

The Regulator Eye module

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The **Regulator Eye** module is designed to monitor sites, their characteristics, and the operators that maintain the work of their network with them. It allows viewing the performance of the sites over a specific period, their location on a map, and data about the regions where the sites are located, including the number of objects connected to the network in each region.

Elements in the interface

The main interface, depicted in Figure 1, can be divided into 2 parts: the right side contains *an information panel*, while the left side features *a map*. The information panel displays data relevant to the objects. The map, in turn, allows users to visually inspect the locations of sites, select regions for more information, and view the metrics of sites displayed on it.

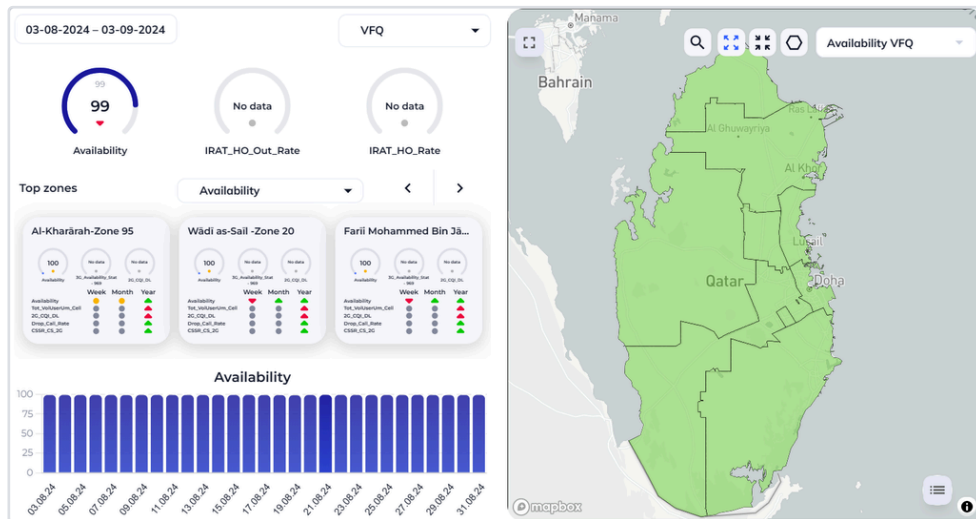


Figure 1 - The **Regulator Eye** module interface

Informational panel

This panel provides information about the current metrics of the network operation in the country. For separate regions, the details are displayed in separate clusters. The informational panel contains the following elements for analysis and visualization:

- **Gages**

At the top of the informational panel, gages (Figure 2) display values of analyzed KPI metrics defined by other platform modules. Depending on the KPI values and established limits, the indicators can change to demonstrate how the metrics change during the network operation.

- - This icon signifies that *no changes* for the KPI metrics occurred.
- ▼ - The icon indicates that the metrics *decreased* during the specific time period.
- ▲ - The icon indicates that the metrics were *improved* during the operation.



Figure 2 - with KPI indicators in the **Regulator Eye** module

For example, when the user selects to view metrics for the **Ooredoo** operator, the gages indicate the level of the network’s availability in the region (the **Availability** gage), downlink average throughput (the **User Throughput DL** gage), and the percentage of calls dropped due to technical problems or coverage gaps in the service provider’s network (the **Drop Call Rate** gage).

- **Time range calendars**

Using the time range feature, the user can set the period for which the KPI metrics will be displayed in the dashboard. The **Time range** button above the counters displays the period of the operation which metrics are measured. The user can set a week or a month for the analyzed period. The button displays two dates: the start date of the time range and the end date. When there is no data for this period, the gages say “**No data**”.

The time range function allows the user to select the period for viewing. For this, he clicks on the button with 2 dates, after which the window with 2 calendars opens, as depicted in Figure 3. In the first calendar on the left, the user sets the initial date for the time period, while in the second calendar on the right, the end date of the range is selected. The set time range is highlighted in the window with the start and end points marked in **blue** circles. When the time range is selected, the dashboard in the module will display information for this period.

