Reference Implementation
Working Group (RIWG)

Demonstration Scenario v1.0

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- (U) The C2SSA COI Reference Implementation Working Group (RIWG) is engaged in building prototype instances of the C2SSA COI Enterprise Data Model (EDM)
    - Using real-world content
    - Unclassified and other

- (U) RIWG Goals:
    - **Attract potential users/implementers to the Enterprise Data Model (EDM), leading by example and breaking down barriers**
    - **Identify potential impediments to integration within the EDM, make recommendations on associated modifications, and test these mods.**
    - **Provide risk reduction and re-use options for other development and information sharing efforts that may be appropriate users of the EDM**

- (U) RIWG is a hands-on group, improving the ease-of-integration/use of the EDM, and highlighting the collaboration potential enabled by the Model.
    - Prototyping functioning software and populated XML documents

- (U) Next step: Apply this experience to a functional Demonstration, linked to a representative SSA problem set, expanding upon the EDM's application to collaborative decision making and associated workflow.

- Demonstrate to the broader SSA Community the utility and potential ('To Be') of SSA in a net-centric environment, enabled by the C2SSA COI EDM
- Show the EDM "in action" to highlight ease-of-integration with existing capabilities
    - Based on integration with real software and real ("legacy") data
- Demonstrate the potential for collaboration enabled by the EDM
    - **Focus on a problem set that requires cross-Community collaboration**
    - **Highlight workflow elements (notional) that the EDM supports**
- Highlight opportunities for Community participation via the EDM, to enable operational success in the Use Case
    - e.g. JMS, Space Fence, NCSDS, GSIN, non-traditional partners
- Ultimate demonstration will be a functioning SW system, primarily based on re-use of existing tools/services now leveraging the EDM.
    - Initially demo will consist of sample displays and data flows identifying key elements of the EDM, and associated workflows.
- The RIWG intends to apply this demonstration capability as a guide & test-bed for all COI Working Groups.

