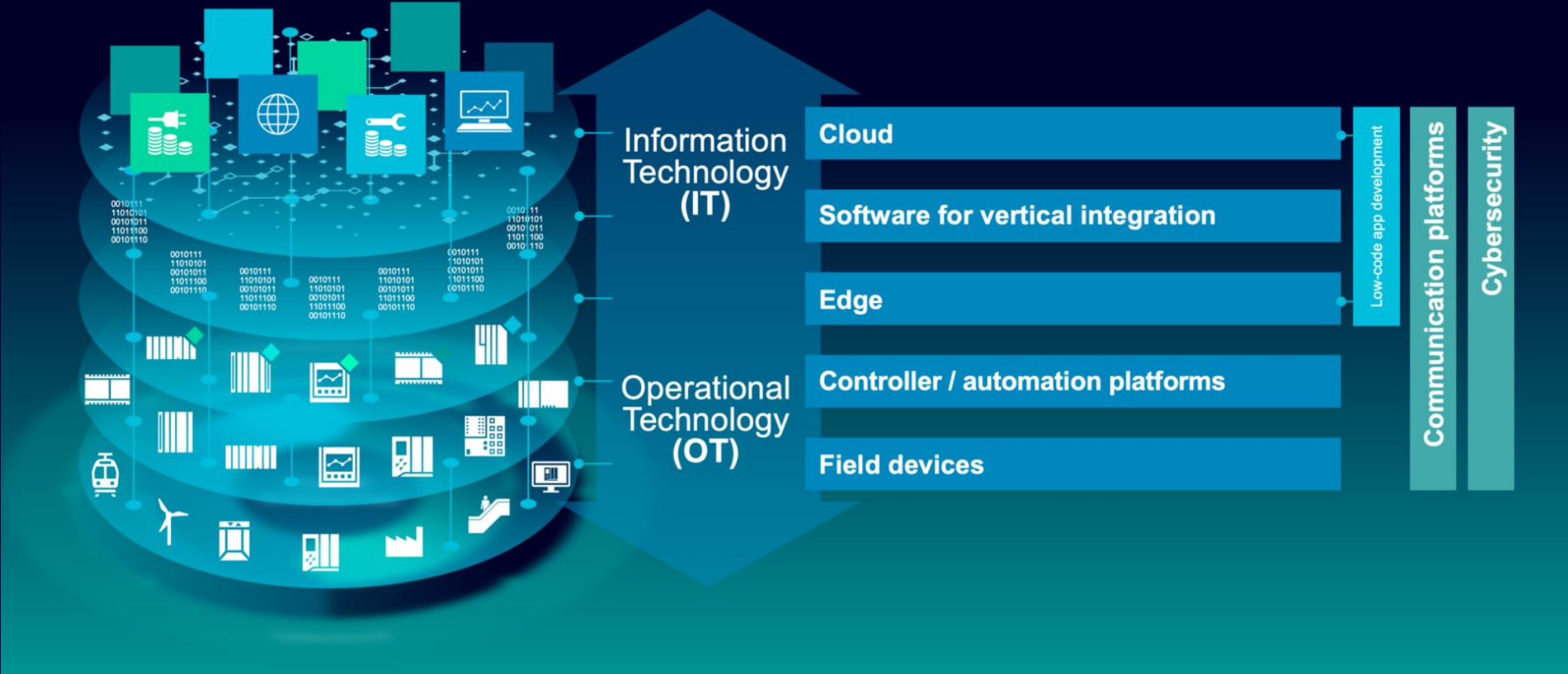


Siemens' view on research challenges in open source HW and RISC-V for industrial automation

