

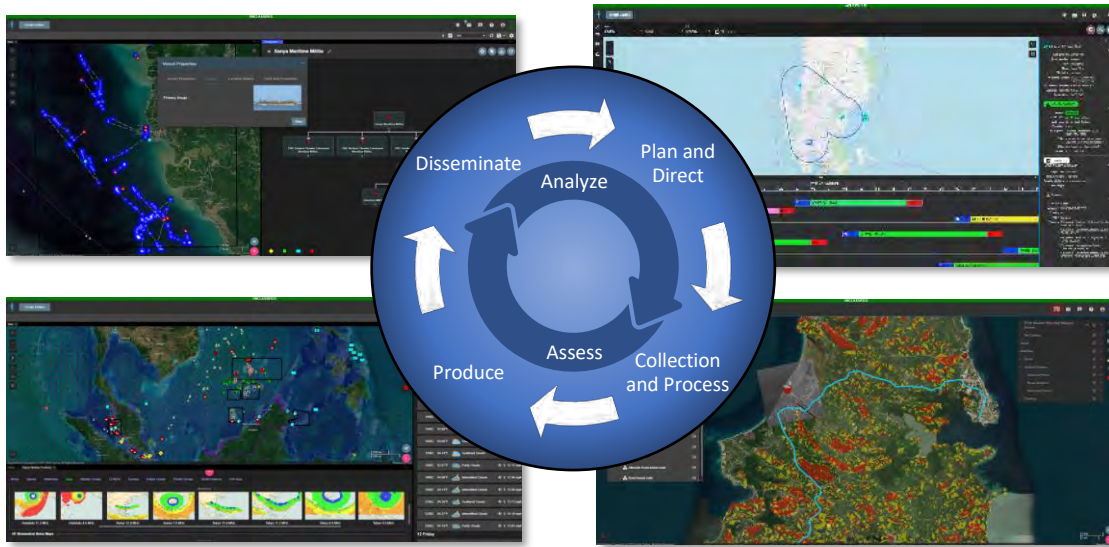
Wide-area ISR Discovery (WISRD) Capabilities Brief



Wide-Area ISR Discovery (WISRDR)



Picture of Technology



Technical Description

CyOne has developed its proprietary, modular, web-based COTS product line called Wide-area ISR Discovery (WISRDR). This product line leverages integrated state-of-the-art opensource technology and DISA-approved IronBank OCI containers to enable end-to-end support of WISRDR's modules.

The five modules that make up the WISRDR product line are *WISRDR-Collection Management (WISRDR-CM)*, *WISRDR-Support to Targeting (WISRDR-ST)*, *WISRDR-All Source (WISRDR-AS)*, *WISRDR-Weather Effects (WISRDR-WX)*, and *WISRDR All-Domain Sensing (WISRDR-ADS)*. The WISRDR product line of capabilities is the Program of Record (POR) for the Army's Intelligence Support to Targeting (ISTT) application and provides support to 1MDTF and 3MDTF in INDO-PACOM. As part of the support to these organizations, WISRDR has demonstrated experience integrating WISRDR capabilities and maintaining interoperability with multiple Joint and Army systems. Throughout these events WISRDR has been well-received by users in both Army and Joint Military organizations.

WISRDR'S federated services demonstrates the effective integration of the latest in opensource technologies that add efficiencies toward intelligence warfighter tasks while retaining the flexibility to utilize both local and cloud-hosted computing resources.

Operational Description

WISRDR-CM enables prioritized, time relevant ISR and other asset collection planning to support operational EW, Intel, and IO Dominance requirements and mission needs. These capabilities support multi-echelon and Joint collaboration to ensure proper alignment and prioritization of assets and dynamic sensor re-tasking.

WISRDR-ST enables critical support to targeting tasks within the operational environment throughout the entire Decide, Detect, Deliver, and Assess (D3A) workflow to support the Military Decision-Making Process (MDMP). These tools service end to end target development life cycle management through its mission planning, target intelligence packaging, alert notifications, and Battle Damage Assessment (BDA) capabilities.

WISRDR-AS enables situational awareness and understanding of the operational environment through data visualization & analytics, threat modeling, mission planning, and support to the targeting process. These tools provide All-Source practitioners with an in-depth and rich toolset to fully build threat knowledge and understanding to enable the MDMP.

WISRDR-WX enables the analysis of weather impacts and effects during the collection, processing, evaluation, and interpretation of relevant military operations. These capabilities enable intelligence professionals with the ability to evaluate the effects of each military aspect of weather and identify which aspects have the most bearing on operations and decision making.

