

# White Paper

## NOC to SOC Evolution

### **What it really means for Operators**

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## Introduction

With the explosion of user applications and content on broadband services, where OTT are thriving on top of very expensive infrastructures that they don't have to invest on, the challenges for operators have quickly escalated to an environment where revenues are eroding, competition is getting more and more fierce and customer demands for performance and capacity are growing. Increasing quality while lowering cost is now a real challenge which will determine who wins and who loses in the battle for customer differentiation and ultimately market and wallet share.

For Network Operations this means **doing more with less** and **shifting from network centric view into a service centric view**, hence the upwards trending of Service Operations Centers (SOCs).



### Customer Journey not Always Understood

The concept of SOC is very often thrown around as the magic bullet to solve Service Quality, but the fact is that most operators are still at a low level of maturity when it comes to Customer Experience Management (CEM) and in a lot of cases the customer journey is not fully understood. Service offering is becoming more and more complex and customers look at the service experience beyond network availability. The mix of complex services with quality differentiators makes it even more challenging for a “mistake free” human intervention in each of the customer “touch points”.



### NOC to SOC “Transition”

Firstly, the word “transition” is broadly used in this context but it's not actually the right one to describe what really happens. The NOC doesn't transition, i.e., the Operation will transition from Network-Centric to Service-Centric, however the traditional NOC functions will still exist, only that it is complemented with SOC functions, or a SOC layer. Establishing a parallel, it's like when Operator X upgraded the network to 4G... in fact, he added a 4G layer on top of the 2G/3G network.

This Whitepaper will address what you, as an Operator, need to do to transition from a **network-centric operation** to a **service-centric operation** in order to boost customer experience, and although there is no “one-size-fits-all” approach, the principles are the same. Some Operators will opt to build a SOC inside the NOC, some may decide to have it as a separate unit and in some cases the operator may need a more long-term view based on evolving the NOC to a more efficient operation with some SOC add-ons.



### Building a SOC requires full CxO alignment on the CEM

While we will focus on the NOC to SOC Evolution, remember that it's key that the entire company at CxO level is aligned with the CEM strategy, i.e., there's no point in a SOC monitoring service A if the CMO is planning to launch a huge campaign on service B and if there's no understanding of the performance levels expected by the customer on the different parts of the Customer Service journey (from the campaign, through activation, and usage of the service). It's key then, to obtain internal sponsorship, which is why it is important to quantify the benefits, which is not always straightforward (this point will be addressed later).

To learn more on your business CEM maturity level, we like to refer our customers to the TM Forum Digital Maturity Level in: <https://www.tmforum.org/digital-maturity-model-metrics/model-overview/>

## Why evolving from NOC to SOC

Starting with the name, a NOC is a **Network Operations Center** and therefore focused on the network and its components (nodes, links, devices, KPIs, etc...) while a SOC is a **Services Operations Center** focused on the services and consequently on the customers on the receiving end of those services (KQIs, KBIs, etc...). Beware that SOC is also commonly used to define a **Security Operations Center**, so when reading about SOC make sure the context is the one you are looking for (Network Operations vs Network Security).

Telecoms are faced with increasing quality demands from their customers and looking for ways to differentiate in a multi-service, multi-technology and multi-vendor eco-system.

In order to differentiate, operators are now faced with the need to boost customer experience without compromising the bottom line.

Establishing a SOC is therefore a key aspect of evolving from a network centric approach to a service centric operation, shifting the focus from nodes and devices to customers and services.

