

## Lessons Learned from Implementing CADM for Integrated Architectures

Briefing to CISA Worldwide 30 October 2002

Department of the Navy Chief Information Officer Enterprise Architecture Team



# **Briefing Outline**

- Lessons Learned About:
  - Deciding that you need an Integrated Architecture Database
  - Managing Architecture Data
  - Building an Integrated Architecture Database
  - Using an Integrated Architecture Database
- Summary and Conclusion



# Three Levels of Architecture Integration

- Stand-alone
  - Architecture "Gurus" or SMEs develop and promulgate for implementation
- Distributed
  - Multiple architecture teams work toward and interoperable solution
- Enterprise
  - All parts of the enterprise within the architecture space collaborate on information, issues, and decision-making, whether they are 'architects' or not.



## Standalone

## <u>Pro's</u>

- Easiest, quickest, and cheapest
- Sufficient for noncomplex architectures
  - Size
  - Issues
- Very good when solution is known and just needs to be documented

## <u>Con's</u>

- Solutions are typically noninteroperable
- Redundant effort
- Mirrors "stovepiped" systems
- Don't scale well



# Distributed

## <u>Pro's</u>

- Split the job into SME teams
- Reduces complexity by breaking up the job
- Less stovepiped

## <u>Con's</u>

- Coordination on terms and objects
- Reconciliation of different conclusions
- Redundant effort
- Re-entry of ADS data
- Value not recognized by rest of enterprise



## Enterprise

## <u>Pro's</u>

- Holistic many of the interdependent variables accounted for
- Becomes an Enterprise decision resource
  - Reduce ad-hoc and often redundant data calls
- Sub-enterprise architectures 'borrow from'

## <u>Con's</u>

- Most expensive
- Difficult to demonstrate ROI up front
- Requires data management
- Requires solving the ADS problem
- Requires semantic data standards
- Sustain/maintain
  - Sr. Level Commitment
  - Refresh



# Qualities of an Integrated Architecture Database (IAD)

- Consistency:
  - Within a product by levels of abstraction
  - Across products
  - Across Inter-project teams, mission areas, capabilities, functional areas, etc.
  - Inter-agency
- Easier to maintain and keep validated
- Relates to other enterprise data
- Multi-perspective views and re-use
- Authoritative Data Source Interfaces
- Real-time Decision Support
- Multiple Tools Interfaced to Common Repository



# Architecture

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(Interfaces, Functional allocation, Performance & Tech Stds.											
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Triggers / Evente											
(to processes nodes systems correlation)											

Taxonomies





To move a node, hold down the shift key BEFORE selecting the node to drag.

Backup/Restore

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			specific to a single organization, wea	pon system, or individual, tha	t enables missions or functions	s to be accomplished.
1.6 - Industrial and/or Contract Property Management			multiple tasks (SPAWAR).	4A, 1996) Note: Multiple proc	esses accomplish a task; a sin	ngle process may support
- 1.7 - Information Lechnology			2. CADM 2.0: PROCESS-ACTIVITY	( (4204/2) (A) THE REPRE	SENTATION OF A MEANS B	Y WHICH A PROCESS ACTS
- 1.9 - Program Management			3. Discussion. An activity is a define	SPECIFIC UUTPUT, (DDDS ed task that is performed by a	person or group of people peri	forming in the role of an
- 1.10 - Purchasing			organization type. An activity could I	be a high level task such as F	REPARATION of forces for a	mission or exercise, or could
□ 1.11 · Science and Technology			be a low-level task such as 'Patrol La B USAGE	aw Enforcement Area."		
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To move a node, hold down the shift key BEFORE selecting the node to drag.

