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A REVIEW ON REPAIR AND MAINTENANCE OF A WIRELESS NETWORK-BASED SYSTEM

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ABSTRACT

One of the most popular forms widely utilized networking methods in today's globe is the wireless network. Staff and lecturers require internet access to carry out various tasks that require the use of the internet; moreover, having a department-wide internet network would be prohibitively expensive; therefore, the idea is to use wireless outdoor radio to pick up data signals from the ICT wireless network and route them to the department's network-based system, allowing staff and lecturers to access the internet. The aim of this study is to repair and maintain an old wireless network-based system by replacing any damaged or ineffective components, such as the wireless outdoor radio, and adding new features to the system, such as a router, to allow mobile users to access the internet while moving around the laboratory and department without losing connection to the network. An effective utilization of this technology will enhance staff performance and increase productivity.

Keywords: Internet, Network, Radio, Router, Wireless.

I. INTRODUCTION

Wireless network are becoming increasingly widespread these days in business, social, Military and health in the current world everyone wants to communicate without the need of a physical structure, at a low, cost, high speed, low power consumption (Dahiya, 2017). The wireless network offer User mobility, flexibility and scalability. The vast wireless network systems that make up today's devices are used every day by people to exchange information and connect with one another. Wireless devices such as smart phones, computer systems, smart watches, body-worn cameras, helmets, glasses, and other examples of devices used on a daily basis include smart phones, computer systems, smart watches, body-worn cameras, helmets, and glasses. (Abramson, 2014)

Wireless networks serves as a way of allowing the flow of data between devices and traditional wired networks. Wireless networks allow one or more devices to interact with each other without any need for physical connections or peripheral cables. Radio frequency transmissions are used in wireless networks to carry data and encourage better user mobility, wireless local area networks are installed as developments to existing wired local area networks. (Geier, 2011). With the help of an access point, a wireless local area network (WLAN) connects two or more devices using a wireless transmission technique (typically spread-spectrum or OFDM radio). Users are able to roam around in a three-local coverage area while still being connected to the network thanks to this. Most modern WLANs based on IEEE 802.11 specifications are marketed under the Wi-Fi brand name. Data networking and communications have been changed by the wireless communication revolution, which has enabled the creation of linkages. Wireless networks are a type of technology that concentrates on the area's networking and user features. It provides a single, global location for archive contributions recording these fast evolving areas of interest. This project work encompasses network designs for personal communication systems, wireless LANS, wireless radio, planned and other wireless networks, protocol analysis and design, network management and performance, the internet's working with cable and other wireless networks, uniformity and controlling requirements, specific system descriptions, application and interface, and enabling technologies for wireless networks. (Dejan, 2017).

II. RELATED WORKS

A wireless local area network (WLAN) connects two or more devices over a short distance via a wireless distribution mechanism, typically providing internet access through an access point. If spread-spectrum or OFDM technologies are utilized, users could be able to move around within a constrained coverage area while

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still being connected to the network. Products using the IEEE 802.11 WLAN specifications go by the term "Wi-Fi." Fixed wireless technology provides point-to-point communications between computers or networks at two different places by using specialized microwave or modified laser light beams through line-of-sight paths. Cities frequently utilize it to link networks in two or more buildings without needing to run cables. A mobile smartphone can connect to Wi-Fi via a wireless router or the private hotspot features of another mobile device (Lamba, 2018).

Mobile computing devices may easily and swiftly connect to the Internet due to Wi-Fi, a wireless local area network. The speeds of Wi-Fi, which is specified as IEEE 802.11 a/b/g/n, are comparable to those of traditional Ethernet. IEEE 802.11 is a set of specifications for wireless local area networks (WLANs) operating at 2.4, 3.6, and 5 GHz. The lower the frequency, the greater the range of transmission. Because the 2.4 gigahertz band has a lower frequency than the 5 gigahertz band, it may reach computers that are further away. However, 5 gigahertz allows for more communications to be carried. "Imagine if you had a freeway that ran a long distance but only had one lane," Figueroa says of 2.4 gigahertz Wi-Fi. In contrast, 5 gigahertz Wi-Fi is like a six-lane highway that doesn't go as far but allows traffic to go more swiftly. In terms of coverage, he says, "Five gigahertz Wi-Fi gives sufficient coverage to cover the entire home." As a result, most people are more concerned with speed than distance (Omorog, 2018).

