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Improve RAN performance with automation tool NetWarden

Bwtech's solution focus on network optimization, taking advantage of machine learning

The Telecom Industry is going through a new era. The 5G implementation requires an even modern and interoperable infrastructure to store and process the amount of data that is being generated. As network sizes get bigger, they will become even more complex, and so will the problems and degradations in its elements. In this scenario, MNOs must obtain efficient network monitoring and optimization solutions capable of maintaining high performance.

One of the main challenges to be overcome by operators is efficiency in problem-solving. The process of investigating networks to identify and solve anomalies is a complex and expensive task, given the high number of elements involved and parameters used for this analysis. Now imagine having a tool that investigates all cells in a network, detects anomalies based on specific KPIs, and presents this information on a user-friendly dashboard, all that by clicking on one button. That is what Bwtech's solution NetWarden is able to deliver!

We invite you to keep reading and learn more about NetWarden and the benefits of automating network issues investigation.
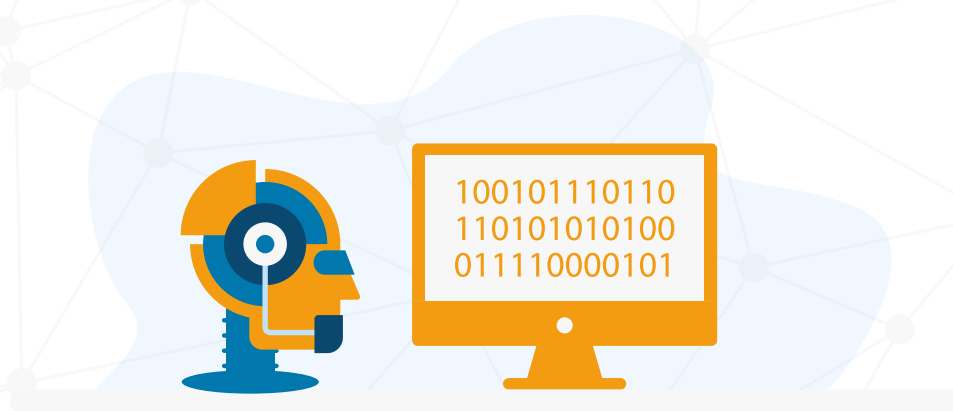
Automation to focus in critical decisions

Today's mobile operator's networks are becoming more dynamic and heterogeneous. The requirement to constantly monitor and optimize network performance to achieve customer expectations creates a high level of complexity.

Netwarden is a cloud-based solution that automatizes network monitoring and optimization by using artificial intelligence and domain knowledge. Its main goal is to help Network Operators to concentrate on taking important troubleshooting actions instead of spending precious time manually collecting, analyzing, and correlating data by themselves.
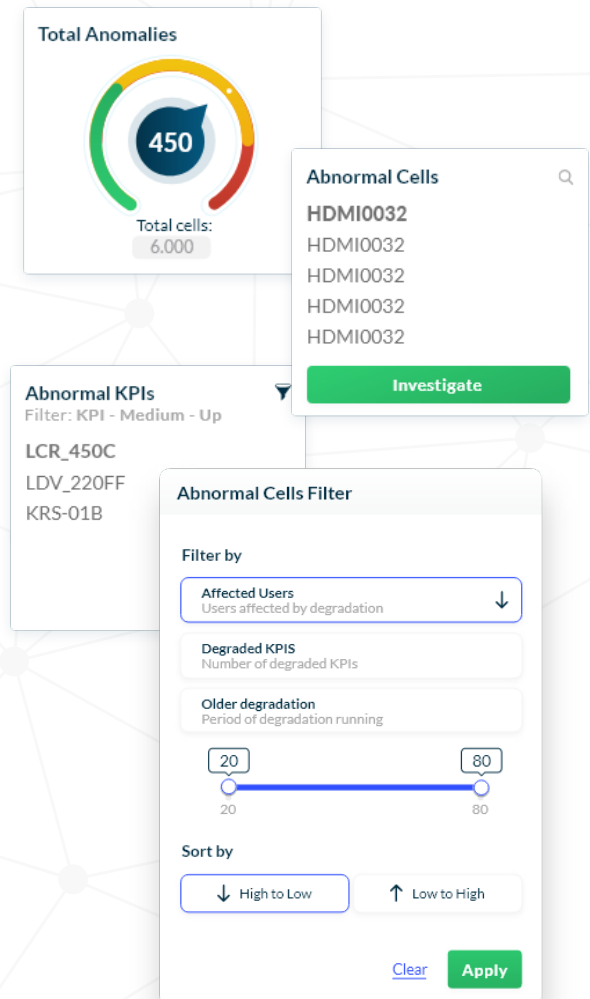
The solution works with two main features: Anomaly Detection and Investigate.