WISRDR-ADS enables the detection, correlation, and analysis of PAI/CAI object detection within the domains of Maritime, Aerial, and Space object. These capabilities enable partner nation sharing and detection of activities in an unclass/sbu environment.

Technology Sponsor



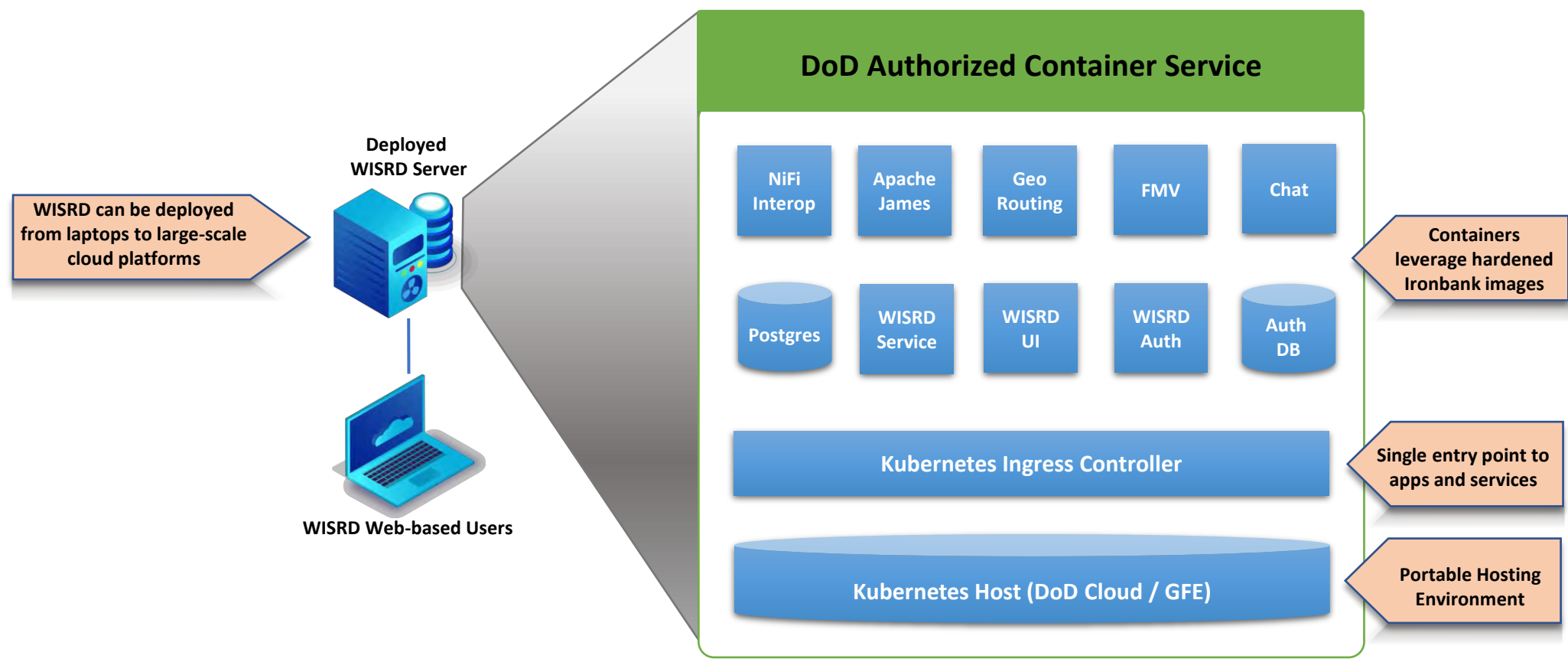
CyOne Inc.

Aberdeen Corporate Park
1202 Technology Drive, Suite B
Aberdeen, MD 21001

CAGE: 78D67

Technical POC: Kevin Mullis
Tel: 703-498-9967
Email: kevin.mullis@cyone.com

WISRD's Current Deployed Architecture



**** In WISRD's classic baseline there was a concept of a "federated" publication and subscription service across multiple WISRD deployments. As the capabilities of WISRD has expanded both from a DB and data feed ontology perspective that federated service became OBE with our latest Refactored builds. In a future release CyOne will introduce a decentralized synchronization capability to better enable synchronization and sharing of relevant data across a WISRD Enterprise solution. In the meantime, WISRD utilizes its current address book and API implementation, as well as ESRI's Enterprise ArcGIS Portal to share relevant intelligence information to external consumers. ****