Wireless networks frequently experience Wi-Fi signal interference, which happens when the frequency or Wi-Fi channel is equal to or close to other frequencies. When there are two or more routers producing Wi-Fi signals in a room or area, the router has been unable to define a fixed and irregular frequency. (Dahiya, 2018). Every new technology has its own set of issues, and Wi-Fi is no different, with Wi-Fi issues being one of the most popular concerns about modern-day connection. In this post, we'll look at the reasons of Wi-Fi interference that may be causing you connection problems and suggest remedies. WLAN technologies such as Wi-Fi networks rely on radio frequency technology for connection transmission, making them subject to a number of security flaws. Even encrypted communication is vulnerable to attacks like jamming and eavesdropping because it is broadcast and can easily be intercepted. Even said, the security concerns related to these Wi-Fi networks haven't been sufficient to stop the development of the need for ubiquitous access (Omorogi et al, 2018).

III. DESIGN ANALYSIS

This work is to repair and maintain the old wireless network based system in the department and laboratory. The main problem to fix is the wireless outdoor radio that is faulty because without the wireless out door radio the departmental and laboratory network system cannot pick signal from the ICT network.

In fig 1.1 below broken lines represents wireless connection while unbroken lines represent wired connection.

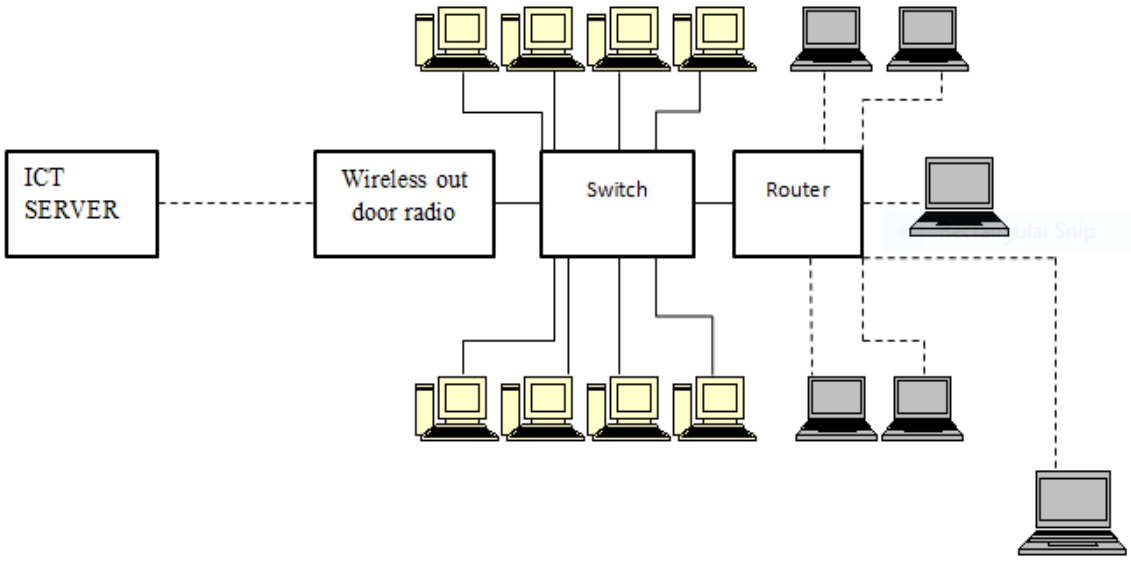

Fig 1: Block Diagram of the Wireless Network Based System

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➢ **Installation Procedure**

The Ethernet cable was attached to the router's Ethernet port, and the other end of the cable was connected to a functional computer system for configuration.

➢ **Configuration Procedure**

Configured the router (TP link model: tl-wa801nd) by following the procedures below one after the other.

- Powered the device using the barrel Jack and connect the device to a host system via Ethernet cable.
- Launch your web browser and type http://tplinkap.net in the address field and press enter.
- Login the username (**admin)** and password (**admin)** and choose login.