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Anomaly detection

Given a history of KPIs, PM, CM and Alarms from all cells, this feature scans the network elements and identifies, for each cell, whether the latest value of a certain data is abnormal or not. After detecting the anomalies, it presents a dashboard with several indicators displayed on graphs, maps, tables, and a list of the abnormal cells. This whole process happens without the need for user intervention to set parameters to identify anomalies.

- Observes a range of KPIs for **all** cells in the network

- Detects any **abnormal** behavior automatically

- Adapts to any KPI type and behavior using **machine learning** techniques

- **Eliminates** "top 10" lists with manually defined thresholds

- Detects **clustered** anomalies

- **Sorts anomalies** by the number of affected users

Total Anomalies

450

Total cells:
6.000

Abnormal Cells

HDMI0032
HDMI0032
HDMI0032
HDMI0032
HDMI0032

Investigate

Abnormal KPIs
Filter: KPI - Medium - Up

LCR_450C
LDV_220FF
KRS-01B

Abnormal Cells Filter

Filter by

Affected Users
Users affected by degradation

Degraded KPIS
Number of degraded KPIs

Older degradation
Period of degradation running

20   80

20   80

Sort by

↓ High to Low   ↑ Low to High

Clear   Apply

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Investigate

Netwarden automatizes the investigation process by making it possible to carry out additional checks for any anomalous cell to find out the causes of the anomaly. After literally pressing the button 'Investigate', the tool starts automatically executing a series of detailed verifications, correlating the chosen cell with others, and provides a list of possible causes of the problem.

- Manual optimization

| Scan multiple KPIs | Identify cells with issues | Check neighboor cells | Check parameters changers | Check alarms | Infer possible cause | Take Action |

- Optimization with NetWarden

| Identify anomalies | Run INVESTIGATE | Take Action |

🕐 Up to 90% reduction time

Inside the investigation
Bwtech's solution is based on nine checks

1 – Availability;
Investigates availability issues on the selected cell and other network cells from their environment that may impact its performance.

2 – Cell Range;
Investigates if the selected cell and others that may impact its performance show any atypical changes in the cell range.

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3 – Alarms;

This feature checks unusual alarm patterns and points out which one has the highest probability to be the root cause and to trigger other alarms.

4 – Received Uplink Power;

This check investigates the total received uplink power for 3G and 4G cells (signal level) and helps identifying issues related to interference and noise that might affect the communication with the users.

5 – Parameter Changes;

Shows the elements and their neighbors with the highest probability to have been affected by parameter changes. Brings data of those that have been altered, old and new values, and their impact on the overall performance.

6 – Neighbors Relations Performance;

This check analyses all neighbor relations performance available in the area. It shows the reference value for the number of the expected attempts, the value in the selected period, and the handover success rate.

7 – Other Anomalies;

Checks if other cells in the neighborhood have any anomalies detected. It shows the affected KPIs and the anomaly severity of the abnormal element.

8 –Transmission Links;

Checks for packet loss degradation on IP links.

9 – New Cells.

Reports new cells integrated in the neighborhood of the investigated cell.

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Machine Learning helping to Investigate

According to Cisco's Annual Internet Report, nearly two-thirds of the global population will have Internet access by 2023. That is, there will be 5.3 billion total Internet users in the world. Following this rise, networks will evolve and become more complex, as the problems that affect them.

NetWarden's checks parameter change and alarm causality have algorithms based on machine learning to ensure a consistent network investigation and provide a better response when dealing with anomalies.

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Parameter change

One of NetWarden's investigation results is parameter changes analysis. This check shows which parameters of the investigated element and its neighbors have undergone modifications. It also presents the relevance of each change based on past correlations with degradations.

For example, if the operator or the network hardware is automated, there may be many automatic parameter changes. The modification in one single parameter can result in several adjustments to the related parameters. Identifying the severity of each of them becomes harder as the network grows.

