sections details

presentation

DAD – Distributed Applications Development

Cristian Toma

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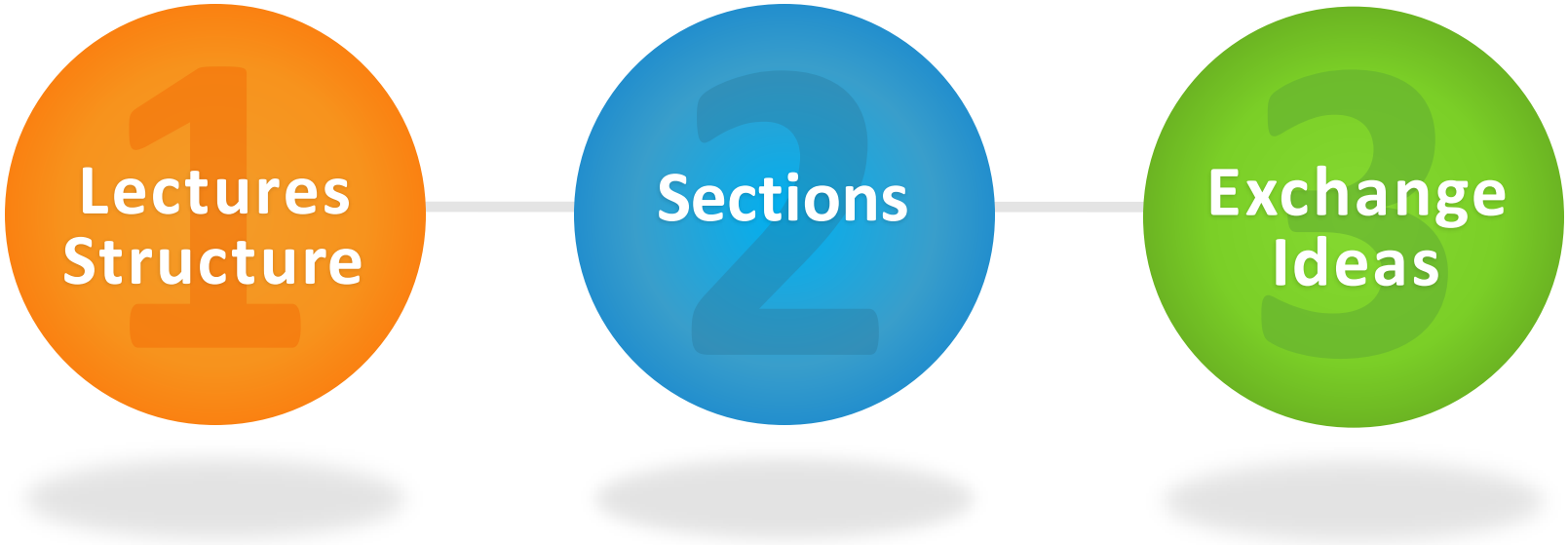
Cristian Toma – Business Card

Agenda for DAD



DAD Administrative issues, Mission, Target Group Profile

DAD Lectures Structure

1.1 DAD Lectures Structure

Main issues:

Didactic Activities: Lectures 50% + Lab / Seminar 50%
14 meetings **14 meetings**

Evaluation: PC Exam – 70% / Seminars tests & assignments – 30%

E-Framework: VMs – VM-Ware Virtual Machines with:

- Linux Ubuntu LTS + JDK 8/9/11 + Eclipse + Apache Tomcat + Spring + GCC + Apache Kafka

