Hagai Bar-El

System Security Executive and Architect

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Field of Activity

System architect for product and cyber security, with strong leadership capabilities.
Over 25 years of proven experience in the architecture of secure systems, Security Development Lifecycle (SDLC) deployment, system security assessment, and leadership of security research and engineering teams, along with their patent portfolios, as a CTO and from seed to acquisition. Experience also covers due-diligence of products and technologies for investment, evaluation of research proposals for the EU (FP7 and H2020 programs), standardization, compliance, and management of innovation processes and intellectual property, all in the fields of hardware, software, system, and cyber security.

Work Experience

Qualcomm: Senior Director of Product Security Roadmap, 2022 to present

Global accountability for product security roadmap, and leadership of the Product Security Roadmap Team.

Akamai Technologies: Senior Director of Security, 2022

Accountability for cloud security across the organization and its services, including the establishment and leadership of the Cloud Security Team, and the definition of cloud security governance methodologies.

ARM: Senior Director of Security, IoT division, 2015–2022

1. Direct professional and organizational management of the *Security Group* that carries out security analysis, threat modelling, definition of security controls, and security reviews of both system, hardware, software, and operations (cyber). The *Security Group* is a team of pure-play security architects coming from both academic and technical backgrounds, and spread across three geographies. Management activities consist of: recruiting and coaching team members, defining and assigning tasks, ratifying all deliverables, forming a professional focal-point for the team, and dispute resolution.

2. Responsibility for the secure design and engineering of *Pelion*®, the cloud-based IoT service framework of ARM, its compliance with ISO 27001 and SOC2 (Type II), its threat modelling, and its adherence to the risk appetite of the organization; in collaboration with the ARM CISO and reporting to the corporate Security Council.

3. Standing at the forefront of product security in all interactions with customers and auditors, presenting our security capabilities to different audiences at different levels of abstraction.

4. Responsibility for both the definition and the day-to-day deployment of the *Security Development Lifecycle*.

5. Responsibility for all security reviews (design and code) of ARM's Platform Security IP.

6. Evaluation of security products, technologies, and intellectual property offered by startups for potential acquisition.

7. Nominated as a corporate-wide *Distinguished Engineer*.

Discretix Technologies: Chief Technology Officer, 2012–2015

This position was held until Discretix Technologies (later doing business as *Sansa Security*) was acquired by ARM and ceased to exist as an independent company, in August 2015.

1. Full CTO capacity, while also remaining the Chief Information Security Architect and the head of the CTO Office, as detailed in the section below.

2. Responsibility for the overall corporate security posture (in lieu of a full-time CISO).

3. Active role in the sell of the company to ARM: presentation of its unique technological merits, support of the due-diligence process, facilitation of the intellectual property transfer to the acquirer, and participation in the migration of the teams into two divisions within ARM.

Discretix Technologies: Chief Information Security Architect, 2000–2015

1. Led the definition of new technologies for future products (2–5 year span), security IP, security requirements and reviews, for the entire lifetime of the company, until (and including) its acquisition by ARM.

2. Served as Chief Information Security Architect since the establishment of the company (as its very first hired employee, by the founders); as head of the CTO Office (the "Technology Group") since July 2006; and as an official member of the company management, since September 2011.

3. Carried out and led the specification of the security schemes and protocols that were implemented into products, such as those at the core of the CryptoCell®, CryptoFlash®, and Sansa-Provisioning® product lines; mechanisms that facilitate: embedded secure storage, secure boot, code integrity, media content protection, automotive network firewalling, and IoT key provisioning; some are protected by patents.

4. Managed all innovation and intellectual property processes: evaluated new ideas for products and security enhancements, defined and enforced the patent filing strategy, drafted patent applications and defined patent claims, saw the intellectual property throughout the patent prosecution process, and managed the analysis of prior art and the interaction with IP service providers.

5. Held responsibility for porting system security knowledge into the company. This activity was extremely important, since Discretix was a security company that was entrusted by its customers to possess the most up-to-date knowledge in this domain.

6. Interacted with external labs that attested for the robustness of the products, such as by FIPS 140 and EMV certification programs, and represented the company and its technologies in standardization bodies such as the GlobalPlatform, MeT (Mobile Electronic Transactions), OMTP (Open Mobile Terminal Platform), OTAFF (Over The Air Flash Forum), OMA (Open Mobile Alliance), and IIC (Industrial Internet Consortium).

Independent System Security Architect, 1995 to present

Self-employed (as sole proprietorship) architect in the field of system security. Engagements so far consisted primarily of:

- Design of secure systems, such as for an industrial firewall and IP TV.

- Evaluation of more than 100 research proposals over a decade for the 7th Framework Program of the European Commission, in several calls addressing all areas related to security, as well as in its continuation program: H2020; including periodic review of one ongoing security research project.

- Evaluation of new and emerging technologies, e.g., for Venture Capital customers, prior to investment.

Clients consisted of major corporate players in the fields of telecommunication, banking, venture capital, defense, and technology, both in the public and in the private sectors.

Education

1994–1997 B.A. cum laude in Computer Science, from the Academic College of Tel-Aviv Jaffa.

1996–2010 Attended several seminars, academic courses, and conferences, on information security, cyber security, cryptography, and intellectual property. Included are trade shows in Israel and abroad, and a "practical cryptography" course at the Weizmann Institute of Science.

2008 Attended a course on Intellectual Property Management, in Lahav Institute, Israel.

Publications

A professional blog, *Hagai Bar-El on Security*, is maintained at `https://www.hbarel.com`, since 2005. The blog contains posts that reflect areas of both work and interest, such as: security policy, security engineering, privacy, practical uses of cryptography, and occasional book reviews.
Publicly-available papers are also listed at this address.

Patents

Inventor (or co-inventor) of the following granted patents:

- In the field of embedded security:

    - US Patents 7,467,304, 7,934,049, 8,369,526, and 8,321,686
    - UK Patent 2,434,673
    - EU Patent 2,189,922

- In the field of IoT device provisioning: US Patents 9,866,376, 8,687,813, 9,231,758, and 10,454,674

- In the field of trust in IoT devices: US Patents 10,592,673 and 11,068,604

- In the fields of content protection and mobile security: US Patents 8,201,260, 9,344,275, and 10,491,379

- In the above fields, co-inventor of 3 additional granted patents in China, Japan, and Korea.