

Virtualization research @ Ericsson

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Outline

- › Ericsson Software Research
- › Why virtualization?
- › Benefits
- › Virtualization R&D

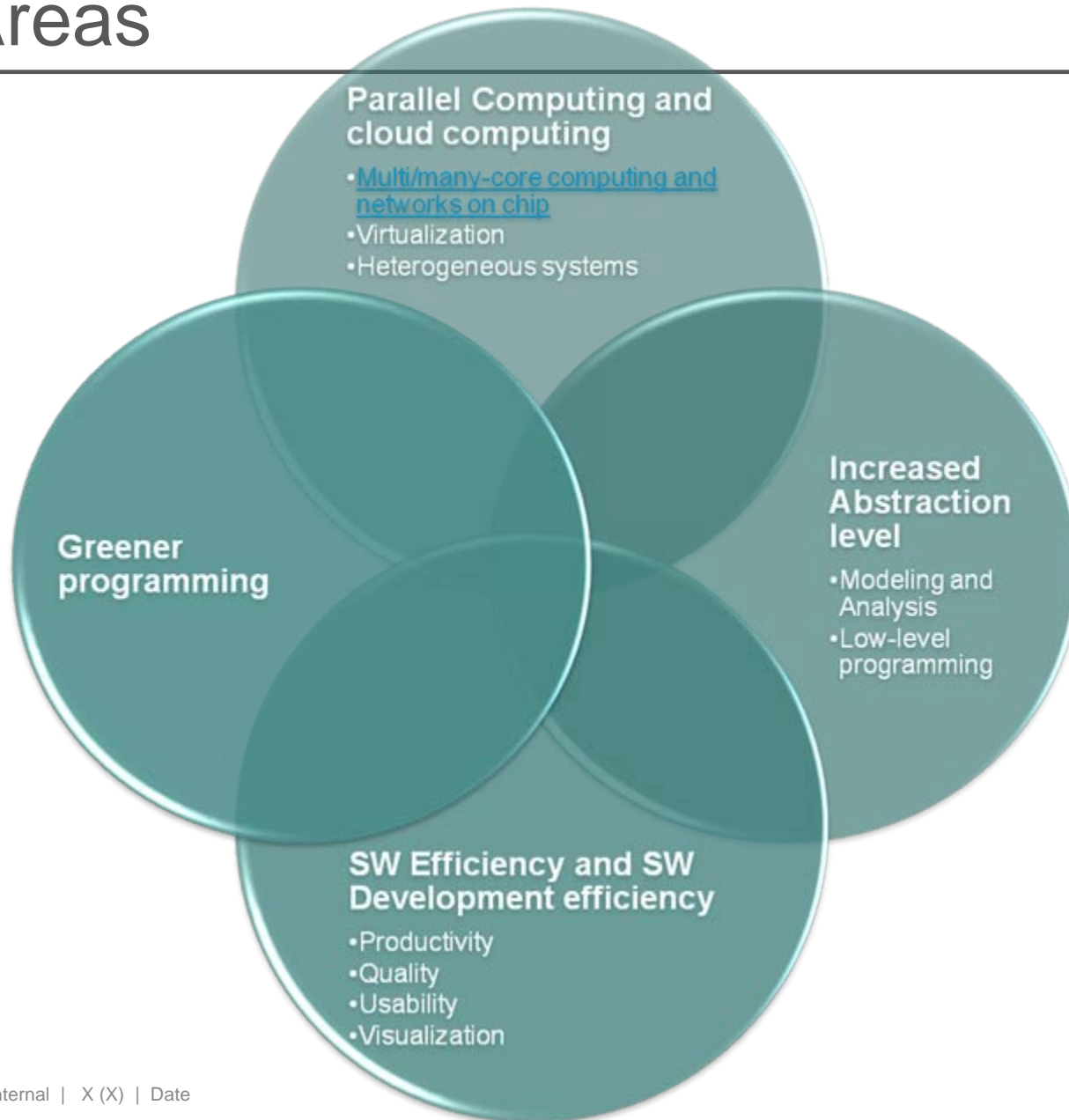
Ericsson Software Research - Principles

- › **Small central organization** but access to and relying on the whole of Ericsson's R&D
- › Focus on **applied research** in a time-span of **3-5 years**
- › Focus on **software technologies** and **software engineering techniques** that help boost Ericsson's technology leadership and R&D efficiency
- › Our projects provide **two types of outcome**
 - Create **knowledge** in certain areas
 - › **what** shall Ericsson drive in relation with providers, **which** aspects/tools/technologies are key and **how** these can be used
 - Provide **proof of concept**

