A

Seminar report

On

# Google App Engine

Submitted in partial fulfillment of the requirement for the award of degree
Of CSE

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# Acknowledgement

I would like to thank respected Mr…….. and Mr. ……..for giving me such a wonderful opportunity to expand my knowledge for my own branch and giving me guidelines to present a seminar report. It helped me a lot to realize of what we study for.

Secondly, I would like to thank my parents who patiently helped me as i went through my work and helped to modify and eliminate some of the irrelevant or un-necessary stuffs.

Thirdly, I would like to thank my friends who helped me to make my work more organized and well-stacked till the end.

Next, I would thank Microsoft for developing such a wonderful tool like MS Word. It helped my work a lot to remain error-free.

Last but clearly not the least, I would thank The Almighty for giving me strength to complete my report on time.

# Preface

I have made this report file on the topic **Google App Engine;** I have tried my best to elucidate all the relevant detail to the topic to be included in the report. While in the beginning I have tried to give a general view about this topic.

My efforts and wholehearted co-corporation of each and everyone has ended on a successful note. I express my sincere gratitude to ……..who assisting me throughout the preparation of this topic. I thank him for providing me the reinforcement, confidence and most importantly the track for the topic whenever I needed it.

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# Abstract

Google App Engine was first released as a beta version in April 2008. It is a platform for developing and hosting web applications in Google-managed data centers. Google's App Engine opens Google's production to any person in the world at no charge. Much like Google gives us all free email with an amazing amount of long term storage, we now have the ability to run the software that we write in Google's data centers.

Google App Engine is cloud computing technology. Google App Engine is software that facilitates the user to run his web applications on Google infrastructure. It is more reliable because failure of any server will not affect either the performance of the end user or the service of the Google.

# Introduction

Google App Engine lets you run your web applications on Google's infrastructure. App Engine applications are easy to build, easy to maintain, and easy to scale as your traffic and data storage needs grow. With App Engine, there are no servers to maintain: You just upload your application, and it's ready to serve your users.

You can serve your app from your own domain name (suc h as http://www.example.com/) using Google Apps. Or, you can serve your app using a free name on the appspot.com domain. You can share your application with the world, or limit access to members of your organization.

Google App Engine supports apps written in several programming languages. With App Engine's Java runtime environment, you can build your app using standard Java technologies, including the JVM, Java servlets, and the Java programming language—or any other language using a JVM-based interpreter or compiler, such as JavaScript or Ruby. App Engine also features a dedicated Python runtime environment, which includes a fast Python interpreter and the Python standard library. The Java and Python runtime environments are built to ensure that your application runs quickly, securely, and without interference from other apps on the system.

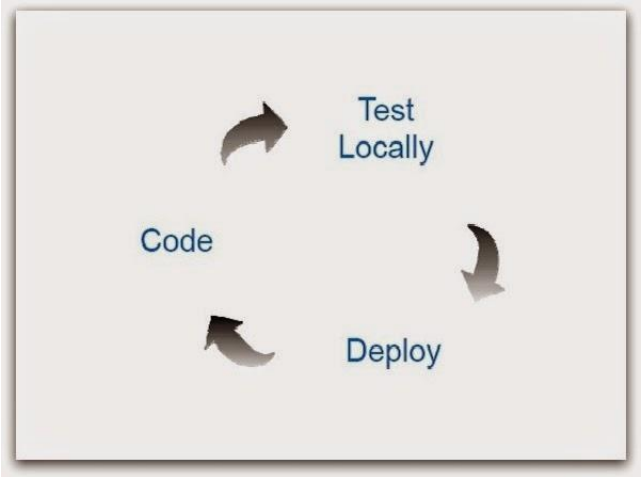
# What Is Google App Engine?

Google App Engine is a Platform as a Service (PaaS) offering that lets you build and run applications on Google's infrastructure. App Engine applications are easy to build, easy to maintain, and easy to scale as your traffic and data storage needs change. With App Engine, there are no servers for you to maintain. You simply upload your application and it's ready to go.

# Working Of Google App Engine

Creating an App Engine application is easy, and only takes a few minutes. And it's free to start: upload your app and share it with users right away, at no charge and with no commitment required.

Google App Engine applications can be written in either the Java or Python programming languages. The Steps for how to create an application and deploy on app engine is shown below.




**Python Runtime Environment**

With App Engine's Python runtime environment, you can implement your app using the Python programming language, and run it on an optimized Python interpreter. App Engine includes rich APIs and tools for Python web application development, including a feature rich data modeling API, an easy-to-use web application framework, and tools for managing and accessing your app's data. You can also take advantage of a wide variety of mature libraries and frameworks for Python web application development, such as Django.

