Bridging Research and Innovation at SAP Security Research

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PUBLIC

Run Simple

Who we are

An industrial research strategy for security

From research to innovation: an example

Collaboration

Lessons learned

SAP Security Research Facts 2018

24 Researchers

6 PhDs students

20+ Master Students

10+ Nationalities

Sophia Antipolis / Mougins

Karlsruhe

Walldorf

20+ Scientific publications

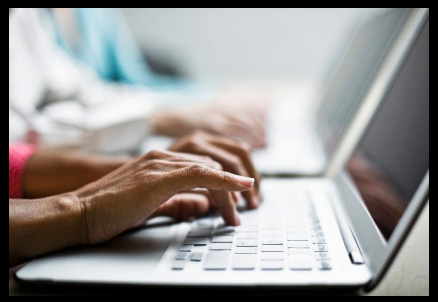
1 Distinguished Paper Award

1 Smart Security Week Award

7 IDFs

20 Patents

4th Professor in 4 years

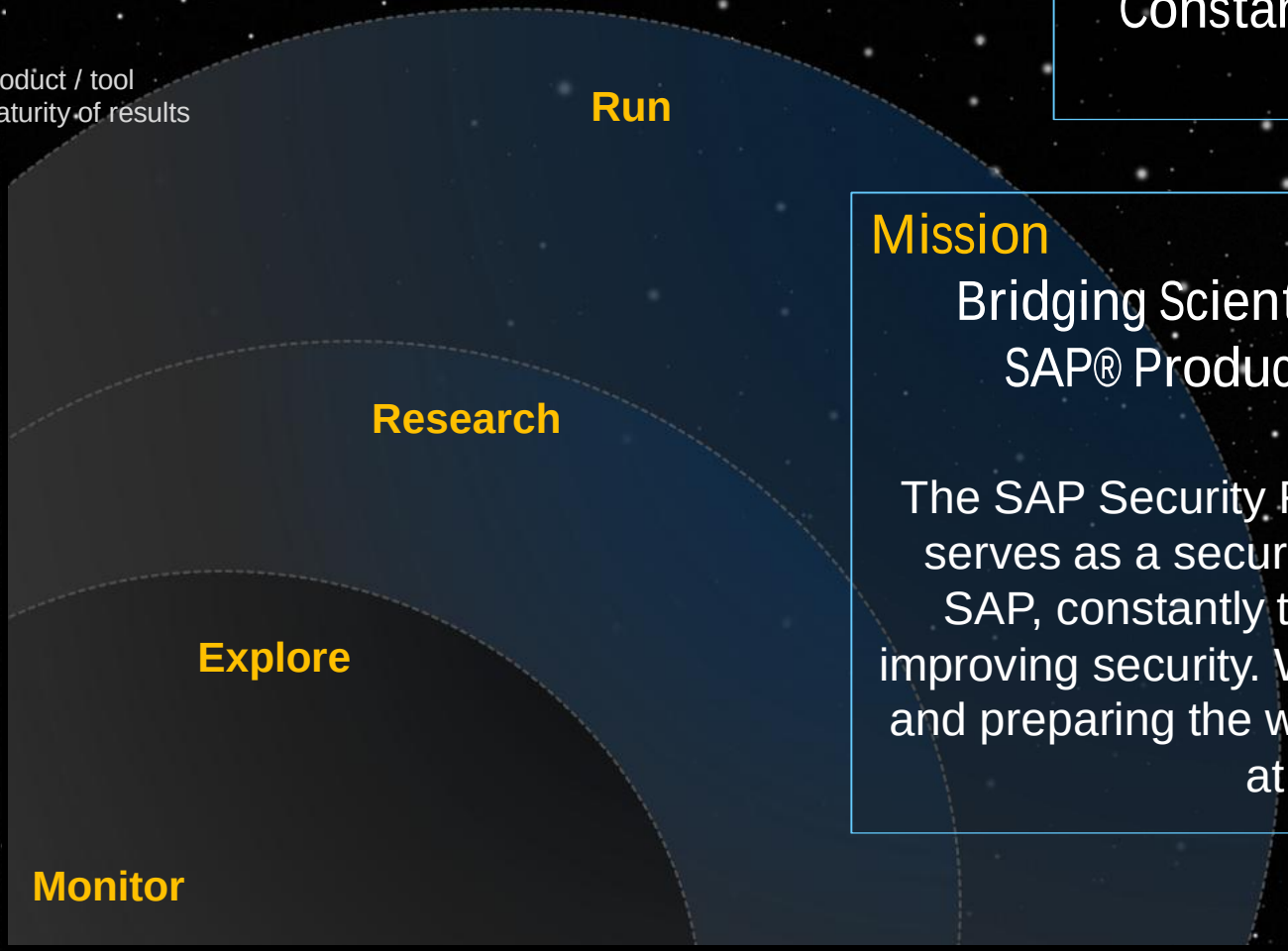


7 Collaborative projects (PFP)

60+ Partners

800+ k€ Funding (est.)

Our Mission at SAP Security Research



Research Objective

Constantly challenge given security assumptions!

Mission

Bridging Scientific Research and SAP® Product Development

The SAP Security Research organization serves as a security **thought leader** at SAP, constantly transforming SAP by improving security. We are **thinking ahead** and preparing the way for product security at SAP.

Innovation by SAP Security Research

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SAP Security Research

Scientific Research	Applied Research	Prototyping	Product Development
Theoretical research, basic principles, new Theories, new fundamental methods, etc.	Refinement of methods (performance, etc.) and application of methods to validate applicability in SW industry	Build prototypes to proof applicability; blueprint for productization	Develop product and ship (OnPrem) or operate (cloud service)

