

Applying intention awareness and content-based routing concepts in Coalitions

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How are we viewing information sharing in coalitions?

- Coalition information sharing aims to optimize the sharing of data between coalition partners.
- Efficient sharing is accomplished by positioning role as a central guide to information sharing requirements.
- Using algorithmic agents to assist an IMO in making sharing decisions is of vital importance.
- Intent is necessary as it both drives and is contained within role. Additionally it greatly increases the ability of agents.

Coalition Information Sharing Systems (CISS) misconceptions

- ❑ CISS are not a C2 system. It may be beneficial (but not required) to implement it inside a C2 system.
- ❑ CISS are not a router. More than simple routing rules are required to effectively share information.
- ❑ CISS are not a low level tool. Operation of a Coalition Sharing System only goes down to the battalion level.

Ontologies in Coalition Sharing

- ❑ Writing explicit rules for each of the properties in C2IEDM is unreasonable.
- ❑ A properly written ontology allows agents to create appropriate rules given the context.
- ❑ Writing proper rules for every potential circumstance is impossible given the complexity of the modern battlefield.
- ❑ Separating the agents from data storage using ontologies allows for agents to be shared across implementations.

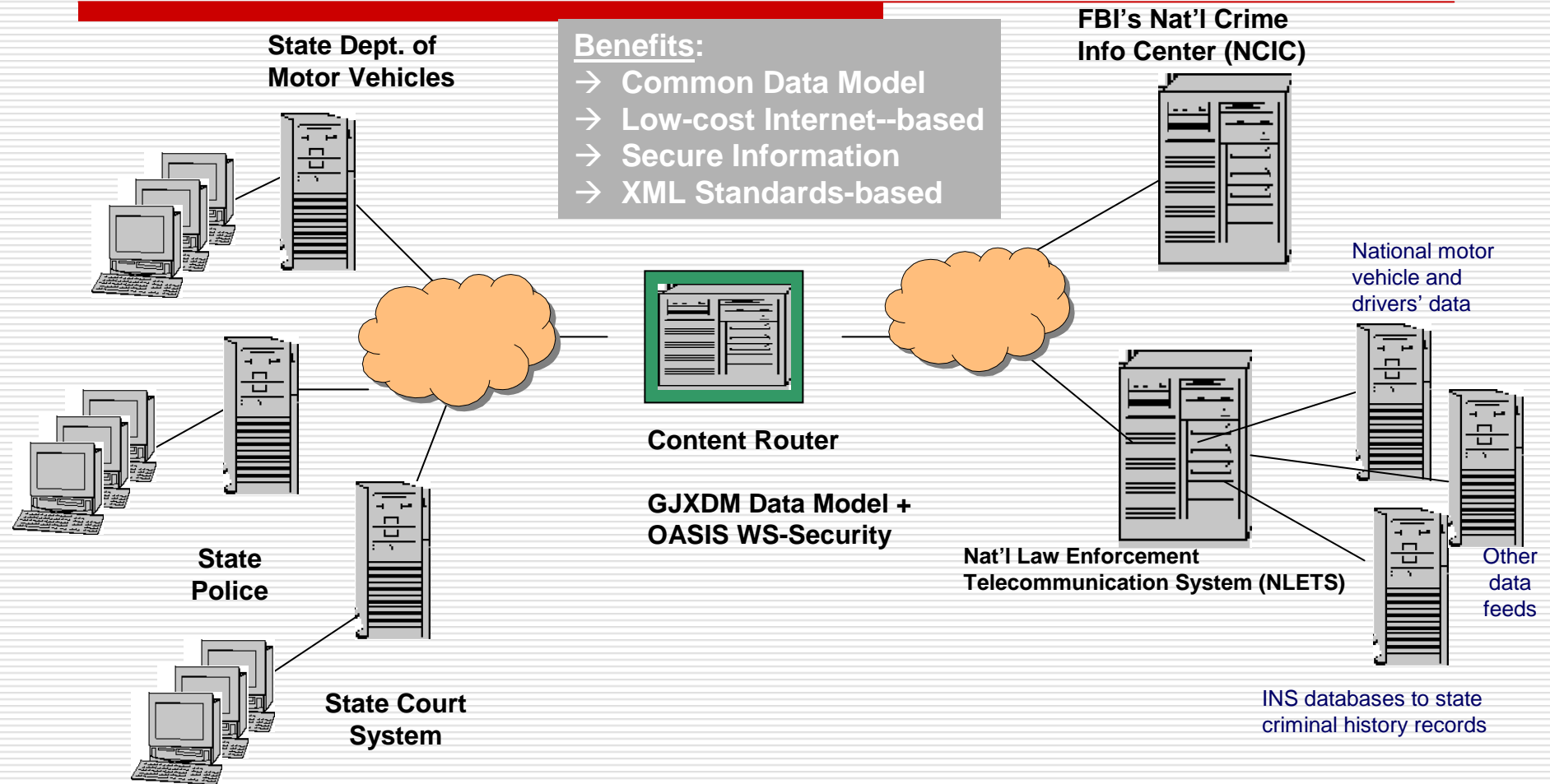
Clarification: Schemas to Ontologies

- ❑ **Schema** – a structured representation of objects and relationships (storage)
- ❑ **Ontology** – an explicit description of the properties and relationships of objects (interpretation)
- ❑ Ontologies allow for important relationships to be discovered instead of predefined.
- ❑ Ontologies also allow for data to be separated from the storage method.

Content Based Routing in Coalition Information Sharing Systems (CISS)

- ❑ CISS information sharing is contract based.
- ❑ Roles are used to suggest contracts.
- ❑ Messages are matched to contracts based on content.
- ❑ Content based routers that use contracts to coordinate routing already exist.

State government use of content based routing



What is intent?

- Intent is an aim which guides action. It is necessary when providing orders as the why of the task plays heavily upon the how.
- Intent enables informed autonomy.
- Intent is always nested (strategic intent, tactical intent).
- Technically, intent is an image of a desired outcome. Coupling this image with an ontology allows intent to be algorithmically approached.

Intention awareness in the military domain

- ❑ Modern battlefield dynamics require distributive command and reliance on understanding the commander's intent rather than explicit tasking
- ❑ The lack of intention awareness is one of the leading causes of fratricide in military action

Why is intent necessary for effective CISS implementation?

- ❑ Information sharing requirements should be based on understanding what drives the action of the unit that you are communicating with, so you can best support its action
- ❑ Intent both drives and is contained within role
- ❑ Unit's current orders alone may not convey the entire requirement
- ❑ Intent based information sharing decreases the need for frequent and explicit updates

Intention Awareness in Military Systems (Digital Crosstalk, DCT)



- Digital Crosstalk analyzes all WOSF communications to discover potential conflicts.
 - WOSF – Military Communications consisting of: Warning Order, Operational Order, Situation Report & Fragmentary Order.
- Problematic orders are presented for confirmation / sanity check.