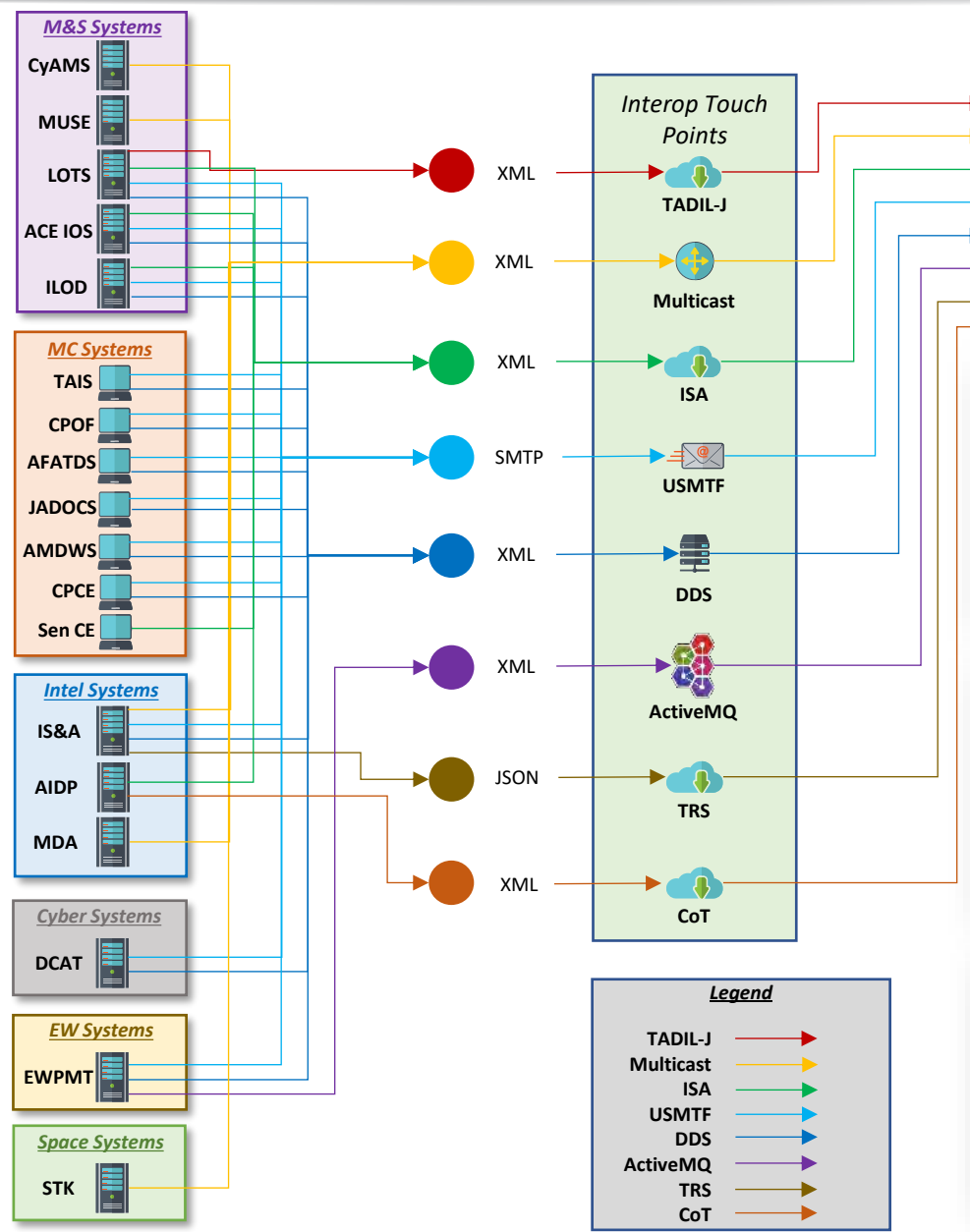
Interoperability Touchpoints

WISRD Supported *Inbound* Message Types

- PAI & CAI (All-Domain Sensing)**
 - Royce Geo
 - ESRI
 - Hawkeye 360
 - Sea Vision
 - SPIRE
 - Turbine One
 - Winward AI
 - Maxar's Crows Nest
 - CelesTrak
 - ICEYE
 - Satelogic
 - Blacksky
 - Planet
 - Cosmo Skymed
 - Umbra
 - Radar Box
 - Flare.IO
 - AIS
 - ADS-B
- Tracks, & PPLI Information**
 - IBS
 - Link-16
 - Trax
 - TADIL-J
 - GCCS-J
 - GMTI 4607
 - MTI 4676
 - JBC-P
 - Sensor CE
 - ISA
 - Arcane Lightning
 - JICD
- Data Synchronization**
 - Hydra API (IS&A)
 - AIDP
 - ICI
 - Trinity
 - ArcGIS Enterprise
 - Geospatial / Imagery**
 - ArcGIS Enterprise
 - GeoServer
 - Minerva (SAR/NITF)
 - FMV**
 - Multicast
 - Unicast
 - TCP/UDP
 - BlueEye
- Tactical Reporting**
 - Cursor on Target (COT)
 - DDS
 - TAK
 - CPCE
 - ISR Synchronization**
 - IDEX
 - EW I&W**
 - EWPMPT
- Structured Reporting**
 - USMTF (CM, TGT, WX, Threat)
 - MIL-STD-6016C (J2/J3 Series)
 - NATO STANAG 4559 (APP-11)
 - Misc.**
 - HyCARS (CBRNE)
 - Photon (RF)
 - HAB (RF/Emitters)

WISRD Supported *Outbound* Message Types

- AIDP Entities
- AIREWARN
- Air PPLI (J2.2)
- Air Track (J3.2)
- Chat (EWPMPT-X)
- CPCE/DDS – Graphics
- CPCE/DDS – I&W
- ENSIT (S309)
- EOBSREP (S303)