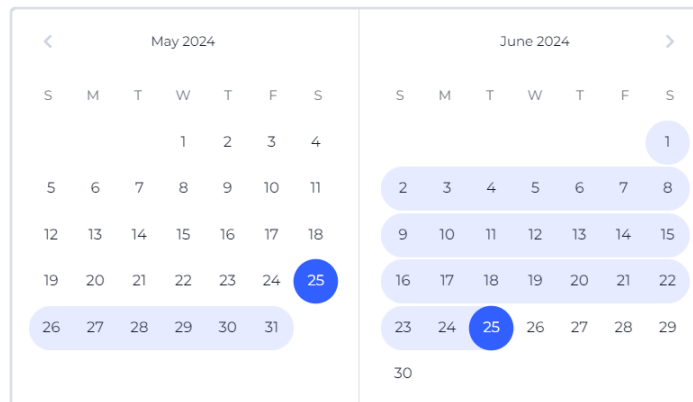


Figure 3 - Calendars for the time range setting

- **Operator selection dropdown**

To *change* the operator, the client needs to click on the **Operator** drop-down to the right of the **Time range** button and select one from the list, as shown in Figure 4. Additionally, by changing the operators, the user can view the sites provided by them and their respective metrics in gages, demonstrated in Figure 2. For example, if the user selects an **Ooredoo** operator, the dashboard will display information about its performance in the selected region.



Figure 4 - The **Operator** drop-down list for changing the operator

- **The top zones clusters**

Beneath the counters, users can find a range of zones (Figure 5) marked with various indicators for **Week**, **Month** and **Year**. The zones are arranged from the *most productive* to the *least productive* according to the KPI metric selected in the drop-down list above the zones. To view all zones, the client needs to use the arrows on the right side above the zones which allows him to slide them.

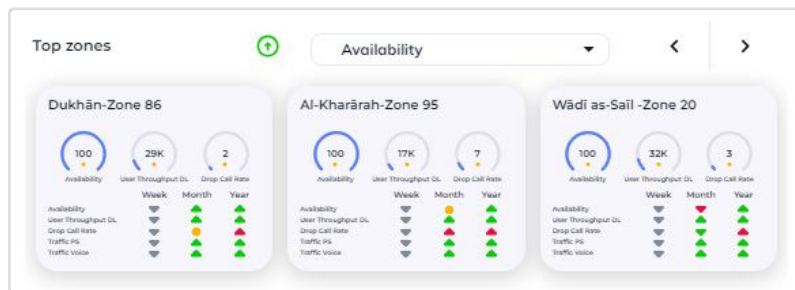


Figure 5 - The **Top zones** section displaying clusters with the highest metrics

The rating of top zones can differ depending on the selected metric. If the user selects between availability, user downlink throughput, and rate of dropped calls, the section will display clusters with the highest selected metric. For example, when the user selects the **Availability** option, the **Top zones** section displays clusters with the biggest percentage of the network’s availability.

Also, when the user selects one zone from the range, he enters the **Cluster** mode and views the dashboard with the details for the selected cluster, as described further in subsection **Zone dashboard**. Additionally, the user can sort zones by ascending and descending. For this, click on the arrow button at the left of the KPI drop-down list. If the arrow points up, the section displays zones with the highest metrics, and if the arrow points down, zones with the lowest metrics are displayed.

- **Bar chart**

The chart indicate the operator’s *performance* based on specific criteria. They provide a visual representation of various metrics, allowing for a comprehensive analysis of how effectively the operator meets those standards. As depicted in Figure 6, the chart demonstrates the changes of only one metric for the provider’s network selected in the KPI drop-down list on the map. The level of this metric is demonstrated both on the map for each region and in the chart. For example, if the user selects the metric of user uplink throughput, the chart will display the changes in this metric during 2 weeks (the period is set by default).

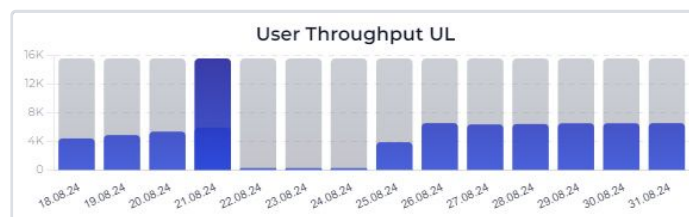


Figure 6 - The chart displaying the dynamics of the KPI metric

Map

At the top of the map, there are *buttons* with various functions. They allow users to quickly find one specific region and view metrics in this area. When hovering the *region*, detailed information about that *region* will appear will automatically pop up in the infotip next to the *cursor*,

as demonstrated in Figure 7.