Database Actions

Backup/Restore

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■       5 + HEALTH SERVICES INFORMATION         ■       6 + LEVELS OF SUPPORT         ■       7 + LOGISTICS INFORMATION         ■       9 + MAGTF (Abstract) INFO         ■       9 + MAGTF (Abstract) INFORMATION         ■       9 + MAGTF (Abstract) INFORMATION         ■       9 + Acoustic         ■       9 + Acoustic         ■       9 + Acoustic         ■       9 + Construct         ■       11 + Construct <td></td> <td><ul> <li>         B 23 - : J181         C 24 - : J0.2 The J0.2 Network Time Update message adjusts the system time to a standard time.         <ul> <li>24 - J0.2 The J0.2 Network Time Update message adjusts the system time to a standard time.</li> <li>25 - J0.3 The J0.3 Time Slot Assignment message is used to permit dynamic assignment of time slots to JUs by a responsible JU.             <li>26 - J0.4 The J0.4 Radio Relay Control message provides the means for the JU responsible for relay control to assign and deassign the             <li>27 - J0.5 The J0.5 Repromulgation Relay message is used to request that those messages in the same time slot containing the J0.5 me             <li>28 - J0.6 The J0.6 Communications Control message shall be used to initiate or terminate specific transmissions, to control communicati             <li>29 - J0.7 The J0.7 Distributed Reservation Announcement message provides the capability for a JU to reserve the required number of t             <li>210 - J10.2 The J10.2 Handover message is used to initiate or terminate specific transmissions, to control communicati             <li>211 - J10.3 The J10.3 Handover message is used to transfer control of aircraft and Remotely Piloted Vehicles/Missiles between contro             </li> <li>213 - J10.5 The J10.5 Controlling Unit Report message is used to identify the JU that is controlling the track and to provide the mission             </li> <li>213 - J12.0 The J12.0 Mission Assignment message is used by C2 JUs to assign missions, designate targets, and provide target inform             </li> <li>216 - J12.1 The J12.1 Vector message is used by controlling units to provide air units with multiple-leg flight path information.             </li> <li>217 - J12.4: The J12.3 Flight Path message is used by controlling units to provide air units with multiple-leg flight path information.             </li> <li>217 - J12.4: Earcle Radio Type             </li></li></li></li></li></li></li></ul></li></ul></td>		<ul> <li>         B 23 - : J181         C 24 - : J0.2 The J0.2 Network Time Update message adjusts the system time to a standard time.         <ul> <li>24 - J0.2 The J0.2 Network Time Update message adjusts the system time to a standard time.</li> <li>25 - J0.3 The J0.3 Time Slot Assignment message is used to permit dynamic assignment of time slots to JUs by a responsible JU.             <li>26 - J0.4 The J0.4 Radio Relay Control message provides the means for the JU responsible for relay control to assign and deassign the             <li>27 - J0.5 The J0.5 Repromulgation Relay message is used to request that those messages in the same time slot containing the J0.5 me             <li>28 - J0.6 The J0.6 Communications Control message shall be used to initiate or terminate specific transmissions, to control communicati             <li>29 - J0.7 The J0.7 Distributed Reservation Announcement message provides the capability for a JU to reserve the required number of t             <li>210 - J10.2 The J10.2 Handover message is used to initiate or terminate specific transmissions, to control communicati             <li>211 - J10.3 The J10.3 Handover message is used to transfer control of aircraft and Remotely Piloted Vehicles/Missiles between contro             </li> <li>213 - J10.5 The J10.5 Controlling Unit Report message is used to identify the JU that is controlling the track and to provide the mission             </li> <li>213 - J12.0 The J12.0 Mission Assignment message is used by C2 JUs to assign missions, designate targets, and provide target inform             </li> <li>216 - J12.1 The J12.1 Vector message is used by controlling units to provide air units with multiple-leg flight path information.             </li> <li>217 - J12.4: The J12.3 Flight Path message is used by controlling units to provide air units with multiple-leg flight path information.             </li> <li>217 - J12.4: Earcle Radio Type             </li></li></li></li></li></li></li></ul></li></ul>
Image: Support Support           Image: Transmission Support		<ul> <li>⇒ 24 - J0.2: The J0.2 Network Time Update message algusts the system time to a standard time.</li> <li>⇒ 25 - J0.3: The J0.3 Time Slot Assignment message is used to permit dynamic assignment of time slots to JUs by a responsible JU.</li> <li>⇒ 26 - J0.4: The J0.4 Radio Relay Control message is used to permit dynamic assignment of time slots to JUs by a responsible for leav control to assign and deassign the</li> <li>⇒ 27 - J0.5: The J0.5 Repronulgation Relay message is used to request that those messages in the same time slot containing the J0.5 me</li> <li>⇒ 28 - J0.6: The J0.5 Communications Control message shall be used to initiate or terminate specific transmissions, to control communication = 2.9 - J0.7: The J0.7 Distributed Reservation Announcement message provides the capability for a JU to reserve the required number of t</li> <li>⇒ 210 - J10.2: The J10.2 Engagement Status message provides the status of an engagement between the Reference TN and the Targe</li> <li>⇒ 211 - J10.3: The J10.3 Handover message is used to transfer control of aircraft and Remotely Piloted Vehicles/Missiles between control</li> <li>⇒ 212 - J10.5: The J10.5 Controlling Unit Report message is used to identify the JU that is controlling the tack and to provide the mission</li> <li>⇒ 213 - J10.6: The J10.6 Daving message is used by C2 JUs to assign missions, designate targets, and provide target informe</li> <li>⇒ 215 - J12.1: The J12.1 Vector message is used by C2 JUs to send vector information and vector discretes specifically to air units operating</li> <li>⇒ 216 - J12.2: The J12.4 Controlling Unit Change message is used to provide new control agency information to an aircraft prior to handof</li> <li>⇒ 217.1 - J12.4: Link 4 Frequency</li> <li>⇒ 217.1 - J12.4: Sadio Type</li> <li>⇒ 217.2 - J12.4: Tack Number, Addressee</li> <li>⇒ 217.5 - J12.4: Track Number, Addressee</li> <li>&gt; 217.5 - J12.4: Recurrence Rate, Receipt/ Compliance</li> </ul>
Image: Stripped s		<ul> <li>⇒ 25 - J0.3: The J0.3 Time Stot Assignment message is used to permit dynamic assignment of time slots to JUs by a responsible JU.</li> <li>⇒ 26 - J0.4: The J0.4 Radio Relay Control message provides the means for the JU responsible for relay control to assign and deassign the 2.7 - J0.5: The J0.5 Repromulgation Relay message is used to request that those messages in the same time sito containing the J0.5 me</li> <li>⇒ 28 - J0.6: The J0.6 Communications Control message shall be used to initiate or terminate specific transmissions, to control communicati = 2.9 - J0.7: The J0.7 Distributed Reservation Announcement message provides the capability for aJU to reserve the required number of the 2.11 - J10.2: The J10.2 Engagement Status message provides the status of an engagement between the Reference TN and the Targe 2.211 - J10.3: The J10.3 Handover message is used to transfer control of aircraft and Remotely Piloted Vehicles/Missiles between control</li> <li>⇒ 212 - J10.5: The J10.5 Controlling Unit Report message is used to identify the JU that is controlling the track and to provide target inform 2.13 - J10.6: The J10.6 Pairing message is used by C2 JUs to asign missions, design hard and provide target inform 2.13 - J12.1: The J12.1 Vector message is used by C2 JUs to send vector information and vector discretes specifically to air units operation.</li> <li>⇒ 216 - J12.3: The J12.3 Flight Path message is used by controlling units to provide air units with multiple-leg flight path information.</li> <li>⇒ 217 - J12.4: Link 4 Frequency</li> <li>⇒ 217 - J12.4: Link 4 Frequency</li> <li>⇒ 217 - J12.4: Stadio Type</li> <li>= 217 - J12.4: Track Number, Addressee</li> <li>&gt; 217 - J12.4: Track Number, Addressee</li> <li>&gt; 217 - J12.4: Recurrence Rate, Receipt/ Compliance</li> </ul>
