One application of utilizing modern data communications is a construct in which a proxy device is used to allow remote access to a device that does not provide remote management in itself. The proxy device is used to hide the geographical distance between the managed device and the managing system, and make it appear to the managing system as if the two entities were directly connected. The data is often transferred to the proxy server via a public network, such as the Internet. Because of this, encryption and authentication of the traffic is often desired. Also, more complete transparency for the interface can be provided if the managed device seems to reside in the same network as the managing system. A virtual private networking solution provides the needed security features and can be used to build a virtual network over a public carrier infrastructure. Such a solution is therefore seen as ideal for the mentioned problems.

This study describes two alternative solutions for implementing virtual private networking functionality to a device server. In addition to the concrete functionality, the study explains the implementation of a set of user-interface elements which allow the solutions to be managed using a WWW-browser program. The platform for which the solutions are implemented is the Viola Arctic integration server from Viola Systems running the µCLinux operating system. However, some of the required functionality is also implemented in a management system that serves as the other endpoint of a tunnel which is needed to establish a virtual network. The software implemented for this part is executable in any Linux-based system.

The solutions are implemented by integrating a set of tools available from the Linux developer community with applications designed as part of this study. The resulting system is capable of providing a secure virtual network, thus allowing confidential traffic through a public network while maintaining the illusion of local network presence of the managed device or devices.

Keywords: Virtual Private Network, µCLinux, Linux, device server, machine-to-machine communications