



Undersea Warfare Decision Support System (USW DSS) Overview

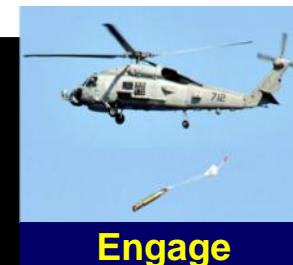
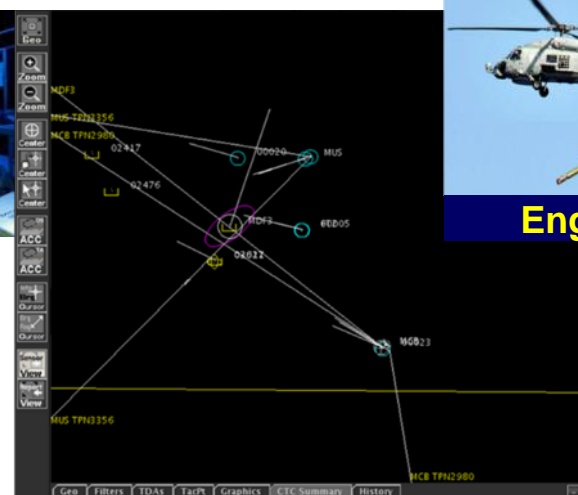
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USW DSS Operational Mission

- USW DSS is the pillar USW Command and Control (C2) Battle Management Aid (BMA) Program of Record (PoR) supporting intelligent C2 of theater and group forces (e.g. surface, subsurface, and air) against high-end adversaries.
- Enables planning and execution of USW group and theater operations; provides “best fit” asset/sensors assignments for exploitation of the environment; manages available resources; balances mission objectives versus risk; and provides a vulnerability assessment of the operational environment.

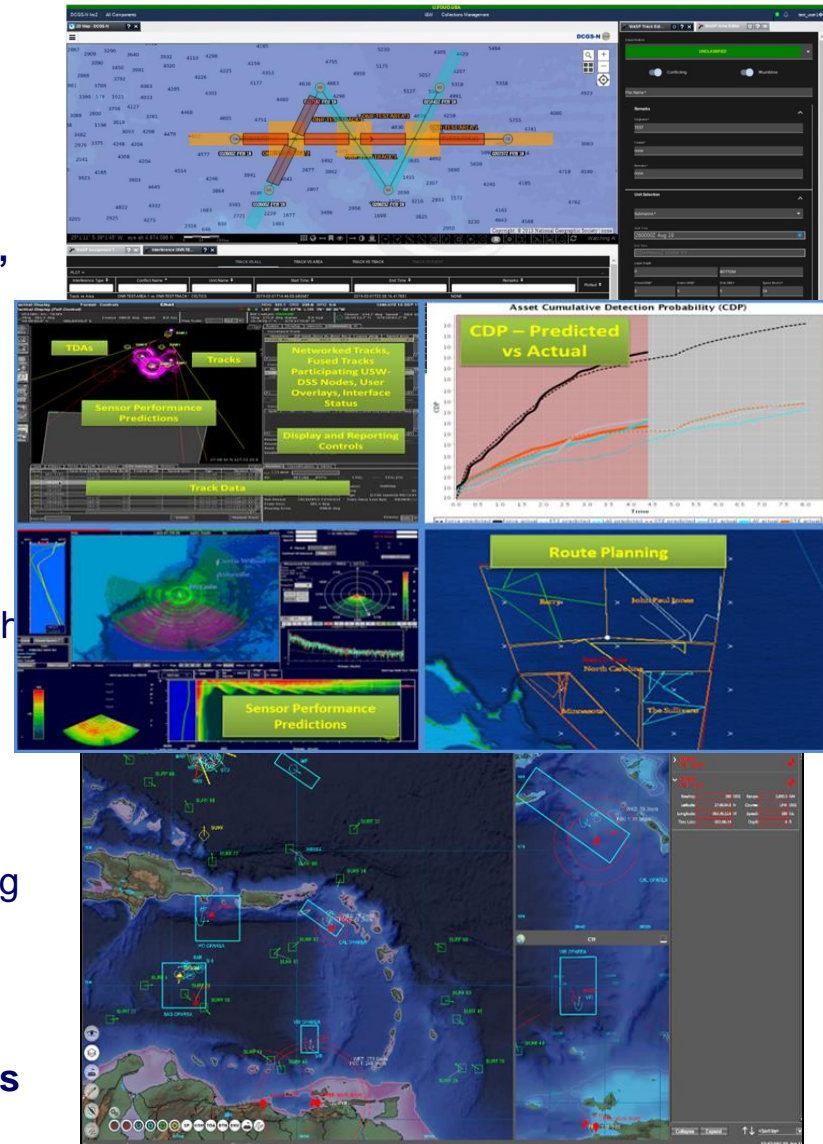


The shared CTP improves the speed and quality of decision-making in the DDE sequence

