Chapter 3
Grid, SOA and Cloud Computing:
On–Demand Computing Models

Mohamed El-Refaey
Middle East Wireless Innovation Center (MEWIC) at Intel Corporation, Egypt

Bhaskar Prasad Rimal
Kookmin University, Korea

ABSTRACT

Service Oriented Architecture (SOA) and Web Services play an invaluable role in grid and cloud computing models and are widely seen as a base for new models of distributed applications and system management tools. SOA, grid and cloud computing models share core and common behavioral features and characteristics by which a synergy is there to develop and implement new services that facilitate the on-demand computing model.

In this chapter we are going to introduce the key concepts of SOA, grid, and cloud computing and the relation between them. This chapter illustrates the paradigm shift in technological services due to the incorporation of these models and how we can combine them to develop a highly scalable application system such as petascale computing. Also there will be coverage for some concepts of Web 2.0 and why it needs grid computing and the on-demand enterprise model. Finally, we will discuss some standardization efforts on these models as a further step in developing interoperable grid systems.

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INTRODUCTION

The furor around Cloud Computing, Grid, and service-oriented paradigm is taking the technology world by storm and is a must for an efficient utilization of computing resources, energy, and capital investment. Service Oriented Architecture (SOA) and Web Services play an invaluable role in grid and cloud computing models, and are widely seen as a base for new models of distributed applications and system management tools. SOA, grid, and cloud computing models share core and common behavioral features and characteristics by which a synergy exists to develop and implement new services that facilitate the on-demand computing model.

A Google trend that is shown in Figure 1 describes the craze of cloud which may even have peaked. Cloud computing has risen from 2007, while grid computing is continuously falling down from 2004 and similarly SOA which is falling down from 2008 onwards.

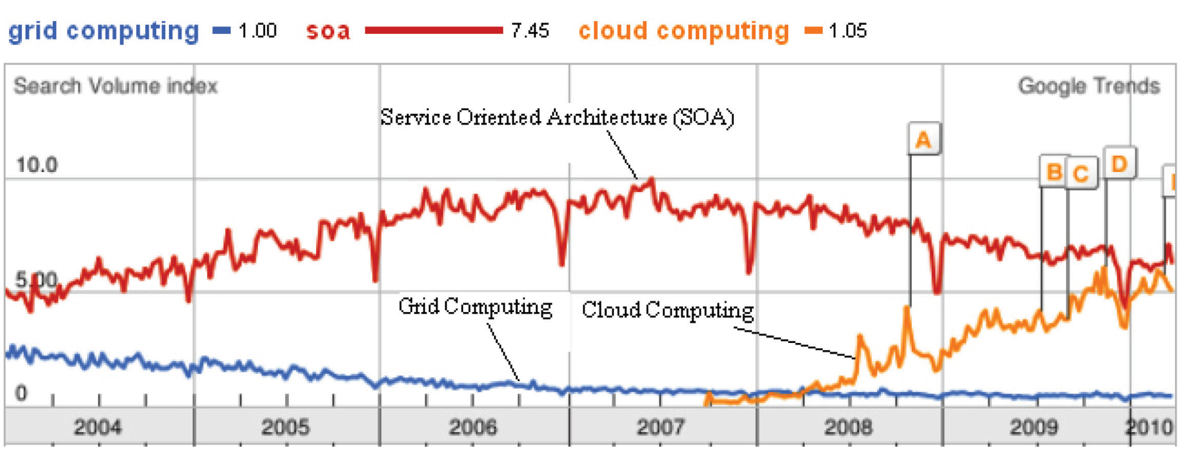
In this chapter we are going to introduce the key concepts of SOA, grid, and cloud computing and the relation between them. This chapter illustrates the paradigm shift in technological services due to the incorporation of these models and how we can combine them to develop a highly scalable application system such as Petascale computing systems. We will, also, cover some concepts of Web 2.0 technology and why Web 2.0 needs grid computing and the on-demand enterprise model to provide more value.

You will find below some of the key enabling technologies that contribute to the cloud and grid computing which will be identified and covered throughout the chapter:

- Virtualization
- Web Service and SOA
- Workflows and Workflow Orchestration
- Web 2.0
- World-wide Distributed Storage System

Finally, we will discuss some of the standardization efforts on these models as a further step in developing interoperable loosely coupled grid and cloud computing systems. The chapter highlights and sections are illustrated in the mind map shown in Figure 2.

Figure 1. The Google trend of grid computing, SOA, and cloud computing from 2004 to 2010



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