## The Traditional NOC

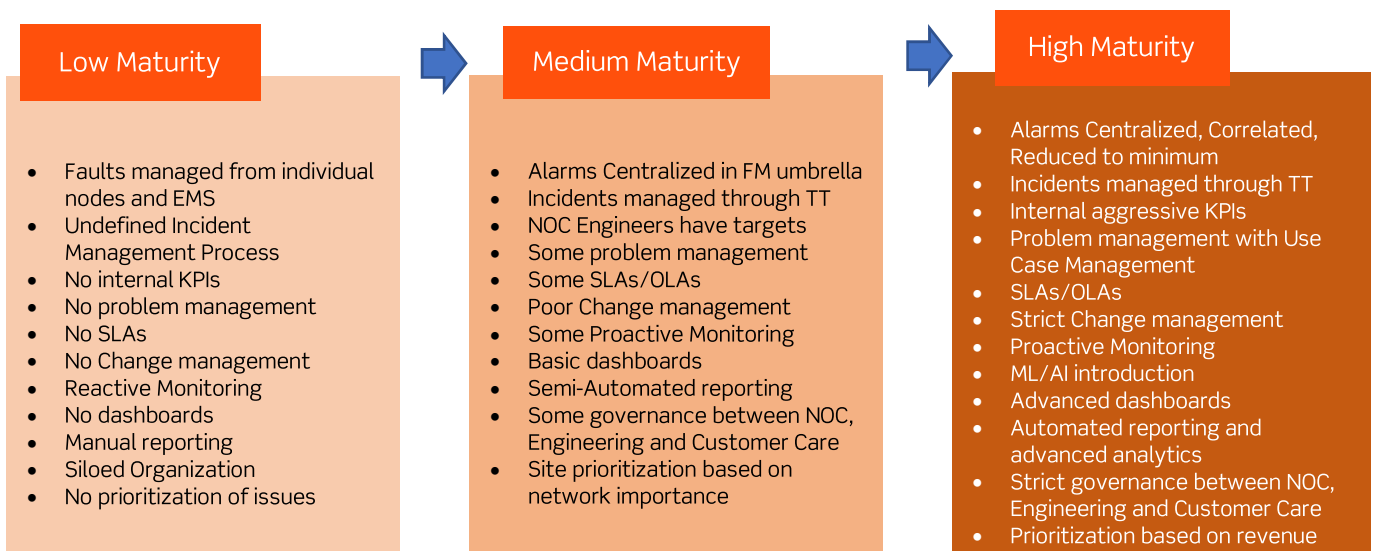
Before moving right on to the SOC, it is important to understand the situation regarding the existing NOC. Traditional NOCs operate with a high focus on the network. The primary focus is Uptime and there's a general assumption that if the network is up, then the services are up. This may be true sometimes, but service quality is not binary. As an example, if the network is up but a customer's video on YouTube is buffering, the customer won't think that "ok, I can't see my video but fortunately the network is up". For that customer, the service is not satisfying, i.e., it is the same as being down (or worse if the customer was really keen to see that video).

Although NOCs have a network centric view, there's been some adaptation through the years to mature towards more efficient models using automation, correlation, problem and change management, etc...

## NOC Maturity Levels

These maturity levels are important as they will define how ready a NOC is to start the journey of evolution to a Services Oriented operation.

The infographic below, shows the different maturity levels that a NOC can have in a typical operator. Remember, we're still talking about NOC, therefore Service Monitoring is still not available even in the High Maturity NOCs.



In conclusion, a NOC can have different levels of maturity, starting from a reactive/fire-fighting type of NOC to a more advanced, proactive, strong process-based operation. Although some may sell a High Maturity NOC as a SOC, this is really not the case, i.e., although a Highly matured NOC is ready to evolve into a SOC, it's not a SOC yet.

Nevertheless, and very importantly, it is necessary to reach a status of High Maturity level in the NOC before attempting to evolve to a SOC, i.e., the journey from NOC to SOC may have to include a first phase of development of your existing NOC and all associated processes, tools and staff skills.