8 · MAGTF (Abstract) INFO         9 · MEASUREMT INFORMATION         9 · 9.4 · Acoustic         9 · 9.2 · Communications         9 · 9.3 · Emitter         9 · 9.4 · ED/Visual         9 · 9.5 · Exploitation         9 · 9.7 · IR         9 · 9.8 · MASINT         9 · 9.7 · IR         9 · 9.8 · MASINT         9 · 9.9 · Navigation         9 · 9.10 · Other Intelligence Data         9 · 9.11 · Other Intelligence Data         9 · 9.12 · Radar         9 · 11 · PLATFORM / FAC / UNIT INFO         9 · 11 · PLATFORM / FAC / UNIT INFO         9 · 11 · Activity/ Intent         9 · 11 · 1.4 · Classification         9 · 11 · 1.4 · Kinemics		<ul> <li>B - 26 - J0.4: The J0.4 Radio Relay Control message provides the means for the JU responsible for relay control to assign and deassign the</li> <li>B - 27 - J0.5: The J0.6 Communication Relay message is used to request that those messages in the same time slot containing the J0.5 me J0.6 Communications Control message shall be used to initiate or terminate specific transmissions, to control communication</li> <li>29 - J0.7: The J0.7 Distributed Reservation Announcement message provides the capability for a JU to reserve the required number of t</li> <li>210 - J10.2: The J10.3 Handover message is used to transfer control of aircraft and Remotey Photod Vehicles/Missiles between control</li> <li>211 - J10.3: The J10.5 Controlling Unit Report message is used to identify the JU that is controlling the track, and to provide the mission</li> <li>213 - J10.5: The J10.5 Controlling Unit Report message is used by capsing missions, designet targets, and provide target information</li> <li>214 - J12.0: The J12.0 Mission Assignment message is used by controlling units to provide air units with multiple-leg flight path information.</li> <li>215 - J12.1: The J12.1 Vector message is used by controlling units to provide air units with multiple-leg flight path information.</li> <li>217 - J12.4: The J12.1 Gentrolling Unit Change message is used to provide new control agency information to an aircraft prior to handod</li> <li>217 - J12.4: Link 4 Frequency</li> <li>217 - J12.4: Link 4 Frequency</li> <li>217 - J12.4: Link 4 Redio Type</li> <li>217 - J12.4: Secure Radio Indicator</li> <li>217 - J12.4: Recurrence Rade, Receipt/ Compliance</li> </ul>
9       MEASUREMENT INFORMATION         9       9.1       Acoustic         9.2       Communications         9.3.1       Emitter         9.4       ED/Visual         9.5       Exploitation         9.6       HUMINT         9.7       IR         9.8       MASINT         9.9.7       IR         9.9.8       MASINT         9.9.9       Navigation         9.10       Other Intelligence Data         9.11       Other Intelligence Data         9.11.1       Other Intelligence Data         9.11.2       Radar         9.11.3       Sensor Exchange         9.14       Space         9.11       PERSONNEL INFORMATION         9.11.4       PERSONNEL INFORMATION         9.11.1       Activity/ Intent         9.11.2       Associations         9.11.3       Attributes         9.11.4       Classification         9.11.5       DIMS Reports         9.11.6       Fusion Structure         9.11.7       Identification         9.11.8       Kinematics		<ul> <li>27 - J0.5: The J0.5 Repromulgation Relay message is used to request that those messages in the same time slot containing the J0.5 me</li> <li>28 - J0.6: The J0.6 Communications Control message shall be used to initiate or terminate specific transmissions, to control communications 2 - 20 - J0.7: The J0.7 Distributed Reservation Announcement message provides the capability for a JU to reserve the required number of the 210 - J10.2: The J10.2 Engagement Status message provides the status of an engagement between the Reference TN and the Targe 2.11 - J10.3: The J10.3 Handover message is used to transfer control of aircraft and Remotely Piloted Vehicles/Missiles between control</li> <li>212 - J10.5: The J10.5 Controlling Unit Report message is used to identify the JU that is controlling the tack and to provide the mission</li> <li>213 - J10.5: The J10.6 Plaining message provides a means to indicate a pairing (not engagement status) between a friendy track and a movide target informe</li> <li>213 - J10.5: The J10.0 Flaining message is used by C2 JUs to assign missions, designate targets, and provide target informe</li> <li>215 - J12.1: The J12.1 Vector message is used by controlling units to provide air units with multiple-leg flight path information.</li> <li>216 - J12.3: The J12.3 Flight Path message is used by controlling units to provide air units with multiple-leg flight path information.</li> <li>217 - J12.4: Link 4 Frequency</li> <li>217.2 - J12.4: Tack Number, Addressee</li> <li>217.3 - J12.4: Tack Number, Addressee</li> <li>217.4 - J12.4: Track Number, Addressee</li> </ul>
9.1 - Acoustic         9.2 - Communications         9.3 - Emitter         9.3 - Faiter         9.3 - Exploitation         9.5 - Exploitation         9.6 - HUMINT         9.7 - IR         9.9 - NASINT         9.9 - Navigation         9.9 - Navigation         9.9 - Navigation         9.9 - Other Intelligence Data         9.11 - Other Intelligence Data About Track/Point         9.12 - Radar         9.13 - Sensor Exchange         9.14 - Space         10 - PERSONNEL INFORMATION         11 - PLATFORM / FAC / UNITINFO         11 - Activity/ Intent         11.1 - Activity/ Intent         11.2 - Associations         11.3 - Attributes         11.4 - Classification         11.5 - DRMS Reports         11.6 - Fusion Structure         11.7 - Identification		<ul> <li>2.8 - J0.6: The J0.6 Communications Control message shall be used to initiate or terminate specific transmissions, to control communications 2.12 - J0.7: The J0.7 Distributed Reservation Announcement message provides the capability for a JU to reserve the required number of 1.2.10 - J10.2: The J10.2 Engagement Status message provides the status of an engagement between the Reference TN and the Targe 2.2.11 - J10.3: The J10.3 Handover message is used to identify the JU that is controlling the track and to provide the mission 2.2.12 - J10.5: The J10.5 Controlling Unit Report message is used to identify the JU that is controlling the track and to provide the mission 2.2.13 - J10.6: The J10.6 Deairing message provides a means to indicate a pairing (not engagement status) between a friendly track and ar 2.2.14 - J12.0: The J12.0 Mission Assignment message is used to 2.2.14 us to assign missions, designate targets, and provide target inform 2.2.15 - J12.1: The J12.1 Vector message is used by C2.2.14 us to assign missions, designate targets, and provide target inform 2.2.16 - J12.3: The J12.3 Flight Path message is used by controlling units to provide air units with multiple-leg flight path information.</li> <li>2.17 - J12.4: The J12.4 Controlling Unit Change message is used to provide new control agency information to an aircraft prior to handod = 2.17.1 - J12.4: Secure Radio Indicator = 2.17.3 - J12.4: Secure Radio Indicator = 2.17.4 - J12.4: Track Number, Addressee = 2.17.5 - J12.4: Recurrence Rate, Receipt/Compliance</li> </ul>
9.2.2       Communications         9.3.5       Emilter         9.3.6       Emilter         9.3.7       IR         9.3.8       - HUMINT         9.3.7       IR         9.3.8       - MASINT         9.3.9       Navigation         9.3.10       Other Intelligence Data         9.3.11       Other Intelligence Data         9.3.12       Radar         9.3.13       Sensor Exchange         9.3.14       Space         9.3.15       Sensor Exchange         9.3.14       Space         10       PERSONNEL INFORMATION         9.3.11.2       Associations         11.1       PACT/ORM / FAC / UNIT INFO         11.1.2       Associations         11.1.2       Associations         11.1.4       Classification         11.1.5       DRMS Reports         111.6       Fusion Structure         111.7       Identification         111.8       Kinematics		29 - J0.7: The J0.7 Distributed Reservation Announcement message provides the capability for a JU to reserve the required number of     210 - J10.2. The J10.2 Engagement Status message isovides the status of an engagement between the Reference TN and the Targe     211 - J10.3: The J10.3 The J10.3 Handover message is used to transfer control of aircraft and Remotely Piloted Vehicles/Missiles between contro     212 - J10.5: The J10.5 The J10.5 Pointing Unit Report message is used to identify the JU that is controlling the track and to provide the mission     213 - J10.5: The J10.6 Pairing message is used to identify the JU that is controlling the track. And to provide the mission     214 - J12.1: The J12.0 Mission Assignment message is used by C2 JUs to assign missions, designate targets, and provide target inform     215 - J12.1: The J12.0 Mission Assignment message is used by C2 JUs to assign missions, designate targets, and provide target inform     216 - J12.1: The J12.1 Vector message is used by C2 JUs to send vector information and vector discretes specifically to air units opera     217 - J12.4: The J12.1 Vector message is used by C2 JUs to send vector information and vector discretes specifically to air units opera     217 - J12.4: The J12.1 Vector message is used by C2 JUs to send vector information and vector discretes specifically to air units opera     217 - J12.4: The J12.4 Controlling Unit Change message is used to provide new control agency information to an aircraft prior to handod     2177 - J12.4: Link 4 Frequency     217.2 - J12.4: Radio Type     217.2 - J12.4: Recurrence Rate, Receipt/ Compliance     217.5 - J12.4: Recurrence Rate, Receipt/ Compliance     217.5 - J12.4: Recurrence Rate, Receipt/ Compliance     217.5 - J12.4: Secure Rate, Receipt/ Compliance     217.5 - J12.4: Secure Rate Rate Compliance     217.5 - J12.4: Secure Rate Receipt/ Compliance     217.5 - J12.4: Secure Rate Receipt/ Compliance     217.5 - J12.4: Secure Rate Rate Receipt/ Compliance     217.5 - J12.4: Secure Rat