The Python runtime environment uses Python version 2.5.2. Additional support for Python 3 is being considered for a future release. The Python environment includes the Python standard library. Of course, not all of the library's features can run in the sandbox environment. For instance, a call to a method that attempts to open a socket or write to a file will raise an

exception. For convenience, several modules in the standard library whose core features are not supported by the runtime environment have been disabled, and code that imports them will raise an error.

Application code written for the Python environment must be written exclusively in Python. Extensions written in the C language are not supported. The Python environment provides rich Python APIs for the data store, Google Accounts, URL fetch, and email services. App Engine also provides a simple Python web application framework called webapp to make it easy to start building applications.

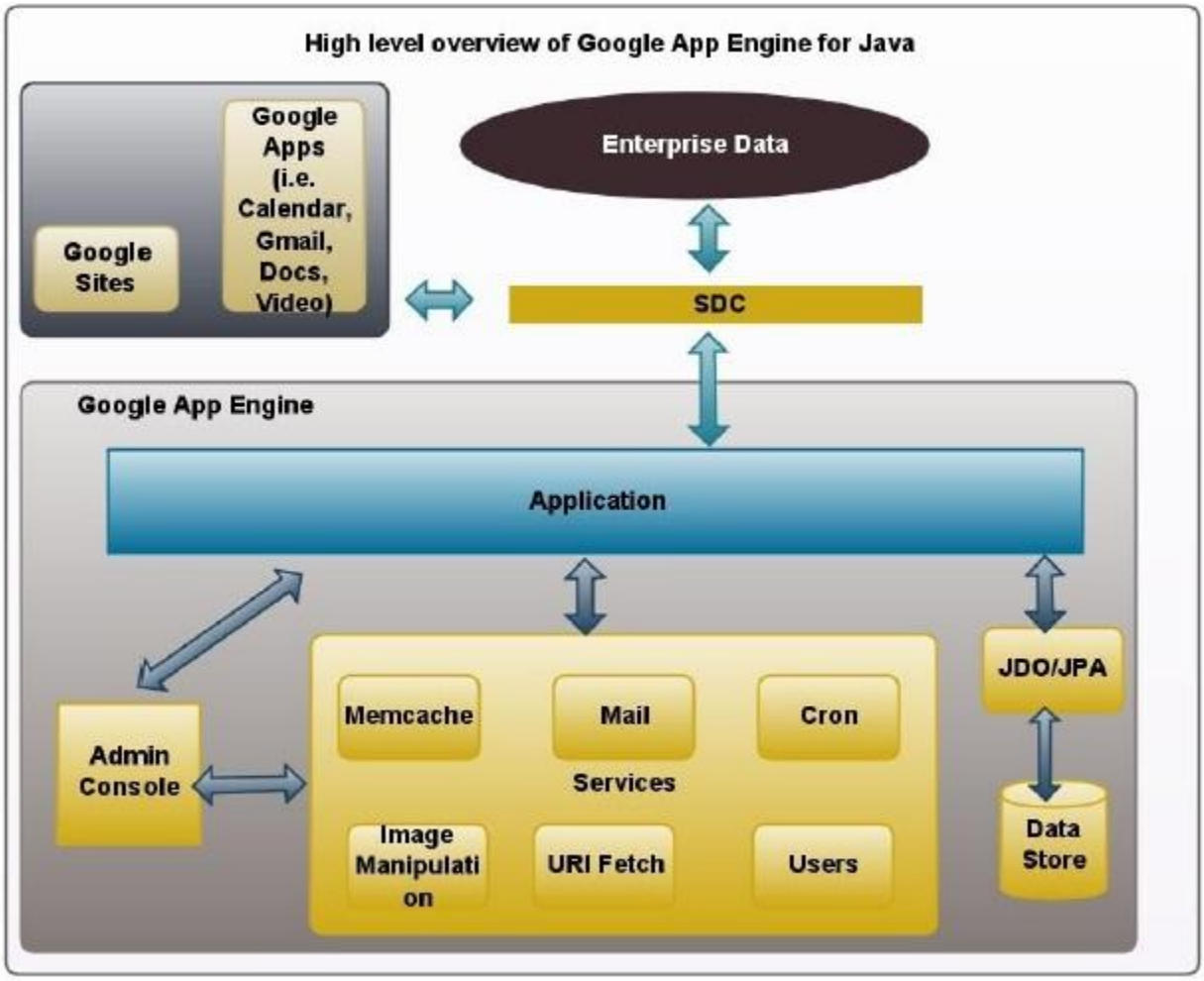
**Billing and Budgeting Resources**

Each App Engine application can consume a certain level of computing resources for free, controlled by a set of quotas. Developers who want to grow their applications beyond these free quotas can do so by enabling billing for their application and using Google Checkout to set a daily resource budget, which will allow for the purchasing of additional resources if and when they are needed. App Engine will always be free to get started, and after you've enabled billing for your app all usage up to the free quotas will remain free.

