

**Abstract- Data intensive science is offering new challenges and opportunities for Information Technology and traditional relational databases in particular. Database file systems offer the potential to store Level Zero data and analyze Level 1 and Level 3 data within the same database system. Scientific data is typically composed of both unstructured files and scalar data. Oracle SecureFiles is a new database file system feature in Oracle Database 11g that is specifically engineered to deliver high performance and scalability for storing unstructured or file data inside the Oracle database. SecureFiles presents the best of both the file system and the database worlds for unstructured content. Data stored inside SecureFiles can be queried or written at performance levels comparable to that of traditional file systems while retaining the advantages of the Oracle database.**

The National Ignition Facility at Lawrence Livermore National Lab is using Secure Files to ingest large volumes of data and images at file system speeds into an Oracle database. Data volumes are projected to exceed one Petabyte within one year. Data must be available for both Laser shot operations immediately and for scientific research within 30 minutes of a laser shot.

The National Ignition Facility has built a operational active archive using Oracle Secure Files and Real Application Clustering that enables both scientific analysis and control system operation within the same enterprise grid infrastructure.

The control system database and scientific analysis system utilized by the National Ignition Facility offer a model for both the operational control of space exploration and the scientific analysis of the large volumes of content generated by these missions.

The future direction of Information Technology will require relational database systems that are equipped to scale to the petabyte level in a cost effective manner. Of equal importance is the ability to analyze petabytes of Tier Zero data and surface this data as meaningful Tier One and Tier Two data in an optimized manner.

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