

Acceleration at the Edge for supporting SMEs Security: The FORTIKA Paradigm.

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Abstract

FORTIKA aims to minimize the exposure of small and medium sized businesses to cyber security risks and threats, and help them successfully respond to cyber security incidents, while relieving them from all unnecessary and costly efforts of identifying, acquiring and using the appropriate cyber security solutions. Towards its vision, FORTIKA adopts a security by design hybrid approach that adequately integrates hardware and software with business needs and behavioral patterns at individual and organizational level to: introduce a hardware-enabled middleware security layer as add-on to existing network gateways; orientate small business users to trusted cyber security services packaged to tailored solutions for each enterprise and further extended to accommodate security intelligence and to encourage security-friendly behavioral and organizational changes. Ultimately, FORTIKA proposes a resilient overall cyber security solution that can be easily tailored and adjusted to the versatile and dynamically changing needs of small businesses.

Introduction

SMEs are typically poorly prepared to defend themselves, their digital assets and their clients' data and privacy against cyber threats compared to large enterprises. 60% of targeted attacks in 2015 were aimed at small businesses, while 'more than 430 million new unique pieces of malware' have been discovered [1], with consequences ranging from minor impact on operational efficiency to detrimental effects on the profitability and/or on the supplier – customer – partner relationship. Clearly, cyber threats comprise a major risk for (European) businesses and as a rule, their vulnerability increases as their size falls. With cyberattacks skyrocketing in number and continuously evolving in terms of sophistication and novelty, effective protection and response can become a major differentiation and competitive advantage for European SMEs and especially those which traditionally do not possess the appropriate resources and/or the relevant expertise.

This is where the opportunity lies and where the FORTIKA concept fits best: the proposed hybrid solution (hardware – software) will consist of a security 'seal' for micro, small and medium-sized enterprises that will reinforce trust and facilitate further adoption of digital technologies, strengthening this way their position compared to the non-European competition. To accomplish this ambition, FORTIKA industry partners will roll-out to the market a new generation of cyber-security products and related services based upon the results of the proposed innovation action. The project will work towards more robust, resilient and effective cybersecurity solutions that can be effortlessly tailored to each individual enterprise's evolving needs and can also speedily adapt/respond to the changing cyber threat landscape. To this end, FORTIKA will open its middleware platform to third-party cyber security applications and services through its marketplace.

Ambition

- Improve and optimize the FPGA SoC accelerator node to meet FORTIKA requirements
- Develop a complete ABAC system powered by cloud and edge computing architectures
- Provide a holistic security assurance that foresees risks and enables a proactive security management
- Boost cybersecurity in detection of malware and vulnerabilities of systems
- Develop homomorphic building blocks that cover a sufficient number of mathematical operations and functions
- Develop a novel algorithm to break any application into a number of pieces where each and every piece can be mapped onto the homomorphic building block residing in the cloud
- Develop a key management framework which seamlessly interconnects the clients, service providers and the cloud service providers (with homomorphic building blocks).
- Design and implement a hierarchical data abstraction.