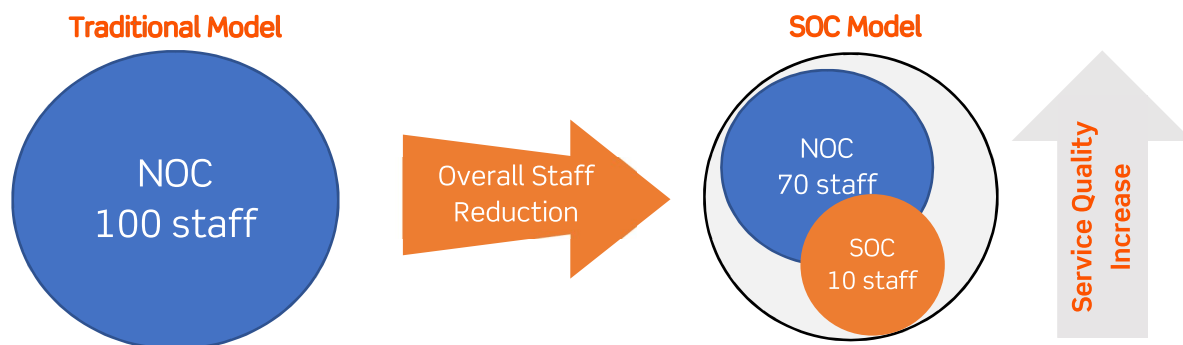
## The Future of the NOC in a SOC world

One of the promises of the SOC is more automation and less staff. Does this mean then, that a SOC completely replaces the NOC?

Although this may come as a shock to many, **the answer is no.** Your network and nodes will still require attention, monitoring, health checks and interventions, however when evolving to a SOC, the overall staff will be most likely reduced in the following way:

1. NOC staff is reduced through automation, AI and proactive + predictive operation, or, as mentioned above, by maturing the NOC to the highest level possible. This is achieved through tools, enhanced processes, advanced analytics, AI and proactive maintenance;
2. The SOC, which can either be part of the NOC or a stand-alone team, will usually require 10% of the original non-matured NOC size.

As an example, assuming a non-mature NOC of 100 staff, the overall footprint would be reduced by 20%:



In conclusion, your NOC will not disappear, and if you are a NOC Manager reading this, “don’t be afraid”, your job is secure and not only is it secure, it is about to become a lot more interesting and motivating.

The amount of efficiencies that can be achieved will largely depend on two factors:

1. The level of maturity of the NOC
2. The level of staffing of the NOC

To better understand how this can impact the benefit quantification, the next section addresses that in more detail.

## NOC evolution benefits

Even without a SOC, maximizing the efficiency of the NOC will bring tangible benefits depending on the current maturity level of the NOC and how much the NOC is under-staffed. The 2x2 matrix below shows the next steps and benefits depending on staffing and maturity levels of your NOC.

<p><b>High Maturity</b></p>	<ul style="list-style-type: none"> <li>- Ready for SOC evolution</li> <li>- Add 10% staff for SOC duties</li> </ul> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>- Benefits on Customer Experience, lower churn and higher revenues</li> </ul>	<ul style="list-style-type: none"> <li>- Ready for SOC evolution</li> <li>- Reallocate 10% staff to SOC duties</li> <li>- Re-accommodate NOC tasks and reduce NOC staff</li> </ul> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>- Benefits on Customer Experience, Opex reductions, lower churn and higher revenues</li> </ul>
<p><b>Low Maturity</b></p>	<ul style="list-style-type: none"> <li>- Staff reduction not significant or not even possible</li> </ul> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>- High benefits on network quality, less churn, higher revenues</li> </ul>	<ul style="list-style-type: none"> <li>- Take measures to mature the NOC and automate manual work</li> <li>- Possible staff reduction 10% to 40%</li> </ul> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>- Medium to High benefits on network quality, lower churn and higher revenues</li> <li>- Opex reduction</li> </ul>
<p><b>Under-Staffed</b></p>		<p><b>Well-Staffed</b></p>

In conclusion, depending on the Maturity of the NOC and the existing staff level it may be possible to evolve to a SOC and still achieve 30% staff reduction which helps the business case from both savings and additional revenue sides. In other cases there may be a need to maintain or increase staff and build the business case on additional revenues, quality differentiation.

## Differences between NOC and SOC

Now that the benefits are clearer and there's clarification on how the NOC maturity can influence the readiness of transitioning to a SOC, let's focus on what a SOC really is.

In order to clarify this in more detail, let's look at the differences between a NOC and a SOC. Please refer to the table below which shows them side by side for different dimensions of the operation.