[1] TRL 1 – basic principles observed

TRL 2 – technology concept formulated

TRL 3 – experimental proof of concept

TRL 4 – technology validated in lab

TRL 5 – technology validated in relevant environment

TRL 6 – technology demonstrated in relevant environment

TRL 7 – system prototype demonstrated in operational environment

TRL 8 – system complete and qualified

TRL ´9 – actual system proven in operational environment

Universities

Identify New Concepts

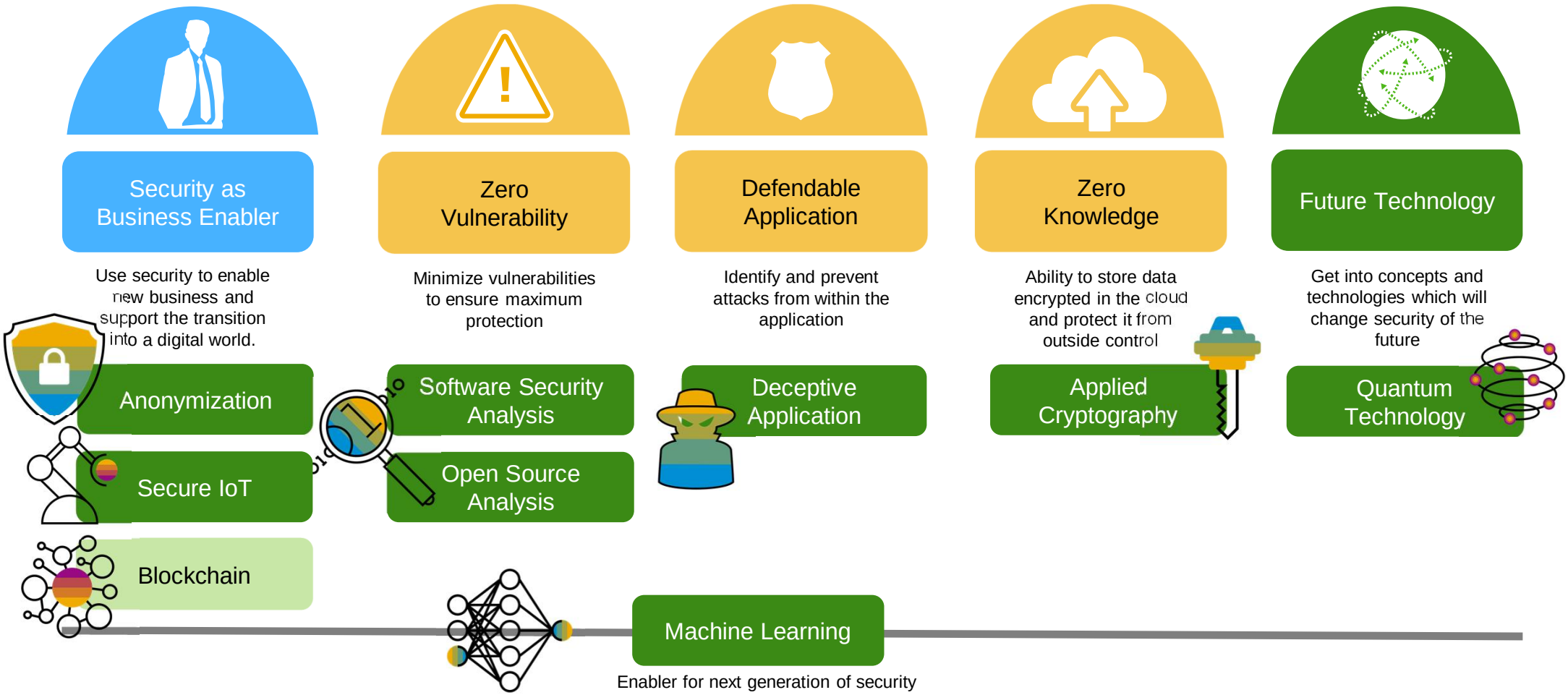
SAP Security Research

Transfer

Consultation

[1] Technology readiness levels (TRL) according to EU definition (Horizon 2020)

SAP Security Research Strategy 2020



Research and innovations: From security now toward security tomorrow

Open Source Security

Relevance: Now

Trend
Market research companies estimate that more than 80% of the codebase of a typical Java application is open source.

SAP Security Research
SAP Vulnerability Discovery tool for open Source, VULAS, is contributed as Open source to accelerate open source security

Built-in Security

Relevance: Now to 3 years

Trend
Huawei plans to spend at least US$2 billion for a secure software redesign (bloomberg.com, Dec 07, 2018).

SAP Security Research