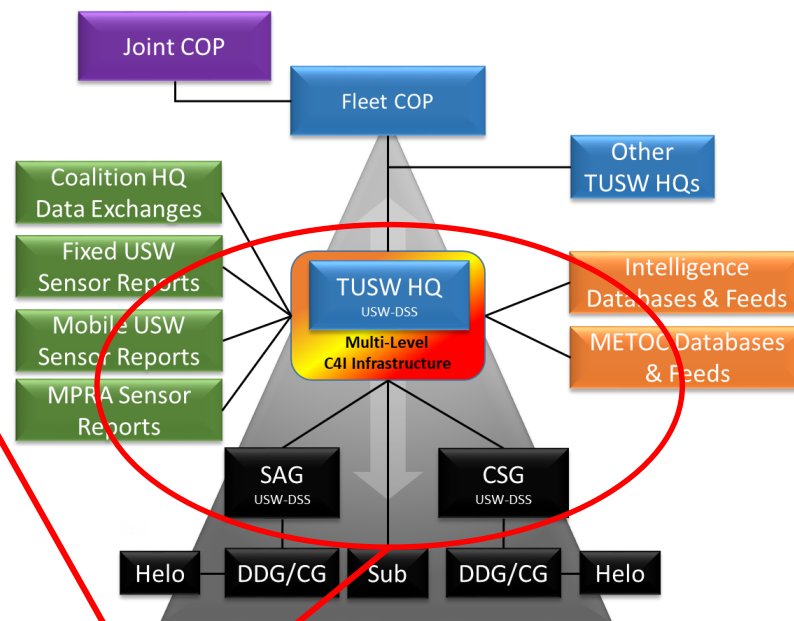
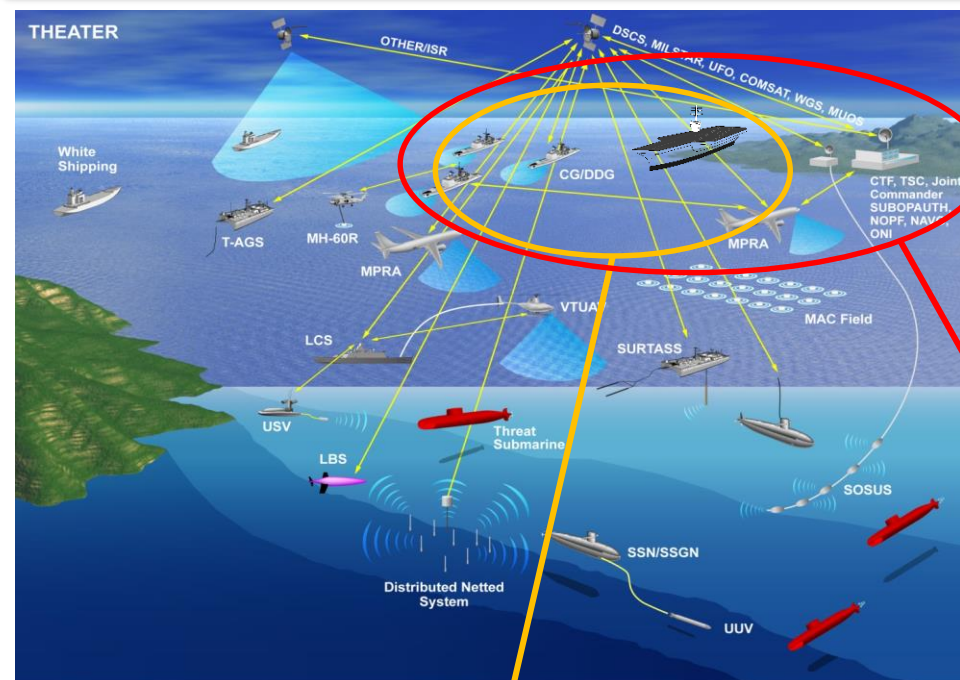


USW DSS Warfighting Impact

- Delivering USW mission planning aids that:
 - Provide “best fit” **objective/risk based asset assignments**, Courses of Action (CoA), and schemes of maneuvers.
 - Provide **enhanced ASW multi-asset (i.e. surface, air, and subsurface) search** planning with understanding of threat probability of detection, acoustic interference, vulnerability, and previous search results.
 - Enable Force to **exploit Metrological and Oceanographic (METOC)** environment to our advantage.
 - Enable commanders to assign submarine force with **prevention of mutual interference** and fratricide risk mitigation.
- Delivering USW mission execution management aids that:
 - Provide **in-situ exchange of tactical data** enabling force to more quickly synchronize actions.
 - Provide in-situ execution assessment enabling commanders to more **quickly adjust plans**
 - Provide commanders needed **situation awareness** about adversary, blue forces, and critical tripwires.