- Entity Export
- Hydra Entities
- Land Point PPLI (J2.5)
- Land Track PPLI (J2.6)
- Subsurface PPLI (J2.4)
- Subsurface Track (J3.4)
- Surface PPLI (J2.3)
- Surface Track (J3.3)
- TACREP (C111)
- TIDAT (S305)
- WISRD's Open API

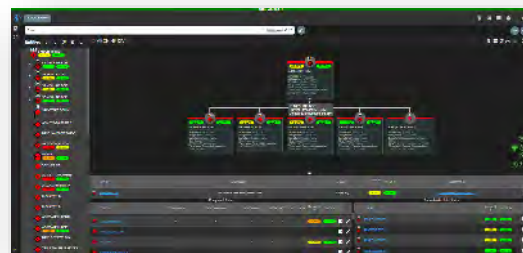



This section displays several screenshots of the WISRD interface, each highlighting a specific functional capability:

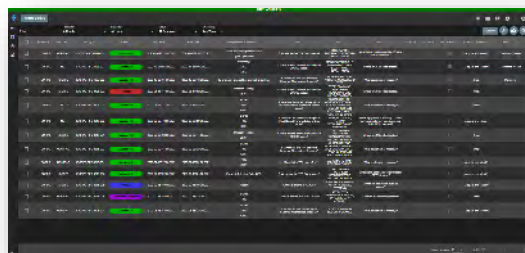
- Evaluate the Threat:** Shows a complex dashboard with multiple data feeds and maps.
- Collection Management / Support to Targeting / All Source Analysis/Fusion / Weather Effects:** A central box listing these core WISRD functions.
- Support to Tasking and Directing:** Displays a map with tasking points and data overlays.
- Sensor Laydown:** Shows a detailed view of sensor coverage and capabilities over a geographic area.
- ISR Visualization / Situational Awareness:** Provides a high-level overview of intelligence gathering and situational awareness.
- Mission Assessment:** Displays performance metrics and mission status for various operations.
- Weather Effects:** Shows weather data and its impact on mission planning and intelligence gathering.
- Intel Support to Targeting:** Focuses on intelligence support for targeting operations.