Built-in security to harden the security of existing and future software. Tainting approach in SAP Cloud Platform as beta version available, deceptive application as research in close collaboration with first applications.

Quantum Technology

Relevance: 5 to 15 years

Trend
Quantum Computing is one of the top 10 IT Trends for CIOs (Forrester, Dec. 2018).

SAP Security Research
Within the EU project "QIA – Quantum Internet Alliance", Quantum Technology is used for secure communication by physics, a preparation for the next generation of the Internet.

Privacy enables an Intelligent Enterprise

Relevance: 1 to 3 years

Trend
Customer experience (CX) is at the top of the CEO agenda (Gartner, 2018).

SAP Security Research
Works on automated text anonymization for text mining that preserves the possibility of performing automated content and sentiment analysis but avoids authorship attribution; a prerequisite for experience management in an intelligent enterprise.

Artificial Intelligence and Machine Learning

Relevance: Now to 10 years

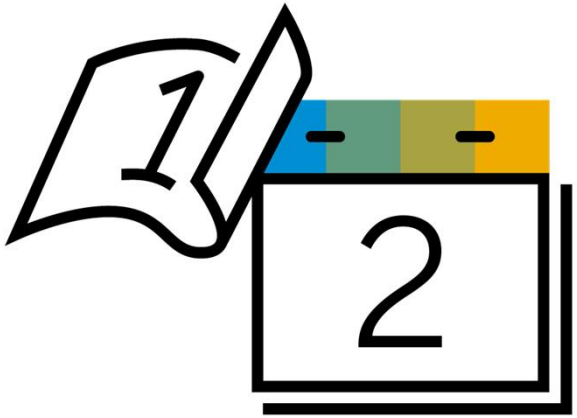
Trend
An intelligent enterprise brings together machine and human intelligence (SAP's product strategy, 2018).

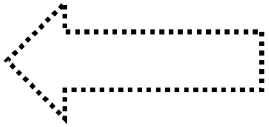
SAP Security Research
Research road map for an intelligent security is available with first solutions using ML to discover vulnerabilities in open source and to detect security threats from the dark Web.