	NOC	SOC
Function	<ul style="list-style-type: none"> <li>• Monitor Network availability and performance</li> <li>• 1<sup>st</sup> level fault rectification, escalation &amp; dispatching of 2<sup>nd</sup> level teams.</li> <li>• Alarm monitoring and troubleshooting,</li> <li>• Management of network incidents and change control and Field support</li> </ul>	<ul style="list-style-type: none"> <li>• Monitor quality of service</li> <li>• Take measures to rectify service outages or degradations.</li> <li>• Focus on specific services/applications or groups of customers like VIP or HVC.</li> </ul>
Staff	<ul style="list-style-type: none"> <li>• Usually divided in 1<sup>ST</sup> Line and 2<sup>nd</sup> Line</li> <li>• Broad knowledge and some specialists in specific domains/vendors that can perform 1st level troubleshooting.</li> <li>• May have a team for internal SLA/OLA management, Change management and Problem Management.</li> <li>• May include a 2nd level Support team with specialized knowledge in domains like Radio, CS/PS Core, IP, Transmission, Charging, etc...</li> </ul>	<ul style="list-style-type: none"> <li>• Mix of specialist with skills in network and IT.</li> <li>• Able to troubleshoot end-to-end services</li> <li>• Can isolate problems that are causing customer service degradation and notify business owners.</li> <li>• Able to quickly perform analytics using advanced tools.</li> </ul>
Size	<ul style="list-style-type: none"> <li>• The size of a NOC will depend on the level of automation.</li> <li>• NOC will usually vary from 20 staff all the way up to 500+ depending on the size of the network.</li> <li>• As a rule of thumb, a normal ratio for a mobile network would be 1 NOC Eng. per 100 sites.</li> </ul>	<ul style="list-style-type: none"> <li>• The SOC can be integrated inside the NOC or implemented as a separate unit</li> <li>• A SOC will need from 10 to 100 depending on the size.</li> <li>• As a rule of thumb, about 10% to 15% of the NOC size.</li> </ul>
Metrics	<ul style="list-style-type: none"> <li>• Standard network based KPIs with reactive approach to detected breaches.</li> <li>• Examples: <ul style="list-style-type: none"> <li>◦ Network Availability, PS Session Drop, Packet Loss</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• SOC engineers use service quality indicators (KQIs) and business indications (KBIs).</li> <li>• Examples: <ul style="list-style-type: none"> <li>◦ YouTube Video quality, Data utilization pattern change, Churn rate</li> </ul> </li> </ul>
Tools	<ul style="list-style-type: none"> <li>• Mainly management tools from the vendors (EMS, OSS) and an FM umbrella system for alarm centralization and correlation.</li> <li>• Other tools include Trouble Ticketing systems and Inventory systems.</li> <li>• More advanced NOCs will have automation of tasks and self-correcting uses cases implemented with or without AI/ML.</li> </ul>	<ul style="list-style-type: none"> <li>• A SOC will require access to Advanced Analytics on Service Performance, Service Quality Management tools</li> <li>• Access to Customer related data regarding service performance and utilization.</li> <li>• A great deal of automation with AI/ML and closed loop use cases.</li> </ul>
Information Access	<ul style="list-style-type: none"> <li>• NOC engineers require real-time access to alarm information, inventory information, KPI reporting, performance information</li> <li>• Advanced NOCs will have high-level dashboards with view of incidents and network impact.</li> </ul>	<ul style="list-style-type: none"> <li>• SOC engineers require analytic tool with access to real-time and historical information</li> <li>• interactive dashboards and AI enabled analytics for service degradation prediction.</li> </ul>
Business Impact	<ul style="list-style-type: none"> <li>• Reduce MTTR, increase network availability</li> <li>• Take proactive measures to avoid outages</li> </ul>	<ul style="list-style-type: none"> <li>• Service Quality increase, Churn reduction, improved customer experience</li> <li>• Reduce potential revenue loss</li> </ul>

## CEM Alignment

While a NOC is mostly a Network Centric function and usually requires some level of alignment with internal departments (usually Customer Care), the SOC has to be part of an overall company effort to track and improve Customer Experience. Doing a SOC in isolation will yield little results and therefore it is important to have a full internal alignment between the CTO and all other CxO levels, especially the CMO, COO and CCO.

