

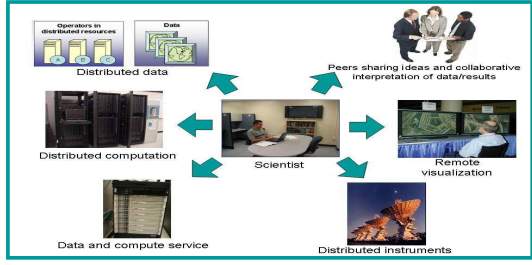


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1 Introduction

We focus our research efforts on an important area that is implicitly included into the WALSAIP conceptual framework: the **distributed processing of signals**. The execution of a set of tasks associated with the signal processing may imply important consumption of computational and storage resources. Therefore, the use of distributed computing technology is a reasonable alternative. In addition to the optimization of resources, a distributed environment to signal processing also provides the opportunity for collaborative design and research.



The **workflow composition of distributed signal processing operators** is the **general purpose of this project**. It targets on the deployment of several operators probably geographically distributed in different domains and developed by different researchers.

2 Objectives

The overall goal of the proposed research is to develop mechanisms to automate the workflow composition of signal processing operators. To accomplish this project the following specific objectives are proposed:

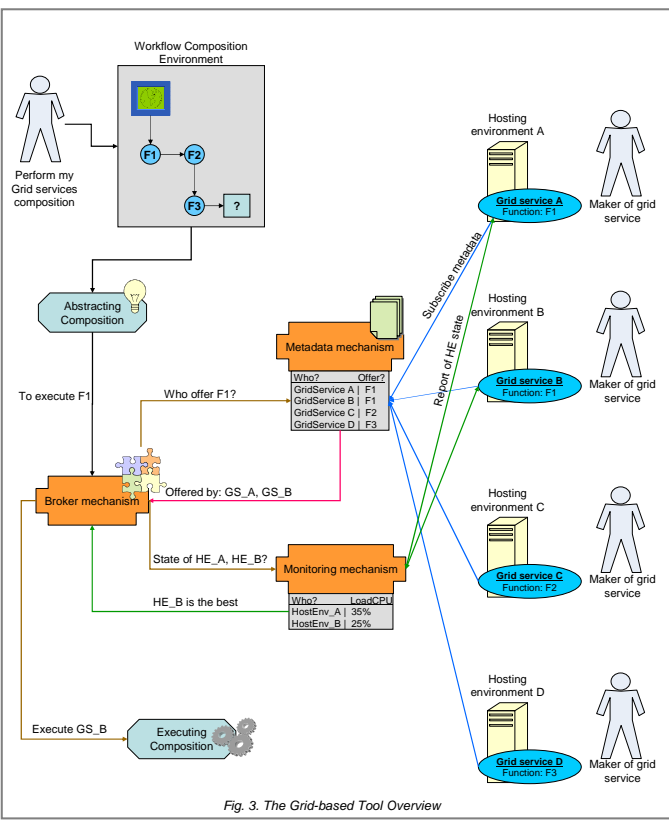
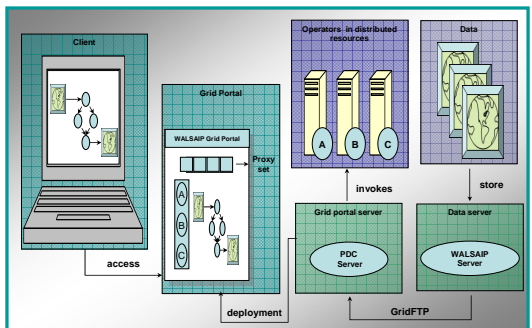
- ❖ To develop a **methodology** to optimize the composition of signal processing operators in a distributed environment.
- ❖ To provide a **grid-based visual interface** to the composition of signal processing operators.

3 Conceptual Framework

Grid service in a general mode, is a set of functions to accomplish a determinate task in a grid environment; each function has associate a set of conventions and interfaces that permit the invocation of that grid service.

A **grid system** may have numerous services, some of these offering the same functionality, and when a user needs to realize a task that involve that functionality, the system should be able to decide what service to execute, and give it to the user in a transparent way. The requirements to achieve this functionality are:

- ❖ Each grid service must offer sufficient information or **metadata** that involve different aspects such as: inputs o parameters and preconditions, outputs and postconditions, approximate time of execution, minimal resources of computing required, among others.
- ❖ The system must have a **monitoring mechanism** to detect and inform the conditions of the resource in which a target grid service is implemented such as: load of CPU, free memory, among others.
- ❖ A **broker mechanism** must act as agent that constant consulting the state of the resources for matching with the metadata of grid services required.



4 Proposed Solution

We use existing **grid technologies** such as *Globus* Toolkit and *Gridsphere* portal framework to develop and deploy a tool for workflow composition of signal processing operators as an application service.

Advantages for the end-user such as visual interface for the tool, offering the services in a transparent way, correctness in matching which service to perform by means mechanisms above mentioned and resources optimization, will be features implemented in our grid-based tool.

Image Processing Operators		
Category	Operator	Description
Geometric Operations	Scale	Change image content size.
	Rotate	Change image content orientation.
Feature detection	Sobel	It is a discrete differentiation operator, computing and approximating the gradient of the image intensity function.
	Edge	Mark the points in a digital image at which the luminous intensity changes sharply.

Fig 4. A Initial List of Identified Operators

Fig 5. WALSAIP Portal demo , the scale operator

5 References

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