Critique of Proactive Fault Tolerance for HPC with Xen Virtualization

The authors propose a proactive scheme for fault tolerance instead of reactive one. The main idea is to anticipate node failures by monitoring health status of the system and migrate from unhealthy to healthy nodes.

Strengths:

- The motivation for the scheme is justified as the MTBF for large-scale systems is very low.
- The authors show a speedup of around 4 through the use of live migration.

Weaknesses:

- The authors do not provide a clear comparison between the reactive schemes-checkpoint and restart, and proactive scheme. There is no comparison between overheads of the two schemes. Also there is no mention of scenarios in which proactive scheme will perform better than the reactive scheme and vice versa.
- The authors propose a daemon for monitoring the health status of the system. However, they have not simulated the daemon. Instead they directly inject migrations into the test system. This approach does not simulate the actual proactive scheme. It only simulates migrations.
- The paper gives a technique to overcome anticipated faults. But there is no discussion about unexpected faults, actions required to tackle them and overhead associated with them.
- The authors plot the absolute overhead due to the proactive scheme. They do not clarify individual overheads and ways to reduce the overheads. Also the overhead due to health monitoring is ignored. Thus, the authors do not give clear inferences about the feasibility of the approach considering the overhead involved.