0.1.2. Contrained and a sectors         0.1.2. Contrained and a sectors <td></td> <td>210 - J10.2 The J10.2 Engagement Status message provides the status of an engagement between the Reference TN and the Targe     2.11 - J10.3 The J10.3 Handover message is used to transfer control of aircraft and Remotely Piloted Vehicles/Missiles between control     2.12 - J10.5. The J10.5 Controlling Unit Report message is used to identify the JU that is controlling the track and to provide the mission     2.13 - J10.5. The J10.6 Pairing message provides a means to indicate a pairing (not engagement between the Reference TN and the Targe     2.14 - J10.5. The J10.6 Pairing message provides a means to indicate a pairing (not engagement status) between a friendly track and at     2.14 - J10.5. The J10.2 Mission Assignment message is used by C2 JUs to assign missions, designate targets, and provide target inform     2.15 - J12.1. The J12.1 Vector message is used by C2 JUs to send vector information and vector discretes specifically to air units opera     2.16 - J12.3. The J12.3 Flight Path message is used by controlling units to provide air units with multiple-leg flight path information.     2.17.1 - J12.4. The J12.4 Controlling Unit Change message is used to provide new control agency information to an aircraft prior to hando     2.17.2 - J12.4. The J12.4 Controlling Unit Change message is used to provide new control agency information to an aircraft prior to hando     2.17.3 - J12.4. Secure Radio Indicator     -2.17.4 - J12.4. Track Number, Addressee     -2.17.5 - J12.4. Frack Number, Addressee     -2.17.5 - J12.4. Encurrence Rate, Receipt/ Compliance</td>		210 - J10.2 The J10.2 Engagement Status message provides the status of an engagement between the Reference TN and the Targe     2.11 - J10.3 The J10.3 Handover message is used to transfer control of aircraft and Remotely Piloted Vehicles/Missiles between control     2.12 - J10.5. The J10.5 Controlling Unit Report message is used to identify the JU that is controlling the track and to provide the mission     2.13 - J10.5. The J10.6 Pairing message provides a means to indicate a pairing (not engagement between the Reference TN and the Targe     2.14 - J10.5. The J10.6 Pairing message provides a means to indicate a pairing (not engagement status) between a friendly track and at     2.14 - J10.5. The J10.2 Mission Assignment message is used by C2 JUs to assign missions, designate targets, and provide target inform     2.15 - J12.1. The J12.1 Vector message is used by C2 JUs to send vector information and vector discretes specifically to air units opera     2.16 - J12.3. The J12.3 Flight Path message is used by controlling units to provide air units with multiple-leg flight path information.     2.17.1 - J12.4. The J12.4 Controlling Unit Change message is used to provide new control agency information to an aircraft prior to hando     2.17.2 - J12.4. The J12.4 Controlling Unit Change message is used to provide new control agency information to an aircraft prior to hando     2.17.3 - J12.4. Secure Radio Indicator     -2.17.4 - J12.4. Track Number, Addressee     -2.17.5 - J12.4. Frack Number, Addressee     -2.17.5 - J12.4. Encurrence Rate, Receipt/ Compliance
3.3       - EUNistin         9.4       - EO/Visual         9.5       - ED/Visual         9.5       - ED/Visual         9.5       - HUMINT         9.5       - HUMINT         9.5       - HUMINT         9.5       - Status         9.5       - HUMINT         9.5       - Status         9.5       - Navigation         9.5       - Status         9.10       - Other Intelligence Data         9.11       - Other Intelligence Data About Track/Point         9.13       - Sensor Exchange         9.14       - Space         9.11       - PERSONNEL INFORMATION         9.11       - PERSONNEL INFORMATION         9.11       - LATFORM / FAC / UNIT INFO         11.1       - Activity/ Intent         11.1       - Activity/ Intent         11.1       - Classification         11.1.4       - Classification         11.1.5       - DIMS Reports         11.1.6       - Fusion Structure         11.1.7       - Identification         11.1.8       - Kinematics		<ul> <li>210 - 5102. The J10.3 Handover message is used to transfer control of aircraft and Remotely Piloteth Vehicles/Missiles between control = 2.12 - J10.5. The J10.5 Centrolling Unit Report message is used to identify the JU that is controlling the track and to provide the mission = 2.13 - J10.6. The J10.6 Pairing message provides a means to indicate a pairing (not engagement status) between a friendly track and a = 2.14 - J12.0. The J12.0 Mission Assignment message is used by C2 JUs to assign missions, designate targets, and provide target inform = 2.15 - J12.1. The J12.1 Vector message is used by Controlling units to provide air units with multiple-leg flight path information.</li> <li>2.16 - J12.3. The J12.3 Flight Path message is used by controlling units to provide air units with multiple-leg flight path information.</li> <li>2.17 - J12.4. The J12.4 Controlling Unit Change message is used to provide new control agency information to an aircraft prior to handot = 2.17.1 - J12.4. Secure Radio Indicator = 2.17.3 - J12.4. Secure Radio Indicator = 2.17.4 - J12.4. Track Number, Addressee = 2.17.5 - J12.4. Recurrence Rate, Receipt/Compliance</li> </ul>
1.3.4       E UNUAL         1.3.5       E Exploitation         1.3.6       F Exploitation         1.3.7       I I Exploitation         1.3.7       Sensor Exchange         1.3.1       PERSONNEL INFORMATION         1.3.1       PROTORNAL INFO         1.3.1       PUTINENT         1.3.2       Astributes         1.3.3       Attributes         1.3.4       Sensoriation         1.3.5       DRMS Reports		212 - 11 - 5103. The J103 Pantover inessage is used to transfer Control of antican and reindery index Vertices/missies between Control     212 - J105. The J105 Controlling Unit Report message is used to identify the UI that is controlling the track and to provide the mission     213 - J106. The J10.5 Controlling Unit Report message is used by C2/Us to assign missions, designate targets, and provide target inform.     214 - J120. The J120 Mission Assignment message is used by C2/Us to assign missions, designate targets, and provide target inform.     215 - J121. The J121 Vector message is used by C2/Us to send vector information and vector discretes specifically to air units operation.     217 - J123. The J123 Fight Path message is used by controlling units to provide air units with multiple-leg flight path information.     217 - J124. The J124 Controlling Unit Change message is used to provide new control agency information to an aircraft prior to hando     2177 - J124. The J124 Endie Type     -217.2 - J124: Redio Type     -217.3 - J124: Secure Radio Indicator     -217.4 - J124: Track Number, Addressee     -217.5 - J124: Recurrence Rate, Receipt/ Compliance
130 - Exploration         9.7 - IR         9.8 - MASINT         9.9.7 - IR         9.9.7 - IR         9.1 - Other Intelligence Data         9.1 - Other Intelligence Data About Track/Point         9.1 - Other Intelligence Data         9.1 - Other Intelligence Data About Track/Point         9.1 - Other Intelligence Data         9.1 - Other Intelligence Data         9.1 - Sensor Exchange         9.14 - Space         10 - PERSONNEL INFORMATION         11 - PLATFORM / FAC / UNIT INFO         11.1 - Activity/ Intent         11.2 - Associations         11.3 - Attributes         11.4 - Classification         11.5 - DFMS Reports         11.6 - Fusion Structure         11.7 - Identification         11.8 - Kinematics		<ul> <li>⇒ 12 - 3103: The J103 Controlling Unit Response message is used to identify the 9U that is controlling the tack, and to provide the mission</li> <li>÷ 213 - 3103: The J106 Fairing message provides a means to indicate a paiing (not engagement status) between a fitnelly tack, and at</li> <li>÷ 213 - J106: The J106 Beairing message provides as means to indicate a paiing (not engagement status) between a fitnelly tack, and at</li> <li>÷ 214 - J120: The J12.0 Mission Assignment message is used by C2 JUs to assign missions, designate targets, and provide target inform.</li> <li>÷ 215 - J121: The J12.1 Vector message is used by C2 JUs to send vector information and vector discretes specifically to at units opera</li> <li>÷ 216 - J122: The J12.3 Flight Path message is used by controlling units to provide air units with multiple-leg flight path information.</li> <li>÷ 217 - J124: The J12.4 Controlling Unit Change message is used to provide new control agency information to an alrcraft prior to handed</li> <li>− 2.17.1 - J12.4: Charling Unit Change message is used to provide new control agency information to an alrcraft prior to handed</li> <li>− 2.17.2 - J12.4: Frack Number, Addressee</li> <li>− 2.17.4 - J12.4: Frack Number, Addressee</li> <li>− 2.17.5 - J12.4: Recurrence Rate, Receipt/Compliance</li> </ul>
