ANEXO 1

FORMATO PARA LA PRESENTACIÓN DE PROYECTOS DE INVESTIGACIÓN CON EL FINANCIAMIENTO DEL FEDU

1. Título del proyecto

IPv6 Plug and Play Business Firewall Design Based on Iptables, Nettop and Linux

2. Área de Investigación

Área de investigación	Línea de Investigación	Disciplina OCDE
Telecomunicaciones	**S**istemas, computación e informática	**2.Ingeniería y Tecnología** **2.2. Ingeniería Eléctrica, Electrónica e informática** **- Telecomunicaciones** **- 06020005**

3. Duración del proyecto (meses)

12 meses

4. Tipo de proyecto

Individual	●
Multidisciplinario	○
Director de tesis pregrado	○

4. Datos de los integrantes del proyecto

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I. Título (El proyecto de tesis debe llevar un título que exprese en forma sintética su contenido, haciendo referencia en lo posible, al resultado final que se pretende lograr. Máx. palabras 25)

IPv6 Plug and Play Business Firewall Design Based on Iptables, Nettop and Linux

II. Resumen del Proyecto de Tesis (Debe ser suficientemente informativo, presentando -igual que un trabajo científico- una descripción de los principales puntos que se abordarán, objetivos, metodología y resultados que se esperan**)**

Due to the increasing threat of network attacks, Firewall has become crucial elements in network security, and have been widely deployed in most businesses and institutions for securing private networks. A Conventional Business firewall is a robust system with a great capacity to manage security and access to other networks, especially the Internet, but is robust in size and requires a large

investment by the company that requires it, about $2000USD and only large organizations have the ability to invest in it. The design of an IPv6 Plug and Play business firewall based on Iptables, Nettop and Linux is much smaller in size, but creates a big impact in the productivity and security of the network business for about $400 USD budget. When device is connected will not require reconfiguration of the local network and clients, and also the device can work as proxy mode, router mode, DHCP server, DNS server and other capabilities. In order to improve security and performance, modern enterprises have to deploy and manage their own firewalls.

III. Palabras claves (Keywords) (Colocadas en orden de importancia. Máx. palabras: cinco**)**

firewall, plug and play, iptables, nettop, linux, security, open source

IV. Justificación del proyecto (Describa el problema y su relevancia como objeto de investigación. Es importante una clara definición y delimitación del problema que abordará la investigación, ya que temas cuya definición es difusa o amplísima son difíciles de evaluar y desarrollar**)**

This firewall is based on software and hardware, it controls incoming or outgoing traffic by analyzing data packets and determining whether they should be allowed to pass through or not, based on rules. This firewall is the boundary between a secure and reliable internal private network and Internet that is not safe.

V. Antecedentes del proyecto (Incluya el estado actual del conocimiento en el ámbito nacional e internacional. La revisión bibliográfica debe incluir en lo posible artículos científicos actuales, para evidenciar el conocimiento existente y el aporte de la Tesis propuesta. Esto es importante para el futuro artículo que resultará como producto de este trabajo)

Firewall is in today's world the first defense against attacks, to improve the security of organizations, they need to deploy customized firewalls by own [1]. A more complex firewall generates more rules, which causes poor performance of the same firewall. It has been shown that a proper network configuration must be established with the correct structure to minimize security holes [2]. Threat of network attacks are increasing, firewall has is a crucial element in security, and is deployed in most businesses and institutions. The firewall can review packets that passes through it and decide whether to letting them pass or not according rules and policies, so firewall now is the first defense line [3]. Exist serious threats to the enterprises because sensitive network policies, like firewall rules, are revealed to cloud providers, which may be leaked and exploited by attackers [4]. The use of web applications has rapid increase. Organizations use web applications to exchange information. Web applications are directly associated with threats and attacks. With the increasing of threats and attacks on web applications, organizations require a more effective concept of web application security [5].

VI. Hipótesis del trabajo (Es el aporte proyectado de la investigación en la solución del problema)

For this design programs and services usually require an operating system in order to function, while also acting as an intermediary between programs and hardware.

