

Distributed Observer Network



Task/Process
Modeling and
Simulation

NASA's advanced visual simulations are essential for analyses associated with life cycle planning, design, training, testing, operations, and evaluation. Kennedy Space Center, in particular, uses simulations for ground services and space exploration planning in an effort to reduce risk and costs while improving safety and performance. However, it has been difficult to circulate and share the results of simulation tools among the field centers, and distance and travel expenses have made timely collaboration even harder.

In response, NASA joined with Valador Inc. to develop the Distributed Observer Network (DON), a collaborative environment that leverages game technology to bring 3-D simulations to conventional desktop and laptop computers. DON enables teams of engineers working on design and operations to view and collaborate on 3-D representations of data generated by authoritative tools, such as Delmia Envision, Pro/ENGINEER, or Maya. DON takes models and telemetry from these sources and, using commercial game engine technology, displays the simulation results in a 3-D visual environment. Multiple widely dispersed users, working individually or in groups, can view and analyze simulation results on desktop and laptop computers in real time.

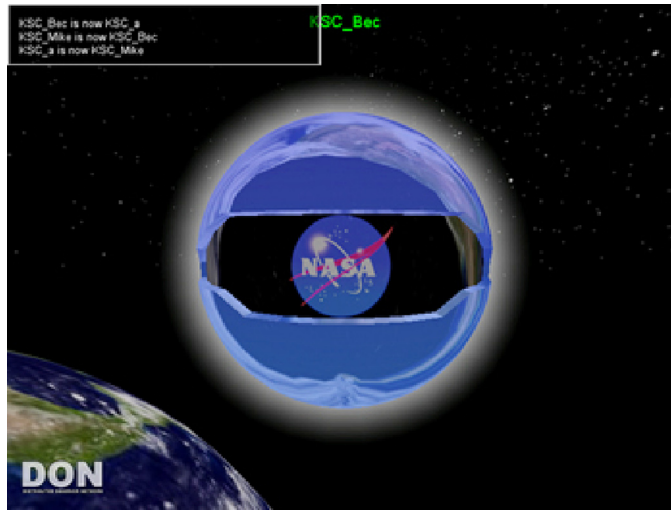
The development team experimented with a variety of NASA mission segment simulations, including Synergistic Engineering Environment (SEE) data, NASA Enterprise Visualization Analysis (NEVA) ground processing simulations, the Dynamic Simulation Suite (DSS) simulation for lunar operations, and the Johnson Space Center TRICK tool for guidance, navigation, and control analysis.

Users connect to DON through a client that runs on their own PCs or Mac computers. They can move freely within its virtual world and can preset camera points that let them jump to specific views. DON allows users to communicate textually or via Voice over Internet Protocol (VoIP); to write and save notes; and to replay, forward, fast-forward, pause, and loop simulations. Through DON, team members can share data, coordinate their work efficiently, and create a digital repository of their simulations and related information.

DON is slated for a 2008 release to support simulations for the Constellation Program. Plans for further development include improving DON's interaction with existing systems. Beyond NASA applications, DON offers opportunities in education and a myriad of other industries, particularly for overcoming the challenges that face dispersed teams collaborating on complex problems.

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DON uses game technology to enable its geographically dispersed engineers to view and collaborate on the results of their complex simulations.



DON lets users replay, forward, fast-forward, reverse, pause, and loop simulations.