Anomaly-Based Fault Management in Distributed Systems

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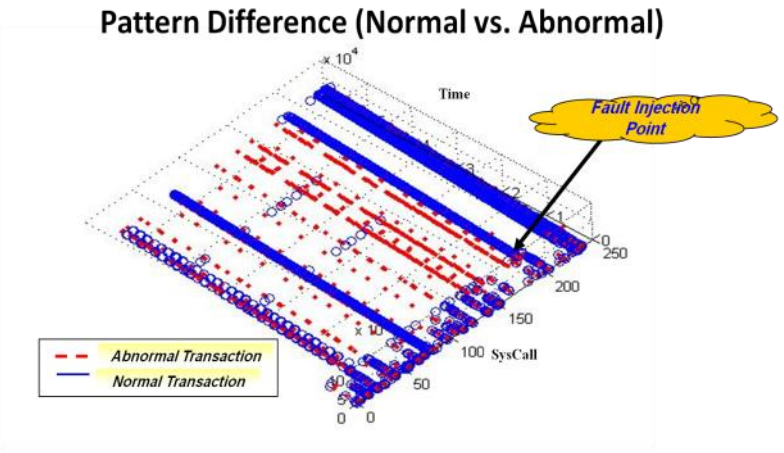

The increased complexity, interconnectedness, dependency and the asynchronous interactions among components (e.g., hardware resources such as computers, servers, network devices, and software such as applications and middleware) makes fault detection and tolerance a challenging research problem. In this project, we present innovative concepts and self-healing architectures analyzing pattern transition sequences of length n during a window interval to detect hardware/software faults as well as root-cause analysis of system and application faults. We use three-dimensional array of features to capture spatial and temporal variability on which our anomaly analysis engine operates and produces an alert when normal-operations captured patterns are violated due to software or hardware failure. Our main contributions are the innovative analysis methodology and the selection of the system and application features to detect and identify any anomalous behavior that is triggered by software of hardware failures. Our preliminary results show a detection rate of above 99.9% with no occurrences of false alarms for a wide range of scenarios.