

Common Database (CDB)



Training devices such as flight simulators have traditionally required a variety of different and unique databases to provide a synthetic representation of the world. These traditional databases are generally created in a proprietary format for the associated simulation system, 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 correlating the databases or making rapid changes to the databases to support training and mission rehearsal requirements.

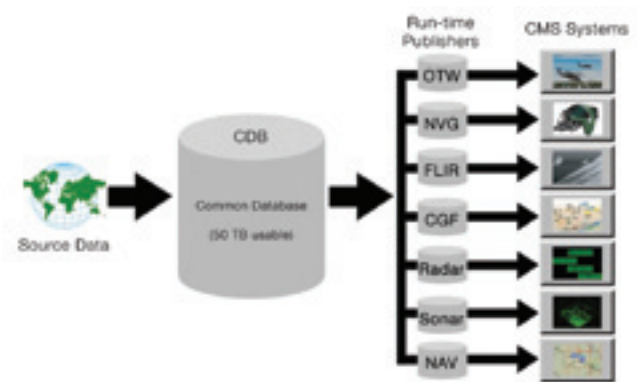
CAE has developed a new approach and architecture for database publication called the common database (CDB). The CDB is a single, standard database that defines a single synthetic representation of the world, and all simulation systems use the same database – the CDB. The CDB is used as a run-time data repository from which the various simulation clients simultaneously retrieve relevant information to perform their respective run-time simulation tasks. The bottom line 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.

Benefits

The implementation of a CDB significantly enhances interoperable training and mission rehearsal capabilities, while reducing development time, configuration control and associated database development costs. One of the main objectives of the CDB is to ensure unity and correlation between the various simulation subsystems, while improving database maintainability. A key benefit is the elimination of all source-level correlation errors.

The CDB also largely eliminates the time-consuming off-line database compilation process for each of the simulation clients. Current compilation steps lead to the replication of data and to a loss of correlation across the simulator network. The 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. The 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.

The CDB also facilitates rapid database updates, thus shortening database generation and build process times. Also, database content is unique and without duplication, so configuration management efforts are reduced significantly. All of these benefits help contribute to another key benefit – reduced costs for database generation deployment, and maintenance.



Program Examples

CAE designed and developed the CDB for the United States Special Operations Command (USSOCOM). Following the development of the CDB architecture, CAE was responsible for implementing the CDB on two combat mission simulators for the U.S. Special Operations Forces 160th Special Operations Aviation Regiment – Airborne. The first simulator to use the CDB was a MH-47G Chinook simulator, which became operational in the summer of 2007. The second simulator to use the CDB was a MH-60L Black Hawk simulator, which CAE delivered to the 160th SOAR(A) in the 2008. The CDB is playing a key role in meeting USSOCOM's requirement for enhanced capabilities to support rapid mission rehearsal timelines using high-fidelity simulation.

While the implementation of the CDB has been on two high-performance combat mission simulators, that does not mean the CDB is only applicable to high-end simulators. For example, the CDB can be implemented on commercial-off-the-shelf (COTS) laptop computers and used for mission preview or deployable training systems. The CDB represents the only fully correlated, rapidly developed, single source, run-time published database solution that is available and deployable today.

Since being implemented for USSOCOM, other global militaries have adopted the CDB standard. At the German Army Aviation School at Bueckeberg, CAE is upgrading the 12 helicopter simulators with the CAE Medallion-6000 image generator and supporting the integration of the CDB. CAE is designing and manufacturing two Hawk 128 full-mission simulators (FMSs) as part of the U.K.'s Military Flying Training System (MFTS) program and both simulators will feature the CDB architecture. Havelsan and the Turkish Air Force have adopted the CDB architecture to significantly enhance the ability to correlate and rapidly update databases to support training and mission rehearsal requirements for Turkey's fighter and trainer aircraft simulators.

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