Introduction

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KTH

2019

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Choosing an operating system

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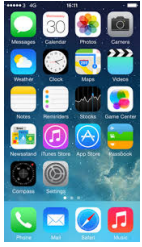

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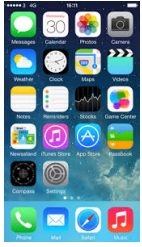

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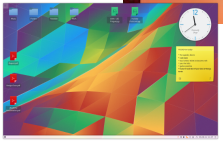

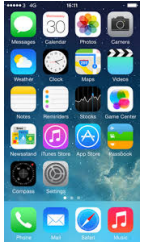

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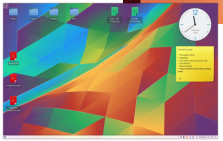

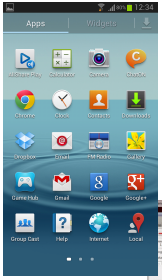

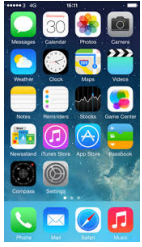

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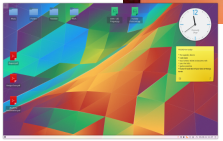

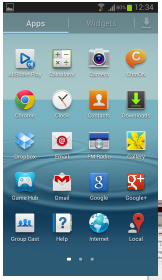

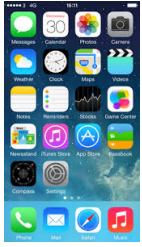

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What is important when choosing an operating system?

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- How it works under the hood.

What is an operating system?

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Abstraction, virtualisation and managing of resource.

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Abstraction, virtualisation and managing of resource.

- Abstraction
  - How do we create an abstraction layer that provides an environment for programming of a process?
- Virtualisation
  - How do we create the image of dedicated hardware while in fact we have several process sharing the same hardware?
- Resource management
  - Given that we have limited amount of resources, how do we share them in a fair way?

Abstraction

The Operating System

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A well structured world

The Operating System

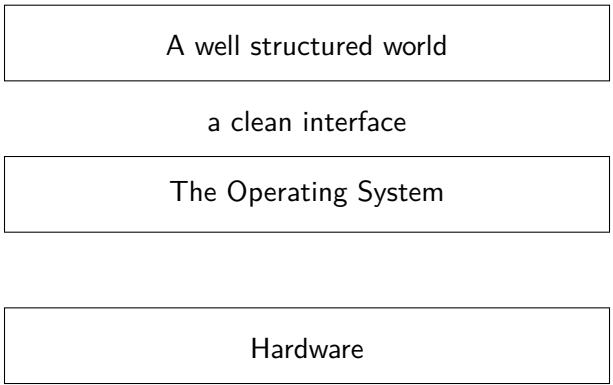
Abstraction

A well structured world

a clean interface

The Operating System

Abstraction



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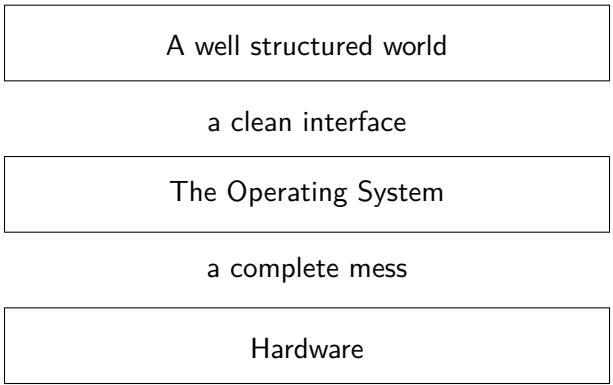

Abstraction

$Hardware : CPU, RAM, HD, SSD, NIC, USB....$

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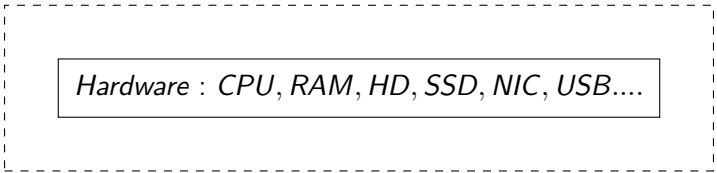

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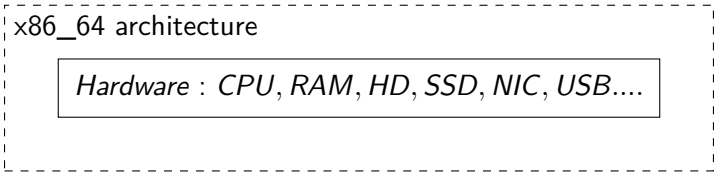