## Understanding the Customer Journey

Part of this alignment is the understanding the customer journey, i.e., from the moment that a customer sees the telecom branding, to his experience during commercial interactions (proposal, pricing, activation), to the journey during the time the customer is using the service and requests support or changes to that service. All these “touch points” with the customer will build up to the overall experience journey and will determine good or bad perception of the service that the customer is receiving. Being able to understand which points are key for the business and implementing ways to measure and monitor them is part of the business journey towards true Customer Experience Management.

This understanding will be key during the SOC setup as explained below.

## How CEM impacts the SOC

Depending on the strategy that the Operator wants to follow, it's important to align at the CxO levels which are the key quality measures and key business factors that the SOC will be monitoring and reacting to. The selection of these must be tied with the overall strategy of the company, i.e., if the aim is to differentiate on Online/Fast Activation process, then this should be an important KBI to measure. If the aim is to be the best in Video, then the top video applications should be part of the KQIs and these should be monitored for quality (throughput, buffer time, video quality, video load time, etc...) which also means that the network should be optimized for video over other applications.

Once these KQIs and KBIs are defined, it's important to have visibility on their evolution. While management will use these to understand the variations in Service Quality, the SOC will use the interactive dashboards and analytics to drill down on the cause of any detected degradation.

## SOC Benefits Quantification

Another important aspect to align at Senior Level is the expectation around the business benefits. Usually it's hard to quantify the benefits in a number that either relates to savings or additional revenues. In order to achieve sponsorship from the organization, it's ideal to start with a small SOC focused on a top KBI or KQI and evaluate the benefits which usually allow for the expansion of the concept.

If the NOC is still in a low maturity level, then it may be possible to have an immediate saving by automating tasks and shifting key people to the SOC organization.

## The Aspire Proposition

### No Big Bangs

In Aspire, we're not advocates of revolutionary drastic changes. Most NOCs are working a certain way due to years of adaptation to how the staff can work better with the existing tools, issues and ways of working of other departments. Thus, Aspire's first approach is to assess what is being done, how it's being done and why. Usually, there's a lot of things that are extremely well done and should not be changed but encouraged, and then there are other things require tuning and others that need a complete change.

In all cases, Aspire is successfully enabling efficiency by automating tasks that are already in place, by integration our own tools on top of existing systems (no agenda of tool swapping) and using experience and use cases from other Telecoms to enhance and improve the operation.

This is a success factor in that confidence of the existing staff is usually gained with this type of approach which favours the acceptance of any required changes.