2021-06-17

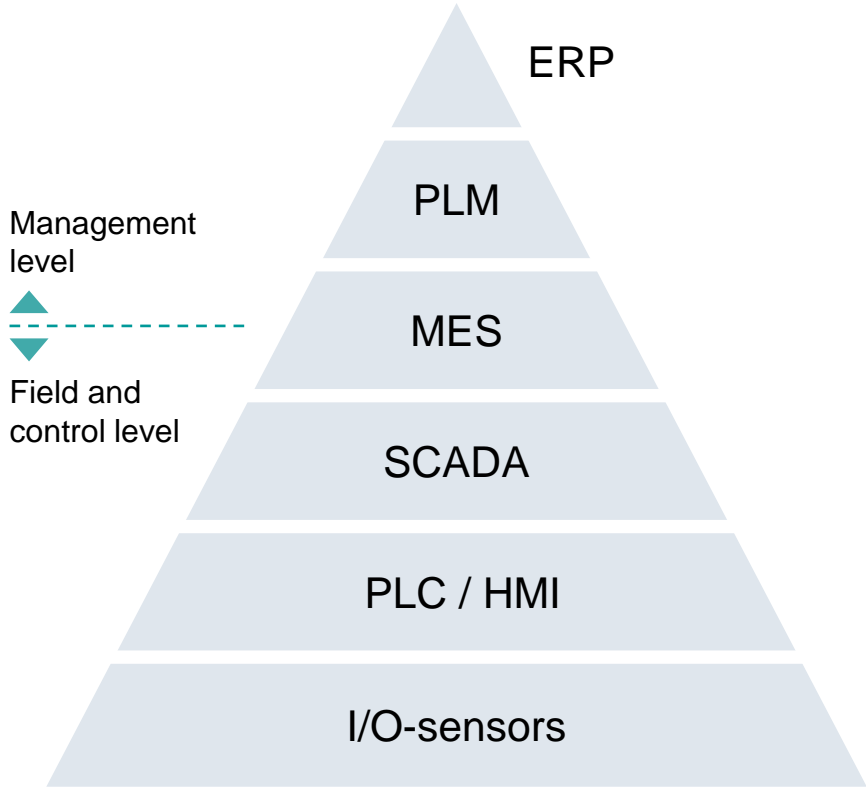
Bringing together Operational Technology (OT) and Information Technology (IT)



Siemens embraces the future of automation – from hierarchical control architecture to flexible orchestration with Edge

