

Joint Enterprise Command & Control (JEC2) Frameworks

Enterprise command and control (EC2) within and jointly (JEC2) among federated¹ enterprises provide policies and mechanisms (*protocols*) that support *collaboration*. Internal and external collaboration involves the ability to establish a consensus view of the world² and to respond to identified situations by developing and executing coordinated plans of action³. Viable⁴ enterprises⁵ survive by utilizing collaborations to achieve and maintain dynamic stability and competitive advantage within their evolving domains.

The Department of Defense (DOD), like large-scale commercial enterprises, is an agent for domestic and international policies, spanning tactical, operational and strategic domains. As such, it is imperative that enterprise agents be able to act alone and in concert to provide accountable⁶ and coordinated behavior, all while prudently and efficiently utilizing human and material assets to their greatest effect. In this context an enterprise is a finite collection of operational agents, each with defined capabilities and governed by specific policies.

Agents (aka, objects) are defined both by the *states* they may occupy at any given time (as defined by the values of their *data*) and the *behaviors* they may exhibit (as defined by the *capabilities* of their *processes*). The *architecture* of an enterprise is defined by the allowable individual and collective behaviors of its agents. A JEC2 *framework* is a technical expression of such an architecture.

Collaboration among agents, whether on strategic, operational or tactical assignments, requires that they share (i.e., interchange) at least some of their data. The ability of two or more agents to exchange data is determined by their inter-connectivity. Their ability to understand (interpret) exchanged data is referred to as *data interoperability*. While data interoperability is necessary, it is not sufficient for effective collaboration – it does not uniquely determine allowable behaviors.

In reacting to data, cooperating agents must also exhibit behaviors whose performance can be measured and whose activities may be coordinated (i.e., synchronized). Performance measurement requires standardized metrics and measurement processes in order to fairly assess effects. Synchronization requires that agents be able to *rendezvous* in both time and space. Optimum performance requires that JEC2 be capable of establishing and enforcing performance targets and rendezvous deadlines⁷ between and among collaborating agents.

Enterprise agents that agree to participate in one or more federations establish “communities of interest” (COI). Such COI agree to be governed by the community’s JEC2 protocols – their rules of engagement. COI operating at strategic, operational and tactical levels may be governed by different sets of protocols – sets that are mutually consistent⁸ and that scale from low level tactical to high level strategic functions. Agents that effectively collaborate under scalable and consistent JEC2 protocols are said to exhibit *process interoperability*.

In summary, effective enterprise JEC2 frameworks (architectures) comprises a body of mutually consistent policies and mechanisms that provide federated agents with a coherent *operational commons*. This JEC2 commons supports both data and process interoperability, *allowing* collaboration through shared awareness and coordinated effects-based planning and action.

¹ A *federation*, following Jeffersonian principles, is an association among independent agents that freely cooperate on behalf of one or more shared value propositions

² Aka, sensory perception, or *situation assessment*

³ Aka, reactive and proactive *behavior generation*

⁴ *Viability* requires that adaptation be made with minimum resources within timeframes dictated by the rate of change of the encapsulating environment (i.e., *agility*)

⁵ An *enterprise* is an arbitrary unit of organization defined by the ability to produce a quantifiable and sustainable measure of value

⁶ Accountability results when *causal relationships* may be found among sequences of events

⁷ The degree to which an enterprise meets its deadlines determines its ability to operate in “real-time”

⁸ Two JEC2 protocols are mutually consistent if a given agent can operate under both without conflicts in either policies or mechanisms