Chapter 1.1

Grid Computing:
Combating Global Terrorism with the World Wide Grid

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ABSTRACT

The emerging grid technology provides a secured platform for multidisciplinary experts in the security intelligence profession to collaborate and fight global terrorism. This chapter developed grid architecture and implementation strategy on how to connect the dots between security agents such as the CIA, FBI, police, custom officers and transport industry to share data and information on terrorists and their movements. The major grid components that featured in the architecture are the grid security portal, data grid, computational grid, semantic grid and collaboratory. The challenges of implementing this architecture are conflicting laws, cooperation among governments, and information on terrorist's network and interoperability problem.

INTRODUCTION

Terrorism can be defined as the use of violence to cause harm, large-scale destruction and fear in order to force change in societal behaviour or to force a society to acquiesce to the goals of the terrorist(s) (Garrison, 2007). Another definition by Ruby (2002) is that terrorism is politically motivated violence perpetrated in a clandestine manner against non-combatants in order to create a fear state of mind in an audience different from the victims. From these definitions, the September 11th attack can be seen as a way of sending dangerous signals to the U.S. government to change its policies against some interest groups rather than the real victims of the attack.

Terrorism dates back as far as 2000 years ago. Some of the early terrorist attacks were carried by the Jewish resistant group known as Sicarii-Zealots (AD 66-72) whose targets are the Romans in Judea. Others are the reign of terror in France (1793-1794), the Anarchists in Europe (1871-1914), the Soviet Revolution (1917), the Irish Rebellion (1919-1921) and Terrorism in the Middle-East and Islamic Fundamentalism (1960s-date). However, the sophistication, targets, victims, perpetrators, causes and justifications offered by terrorists and their collaborators have changed significantly over the years.

Never in the history of the world had terrorism received attention as in the 21st Century. Terrorists have attacked cities like London, Madrid, Moscow, World Trade Centre, Pentagon and Mumbai. These attacks usually witnessed mass wanton destruction of lives and properties with devastating and lasting psychological, socio-political and economic consequences. Very recently, a major terrorist attack was exposed and stopped at Heathrow Airport in London on August 10, 2006 due to efficient, pervasive, secured, coordinated and timely distributed access to information by the intelligence personnel leading to the arrest of about 24 national and international suspects. Another two attempts were thwarted in London and Glasgow early this year again. It appears that timely distributed information about terrorists' activities is a great strategy in combating the menace of terrorism. This is where grid computing can play a great role with its pervasive, secured, dynamic and distributed data and information services. Grid computing connects islands of information sources and link different agents around the world to collaborate and respond immediately to disasters (Assuncao and Buyya, 2005). This form of collaboration is possible through efficient high volumes of data processing using data clustering techniques for counter-terrorism (Rajasekaran et al., 2005).

BACKGROUND

September 11, 2001 could have passed like any day if only the United States intelligence agencies had been better equipped with pervasive and coordinated information technology systems. According to a U.S. Department of Defence report, ample relevant data was captured and stored in U.S. foreign intelligence databases but were not used because of inadequate coordinated distributed information technology (IT) that can enable sharing and analysis of information in the databases for prompt decision (Popp et al., 2004). The ultimate goal of using distributed IT for counter-terrorism is to empower users within the intelligence community (CIA, FBI, etc) with virtualised information so that they can anticipate and pre-empt terrorists' attacks through faster and agile analyses of collaborative multiple foreign agencies databases across the world (Popp et al., 2004). However, current IT infrastructures including high performance computing (HPC) do not have the scalability and robustness to handle biometric data workloads (Moretti et al., 2006). Moretti et al. (2006) observed that the emerging grid technology has the capability to handle data intensive biometric information of individuals collected from check points. Currently the U.S. has a terrorism watch list of approximately 350, 000 individuals (Moretti et al., 2006; The Washington Post, 2006). As the trend of terrorism increases, this list will also increase. This is where grid computing can play a role in handling the data and computational intensive nature of biometric data analysis of terrorists' watch list. Grid computing is a large-scale distributed technology which uses its secured, pervasive, independent, autonomic and dynamically coordinated features to provide sharing of resources (data, information, hardware, software, sensors, CCTV, etc) and collaboration among multidisciplinary virtual organisations (VO) (Foster and Kesselman, 1999). The use of grid computing to link professionals within virtual organisation such as transport industry

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