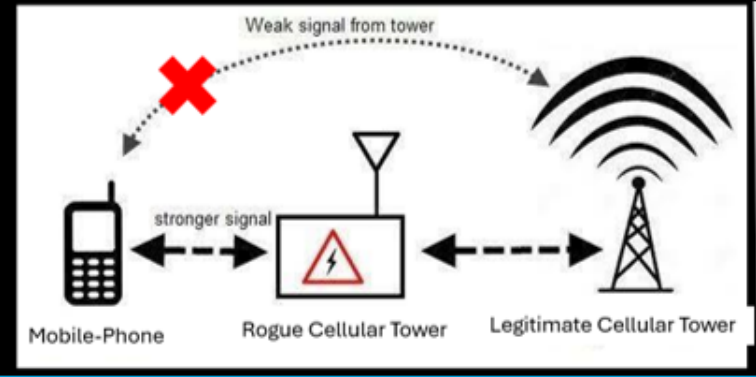
Master Dashboards Template: Cellular DFP

- Uses **Network Survey (NS) data** to shape understanding of cellular activity in AOI
- Detects **anomalies in cellular behavior** (service drops, missing neighbors, abnormal signal strength, unexpected carrier codes) that may signal threats.
- Provides **situational awareness** to deter adversary use of manipulated or abnormal cellular infrastructure.
- Enables analysts to filter, pivot quickly**, and map data** by time, location, or device.
- Supports **decision-making and deterrence** with clear visualizations (heat maps, histograms, line charts).

Rogue Tower: Intercepting Cellular Communication



Common Places Found

Choke Points
- Airports
- Traffic Circles
- Dwell locations
- Train Stations

Places of Interest
- Government Buildings
- Embassies

Identifying a potential Rogue Tower Event

Where to find this data: Survey data can show the indicators of the event between the device and tower; potentially, AdTech or cell tower information can show the historical activity of that rogue tower.

Threat Detection	Operations and Planning
Capture signatures associated with Rogue Towers	Identify areas with less secure technologies (2G GSM & 3G UMTS)
Jamming – Signals are blocked, causing sudden loss of service in an area.	Mapping of the cellular environment
	Cellular change detection
Capture signatures of Cross-Border Signal Expansion	Monitor blue force digital footprint

Cellular DFP Dashboard used for- Ebril Iraq

SEME Tactical Mission Network

BLUF: ShadowView visualized Cellular data records for Digital Force Protection (DFP) overwatch leading to the identification of two cellular anomalies that occurred during a routine route on 04JAN24 from 0700Z – 1330Z.

Details

EUD streaming NS data to the data lake (WiFi, Bluetooth, Cellular & GNSS records)

The analysis was conducted after the route due to having little to no digital baseline.