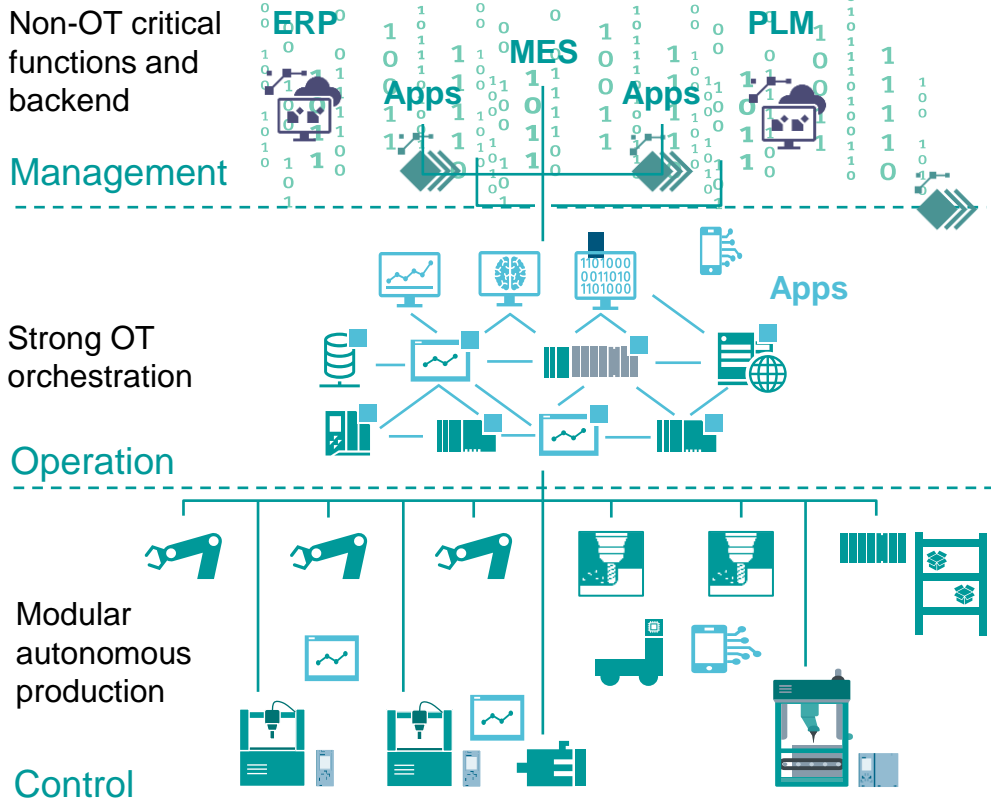
Today

Hierarchical control architecture



Future

Modular autonomous intelligent production



App repository and store

3 Shop-floor apps based on new techs

2 OT data model & orchestration

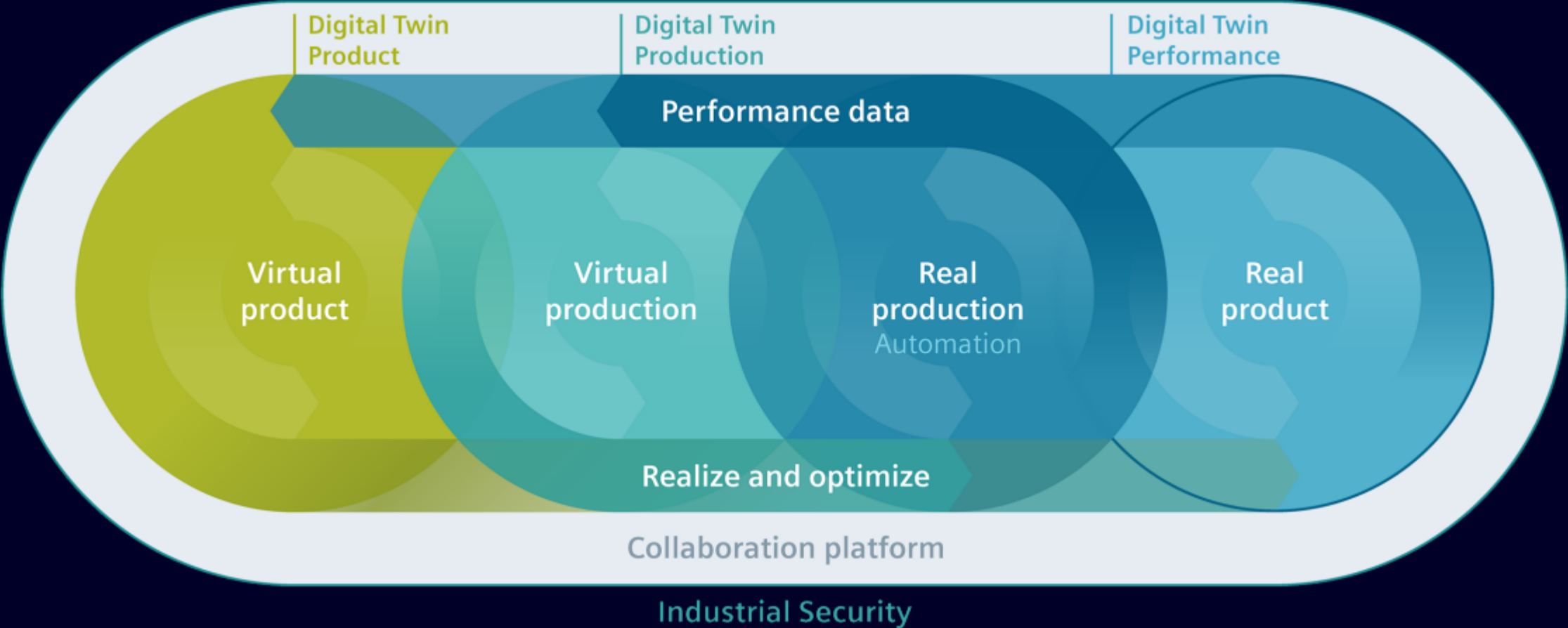
Device/ App Management

1 Central management of devices and applications

Runtime

Industrial Edge

Digital Twin integrates the entire product lifecycle – product engineering, production and operation



