



Sudan University of Science and Technology

College of Engineering



School of Electronic Engineering

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An Implementation of Protocol Converter Between Ethernet & RS-232

تنفيذ محول البروتوكول بين الإيثرنت و الrs232

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قال الله تعالى:

{يَا أَيُّهَا الَّذِينَ آمَنُوا إِذَا قِيلَ لَكُمْ تَفَسَّحُوا فِي الْمَجَالِسِ فَافْسَحُوا يَفْسَحِ اللَّهُ لَكُمْ وَإِذَا قِيلَ انشُزُوا فَانْشُزُوا يَرَفَعِ اللَّهُ الَّذِينَ آمَنُوا مِنْكُمْ وَالَّذِينَ أُوتُوا الْعِلْمَ دَرَجَاتٍ وَاللَّهُ بِمَا تَعْمَلُونَ خَبِيرٌ}

المجادلة الآية 11

Dedication

To

Our Beloved mothers

To

Our fathers

To

Our brothers and Sisters

To

Our teachers & colleagues

Aknowledgement

First Alhamdulillah that with his blessing this work is fulfilled

*All thanks and appreciation for our supervisor Dr.Rania Abdelhameed
and teacher Mohammed matter for their patience with us*

*We appreciate the countless hours and the efforts they dedicated to
guide us through this thesis*

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for their efforts in help and support*

Abstract

The purpose of this study is to develop conversion software to enable two systems with different protocols to communicate and convert packet type from Ethernet to R-232 and vice versa to enable data and command transmission. Protocol conversion has become a necessity for the internetworking in a heterogeneous network environment. Incompatibility between Ethernet and RS232 is the reason of implement this study which means differ of packet for example In serial communication (R-S232) needs additional fields for ‘start of packet’ and ‘end of packet’ which not needed for Ethernet packet. Protocol converter has been proposed in this study to solve incompatibility between Ethernet and RS-232 .the result of running programs in three PCs is investigated the matching of data in PC1 and PC3 that mean PC2 successful converted Ethernet data to RS-232 data.

المستخلص

الغرض من هذه الدراسة تطوير برامج تحويل البروتوكول حتى تسمح لنظامين بروتوكولات مختلفة بالتواصل لأن لكل بروتوكول شكل حزمة يختلف من بروتوكول إلى آخر، وذلك بتحويل نوع الحزم بين البروتوكولين لنتمكن من تبادل الأوامر و البيانات . محول البروتوكولات أصبح ضرورة في بيئة الشبكات المتباينة ، عدم التوافق بين الإيثرنت بروتوكول و بروتوكول الإتصال المتسلسل هو السبب في تنفيذ هذه الدراسة حيث أن بروتوكول الإتصال المتسلسل يحتاج إلى حقل يمثل بداية الحزمة وكذلك حقل يمثل نهاية الحزمة اللتان لانهما في حزمة الإيثرنت . محول البروتوكولات مقترح في هذه الدراسة ليحل عدم التوافق بين الإيثرنت و بروتوكول الإتصال المتسلسل ولعل ذلك نستخدم ثلاثة أجهزة كمبيوتر في كل جهاز برنامج يقوم بأداء مهمة معينة . نتيجة تنفيذ هذه البرامج حققت تتطابق البيانات في الجهاز الأول والجهاز الثالث مما يعني نجاح الجهاز الأوسط في تحويل البيانات من إيثرنت إلى بروتوكول الإتصال المتسلسل .

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List of abbreviation

USB	Universal Serial Bus
TCP	Transmission Control Protocol
IP	Internet Protocol
UDP	User Datagram Protocol
ICMP	Internet Control Message Protocol
SMTP	Simple Mail Transfer Protocol
POP	Post Office Protocol
HTTP	Hypertext Transfer Protocol
FTP	File Transfer Protocol
LAN	Local Area Network
DTE	Data Terminal Equipment
PC	Personal Computer
MAC	Media access control
DCE	Data Circuit Terminating Equipment
ARP	Address Resolution Protocol
RARP	Reverse Address Resolution Protocol
DHCP	Dynamic Host Configuration Protocol
RIP	Routing Internet Protocol

FD	Function Definition
I2C	Inter-Integrated Circuit
UART	Universal Asynchronous Receiver/Transmitter
RS-232	Recommended standard-232