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Cloud Computing Theory DA

INTELLIGENCE BUSINESS LINE OF AIRBUS DEFENCE & SPACE

ONEATLAS

The intelligence business line of Airbus Defence and Space uses the **GOOGLE CLOUD PLATFORM** to build a scalable online platform, enabling customers to access petabytes of satellite imagery in real time.

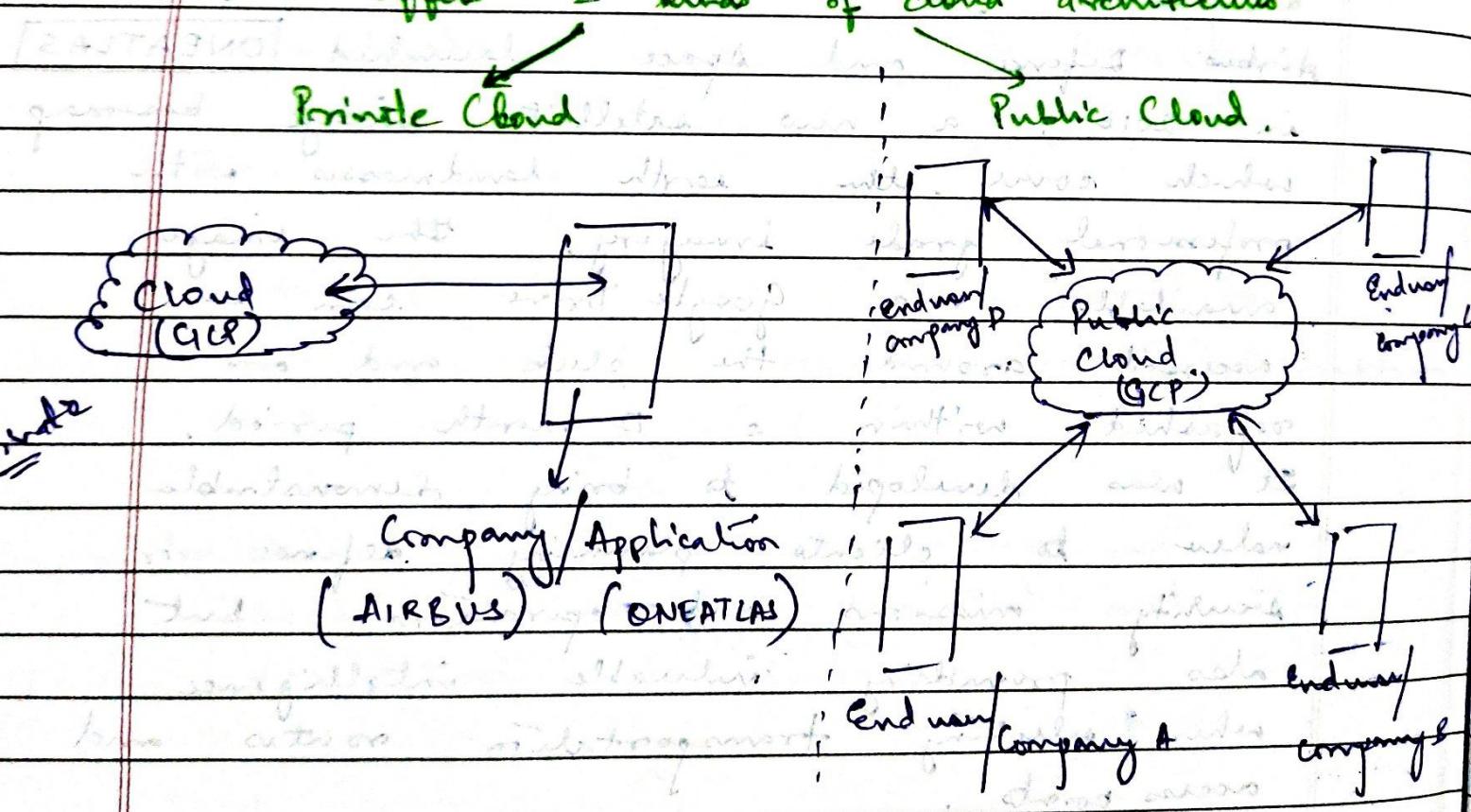
A brief introduction to the product which will be explained further in the assignment :-

Airbus Defence and Space launched **ONEATLAS** in 2016, a new satellite image basemap which covers the earth landmasses with professional grade imagery. The images available via Google Drive can be accessed around the clock and are refreshed within a 12 month period. It was developed to bring demonstrable value to clients planning defence or security missions (and operations) but also providing valuable intelligence when selecting transportation routes and access points.