Hardware for Industrial Automation faces some specific challenges on top of the vertical-independent generic challenges

Scalable performance

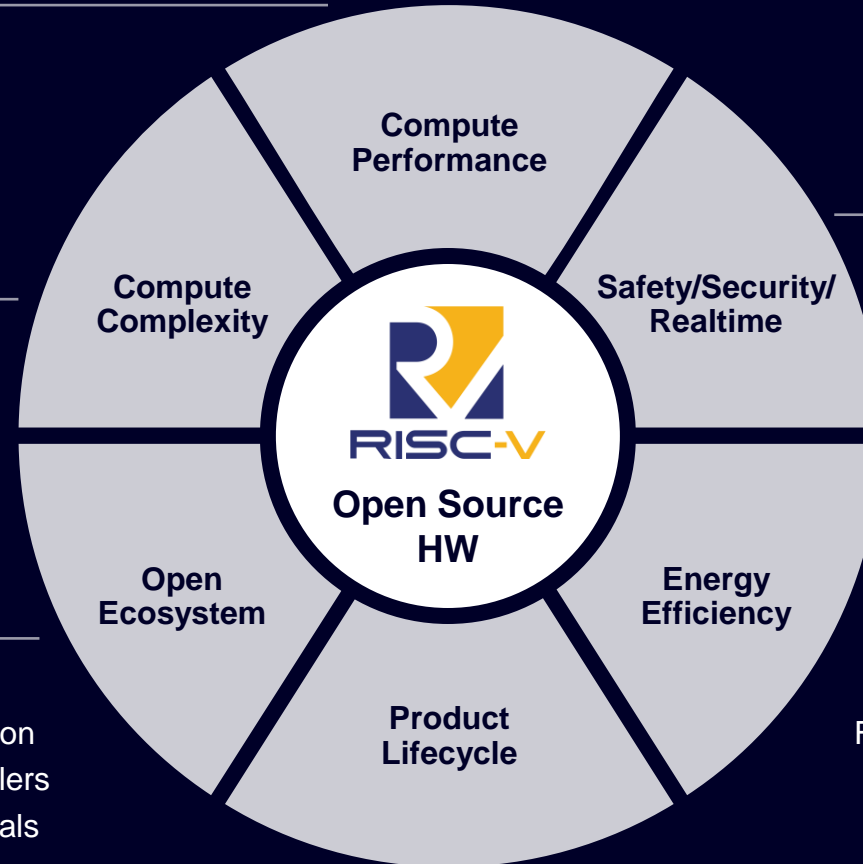
Constraint field/IoT devices
Simple gateways
Linux-class Edge computing devices, IPCs, PLCs
On-premise servers

Next generation workloads

From low-complex MCU class applications, mixed-critical hard real-time automation up to general purpose processing
Complemented with AI/ML acceleration
SW-defined HW

HW + SW

Starting from MBSE for system architecture exploration
SW Ecosystem from Hypervisor, OS/RTOS to compilers
Industry-grad design IPs for processing and peripherals
EDA from architecture exploration to implementation
Lower entry barrier for technology adoption



Safe and secure real-time Systems

Ecosystem compliant with regulations
Certification-ready
Holistic design/verification/test methodology
Long-term security

Highest Instructions/Joule

Computational efficient architectures
Optimized for efficient implementation
From energy-harvesting powered IoT-class
To thermal-constraint embedded server class

Durable world-market products

Production and operation 10+ years
Cost optimized R&D and products
For global market w/o geopolitics constraints (e.g. ECC)
Reliable roadmap and implementation of ecosystem
Reliable and resilient supply chains

| Contact

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