

Office of Naval Intelligence (ONI) Repository of Characterized Adversaries (ORCA)

ORCA is the next-generation solution for the Office of Naval Intelligence characterization of naval threats. This encompasses conversion of the ONI database into a graph database to mitigate the challenges ONI experiences with its current Intelligence data solution. Since the graph database is not developed with a schema, BigBear.ai's solution allows ORCA users to quickly add new entities and attributes to the database as soon as they are needed. The graph database solution performs and scales much better than relational databases when working with the highly-connected and hierarchical data at ONI. Finally, the graph database solution will also be used as the central repository for machine learning as graph databases can highlight insights one would not see in a traditional relational database.

ORCA is designed to be cloud native, but also capable of being deployed on bare metal aboard naval vessels. KNIME is being leveraged for data migration workflows, and ReactJS is the basis of the user interface. Middleware is deployed as Spring Boot services, with Neo4j providing the graph data store which makes flexible schema and data provenance possible.

BigBear.ai designed, developed, and operates a modernized maritime characterization and performance

ORCA is the modernization of the Naval Intelligence Database (NID), enabling machine learning-derived assessments in cloud native and distributed, elastic, and intermittently disconnected operations. It is the Naval Intelligence cloud ecosystem across Unclassified (NIPRNet), Secret (SIPRNet), and Top Secret (JWICS) domains.

system that is replacing the Naval Intelligence Database (NID), aligned with the Defense Intelligence Agency's Machine Assisted Rapid-Repository Services (MARS). ORCA is highly scalable (specific data to big data), cloud native, and modular (open development standards). It is advanced computing enabled (artificial intelligence and machine learning) and leverages open-source technology platforms (i.e., KNIME and Neo4j), making the platform highly extensible. The system provides both machine and graphical user interfaces for all business processes, including data input, exploration and discovery, workflow management, and data export.

The ORCA team engaged closely with ONI analysts to understand their processes and frustrations with legacy systems, and performed thorough technical assessments of those systems to ensure new designs were able to mitigate challenges. Our team followed agile software development methodology to ensure users were involved in iteratively improving designs and guiding ongoing development, resulting in high user satisfaction and usable deliveries early in the contract's period of performance.