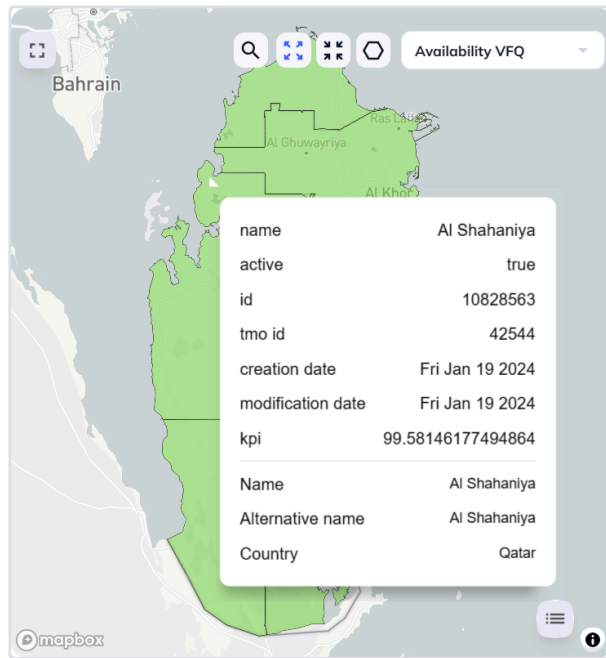


Figure 7 - The map view and additional information about a region

Above the map, there are buttons that perform various functions adjusting the map for the user. These buttons and their functions are described in the table below:

Elements	Description
	The Fullscreen button allows the map to expand to <i>full screen</i> when clicked. Clicking it again will return the map to its <i>original size</i> .
	The Search button reveals a search bar when clicked. Using it, the client can search for <i>region</i> on the map.
	When the Regional Polygon button is enabled (<i>highlighted</i>), the map will display the entire region being analyzed.
	The Cluster Polygon button <i>zooms</i> in on a specific cluster on the map, allowing users to view detailed information about the operator's performance in that area.
	When the Point and Hex button is activated, the map will show all <i>network sites</i> established by the operator in the analyzed area.

The drop-down list with performance metrics (Figure 8) is located at the right of the **Point and Hex** button. To view one metric of the operator's performance on the map, the client can select the needed option, after which the relevant areas will be *highlighted* on the map.

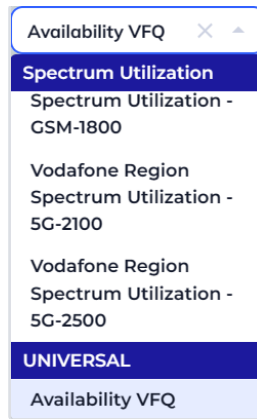


Figure 8 - The drop-down list with KPI metrics for viewing

For example, if the user needs to analyze the availability of the service provider's network, he selects the **Availability Ooredoo** option, and the map, in turn, highlights regions with different levels of the network's availability, indicated by the color (the darker the region, the higher the percentage of availability), as demonstrated in Figure 9. Also, the metric chart and the legend on the map display values and elements specifically for the selected KPI indicator.

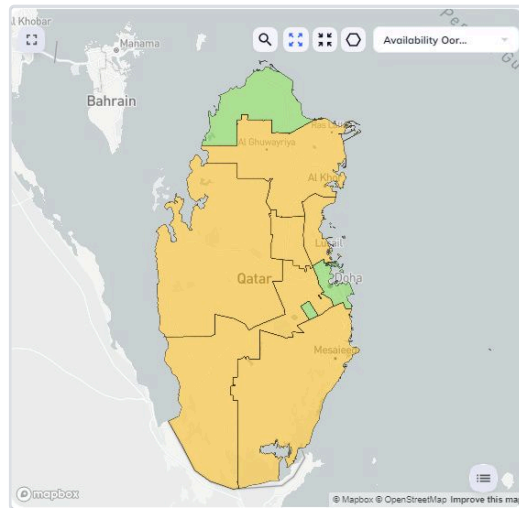


Figure 9 - Regions on the map highlighted by the KPI metric

To find a site or a cell, the user needs to click on the **Search** button to open the field and enter the name of the site or cell in the field. While typing, the drop-down list below the **Search** field (Figure 10) will display sites and cells whose names match the request, and the user selects the one he needs from the list of results.