DEVELOP REQUIREMENTS



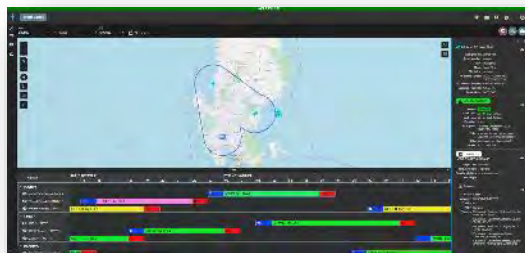
ASSESS COLLECTION



DEVELOP THE COLL MGMT PLAN



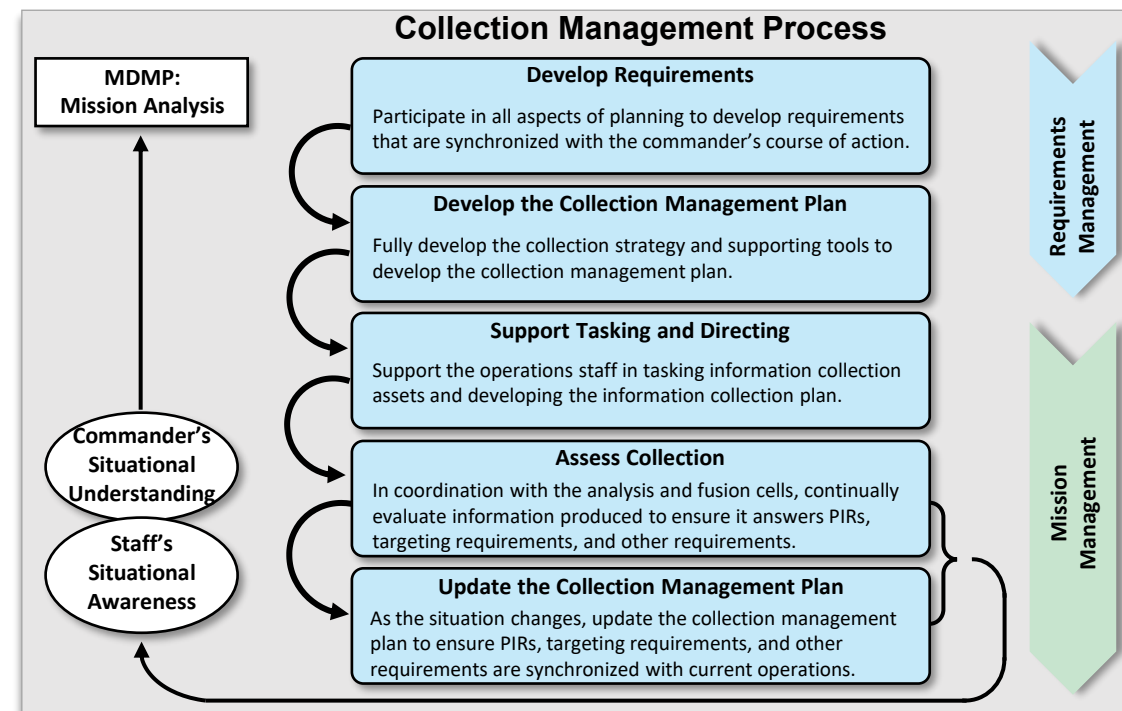
UPDATE THE COLL MGMT PLAN



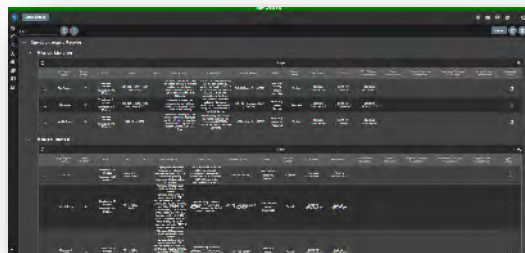
SUPPORT TASKING AND DIRECTING



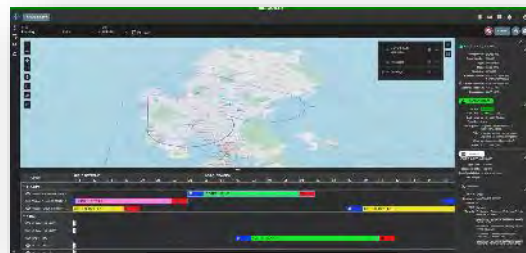
SIT AWARENESS & UNDERSTANDING



WISRD provides the ability to be intelligence-focused when conducting requirements management and operations-focused during mission management. WISRD allows the collection management team to be the conduit between operations and intelligence, which synchronizes intelligence efforts to meet operational requirements. WISRD seamlessly incorporates IPB outputs and intelligence analysis to develop requirements. This allows collection managers to apply those requirements to a scheme of maneuver to develop an effective collection plan. The collection plan is then assessed at the end of each operational phase, as well as feedback is provided back to collectors.



