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Technologies and Web Programming

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Production

Production

Web Applications Deployment

Production Environment

- The production environment is the environment provided by the server computer where you will run your web application for external consumption.
- It includes:
  - Computer hardware on which the website runs.
  - Operating system (e.g. Linux, Windows).
  - Programming language runtime and framework libraries on top of which your website is written.
  - Web server used to serve pages and other content (e.g. Nginx, Apache).
  - Application server that passes "dynamic" requests between your web application and the webserver.
  - Databases on which your application is dependent.

Production Environment

- The server computer could be located on your own facility and connected to the Internet by a fast link

  OR

- Use a server computer that is hosted "in the cloud“.
  - In this case, your code is run on some remote computer, or possibly a "virtual" computer, in a hosting company's data center.
  - The remote server will usually offer some guaranteed level of computing resources (e.g. CPU, RAM, storage memory, etc.) and Internet connectivity for a certain price.

Production Environment - IaaS

- IaaS - Infrastructure as a Service – is a remotely accessible computing/networking hardware, provided as a hosting service.
- Many IaaS providers offer options to preinstall a particular operating system, onto which you must install the other components of your production environment.
- Other vendors allow you to select more fully-featured environments, including a complete particular web framework, e.g Django, and a web-server setup.

Production Environment - PaaS

- PaaS - Platform as a Service – is another kind of hosting service where the host platform takes care of:
  - most of the production environment – web server, application server, load balancers;
  - and most of what you need to scale the application.
- PaaS makes deployment quite easy, because you just need to concentrate on your web application and not all the other server infrastructure.

Choosing a Hosting Service

- Issues to take in account:
  - How busy your site is likely to be and the cost of data and computing resources required to meet that demand.
  - Level of support for scaling horizontally (adding more machines) and vertically (upgrading to more powerful machines) and the costs of doing so.
  - Where the supplier has data centers, and hence where access is likely to be fastest.
  - The host's historical uptime and downtime performance.
  - Tools provided for managing the site — are they easy to use and are they secure (e.g. SFTP vs FTP).

Choosing a Hosting Service

- Continue:
  - Inbuilt frameworks for monitoring your server.
  - Known limitations. Some hosts will deliberately block certain services (e.g. email). Others offer only a certain number of hours of "live time" in some price tiers, or only offer a small amount of storage.
  - Additional benefits. Some providers will offer free domain names and support for SSL certificates that you would otherwise have to pay for.
  - Whether the "free" tier you're relying on expires over time, and whether the cost of migrating to a more expensive tier means you would have been better off using some other service in the first place!

Choosing a Hosting Service

- A few sites provide "evaluation", "developer", or "hobbyist" computing environments for "free".
- These are always fairly resource constrained/limited environments, and you do need to be aware that they may expire after some introductory period.
- They are however great for testing low traffic sites in a real environment, and can provide an easy migration to paying for more resources when your site gets busier.
- Popular choices in this category include Heroku, Python Anywhere, Amazon Web Services, Microsoft Azure, etc.

Choosing a Hosting Service

- Some providers also have a "basic" tier that provides more useful levels of computing power and fewer limitations.
- Digital Ocean and Python Anywhere are examples of popular hosting providers that offer a relatively inexpensive basic computing tier (in the $5 to $10USD per month range).
- That’s why, we will choose **Python Anywhere** to deploy our Django Web Application.