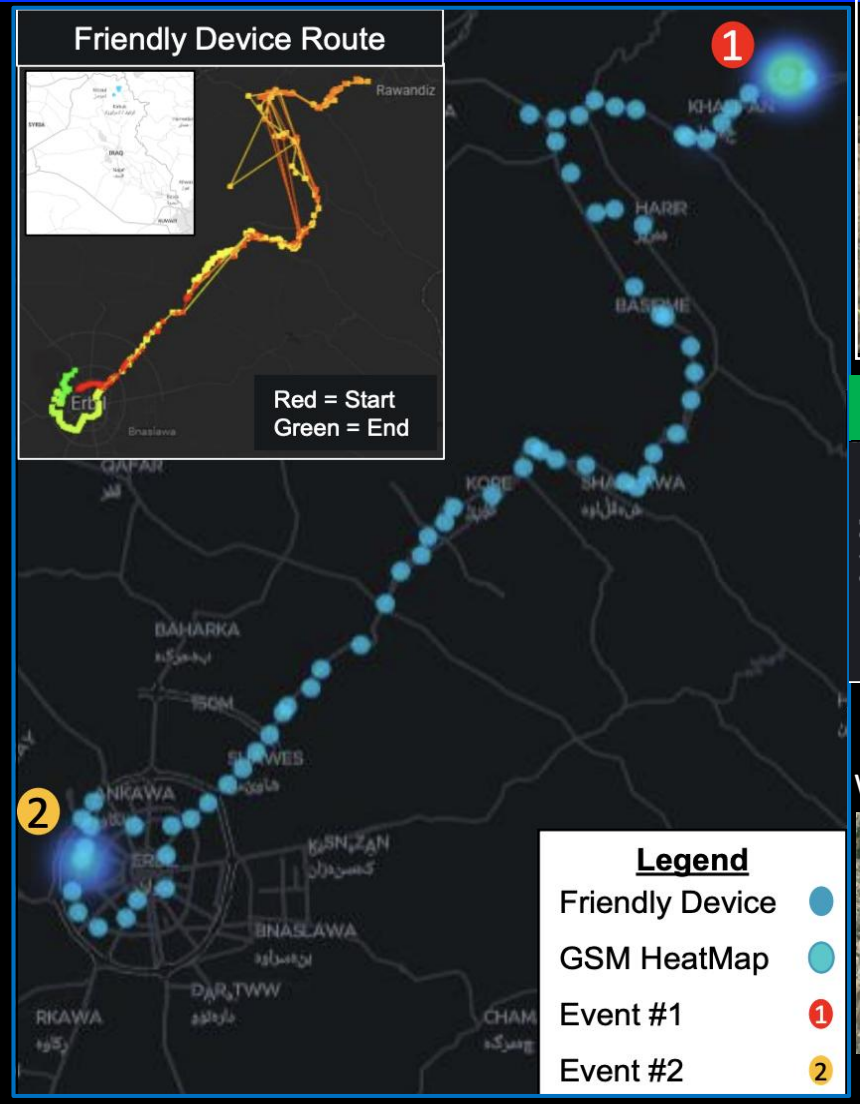
2 events shared unexpected drops in service from LTE to GSM.

Each Anomaly meet specific criteria to be considered anomalous.

Event 1 has met the threshold to be considered a significant Cellular Anomaly

Event 2: identified that their was a pattern of anomalies

Results were relayed to operators back on the ground to take mitigating actions



Event 1

Where: Valley Terrain

Details

Severity 4 Alert

5/9 cellular signature anomalies met

-Time&Length: 40Min 0900Z– 0940Z

- Record count Increased
- Drop in Technology 4G to 2G
- Valley ideal for digital choke point
- Potential Natural Interference

Alert Dashboard for Cellular Neighbor Lists

Event 2

Where: Urban Terrain

Details: 2 hours later

Severity 2 Alert

3/ 9 Cellular anomaly Signatures met

- Time &Length: 32Min 1153Z – 1225Z
- Record count Increased
- EUD was stationary in building in Urban Terrain
- 2nd Event starts a pattern of anomalies

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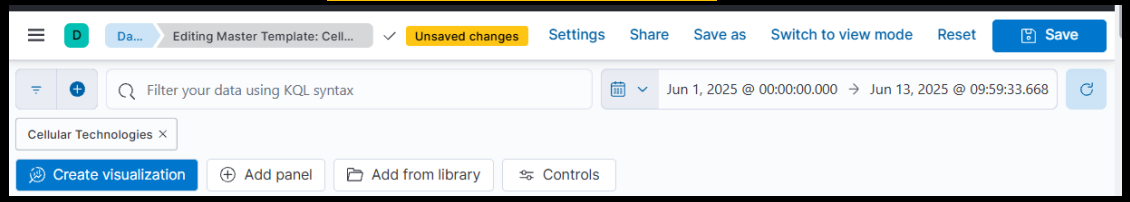
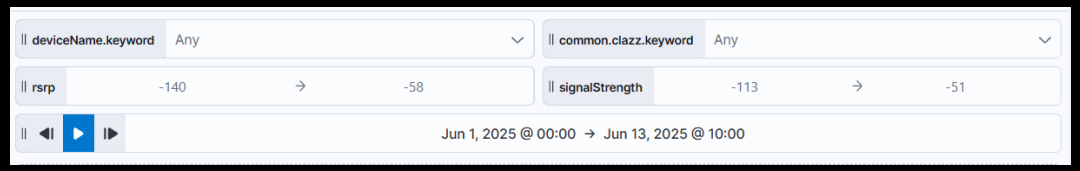
SEME Tactical Mission Network

