

**Cloud Computing**  
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**Lecture - 19**  
**Case Study: Google Cloud Platform (GCP)**

Hi. Let us start our discussion or continue our discussion on Cloud Computing. As we mentioned that there are several commercial cloud and open source cloud are available in providing services at various level like IaaS, PaaS or SaaS. So, one of the one of the popular such cloud we will discuss. So, again the major objective is to I just show you how a commercial cloud works and so that you can try yourself and see that have the flavor of the cloud right.

So, today we will discuss about Google cloud platform briefly we will discuss and we will also give you a short demo how to develop a app or host your web app into the global Google cloud platform which is very user friendly and easy to use. So, again there is no immediate there is no particular motivation in basically having working with some commercial cloud, but it is just to use, it as a use case or test case where you can practice and see that how things works. And we are using free account a demo account, so that you can also try at your end and see that how things works

So, as we understand Google as worldwide presence and their data centers are across the globe, and this Google cloud platform also if you see, they are in various regions right like North American region, UK region, and Asia and so on and so forth. So, they are distributed regions, every region have some zones and so that these are divided into geographically spread right. So, there are several services which has a global view, which has a zonal view and more infrastructure wise a view. So, keeping all this at the backbone, we will try to see that what Google cloud platform provides.

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**What's Google Cloud Platform?**

- **Google Cloud Platform** is a set of services that enables developers to **build, test** and **deploy** applications on Google's reliable infrastructure.
- **Google cloud platform** is a set of modular cloud-based services that allow you to create anything from simple websites to complex applications

Source: <https://cloud.google.com/>; <https://developers.google.com>

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So, if you see like it say state of services what they provide is a set of services that enables developers to build, test, deploy application on Google's reliable infrastructure. So, we have taken these thing from their web resources, there one is cloud dot Google dot com and developers Google dot command related resources. So, what they claim that it say set of they provide larger set of services that enable developers to build, test, deploy application on Google infrastructure. Google cloud platform is a set of modular cloud base services that allow you to create anything from simple website to complex applications; that means, you can have a you can host your website or you can have a complex application running on the cloud.

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So, if we look at little broad aspect, so it build, store, analyze, so this is the three motto. And in order to have, so we have Google have a computer services which is provided by Google app engine which is primarily a PaaS and compute engine which provides IaaS type of services other than that it has a storage services cloud storage cloud SQL and cloud data store. So, they are cloud storage services in Google and there are other services like query, cloud endpoint type of services. Rather if you look at their website t portal services are listed there and they are implemented or increasing or modified overtime right.

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The slide is titled "Google Cloud Platform?" and has a subtitle "Run on Google's Infrastructure". The main text reads: "Build on the same infrastructure that allows Google to return billions of search results in milliseconds, serve 6 billion hours of YouTube video per month and provide storage for 425 million Gmail users." Below this text is a bulleted list of three points: "✓ Global Network", "✓ Redundancy", and "✓ Innovative Infrastructure". The slide has a light yellow background with a dark blue header and footer. The footer contains the logos for IIT KHARAGPUR and NPTEL ONLINE CERTIFICATION COURSES. In the bottom right corner, there is a circular inset image of a man in a white shirt and glasses.

So, what they claim or what Google try to support is run your application, host your site on Google's infrastructure build on the same infrastructure that allow Google to return billions of search results in milliseconds that means they are basic infrastructure, they serve around 6 billion hours of YouTube video per month and some 425 million Gmail users. So, the same sort of infrastructure you can use when you are using thing. So, it is a globally connected over the network, highly redundant. So, it is fault tolerant in that respect and Google go on what they claim that go on doing innovation. So, you have innovative infrastructure in place, so that is what even one use Google platform what Google wants to provide them.

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**Google Cloud Platform? (contd..)**

*Focus on your product*

Rapidly develop, deploy and iterate your applications without worrying about system administration. Google manages your application, database and storage servers so you don't have to.