**Assessment Phase - The steps from NOC to SOC**

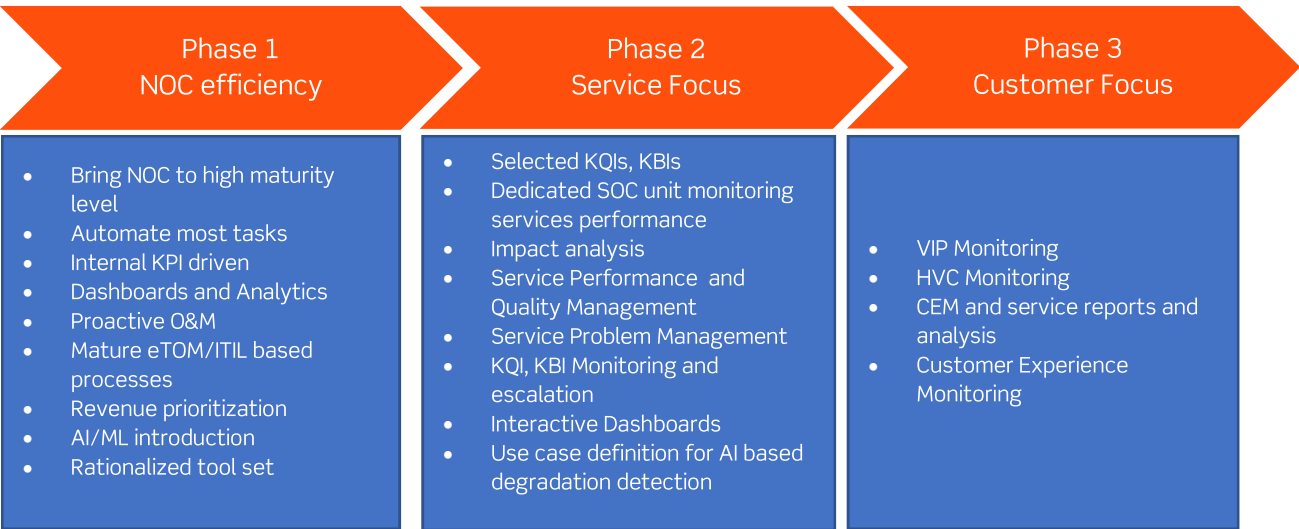


**Step 1 - NOC maturity assessment** - Aspire will put at the Operator’s service, experienced consultants in NOC processes, tools and organization of the NOC inside the whole Operation with a view of the Business targets for the Operator. This assessment entails important dimensions of the NOC like: Structure; Staff Skills; EMS/NMS assessment; Alarm analysis; Incident analysis; KPI assessment; Process analysis; Task analysis and automation level assessment; Interaction with other business units; SLA assessment; etc...

**Step 2 - Gap Analysis** - Once the assessment is complete, the different dimensions will be scored in terms of maturity and for each one, a set of measures will be identified to close the Gap between the “AS-IS” and the “TO BE” status.

**Step 3 - Agreeing on a roadmap** - Depending on prioritization and cost, it’s key to sign-off with the Operator which measures are going to be put in place in short, medium and long term. Not all organizations require a highly matured NOC or a Service Oriented Operation. It’s about defining the biggest benefit for the business within the budgetary constraints and benefits of each measure.

**Step 4 - 3 phase Implementing the roadmap** - The implementation of the roadmap can be done by the Operator with support from Aspire or additional third-party partners that are best suited for each part of the roadmap. From upskilling the staff, to automating processes, bringing new tools on board and re-engineering operational and business processes, Aspire can support you all the way. In a typical roadmap implementation from a NOC to an advanced SOC, the following infographic depicts how the project would evolve:



# Implementing the roadmap

## Operations Expertise and no “one-size fits all approach”

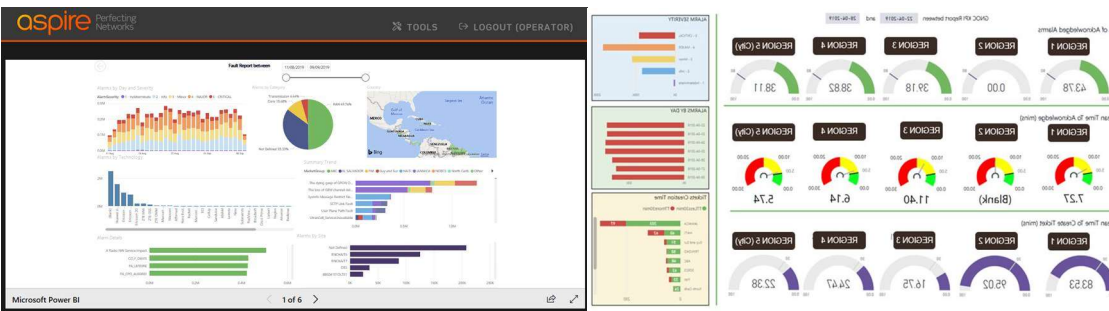
Aspire has been supporting customers achieving outstanding results based on the expertise gained through hundreds of projects in different vendors using multi-technology. This has given us a solid background of use-cases and lessons learned that can be applied to new scenarios in a tailored way depending on business challenges and objectives.

## Short Turn-Around Times

The NOC maturity assessment can be done in a matter of weeks using a sample of the existing alarms and assessing the NOC on site. Any required development to enable automation or provide data analytics is done in short time and low cost.

