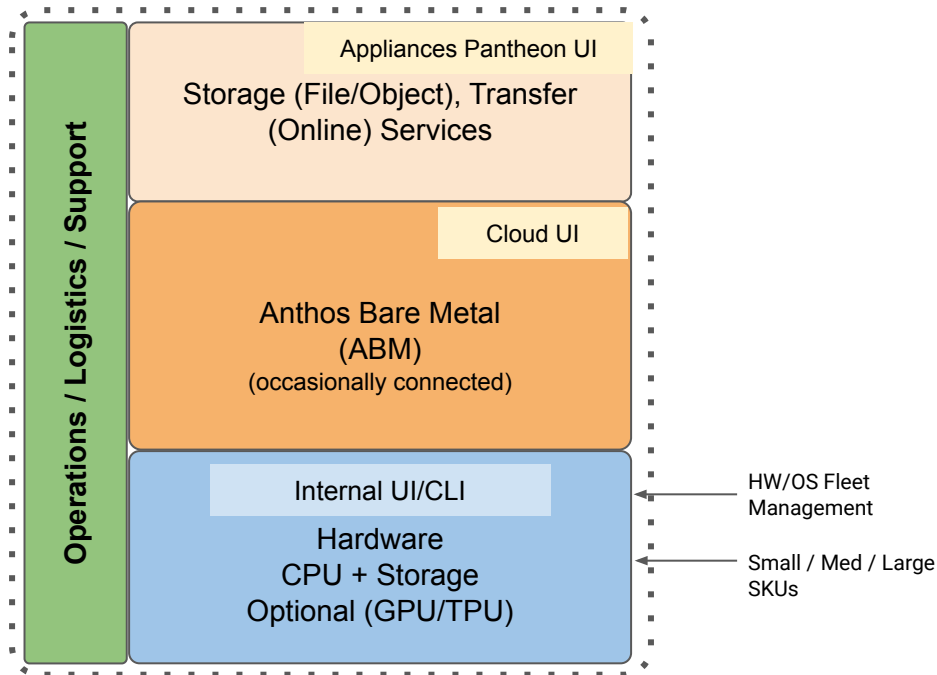
Secure & tamper-evident transit, secure storage, secure transfer

Edge Appliance Stack

- **Google Cloud Appliances**
  - **Integrated** HW+SW+Ops
  - Deliver **Transfer (online) + Anthos**
  - Google **Owned & Operated**
    - Similar to GDCE, unlike GDCH
- **Capabilities**
  - Transfer Services
  - Anthos middleware
  - Base Platform (OS, NFS storage)
- **Operations**
  - Logistics
  - Lifecycle
  - Support

Customer Edge compute options

DIY Kubernetes **Assemble Hw+Sw+Ops**	**GDC - Edge Appliance** **Application infra as-a-service**	**Hybrid - Anthos** **Assemble Hw+Ops**	**GDC - Edge Racks** **Fully managed racks**

On-Premise Servers

SITE Appliance

Anthos

Telco Edge

Open source installers, bug fixes, security patches, security updates, and upgrades that customers procures and uses.

Customer manages:

- Infrastructure (incl OS)
- Version selection
- Compatibility & compliance
- Deployment
- Configuration
- Release Planning
- Change Management
- Security Patches applied

Google **manages** installers, bug fixes, security patches, security updates, and upgrades for customers on Site Appliances.

Google managed OS+Kubernetes accessible from Cloud console

SLAs include monthly maintenance windows

Customer manages:

- Power / space / network

Google **provides** installers, bug fixes, security patches, security updates, and upgrades available for customers to access and use.

Customer manages:

- Infrastructure (incl OS)
- Deployment
- Configuration
- Release Planning
- Change Management
- Security Patches applied

Telco cloud based services - Platform-as-a-service.

Telco + Google managed full stack accessible from Cloud console

Telco + Google managed Network + OS + Kubernetes

Customer manages:

- Power / space

What you get with GDC Edge and GDC Edge Appliance

	GDC Edge	GDC Edge Appliance
Hardware procurement	Included	Included
Hardware assembly	Included	Included
Delivery, installation and removal	Included	Shipped with instructions
Anthos	Included	Included
Logging & monitoring	Included	Included
SLO	Included	Included
Software updates	Included	Included
Hardware repairs	Included	Rip-replace
Premium Support	Required	Optional

Edge Appliance offerings

	EA-STORAGE-10	EA-GPU-T4	EA-TPU (coming soon)
Local buffer	7TB (NFS)	3.6TB (NFS)	3.6 TB (NFS)
GPU	None	NVIDIA TESLA T4 / A2	TPU
CPU/RAM		16 Core CPU (32 vCPU), 64GB RAM	
Network		10G (RJ45)	
Pricing		$1000/mo OR $750/mo 1 year commit OR $500/mo 3 year commit	

Transfer Appliance offerings

	TA300	TA40	TA7
Local buffer	300TB (NFS)	40TB (NFS)	7TB (NFS)
Network	50Gbps (QSFP) 10G (RJ45)		
Pricing	$1800 (base fee)	$300 (base fee)	$300 (monthly)
Usage Days	25 included ($90/ extra day)		N/A
Weight	~50lbs	~50lbs	~20lbs

Thank you