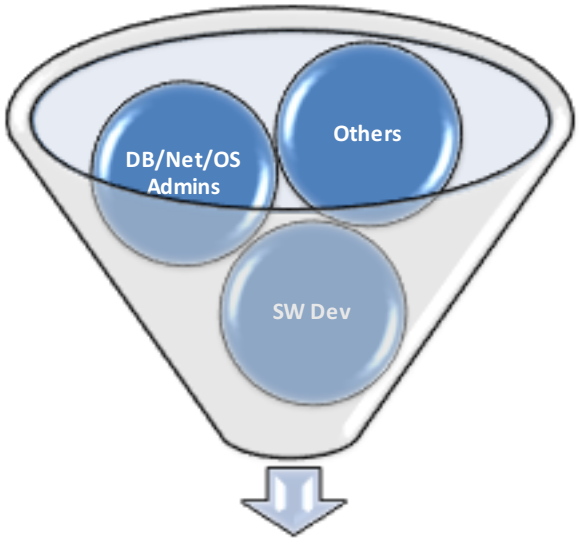
E-Learning Platform: SAKAI – http://ism.ase.ro - http://acs.ase.ro/dad | https://github.com/critoma/dad

Prerequisites: Fundamentals of Java SE + node.js + C/C++ with Networking + Linux/Windows OS | Optional –Python

Mission: Technological transfer from university to the students of practical and theoretical issues related with distributed applications development.

1.2 Target Group Profile

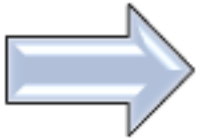
DAD – Distributed Applications Development

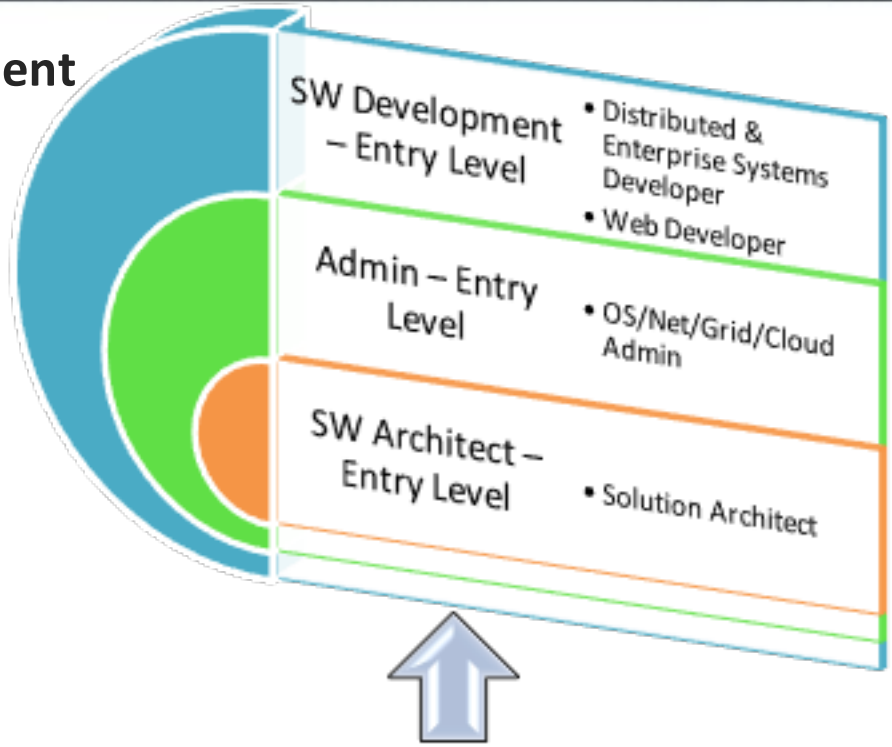


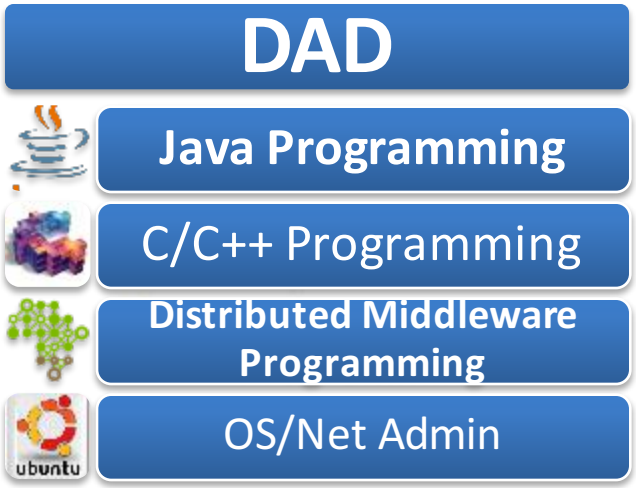
DAD needs students with

C/C++, C#, Java, Networking, OS

Knowledge of Fundamentals







Sections – OOP, Networking, Web Dev, Core Middleware Dev, Distributed Solutions Dev

