9/3/2024

Mapping Document

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IT Situation/Description of the Central Karoo Community Network Project

Scenario Overview:

The Central Karoo is a rural region that has transformed from a busy rail hub to one that relies primarily on agriculture, but the area faces significant communications challenges with limited access to reliable landline and internet services. Despite the introduction of 5G, the network remains unstable, with frequent service outages and poor coverage, especially in remote areas. The district includes about 3,000 homes, three district hospitals and an administrative building housing 28 offices and 200 government employees. These entities are mainly based on local Internet suppliers for communication and access to data.

Current IT Situation:

**Limited Connectivity**: The district suffers from inadequate Internet and telephony infrastructure, which hampers communication and access to online services for both residents and critical institutions like hospitals and government offices.

**Existing Network Infrastructure**: The existing network is based on a wireless backbone infrastructure using Smart Bridges multi-band access points. The current network topology is a star topology with two access points—one with a 90-degree sectoral antenna and the other with omnidirectional coverage. This setup provides basic connectivity but is insufficient to meet the growing demands of the community.

**Security Concerns**: There are issues with the security of government data, especially concerning external suppliers who access the government's IT infrastructure. The lack of robust security measures puts sensitive information at risk.

**Operational Dependencies**: The district's three hospitals, with approximately 40 wards and 10 executive offices each, depend on local ISPs for connectivity. The hospitals require reliable access to patient data and communication networks to perform their day-to-day functions effectively.

**Computer Network Infrastructure Requirements**

To support the business functions and processes of the Central Karoo district, the following network infrastructure requirements are essential:

1. Reliable and Scalable Network Infrastructure:

* The network must provide consistent and reliable connectivity across the entire district, ensuring that all 3,000 homes, government offices, and hospitals are connected. This requires upgrading the current wireless backbone infrastructure with more advanced and scalable solutions that can handle higher traffic loads and provide broader coverage.

1. Enhanced Security Measures:

* To protect sensitive government and healthcare data, the network infrastructure must include robust security protocols. This includes implementing firewalls, encryption, and secure access controls to prevent unauthorized access. Additionally, a Virtual Private Network (VPN) could be established for secure communication between government offices and external suppliers.

1. High-Availability Solutions:

* Given the critical nature of the services provided by the district hospitals, the network must include high-availability solutions to ensure minimal downtime. This may involve the use of redundant systems, backup connectivity options, and disaster recovery plans to maintain continuous operations in case of network failures.

1. Centralized Network Management:

* A centralized Network Operating Centre (NOC) is necessary for the efficient management and monitoring of the entire network. The NOC would be responsible for overseeing network performance, managing traffic, and responding to any technical issues that arise. The existing NOC infrastructure, with its power backup systems and server facilities, should be expanded to accommodate the new network’s requirements.

1. Improved Wireless Coverage:

* To address the current issues with network coverage, additional access points and antennas should be deployed. This includes extending the reach of the sectoral and omnidirectional antennas and possibly introducing mesh networking to provide seamless connectivity across the district, especially in hard-to-reach areas.

1. Integration with Existing Systems:

* The new network infrastructure must be compatible with existing systems, such as the ERP and Microsoft Office applications used by the government offices. This ensures that there is no disruption to ongoing business processes and that employees can continue to perform their duties without interruption.

1. Support for Remote and Mobile Access:

* With the expansion of the network, there should be provisions for remote and mobile access to ensure that employees, particularly those in the field or working from home, can securely access the network. This includes the implementation of secure wireless access points and mobile device management (MDM) systems.