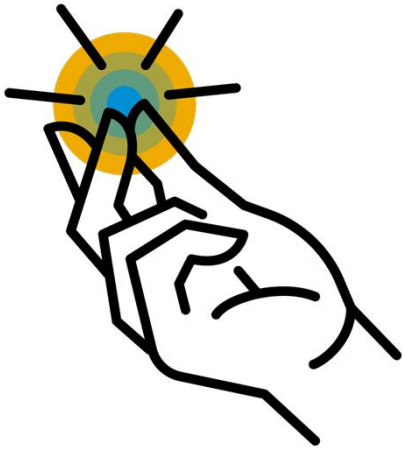
Chronos and Kairos – Strategy and Opportunities

Strategy

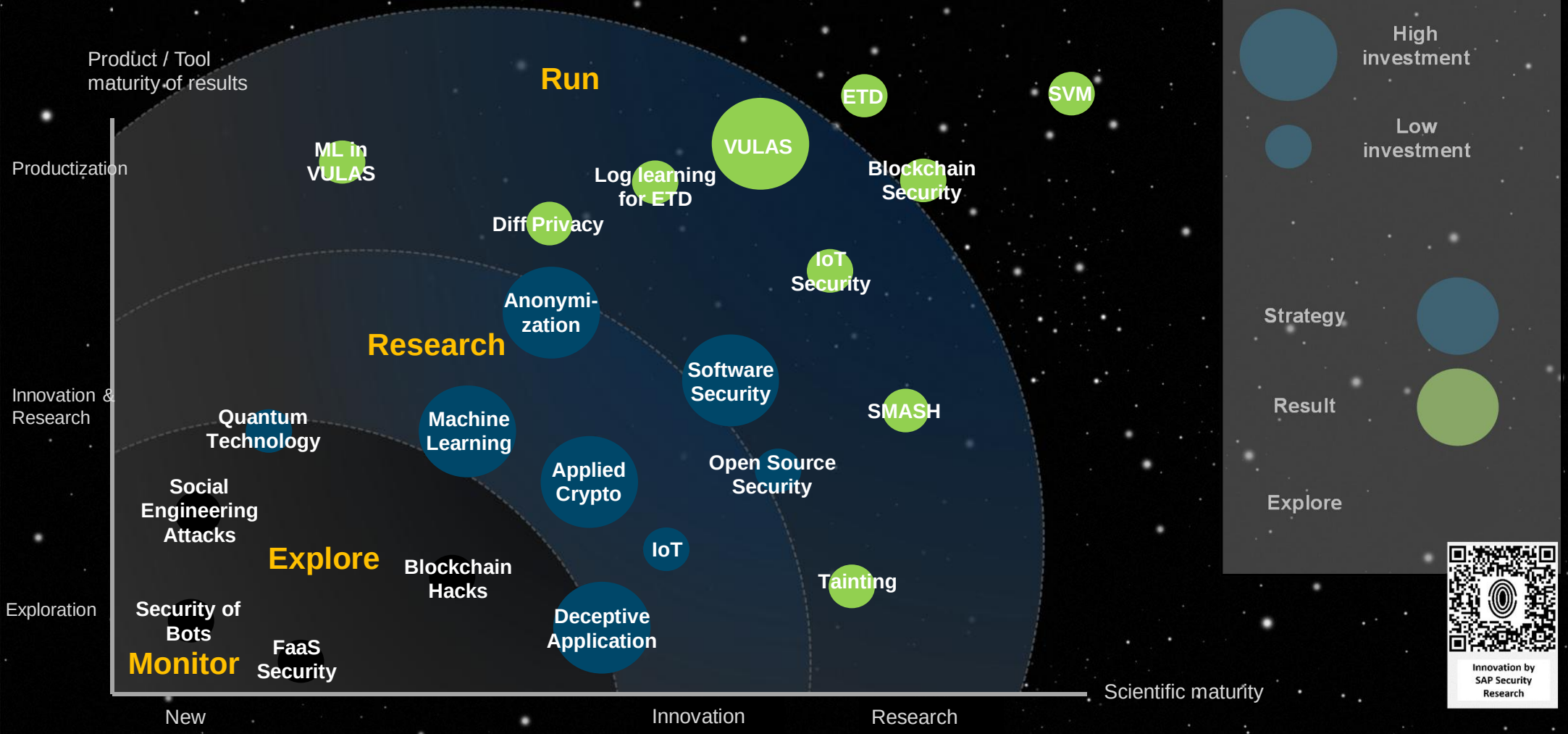
Opportunities & Exploration







Emerging Topics at SAP Security Research



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Trend – Past and new realities in the software stacks [1)]