DAD Sections & References

It’s not just about the programming, but providing smart solutions

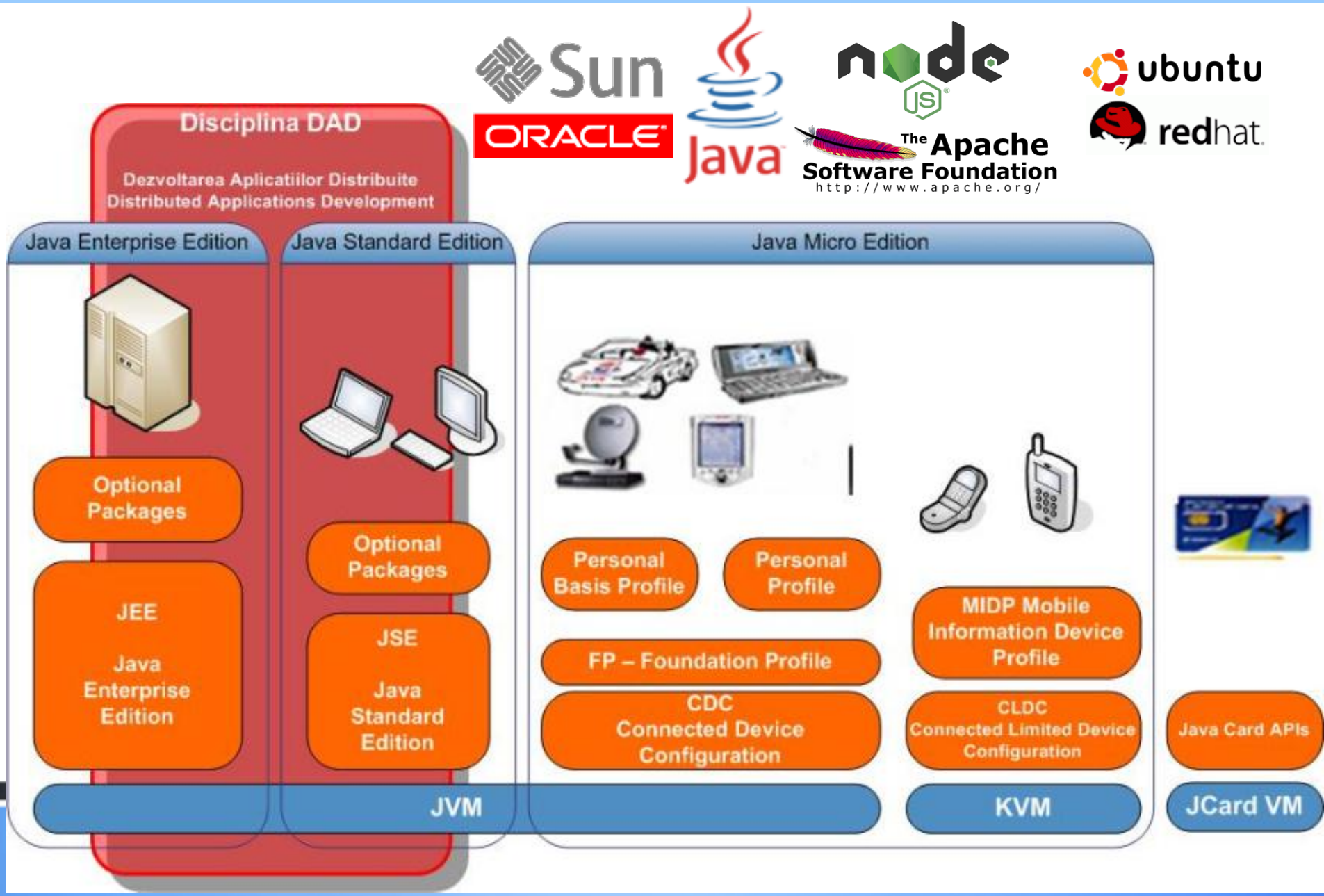
DAD Sections & References

What about the DAD as it is @ Harvard/MIT?