- Demonstration Focus: The SSA problem set associated with a potential maneuver of an Resident Space Object (RSO), and effective collaborative engagement of SSN and non-SSN resources
- Scenario is Unclassified, but represents elements of collaboration and associated workflow that would be required - and substantially enabled by the EDM - in a full cross-domain implementation
- Key elements of the demonstration:
  - **Development/Maintenance and Community-wide sharing of a high-interest RSO list, Including changes to the list vs. time**
  - **Community-wide sharing of updates on these RSOs (both positive and negative observations or other reporting)**
  - **Sharing of possible maneuver alerting and associated cueing information**
  - **Sharing of SSA resource availability/opportunities in response to these alerts**
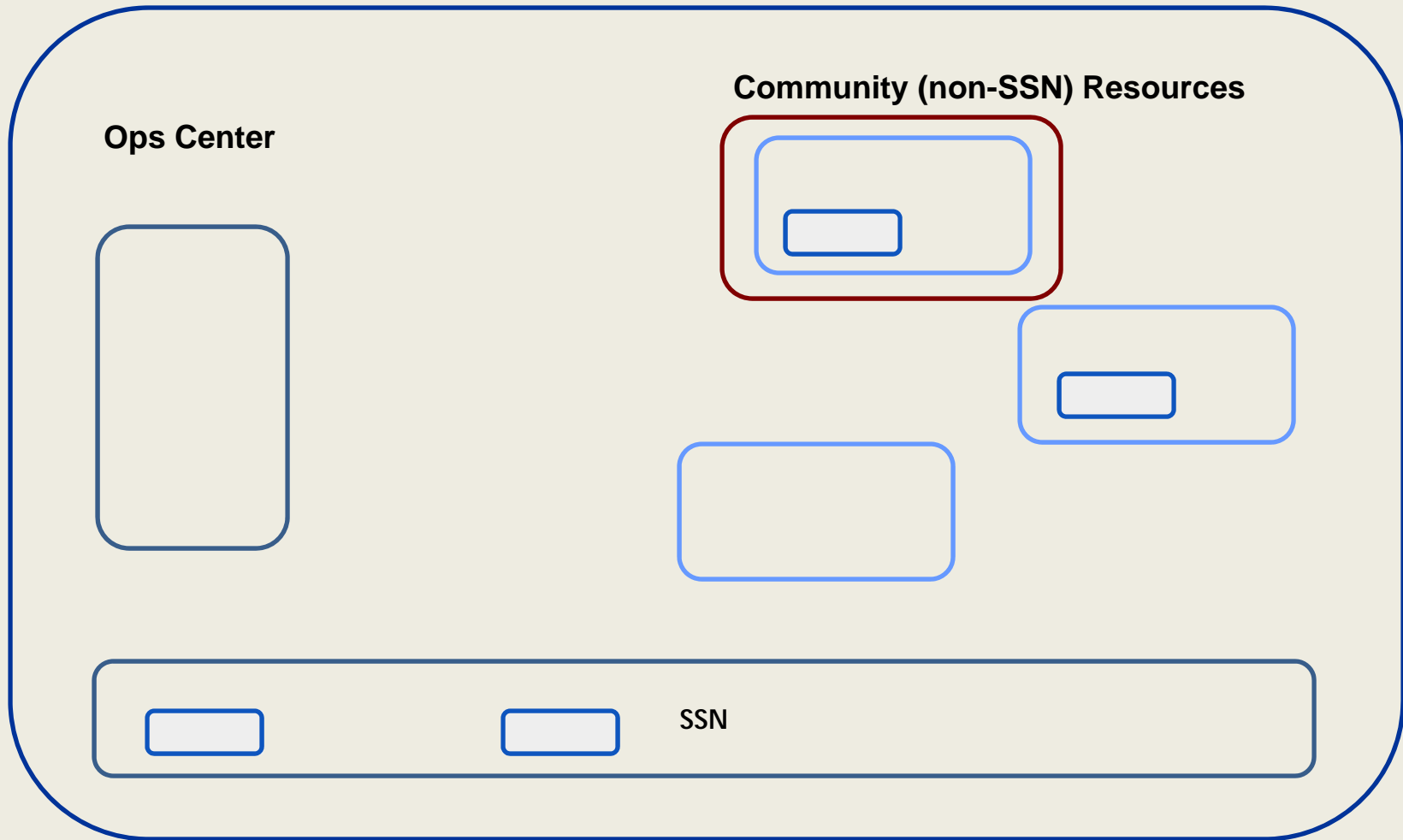- Demonstration will identify and implement selected EDM messages traceable to this scenario

I. Operations Center maintains high-interest RSO list for potential (non-cooperative) maneuvers.
- Captures inputs from around the DoD/IC/Partners to maintain attributes of this list.
- Applies priority to items on the list (e.g. based on STRATCOM guidance).
- EDM Messages:
  - *RSOSituationReportType*