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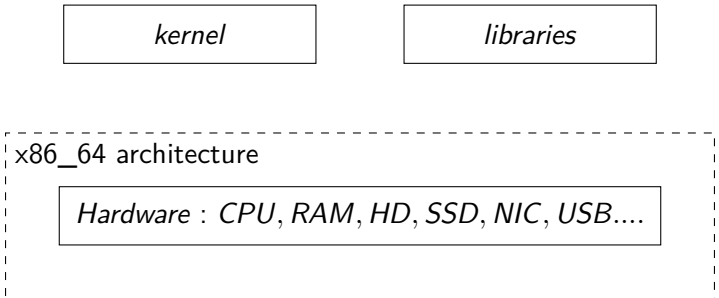

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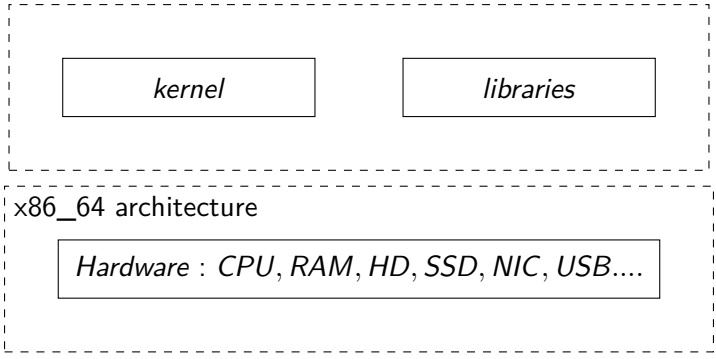

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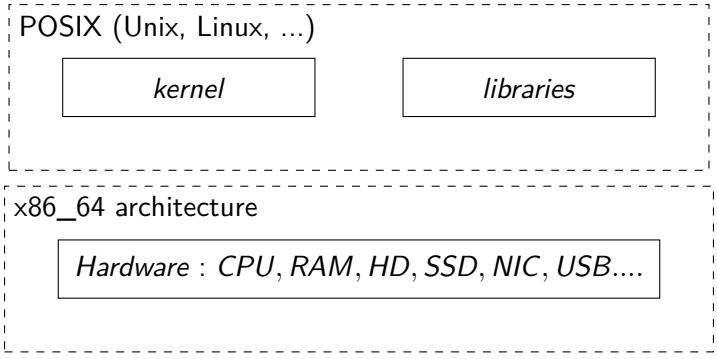

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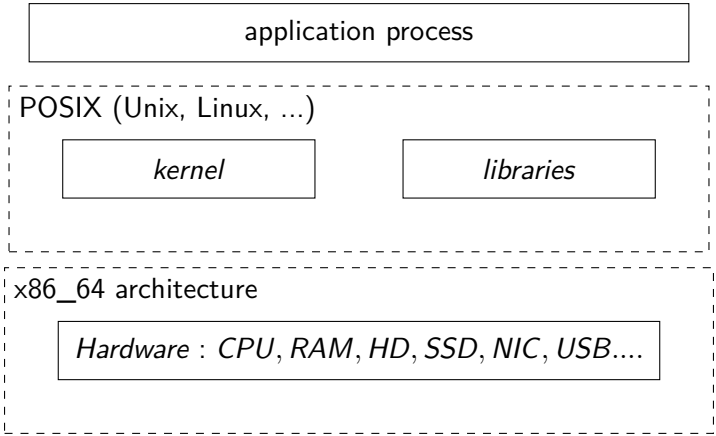

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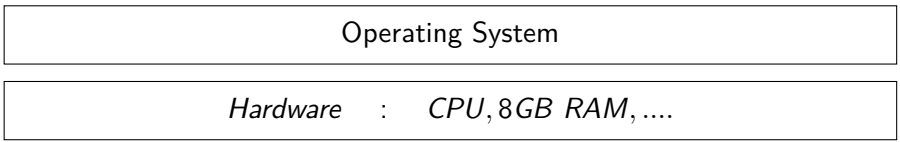
C programs

```
int counter = 0;

void hello(char *name){
  printf("Hello: %s, %d\n",  name, counter);
}

int main() {
  char *me = argv[1];
  while(counter != 10) {
     counter++;
     hello(me);
     sleep(1);
   }
   return 0;
 }
```

Virtualization



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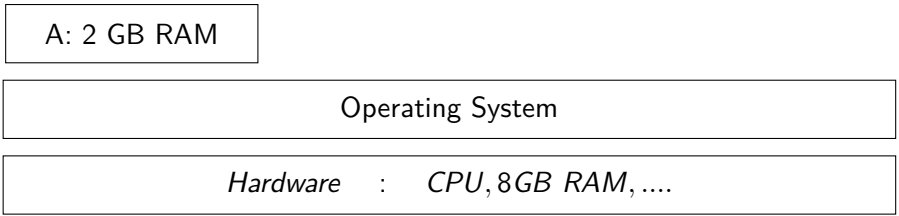