Could you provide a solution for finding out the biggest mark in the class?

Do we have unicast, multicast, broadcast messages or client-server, P2P / hybrid paradigms?...GREAT...Please upload the solution in Java / C# / C/C++ / Python / Ruby till next week 23:50 in e-learning platform – SAKAI...I'm NOT kidding...

Java SE: 30% + Java EE: 30% + node.js: 20% + DevOps/Cloud/OS: 20%



TIOBE Programming Languages Index – 2020

Feb 2020	Feb 2019	Change	Programming Language	Ratings	Change
1	1		Java	17.358%	+1.48%
2	2		C	16.766%	+4.34%
3	3		Python	9.345%	+1.77%
4	4		C++	6.164%	-1.28%
5	7	↑	C#	5.927%	+3.08%
6	5	↓	Visual Basic .NET	5.862%	-1.23%
7	6	↓	JavaScript	2.060%	-0.79%
8	8		PHP	2.018%	-0.25%
9	9		SQL	1.526%	-0.37%
10	20	⇈	Swift	1.460%	+0.54%
11	18	⇈	Go	1.131%	+0.17%
12	11	↓	Assembly language	1.111%	-0.27%

http://www.tiobe.com/index.php/content/paperinfo/tpci/index.html

IDE Index - 2019

Worldwide, Feb 2019 compared to a year ago:

Rank	Change	IDE	Share	Trend
1		Visual Studio	22.93 %	-3.0 %
2		Eclipse	21.5 %	-3.6 %
3		Android Studio	16.58 %	+6.1 %
4		NetBeans	6.49 %	-0.3 %
5	↑↑↑	IntelliJ	4.74 %	+0.8 %
6	↑↑↑↑	Visual Studio Code	4.5 %	+1.7 %
7	↓	Sublime Text	4.14 %	-0.1 %
8	↑	pyCharm	4.11 %	+1.1 %
9	↓↓↓↓	Atom	3.91 %	-0.5 %
10	↓↓↓	Xcode	3.46 %	-0.8 %
11		Code::Blocks	2.03 %	-0.4 %
12	↑	Vim	1.05 %	-0.1 %
13	↓	Xamarin	0.94 %	-0.3 %
14		PhpStorm	0.8 %	+0.0 %
15		Komodo	0.65 %	-0.0 %
16		Qt Creator	0.34 %	-0.3 %
17	↑↑	Emacs	0.31 %	-0.0 %
18		geany	0.29 %	-0.0 %
19	↓↓	JDeveloper	0.26 %	-0.1 %
20	↑	MonoDevelop	0.19 %	-0.0 %
21	↓	Aptana	0.16 %	-0.1 %
22		JCreator	0.14 %	-0.0 %

http://pypl.github.io/PYPL.html

e.g. Why Python for FaaS Cloud and Java/Kotlin/Scala or C/C++ for REAL Back-end Production?

Class & Inheritance in Java:

```
class Animal{
     private String name;
     public Animal(String name){
          this.name = name;
     }
     public void saySomething(){
     System.out.println("I am" + name);
     }
}

class Dog extends Animal{
     public Dog(String name) {
          super(name);
     }
     public void saySomething(){
     System.out.println("I can bark");
     }
}

public class Main {
public static void main(String[] args)
     {
     Dog dog = new Dog("Chiwawa");
          dog.saySomething();
     }
}
```

Class & Inheritance in Python:

```
class Animal():

     def __init__(self, name):
          self.name = name

     def saySomething(self):
          print "I am " + self.name

class Dog(Animal):
     def saySomething(self):
          print "I am "+ self.name\
          + ", and I can bark"

dog = Dog("Chiwawa")
dog.saySomething()
```

e.g. Why Python for FaaS Cloud and Java/Kotlin/Scala or C/C++ for REAL Back-end Production?

