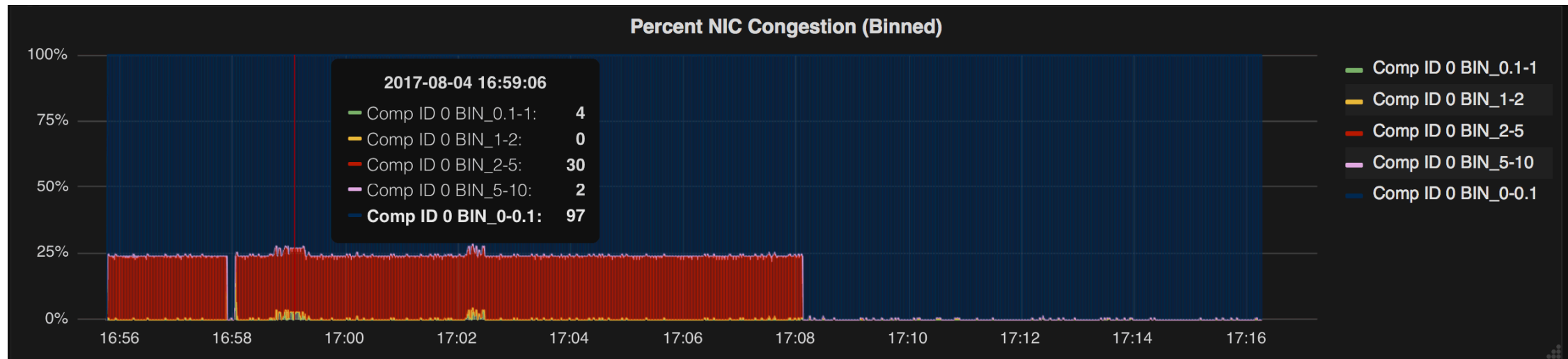


Gentile (SNL): Dynamic Assessment and Feedback

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- Problem: Variable application demands and system state (e.g., health, contention for shared resources) can result in dynamic conditions that adversely affect performance
- Approach: Determine, detect, and respond to adverse system conditions
- Benefit: Improve application and system resource utilization and throughput.



Runtime analysis and visualization of shared network congestion metrics. Backpressure in the network due to multiple applications' traffic limits the injection rate, reducing application performance. Shown: Percentage of NIC's with performance-impacting values.

Dynamic Assessment and Feedback

- What makes this a novel use of monitoring data?
 - Continuous full-system assessment with low-latency feedback for response to changing conditions
 - Currently:
 - Monitoring-related assessment is simplistic (e.g., processor temp only, power only)
 - HPC Application to resource mapping is largely static.
- What was the most significant roadblock/gap you had/have to overcome?
 - Functions of Metrics and their values that can be associated with application impact are largely unknown. (Still are!)
 - Attribution of sources of shared-resource contention can be difficult
- Any successes?
 - Particular case: Up to 50% of time lost to congestion can be recovered by analysis and dynamic mapping response
 - Our visualizations are providing our first insights into the state of the shared network (even without the response part yet).
- What are your next steps?
 - Analyses to characterize and classify state (multi-variate, many components)
 - Analyses to associate that state with application performance