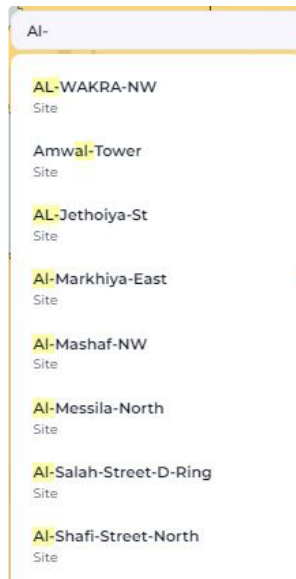


Figure 10 – The list of results matching the request in the **Search** field

When the user clicks on the needed site or the cell in the list of search results, he opens a dashboard with details about this item and its performance.

In the bottom right corner of the map, there is the **Legend** button (☰). When the client clicks on it, a window will open showing the selected region node. Next to the region, there is the **Settings** button (⚙️). If the user clicks on it, a window will appear where they can choose a set of filters. They can change the colors and their meanings.

At the bottom of this window, there are buttons for:

- **Apply** - applies the color set selected by the client to the map;
- **Edit** - allows editing the color scheme of the filter;
- **Create New** - allows creating a new color set;
- **Select Default** - resets to the default filter.

When the client clicks on the **Unwrap** button (▾), a list of all colors and their names in the selected *filter* will open, as depicted in Figure 11.

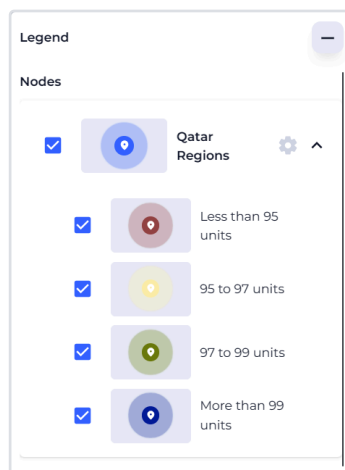


Figure 11 - The **Legend** window with the description of elements on the map

When the user clicks on the **Edit** or **Create new** option, a window opens where the user changes the color of elements by the metric, as demonstrated in Figure 12.



Figure 12 - Menu for editing and creating a new colouring filter for the map legend

- Under the **Name** label, there is a field where user can provide a name for the new filter. Below this, there are two toggle switches:
 - 1) "**Make this filter set private**"- this option ensures that the color set remains private;
 - 2) "**Set this filter set to default**"- this option applies the color set to the map by default.
- Additionally, when hovering over the colors, a **+ Add a Tier** button labeled appears allowing users to add a new color. The user sets the values for tiers either by typing them in the field or using **Up** and **Down** arrows at the right of the number fields.
- The **Delete** button (🗑️) next to each color set removes the tier from the settings. By default, there should be at least 2 color rows for the legend, so the tiers can be removed by the **Delete** button only when there are more than 2 of them.
- To adjust colors for each row, click on the color square close to the center which will open a small plane where the color is selected, as demonstrated in Figure 13.



Figure 13 - The plane configuring colors for tiers

Using the color stripe under the plane, the color can be selected to mark the values within a specific range (a tier). By moving a cursor and setting coordinates on the plane, the user can select a shade of a specific color for the tier.

The coordinates are displayed under the color stripe, and the user can adjust the shade by typing values there. These coordinates are displayed as a color code in 3 modes:

1. **HSL** (adjusting Hue, Saturation and Lightness);
2. **HEX** (gives the color code as its indicator);
3. **RGB** (Red, Green and Blue initial colors are mixed together to reproduce a broad array of colors).

To quit the plane, click anywhere in the window outside this plane.

Region dashboards

If the user selects a region and clicks on it on the *map*, the map will *zoom* into that region and *display* the zones within it. Detailed information about the *region* will also appear in a dashboard on the left side, showing the *operators performance* in the region, as illustrated in Figure 14.