# GAE Application Environment

Google App Engine makes it easy to build an application that runs reliably, even under heavy load and with large amounts of data. App Engine includes the following features:

persistent storage with queries, sorting and transactions¬
automatic scaling and load balancing¬
APIs for authenticating users and sending email using Google Accounts¬
task queues for performing work outside of the scope of a web request¬
scheduled tasks for triggering events at specified times and regular intervals¬
dynamic web serving, with full support for common web technologies¬




**Java Runtime Environment**

• You can develop your application for the Java runtime environment using common Java web development tools and API standards. Your app interacts with the environment using the Java Servlets standard, and can use common web application technologies such as Java Server Pages

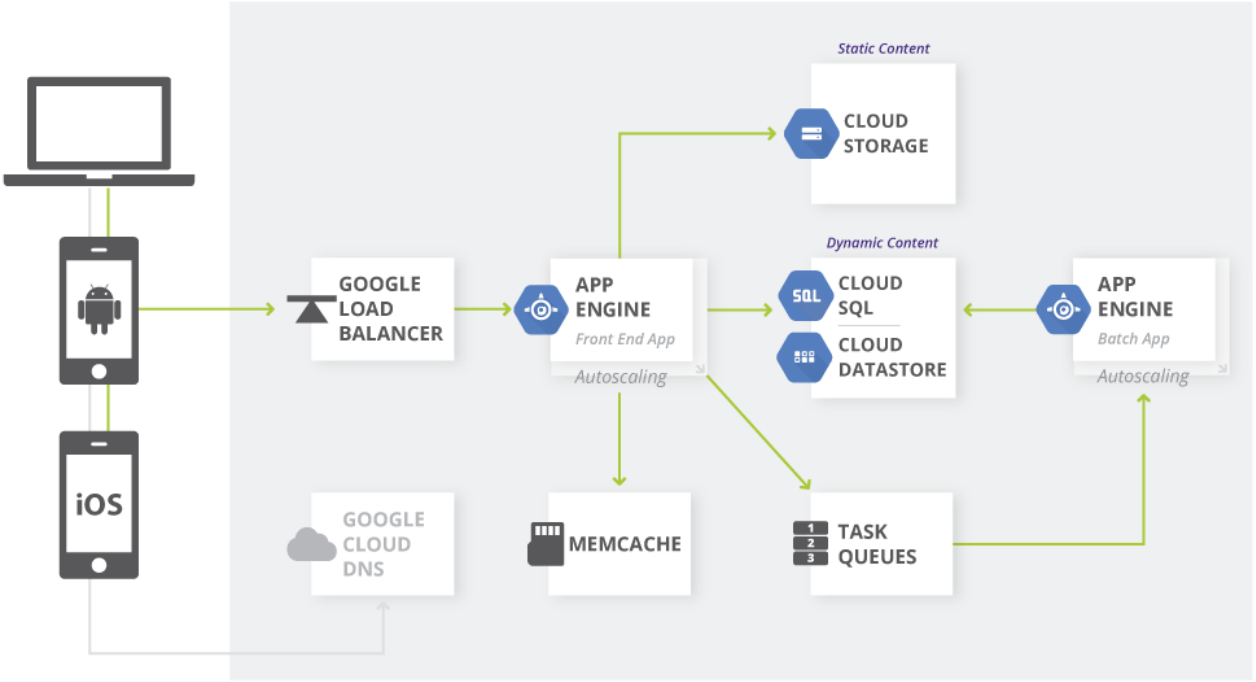
The Java runtime environment uses Java 6. The App Engine Java SDK supports developing apps using either Java 5 or 6. The environment includes the Java SE Runtime Environment (JRE) 6 platform and libraries. The restrictions of the sandbox environment are implemented in the JVM. An app can use any JVM byte code or library feature, as long as it does not exceed the sandbox restrictions. For instance, byte code that attempts to open a socket or write to a file will throw a runtime exception.

Your app accesses most App Engine services using Java standard APIs. For the App Engine data store, the Java SDK includes implementations of the Java Data Objects (JDO) and Java Persistence API (JPA) interfaces. Your app can use the JavaMail API to send email messages with the App Engine Mail service. The java.net HTTP APIs accesses the App Engine URL fetch service.

