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Cross-Domain Ontology Resolution in Net-Centric Command and Control

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Abstract

We have argued that the success of Net-Centric Operations and Warfare (NCOW) depends upon the ability of net-centric environment (NCE) users—both human and automated—to readily discover useful information and Web-based services.[1] Effective discovery requires, in turn, effective meta-data "tagging." It was argued that no single, overarching classification scheme is adequate to provide the semantic support required for the successful deployment of such core enterprise services as discovery, collaboration, mediation, and storage. What was needed was a way to support *multiple taxonomies* with automatic taxonomy evolution using machine learning and intelligent agent technology. In this paper we analyze the underlying reasons for this claim and show that what is really needed is a way to allow multiple *ontologies* (along with their taxonomic correlates) with cross-domain (i.e., inter-ontology) resolution (translation) to coexist in a net-centric environment. After surveying some apparent theoretical limits to ontology commensurability, we describe a conceptual framework—in pseudo-code—that is sufficient to enable information and Web-services interoperability for command and control NCE. We compare this framework to current semantic web approaches to show what our framework contributes.

[1] Lichtblau, Dale. E., et al., "Taxonomic and Faceted Classification for Intelligent Tagging and Discovery in Net-Centric Command and Control," 2006 CCRTS, San Diego.