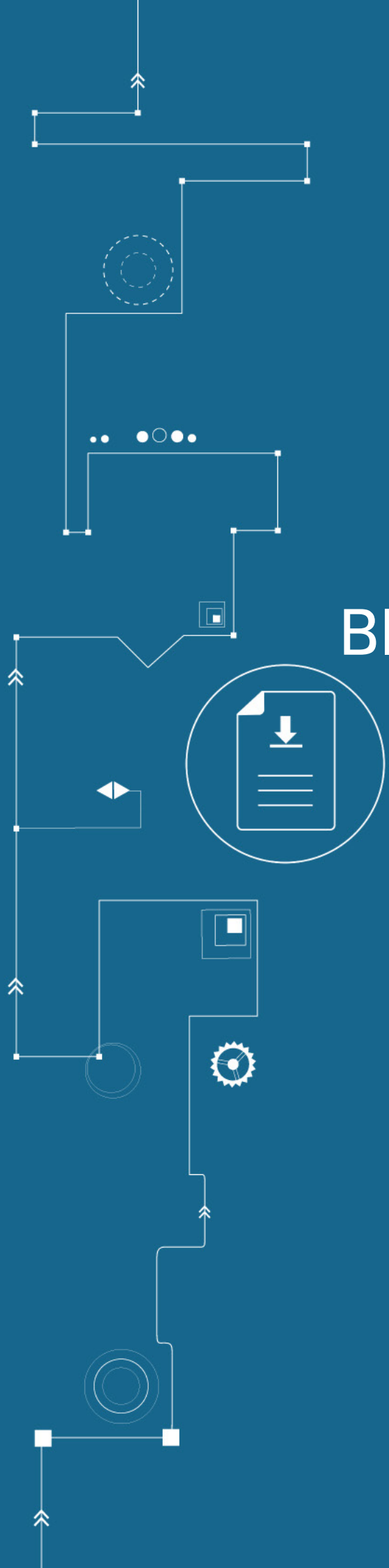
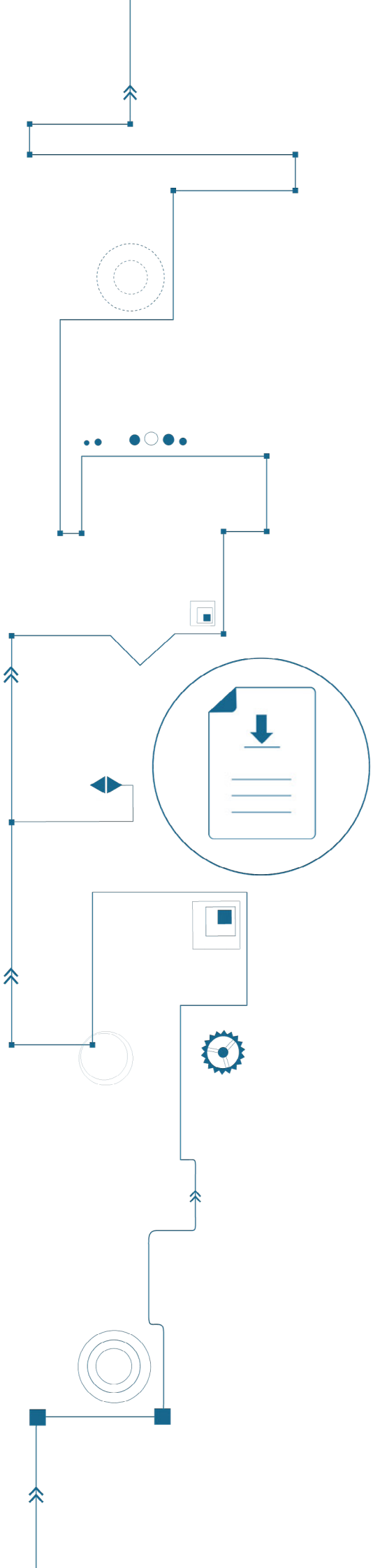


CUBRO
NETWORK VISIBILITY

THE KPI MYTH BIG DATA & MACHINE LEARNING

WHITE PAPER

OCT 2017



CUBRO
NETWORK VISIBILITY

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Introduction

In many industries, KPIs are used to define and measure performance and, based on any changes, are used to trigger some action(s).

In telecom and networking industries, especially, KPIs are often the only metrics used to measure the performance of the network. The problem with this approach is that a KPI is only useful to measure changes from a given baseline. In networks, however, there is not a baseline available as there is no golden standard for an LTE network.

Network, due to their complexity, is more like a living species; with good and bad days. This occurs because many non-linear and deterministic events impact the functioning of the network: customer behaviour due to the weather, customer behaviour based on events, the weather itself, connected networks, and thousands of known and, perhaps, millions of unknown events.

