



Analysis Chain Tracking

The Joint European Torus (JET) project is the worlds largest experimental nuclear fusion device. Administered by the UKAEA under the European Fusion Development Agreement (EFDA) framework it aims to establish the feasibility of fusion as a means for future electricity production

Business and IT challenge

To fulfil the requirements of EFDA, JET must aim to undertake one experimental 'pulse' approximately every 30 minutes. Since data from one pulse is often required to configure the next the need for rapid, accurate inter-pulse data analysis is paramount. Problems during data production are therefore costly.

JET required a system to monitor the status of a suite of 73 individual analysis codes running in the 5 minutes following a pulse. These codes rely on input from raw data sources and other analysis codes for the same pulse, creating a complex event driven processing chain. An existing file based solution was in place to monitor this chain but was difficult to use, inaccessible to crucial operational staff and time consuming to analyse. The new system was to draw information from a

distributed range of sources into a central display in such a way that made problems easy to identify, diagnose and remedy - minimising the impact of this key data production process on experimental operations.

Delivering the vision

After lengthy consultation with key operational staff, a web based solution was decided upon as this provided a common interface across the multiple computing platforms found within JET. It also provided a convenient mechanism for remote users across Europe to monitor data availability from their home research laboratories.

The web interface was developed in PERL - a powerful file and text manipulation language. This allowed exploitation of the existing file

based inter-pulse analysis control system, reducing development time significantly.

The main monitoring page displays the status of each analysis code using an intuitive colour coding scheme. This is updated in pseudo-real-time. Such updating not only allows rapid, easy identification of errors, potential problems and successfully completed analyses but provides a mechanism for representing the degree of completion for the full analysis suite.



Results and Benefits

The newly implemented system is very popular with operational staff and now plays an essential role in daily experimental operations. Among general users, the system has remained one of the most used web sites at JET since its release. The interface has greatly streamlined the process of problem identification, diagnosis and remedy, proving itself a vital tool in an operationally critical environment.

A similar philosophy has also been applied to monitoring the raw data used by each code, allowing identification of potentially serious problems in data collection systems

From the main monitoring display Javascript links provide access to detailed information for each analysis code. This includes a list of data produced, details of the people responsible for that code and diagnostic error messages. A mechanism for tracing the unique flow (and status) of events or processes required by each code is also available. In addition, historical information is provided for the previous 50 pulses.

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