A characterisation of reliability tools for Software Defined Networks[*]

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Software Defined Network (SDN) is a new paradigm in networking that moves the network control logic from the network devices to a set of network applications running in a centralised controller. This paradigm introduces great flexibility, allowing the dynamic configuration of parts of the network through centralised programming. SDN has been successfully applied in field networks, and is now being applied to wireless and mobile networks. SDN can also be combined with Network Function Virtualization (NFV) producing a *software network* in which the specific hardware is replaced by general purpose computing equipment running SDN and NFV software solutions. This highly programmable and flexible network introduces many challenges from the point of view of reliability (or robustness), and operators need to ensure the same level of confidence as in previous, less flexible deployments. This paper provides a first study of the current tools used to analyse the reliability of SDNs before deployment and/or during the exploitation of the network. Most of these tools offer some kind of automatic verification, supported by algorithms based on formal methods, but they do not differentiate between fixed and mobile/wireless networks. In the paper we provide a number of classifications of the tools to make this selection easier for potential users, and we also identify promising research areas where more effort needs to be made.

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