Summary

In summary, a set of techniques that can be used individually or in combination as a framework/architecture that allows handling of the various key performance monitoring challenges in modelling of complex systems is proposed. The models of complex systems from diverse application areas that were created were analyzed and their performance validated using various mathematical analysis techniques developed for Petri Nets. It is demonstrated that the efficiency of the complex systems can be improved by adopting various modelling techniques for performance monitoring and by managing the alerts raised during the monitoring of complex systems. Using various mathematical model evaluation and validation techniques including Reachability Analysis, Invariant analysis and usage of Erlang distribution the validity of the developed models have been analysed and proven.