Messaging Lessons-Learned

16 February 2016

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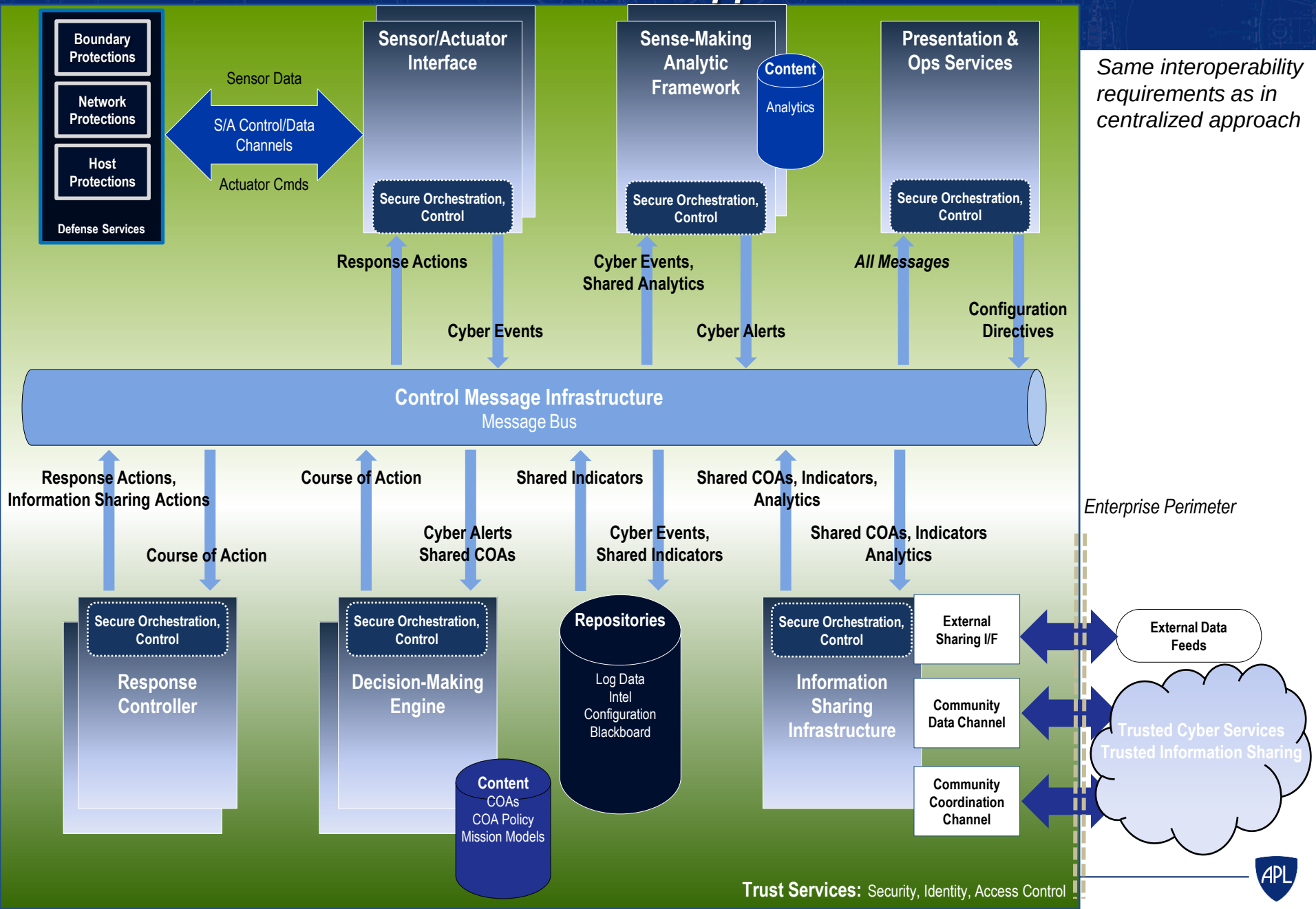
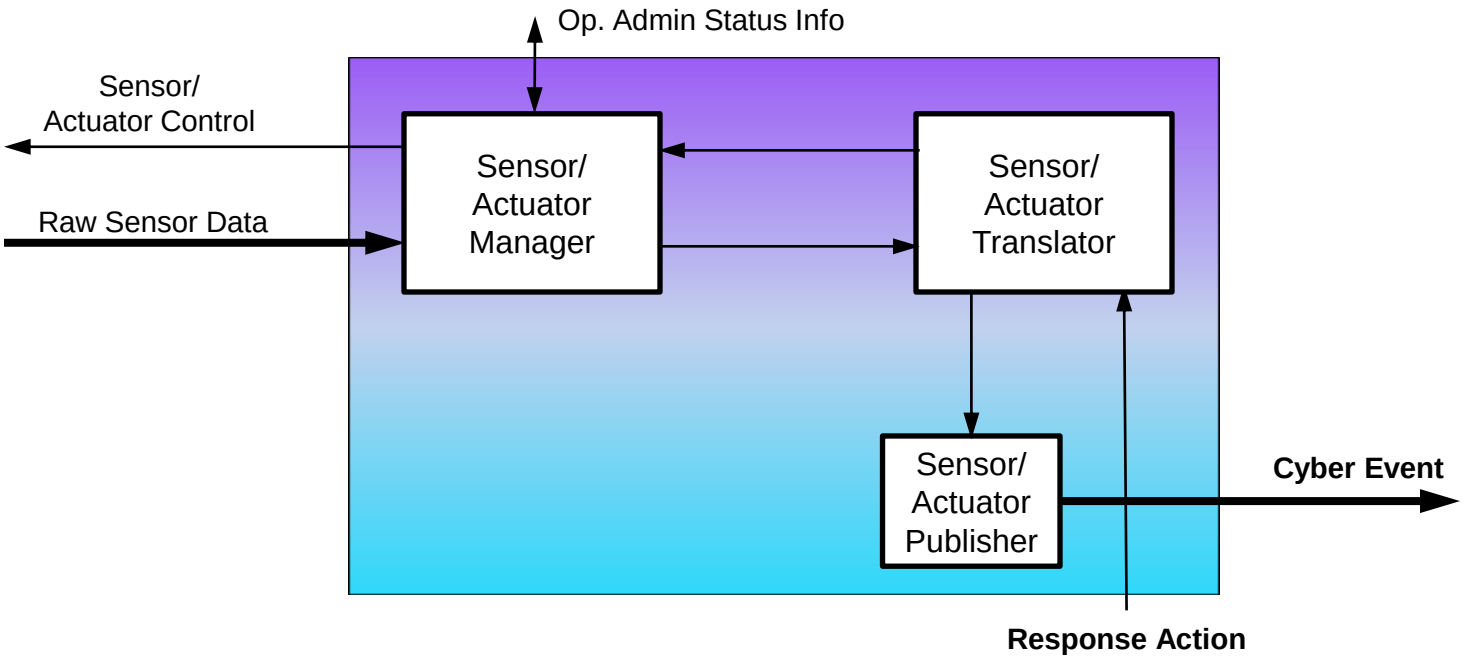
Message Fabric
Decentralized Service Orchestration Approach