Java

```java
public class User {
    private final String firstName;
    private final String lastName;
    private final int age;

    public User(String firstName, String lastName, int age) {
        this.firstName = firstName;
        this.lastName = lastName;
        this.age = age;
    }

    public String getFirstName() {
        return firstName;
    }

    public String getLastName() {
        return lastName;
    }

    public int getAge() {
        return age;
    }

    public String toString() {
        return firstName + " " + lastName + ", age " + age;
    }
}
```

```java
class Main {
    public static void main(String[] args) {
        System.out.println(new User("John", "Doe", 30));
    }
}
```

Kotlin

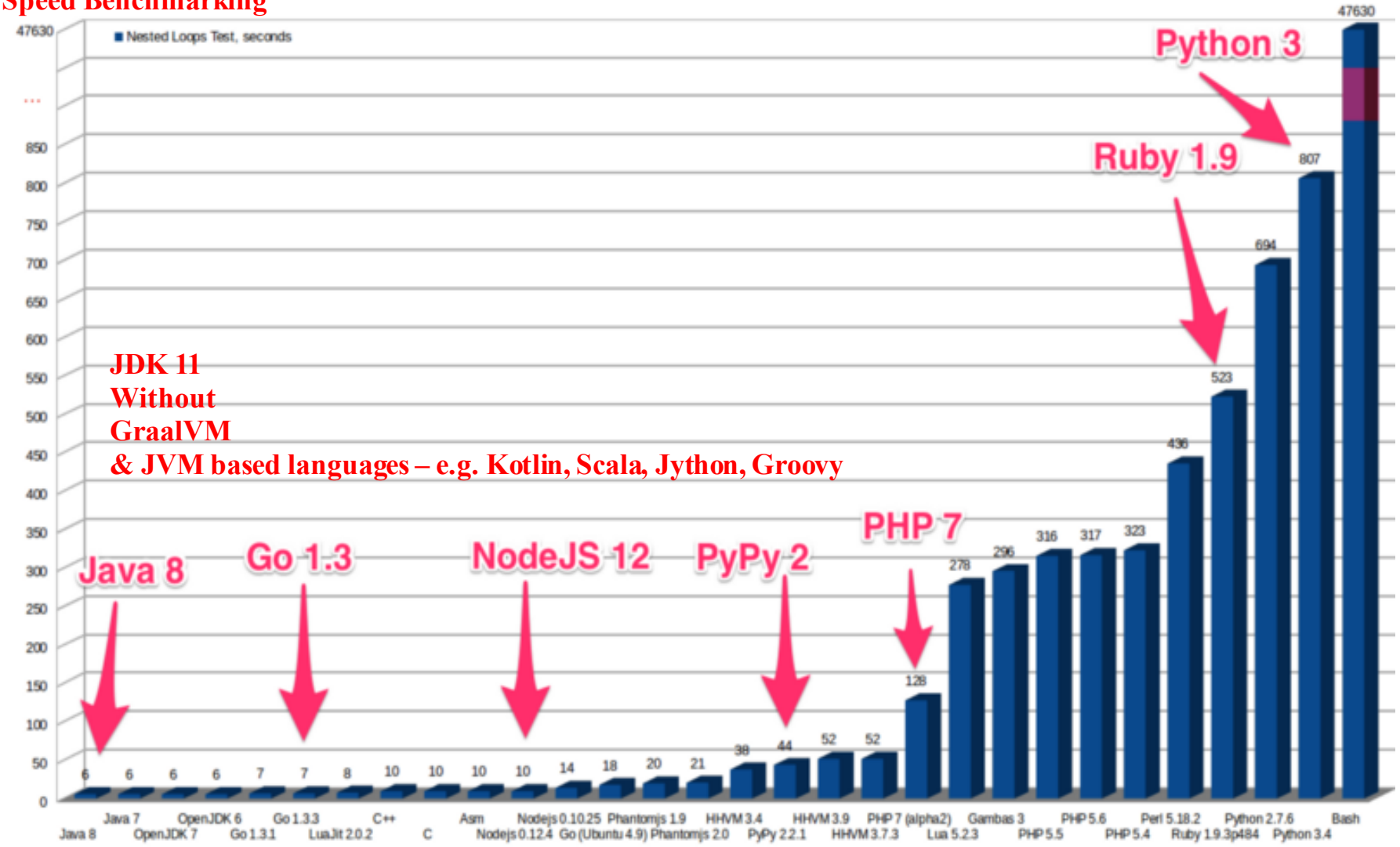
```kotlin
public class User(val firstName: String,
                  val lastName: String,
                  val age: Int) {

    fun toString() = "$firstName $lastName, age $age"

}
```

```kotlin
fun main(args : Array<String>) {
    println(User("John", "Doe", 30))
}
```