II. Updates to the list are disseminated across the Community.
- Includes positive confirmation of receipt, with top-level statement of capability to respond.
- Examples of capability to respond: Type of orbit(s), size of object(s), condition of the collection resource, priority, available capacity.
- EDM Messages:
  - *RSOSituationReportType*
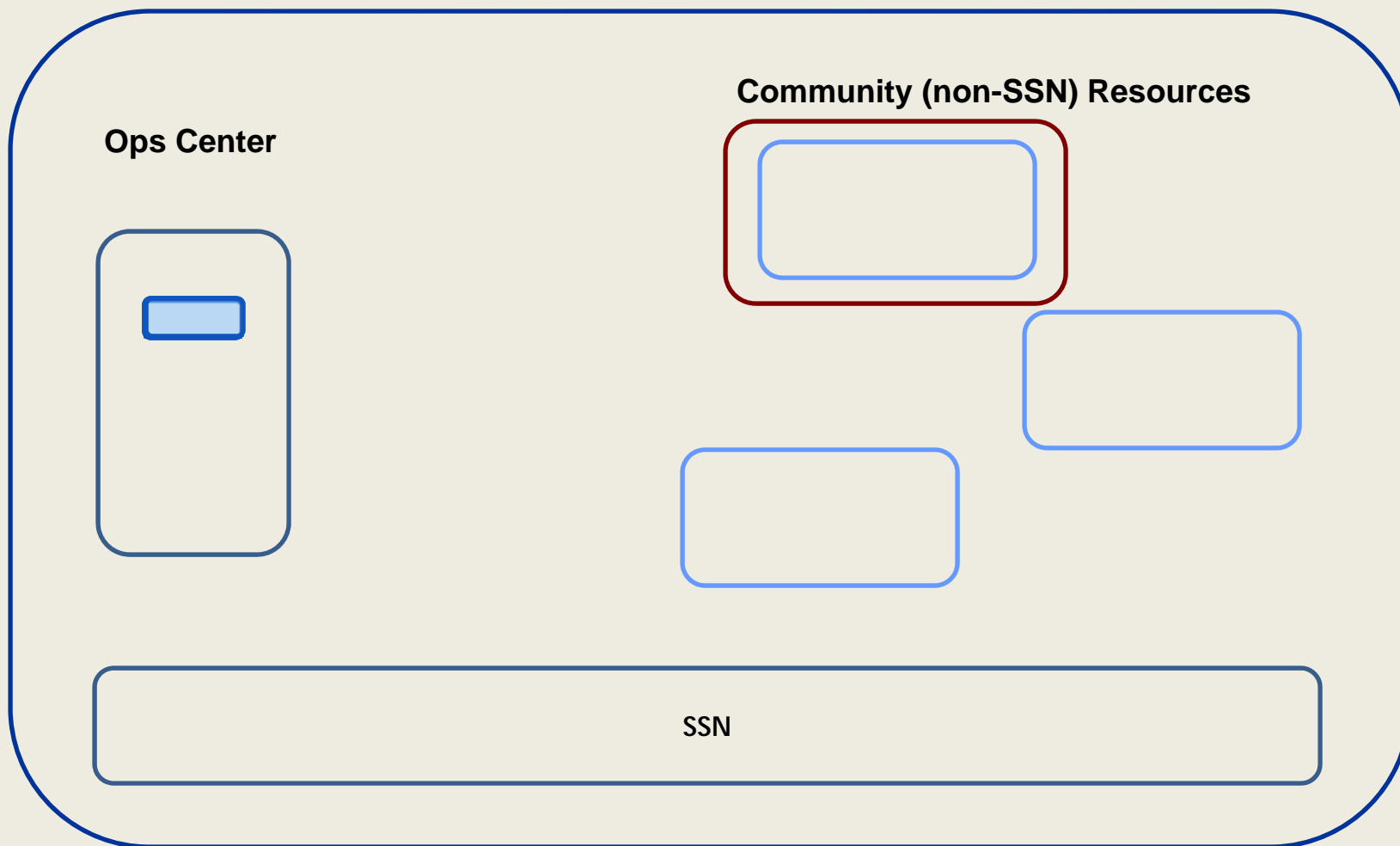 - *RequestAcknowledgementType*