GOOGLE CLOUD PLATFORM : (GCP)

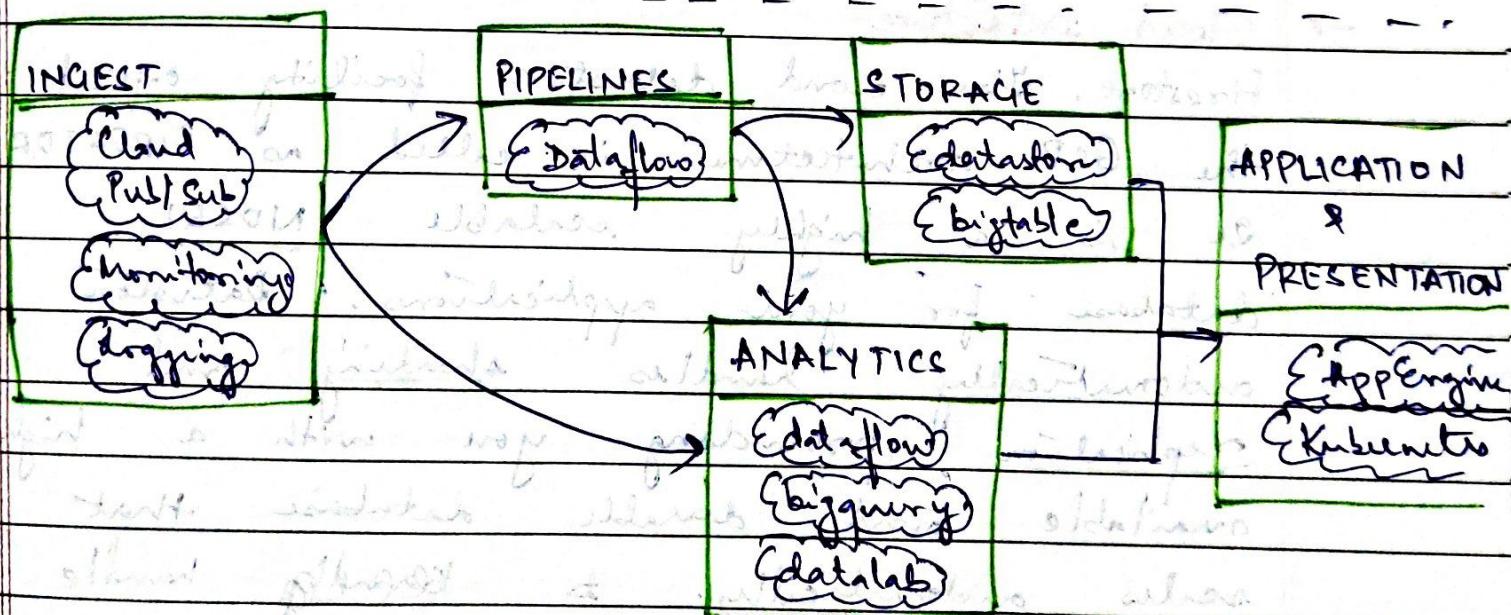
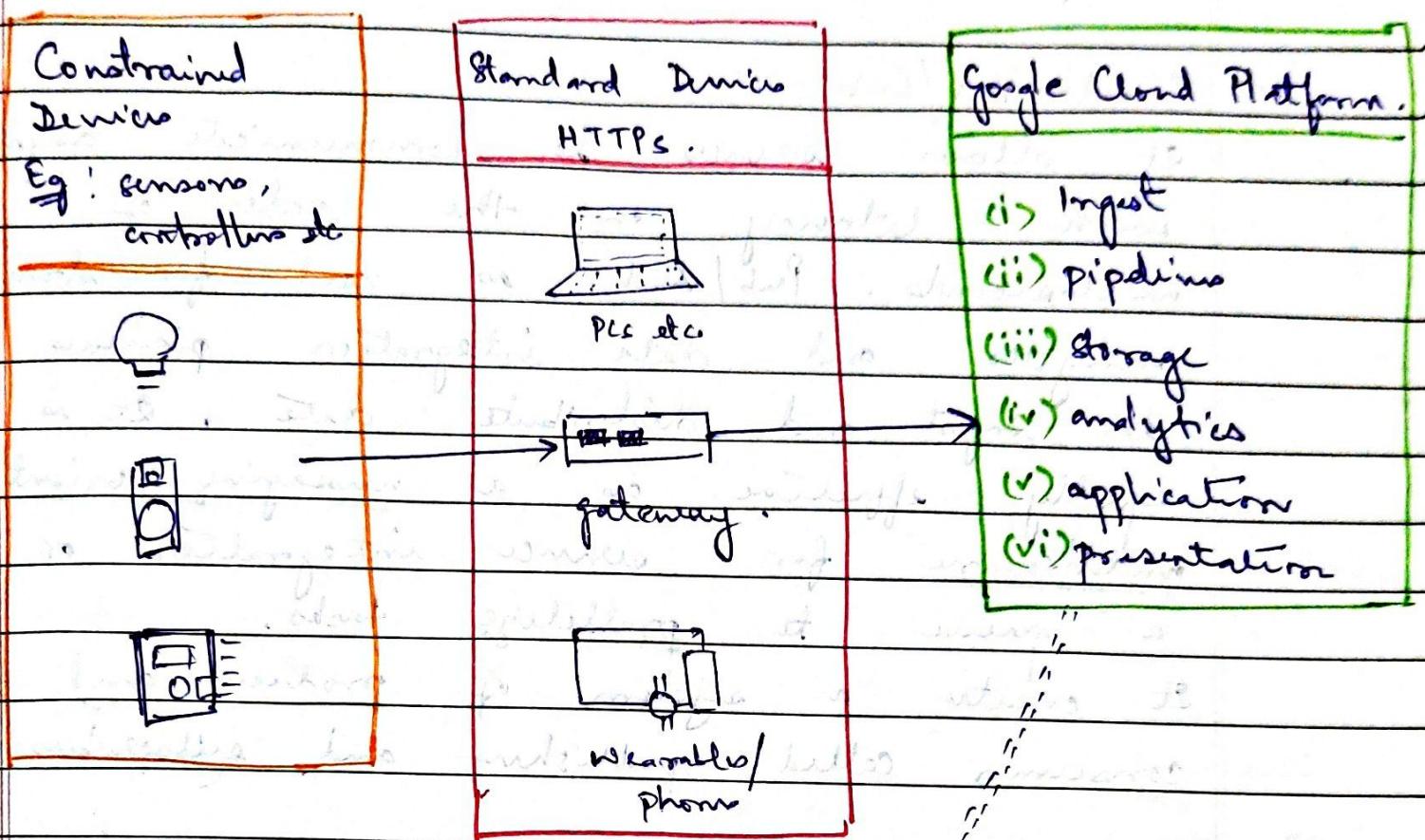
Google Cloud Platform, offered by Google, is a suite of cloud computing services that runs on the same infrastructure that Google uses internally for its end-user products. Alongside, a set of management tools, it provides a series of modular cloud services including computing, data storage, data analytics and machine learning.