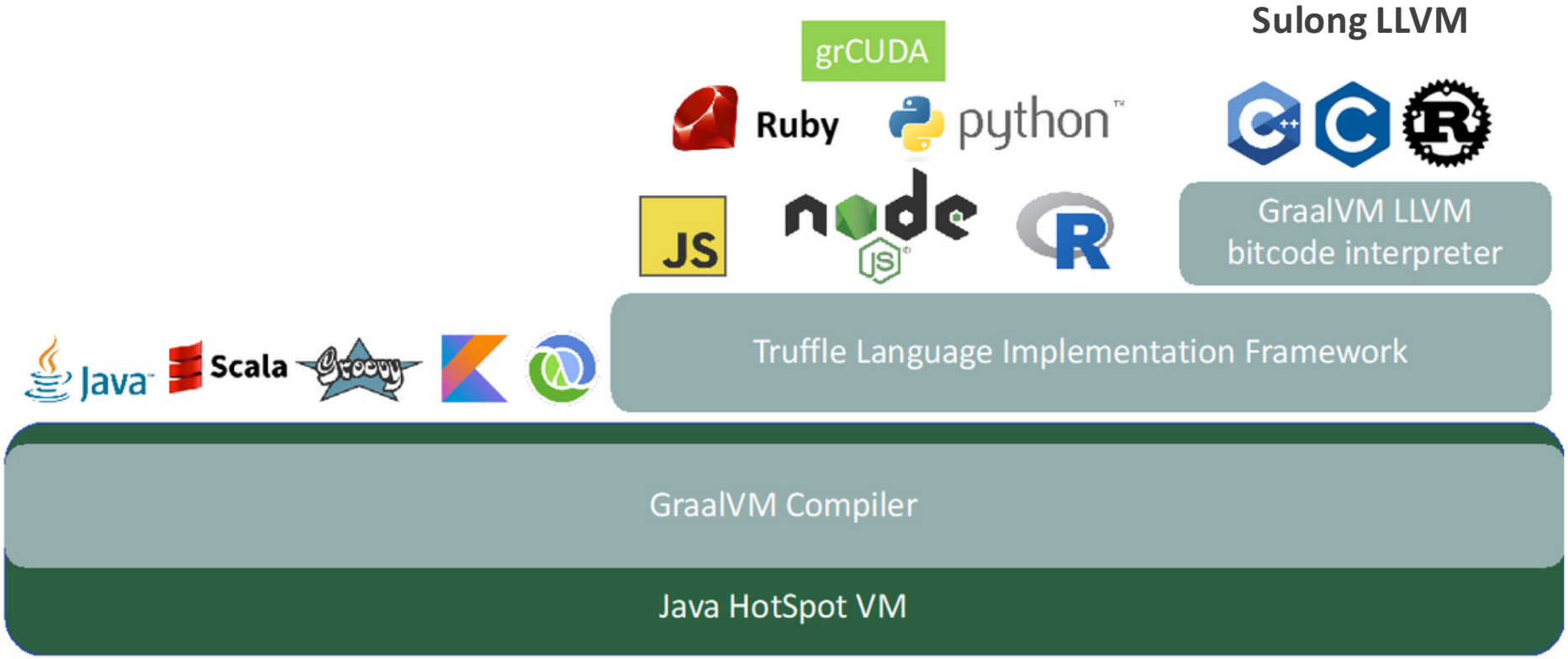
Could be a matter of flavor and availability in terms of the jobs in the market,
But the Performance and Resources (CPU, RAM, speed, etc.) should be the most important!

