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Whether using Encryption in SCADA systems, the services performance requirements are still met in OT IT environment over an MPLS core network?

A Research Project Abstract

submitted in fulfillment of the requirements

for

Master of Science in Engineering [Electrical]: Telecommunications

at the

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by

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Abstract

Utilities use Supervisory Control and Data Acquisition systems as their industrial control system. The architecture of these systems in the past was based on them being isolated from other networks. Now with recent ever changing requirements of capabilities from these systems there is a need to converge with information technology systems and with the need to have these industrial networks communicating on packet switched networks there are cyber security concerns that come up.

This research project looks at the whether using encryption in an IP/MPLS core network for SCADA in an OT IT environment has an effect on the performance requirements. This was done through an experimental simulation with the results recorded. The research project also looks at the key literature study considerations.

The key research question for the research project of this MSc 50/50 mini-thesis is *"whether using encryption in SCADA systems, the services performance requirements are still met in OT/ IT environment over an MPLS core network"?* The research project seeks to determine if SCADA performance requirements are met over an encrypted MPLS/IP core network in an OT/IT environment. The key focus area of the research project is only encryption in the whole cyber security value chain versus SCADA services performances. This means that the research project only focused on the encryption portion of the whole cyber security value chain and the scope did not focus on other aspects of the value chain. This suffices for an MSc 50/50 mini-thesis research project as a focus on the whole value chain would require a full MSc thesis.

Thus the primary objective for the research project is to research and demonstrate that encryption is essential for secure SCADA communication over a MPLS/IP core network. As aforementioned encryption forms an essential part of the Cyber Security value chain which has to achieve the following objectives.

Confidentiality: ensuring that the information source is really from that source.
Integrity: ensuring that the information has not been altered in any way.
Availability: ensuring that system is not comprised but that it is available.

These objectives of encryption should be met with SCADA service performance requirements not violated which is the objective of the research project.