Community (non-SSN) Resources

Ops Center

SSN

RSO *SituationReport Type*

Ops Center

Community (non-SSN) Resources

SSN

RSO *SituationReport Type*

Community (non-SSN) Resources

Ops Center

SSN
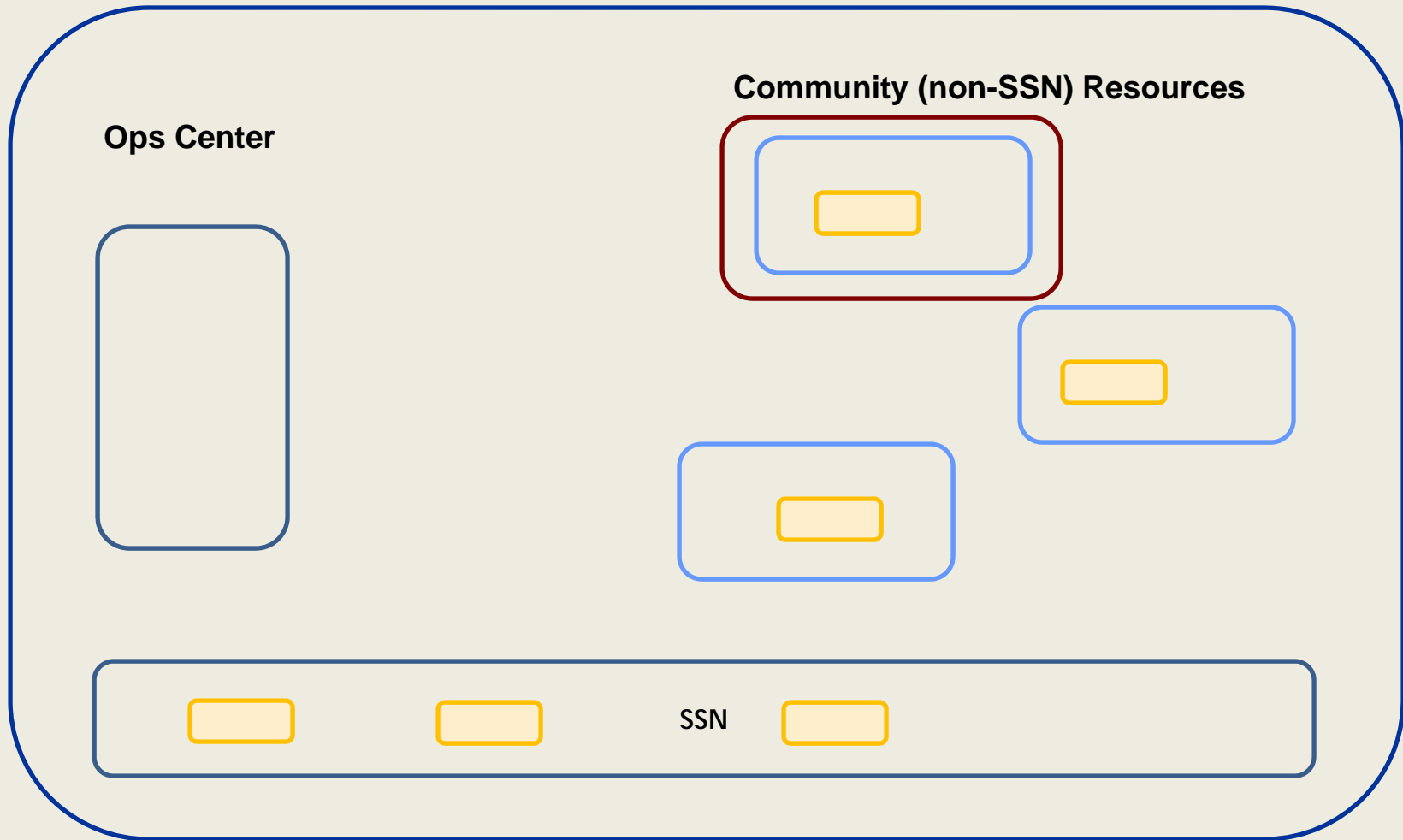
| RSO *SituationReport Type* | RequestAcknowledgement *Type* |

III. Community-wide SSA resources report periodically on RSO on the list

- Reports may include a wide range of SSA content based on type and capability of each resource
- Reporting may include a resource-specific indicator of a potential maneuver detected, and associated follow-up content – especially for non-SSN resources
- EDM Messages:
  - *SpaceEventAlert* with *MetricObservationTrackType*
  - *SpaceEventAlert* with *SensorObservationType*
  - *SpaceEventAlert* with *OpsIntelBriefType*
  - *SpaceEventAlert* with *EphemerisType*
  - *EventAlertAcknowledgementType*

