Journal of computer science and software applications
https://www.mfacademia.org/
ISSN:2377-0430
Vol. 4, No. 1, 2024

Enhancing Hotel Service Quality: Design and Implementation of WiFi Coverage

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Abstract:

Hotels serve as temporary accommodations for individuals traveling for leisure or work. Guests increasingly expect reliable internet access for activities such as leisure and entertainment, information retrieval, email communication, and telecommuting. Consequently, a robust internet infrastructure has become a crucial criterion for evaluating a hotel's service quality. This paper examines the current state of hotel internet provisions and the corresponding demand, and it details the design and implementation of a hotel WiFi coverage strategy. The use of the common IEEE 802.11b standard access point (AP) is emphasized to ensure system scalability. This approach not only addresses the deficiencies in service quality associated with outdated hotel networks but also allows for considerable flexibility in future network upgrades.

Keywords:

Wireless network; Cover; The hotel.

1. Introduction

In today's information age, which is rapidly updated with high technology, our way of life and environment are also rapidly changing. Disadvantages of traditional wired LAN are also gradually highlighted [1]. The traditional cable network not only needs to knock the wall to make a hole in the comprehensive wiring construction is slow, but also lays a lot of cables to increase the input cost of the hotel; Moreover, it is more difficult to manage and maintain and troubleshoot faults in the later stage due to more cables and equipment types. And with the popularization of mobile terminals, the lobby, conference room, restaurant, garden and other areas have become the main areas for people to access the Internet, and the traditional wired LAN in these areas is difficult to achieve network coverage. At present, the mature wireless LAN technology (WiFi) can exactly make up for the disadvantages of the traditional wired network, so as to realize the seamless connection between the mobile terminal and the Internet [2]. In wireless network coverage within the hotel can let passengers in the hotel office no longer constrained by cable, and thus become very convenient and flexible, can be a very good adding good experience to stay in hotels for our clients, both in the hotel guest room, restaurant, garden or meeting room can enjoy the wireless network bring to enjoy high-speed Internet access [3]. The access of wireless network not only improves the soft service ability of the hotel, but also promotes the increase of the check-in quantity in the hotel. Therefore, wireless network coverage in hotels has become a necessary trend [4].Organization of the Text

2. Current situation of hotel network

Zhongzhou hotel, located in the middle of xie 'an road, taikang county, is a three-star hotel built in recent years. Zhongzhou hotel undertakes the preparation work of taikang county government and business conference. Since the hotel initially chose wired local area network coverage, with the increasing demand for network of intelligent mobile terminals, the network service shortage of

zhongzhou hotel is increasingly prominent. Especially restaurants, hall, gardens and other regional cable network can't service area cover which is formed by the blind area, has seriously affected the customer experience feeling [5] in the hotel, because of a large number of cable laying in the meeting room not only affects the overall beautification room decoration, for a mobile terminals such as PDA,smart phones, unable to provide network services has become a big obstacle of the development of hotel [6]. In view of this situation, zhou hotel urgently needs to upgrade its existing network mode to make it more dynamic and develop in the modern commercial competition [7].

3. Demand analysis of hotel WiFi coverage

Nowadays, the focus of hotel managers has shifted from the traditional simple accommodation to soft service ability. Every hotel manager is also trying to make their soft power more dominant in the industry to improve their competitiveness [8]. In recent years, with the mature development of the Internet in the domestic market, people rely more on and need the Internet in their daily life. Therefore, it is very necessary to provide hoteliers with a new high-standard wireless network system [9]. Wireless network body system is not only a performance of the hotel as a soft service capability, but also a targeted business promotion within a certain range by increasing the wireless coverage area [10]. In the wireless design of zhongzhou hotel should first meet the system equipment technology is relatively advanced, so that the system will not be covered and soon be outdated; The system should also have a certain course to expand the hotel to adapt to the future development of other business needs; Then the system to be easy to maintain, too cumbersome system is difficult to meet the needs of the current development ah; The most important thing is to guarantee the speed and stability of the network on the basis of covering no blind area. A good wireless network experience can help increase customers' check-in experience and good impression of the hotel [11].

4. Hotel WiFi coverage solution

4.1 IEEE802.11 standard

This scheme will be used is standard IEEE802.11 b network of AP as WiFi hotspot of network system, IEEE802.11 b is an important standard of the wireless local area network (wlan) [12], the transmission speed of 11 mbit/s, is the most famous in all the wlan standard IEEE802.11 b, is also the most widely spread standard [13], because this standard product has good compatibility, so the hotel network expand more convenient [14]. In IEEE802.11 standard b data into multiple AP coverage it will according to the signal strength of each AP and detected by the frame error rate, the choice of performance and come to join with the one of the best AP, once GaiDian AP receiving, mobile site will adjust the wireless channel to the AP, mobile site regularly to detect all the IEEE802.11 b channel, in order to determine whether there are other AP can provide better performance. If the desired AP is detected, the mobile site will reconnect with the new AP [15].

4.2 Hotel network architecture

Hotel network system network architecture can be divided into the following four parts: the first is the center layer, the part of the main equipment is composed of main router, server, etc, and cloud connection control network system, then the convergence layer, the main equipment such as switches, wireless controller, responsible for the control of wireless transmitters, network management and connect with the AP router forward the data to the center, the third part for the transmission network, is responsible for gathering layer to the final communication link between WiFi hotspots; The fourth part is the WLAN hotspot area, which is responsible for the operator's network access to the final customer, and is also the key part of the system integration construction [7].