Alarm causality

In telecom networks, a problematic event can trigger a series of alarms providing a lot of information. It is known that not all of them are relevant, which can get in the way of solving the problem. In this scenario, the Alarm Causality algorithm helps to find the anomaly's root cause. It does that by showing the most relevant alarms that might be responsible for shooting the other ones.
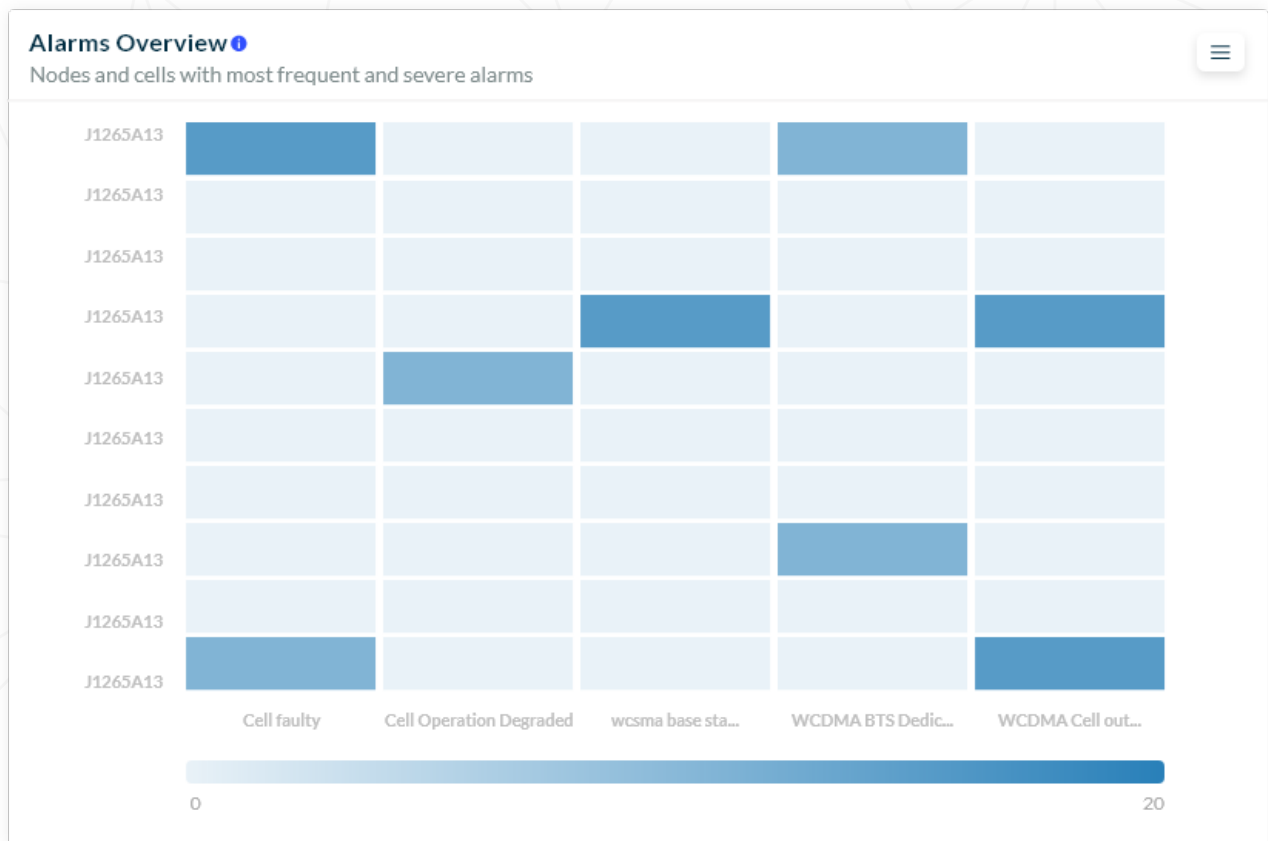
Affected Users

As we pointed out before, NetWarden makes it possible for operators to identify and solve degradations in network elements with more agility and assertiveness. While some of these problems affect very few users, others can reach a considerable number of people, impacting the quality of the service. Manually identifying the impact of a issue can require precious time and effort, that could be invested in actualy solving the problem.

The affected user's feature allows ordering and filtering anomalies based on the number of users that might have been affected. By doing that, it makes it possible to identify the problems that reach more people and solve them first, saving time and improving customer satisfaction.

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Key Benefits of NetWarden

- Automated network monitoring
- Reduced troubleshooting time (MTTR)
- Data visualization in user-friendly interface
- Ability to apply filters to evaluate specific scenarios
- Anomalies classified according to degradation severity
- Allow engineers to proactively identificate problems for more assertive actions

Want to know more about our solutions? Feel free to get in touch with us! You can send an e-mail to **hello@bwtech.com** and we will talk soon.