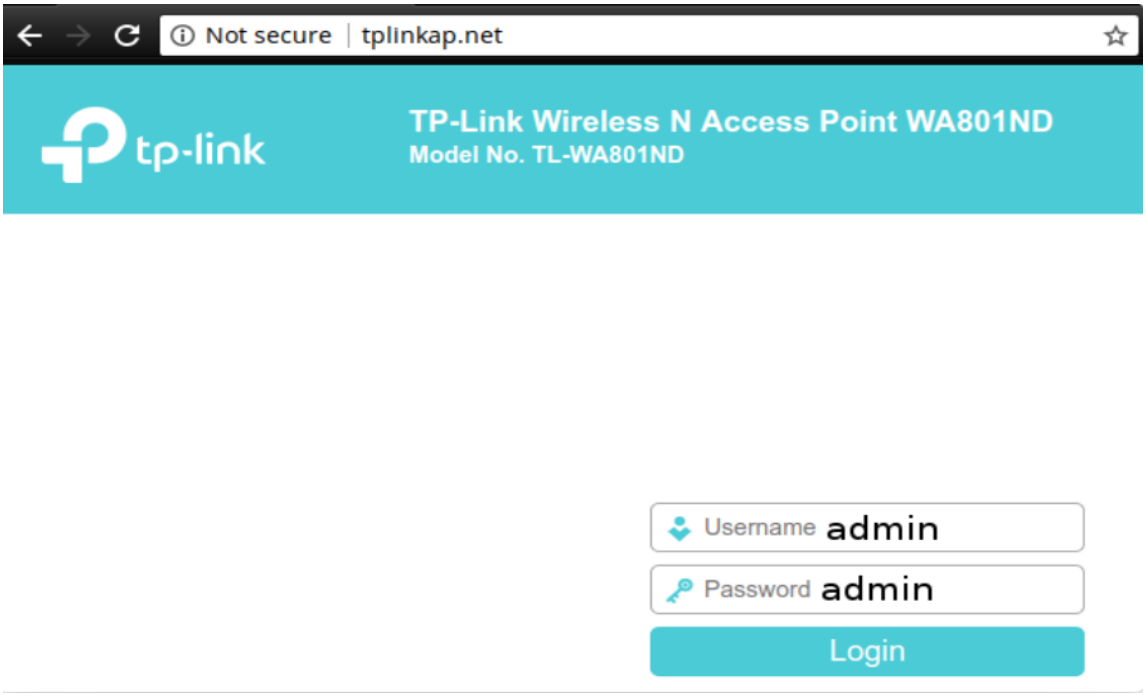

Fig 2: Tplink.net Login Environment

- Clicked on the Quick setup from the left side, then **next**

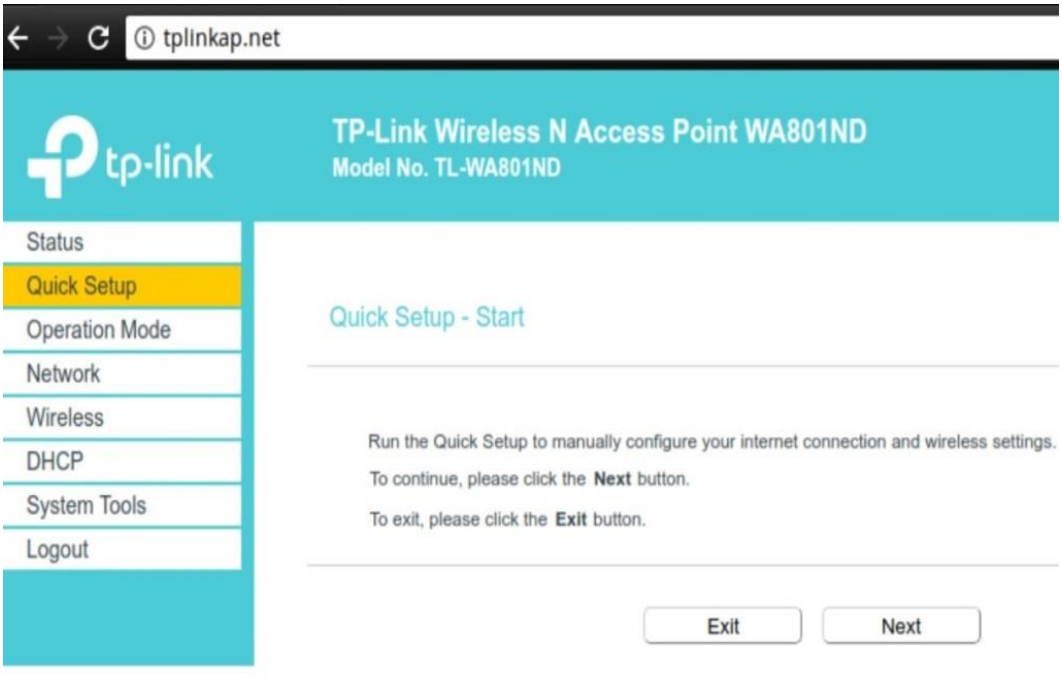

Fig 3: Tplink.net Quick "Start" Setup Environment

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- Choose the **client** as the operation mode and press **next**

