

Programming Distributed Computing Platforms with COMPSs

Objectives

Outline: COMPSs is a programming model which is able to exploit the inherent concurrency of sequential applications and execute them in a transparent manner to the application developer in distributed computing platform. This is achieved by annotating part of the codes as tasks, and building at execution a task-dependence graph based on the actual data used consumed/produced by the tasks. The COMPSs runtime is able to schedule the tasks in the computing nodes and take into account facts like data locality and the different nature of the computing nodes in case of heterogeneous platforms. Additionally, recently COMPSs has been enhanced with the possibility of coordinating Web Services as part of the applications.

Learning Outcomes: In the course, the syntax, programming methodology and an overview of the runtime internals will be given. The attendees will get a first lesson about programming with COMPSs that will enable them to start programming with this framework.

A hands-on with simple introductory exercises will be also performed. The students who finish this course will be able to develop simple COMPSs applications and to run them both in a local resource and in a distributed platform (initially in a private cloud)

Prerequisites: Programming skills in Java

Agenda:

Day 1

Session 1 / 9am – 11am: Introduction to COMPSs

Programming mode

- Overview
- Steps
- Properties

COMPSs runtime system

- Overview
- Features

Session 1 / 11:30am – 1pm: Application examples

- Sample codes
- Demos
- Graphical interface (IDE)

Lunch Break 1pm to 2pm

Session 2 / 2 pm- 3:30 pm: Hands-on I

- Virtual Machine Setup
- Application Overview
- Code modification

Session 2 / 4 pm- 6 pm: Hands-on II

- Configuration, compilation & execution
- Monitoring, debugging & tracing
- Final notes

Free hands-on: Students use COMPSs environment with prepared examples, except in the free hands-on session were they can bring their own application.

END of COURSE

Reasoning: Distributed computing platforms like clusters, grids and clouds pose a challenge on application developers due to different issues such as distributed storage systems, complex middleware, geographic distributions

Recommended Accomodation:

From the Airport

Barcelona airport is at 12 Km from the city. More information about Barcelona's airport: www.aena.es. You can arrive with different transport methods from the airport to BSC:

By taxi

In T1, you will find a taxi stand in the arrivals zone (P0) and in the Barcelona-Madrid air corridor; in T2, opposite terminals T2A, T2B and T2C. If they are available, they will show a green light with the text LIBRE or LLIURE (it means "available"). You can check fees at www.taxibarcelona.cat.

By car

If you rent a car from the airport (T1), please leave "El Prat del Llobregat" and take C-32B. Continue along this route and head towards Ronda de Dalt / Lleida / Girona. Close to Barcelona, take route C-32 passing close to Cornellà del Llobregat and L'Hospitalet. Take B-20 and take Exit 10 called "Carretera d'Esplugues". Take the street called "carrer del Gran Capità" and turn left towards Jordi Girona street.

By train

There is a Renfe suburban train. The airport station is situated opposite of terminal T2, and is connected to this terminal via an airbridge. There is also a Bus transit service between the Rail station and T1. From the airport to Barcelona Sants there is approximately 20 minutes journey. From this station, take the L3 (green line) in direction to "Zona Universitaria" and get off on the "Palau Reial" stop. You will have a 5-minutes walking distance to arrive to BSC. (www.renfe.es)

By Bus (Aerobus)

Airport stops: Bus stops at Terminal T1 and T2 (A, B, C)

Downtown stops: This line ends at Plaça Catalunya (city center). Once there, you may take L3 of the underground to "Palau Reial" or "Zona Universitaria" stations.

From the City Centre

Campus Nord of Universitat Politècnica de Catalunya is located at the North-West corner of the city, at the end of the Green Line (L3) of the underground. In order to reach the Campus by public transport, it is advisable to use the underground. There are two stations near to the Campus, "Zona Universitària" and "Palau Reial", both on L3

Contact Us:

education [at] bsc [dot] es (CONTACT US) for further details about MSc, PhD, Post Doc studies, exchanges and collaboration in education and training with BSC.

For further details about Postgraduate Studies in UPC - Barcelona School of Informatics (FiB), visit the [website](#).

Materials

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Download the slides [COMPSs Tutorial](#)

Barcelona Supercomputing Center - Centro Nacional de Supercomputación

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