- ✓ Managed services
- ✓ Developer Tools and SDKs
- ✓ Console and Administration

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So, from the user point of view they are focus on their application or the product rapid development, deploy, iterate your applications without worrying about the system administration etcetera. So, all those things are taken care by the backend service provider, in this case Google. Google manages your application database storage server. So, you do not have to manage all those things so manage services right developers tools and SDKs are available, console and administration for management of the things. So, these are the things which are comes with you when we use Google platform.

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**Google Cloud Platform? (contd..)**

**Mix and Match Services**

Virtual machines. Managed platform. Blob storage. Block storage. NoSQL data store. MySQL database. Big Data analytics. Google Cloud Platform has all the services your application architecture needs.

- ✓ Compute
- ✓ Storage
- ✓ Services

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So, other aspects what they claim or what you can have is mix and match of services. So, you have virtual machine, manage platform, blob storage, block storage, NoSQL data store, MySQL databases, big data analytics, Google cloud platform has all the services your application architecture needs. So, it says you can have a number of services if you and you can have a mix and matches of the services to develop or launch your application right. So, compute storage and services are the core of the things and you can mix and match of several services to realize your particular application or particular objective of your particular application.

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**Google Cloud Platform? (contd..)**

**Scale to millions of users**

Applications hosted on Cloud Platform can automatically scale up to handle the most demanding workloads and scale down when traffic subsides. You pay only for what you use.

**Scale-up:** Cloud Platform is designed to scale like Google's own products, even when you experience a huge traffic spike. Managed services such as App Engine or Cloud Datastore give you auto-scaling that enables your application to grow with your users.

**Scale-down:** Just as Cloud Platform allows you to scale-up, managed services also scale down. You don't pay for computing resources that you don't need.

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So, the other advantages what they offer is the scale to millions of users. As such Google has they have use user base and they have the infrastructure, which can support this user base and as you are using the same infrastructure as you will be used this same infrastructure. So, we can basically scale to this millions of users. So, applications hosted in cloud platform can automatically scale up to handle most demanding workloads and scale down when the traffic is updates. So, scale up, scale down is both possible. So, you pay only you use right pay as you go model.

Scale up cloud platform is designed to scale like your own products like if you use Google other products whenever the demand is high scale up and so forth right. Even when you experience a huge traffic spike then it actually what they propose or what they offer is that the type of things they are doing with their own products the same type of support or management they do for when you somebody launches something on the Google cloud platform. So, manage services searches Google app engine or cloud data store give you, auto-scaling that enables user grow with your user.

So, these are the manage service like GIE Google app engine or cloud data store which provides auto scale whenever the load is higher, it goes up or other way out. Scale down just as cloud platform as allows you to scale up, manage services also scale down right you do not pay for computing resources you do not. So, if you have lesser load. So, you can scale down, so that release of the or deactivating the computing resources are in place.

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**Google Cloud Platform? (contd..)**

*Performance you can count on*

Google's compute infrastructure gives you consistent CPU, memory and disk performance. The network and edge cache serve responses rapidly to your users across the world.

- ✓ CPU, Memory and Disk
- ✓ Global Network
- ✓ Transparent maintenance

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See also claim that or we can have a good performance or return on our investment or hiring these Google cloud platform. So, Google's compute infrastructure give you consistent CPU a memory and disk performance, so that is guarantee. So, that they can network and age case response is rapidly to your users across the world. So, if you are a business user or a you have intern that user across the world, so they also get the advantages of Google's scale up and type of services right. So, it can be in terms of CPU memory disk, it can be in terms of the network global network. It can be or maybe in transparent maintenance of the infrastructure or you know application.

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**Google Cloud Platform? (contd..)**

*Get the support you need*

With a worldwide community of users, partner ecosystem and premium support packages, Google provides a full range of resources to help you get started and grow.