Same interoperability requirements as in centralized approach

Message Content
Sensor Actuator Interface

Sensors and actuators have translators and managers that bridge the proprietary interfaces (*Raw Sensor Data*) to the standard Control Message Infrastructure format (***Cyber Events***)



Experimentation Result

- **Integration of sensors to the message bus only required "shimming"**
  - **Typical standard process for integration, nothing abnormal**
  - **Transforms data between application native format and Common Event Format (CEF) if necessary**
  - **Transports data in/out of the message bus**

The Sensor Actuator Interface is the right level of abstraction

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Lessons Learned

- **Message Fabric**
  - **Products and applications did <u>not</u> need to know about each other or be pairwise integrated to be added into the environment**

- **Sensor/Actuator Integration**
  - **Cybersecurity tools did not have a common interface, data model, or trust model**
    - **The site or the vendors must perform the integration and associated management functions**
    - **Significantly limits the products and applications that can be included in any enterprise**

Message Buses support Scalability, Interoperability, and Simplicity

Implications of Lessons Learned

- **There is potential value in using a message bus when your environment includes:**
  - **Multiple consumers**
  - **Large scale integration**
  - **Dynamic environments**
  - **Extensive network connectivity**

- ***Sustainable* and *extensible* SRCE components need to have common or standardized connectors and data formats**
  - **Standards are not required internal to a single enterprise if the site is willing to be limited by vendor integration**

Implications for SRCE

- **Long Term Need: A common message fabric with standard message sets, services, and interfaces**

  - **Short Term: Common Connector**
    - **Products and applications come with at least one of a small set of ways to "plug" into message bus instances**
    - **May not need to be standardized as much as a small list where vendors must support at least one**

  - **Short Term: Initial common data model**
    - **Cyber Alerts and Response Actions**

Standardization offers more flexibility and avoids significant custom integration

