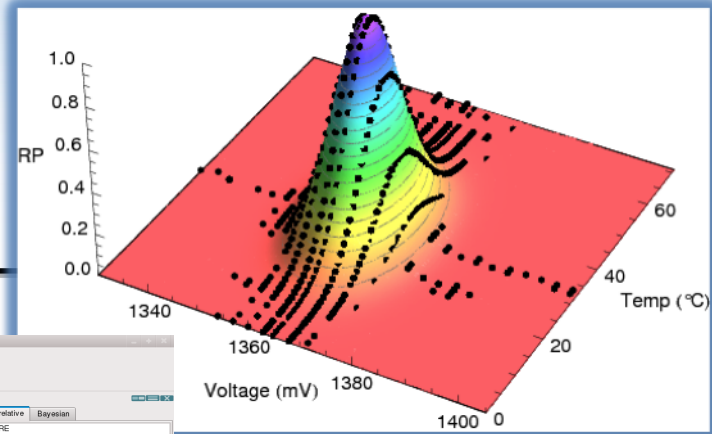


HPC Failure Prediction

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.

Metric	Value
rnnode:PROCPIC_0_CORE	5.07163
rnnode:PROCPIC_0_Proc_Int	8.21949

Results: Hasuspex submitted successfully

Inputs:

- Multi-Correlative Hasuspex - Monitor, Rnode:PROCPIC_0_CORE, Rnode:PROCPIC_0_Proc_Int, [8-06:50 8-06:51 8-06:52 8-06:53 ... 8-06:57], [Nov 8 2007 10:05:02 AM - Nov 8 2007 4:45:02 PM], Threshold:0.005

Mean Rnode:PROCPIC_0_CORE: 1364.15
Mean Rnode:PROCPIC_0_Proc_Int: 32.4116

Cholesky Rnode:PROCPIC_0_CORE: 5.07163
Cholesky Rnode:PROCPIC_0_Proc_Int: 8.21949

Cholesky Rnode:PROCPIC_0_CORE Rnode:PROCPIC_0_Proc_Int: -0.407803

Results:

85 outliers:

- Max Staleness=0, 8-30:26:2, Nov 8 2007 12:45:01 PM, (1492, 38), 1.574e+139 = relative.pdf
- Max Staleness=0, 8-30:26:2, Nov 8 2007 10:45:02 AM, (1492, 38), 1.574e+139 = relative.pdf
- Max Staleness=0, 8-30:26:2, Nov 8 2007 3:45:01 PM, (1492, 38), 1.574e+139 = relative.pdf
- Max Staleness=0, 8-30:26:2, Nov 8 2007 10:45:02 AM, (1492, 38), 1.574e+139 = relative.pdf
- Max Staleness=0, 8-30:26:2, Nov 8 2007 1:45:02 PM, (1492, 38), 1.574e+139 = relative.pdf

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.