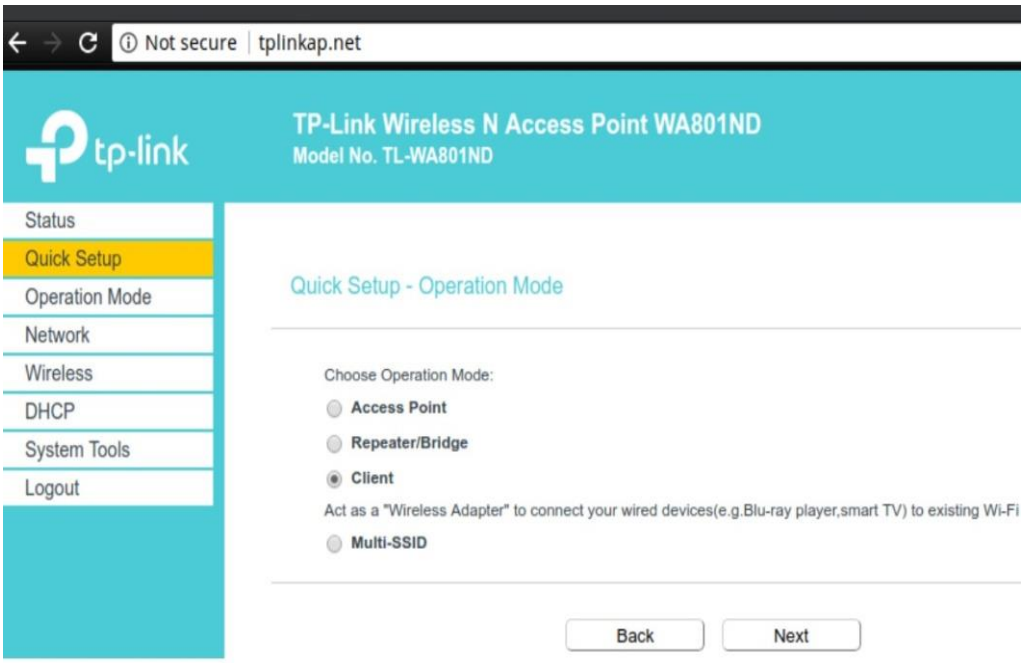

Fig 4: Tplink.net Quick Setup "Operation Mode" Environment

- **Located** the network and **connected** to it.
- **Change** the wireless network password (compeng2019) and the SSID (computer engineering) and choose **next**.

