## SSH

### Introduction

SSH( Secure Shell) is a protocol to communicate machine with one another over the internet. It allows users to share files as well as control and modify remote computers over the internet and also everything is encrypted.

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### Use of SSH

1. SSH connection in GitHub.
2. Remote connection in another device.

Command : ssh root@<machinename || ipaddress>

### Techniques used in SSH

There are three technique used in SSH. These technique used when we works with Https, block chain etc.

#### Symmetrical Encryption.

It uses one secret key for both encryption and decryption. Disadvantage is if anyone has the key can decrypt the message.

The disadvantage can be solved by Key Exchange Algorithm (Secure way exchange the key with our bad person intercepting it.

#### Asymmetrical Encryption.

It uses two separate keys for encryption and decryption. And it will have public and private key for both the machine which will be communicate. Public key can be shared to outside but the private key should not be share to anybody.

Message that encrypted by machine public key can only be decrypted by the same machine private key.

**Difiie Hellman key exchange algorithm**

**It uses the information of public and private key information of two machines two generate without exchanging the keys. Each machine on its computer can generate asymmetrical key**

#### Hashing

It is another form of cryptography used in secure shell connection. They are never meant to decrypt anything, it simply generate a unique value of a fixed length for each input that it gets (but for the generate key we can’t get the input string its one way)

Using hash function each message that it transmitted must contain a mac and this mac is a hashed generated from the symmetric key.

## Performance

### 3 Keys to increase the performance

1. Front End Side
2. Transfer of file over the wire (network latency)
3. Back End Side

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### Network Performance

#### Minimize Files:-

##### Minimize Text (CSS, Html, JavaScript) – Very easy to do using Web-Pack while build the project files.

##### Minimize Images

Image File Formats:-

JPG: - Usually used for photos, images and things with many colors. And also we cannot change the background of the image with this format.

GIF: - Usually used for small animation. And it usually limit the color counts we can use in it (2- 256) and reducing the color leads to file saving.

PNG: - Usually used in logo and limits the color counts we can use and it tends to lot smaller in size than JPG. We can add transparency to that (means changing the background color).

SVG:- It’s an Extensible Markup Language (XML)-based vector image format for two-dimensional graphics with support for interactivity and animation. And also we can customize it using CSS.

**All remember to pick the right format of images and compress them as much as we can without minimize the quality.**

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|  | Category | Palette | Use for |
| JPG | Lossy | Millions of colors | Still Images Photography |
| GIF | Lossless | Maximum 256 colors | Simple animations Graphics with flat colors Graphics without gradients |
| PNG-8 | Lossless | Maximum 256 colors | Similar to GIF Better transparency but no animation Great for icons |
| PNG-24 | Lossless | Unlimited colors | Similar to PNG-8 Handles still images and transparency |
| SVG | Vector/lossless | Unlimited colors | Graphics/logos for web Retina/high-dpi screens |

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**Display Different sized images for different backgrounds:** Using **@media** we can do that

<https://gist.github.com/bartholomej/8415655>

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**Use CDN like imigx:** It says give us all the images no matter how big they are or un-optimized, just upload on to their website and they will give a URL, which we can plugin in our website. And they also do it via CDN (content delivery network)

<https://www.imgix.com/>

**Remove image metadata: -** Meta data means which device it clicked, when it clicked etc. Use the below url to remove it.

<https://www.verexif.com/en/>

#### Minimize Deliveries

Reducing the download frequency

## Resources

### Digital Ocean

Cloud platform for hosting

<https://www.digitalocean.com/>

### Asymmetric Encryption

<https://www.youtube.com/watch?v=NmM9HA2MQGI>  
  
<https://www.youtube.com/watch?v=Yjrfm_oRO0w>  
  
<https://www.youtube.com/watch?v=vsXMMT2CqqE&t=>  
  
<https://www.youtube.com/watch?v=NF1pwjL9-DE>

### Set SSH for GitHub

<https://github.com/antonykidis/Setup-ssh-for-github/blob/master/Setup-ssh-on-github.pdf>

### Blog

<https://zerotomastery.io/blog/?tag=WDM>

### Image Types

<https://99designs.com/blog/tips/image-file-types/>

<https://pageweight.imgix.com/> (for analyze any website)

<https://www.sitepoint.com/gif-png-jpg-which-one-to-use/>

### JPG image optimizer

<http://jpeg-optimizer.com/>

### PNG image optimizer

<https://tinypng.com/>

### Media Queries for image optimization

<https://gist.github.com/bartholomej/8415655>

<https://css-tricks.com/snippets/css/media-queries-for-standard-devices/>

### Remove Meta tag of an image

<https://www.verexif.com/en/>