Data Processing Phase

First, the Excel file was uploaded into Power BI.

In Power Query, the *Detect Data Type* option was applied to ensure that all columns had the correct data formats.

Missing values were then inspected. Only the **RSSI** column contained missing values. After creating a metric, it was observed that these blank values represented **34.06%** of the dataset. Given their significant weight, a **flag column** was created, where:

- 1 indicates missing RSSI values
- 0 indicates valid RSSI values

Next, a categorical variable was created to represent RSSI signal quality:

- **Unknown** (flag = 1)
- **Excellent** ≥ -70 dBm
- **Good** ≥ -85 dBm
- **Fair** ≥ -90 dBm
- **Weak** > -91 dBm

Some column names were renamed for clarity.

The routing values were standardized and replaced with:

- **Ethernet**
- **WiFi**

Note: Due to a Power BI issue, it was not possible to include the NOS logo in the dashboard.

Analysis Report

The data under analysis corresponds to the period between **July 17 and July 30**.

From an overall perspective, the dataset contains approximately **88k errors** and **14k reboots**. Although these values may seem high in absolute terms, when analyzed as a percentage of total events, they represent only **4% errors** and **5.35% reboots**.

Ethernet vs WiFi Comparison

When comparing **Ethernet** and **WiFi**, Ethernet presents:

- **12k more errors**
- **5k more reboots**

This already suggests a potential difference in performance between the two connection types.

From a temporal perspective, both networks show a **general downward trend in errors over time**. However, Ethernet displays **significant error spikes**, whereas WiFi shows a **more stable and predictable decrease**.

Impact of Signal Quality

When analyzing by signal quality, the highest number of errors occurs when the signal is classified as **Excellent**. Interestingly, although Ethernet shows worse overall performance globally, this pattern changes under this filter:

- **WiFi:** 37k errors
- **Ethernet:** 21k errors
- **Reboots:** similar for both

The time series also shows that errors decrease for both connections, but WiFi still ends the period with **nearly 1,000 more errors** than Ethernet.

For the remaining signal categories (**Good**, **Fair**, and **Weak**), a similar behavior is observed:

- **WiFi:** 942 errors and 199 reboots
- **Ethernet:** 184 errors and 77 reboots

Unlike the *Excellent* signal category, where errors consistently decrease, these weaker signals show **error peaks over time and an increase towards the end of the period** for both routing types. This may indicate that weaker signal conditions are more problematic in the long term.

Unknown Signal Category

The **Unknown** signal category was retained due to its significant weight (**34% of the data**). This category:

- Only appears in **Ethernet**
- Represents devices **not connected**
- Shows strong error indicators:
    - **29k errors**

- **4k reboots**

At this point, two possible analytical approaches can be taken:

1. Base the decision on **all data**, including *Unknown*
2. Exclude *Unknown* and focus only on **connected devices**

Given that *Unknown* represents a lack of connection, the final decision was based on connected signal categories:
Excellent, Good, Fair, and Weak.

Conclusion

After a more detailed analysis of these four signal categories, **Ethernet consistently demonstrates better performance**, both under strong signal conditions (*Excellent*) and weaker signal conditions (*Good, Fair, Weak*).

Therefore, **Ethernet is the recommended routing option to be implemented as the default connection**.

However, it is important to highlight that the **Unknown signal category significantly alters the overall scenario**. Further investigation would be required to fully understand what these records represent and whether they indicate data quality issues or specific device behavior.