GCP offers 2 kinds of cloud architectures



Architecture Diagram

Following is the architecture diagram specific to the application :-



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From the architecture diagram, the flow of control is visible. In this section, I will be explaining the major components of the architecture.

→ Cloud Pub/Sub.

It allows services to communicate asynchronously with latency on the order of 100 milliseconds. Pub/Sub is used for streaming analytics and data integration pipelines to ingest and distribute data. It is equally effective as a messaging-oriented middleware for service integration or as a queue to parallelize tasks.

It creates a system of producers and consumers called publishers and subscribers.

→ Cloud Datastore

Firestore. The cloud datastore facility offered in the GCP architecture is called as FIRESTORE.

It is a highly scalable NOSQL database for your applications. Datastore automatically handles sharding and replication, providing you with a highly available and durable database that scales automatically to handle your app's load.

→ Cloud Storage:

→ super set of cloud datastores, cloud storage provided by GCP provides for object storage for companies of all sizes to store any amount of data and retrieve it as often as you like. It is a reliable and secure object storage which can transition to lower-cost classes easily, has multiple redundancy options and can handle workload of any object type efficiently.

→ Kubernetes Engine:

It is a simple way to automatically deploy, scale and manage applications. Kubernetes is an open source container orchestration system for automating software deployment, scaling and management. It is also known as K8s. Some key features of this engine include:-

(i) Multiple modes of operations under one Engine (GKE)

(ii) Pod & Pod Cluster auto scaling

(iii) Prebuilt Kubernetes applications and templates

(iv) Container native networking & security.

How does AIRBUS INTELLIGENCE : ONEATLAS use the architecture of GCP explained?