4.3 Hotel conference room

In the conference room of the hotel, the number, power and location of wireless transmitter should be planned according to the specific situation of the conference room. Moreover, due to the large capacity of guests in the conference room of the hotel and the high number of concurrent Internet access, the design of coverage scheme should focus on increasing the bandwidth and the number of AP placement [8]. There is a conference room with an indoor area of about 590 square meters in

zhongzhou hotel, which can host large-scale meetings of about 300 people. The demand of wireless network is relatively high, and the number of concurrent customers is about 150 people. 6 indoor 100MW AP were used for coverage, among which 3 only turned on single frequency, and the other 3 were 2.4ghz + 5.8ghz dual-frequency AP. The AP is installed in the ceiling of the conference room and has its own antenna. To control the coverage of single AP, the transmission power is adjusted to 25%~50%.

4.4 Hotel rooms

According to the building situation of the housekeeping department, if the WiFi signal coverage intensity in this area is to be satisfied, the AP with higher power should be adopted for layout. Generally, the AP should be placed in the weak electric well of each floor, and the antenna of transmitter should be laid into the room of the guest room [9]. Indoor wireless AP can be divided into two types according to the transmitted power: 100MW and 500WM. Because the dense reinforced concrete structure of the housekeeping department will form a larger shield to the transmission of wireless signals, resulting in the wireless coverage in this area is easy to form the signal strength uneven situation. The extension of transmitter antenna will increase the construction time and wiring cost. Therefore, it is advisable to use a transmitter with larger power to lay in this area to ensure the signal stability and uniform strength in this area [10]. The hotel lobby and other leisure areas calculate the number of concurrent visitors to the Internet according to the actual situation to determine the transmission power, coverage and bandwidth size of each wireless signal transmitter. The hotel lobby is generally open and beautifully decorated. Considering the decoration effect of the hotel, the installation location and wiring requirements of the transmitter should be stricter. The transmitter should be outdoor or high-power indoor to expand the coverage of a single AP and reduce the number of transmitters in this area as much as possible [12]. Design the AP is installed in the floor, and the wiring route to field survey on each floor of the original cable arrangement, usually within the corridor of the ceiling is gas, electrical wiring, conduit, and other equipment line or decorate place, the line layout complex obstacle is more, it bring certain difficulty for network system construction, so all the lines when arranging cables to wear PVC tube, and use annotations in the pipe, tube every thread direction [14] showed that the connected. Since the wireless antenna has been placed in the interior of the guest room, the output power of the antenna should be reasonably adjusted during installation and debugging, so as to avoid resource waste caused by excessive power and cover crossing formed by wireless signal penetrating into other areas, which would affect the stability of network connection and signal transmission rate. At the same time, the antenna can be directly placed indoors to ensure the strength in the core area covered by the signal, thus increasing the stability [15].

5. Network security certification

Comprehensive hotel business needs, if the use of web connection authentication will cause a waste of resources and to increase the input cost of this system, we adopt WPA2 authentication and WPA encryption . A new encryption strategy developed on the basis of WEP not only solves many problems existing in WEP, but also enhances the complexity of secret key algorithm to make WPA more secure. WPA2 is an upgraded version of WPA, which is further enhanced on the basis of WPA encryption algorithm and claims to have 100% security at present. Can fully meet the business needs of hotel. In the wireless network system after the completion of the background data information access to set permissions to prevent background data and network configuration information is malicious modification.

6. Implementation of hotel WIFI coverage project

6.1 Installation of switch and POE module converter

1. The switch should be placed in the weak current well on the floor;

2. The network cables connected to the switch and POE module should be arranged neatly, labeled with labels and tied up firmly;

3. The power line should be neat and beautiful;

4. All kinds of cables should be neatly placed, not crossed or tangled;

5. Cable labels should be firm, clear and not confused.

6.2 AP (Access Point) and amplifier installation

1. AP shall be installed on the roof or flat floor;

2. After the layout of wireless signal transmitter is completed, use a clean cloth to clean the surface of the cleaner;

3. AP installation location should be concealed as far as possible, so as not to affect the original decoration effect of the hotel;

4. Set the AP transmission power to avoid conflicts in the cross-channel coverage.

5. Check the fixed structure after AP installation to ensure that it is not easy to fall off.

7. Conclusion

The rapid advancement of science and technology has significantly transformed people's lifestyles. Innovations such as smartphones with a multitude of additional functions, tablets, and ultraportable laptops have made daily life increasingly convenient. However, this convenience has also led to greater dependence on electronic devices. People now use mobile social software to communicate globally, often neglecting those physically nearby, and spend time playing games on their phones or computers instead of engaging in physical exercise.

Professor Wang Yuelun, a philosopher, posits that as technology progresses, human instincts tend to atrophy because we rely more on external tools to manage daily activities. He emphasizes the importance of maintaining a balance, urging people to appreciate the convenience of modern technology without losing essential human instincts.

Through the completion of this paper, I have come to understand the importance of continuous learning, a process that does not end with graduation. During my research on WiFi coverage schemes, I discovered a more efficient and practical method: using multiple wireless repeaters to create a wireless bridge for WiFi signal transmission in a specific area. This method not only reduces the need for extensive wiring compared to traditional schemes but also minimizes coverage blind spots. However, I have yet to verify whether this approach ensures network stability and speed.

Acknowledgements

This work was financially supported by 2019 Central University Basic Scientific Research Project of Railway Police College (2019TJJBKY015).

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