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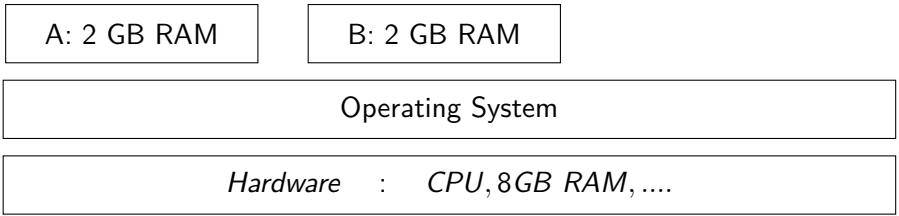

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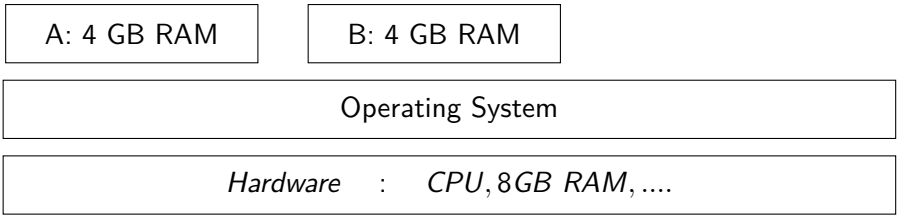

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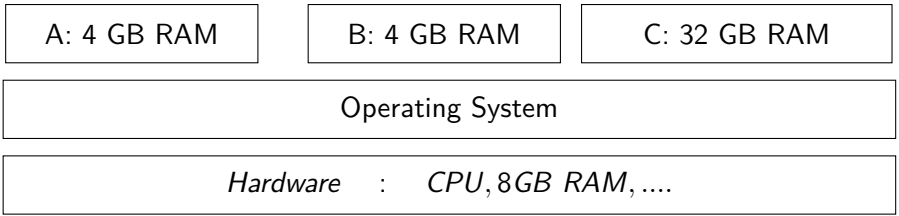

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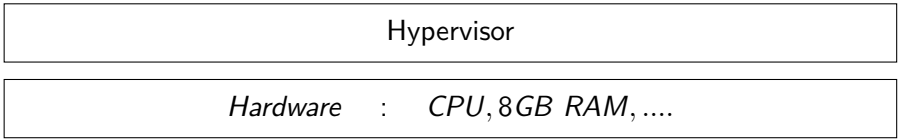

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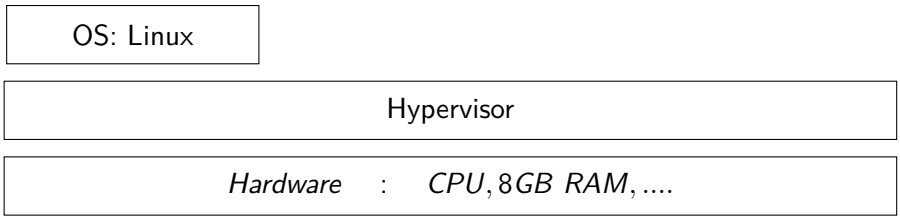

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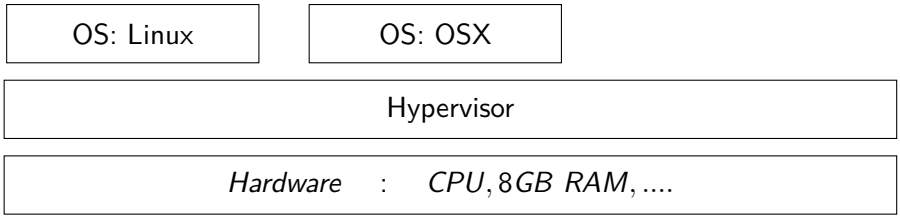

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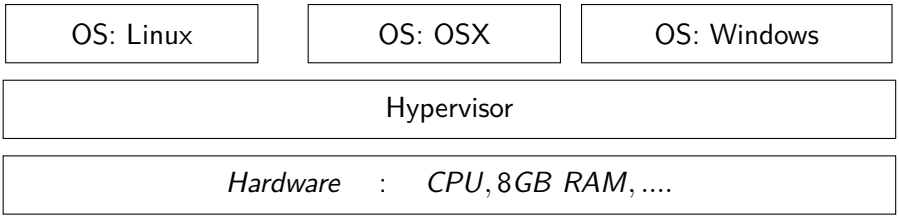

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- Memory: efficient allocation and deallocation, malloc/free...
- Storage: HDD, SSD, ...

to implement an operating system

Why is it hard to implement an operating system?

Summary

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Start programming today.