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A Framework of Recognized Operational Support Picture for Asset Visibility

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Abstract

This paper presents the approach, architecture and implementation guidelines for a Recognized Operational Support Picture (ROSP) framework suitable for the aggregation and presentation of up to date information related to the Canadian Armed Forces/Department of National Defence (CAF/DND) assets based on the requirements of the decision makers within the organization. The contribution of this paper is threefold. It first presents state-of-the-art asset visibility initiatives and their new associated concepts (such as Net-Centric Operations) followed by a ROSP/Asset Visibility (ROSP/AV) model of organizational assets. Then, it illustrates Net-Centric architecture for a ROSP/AV framework that is supported by an elaborated case study. Finally, the paper presents some mock-ups of relevant screen displays of a ROSP/AV capability.

Keywords: Recognized Operational Support Picture; Common Operating Picture; Asset Visibility; Net-Centric Operations**.**

1. Introduction

Asset visibility (AV) plays an instrumental role in achieving key decision support objectives inside large institutions. AV may be defined as the ability to provide decision makers and operators with accurate information on organizational resources in real-time or near-real time. It also encompasses asset tracking conveying location, movement, status, and resource identification information. Furthermore, it represents an operating concept allowing decision makers to achieve balanced resource management in the context of their respective authorities

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and in accordance with organizational policies and visions.

Several full-scale AV avenues and approaches can be found across academic institutions, business industries and military organizations. Commercial organizations are highly focused on building Decision Support Systems (DSS) that readily identify pitfalls within institutions. Military organizations alternatively emphasize accurate asset information visualization to allow commanders to make decisions that are more responsive and effective. There is a growing need within Canadian Armed Forces/Department of National Defence (CAF/DND) to generate timely and accurate asset information to decision makers and operators. This can be achieved by developing a comprehensive AV capability producing asset information to a Recognized Operational Support Picture (ROSP) for any CAF/DND assets regardless of the system of records concerned. Gaining greater asset visibility and highly accurate information are key requirements for CAF/DND to be more effective and efficient. Indeed, a ROSP/AV capability is a vital enabler to DND responsiveness and effectiveness.

A ROSP capability can be defined as an integrated multi-layer information/knowledge-sharing and decision support environment that combines support functions for transactional data, specialized operational support domain awareness views, and decision support planning capabilities. It could eventually be interconnected to other Common Operating Picture (COP) environments/levels (e.g., North Atlantic Treaty Organization (NATO) COP or other coalition COP) supporting AV information from a single point of access.

Military decision makers typically require a ROSP/AV system having functionalities, such as:

- Visualisation: a near- real time accurate picture;
- Monitoring: observation of changes occurring over time;
- Forecasting: observation of prediction of the situation and demands.

The remainder of this paper is organized as follows. Section 2 summarizes the state-of-the-art on AV initiatives and the Net-centric concept and its related architecture. Section 3 describes the ROSP/AV framework whereas Section 4 presents a case study. The latter is based on a Research and Development activity carried out by the Defence Research and Development Canada (DRDC) centre. Finally, concluding remarks are given in Section 5.

2. Related work and initiatives

The complexity of the future security environment will require approaches that are comprehensive, integrated, adaptive, and networked in the execution of national intent (Department of National Defence - DND 2009). Such context will demand operational support systems that are proactive (Toward Land Operations 2021). Indeed, future DSS will exploit computational and networking advances to proactively detect emerging requirements, monitor resources, and track support processes to enhance domain-wide situational awareness and decision support (Department of National Defence DND 2008). From another side, future DSS will also exploit new concepts to reduce risk and the effects of uncertainty and to generate efficient systems in terms of human and resource utilization. Net-Centric Operations (NCO), Sense and Respond Logistics, Focused Logistics, Performance Based Logistics and related variants represent such emerging concepts. We will focus in this paper on the NCO concept. Net-Centric is defined within military context as ``the ability to provide a framework for full human and technical connectivity and interoperability that allows all Department of Defense (DoD) users and mission partners to share the information they need, when the need it, in a form they can understand and act on with confidence, and protects information from those who should not have it'' (DoD Information Enterprise Architecture, Department of Defense).

2.1. Asset visibility and common operating picture (COP)

In all major planning and resource allocation activities of CAF/DND, visualization of military assets is paramount. A comprehensive appraisal of the operational readiness, availability and suitability of the assets for particular operations or military activities is therefore essential. Despite existing systems, ongoing projects and R&D initiatives, most fail to offer an end-to-end AV or integrated information visualization. A typical example from a DND perspective is the National Movement Distribution System (NMDS) aimed at providing in-transit AV.