Ops Center

Community (non-SSN) Resources

SSN
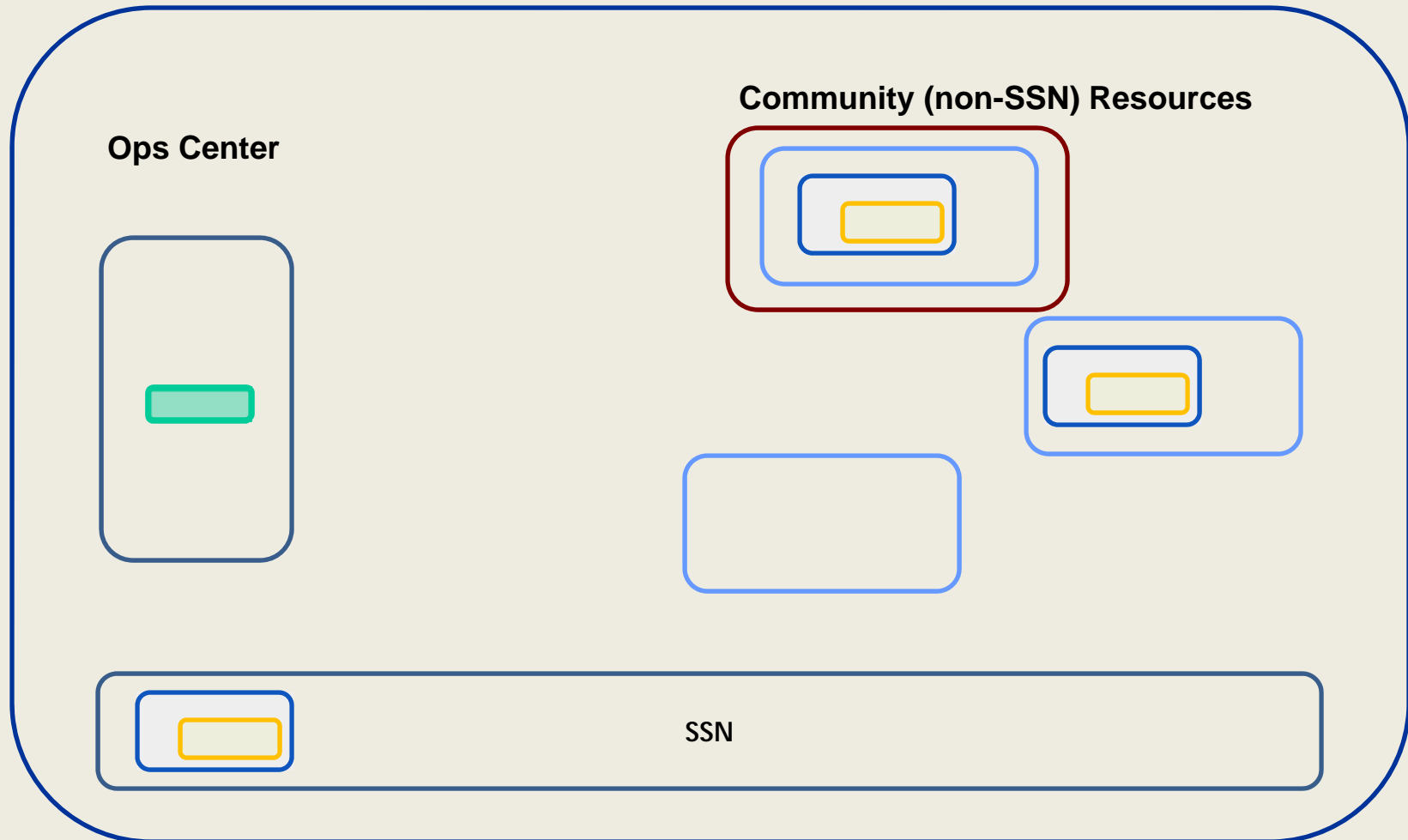
SpaceEventAlert

EventAlertAcknowledgementType

MetricObservationTrack Type

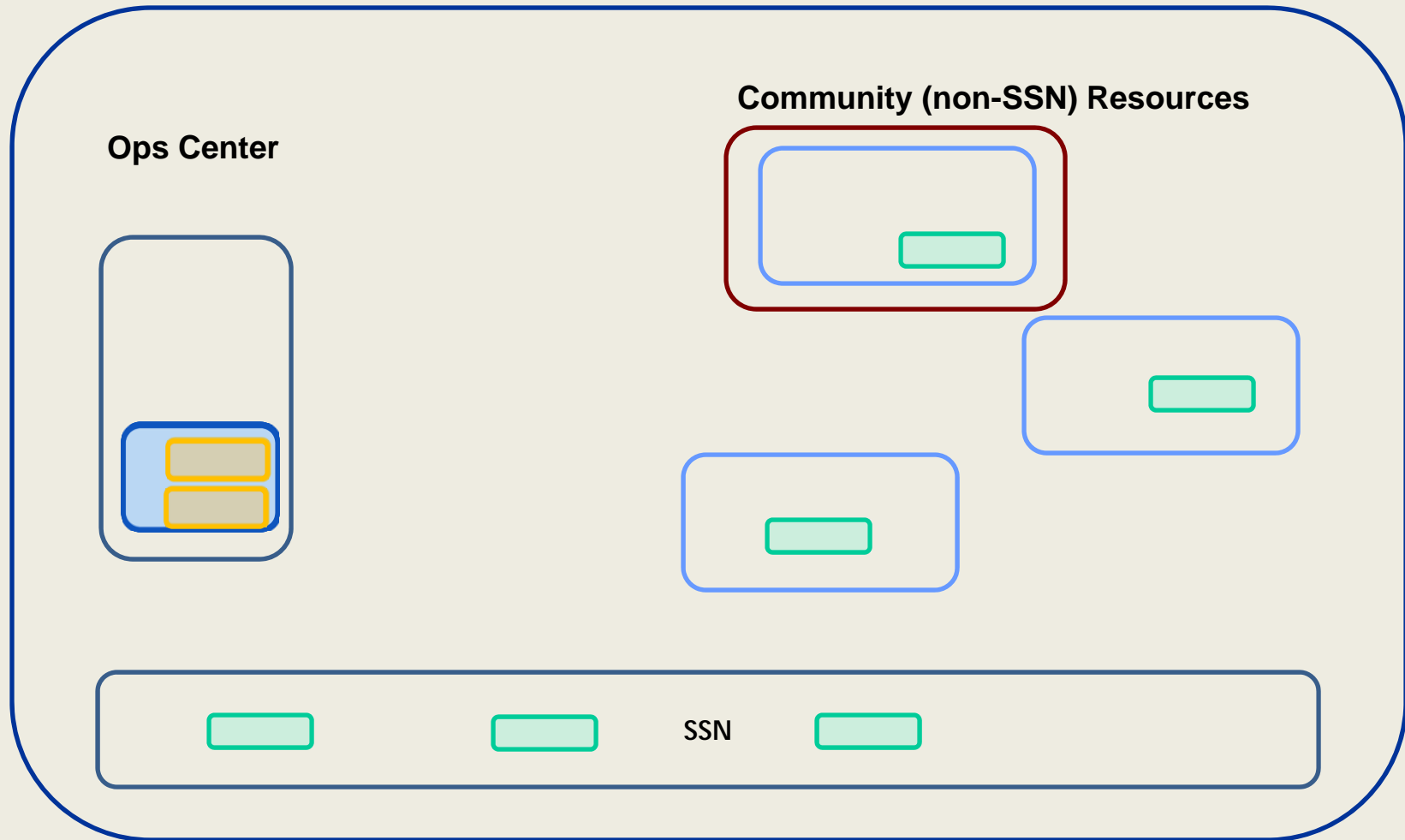*SensorObservation Type*

OpsIntelBrief Type

Ephemeris Type

IV. Operations Center integrates resource-specific SSA reporting to decide that a maneuver has occurred for a prioritized RSO; disseminates this decision along with best-available cueing info to all SSA resources (cross-domain).

- Decision cycle may have several steps, sharing of status on the decision process across the Community may also be appropriate
- EDM Messages:
  - *SpaceEventAlert* with *ManeuverType* and *RSOElementSetTypes*
  - *EventAlertAcknowledgementType*
  - *SensorSupportRequestType*

V. SSA resources respond (if able) with statement of ability to respond, and resource availability/plan if possible

- EDM Messages:
  - *SensorAllocationPlanType*
  - *TaskingType* or *TaskingParametersType*
  - *TaskingResponseStatisticsType* or *TaskingResponseThresholdType*

Community (non-SSN) Resources

Ops Center

SSN

SpaceEventAlert

ManeuverType Type

RSOElementSet Type

EventAlertAcknowledgement Type

VI. Operations Center integrates into Community-wide view of SSA resources against prioritized RSO list vs. time, and disseminates to Community.

- Provides each resource provider (especially non-SSN) with awareness of other resources engaged, to facilitate yet more collaboration in response.