35. FHOMINI         9.9.7. IR         9.9.7. IR         9.9.7. IR         9.9.7. Navigation         9.9.7. Other Intelligence Data About Track/Point         9.9.7. Sensor Exchange         9.13. Sensor Exchange         9.14. Space         9.11. PLATFORM / FAC / UNIT INFO         9.11. Activity/ Intent         11.2. Associations         9.11.3. Attributes         11.4. Classification         11.5. DRMS Reports         11.15. DRMS Reports         11.16. Fusion Structure         11.17. Identification		<ul> <li>⇒ 213 - J102: The J102 Paring message provides a means to indicate a paining (not engagement status) between a threndy track and a = 214 - J102: The J120 Mission Assignment message is used by C2 J18 to assign missions, designate targets, and provide target inform.         = 215 - J12.1: The J12.1 Vector message is used by C2 J18 to assign missions, designate targets, and provide target inform.         = 216 - J12.3: The J12.3 Flight Path message is used by C2 J18 to assign units on provide air units with multiple-leg flight path information.         = 217 - J12.4: The J12.4 Controlling Unit Change message is used to provide are units with multiple-leg flight path information.         = 217.1 - J12.4: The J12.4 Controlling Unit Change message is used to provide new control agency information to an aircraft prior to hando         = 217.1 - J12.4: Eadio Type         = 217.4 - J12.4: Secure Radio Indicator         = 217.4 - J12.4: Track Number, Addressee         = 217.5 - J12.4: Recurrence Rate, Receipt/Compliance         = 217.5 - J12.4: Recurrence Rate, Receipt/Compliance         = 217.5 - J12.4: Secure Rate Rate, Receipt/Compliance         = 217.5 - J12.4: Secure Rate Rate, Receipt/Compliance         = 217.5 - J12.4: Secure Rate Rate Rate Rate Rate Rate Rate Rat</li></ul>
		<ul> <li>⇒ 2.14 - J12.0: The J12.0 Mission Assignment message is used by C2 JUs to assign missions. Adeignate targets, and provide target inform.</li> <li>⇒ 2.15 - J12.1: The J12.1 Vector message is used by C2 JUs to send vector information and vector discretes specifically to air units operative error information.</li> <li>⇒ 2.16 - J12.3: The J12.4 Flight Path message is used by controlling units to provide error with multiple-leg flight path information.</li> <li>⇒ 2.17 - J12.4: The J12.4 Controlling Unit Change message is used to provide new control agency information to an aircraft prior to hando</li> <li>= 2.17 J12.4: Link 4 Frequency</li> <li>= 2.17.2 - J12.4: Secure Radio Indicator</li> <li>= 2.17.4 - J12.4: Error K Number, Addressee</li> <li>= 2.17.5 - J12.4: Recurrence Rate, Receipt/ Compliance</li> </ul>
		<ul> <li>         P: 215 - J121: The J121 Vector message is used by C2/Us to send vector information and vector discretes specifically to air units opera         P: 216 - J123: The J123 Flight Path message is used by controlling units to provide air units with multiple-leg flight path information.         P: 217 - J124: The J124 Controlling Unit Change message is used to provide new control agency information to an alicraft prior to hande             2.17.1 - J12.4: The J12.4 Endio Type             2.17.2 - J12.4: Flacio Type             2.17.3 - J12.4: Secure Radio Indicator             2.17.4 - J12.4: Track Number, Addressee             2.17.5 - J12.4: Recurrence Rate, Receipt/Compliance         </li> </ul>
		El: 2:16 - J12.3: The J12.3 Flight Path message is used by controlling units to provide air units with multiple-leg flight path information.     217 - J12.4: The J12.4 Controlling Unit Change message is used to provide new control agency information to an aircraft prior to hando     -217.1 - J12.4: Link 4 Frequency     -217.2 - J12.4: Radio Type     -217.4 - J12.4: Secure Radio Indicator     -217.4 - J12.4: Recurrence Rate, Addresse     -217.5 - J12.4: Recurrence Rate, Receipt/Compliance     -217.5 - J12.4: Recurrence Rate, Receipt/Compliance
		217 - J124: The J124 Controlling Unit Change message is used to provide new control agency information to an aircraft prior to hando -217.1 - J124: Link 4 Frequency -217.2 - J124: Radio Type -217.3 - J124: Radio Indicator -2.17.4 - J124: Track Number, Addressee -2.17.5 - J124: Recurrence Rate, Receipt/ Compliance
		<ul> <li>217.1 - J12.4: Link 4 Frequency</li> <li>2.17.2 - J12.4: Radio Type</li> <li>2.17.3 - J12.4: Secure Radio Indicator</li> <li>2.17.4 - J12.4: Track Number, Addressee</li> <li>2.17.5 - J12.4: Recurrence Rate, Receipt/ Compliance</li> </ul>
■ 9.13 - Sensor Exchange         = 9.13 - Sensor Exchange         = 9.14 - Space         = 10 - PERSONNEL INFORMATION         = 11 - PLATFORM / FAC / UNIT INFO         = 11.1 - Activity / Intent         = 11.1 - Activity / Intent         = 11.2 - Associations         = 011.3 - Attributes         = 11.4 - Classification         = 11.5 - DRMS Reports         = 11.6 - Fusion Structure         = 11.7 - Identification         = 11.8 - Kinematics         = 11.7         = 11.8 - Kinematics         = 11.7         = 11.8 - Kinematics         = 11.7         = 11         = 11.7         = 11.7         = 11         = 11         = 11		<ul> <li>2.17.2 - J12.4: Radio Type</li> <li>2.17.3 - J12.4: Secure Radio Indicator</li> <li>2.17.4 - J12.4: Track Number, Addressee</li> <li>2.17.5 - J12.4: Recurrence Rate, Receipt/ Compliance</li> </ul>
9.13 - Sensor Exchange     9.14 - Space     10 - PERSONNEL INFORMATION     11 - Activity/ Intent     11.1 - Activity/ Intent     11.2 - Associations     11.3 - Attributes     11.3 - Attributes     11.4 - Classification     11.5 - DRMS Reports     11.6 - Fusion Structure     11.7 - Identification     11.7 - Identification     11.7 - Identification		<ul> <li>2.17.3 - J12.4: Secure Radio Indicator</li> <li>2.17.4 - J12.4: Track Number, Addressee</li> <li>2.17.5 - J12.4: Recurrence Rate, Receipt/ Compliance</li> </ul>
		-2.17.4 - J12.4: Track Number, Addressee -2.17.5 - J12.4: Recurrence Rate, Receipt/ Compliance
		-2.17.5 - J12.4: Recurrence Rate, Receipt/ Compliance
		2.17.3 · 312.4. Recurrice hate, Receipt Compliance
Image: International Control Internation         Image: Internation <td></td> <td></td>		
		2.17.0 · J12.4, necept/compliance
		2.17.8 - J12.4: Control Change Indicator
		-2.17.10 - J12.4: Voice Frequency/Channel
B □ 11.6 - Fusion Structure □ 11.7 - Identification □ 11.8 - Kinematics		
⊞		2.17.12 - J12.4: Message Only
n  ☐ 11.8 - Kinematics		2.17.13 - J12.4: Track Number, New ControlAgency
The H 11 9 - Platfac C&P		
		$\pm 1.11$ to $\pm 1.12$ The 112 S Target/Track Control agency is used by controlling C2 III a to (a) correlate a target and a track (b) decorre
		$\pm 2.10 - 112.0$ . The 112.5 Taylor Taking measure is used by conforming close of a large and a takk, [b] decome
		m <sup>2</sup> 213 · 012.0. The 102.0 Farget Solution interseque is used to (a) enable holic2 30% to distinguish targets alloing themselves, (b) pass thete
		H 2.20 - J12.7: The J12.7 Target bearing message
		H=2.21 - 31.3.2 in e 31.3.2 Air Platform and System Status message provides the current status of an air platform to include ordnance load,
H 14.1 · AAM L&P		H-2.22 - J13.3: I he J13.3 Surface (Maritime) Platform and System Status message provides the current status of a surface (maritime) platform
⊕-□14.2 - Acoustic U&P		
⊕- 🗖 14.3 - Aerial Bomb C&P		⊕ - 2.24 - J14.2: The J14.2 Electronic Warfare Control/Coordination message provides the means for EW participants to coordinate EW action
🗖 14.4 - Aerial Guns C&P		🖶 2.25 - J17.0: The J17.0 Target Nomination/Engagement Point Location msg.
⊕- 🗖 14.5 - Aerial Rocket C&P		🗄 2.26 - J17.1: The J17.1 Weapon-Target Pairing (WTP) msg
14.6 - Airfield Equipment C&P		⊞ 2.27 - J17.2: The J17.2 Weather Message
亩-□ 14.7 - BM C&P		由 2.28 - J17.3: The J17.3 Radar Service Request/Response msg
		FI 2.30 - J17.6: The J17.6 Radar Service Request/Response msg
a dia dia mandri dia dia dia dia dia dia dia dia dia di		E-2.31 - J18.0: The J18.0 Handover
		(a) 222 - 120: The 12 0 Indirect Interface Unit PPLI message is used to provide Participating Unit/Reporting Unit information on the Link 11
		12.23 1.22 The 12 A in B II message is used to provide a start another point reporting on the link if the start is in the link.
En 11/13 - Eusion Sustans C&P	▼	
Description:	De	scription
or measurements resulting from reflected man-made electromagnetic waves in the 100 to 25,000 MHz spectrum.	No D	lesciption