USW DSS Variants



B2R3 (Legacy)

USW-DSS Build 2 Revision 3 (B2R3) hosted on internal shipboard hardware environment, delivering networked Command & Control (C2) focused on Group ASW planning and execution.

B3 (New)

USW DSS Build 3 is hardware agnostic and virtualized, focused on implementing a new architecture enabling rapid incremental delivery of theater and group USW C2 capabilities.



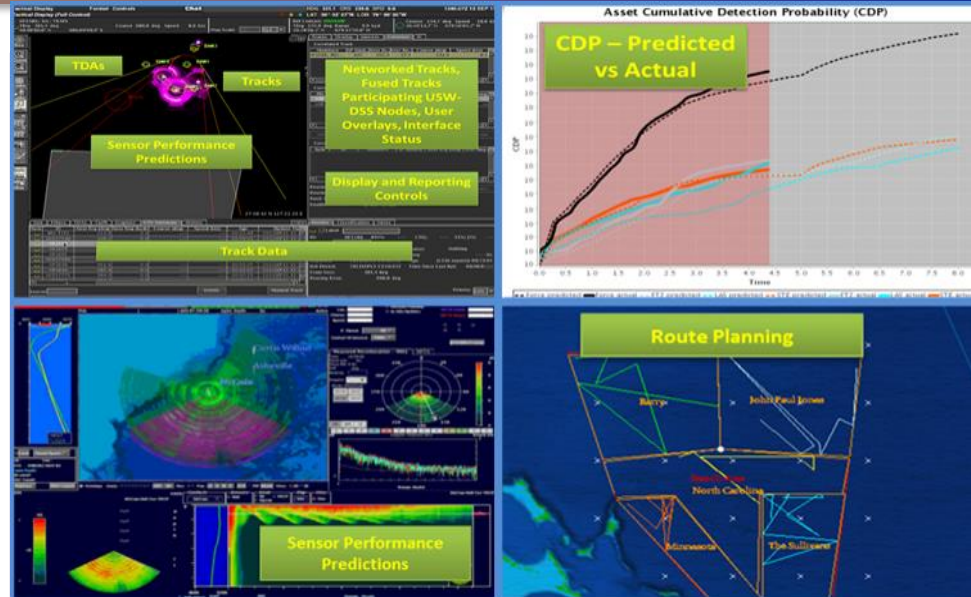
USW DSS Legacy System: B2R3

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Command and Control

- **Provide shared situational awareness across the USW group commanders and platforms**
- **Tactical Situation Displays**
 - Track Management and Track Fusion
 - Tactical Picture and Tactical Decision Aids
- **Cross Platform Data Exchanges (w/other USW DSS Nodes)**
 - Track and TDA Dissemination
 - Sensor Performance Predictions, Measured environment, Mission Plans
 - Electronic Status Boards (Force Sensors/Weapons/C2)
- **Communications**
 - Network (“USW DSS Composition”) data sharing over IP communications

