Activity 02 – Distributed computing applications. Case of Study.

The main aim of this activity is to discover the current state of distributed computing applications: architectures, technologies, methodologies, applications, challenges, new trends, etc. You must choose one of the topics proposed below or purpose a new one.

In the case of choosing an application or tool it is interesting to know **how the application deals with challenges and concepts we learnt in Chapter 1**, **focusing the discussion on the architecture, protocols, tools, techniques, and good practices.** Also, you should enrich the discussion analyzing the advantages of these organizations or decisions with respect other competitors or options in the market, as well as drawbacks and challenges.

With respect other topics more related to techniques or methodologies, discus about limitations of current technologies to deal with the new era challenges, etc., you must present the problem or limitations and shed light on the industrial or researchers proposals to solve them, new trends, etc.

The discussion must be always done considering the concepts, techniques, methodologies we have seen in Chapter 1. The objective is not to elaborate in detail the functionalities of the applications, tools, technologies or techniques but to understand the current problems(limitations) and the approaches to face them, conducting a smart analysis, an interesting discussion and a good synthesis.

The list of proposed topics can be seen in Table 1. Next, you can see a list of references. The references are not the text to stick to but a starting point to propose your topic of discussion.

1	Volunteer computing with BOINC. (Architecture, case of study analysis)	[4]
2	Hadoop + Spark. Architecture and applications. Examples.	[6]
3	IoT or Pervasive applications. Technologies and use case analysis.	[7][8]
4	No SQL databases. What, when and why?	[11]
5	What is Blockchain Technology? A Step-by-Step Guide For Beginners	[16]
6	What are microservices? The Hardest Part About Microservices: Your Data	[27][28]
7	Dokers y Kubernetes. Architecture, functionalities and applications.	[18][19][27]
8	RabbitMQ. Components, benefits and application.	[22][23]
9	Kafka. Components, benefits and applications.	[24][25][26]
10	Cloud Computing to Support the Evolution of Massive Multiplayer Online Games. Architecture and Challenges.	[21]
11	Edge and Fog Computing. Architecture and applications.	[29][30]
12	gRPC. A high performance, open source universal RPC framework	[31]
13	Reactive programming. ReactiveX I JavaRx.	[32][33][34] [35][36]

Table 1: Topics proposal

Deliveries and Evaluation

For this activity must prepare a report where you elaborate the chosen topic. In this report you can elaborate in detail your discussion and analysis about the topic, use images, figures, tables, and all tools that you need to properly show the information. Be concise but show the information clearly and completely. Conduct an interesting and full of content discussion. Do not ramble.

In two weeks you will have a follow-up session where the main sections of your discussion, the table of contents, an outline of the main contents and the focus of the discussion should be presented.

In addition to the content, it is also very important to take care of the presentation of the report. We recommend you take a look at the "ReportingGuidelines" document that you will find on the virtual campus.

The activity can be done in groups of maximum two students. Send your topic election through a message on the Forum section in the virtual campus.

References

[4] http://boinc.berkeley.edu

[6] http://hadoop.apache.org

[7] http://www.libelium.com/resources/top_50_iot_sensor_applications_ranking/

[8] https://www.ibm.com/blogs/internet-of-things/data-acquisition-and-integration/

[9] http://katemats.com/distributed-systems-basics-handling-failure-fault-tolerance-and-monitoring/

[11] https://www.linkedin.com/pulse/20140612181108-4788696-5-reasons-why-dynamodb-is-better-than-mongodb/?lipi=urn:li:page:d_flagship3_profile_view_base_post_details;a3bQyARaQOKJzmnzViAQYA

[16] https://blockgeeks.com/guides/what-is-blockchain-technology/

[18] https://www.xataka.com/otros/docker-a-kubernetes-entendiendo-que-contenedores-que-mayores-revoluciones-industria-desarrollo

[19] https://azure.microsoft.com/es-es/topic/kubernetes-vs-docker/

[21] https://link.springer.com/chapter/10.1007/978-3-642-24355-4_11

[22] https://www.pragma.com.co/academia/lecciones/conozcamos-sobre-rabbitmq-sus-componentes-y-beneficios

[23] https://www.sdos.es/blog/microservicios-mensajes-spring-rabbitmq

[24] https://www.ionos.es/digitalguide/servidores/know-how/que-es-apache-kafka/

[25] https://www.confluent.io/what-is-apache-kafka/?utm_medium=sem&utm_source=google&utm_campaign=ch.sem_br.nonbrand_tp.prs_tgt.kafka_mt.xct_rgn.emea_lng.eng_dv.all_con.kafka-general&utm_term=kafka&creative=&device=c&placement=&gclid=Cj0KCQjw18WKBhCUARIsAFiW7JyY8AbMFcdY6bsQYvTS4keEc__DsV5FYF-4xY4ZDn5_ffTW-T1XxzEaAlHfEALw_wcB

[26] https://aprenderbigdata.com/apache-pulsar/

[27] https://www.ibm.com/cloud/learn/microservices

[28] https://developers.redhat.com/blog/2016/08/02/the-hardest-part-about-microservices-your-data?extIdCarryOver=true&sc_cid=701f2000001OH7EAAW#

[29] https://www.networkworld.com/article/3147085/which-iot-applications-work-best-with-fog-computing.html

[30] https://www.networkworld.com/article/3224893/what-is-edge-computing-and-how-it-s-changing-the-network.html

[31] https://grpc.io

[32] https://en.wikipedia.org/wiki/Reactive_programming

[33] https://en.wikipedia.org/wiki/ReactiveX

[34] https://en.wikipedia.org/wiki/Reactive_Streams

[35] https://programacionymas.com/blog/introduccion-rx-java-tutorial-android

[36] https://www.reactiveprinciples.org

Instructions

The activity must be in groups maximum 2 person. You must consider the following deliveries:

- **September 04th**. Topic election.
- **October 11th**. Follow-up session
- **October 30th**. Report deadline
- **November 02-03th**. Oral presentation