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## GUI vs. Data Structure



lode_1_NODE	Node_2_NODE	NA_ID	NA_nm	NA_descr_tx	NA_cat_cd	NA_ty_cd	DOC-ID	NA_colloc_ind
1	373	0			01	01		
210	330	0			01	01		
210	5714	0	Joint Intelligence		04	01		
220	3585	0	ANTIETAM to A		04	01		<b>F 4 F</b>
228	3585	0	ANTIETAM to A		04	01	14	515
233	3585	0	ANTIETAM to C		04	01		
233	8023	0			04	01		
236	2427	0			04	01		
243	449	0			01	01		

NODE_ID	NODE_nm	NODE_descr_tx	NODE_cat_cd	NODE_phy_ind_cd	NODE_lim_descr_tx
202	ACE		OT	01	
203	AE		OT	01	
204	AFRL		OT	01	
205	AFSC		OT	01	47454
206	AFWA		OT	01	17454
207	AGF		OT	01	
208	AIR CTRL		OT	01	
209	AIR WING		OT	01	

NODE_ID	PROC-ACT-ID	PROC-ACTV-V	NODE_PA_id	NODE_PA_r
475	1194	0	0	03
476	1567	0	0	03
479	641	0	0	03
481	643	0 73	າຊໍ	03
483	1233		0∠0 ₀	03
485	1229	0	0	03
487	1470	0	0	03
491	1351	0	0	03

