

OLZADIA/NETWORK

Project description



Problem statement

Purpose: Design and Implementation of an Access Control System for Communication Services and Internet Access.

In the newly constructed hotel, the customer has requested consulting services and the development of a centralized internet access system that will provide comprehensive coverage of the entire facility with a single access control area, including categorization, pricing, and accounting for communication service usage. Additionally, the customer requires the development of a backbone network to support the deployment of hotel management systems, security measures, access control, and video surveillance services at a reasonable cost.

The customer wishes to ensure fast internet access within reasonable bandwidth limits in the context of an archipelagic environment.

Finding a Solution

During our research, we proposed a solution based on MikroTik equipment.

The system comprises a structured Category 6 cable network installed in cable conduits fixed to the rear façades of buildings, along with a sixth-generation Wi-Fi network (AX).

The structured cabling system is terminated in a server room, on a patch panel that is located within a telecommunications cabinet.

A centrally managed switchboard is also located within the same cabinet, and additional similar equipment can be added to it if needed, expanding the underlying support network.

Finding a Solution

The reference network consists of a combination of VLAN-based networks (up to 128 total, although only 5 are currently in use), which allows for the integration of non-overlapping LANs within a single, unified reference network:

1. HotSpot for connecting users to the internet.
2. A work network for managing equipment.
3. The working network of the hotel management (including local administration, accounting, etc.).
4. Video surveillance network.
5. Security network.

Each terminal device (AP) has separate control over the assignment and availability of ports across all VLANs at the same time.

Finding a Solution

The head unit provides a number of network services, some of which are worth highlighting:

1. DNS and DHCP servers for all networks, allowing management of IP address leases and name resolution to addresses.
2. Capsman, a centralized access point management system, which performs individual assignment of access point parameters, roaming management for clients between access points, and frequency range management for optimal equipment operation.
3. HotSpot, a server that handles personal guest and hotel staff access to network resources.
4. RADIUS server (UserManager), which handles AAA (authentication, authorization, and accounting) issues.

Finding a Solution

The head unit also has partial control over switches.

Server hardware designed to perform various tasks (for example, a local file streaming service without internet access or a monitoring equipment server) is connected to the access (untagged) ports of the relevant virtual private networks.

Starlink equipment has been chosen as the uplink, with connection speeds under normal conditions reaching up to 250 Mbps or higher.

During the search for solutions, unique configurations and automated scripts were developed in order to create a reliable and scalable data transmission network.

Result

The customer has a fully developed and tested support network that is capable of handling the majority of tasks.

The network provides a unified Wi-Fi coverage throughout the hotel, with a single access control system and resource accounting.

There are approximately 30 access points that reliably cover the entire hotel and surrounding area with wireless access.

Furthermore, the system provides a reliable and high-quality communication channel to the internet.

It has individual access means to the data transmission network for each individual subscriber.

It also has means for monitoring and accounting of consumed resources within the entire facility's territory.