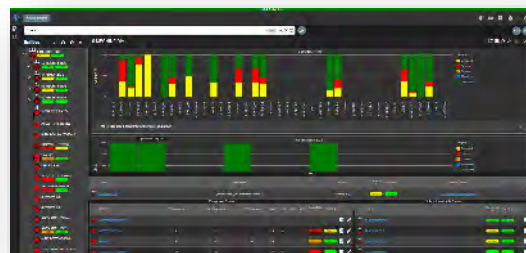
DECIDE



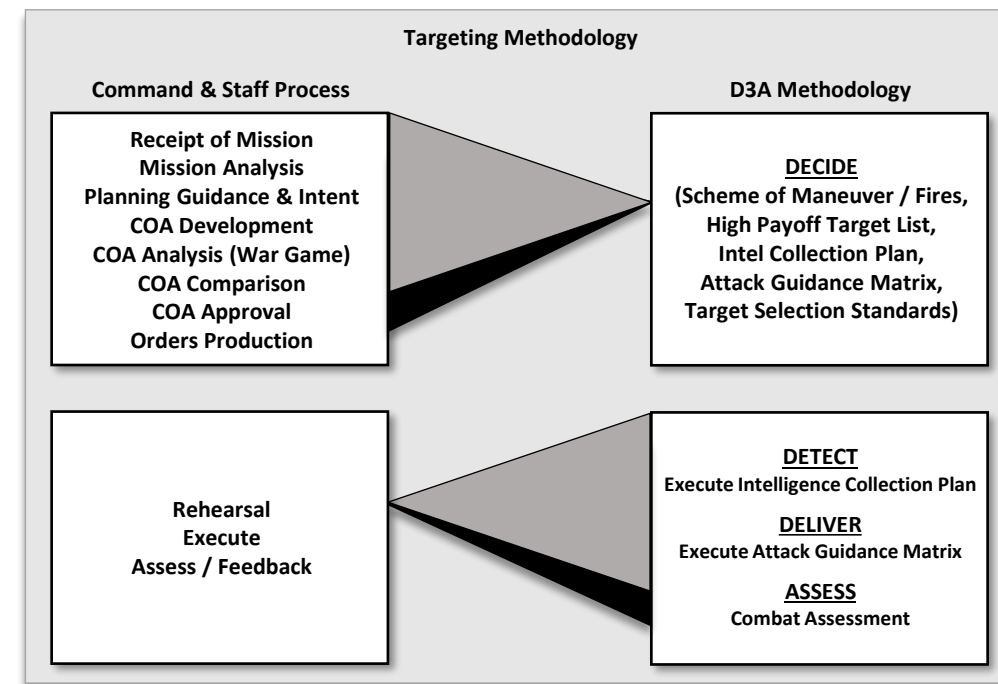
DETECT



DELIVER

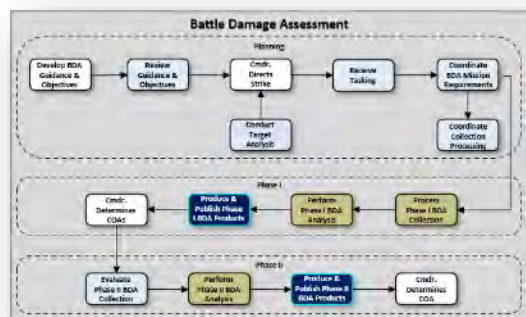
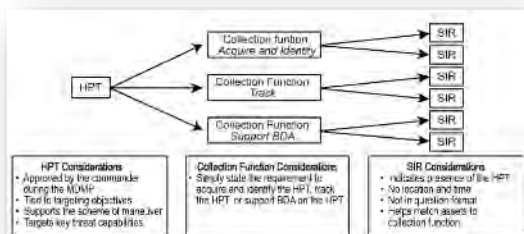


ASSESS



WISRD provides intelligence support to targeting and the Decide, Detect, Deliver, and Assess (D3A) methodology by providing the commander's staff a capability to plan for the collection and engagement of targets. Utilizing the D3A methodology, WISRD assists with organizing the efforts of the commander and staff to accomplish key targeting requirements. Through WISRD, the commander's staff can establish the requirements for the development of an effective information and intelligence collection effort. This in turn, helps the staff and targeting working group decide which targets must be acquired and engaged.

Targeting develops options used to engage targets. Options can be lethal or nonlethal, organic, or supporting at all levels throughout the range of military operations. In addition, WISRD assists in the decision of who will engage the target at the prescribed time. It also assists targeting working groups with determining requirements for combat assessment to assess targeting and attack effectiveness.



WISRD-AS & Intelligence Preparation of the Operational Environment (IPoE)

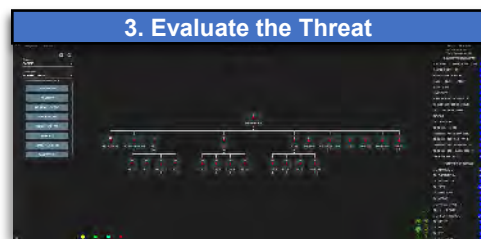


IPoE is the systematic process of analyzing the mission variables of enemy, terrain, weather, and civil considerations in an area of interest to determine their effect on operations. IPB allows commanders and staffs to take a holistic approach to analyzing the operational environment (OE). IPB results in intelligence products that are used during the military decision-making process (MDMP) to assist in developing friendly courses of action (COAs) and decision points for the commander. Additionally, the conclusions reached and the products (which are included in the intelligence estimate) developed during IPB are critical to planning information collection and targeting operations. IPB products include:

- Threat situation templates with associated COA statements and high-value target (HVT) lists.
- Event templates and associated event matrices.
- Modified combined obstacle overlays (MCOOs), terrain effects matrices, and terrain assessments.
- Weather effects work aids—weather forecast charts, weather effects matrices, light and illumination tables, and weather estimates.
- Civil considerations overlays and assessments.