Fig 5: Tplink.net Quick Setup "Wireless" Environment

- **verify** the settings that choose, and choose **finish**

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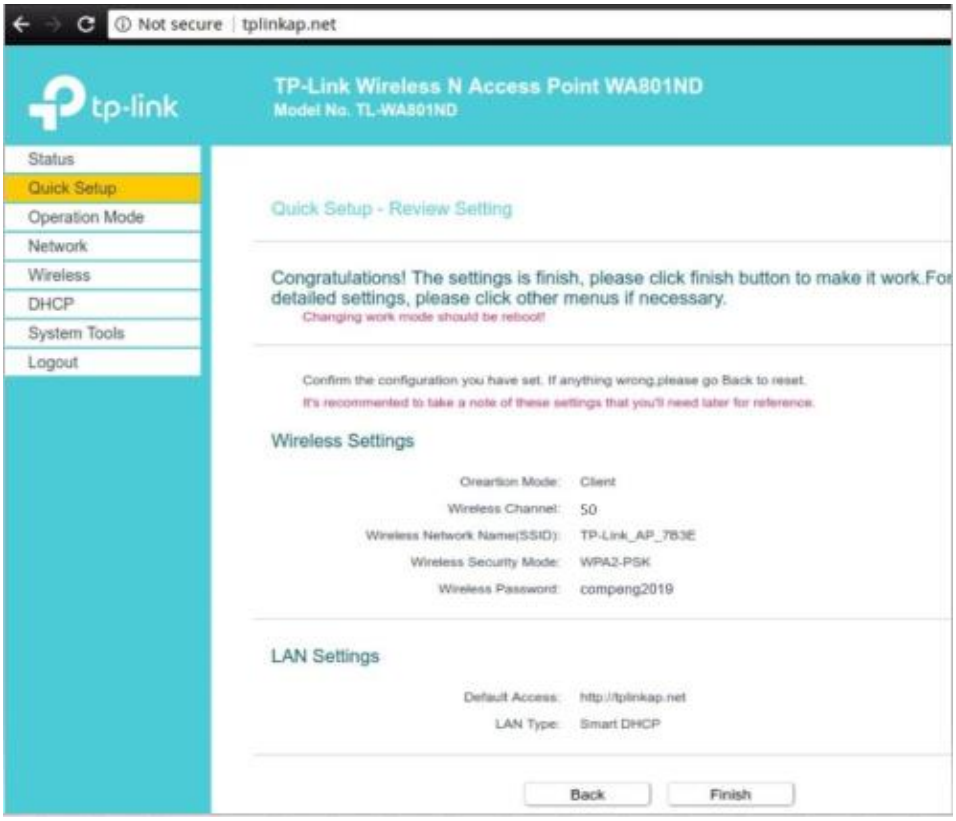

Fig 6: Tplink.net Quick Setup" Review Setting" Environment

IV. RESULT AND DISCUSSION

According to what was designed, we are able to put the design into test and the results are presented which are quite reasonable and encouraging. At the end of the design we were able to browse with the network.