1999 >95% home grown code

90% from SAP	SAP GUI
>98% from SAP	SAP ERP
95% from SAP	SAP NetWeaver Application Server
100% from vendor, contract	Database
100% from vendor, contract	Operating System

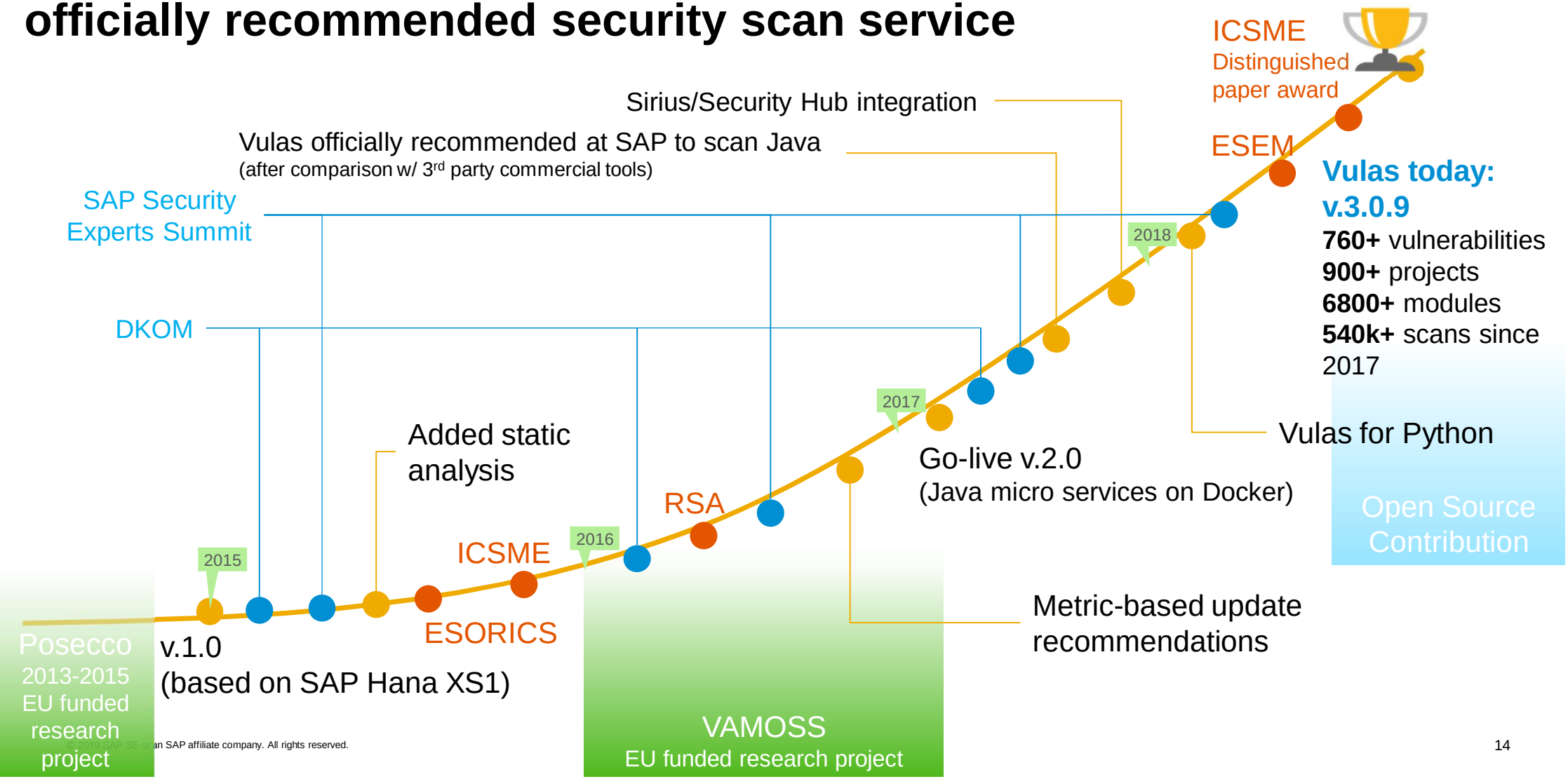
1) Holger Mack,Tom Schröer, SAP Product Security Summit 2019, “Security Midlife Crisis”