- EDM Messages:

  - *RSOSituationReportType*
  - **Multiple** *SensorAllocationPlanType*
  - *TaskingResponseStatisticsType*, **or**
  - *TaskingResponseThresholdType*

Community (non-SSN) Resources

Ops Center

SSN
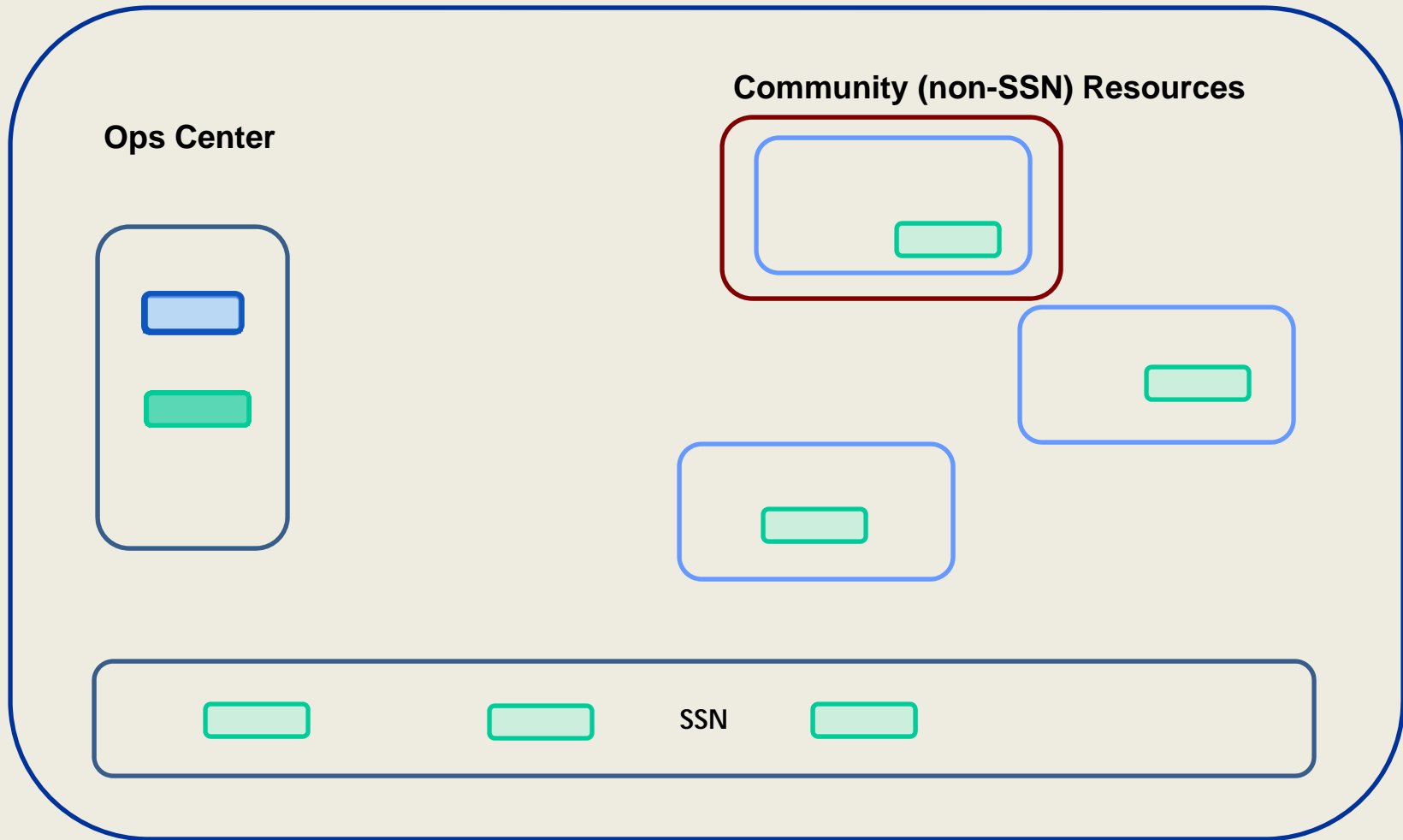
| RSO *SituationReport Type* | *SensorAllocationPlan Type* |