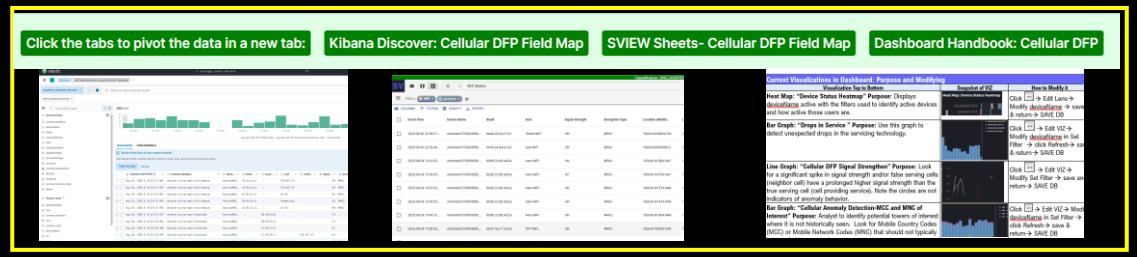
Dashboard Functions



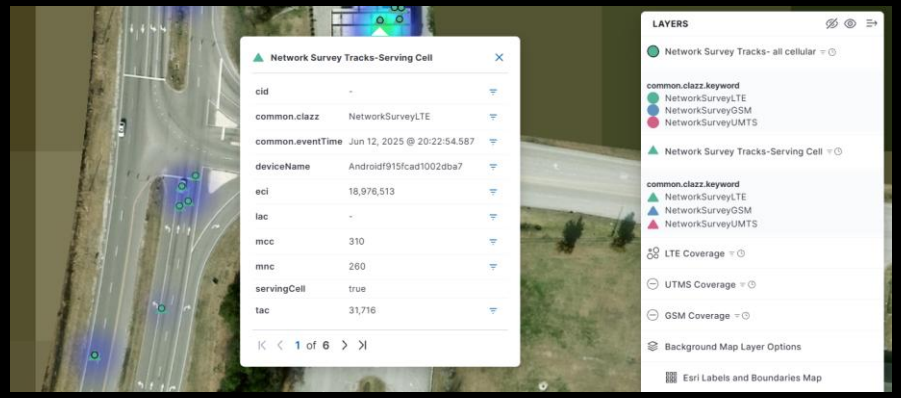
Controls



Pivot Data



Maps



Dashboard Functions

- Starting point for filtering data in the Master Template
- Analysts can query by device, set time ranges, and begin shaping results
- Template can be cloned, shared, and modified for specific analysis

Controls

- Interactive filters for refining results in the Master Template
- Narrow data by clazz (2g,3g,4g), device name, DTG range , & signal strength GSM and UMTS (LTE RSRP)
- Filter for specific devices or access points for deeper analysis

Pivot Data

- Provides **pivot URLs** with predefined field maps in both **SVIEW** cellular fields all technologies and **Kibana** (Sheets View & Discover)
- Enables data exploration without rebuilding filters or re-selecting fields
- Includes a **Dashboard Handbook link** explaining how to modify visualizations and explain DFP purpose.

Maps:

Map 1 –Identifies the end users cellular technologies as well as a heat map of those technologies and than identifies the serving cell vs the neighboring cell.

Master Dashboards Template: Cellular DFP

SEME Tactical Mission Network

Device Status Graphs

Device Status Graphs- current end users- deviceNames activity

- **Device Heat Map:** Displays criteria filtered end users in the dashboard, great tool for operations pre-check devices are operational.
- **Devices in AOI Metric Display** – Shows the total number of end users
- **Service Drop Detection Histogram**–IDs gaps in records or service that may indicate anomalies

Cellular Tower Measurements

Cellular Tower Measurements – Used to ID anomalous cell tower activity

- **Neighbor List Histogram)** – Shows serving vs. neighbor cells; normally equal (red/green), anomalies if only red or green.
- **Signal Strength Line Chart** – Compares serving cell vs. neighbor cell; serving cell should usually be stronger.
- **Rolling TAC/LAC Chart** – Detects anomalies when rapidly changing
- **MCC/MNC Histogram** – Identifies country and carrier codes; only the expected MCC (country code) should appear.