OGC® CDB

Overview

Training devices have traditionally required a variety of different and unique databases to provide a synthetic representation of the world. These databases have generally been created in proprietary formats tailored for the associated simulation systems, also called simulation clients, needing to use the database. These simulation clients include subsystems such as the out-the-window visual, radar, forward-looking infrared (FLIR), computer-generated forces (CGF), and more. Having many unique databases for each simulation system creates a number of challenges, such as correlation between the databases and making rapid changes to the databases to support training and mission rehearsal requirements.

In order to address the aforementioned challenges, CAE developed a new approach and architecture called the common database (CDB). The CDB is a standard database that defines a single synthetic representation of the world, and all simulation systems use the same database – the CDB. The CDB is used as a run-time data repository from which the various simulation clients simultaneously retrieve relevant information to perform their respective run-time simulation tasks. The end result is that with the CDB, the creation, modification and correlation of run-time databases can take minutes or hours instead of days, weeks or months. Just as importantly, these changes can be made very rapidly using the latest intelligence and source data available.

CAE originally designed and developed the CDB for the United States Special Operations Command (USSOCOM). While the initial implementation of the CDB was on two high-performance combat mission simulators, CDB was soon implemented on commercial-off-the-shelf (COTS) laptop computers and used for mission preview or deployable training systems. The CDB represents fully correlated, rapidly developed, single source, run-time published database solution that is available and deployable today.

Since CDB was developed, the CDB specification has been maintained and updated by an industry-led board. In early 2015, CDB was submitted to the Open Geospatial Consortium (OGC®) as an independent, international consensus-based standards development organization, for their consideration as an eventual OGC standard. In September 2016, the OGC formally approved the CDB as a standard and it is now referred to as the OGC CDB. The adoption of the CDB as an OGC standard brings together the geospatial intelligence and modelling and simulation industries to establish greater interoperability in the use of geospatial data.

CAE

Key Benefits of OGC CDB

- Implementation of the OGC CDB significantly enhances interoperable training and mission rehearsal capabilities, while reducing development time, configuration control and associated database development costs
- OGC CDB ensures unity and correlation between the various simulation subsystems, while improving database maintainability. A key benefit is the elimination of all source level correlation errors and it is a format adaptable for high-performance deterministic systems, like fast jets
- OGC CDB eliminates time-consuming off-line database compilation process for each of the simulation clients. This reduces replication of data and loss of correlation across the simulator network. Furthermore, the OGC CDB redefines a new balance between off-line and on-line compilation processes because modern computer platforms can accomplish most of the compilation process in real-time
- OGC CDB provides a single, logical repository consisting of a static synthetic representation ranging from small areas of interest to the entire world. It includes all the relevant information for clients to perform their respective simulation tasks and avoids any data content duplication
- OGC CDB facilitates rapid database updates, thus shortening database generation and build process times. This results in reduced costs for database generation, deployment, and maintenance

Program Examples

Following the development of the architecture, CAE was responsible for implementing the OGC CDB on two USSOCOM combat mission simulators. The OGC CDB has and continues to play a key role in meeting USSOCOM's requirement for enhanced capabilities to support rapid mission rehearsal timelines using high-fidelity simulation.

Since being implemented for USSOCOM, other global militaries have adopted the OGC CDB standard.

- CAE completed the development of a Bell 412/429 helicopter simulator for the Canadian Coast Guard – the first implementation of the latest OGC CDB synthetic environment database, in 2021
- At the German Army Aviation School at Bueckeburg, CAE upgraded the 12 helicopter simulators with the CAE Medallion-6000MR image generator and supported the integration of the OGC CDB
- CAE designed and manufactured Hawk 128 full-mission simulators (FMSs) as part of the U.K.'s Military Flying Training System (MFTS) program leveraging the benefits of the OGC CDB architecture
- In Canada, the OGC CDB architecture has been implemented on a range of Royal Canadian Air Force training systems, including the CC-130J Hercules, CH-147 Chinook, CP-140 Aurora, and CH-146 Griffon
- In addition, the OGC CDB is being implemented as a dynamic worldwide terrain repository in the U.S. Joint Staff J7 Cloud-Based Terrain Generation Service

For more information contact us:

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