Community (non-SSN) Resources

Ops Center

SSN
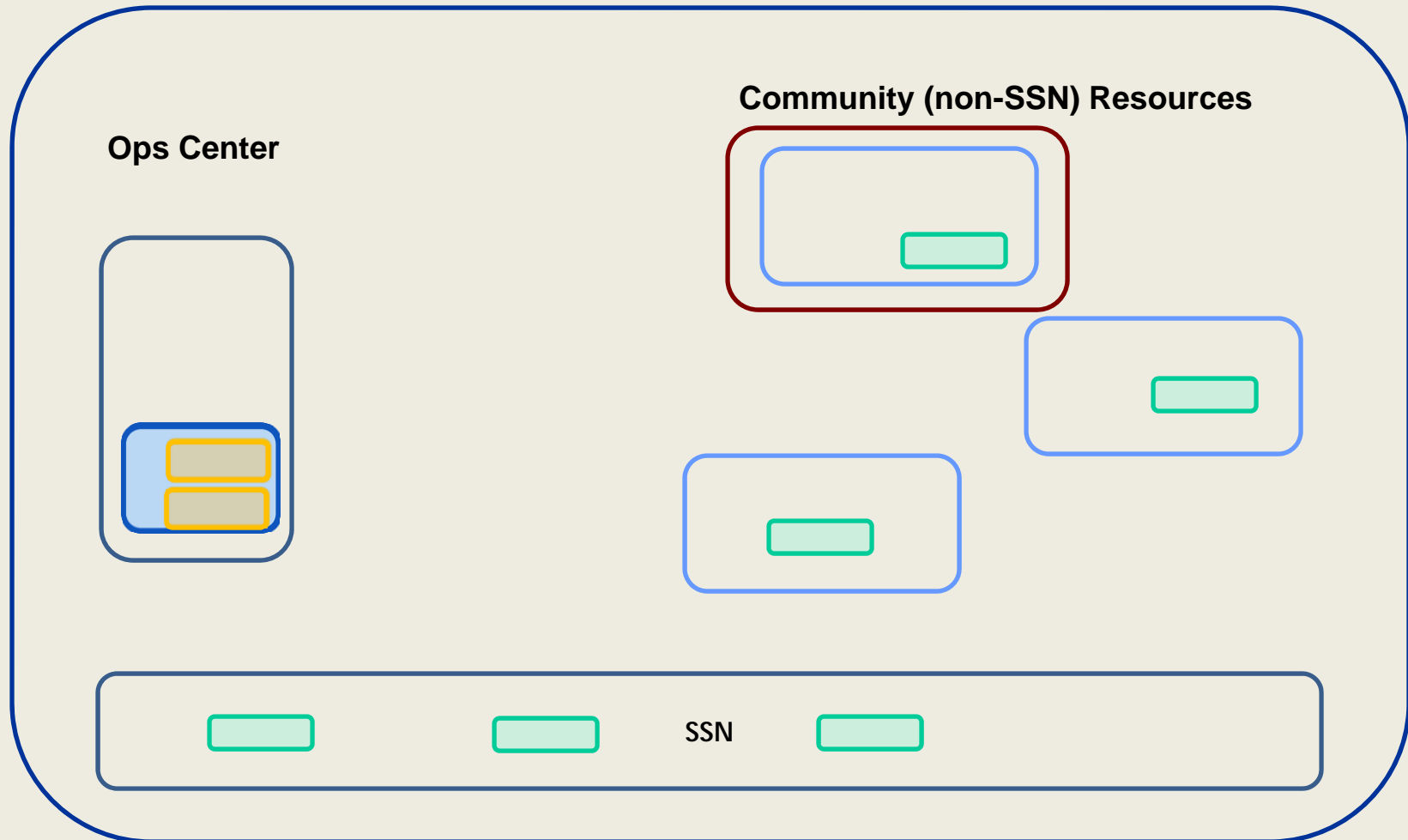
SpaceEventAlert

EventAlertAcknowledgement Type

ManeuverType Type

RSOElementSet Type

- **RIWG Demonstration Scenario 1.0 is a two-way implementation of the EDM highlighting potential step functions in key areas of SSA:**
  - Cross-community collaboration
  - Automated workflows linked to conops and decision making
- **Scenario demonstrates that RIWG recommendations and shared lessons-learned have significantly reduced EDM integration risk**
  - Demonstrated that the EDM can be adopted incrementally; low risk to "legacy" capabilities
  - Initial integration cost can be low, with potential high-payoff in content/product value and efficiency via automation
- **Continued RIWG efforts will further reduce perceived and actual "barriers to entry" re adoption of the EDM**