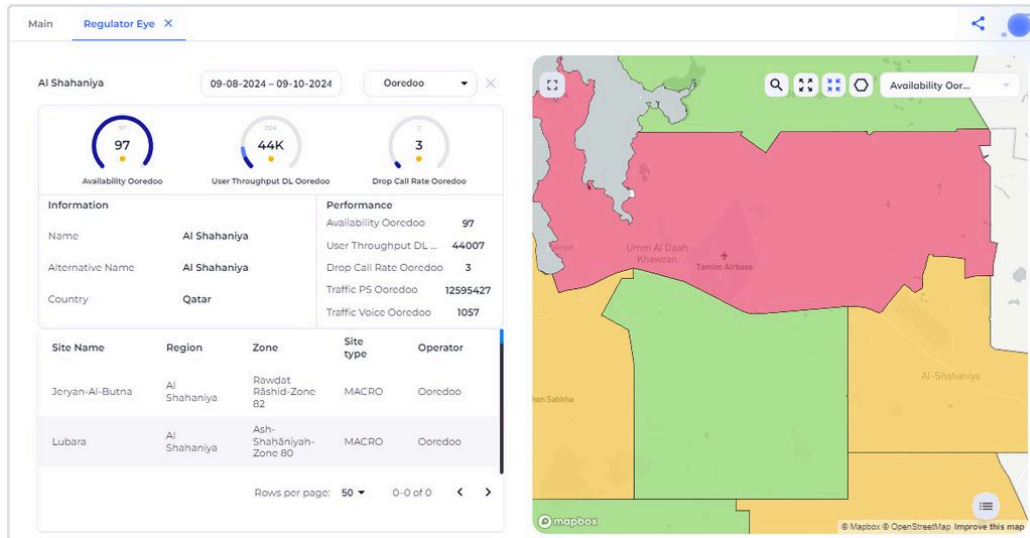


Figure 14 - The map of the region and zones included in the region

The informational dashboard

The dashboard includes gages showing the KPI value of the selected operator in the chosen region for the specified time period. Below the gages, there is detailed information about the *region* and *its performance*, as depicted in Figure 15.



Figure 15 - The details about the region in the dashboard

Below the details about the region, users can find and select any site within the selected region. In the displayed column, users can see that the sites managed by the selected operator are categorized by name, region, zone and operator. Below, users can view the total number of sites for the selected operator in the region, as depicted in Figure 16.

Site Name	Region	Zone	Operator
GDI6070_NDIA	Ad Dawhah	Maṭār ad-Duwalī-Zone 49	VFQ
GDS2974_HIA-MainFireStation	Ad Dawhah	Maṭār ad-Dawḥah ad-Duwalī-	VFQ

Rows per page: 50 1-37 of 37 < >

Figure 16 - The table with the information about sites in the region

Zone dashboards

When the user clicks on a specific zone, he gets access to the detailed information about the zone. The selected zone will simultaneously zoom in on the map (similar to when a user clicks on a region), and all sites managed by the *selected operator* will be highlighted, as demonstrated in Figure 17.

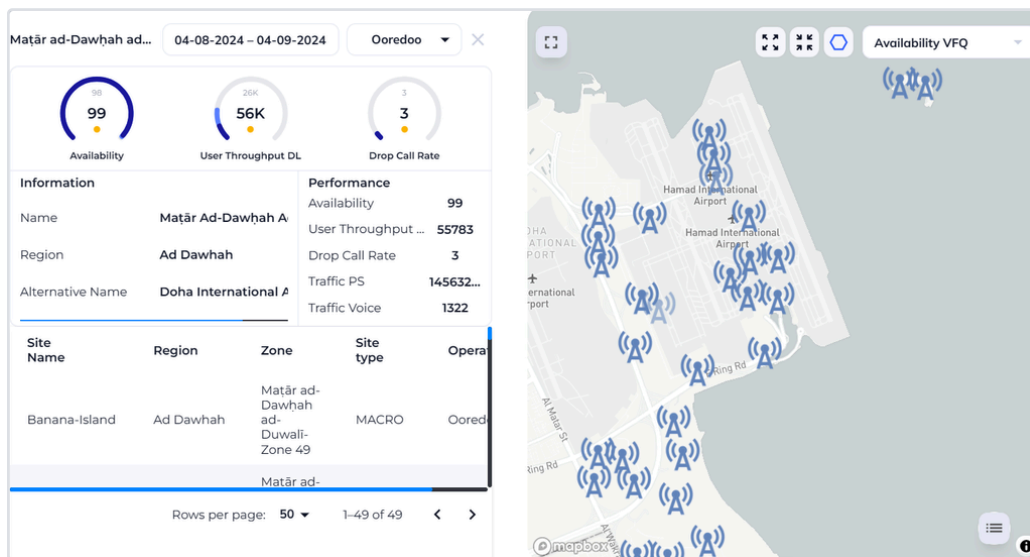


Figure 17 - The selected zone, its characteristics and location

Informational dashboard

The information panel for a zone is similar to the one for a region, as depicted in Figure 18. However, it focuses specifically on details about the zone and the *performance* of the operator's sites within it over a selected period of time. Below the zone information, similar to the regional dashboard, there is the table with sites managed by the selected operator.

