# 3D Security-Enhanced Communication Structure for 3D-MPSoCs Protection: Challenges and Opotunities

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*Abstract*—Three-dimension Multiprocessors System-on-Chip (3D-MPSoCs) hold promises to allow the development of compact and efficient devices. By means of such technology, multiple applications are supported on the same chip, which can be mapped dynamically during the execution time. This flexibility offered by 3D technology, also represents vulnerability, turning the 3D-MPSoC security specially challenging. 3D *communication structures* (3D-HoCs), which combines buses and Network-on-chip can be used to efficiently overcome the present 3D-MPSoC vulnerabilities. 3D-HoCs can be used to implement different security services, monitor the data exchange and isolate dangerous IPs. In this paper, we describes the security challenges and the opportunities that 3D fabrication technology offers. As a study case, we implement Quality of Security Service (QoSS) in 3D-HoC to efficiently detect and prevent attacks by means of agile and dynamic security firewalls. It takes advantage of the 3D-HoC wide system visibility and critical role in enabling system operation. We evaluate the effectiveness of our approach over several 3D-MPSoCs attack scenarios and estimate their impact on the overall performance. Results show that our architecture can perform a fast detection of a wide range of attacks and a fast configuration of the different security policies.