NODE_ID	ORGT_id	NODE	ORGT	role_cd	NODE	ORGT_ic
202	216	01				
203	167	01				
204	76	01				
205	50	01		$\gamma \gamma \gamma$	DO	
206	77	01		<b>2</b> 2、	DO	
207	136	01				
208	245	01				
209	221	01				
210	2	01				

PROC-ACT-ID PROC-4	DOC-ID	PROC-ACTV-NM	PROC-ACTV-DSC-TX	PA_cat_cd	PROC-ACT	PRCS AC	PRC-ACT-SCI	PA_valid_ind_cd	ACT_ID
30	6557	DEPLOY FORCES/CONDUCT MANEUVER	To move forces to achieve a position of advantage with respect to enemy forces. This task includes the employment of forces	98					
4 0	6558	Conduct Countermobility	To delay, disrupt, fix, channel, block, or stop the enemy's offensive movement (both on sea and/or land) in order to destroy	98					
5 0	6559	Conduct Alien Migrant Interdiction Operations	To intercept alien migrants at sea and prevent their passage to US waters and territory.	98		720	0		
6 0	6560	Conduct Blockade	To blockade designated areas in conjunction with US policy.	98		132	20		
7 0	6561	Conduct Maritime Counter-Drug Operations	To coordinate with all applicable agencies to provide vessels and qualified boarding teams to intercept, board and search vessels	98					
8 0	6562	Conduct Maritime Interception	To intercept commercial, private or other non-defense or non- naval vessels by conducting Maritime Interception Operations	98					

PROC-ACT-ID	PROC-4	DOC-ID	PROC-ACTV-NM	PROC-ACTV-DSC-TX	PA_cat_cd	PROC-ACT\	PRCS-AC	PRC-ACT-SCI	PA_valid_ind_cd	ACT_ID
3 (	D	6557	DEPLOY FORCES/CONDUCT MANEUVER	To move forces to achieve a position of advantage with respect to enemy forces. This task includes the employment of forces	98					
4 (	D	6558	Conduct Countermobility	To delay, disrupt, fix, channel, block, or stop the enemy's offensive movement (both on sea and/or land) in order to destroy	98					
5 (	0	6559	Conduct Alien Migrant Interdiction Operations	To intercept alien migrants at sea and prevent their passage to US waters and territory.	98					
6 (	0	6560	Conduct Blockade	To blockade designated areas in conjunction with US policy.	98		2	000		
7 (	D	6561	Conduct Maritime Counter-Drug Operations	To coordinate with all applicable agencies to provide vessels and gualified boarding teams to intercept, board and search vessels	98		22	230		
8 (	D	6562	Conduct Maritime Interception	To intercept commercial, private or other non-defense or non- naval vessels by conducting Maritime Interception Operations	98					

### E Department of Navy Integrated Architecture Database - [Process Activities performed by Operational Nodes] \_ 8 × 🖼 File General Info Architecture Data Sets Data Edit and Use Formal Reports and Diagrams Window Help \_ 8 × Select a node by double-clicking on it View Associations Export to Excel Right click in tree to search for node. Process Activities performed by the Operational Node: 1.5 - CIA - Central Intelligence Agency -1 - JC2 OP NODES - JC2 OP NODES ∃ ♥ 0 - PROCESS ACTIVITIES -1.1 - AADC - AADC E 1 - Provide Operational C2 -1.2 - AFFOR - AFFOR 🗄 🔲 1.1 - Lead the Force -1.3 - ARFOR - ARFOR 1.2 - Provide Command and Control 🗄 🔽 1.2.1 - Act on a COA -1.4 - AWACS - AWACS 1.5 - CIA - Central Intelligence Agency E-1.2.1.1 - Assess Operations - 1.2.1.2 - Command Subordinate Forces (Execute) -1.6 - CMOC - CMOC -1.7 - CMOTF - CMOTF 1.2.1.2.1 - Conduct Consequence Management -1.8 - COALITION - Coalition Forces 1.2.1.2.2 - Execute (C4) Policies & Procedures for the JOA 1.2.1.2.3 - Execute Operations -1.10 - DIA - DIA 1.2.1.2.4 - Integrate Operational Information Operations ± 1.2.1.2.5 - Synchronize & Integrate Operations E 1.2.1.3 - Prepare Plans & Orders -1.12 - DLA - DLA 1.2.1.3.1 - Approve Plans & Orders -1.14 - FEMA - Federal Emergency Management Agency I.2.1.3.2 - Coordinate and Integrate Joint/Multinational and Interagency Support -1.15 - FOREIGN - Foreign Military ✓ 1.2.1.3.2.1 - Approve Plans and Orders -1.16 - HOST NATION - Host Nation - 1.2.1.3.2.2 - Coordinate Coalition Support -1.17 - HQ JTF - HQ Joint Task Force 1.2.1.3.2.3 - Coordinate Plans with non-DOD Organizations -1.18 - INS - INS 1.2.1.3.2.4 - Develop Multinational Intelligence/Information Sharing Structure 1.2.1.3.3 - Prepare Campaign Plans & Orders -1.19 - JC2WC - JC2WC -1.20 - JCMOTF - JCMOTF 1.2.2 - Decide on a COA -1.21 - JCS - JCS Deserve the JOA -1.22 - JCSE - JCSE 1.2.3.2 - Integrate Operational & Strategic Information -1.24 - JFLCC - JFLCC □ 🔽 1.2.3.2.1 - Determine Quality of Information 1.2.3.2.1.1 - Determine Accuracy -1.25 - JFMCC - JFMCC -1.26 - JISE - JISE 1.2.3.2.1.2 - Determine Completeness -1.27 - JPOTF - JPOTF 1.2.3.2.1.3 - Determine Relevancy -1.28 - JSOTF - JSOTF 1.2.3.2.2 - Fuse Friendly Force and Intelligence Data -1.29 - JSTARS - JSTARS 1.2.3.2.3 - Fuse Friendly Force Information & Intelligence Data -1.30 - JTF - JTF 1.2.3.2.4 - Obtain Friendly Information 1.2.3.2.5 - Obtain Multi-Source Intelligence Data -1.32 - MARFOR - MARFOR 1.2.3.2.6 - Post Map Boards, Databases, and Screen Displays -1.33 - NAVFOR - NAVFOR 1.2.3.2.7 - Prepare Information for Integrated View of Battle Space -1.34 - NGO - NGO 1.2.3.2.8 - Prepare Information for Integrated View of Battlespace ± 1.2.3.3 - Maintain Operational Information & Force Status -1.35 - NIMA - NIMA -1.36 - NIST - NIST ⊡ ☑ 1.2.4 - Orient on the Operational Situation -1.37 - NSA - NSA E-1.2.4.1 - Conduct Operational Mission Analysis -1.38 - POLAD - POLAD 1.2.4.2 - Formulate Assessment E 1.2.4.3 - Manage CCIR -1.39 - PVO - PVO -1.2.4.3.1 - Consolidate CCI -1.40 - RAOC - RAOC 1.2.4.3.2 - Consolidate CCIR -1.42 - SPACECOM - SPACECOM 1.2.4.3.3 - Determine CCIR -1.43 - STATE - STATE 1.2.4.3.4 - Task Priority Intelligence Requirements (PIRs) ± 1.2.4.4 - Monitor Strategic Situation -1.44 - THEATER HQ - Theater Headquarters -1.45 - TOC - TOC - 1.3 - Unspecified -1.46 - TRANSCOM - TRANSCOM 🗄 🔲 2 - Tasks -1.47 - TREAS - Treasury -1.48 - UCOM HQ - Unified Command HQ -1.49 - UN - United Nations -1.50 - US EMBASSY - US Embassy ▼ Description - Operational Nodes **Description - Process Activities** A. DEFINITION To be determined. ۰ 1. AFD 2.0: Process -- A group of logically related activities required to execute a specific task or group of tasks (Army Systems Architecture Framework). Note: Multiple activities make up a process (SPAWAR). Task - A discrete unit of work, not specific to a single organization, weapon system, or individual, that enables missions or functions to be accomplished. (Extension from UJTL, JCSM 3500.04A, 1996) Note: Multiple processes accomplish a task; a single process may support multiple tasks (SPAWAR). 2. CADM 2.0: PROCESS ACTIVITY (4204/2) (A) -- THE REPRESENTATION OF A MEANS BY WHICH A PROCESS ACTS ON SOME INPUT TO PRODUCE A SPECIFIC OUTPUT. (DDDS, June 1998) 3. Discussion. An activity is a defined task that is performed by a person or group of people performing in the role of an organization type. An activity could be a high level task such as PREPARATION of forces for a mission or exercise, or could be a low-level task such as 'Patrol Law Enforcement B LISAGE Activities are used in OV-3, OV-5, SV-4 (System Functionality Description) and SV-5 (Operational Activity to System Function Traceability Matrix).

