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The bridge to possible

Serverless isn't Secureless

How to Secure Serverless Functions

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PSOETI-2100

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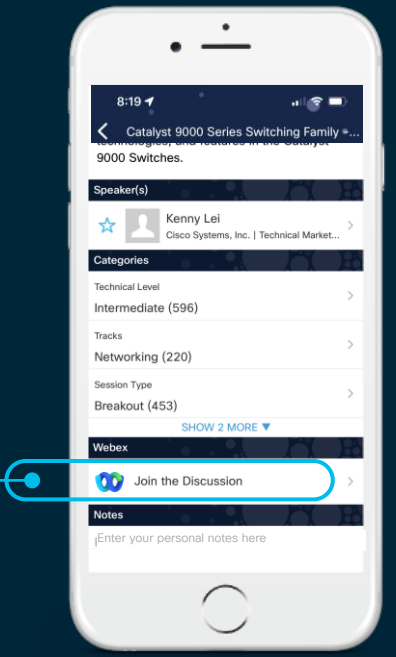

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A-bit-about-me

Ran Ilany

Director Eng. ET&I at Cisco

Co-Founder, CEO Portshift (Cisco acquired)

Head Security I/S, Check Point

Founder, CEO, BladeFusion (ISS/IBM)

VP R&D, MainControl (IBM)

Cloud Native Security Platforms

Containers, k8, Serverless, API, Service Mesh

Head of Cisco ET&I Israel

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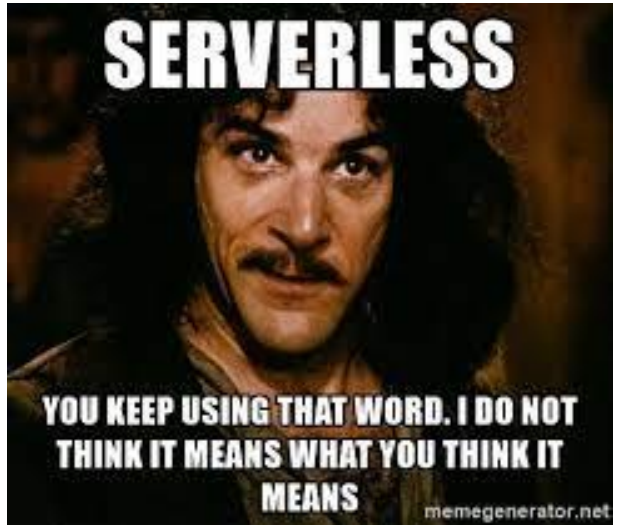
Agenda

- What is Serverless
- The Attack Surface
- Security Model: Shared Responsibility
- Standards on Serverless Security
- Cisco’s solution: Panoptica
- Demo
- Conclusion

What Are Serverless Applications?

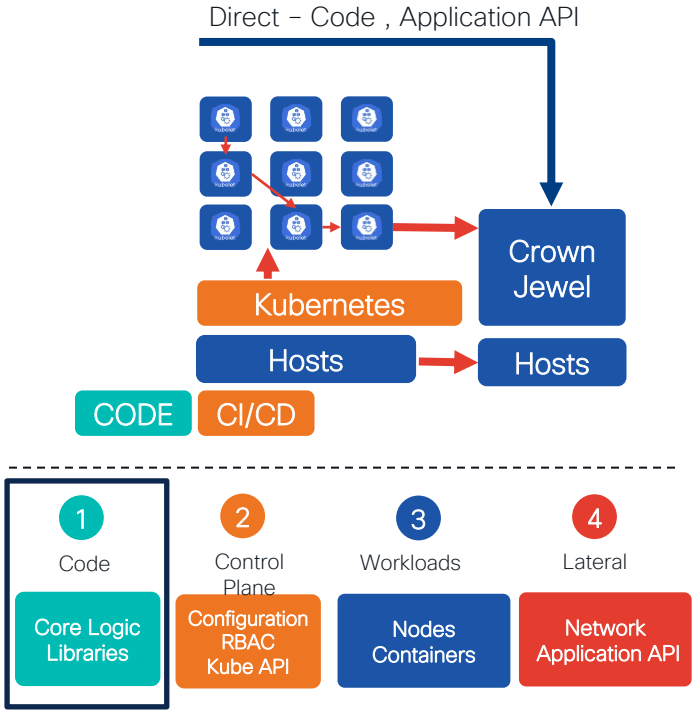
- A cloud-native development model that allows developers to build and run applications without having to manage servers
  - There are still servers in serverless but they are abstracted away from app development

- Motivations:
  - Eliminate infrastructure complexities
  - Cost saving: pay-per-use billing model
  - Yes, better security



Serverless Application: The Attacker Perspective

- Serverless Apps are more secure by default
  - No access to the host/OS or the filesystem
  - No persistency (ephemeral execution)
  - Classical/known attacks are not applicable
- The only attack vector is the App Libraries/logic
  - Flaws in the application code or dependencies
- Traditional security tools(WAF, FW etc) can't protect serverless functions



Serverless: Where Things Can Go Wrong?