IPB PROCESS ACTIVITIES

The IPB process consists of the following four steps:



Area of Operations (Figure 3-2) Step 1

- Defined by the commander
- Comprises an external boundary:
 - Delineates the areas of operations areas of operations of adjacent units
 - Includes subordinate unit areas of operations

Modified Combined Obstacle Overlay (Figure 4-9) Step 2

- Portrays the military aspects of the operational environment:
 - Avenues of approach
 - Mobility corridors
 - Natural and man-made obstacles
 - Terrain mobility classifications
 - Key terrain

Threat Overlay (Figure 4-2)

Portrays current physical locations of potential threats in the area of operations and area of interest

Threat Model (Figure 5-4) Step 3

- Convert threat doctrine or patterns of operations to graphics
- Describe the threat's preferred tactics, options, and peculiarities
- Identify high-value targets
- Identify enemy dispositions, compositions, and strengths

Threat Template (Figure 5-6)

- Distance and/or time between threat forces conducting an operation or activity
- Graphic control measures

Situation Template (Figure 6-3) Step 4

- Developed based on the threat's preferred method of operations:
 - Doctrinal rates of march
 - Time phase lines
 - Graphic control measures
 - Named areas of interest
 - Task, purpose, method, and end state
 - Key enemy weapons systems range fans
 - Avenues of approach

Event Template (Figure 6-12)

- Guide for collection planning:
 - Time phase lines
 - Named area of interest
 - Threat decision points
 - Indicators of threat activity

Event Matrix (Figure 6-13)

Association of named areas of interest and threat decision points with indicators to determine which course of action the threat commander implements

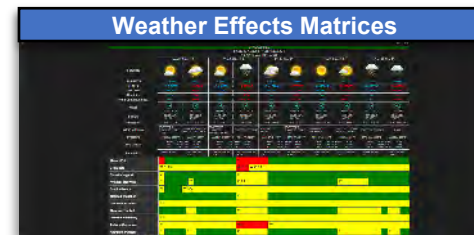
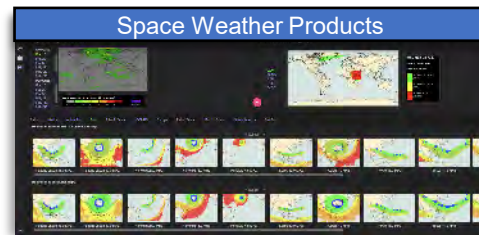
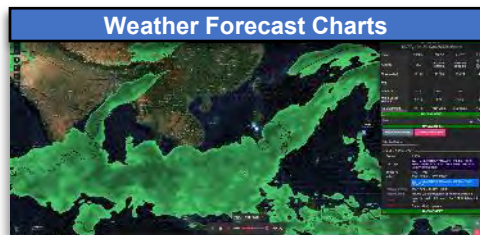
Area of Interest	Threat Decision Point	Indicator	Activity
1. (S) (U) (S) (U) (S) (U)	1. (S) (U) (S) (U) (S) (U)	1. (S) (U) (S) (U) (S) (U)	1. (S) (U) (S) (U) (S) (U)
2. (S) (U) (S) (U) (S) (U)	2. (S) (U) (S) (U) (S) (U)	2. (S) (U) (S) (U) (S) (U)	2. (S) (U) (S) (U) (S) (U)
3. (S) (U) (S) (U) (S) (U)	3. (S) (U) (S) (U) (S) (U)	3. (S) (U) (S) (U) (S) (U)	3. (S) (U) (S) (U) (S) (U)
4. (S) (U) (S) (U) (S) (U)	4. (S) (U) (S) (U) (S) (U)	4. (S) (U) (S) (U) (S) (U)	4. (S) (U) (S) (U) (S) (U)

Weather has both direct and indirect effects on military operations. The following are examples of direct and indirect effects on military operations:

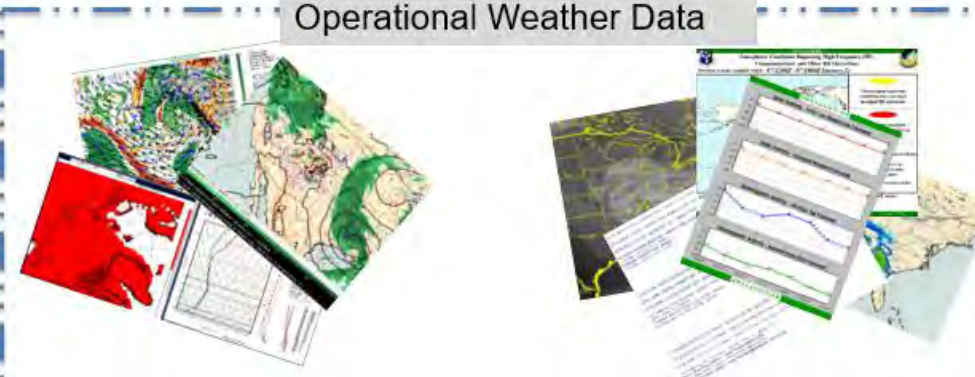
- Temperature inversions might cause some battle positions to be more at risk to the effects of chemical agents because of atmospheric ducting, a process that occurs when strong high pressure influences an area and prevents particulates from dispersing into the upper atmosphere.
- Local visibility restrictions, such as fog, affect observation for both friendly and threat forces. Severe restrictions to visibility often restrict aviation operations.
- Hot, dry weather might force friendly and threat forces to consider water sources as key terrain.
- Dense, humid air limits the range of loudspeaker broadcasts, affecting sonic deception, surrender appeals to threat forces, and the ability to provide instruction to friendly or neutral audiences.
- Sandstorms with high silica content may decrease the strength and clarity of radio and television signals.

The G-2/S-2 coordinates with the Air Force staff weather officer to provide weather effects to support operations. The following work aids are some examples the Air Force staff weather officer may provide to assist in analyzing and describing weather effects on operations:

- **Weather forecast charts** are guides for determining the weather information needed for planning and operations.
- **Light and illumination data tables** are guides for determining the light and illumination data needed for planning and operations.
- **Weather effects matrices** are guides for determining the weather effects on personnel, weapons, and equipment needed for planning and operations.



Operational Weather Data



Model Data

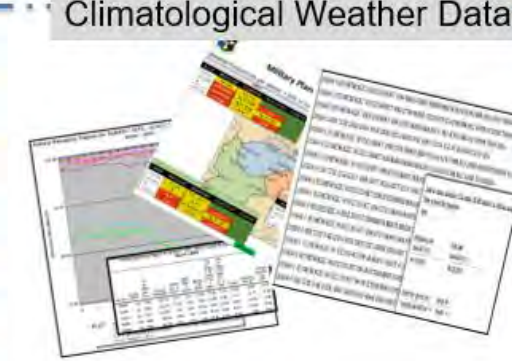
- .grib2

Weather Products

- Satellite, Radar, Space, Surface Obs, Text Files

This block contains two sub-sections. The first, 'Model Data', shows a 3D terrain map with a green overlay and a .grib2 file icon. The second, 'Weather Products', shows a satellite image, a radar map, and a text file with a line graph.

Climatological Weather Data



Historical Obs, Hazards, Ceiling/Visibility, Occurrence percentages

This block contains a sub-section 'Climatological Weather Data' which shows a 'Military Plan' document, a map, and a table of data. Below this, it lists 'Historical Obs, Hazards, Ceiling/Visibility, Occurrence percentages'.

WISRD-ADS's unclassified COP to enhance PAI/CAI collaboration between US forces and partner nations



All-Domain Sensing for Shared Situational Awareness & Understanding

All-domain sensing enables synchronized kinetic and non-kinetic capabilities and has been a consistent priority for Army senior leaders. It supports synchronization and optimization of intelligence collection, processing/dissemination activities and sensor-to-shooter activities. The Army must be able to see as far as it can shoot, see after it shoots, access machine-speed analytics to make informed decisions and understand the impacts of multiple effects on the battlefield.

Key Aspects of All-Domain Sensing:

1. **Integration Across Domains:** Requires the integration of sensors and intelligence-gathering assets from each domain. This means that data from space, air, land, sea, and cyber tools are combined to provide a comprehensive view of the operational environment.
2. **Real-Time Data Fusion:** Information gathered from different domains must be processed and fused in real-time to create a cohesive operational picture.
3. **Interoperability:** Relies heavily on the interoperability of systems across different branches of the military and allied forces. This ensures that data and intelligence can be shared seamlessly, enabling coordinated action across domains and with partner nations.
4. **Resilience and Redundancy:** Given the contested nature of modern warfare, systems must be resilient to disruption, whether from electronic warfare, cyber-attacks, or physical destruction.