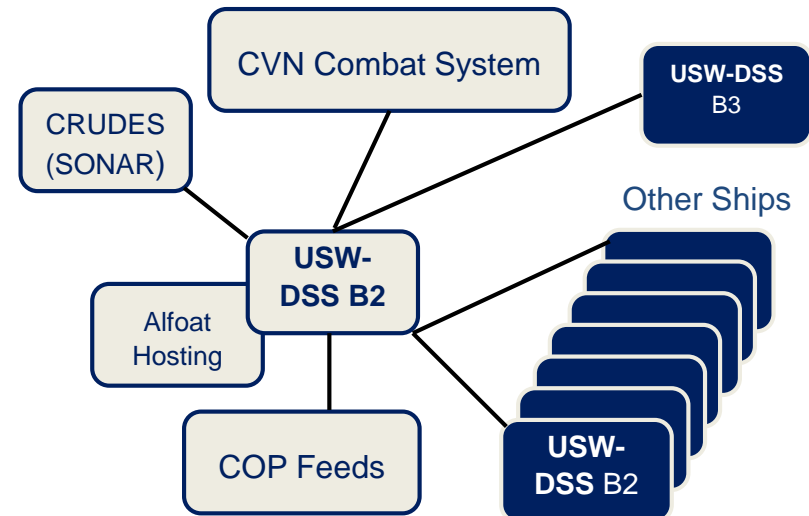
System Views



Mission Planning / Execution Monitoring

- **"Best Fit" employment of ASW Sensor platforms to maximize probability of detection of threat contacts**
- **Mission Planning**
 - Provides recommendations for “Best Fit” sensor settings and route planning for Area, Barrier, and Datum searches
 - Calculates Cumulative Detection Probability (CDP)
- **Sensor Performance Predictions**
 - Predicts sensor performance based on sensor characteristics, in-situ/historical environmental data, and threat characteristics
- **Execution Monitoring**
 - Assesses in-situ sensor performance and coverage versus planned performance
 - Updates CDP using in-situ sensor data

System Interfaces





USW DSS New System: Build 3

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Command and Control

System Views

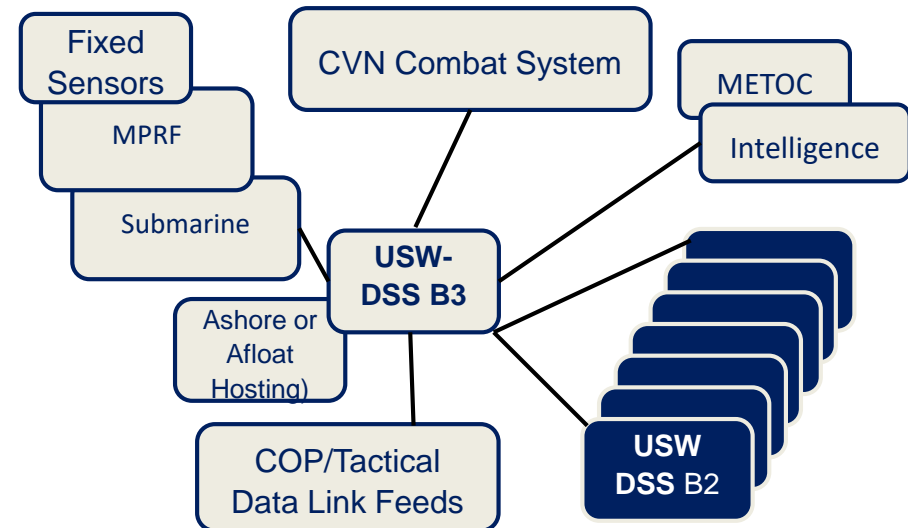


- **Provide shared situational awareness across the USW theater and group commanders and their platforms**
- **Tactical Situation Displays**
 - Track Management and Track Fusion
 - ASW contact management
 - Tactical Picture and Tactical Decision Aids
- **Cross Platform Data Exchanges (w/other USW DSS Nodes and Systems)**
 - Track and TDA Dissemination
 - Sensor Performance Predictions, Measured Environment, Mission Plans
 - Electronic Status Boards (Force Sensors/Weapons/C2)
- **Communications**
 - Network (“USW DSS Composition”) data sharing over IP communications

Mission Planning and Execution Management

System Interfaces

- **Sensor Performance Predictions**
 - Ingest and display climatology and forecasted environment data on tactical displays
 - Supports sensor performance predictions and future mission planning
- **Area planning Improvements**
 - Supports Waterspace assignment and interference checks
 - Developing Area assignment recommenders based on sensor performance, target probability, and other risks.
- **Architecture and Business Changes**
 - Migrate software architecture and business practices to enable DEVSECOPS and Continuous Integration / Continuous Delivery (CI/CD) of software
- **Physical and Virtual Workstations**
 - Utilizes remote virtual desktop access from anywhere
 - Developing Web based UIs for TACSIT and planning

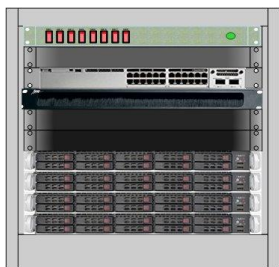


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Baseline USW DSS Computing Environment

- 12U Equipment Rack
 - Sound Isolated enclosure
 - Four 1U Virtualization/Compute Nodes
 - Each with 32 Cores, 512GB RAM, 4 TB SSD Storage
 - RHEL with Kernel Virtual Machine (KVM) Support
 - Virtual Networking
 - 24 port 10G base-T Switch
 - VLAN and routing support
- Four Operator Workstations
 - 6 Core, 16GB RAM, OpenGL Graphics Support
 - 27” Display
- Two 55” Touch Displays
 - Adjustable Height and Tilt



System is virtualized and can be hosted on most comparable hardware



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