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And also you get support you need with a worldwide community users, partner ecosystem and premium support packages, Google provides full range of resources to help you to get start and go so that means, the Google the overall support come into play wherever you launch in the global cloud platform. So, these are more what we say means advantages Google claim they provide and it is if these are available to a customer or a user, so it is the headache of maintenance, manageability etcetera are is reduced to a large extent and you pay for the services you use and type of things.

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**Google Cloud Platform Services**

**Compute**

- Compute Engine
- App Engine

- I. Cloud Platform offers both a fully managed platform and flexible virtual machines, allowing you to choose a system that meets your needs.
- II. Use App Engine, a Platform-as-a-Service, when you just want to focus on your code and not worry about patching or maintenance.
- III. Get access to raw virtual machines with Compute Engine and have the flexibility to build anything you need.

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So, if we look at the Google cloud platform, so compute services one is compute engine, another is a app engine, one is primarily IaaS types of things and another is the PaaS type of stuff. So, cloud platform offers both a full manage platform with flexibility flexible virtual machine allow you to choose a system that you needs to that you needs, so that when a Google cloud platform it has a both a manage platform and a flexible machines, so that means, you can have a flexibility configure VM. Use app engine or past type of services when you just want to focus on your code and not worry about the patching on maintenance etcetera not about the infrastructure, so you require a development platform.

And get access to raw virtual machine with compute engine and have flexibility to build anything with this, so other than you can have your own VM and then you have flexibility of loading apps or other type of things in that virtual machine, and have a IaaS type of services out of it.



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**Google Cloud Platform Services**

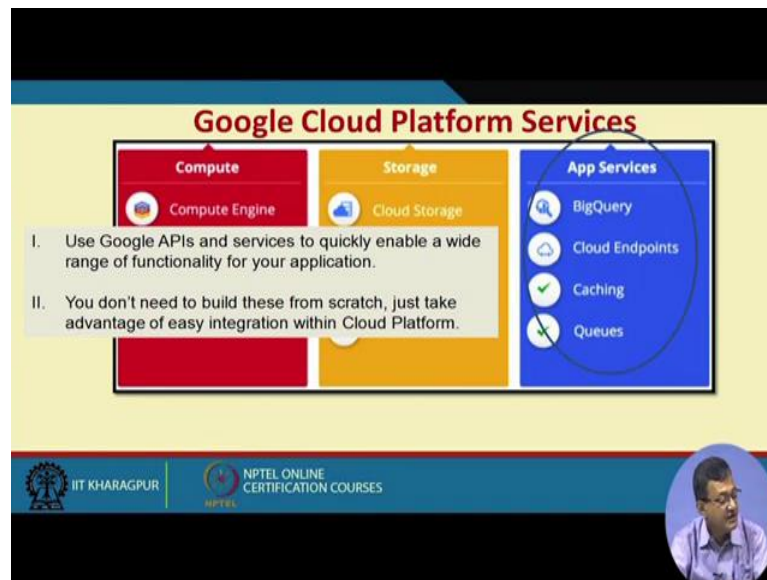
Compute	Storage	App Services
Compute Engine	Cloud Storage	BigQuery
App Engine	Cloud SQL	Cloud Endpoints
	Cloud Datastore	Caching
	Persistent Disk	Queues

- I. Google Cloud Platform provides a range of storage services that allow you to maintain easy and quick access to your data.
- II. With **Cloud SQL** and **Datastore** you get MySQL or NoSQL databases, while **Cloud Storage** provides flexible object storage with global edge caching.

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Secondly, another vertical is storage. So, it provides when variety of sense one is cloud storage, cloud SQL, cloud data store persistent disk. So, these are the different things which are offered by TCP or the Google cloud platform. It provides a range of services that allow you to maintain and easy quick access to your data right. So, it is a range of services with cloud SQL and data store you get mySQL and noSQL databases while cloud storage provides flexible object storage with globalized things, for with data store and SQL or SQL and you get the mySQL thing and another type noSQL type of databases. So, this is more of a base related service or cloud storage provide object storage with globalized thing that means, you can basically store and access across the glob.

