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OPTIMUM ORGANIZATION OF DATA EXCHANGE IN THE LOCAL NETWORK AND CONTROL OF THE LOCAL NETWORK USING CLOUD SYSTEMS.

Annotation:

This article provides information on the aspects of the physical location of network devices in the local network (LAN)that should pay attention to when placing them in the most convenient, most optimal way. Several secure data sharing protocols have been provided to ensure secure data exchange between users in a local area network environment.

Key words: cloud system, QoS (quality of service), virtual design, firewall.

INTRODUCTION

Network topology: The physical location and interconnection of devices on a network can greatly affect the efficiency of data exchange. Commonly used topologies include star, bus, ring, and mesh configurations. Analyzing the specific needs and limitations of your local network will help determine the most appropriate topology. Taking into account the above, after choosing a network topology, it is necessary to correctly choose the location of network devices based on the chosen topology, especially in a wireless local area, this is very important. Therefore, it is better to use cloud systems that create a virtual wireless network map by analyzing the pre-existing conditions, which help to take into account any external and internal influences in the construction of today's modern wireless local network. Tp-link omada cloud system was used for virtual design of wireless local area network in writing this article and many other possibilities of Tp-link omada cloud system were highlighted.

The tp-link Omada cloud system offers centralized management with Omada controller software and cloud access, helping network administrators easily manage the entire network from one place. The ability to manage, configure, and visualize your entire network from any connected PC makes centralized business Wi-Fi management more efficient and cost-effective than ever before. The tp-link Omada cloud system currently includes 802.11n, 802.11ac, 802.11ax software-controlled access points.[1] In addition, the capabilities of the Tp-link Omada cloud system are very wide, so without deviating from the topic, we can enter any

building project from the map section after installing the Tp-link Omada cloud system to determine the virtual approximate location of the wireless local network. (Figure 1.1)

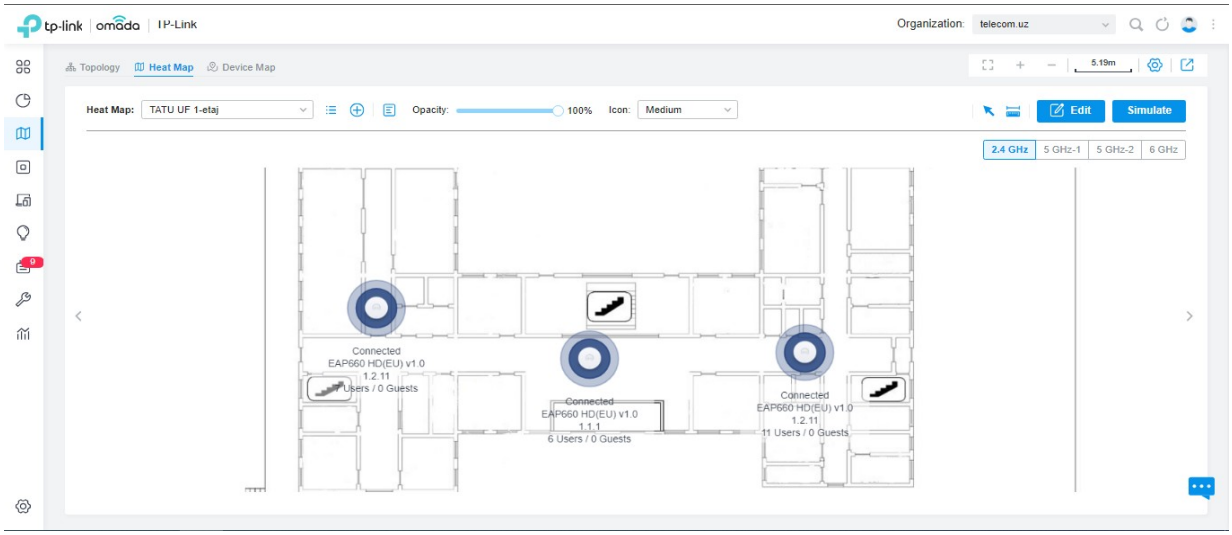

Figure 1.1. Placement of building layout and wireless LAN devices in TP-link Omada cloud system.

After placing the building scheme and wireless local network devices in the TP-link Omada cloud system, we can see the virtual state, whose accuracy indicators are almost indistinguishable from the real state. (Figure 1.2)

Figure 1.2. The state created after placing the building scheme and wireless LAN devices in the TP-link Omada cloud system.

Protocols and Standards : Ensuring the use of standardized network protocols such as Ethernet, Wi-Fi, TCP/IP, etc. can facilitate seamless data

exchange between devices. Adherence to industry-accepted protocols ensures interoperability and scalability.

Ethernet is a family of related protocols that deal with how data is sent across Ethernet cables—it's not a single protocol. There are many parts to the Ethernet family of protocols, including how the hardware is managed, how data is sent and received, and how data collisions are managed.

Wi-Fi is also a related family of protocols that deal with how data is sent over wireless connections. In fact, Wi-Fi is a trademark, and the general term for this type of network is WLAN. Any device with the Wi-Fi logo uses the Wi-Fi protocol and can therefore connect wirelessly to other Wi-Fi enabled devices.

Transmission protocols - TCP and UDP

Both TCP and UDP control how packets are prepared to be sent over the Internet and what happens to them when they are received by the other end.

TCP is the most widely used of the two and is also the most reliable. Using TCP, packets are addressed and tracked over the network to ensure they reach their destination safely. Any packages that do not reach their destination are re-sent by the sender. UDP, on the other hand, does packet tracking, which means that everything is sent once, and if packets do not arrive, they are not sent again. The advantage of using UDP is that it is much faster, and thus it is often used in online games or live streaming, where quality is less important than speed.[2]

Bandwidth Management : Proper allocation and management of available bandwidth is essential. This may include methods such as traffic prioritization, quality of service (QoS) policies, and load balancing to optimize data transmission.

Network Segmentation: Dividing a local area network into logical subnets, or VLANs, helps keep traffic within defined segments, reduces congestion, and improves overall performance.[3]

Switching and routing: The selection and configuration of network switches and routers can significantly affect the efficiency of data exchange. Factors such as port speed, switching capacity, and routing algorithms must be considered.

Security and Access Control: Implementing appropriate security measures such as firewalls, access control lists, and virtual private networks (VPNs) can help protect the integrity and confidentiality of data exchanges within a local network.

Monitoring and Troubleshooting: Regularly monitoring network performance, identifying bottlenecks, and proactively troubleshooting can help ensure optimal data exchange on your local network.

Scalability and flexibility: Designing the network infrastructure with future growth and evolving requirements in mind ensures that the data exchange solution remains effective as the organization's needs change over time.[4]

Summary

In this article, in today's rapidly developing field of information technologies, the increasing need for a high-performance Internet network to organize high-quality information exchange, to meet the needs of users, and the correct design of the corporate network, which is considered as a small link of the telecommunications network. It was mentioned that design is the need of the hour, in which cloud systems based on modern technologies give us the following opportunities:

• centralized management
• network segmentation
• monitoring and troubleshooting
• scalability and flexibility

In addition, this article provides recommendations on network protocols and the use of standardized network protocols to facilitate seamless data exchange between devices. Also, one of the things we can focus on when building a local area network is that adherence to industry-accepted protocols ensures interoperability and scalability.

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