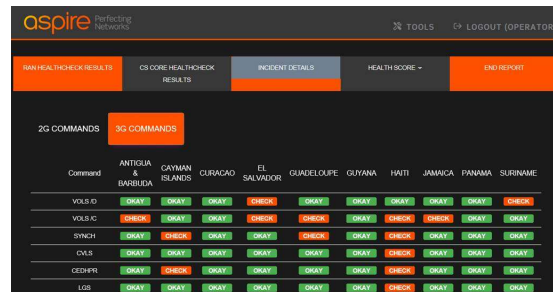
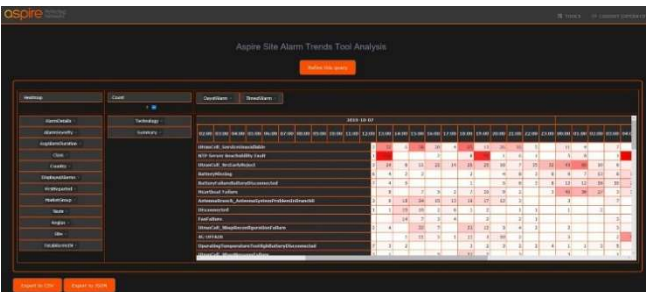
## Tools

Powerful tools that can be quickly deployed over the existing Operator systems, will enable powerful analytics and dashboards that help understand the network behaviour from Engineering level to Business level, all based in a single source of data that is valid for all layers of the organization (1 single source of truth).



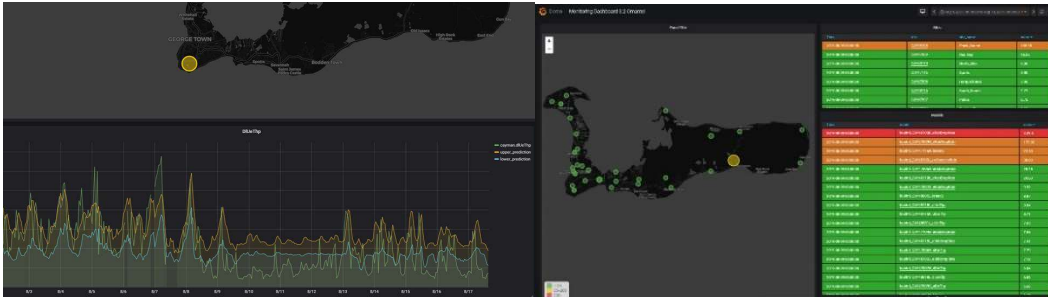
## R&D that understands Fixed and Mobile Telecom

Our R&D expertise will support bringing automation to existing processes without the need to spend thousands or millions on expensive systems. Our powerful analytics and Proactive automated health checks will remove hours of work from your engineers allowing them to focus on what matters. Aspire can easily and quickly adapt these to your environment or create new tools from scratch through our Telecom experienced R&D department.



## AI/ML

AI/ML enabled analytics will support preventive analysis of common issues that result in outages or service degradation enabling the NOC/SOC to act before the degradation severely impacts service. Our AI can learn the behaviour of several KPIs on a cell level and identify when something is behaving differently. This eliminates hundreds of false positives and allows your Engineering team to focus on taking actions on real problems, before they have a high impact on customers.



## Competence Development

Aspire is keen on passing knowledge during projects. For situations where there's a knowledge gap that impacts the operation, Aspire will be able to create a development program that runs in parallel with our roadmap implementation.

## Non-disruptive Tool Strategy

While tools are important to drive, measure and optimize processes, Aspire's strategy is to build or integrate existing tools to minimize disruption on the operation. Unless it's a requirement from the Operator, there's no approach of "remove all and start from zero". The reason behind this is that most tools are part of the vendor EMS toolset or embedded in many of the existing working processes. Instead, Aspire will support integration or use the available information from existing tools to create intelligence available to all levels of the organization.

## Engage with Aspire Technology Now

Talk to our network support specialists and understand how you could evolve to a future mode of operation. Aspire can perform a free audit based on your current FM data and help you build your business case to disrupt your operations support model.