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And finally there are several app services which is like big query, cloud endpoints, catching and queues. So, these are app services with Google APIs and services to quickly you can use Google API services to quickly enable a wide range of functionality for your application right. So, you can build your application using this app services, one need not build these from scratch just take advantage of easy integration of Google platform, so that that is the app engine tries do. So, it is a bunch of APIs which can be leverage for your own developing your own application.

So, this is a quick brief overview of what are the different modules and vertical of Google is. So, if you, want more details you can basically go to their website and check that more how things works these are says to shows that these are the different verticals. But as I mentioned at the beginning of the thing our objective is to show some example cases on some commercial and open source cloud, so that you can try yourself and see that how things works, and what are the nitty-gritty of the things right.

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**Google Cloud Platform Services – from User end!**

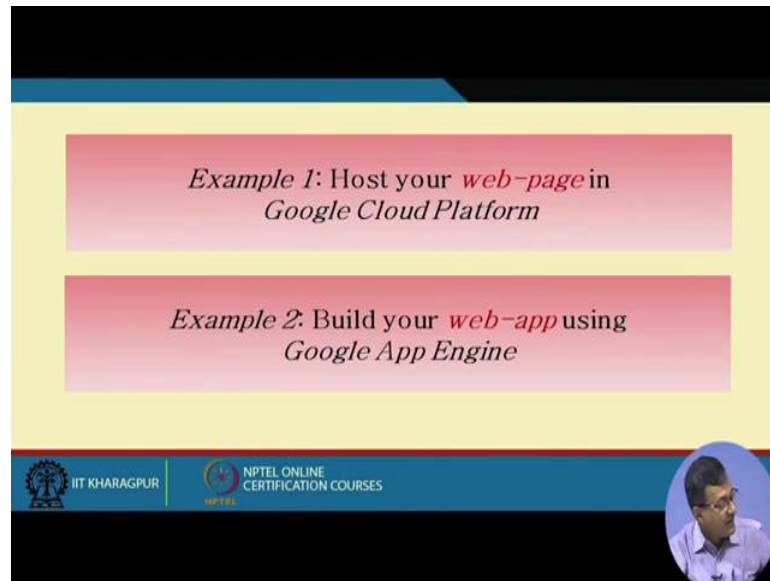
- Consider to migrate your web application to Google Cloud Platform for better performance using **GoogleAppEngine**.
- Your application should go wherever your users go: Scale your application using **GoogleCloudEndpoints**.
- Integrate Google's services into your Application using **GoogleAPIs**.

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So, like here also we will, so two applications to example cases now so before that. So, we if you look at the whole thing like it is a cloud platform services from the user end considered to migrate your application to Google cloud platform or for better performance using Google app engine where you can migrate your application web application to cloud platform or your applications should go wherever your users grow like your scale applications using Google cloud end points. And integrate Google services into your application using APIs right.

So, if you can integrate Google services in your applications which may be running locally or in cloud and using Google API. So, Google app engine, Google end points, Google API or some other things which plays important role.

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And as we were discussing we will, so two example scenario with these Google cloud platform or GCP which to demonstrate that how a typical cloud works right, you can try yourself and have more complex example. These are two simple example, one is to host your web page in the Google cloud platform that is already you are having a web page design locally and you want to upload host is the web pages into Google cloud platform, sorry Google cloud platform or GCP, and use their storages for that. The second one is building web application using Google app engine. So, we will use these Google app engine services to build a web application. So, two simple applications, but I believe that it will help you to specially those who are new to this cloud thing to help you in developing small application and hands on experience with the commercial cloud fine.

So, we will we will continue with the application, then for this with me Shreya will join. She will show you how a Google like a Google webpage can be hosted or a webpage can be build using Google app engine.