Trend – Past and new realities in the software stacks [1)]

1999 >95% home grown code		2019 <5% home grown code	
90% from SAP	SAP GUI	Browser, JavaScript	100% “3rd party or Internet”
>98% from SAP	SAP ERP	Microservice (npm, python, Java,…)	90% “from the Internet”
95% from SAP	SAP NetWeaver Application Server	Application server (Tomcat, node, ..)	90-100% “from the Internet”
100% from vendor, contract	Database	Container Operating System	x times “from the Internet”
100% from vendor, contract	Operating System	Kubernetes, Docker, Cloud Foundry	100% “from the Internet”
		Operating System	100% “from the Internet”

1) Holger Mack,Tom Schröer, SAP Product Security Summit 2019, “Security Midlife Crisis”

Example VULAS: From research to a patented, productive and officially recommended security scan service



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Funded projects (H2020, EIT, EID, BMBF, ANR, …)

§ Currently: …

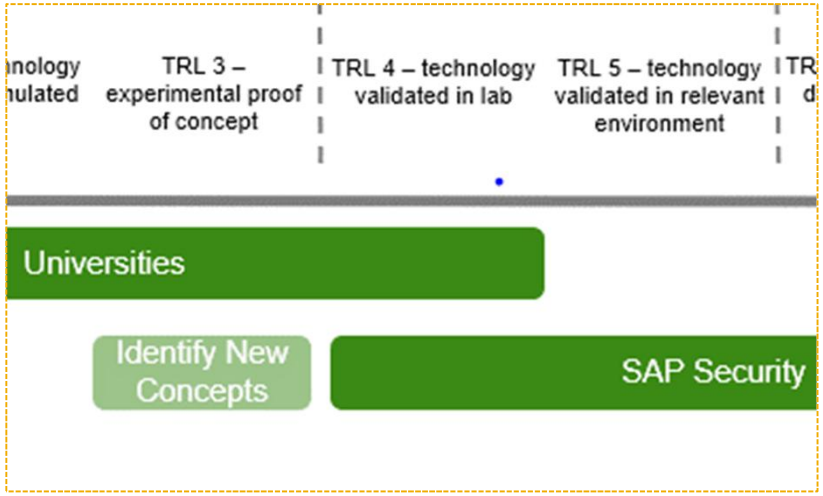
Bilateral research contracts

PhD program

Publications

Scientific community service (PC, conferences)

SAP Security Research Seminar



Collaborations (bilateral)

EURECOM
Sophia Antipolis

KIT
Karlsruhe Institute of Technology

Technische Universität Braunschweig

TECHNISCHE UNIVERSITÄT DARMSTADT

UNIVERSITY OF TRENTO

PADERBORN UNIVERSITY

UNIVERSITY OF WATERLOO

Universität Stuttgart

UNIVERSITY OF MANNHEIM

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Lessons Learned

Strategy alignment on all corporate levels needed

- Digital transformation requires secure systems
- Security as technology foundation and business enabler
- Build or buy
- Low footprint on processes: automation

Accept failure

- Can you risk to miss an opportunity?

Funding strategy determined by corporate strategy

Collaborate with strong partners: academia, research institutes, business

Key to successful proposals: clear problem statement and convincing solution idea

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