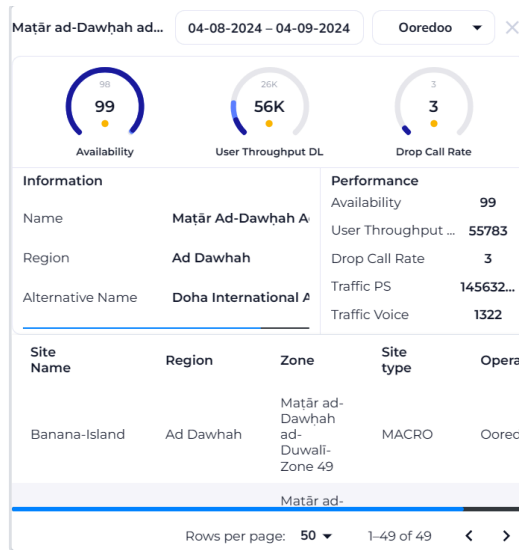


Figure 18 - The dashboard with Information about the zone and the sites in it

Map of the zone

In the zone selected by the user, all sites within it are highlighted. When hovering the cursor over any of these sites, information about the site will appear in the infotip, as demonstrated in Figure 19.

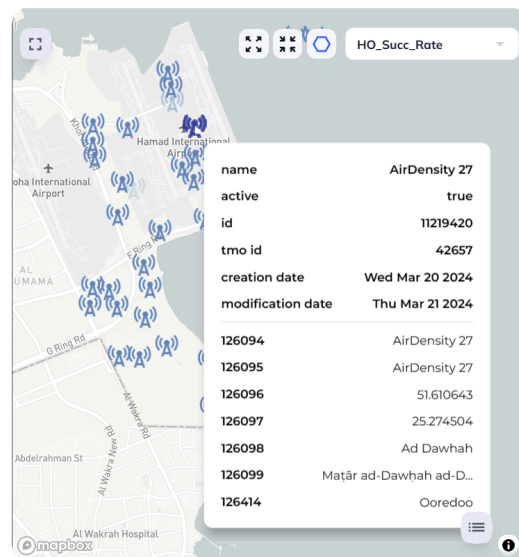


Figure 19 - The infotip about the site inside the zone

Sites dashboards

The sites selected by the client will be displayed on the map. Detailed information about a network site and its performance will be shown on the dashboard, as depicted in Figure 20.

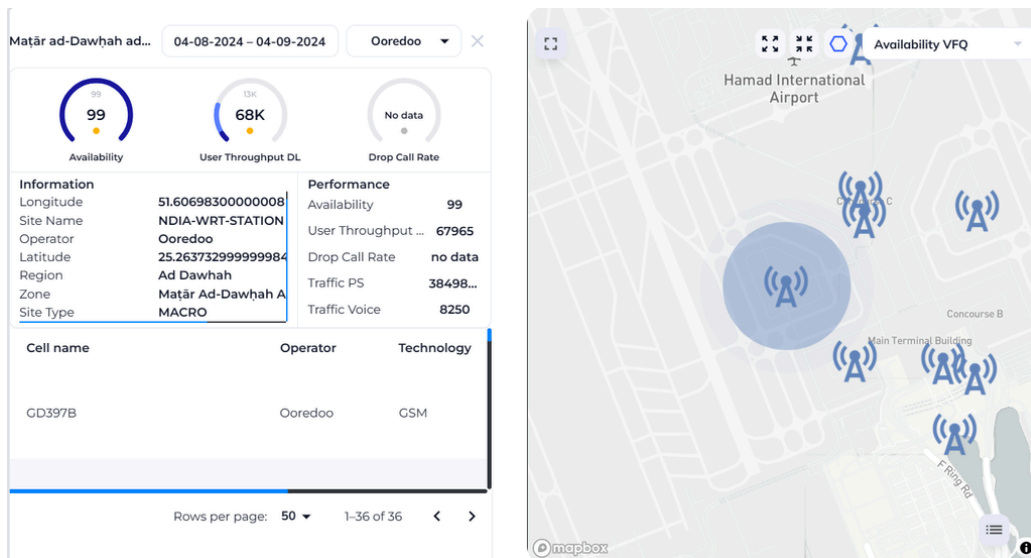


Figure 20 - The dashboard with the information about the selected site

Information panel of the sites

The dashboard displays all details and performance metrics for the network site. To view the information for a specific network site, click on it on the map, after which a dashboard with the site details will open, as demonstrated in Figure 21.