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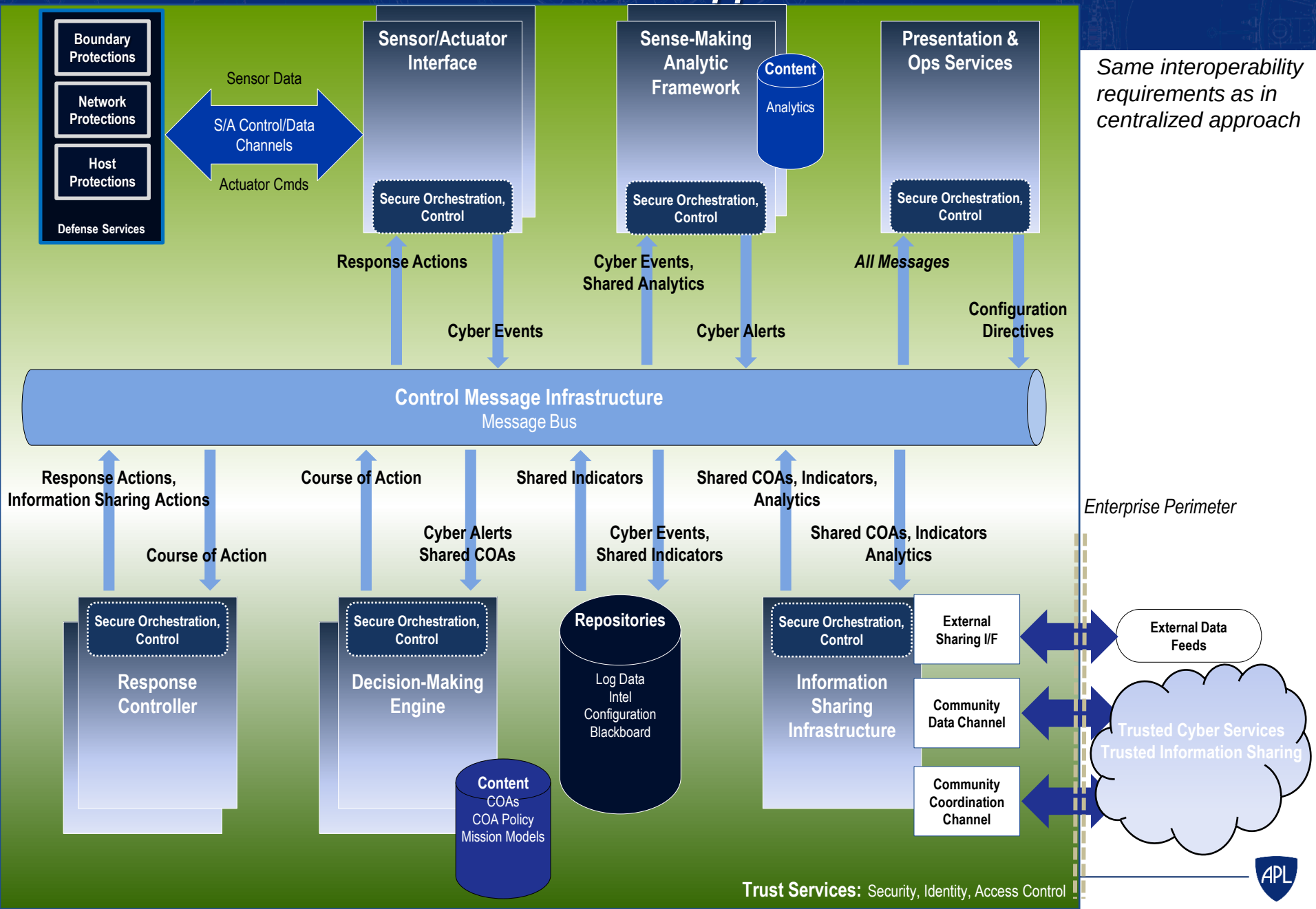

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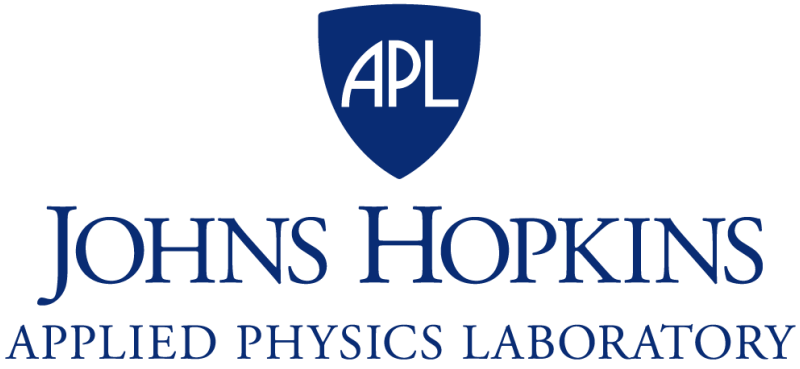
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