A new architecture for NIDPS deployment was designed, implemented and evaluated. There has recently been massive development in computer networks regarding their ability to handle different speeds and data volumes. As a result of this rapid development, computer networks are now more vulnerable than ever to high-speed attacks and threats. These can cause considerable trouble to computer networks and systems. Network intrusions can be categorized at various levels. Many high-speed attacks can be classified as being difficult to detect or prevent. It will become ever more difficult to analyze increasing volumes of traffic due to the rapid shifts in technology that are increasing network speed.