



CUBRO
NETWORK VISIBILITY

MEAN TIME BETWEEN FAILURE (MTBF)

WHITE PAPER
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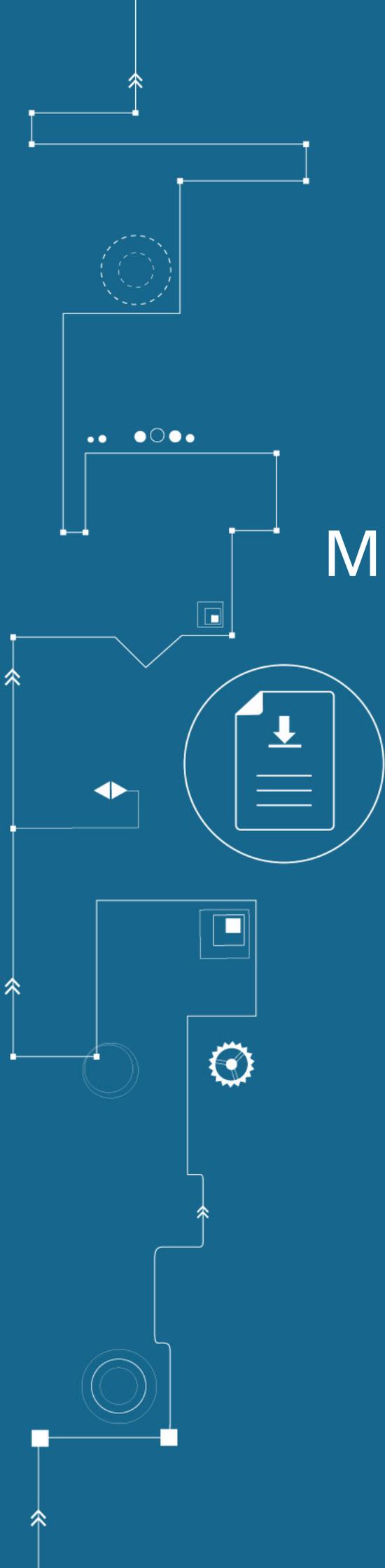
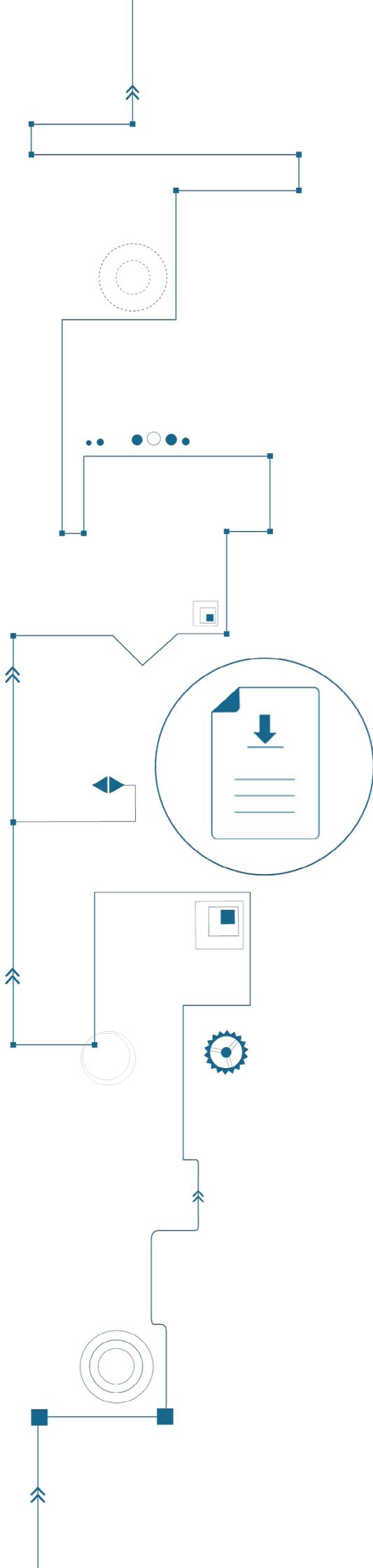




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MTBF is a measure of how reliable a hardware product or component is. A desired MTBF can be used as a quantifiable objective when designing a new product.

Introduction

MTBF (mean time between failures) is a well-known parameter that can be found on nearly every datasheet. But what does a MTBF figure 156000 mean? Does it mean that an instrument runs in average 6500 days or 17 years? No - nobody has tested this and it does not mean that the unit runs 17 years!

MTBF is a measure of how reliable a hardware product or component is. A desired MTBF can be used as a quantifiable objective when designing a new product. The MTBF figure can be developed as the result of intensive testing, based on actual product experience, or predicted by analyzing known factors. The manufacturer may provide it as an index of a product's or component's reliability and, in some cases, to give customers an idea of how much service to plan for.

How MTBF is calculated?

MTBF is a calculated value out of the components used in a product. Each resistor, LED, processor, connector has a value given by the producer of the part and then a complex calculation generates the MTBF value of the equipment. As rule of thumb you can say that a more complex product has a lower MTBF. In cases where every minute of down time can negatively impact the market value of a business, it is vital that the physical infrastructure supporting the network is reliable.

Usually assumptions are required to simplify the process of estimating MTBF because it is nearly impossible to collect the data required to calculate the exact number. MTBF impacts reliability as well as availability. Reliability is the ability of a system or component to perform its required functions under stated conditions for a specified period of time. It means that it is the likelihood that the system or component will succeed within its identified mission time, with no failures.

Whereas availability is the degree to which a system or component is operational and accessible when required for use. It means that it is the likelihood that the system is in a state to perform its required function under given conditions at a given instant in time. MTBF is a basic measure of a system's reliability and is typically represented in units of hours. The higher the MTBF number is, the higher the reliability of the product.

MTBF is an important metric to track in regard to system reliability. As the level of complexity and coupling increases, systemic failure due to the accumulation of component failures interacting in unexpected ways is inevitable.

What does this mean for a TAP system?

Usually a TAP system consists of several different units. If you monitor complex networks you need several TAPs on multiple interfaces. Each unit added to the system reduces the MTBF, if you add complex units with low MTBF the system MTBF drops even more.

Example:

The customer requests a monitoring on the STP's (signaling transfer point) of a mobile/fixed carrier. The STP is one of the most critical points in the network and the special case here is that the links are 100 Mbit.

Aggregate 24 links and Aggregate 4 of this 24 to different output

Option 1:

Use a Cubro 24 Link Multi Link aggregation unit for aggregation and the link save feature and a Packetmaster EX5 for the special filtering of these 4 special links

MTBF calculation:

Multilink : 189.000 h
 EX5: 156.000 h
 Total System 95.000 h

Option 2:

Use a Cubro 24 x 1 Link taps with linksave and railway certificate for best quality and safety. The Packetmaster EX5 for aggregation and filtering.

+ each link can be replaced no downtime for the full STB during a failure
 - Rackspace
 - Price
 ++ MTBF
 1 link TAP 352.000 h
 EX: 156.000 h
 Total System: 145.800 h

Conclusion

MTBF is an important metric to track in regard to system reliability. As the level of complexity and coupling increases, systemic failure due to the accumulation of component failures interacting in unexpected ways is inevitable. Network tools should look at solutions holistically which work best for the network system.