Why is a KPI not an accurate measure of a network?

A KPI is not developed to interact with external events. A KPI is a linear formula which calculates a figure based on some number of measurements. In order to give a measurement result value, it is essential that the result is given some context. For example, a high heartbeat rate does not say much about a person's health without being put in context. Within a particular context (whether the person is at rest or running a marathon) the measurement gives us some indication of that person's health.

Similarly, if you measure the attached success rate in a live mobile network as a sole source of information, it is relatively useless. It is not a simple matter to measure the current status of the network (at rest or running a marathon) without some context onto which the measurements can be projected.

Additionally, it gets more complicated because the network is consistently in the process of transition: upgrading, expanding, and adding new features, and so on. This means that the context the network is in also changes constantly.

In fact, an approach using linear measurements will not lead you in the right direction. Likely, it will lead you in the wrong direction. Misleading information can cause more damage than no information at all.

"We want to detect the issues in the blind spots."

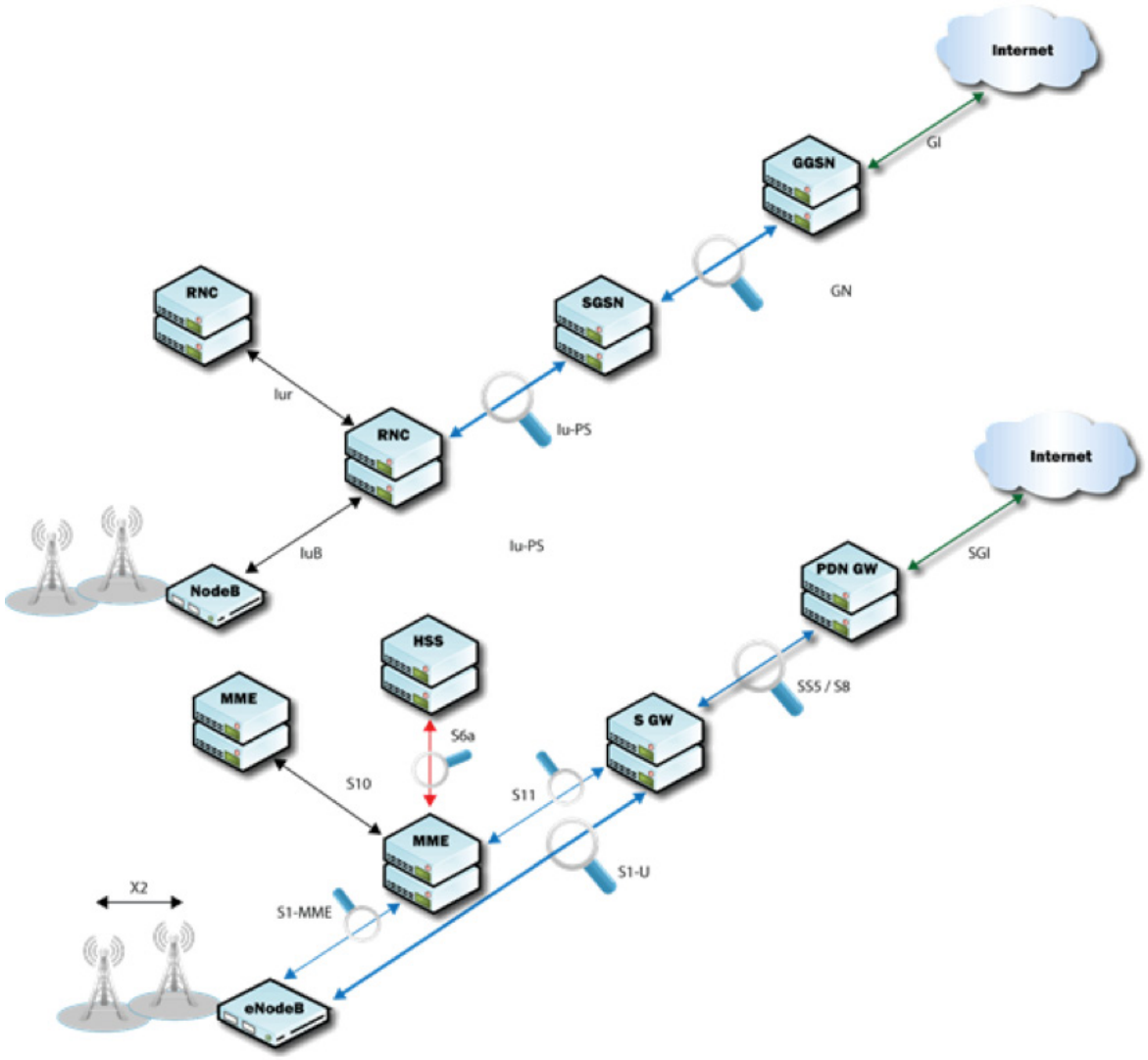
Why does this matter?

