Demo: CE-Based Policies Conflict Analysis for Sensor Services Management in Information Fabric

Christos Parizas*, Alun Preece*, Petros Zerfos†, S. Yousaf Shah‡, Boleslaw Szymanski‡, Christopher Gibson§, Dominic Harries§

*School of Computer Science and Informatics Cardiff University, UK, Email: {C.Parizas, A.D.Preece}@cs.cardiff.ac.uk
†IBM T.J. Watson research CenterHawthorne, NY, USA, Email: pzerfos@us.ibm.com
‡Rensselaer Polytechnic Institute, Department of Computer Science, Troy, NY, USA, Email: {shahs9, szymab}@rpi.edu
§IBM Hursley, UK, Email: {christopher.gibson, dharries}@uk.ibm.com

***Abstract*—The configuration, monitoring and control of large-scale distributed systems is a complex and daunting affair. Policy-Based Management Systems (PBMS) have been proposed as suitable paradigm to reduce this complexity and provide a means for automated administration. One of the reasons why PBMSs are not broadly adopted is that it is difficult to develop and maintain them whilst guaranteeing integrity in terms of policy conflicts. Conflicts occur when two or more policies are applied simultaneously and their resulting actions contradict each other, leading to unpredictable system behaviors. We present a policy conflict analysis model for semiautomatically detecting and resolving static and dynamic conflicts using a Controlled English (CE)-based approach. CE is a Controlled Natural Language which is understood by both humans and machines and in which domain model definition and policy rules execution can be precisely expressed. CE also encourages the development of novel hybrid ways of reasoning and thus conflicts detection. In this demonstration, we show policy conflict resolution in a dynamic service configuration scenario using the ITA Information Fabric, a middleware framework for developing sensor networks, and test it under authorization and obligation policies, which control asset sharing in multi-partner coalition operations in a real military scenario.**

I. Scenario

Consider the scenario of a hostage rescue operation. The hostages are kept at location towards NE. The UK special force team prepares for the rescue operation and will be the main force involved in the operation. The US forces in the NW area are the observer forces and would be only used as backup if needed. After the rescue operation has started and UK forces surround the building known to have hostages, the UK ISR resources deployed near the NW area inform the UK forces that the hostages are being moved to a location near the NW which is closer to US backup team. The initial policies, developed at command and control center, do not allow US forces to access UK owned resources near the NW area but in current situation these resources can provide highly reliable and actionable intelligence to US backup team. Therefore, the UK forces operating at the network's edge develop new CE-based policies which contradict with pre-existing policies. In such a dynamic situation where policies conflict, our CE-based conflict analysis and resolution system automatically defines and semiautomatically resolves the conflicts and enables US forces to use UK ISR resources.

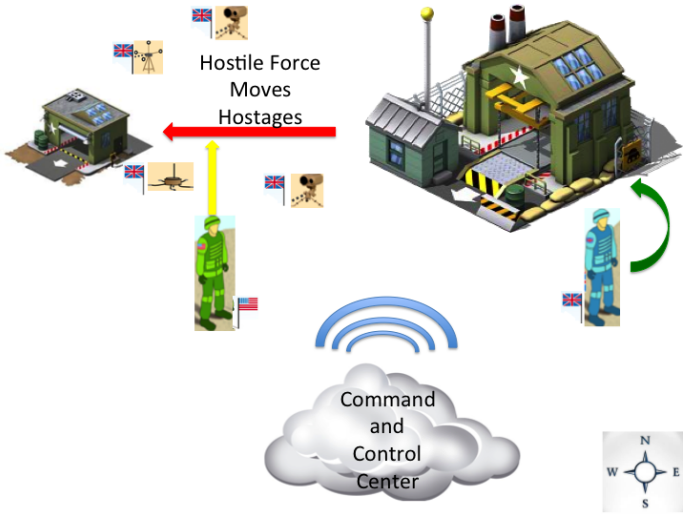

Fig. 1. Hostage Rescue Operation

II. Demo Requirements

We will require a table with 2 external monitors, and 8 power sockets. In addition we will need 2 Ethernet points and 1 easel for the poster.

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