Application Name: **ONEATLAS**

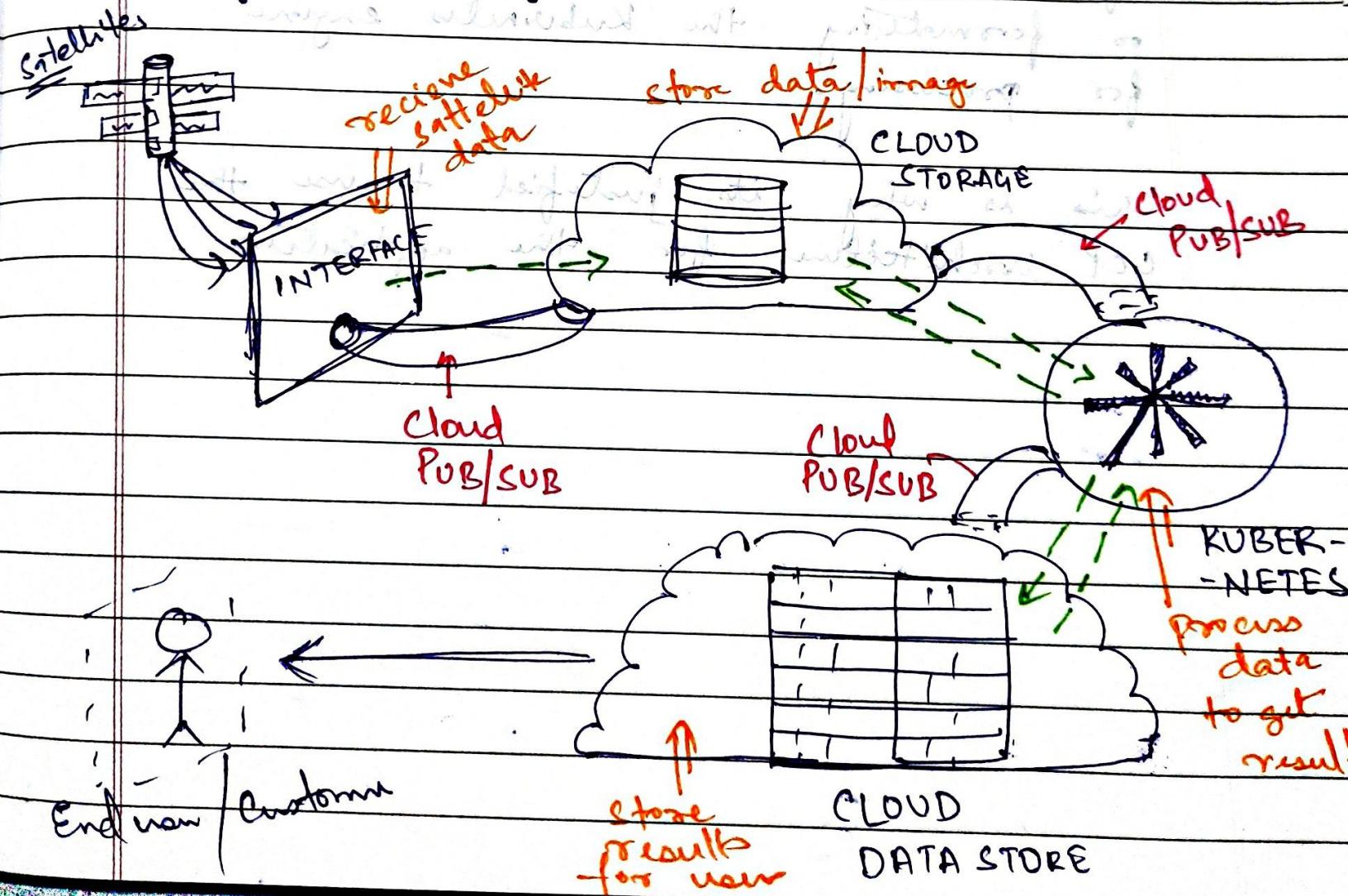
~~produced~~ ~~process~~ ~~access~~ ~~a~~ ~~customer~~

Producing satellite imagery is a complex business. Airbus continues to access 14 satellites and provides images all over the world everyday.

Airbus launched Oneatlas to provide customers with the images and data they need as quickly as possible without compromising on quality or the range of coverage. In addition, the specialized type of imagery provided meant that the customer required to have the right ~~technology~~ technology. Therefore, Airbus decided to use GCP for democratizing their entire process and focus different aspects separately.

Hence they introduced **CLOUD STORAGE**. It holds hundreds of terabytes of data and imagery that's easily accessible in the cloud and doesn't require positioning of large servers.

The first product of OneAtlas was Basemap. It required a lot of image processing techniques along with deep learning algorithms in TensorFlow. To process the images, **KUBERNETES ENGINE** provided various methods used to extract information from images and company could scale its compute power up and down. **CLOUD PUB/SUB** was used as a pipelining mechanism which provides a middleware for messaging and the data is finally held in **CLOUD DATA STORE** for easy scalability.



[Google Cloud Platform provides for security
and scalability.]

The GCP provides a huge amount of scalability and the security features of Google are well known. The entire world is operating on Google services makes it easier for users to integrate and use the services provided by Google.

Also, the GCP allows a vast amount of customization be it data storage or formulating the Kubernetes engine for processing.

This is why its justified to use the GCP architecture for the application.