There has been an unprecedented growth in network traffic, and service providers are facing several problems every day due to the pressure of costs, customer complaints, compatibility problems, and many other issues. In order to deal with these issues, service providers must find efficient ways to correlate all data sources.

Up until now a service provider typically runs a bunch of monitoring systems and has hundreds of database, often with overlapping data from different sources, or even the same source. The entire data silo is not consolidated due to technical issues and costs. Apart from the issues, operating the data silos is also a big cost driver.

Big Data is a tool to consolidate all of these different platforms into one Big Data Storage (not a database). Data sources can be network elements, server logs, and passive probes.

Big Data – AI:
Machine learning approach on Mobile Network Monitoring Data



The network in this image is monitored using monitoring probes. The probe is connected via a TAP network and aggregation devices (network packet brokers) to the different interfaces on the network. These interfaces are logically and physically distinct which allows us to get a full view of what's going on in the network. Probes analyze all of these different interfaces.

A probe is a device that can decode the traffic from the network and produce metadata records (XDR extended Data Records). The records are sent to the database. The database must be very powerful in terms of processing and storage capabilities in order to handle the massive amount of data. Such a system will produce, even on a mid-sized network, a terabyte of data and a billion records per day.

Typically, such a monitoring probe covers L5 – L7 in the OSI stack.

Why is this done?

Monitoring is essential to the network, and this data can be used for several applications:

- Improving customer satisfaction
- Network planning, troubleshooting, dimensioning
- Fraud detection and Security
- Performance measurements –
  - SLA against customers
  - SLA against other providers
  - SLA against network vendors

A high-performing monitoring system can save a lot of money and help to improve performance.

Big networks behave like a living organism that can be influenced by a customer's behaviour, external factors such as weather, and the transported content.

What is the challenge and how big data and AI can be useful?

Typically, monitoring systems, such as this, provide KPIs (key performance indicators). A KPI is a formula which calculates some information based on the XDR from the probes and provides the results in various graphs. The primary issue with KPIs is that they are predefined in a lab and are not flexible. They are adapted to neither the customer's network nor its changes.

Big networks behave like a living organism that can be influenced by a customer's behaviour, external factors such as weather, and the transported content. A KPI is therefore not an accurate way to show network behaviour because it is unidimensional – too strictly defined and not at all flexible.

KPIs do not typically account for known existing issues in networks such as updates, weather, and other external factors and their impacts. These are the reasons that KPIs often produce a lot of false positive results. Most importantly, KPIs, by definition, can only show known issues. For instance, dynamically correlated events could never be detected with KPIs.

The concept with Big Data is to now add intelligent, flexible, and multidimensional views to a network. With the help of databases like Hadoop and MongoDB it is now possible to add data from multiple resources to produce more useful reports.

Cubro's solution for complete network visibility

An innovative approach is needed to see the network and identify problems. Our tools can change this situation. Big Data and machine learning are powerful tools which can help you understand the network in a holistic way. Big Data is not the solution; only a tool which can help.

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We have invested in Machine Learning that is based on the metadata of the Cubro Probe platform. We are working with a major European operator on this project and are attempting to detect network issues with this innovative, holistic approach.

That's not all…

Cubro Network Visibility has successfully tested the new Probe platform based on a 108 core ARM server which can help companies with efficient resource utilisation through improved network performance in real-time by making use of all of the data. The Probe is built upon two Cavium Thunder X2 CPUs. The unit supports up to 2TB of memory with a dual 100Gb NIC card. In combination with the Cubro EX32100 the Probe platform can support more than 100Gbps of metadata performance per unit.

On to the next step in the Cubro Probe evolution. The probe IP is software that already supports multi-core platforms, therefore, while the port from MIPS to ARM is still a complex task, the general design fits. One of the major benefits is a tremendous amount of memory and low latency networking; the design is extremely beneficial. The expansion options will also be better than in the existing design.

About Cubro Network Visibility:

Cubro Network Visibility is among the leading vendors of Network Probes, Network Packet Brokers (NPBs), and Network TAPs (Test Access Points), a partner of the world's largest Telecommunications company, and has installations in enterprises on all continents. We offer a complete portfolio of network visibility products that can help organisations gain insight into their network traffic. We have a global reach with customers located in Europe, Asia, Japan and North America.

For more information check our website www.cubro.com or contact us at support@cubro.com.