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43 Operations Area (JOA) (OP - 4.5.)						1	1	1	1								1																						7	
Manage Theater Strategic Intelligence								-																										++		++	++			
44 Activities (ST-2.1)					1													1																					4	
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46 Navigate and Close Forces		- 1			+							+									+					++					++			$\perp$	$\vdash$	++	++		3	
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47 Environment (ST-5.1) 48 Organiza Fire Support Assets		1	-	++	+						++	++	+				++	+	$\vdash$	+	+ +				++	++		-		++	++	-		+			++		10	
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50 Activities (SN-2.1)																																1							2	
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52 Prepare Plans and Orders (OP-5.3)		++	_		+++	$\square$	+			$\vdash$	++	++	+	+			4		11	'   -	+	+	$\parallel$		++	++	++		$\vdash$	$\square$				+	⊢⊢	++	++	++	6	
53 Process and Exploit Collected Information		++		++	+ $+$	$\left  \right $			$\left  \right $		++	++	+	+		$\vdash$	+	+	++	++	+		+		++	++	++		$\vdash$		4+	+	+	+	<u> </u>	++	++	++	6	
54 Information (OP-23)																		1														1							2	
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56 Produce Intelligence																																		++	i ti	++	++		5	
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57 Intelligence Products (OP - 2.4)	•	/			1													1														1			$\vdash$				7	
58 Produce Strategic Intelligence (SN - 2.4)			_	$\vdash$				_	$\square$		++	++	++				++	_	$\vdash$	+	+				++	++				$\vdash$	-1			+	$\vdash$	++	++		4	-
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60 (SN-8.2)	1															,	-																						3	
Provide for Maintenance of Equipment in the																																								
61 Joint Operations Area (JOA) (OP - 4.3)						1	1	1	1		1						1																	$\perp$	$\square$	$\square$			8	
Provide Operational Air, Space, and Missile																																			.					
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63 (OP-47)										1		.					.																						6	
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64 Means, and Noncombatants (OP - 6.2)																		1	1																				2	
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## DON Integrated Architecture Database and CADM From the development view Pro's Con's

- Powerful and expressive model
  - Object class hierarchy provides tremendous capability at relatively little complexity
- Enforces proper architecture object relationships and semantics
- Being based on DoD data standards, should support interfacing to ADS's
- Auto-generate DB from CADM physical model

- Hard to program applications to handle
  - Inheritance, Rollup-Drilldown rules
  - Recursive entities to hierarchy trees
- "Live" interface to graphics and modeling tools is difficult to infeasible
- "ADS's" typically are noncompliant with DoD data standards



# Rollup/Drilldown

- A key feature of the architectural approach
  - Allows data developed at one level of abstraction (or composition) to imply data at another level
- Problem
  - Rules don't exist (Navy has proposed some)
  - Very hard to program
- But ignoring causes inconsistent results at different levels
  - a common problem in CASE tools





## Experience with Architecture Data Import / Export Translation Software

- "New" imports
  - How does the importer know if it is new or update?
    - · How does it know what architecture is being updated?
    - How does it know if the source has the authority to overwrite?
  - What happens when a biz rule is violated? Abort?
- Update imports
  - How to tell the importer about deleted items
  - How to tell the importer about a subset or different "slice-and-dice" that is being imported
- Export generation
  - How to get CADM data exported?
  - How to tell what to export, in terms of product, level of detail, and scope
  - What exporter should do if export is rejected
  - How to re-import
  - How to generate exports for custom reports and diagrams
- Taxonomies
  - How to force external tools to comply

Import / export translation can be harder than apps development



# Integrated Architecture Database and CADM

From the User's View Pro's Con's

- Enforces consistency so don't have to reconcile later
- Allows reuse and "slicing and dicing" the data by mission area, functional area, capability, etc.
- Open so ad-hoc reports and queries can be run or interfaced to other tools for analysis

- Referential integrity rules require all objects to be defined
- Multi-use of taxonomies requires collaboration and CM; require continuous data quality and integrity monitoring
- Shared architecture data requires authority to see, change, and CM
- CADM misunderstanding
- Custom reports and diagram styles – you have to know CADM
- Data management and repositing cultural issues



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# Summary

- An Integrated Architecture Database is more than "just" a database
  - The database is not the hard part to build
- Data Management is required
  - Multiple authoritative data sources
  - Collaboration on taxonomies
- Presentation vs. Structure
  - Must have an application to access the data
  - There is no simple solution to the application problem; you will wind up building a bunch of software
- Users
  - They "do and don't" like the CADM structure
  - Hard to prove the ROI up front



# Conclusions

- If your objective is an integrated architecture:
  - The database must have certain features (Slide 7)
  - All the usual data management challenges apply
  - Enterprise taxonomies, collaboratively developed, validated, maintained, and managed, are essential
  - Applications to access the database have to be built
    - Custom
    - Translators to/from COTS and GOTS
    - Hybrid
  - Rules, e.g., rollup/drilldown, need to be developed
  - Users need indoctrination