e.g. Why Python for FaaS Cloud and Java/Kotlin/Scala or C/C++ for REAL Back-end Production?

Speed Benchmarking



GraalVM in one slide



Recommended Languages, OS & Technologies

OS & Virtualization

Programming Languages

Interpreted Languages

HTC – High Throughput Computing & HPC Academic Frameworks & Languages

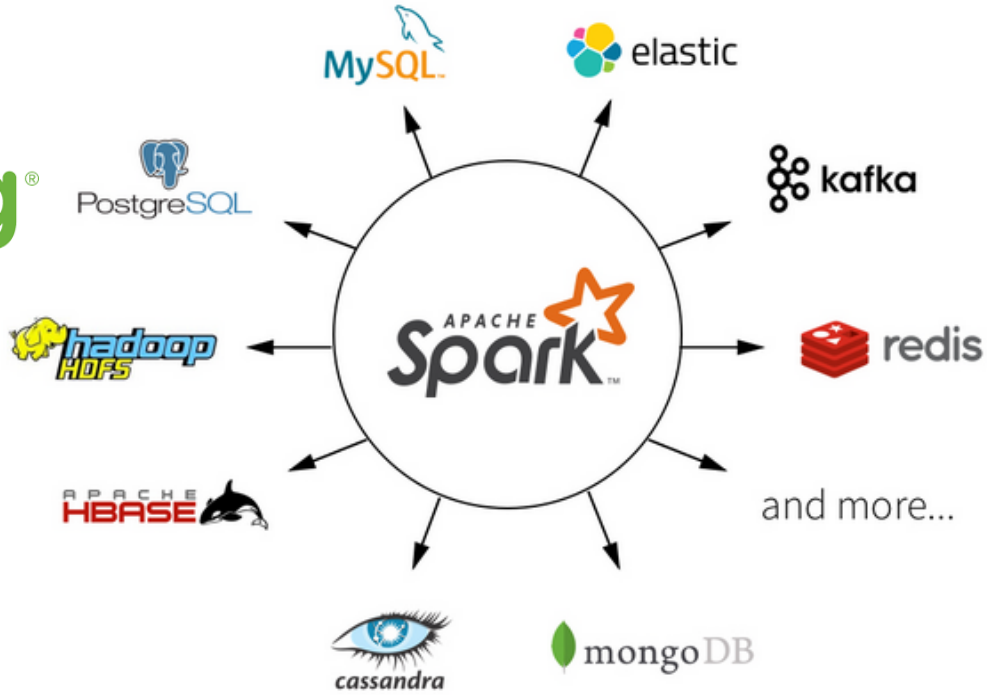
Open MPI: Open Source HPC

HPC – High Performance Computing / Parallel Computing Frameworks & Languages

Recommended Languages & Technologies for HTC

HTC – High Throughput Computing Frameworks based on C/C++/Java

Java Map-Reduce and Distributed Framework | Data Processing Micro-Services & Actors



Recommended Platforms for the Cloud

IaaS/PaaS/CaaS/FaaS Providers

Public Cloud Services Comparison (March 18th,2019)