App Engine also includes low-level APIs for its services to implement additional adapters, or to use directly from the application. See the documentation for the data store, memcache, URL fetch, mail, images and Google Accounts APIs. Typically, Java developers use the Java programming language and APIs to implement web applications for the JVM. With the use of JVM-compatible compilers or interpreters, you can also use other languages to develop web applications, such as JavaScript, Ruby.

# Architecture: Web Application on Google App Engine

Developers leverage Google App Engine to simplify development and deployment of Web Applications. These applications use the autoscaling compute power of App Engine as well as the integrated features like distributed in-memory cache, task queues and datastore, to create robust applications quickly and easily.




App Engine is Google's PaaS platform, a robust development environment for applications written in Java, Python, PHP and Go. The SDK for App Engine supports development and deployment of the application to the cloud. App Engine supports multiple application versions which enables easy rollout of new application features as well as traffic splitting to support A/B testing.

Integrated within App Engine are the Memcache and Task Queue services. Memcache is an in-memory cache shared across the AppEngine instances. This provides extremely high speed access to information cached by the web server (e.g. authentication or account information).

Task Queues provide a mechanism to offload longer running tasks to backend servers, freeing the front end servers to service new user requests. Finally, App Engine features a built-in load

balancer (provided by the Google Load Balancer) which provides transparent Layer 3 and Layer 7 load balancing to applications.

## Advantages of Google App Engine

There are many advantages of the app engine, including:

**Infrastructure for Security**

Around the world, the Internet infrastructure that Google has is probably the most secure. There is rarely any type of unauthorized access till date as the application data and code are stored in highly secure servers.

You can be sure that your app will be available to users worldwide at all times since Google has several hundred servers globally. Google's security and privacy policies are applicable to the apps developed using Google's infrastructure.

**Scalability**

For any app's success, this is among the deciding factors. Google creates its own apps using GFS, Big Table and other such technologies, which are available to you when you utilize the Google app engine to create apps. You only have to write the code for the app and Google looks after the testing on account of the automatic scaling feature that the app engine has. Regardless of the amount of data or number of users that your app stores, the app engine can meet your needs by scaling up or down as required.

**Performance and Reliability**

Google is among the leaders worldwide among global brands. So, when you discuss performance and reliability you have to keep that in mind. In the past 15 years, the company has created new benchmarks based on its services' and products' performance. The app engine provides the same reliability and performance as any other Google product.

**Cost Savings**

You don't have to hire engineers to manage your servers or to do that yourself. You can invest the money saved in to other parts of your business.

**Platform Independence**

You can move all your data to another environment without any difficulty as there is not much dependency on the app engine platform.

# Disadvantages of Google App Engine

Like all other products and applications Google App Engines does have some flaws and disadvantages. If you are considering using this platform for creating web application you should also be aware of the downsides too. Let us take a look at some of these.

**You Are At Google's Mercy**

When you are developing an app using Google's App Engine you are at their complete mercy. Think about a situation where all of Google's servers are down, your application will also have to face the music. If you are creating apps that are required by customers to immediate tasks such as book tickets etc. your brand name is likely to take a hit in such cases. With web applications that run on Google's infrastructure you won't even have an alternative in case of such situations.

**Violation of Policies**

When you upload an application on Google you have to agree to a long page of privacy policies. How many developers do actually read these policies and even if they read how many can really make out from what they read. Even if unknowingly you violate on of the policies of Google

your application stands to be banned. In the past many users have unknowingly violated the polices of Google AdSense and had to lose all their revenue at one go. Here your entire application stands to be banned if you violate any of the policies.

**Forget Porting**

Application developers have all these while been used to porting their applications between different platforms. But with Google App Engine you can forget porting as most of the infrastructure that you are going to use is proprietary and thus all your data will be locked into BigTable that isn't how traditional relational databases worked and allows you to port the application from one technology to another. So if you plan to opt out of Google in the future you will have to create your application from the scratch.

**It isn't Free**

Though Google is advertising App Engine as a free platform it isn't free if you are planning to develop an advanced application as you will need to purchase resources. Also you will be at the complete mercy of Google's future pricing plans if you join the network.

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## Conclusion

Google App Engine enables you to build web applications for your business leveraging Google's infrastructure.

App Engine applications are easy to develop, maintain, and can scale as your traffic and data storage needs grow. With App Engine, you don't end up paying for large server spaces and then spend on resources maintaining them. You just upload your application, and it's ready to serve to your users. Rest is taken care by Google Cloud.

## References


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