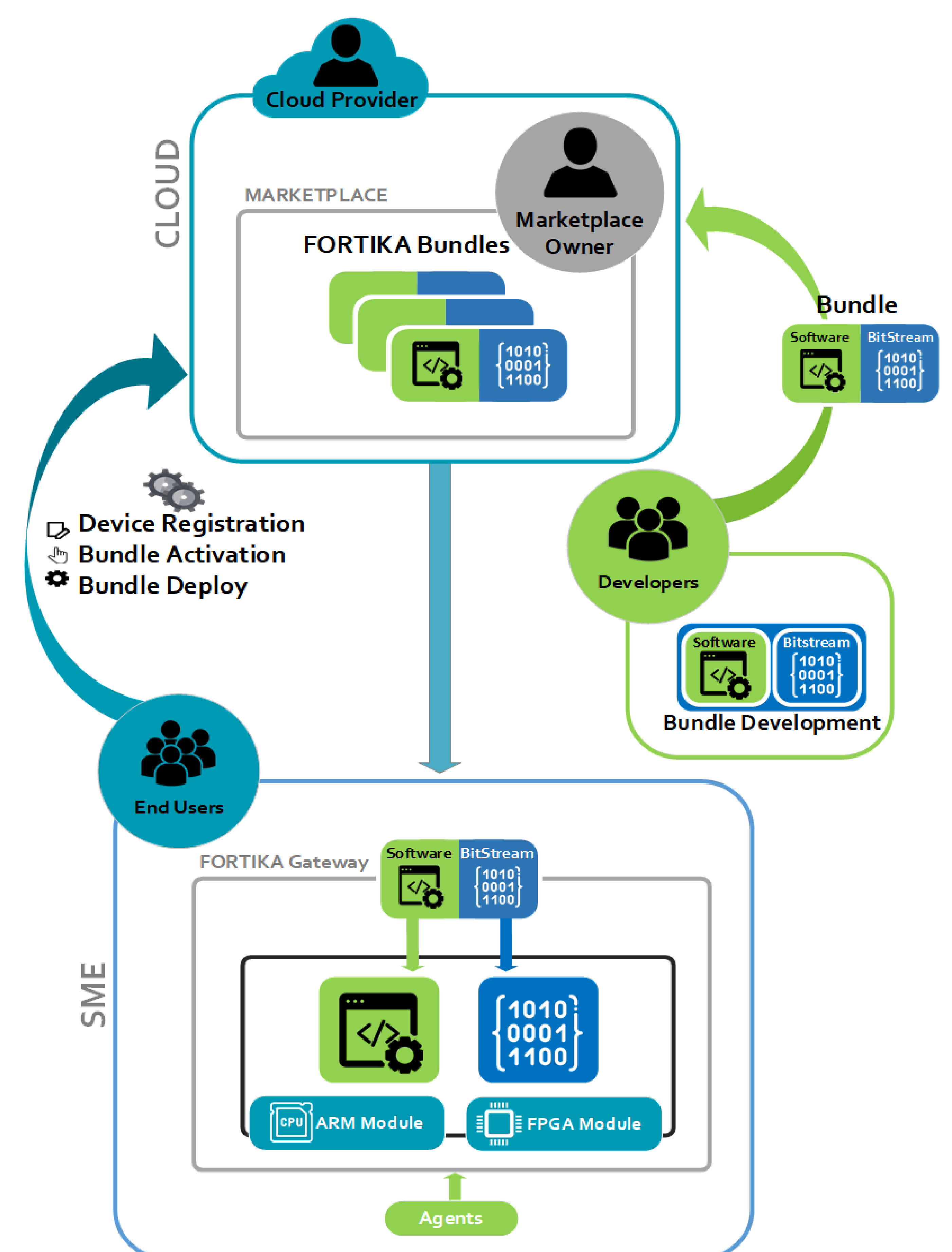
Objectives

- To provide an embedded, smart and robust security layer enhanced with an adaptive data security management tool.
- To create a B2B cyber security marketplace for SMEs to allow For an easy access to peer reviewed, existing, trusted solutions and comparative data on the basis of functional characteristics and pricing.
- To provide tailored cyber security insights in line with each SME needs.

Objectives

- To apply behavioural analysis to detect and assess the risk level from organizational processes and/or individual behaviours with the aim to automatically implement appropriate incentives for behavioural change and awareness enhancement.
- To validate the proposed technology and business framework through pan-European demonstrations in small SMEs.
- To improve overall cybersecurity performance of modern, digital SMEs ecosystem and to create a seamless and secure information system by offering a wide variety of tailored information security services.
- To offer a novel architecture for the provision of highly adaptive cyber security services and intelligence dynamically adjusted to the changing needs of SMEs.

Architecture



References

- [1] 'Internet Security Threat Report' Volume 21, Symantec, 04/2016
[2] <http://fortika-project.eu/>

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