Organization of SW Research work



Focus Areas



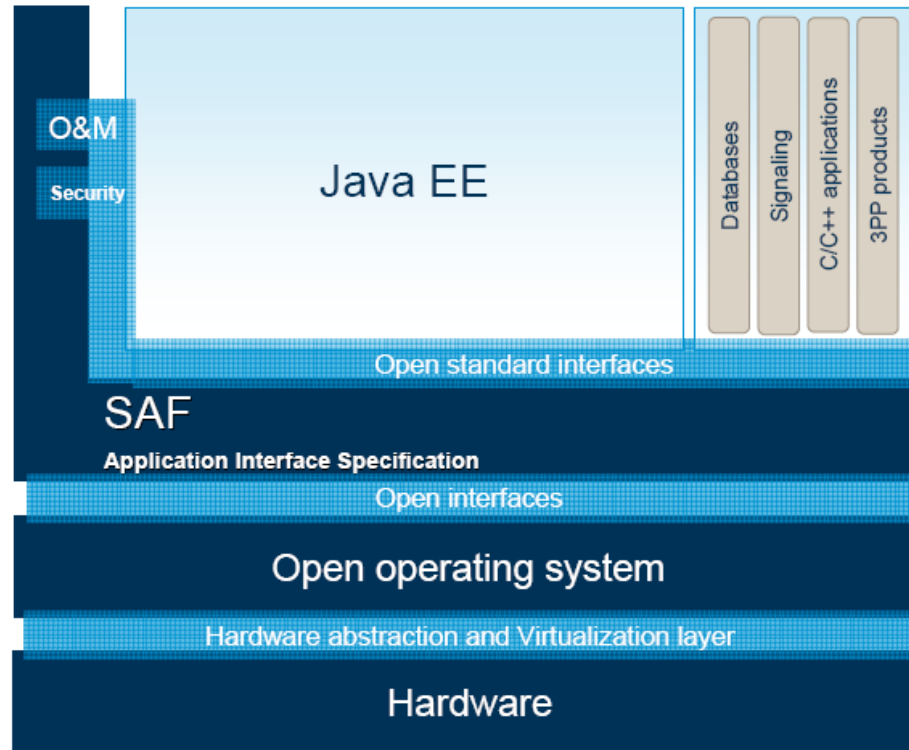
Use Cases for virtualization

- › SW that assumes **it owns the HW**
- › Create a **less parallelized** environment
- › **Collocating different functions** on the same server
- › Allow for **different version** of same SW function
- › **Scale payload applications** for higher throughput

Examples of virtualization R&D

- › Open Server Architecture
- › EU project 4WARD: the Future Internet
- › Virtualization and security

Open server architecture



“Virtualization is the other **increasingly important component** in the application server domain; the ability to **efficiently deploy new services requires the ability to deliver services that can grow and shrink with customer demand**”

Source: Ericsson white paper on Open Server Architecture

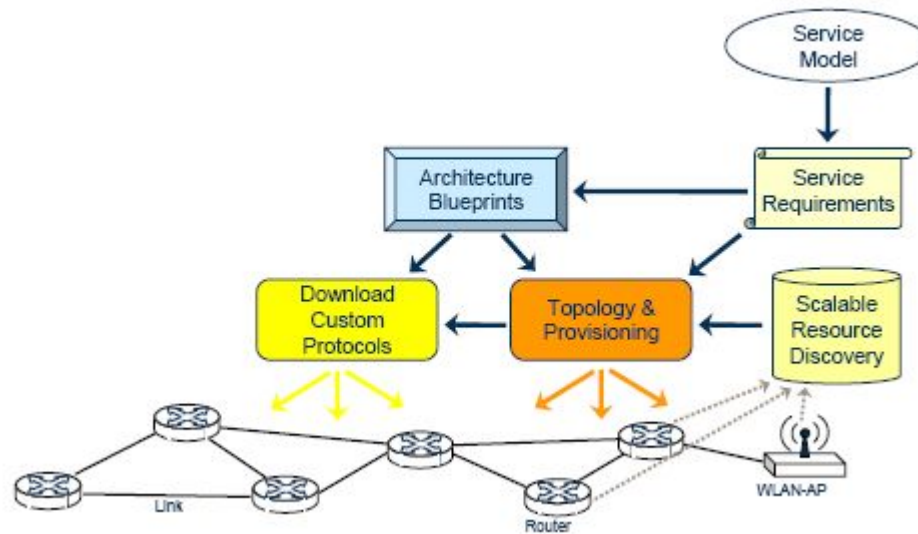
4Ward: building the future internet

- › Virtualization as key technology for the Future Internet
 - Coexistence of different network architectures
 - Emergence of new business models
 - Better use of resources

- › No coherent framework exists to enable flexible resource management and deployment of arbitrary architectures across different providers

4WARD Virtualization Concepts

- › Goal: Unified provisioning framework for virtual networks
 - On-demand instantiation of virtual networks from a diversity of virtualized resources
 - Common management interfaces for virtual resources



Virtualization and security

Secure Virtualization and Multicore Platforms

▸ People

▸ Publications

Research groups:
NETS

Contact:
Christian Gehrman



KEYWORDS

multicore
security
virtualization
all keywords

Secure Virtualization and Multicore Platforms

Software virtualization is common in modern computer and telecommunication systems as it allows considerable cost savings through software reuse and efficient hardware utilization. Virtualization technologies do not just enable hardware abstraction but can also give stricter control over the computing platform resources, which in turn, allows creation of secure execution environments on server and application platforms. For single-CPU systems the performance and security tradeoffs provided through different virtualization technologies are rather well understood. However, this is not true for multi-core systems.

The project evaluates how virtualization in multi-core environments can serve security while preserving its other benefits (hardware abstraction) without too high performance cost. We base our work on widely deployed commercial hardware platforms and well established virtualization technologies, evaluating them from security and performance perspective when applied to multi-core environment. The main security feature expected when employing a virtualized runtime environment is isolation between such environments. To have an efficient solution one also needs secure inter-VM-communication as well as secure resource sharing. We study how we can assure that a virtualized environment (hypervisor) itself is secure and that the OS (OSes) and "applications" running in each virtual machine (VM) are secure.

This is a joint research project between SICS and Ericsson Research in Kista and Lund.





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