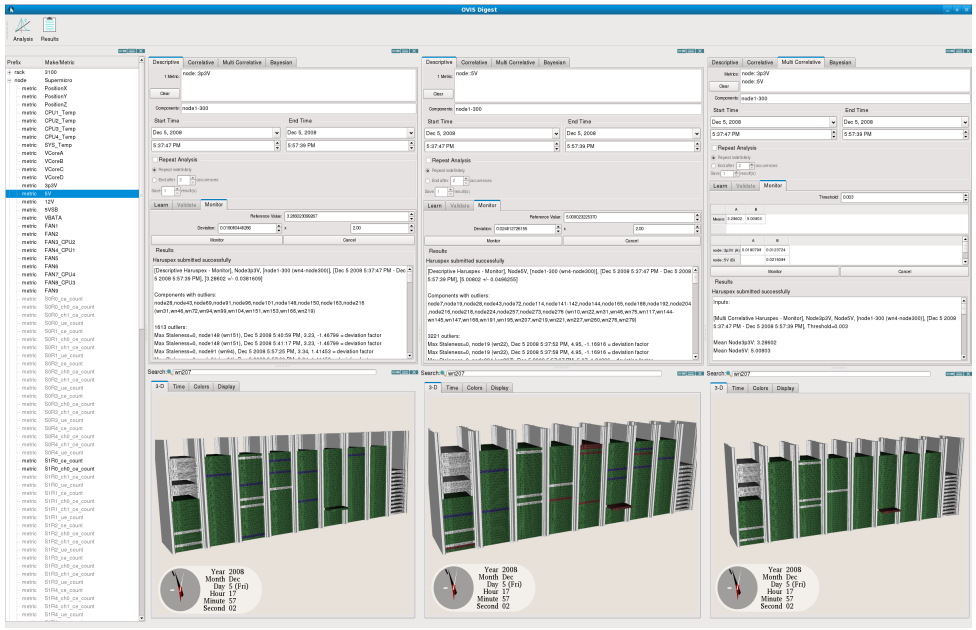
OVIS: Scalable Real-time Analysis of Very Large Data Sets

(http://ovis.ca.sandia.gov)

- Goal: Detection of anomalous behaviors in large aggregations (e.g., space, time)
  - HPC Clusters, Battery Arrays – Failure Prediction
  - Chemical Sensor Arrays – Early detection of TIC/CWA agent release
- OVIS Features:
  - Scalable Fault-tolerant Architecture for both data collection and analysis
    - Distributed Data Collection
    - Distributed Database
  - Real-time Statistical Analyses:
    - Descriptive, Multi-variate correlations, Bayesian Inference
    - Characterization of non-uniform background environments
    - Automatic outlier detection
  - 3D interactive physical display



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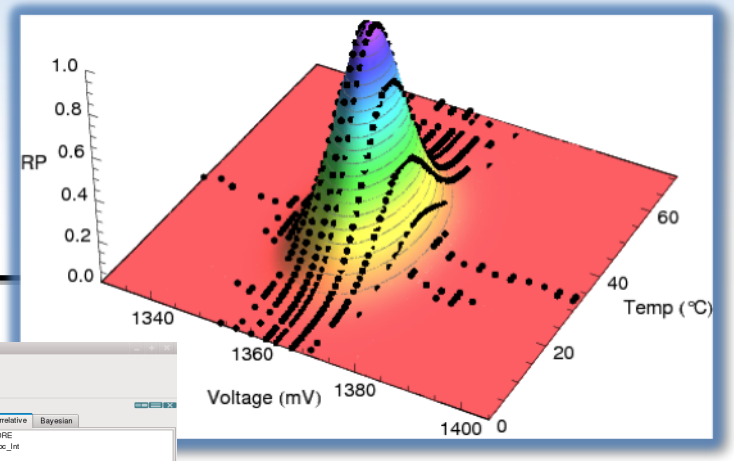
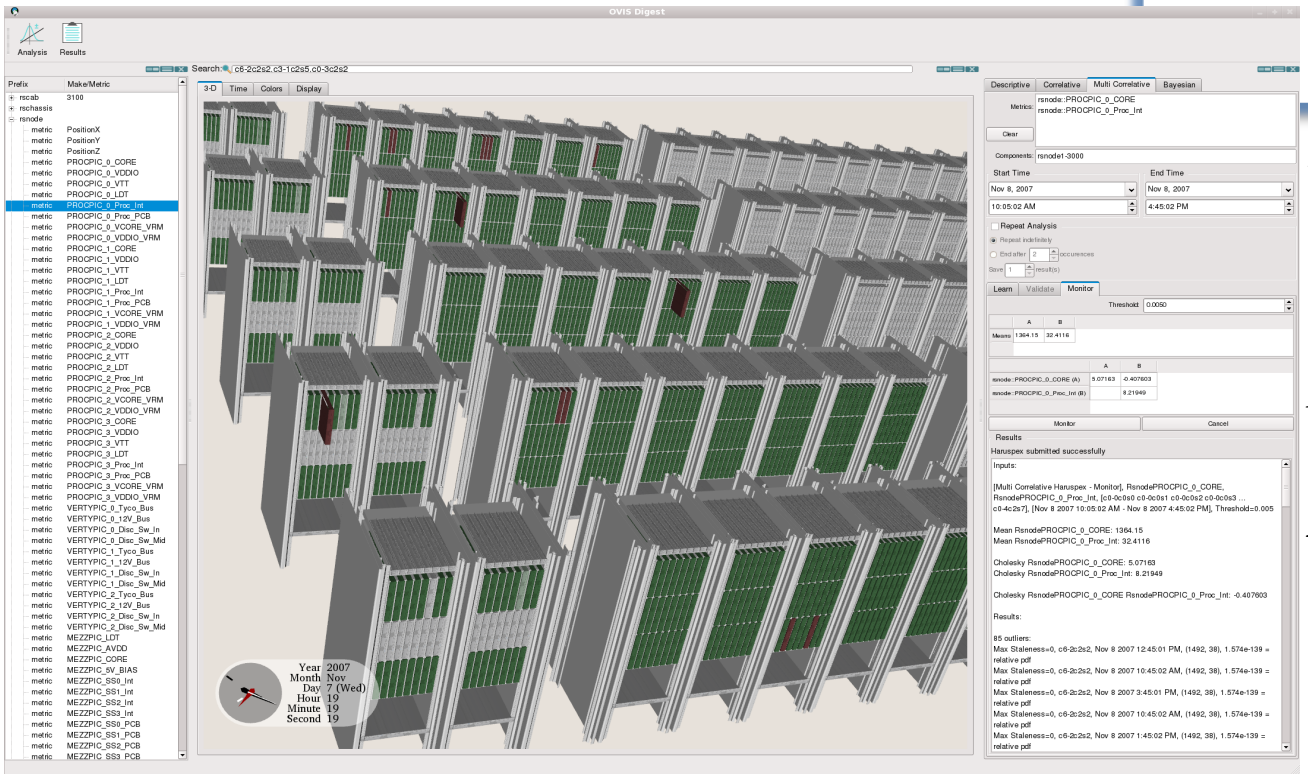
HPC Failure Prediction

Anomalous behavior can be an early indicator of impending failure



Multivariate statistical analysis builds model of system values (above). Red has lower relative probability.

Anomalous behavior detected in real-time.



Sandia's OVIS tool for real-time data collection and analysis.
Anomaly detection on Red Storm. Abnormal compute nodes shown in Red (low probability values in 2-variable correlation); normal shown in green.

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