VII. Objetivo general

The Plug and Play firewall prototype design should have the following characteristics: small, cheap, plug and play, support free software, support for IPv4 and IPv6, also should not lose the capabilities of a robust firewall.

VIII. Objetivos específicos

This new design, is a firewall that is a computer like any other, but has specific functions, therefore has an operating system inside so their programs and services can work. For example, Cisco network devices have an operating system called IOS, Juniper Systems devices use an operating system called Junos. In this way it is achieved that each network device has a complete administration of its hardware resources to be able to provide them correctly to its programs and services. This operating system needs to manage IPv4 and IPv6.

IX. Metodología de investigación (Describir el(los) método(s) científico(s) que se empleará(n) para alcanzar los objetivos específicos, en forma coherente a la hipótesis de la investigación. Sustentar, con base bibliográfica, la pertinencia del(los) método(s) en términos de la representatividad de la muestra y de los resultados que se esperan alcanzar. Incluir los análisis estadísticos a utilizar**)**

Another very versatile configuration the use of wireless broadband interface, this will be the WAN interface to connect Internet, while the LAN interface is based on the Wi-Fi wireless physical interface as acting like hotspot mode, in this way works as a mobile router. The wireless broadband interface is connected to a USB port in the computer.

X. Referencias (Listar las citas bibliográficas con el estilo adecuado a su especialidad)

[1] H. Sheng, L. Wei, C. Zhang and X. Zhang, "Privacy-Preserving Cloud-Based Firewall for IaaS-based Enterprise," IEEE Xplore, 2016.
[2] A. Singh, D. Singh, A. Kumar Singh, H. Pandey and P. C. Vashist, "Security through Optimization Techniques of Firewall Rule Sets," IEEE Xplore, 2020.
[3] S.-d. Krit and E. Haimoud, "Overview of firewalls: Types and policies: Managing windows embedded firewall programmatically," IEEE Xplore, 2017.
[4] L. Wei, C. Zhang, Y. Gong, Y. Fang and K. Chen, "A Firewall of Two Clouds: Preserving Outsourced Firewall Policy Confidentiality with Heterogeneity," IEEE Xplore, 2016.
[5] R. Agung Muzaki, O. Candra Briliyant, M. Andika Hasditama and H. Ritchi, "Improving Security of Web-Based Application Using ModSecurity and Reverse Proxy in Web Application Firewall," IEEE Xplore, 2020.
[6] J. E. Cruz de la Cruz and C. A. Romero Goyzueta, "Design of a dynamic rules firewall to block avoidance internet censorship systems based on proxy," IEEE Xplore, 2016.

XI. Uso de los resultados y contribuciones del proyecto (Señalar el posible uso de los resultados y la contribución de los mismos)

Crear un dispositivo de red económico y con el rendimiento de un dispositivo de red del mercado.

XII. Impactos esperados

i. Impactos en Ciencia y Tecnología

Innovación de dispositivos de red.

ii. Impactos económicos

Dispositivo de red más barato del promedio en el mercado.

iii. Impactos sociales

La sociedad se beneficia de equipamiento desarrollador localmente y mucho más baratos del promedio del mercado.

iv. Impactos ambientales

Mayor eficiencia de funcionamiento.

XIII. Recursos necesarios (Infraestructura, equipos y principales tecnologías en uso relacionadas con la temática del proyecto, señale medios y recursos para realizar el proyecto)

Mini computadora, software libre.

XIV. Localización del proyecto (indicar donde se llevará a cabo el proyecto)

Puno, Perú

XV. Cronograma de actividades

Actividad	Meses											
	Ene	Feb	Mar	Abr	May	Jun	Jul	Ago	Set	Oct	Nov	Dic
Identify problems	■	■										
Design		■	■									
Implement			■	■								
Design test				■	■	■	■	■				
Results								■	■	■		
Conclusions										■	■	■

XVI. Presupuesto

Descripción	Unidad de medida	Costo Unitario (S/.)	Cantidad	Costo total (S/.)
Mini computadora	Unidad	3000	2	6000
Accesorios	Unidad	4000	1	4000
			Total	10000