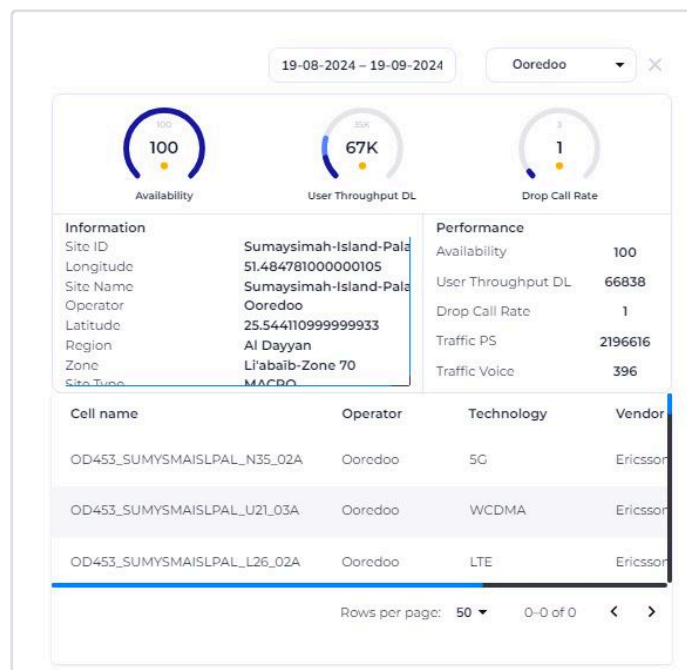


Figure 21 - The dashboard with the information about the network site and its performance

Like dashboards for [regions](#) and [zones](#), this one also includes gages with 3 main KPI metrics: the network's availability for the site, the user downlink average throughput, and the rate of dropped calls. In the **Information** column above the gages, the user views details about the site: such as its ID number, coordinates, the name of the operator providing the network, and the region where the site is located. The **Performance** column, in turn, provides details about the network performance at this site: such as the number of network's package-switching (**Traffic PS**) and the rate of calls transmitted through the provider's network (**Traffic Voice**) alongside the 3 main KPI metrics in the module.

To view the performance of the site with another operator, click on the **Operator** drop-down list located at the top of the dashboard and select the needed operator. To set the period of the site's performance, click on the **Time range** field and select the range for viewing.

At the bottom of the dashboard, there is a table with network cells within which the connection is covered by network sites. The table includes information about the vendor who provided the equipment for sites (the **Vendor** column), an operator managing the connection in the cell (the **Operator** column), the technology used to provide connection (the **Technology** column), the region where the cell is located (the **Region** column) and the zone which it covers (the **Zone** column).

If the user clicks on the cell in the table, he will open the dashboard (Figure 22) with the information about the cell covered by the network site.

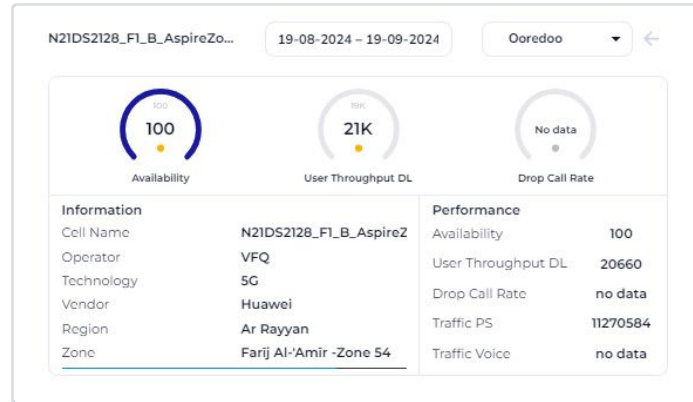


Figure 22 - The dashboard with the details about the cell