Category	Service	amazon web services	Azure	Google Cloud Platform	IBM Cloud	ORACLE	Alibaba Cloud
Compute	**Shared Web hosting**		Azure shared App Services		Web hosting services		Web Hosting Simple Application Server
Compute	**Virtual Server**	Amazon EC2	Azure Virtual Machine	Compute Engine	Virtual Server Infrastructure (VSi)	Compute	Alibaba ECS
Compute	**Bare Metal Server**	Amazon EC2 Bare Metal Instance (Preview)	Azure Bare Metal Servers (Large Instance Only for SAP Hana)		Bare Metal Servers	Bare Metal Servers	ECS Bare Metal Instance
Compute	**Virtual Dedicated Host**	Amazon EC2 Dedicated Hosts		Sole Tenant Node (Beta)	Dedicated Virtual Servers Infrastructure (VSi)	Dedicated Compute Classic	Dedicated Host
Compute	**Container Registration Service**	Amazon EC2 Container Registry	Azure Container Registry	Container Registry	IBM Cloud Container Registry	Oracle Cloud Infrastructure Registry	Container Registry
Compute	**Container Management Service**	Amazon EC2 Container Service Amazon Elastic Container	Azure Kubernetes Service (AKS) Azure Container	Kubernetes Engine	IBM Cloud Kubernetes Service	Container Engine for Kubernetes (OKE)	Container Service Container Service for

DAD Issues Summary
for easy sharing

Section Conclusions

DAD – Distributed Applications Development

Technological Transfer from UNI2Student

Main Technologies

- **IPC Linux + Multi-threading**
- **Java Standard Edition**
- **Java/Jakarta Enterprise Edition**
- **Core Distributed Middleware**
  - **RMI**
  - **CORBA**
  - **SOA – Web Services**
  - **JMS, EJB**
- **Distributed Systems for Parallel & Distributed Computing – Case Studies:**
  - **Apache Hadoop**
  - **Condor**

Share knowledge, Empowering Minds

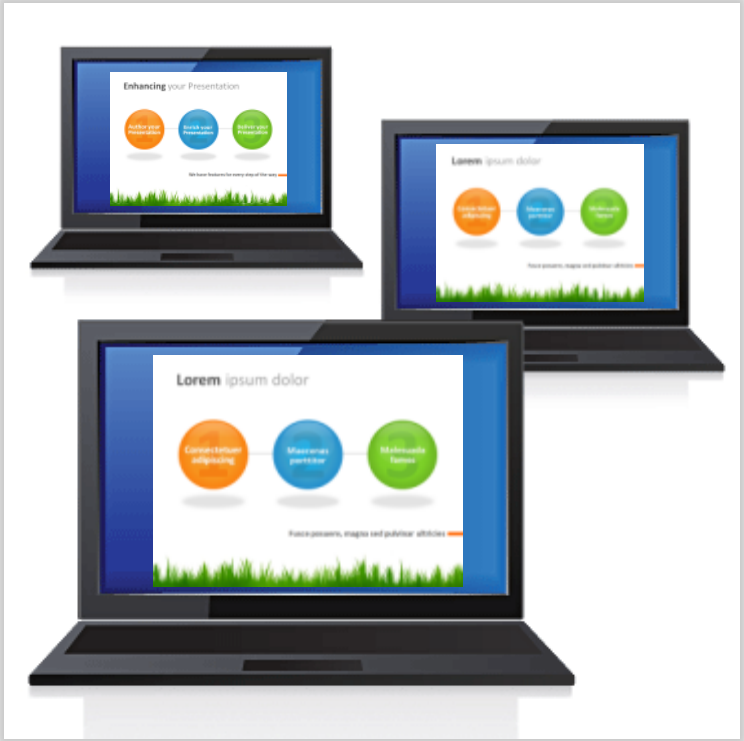
Communicate & Exchange Ideas

SHARE IT

» Show and tell our **KNOWLEDGE**

» Share and realize **IT&C Technological Transfer**

» CREATE together **Distributed Application Development Entry-Level Support - AWERNESS**!



Questions & Answers!

But wait…

There's More!

1. DAD - Is what you expected?
2. How many hours per week are you going to invest in order to achieve DAD goals?
3. How many of you are working in IT field – SW Dev., Admin., Designers?
4. What bachelor programs are you graduated from?
5. How many students get the payment scholarship from the companies vs. how many are/aren't paying the studies?
6. In what disciplines did we collaborate together?

Thanks!