Evaluation of Performance Analysis And Network Security Using OPNET

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Abstract

The Networks security is critical issue and represents a challenge to professional systems developers in protection against diverse attacks. The study deals specifically with network security and exactly evaluate performance analysis of networks.

The objective of study to find good analyzing networks configuration to achieve excellent performance, high throughput, low packets loss rate, decreased re-transmissions data and decreased collisions data.

The study used OPNET analysis system simulator, which is good analyse system, to estimate the performance of new solutions to existing networks, and the simulation can provide the time and effort.

The most important results is to evaluate the performance of the role of firewalls and virtual private networks to provide security for the common public networks such as the Internet. Also the findings of the ringed network under different scenarios where the research examines the impact of asynchronous mode of transmission data and its impact on a range of services and quality.

The study recommended using laboratory results to the output of the program and take advantage of computer networks in real applications. The study also recommended the development of all of its security testing and evaluation of performance of computer networks under Opnet14.0 program environment, which is a good simulation environment and to design models and data analysis are excellent

المستخلص

إن أمن الشبكات قضية حاسمة وتحدي إلى مطوري النظمِ المحترفينِ في الحماية ضد الهجمات المتنوعة وتتناول الأطروحة بشكل محدد أمنِ الشبكات وبالتحديد تقييم تحليل أداء الشبكات.

استخدمت الدراسة نظام تحليل المحاكاة opnet الذي يعتبر نظامِ تحليلِ جيد, فهو يقوم بتخمين أداء الحلولِ الجديدة للشبكات الحالية، كما ان المحاكاة يُمكن أن توفر الوقت والجهد.

تهدف الدراسة لإيجاد تحليل إعداد ألشبكات بصورة جيدة لتحقيق الأداء الامثل والطاقة الإنتاجية العالية ونسبة خسارة حزم منخفضة، وتقليل إعادة إرسالِ البيانات وايضاً تقليل تصادمات البيانات.

ومن اهم النتائج التي توصل اليها البحث هي تقييم أداء دور الجدران النارية والشبكات الخاصة الافتراضية في توفير الأمن للشبكات العامة المشتركة كالإنترنت. وأيضاً من النتائج الهامة الشبكة الحلقية تحت السيناريوهات المختلفة حيث تم فحص تأثير النمط الغير متزامن لإرسالِ البيانات وتأثيره على مدى الخدمات وجودتها.

توصي الدراسة باستخدام النتائج المعملية التي توصل اليه البحث لمخرجات البرنامج والاستفادة منها في بناء وتطبيقات شبكات الحاسوب الواقعية . كذلك اوصت الدراسة بوضع كل الاختبارات الامنية وتقييم الأداء لشبكات الحاسوب تحت بيئة برنامج (Opnet14.0) والذي يعتبر بيئة محاكاة جيدة ويقوم بتصميم النماذج وتحليل البيانات بصورة ممتازة.

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Conclusion

The experiments discuss a variety of Evaluate Performance Analysis and Network Security, networking designs and protocols. They do not require programming skills as a prerequisite. They are generic and can be easily expanded to utilize new technologies and networking standards. With the free, easy-to-install software, the OPNET IT Guru Academic Edition.

Thesis discus of 5 cases which intend to be an approach to Evaluate Performance Analysis and Network Security. It has a special focus on security issues.

OPNET IT Guru is a complete tool for this purpose and has been proved to simulate Firewalls and VPN (Network Security and Virtual Private Networks), internet Control Message Protocol (ICMP), Web Caching and Data Compression Improving Web Access and Server Performance, Switched LANs, VLANs: Virtual Local Area Networks.

The scenario duplication mechanism has shown itself a powerful feature to construct the three security schemes using a common root scenario.

Statistics and Simulation Logs compared between multiple scenarios within a same project has demonstrated to be a pedagogical way to show whether a connection is available between peers or not, which was a requirement to assure the correct implementation of the security schemes.

Recommendations

The researcher recommended:

- Using laboratory results to the output of the program and take advantage of computer networks in real applications.
- The development of all of its security testing and evaluation of performance of computer networks under Opnet program environment, which is a good simulation environment and to design models and data analysis are excellent .
- Developed all laboratories in OPNET Modeler 14.5 simulation environment which is a network simulator that offers the tools for model design, simulation, data mining and analysis.

  Newer version of Opnet software should be considered. This is due to the limitation of blocks in communication toolbox and block set. Even though the numbers of block in communication block set are many, more designs of block set using opnet, especially advance opnet software technologies are needed in that's labs .