PRESENTATION OF RESULT

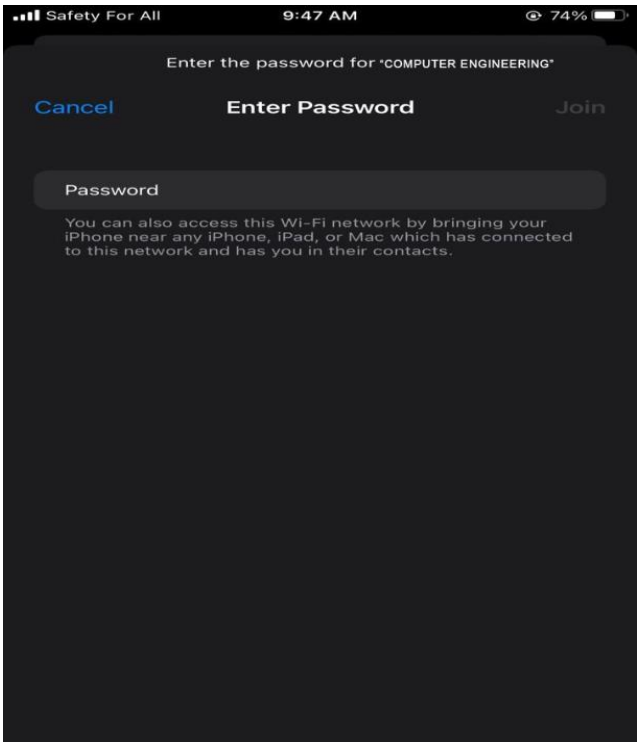

Fig 7: Enter Password Environment

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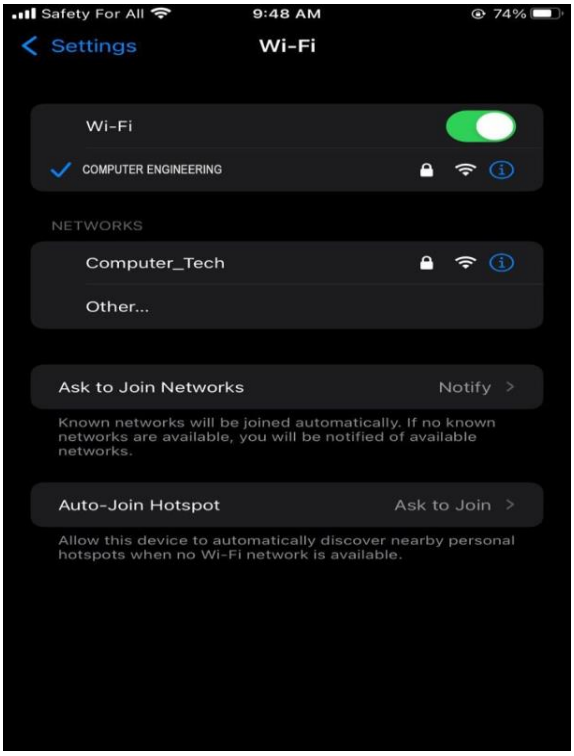

Fig 8: WiFi Environment

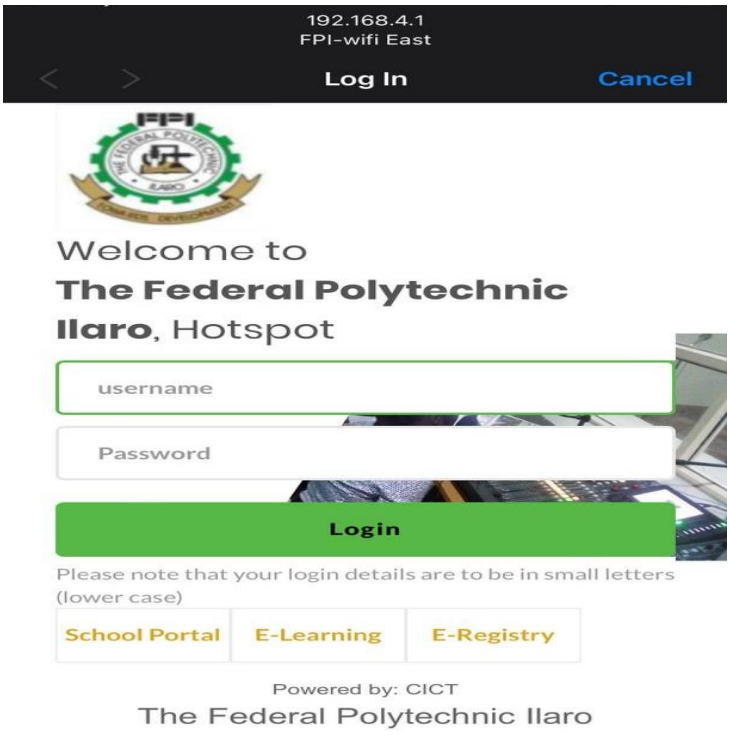

Fig 9: FPI Network Hotspot" login

DISCUSSION OF RESULT

The aim of this paper was achieved successfully after the final installation was done, which was tested and it gives the required output as expected, the following parameters were measured and recorded in the table below

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Table 1: The Wireless Network Capability.

The Network speed	Up to 11Mbps
The network coverage	30.5m from the router location
Wireless frequency bands	2.4GHz
Strength of the password	Good (Compeng2019)

V. CONCLUSION

It can be seen that the project has fulfilled the requirement, specification and objectives that was placed upon it and the network based system has been experimentally proven to work satisfactorily by connecting all components needed for the project to perform its function, Each hardware device used was successfully tested and makes sure that all working fine and accurate, So stuffs and lecturers that have access to the network can use it without stress.

VI. RECOMMENDATIONS

- Protect the wireless outdoor radio from lightning strike which can damage the device.
- Preventive maintenance should be done to the network based system a least five times in a month.
- Another router can be added to the network so as to extend to cover more locations.

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