- Application code
  - Vulnerable library code
  - Vulnerable logic
    e.g. SQL Injection, Crypto mining (e.g. April 22 CATO Labs)
- Cloud serverless configuration
  - Permissions: Least-Privileged
  - Secrets/Access credentials
  - Authentication and Authorization

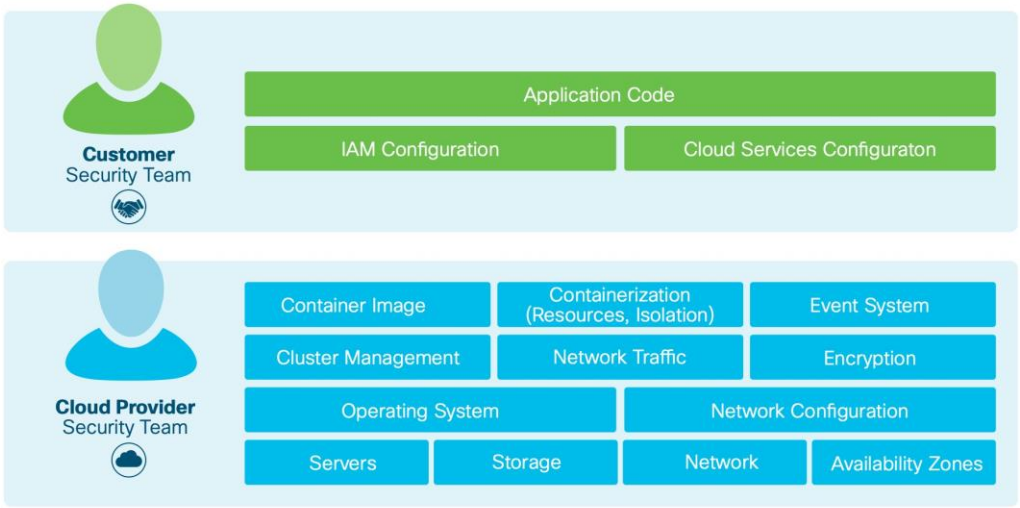
Serverless: It’s A Shared Responsibility

The Shared Responsibility Model

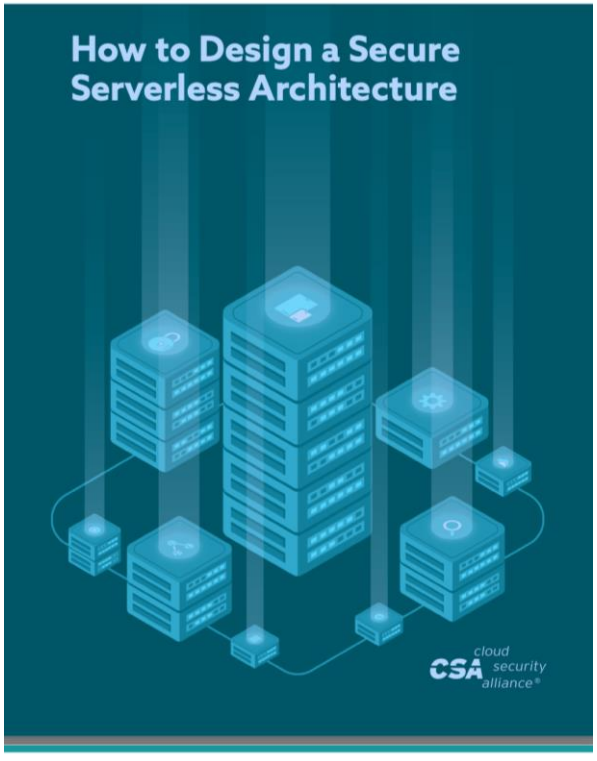
Security in the Cloud is a shared responsibility model

- Users
- Cloud Providers

Serverless leaves the App code and configurations to the user



Serverless Security Guidelines



CLOUD NATIVE COMPUTING FOUNDATION

CNCF WG-Serverless Whitepaper

Abstract

This paper describes a new model of cloud native computing enabled by emerging "serverless" architectures and their supporting platforms. It defines what server-less computing is, highlights use cases and successful examples of serverless computing, and shows how serverless computing differs from (and interrelates with) other cloud application development models such as Infra-structure-as-a- Service (IaaS), Platform-as-a-Service (PaaS), and container orchestration or Containers-as-a-Service (CaaS).

This paper, published by the CNCF Serverless Working Group, includes a logical description of the mechanics of a generic serverless platform with an associat-ed programming model and message format, but it does not prescribe a standard. It introduces several industry serverless platforms and their capabili-ties, but it does not recommend a particular implementation.

The CNCF Serverless Working Group is a forum for the CNCF community to explore the intersection of cloud native and serverless technology. The working group focuses on defining common terminology, scope of serverless as it relates to cloud native technology. This includes identifying common use cases and patterns with existing serverless implementations and analyzing the role of serverless relative to container orchestration. Their work will summarize potential next steps for the community and/or CNCF, outlining areas for possible harmonization, candidate projects and interoperability work.

To get involved in CNCF's work to advance serverless computing, join the CNCF Serverless Working Group or the community project CloudEvents, a draft specification for a common, vendor-neutral format for event data that is aimed to be proposed to the CNCF TOC as an official project later this year.

WG Chair/TOC Sponsor: Ken Owens (Mastercard)

WG Members (alphabetical by last name):
Sarah Allen (Google), Ben Browning (Red Hat), Lee Calcote (SolarWinds), Amir Chaudhry (Docker), Doug Davis (IBM), Louis Fourie (Huawei), Antonio Gulli (Goo-gle), Yaron Haviv (iguazio), Daniel Krook (IBM), Orit Nissan-Messing (iguazio), Chris Munns (AWS), Ken Owens (Mastercard), Mark Peek (VMWare), Cathy Zhang (Huawei), Chris A.

Additional Contributors (alphabetical by last name):

ABOUT CNCF

The Cloud Native Computing Foundation (CNCF) hosts critical projects of cloud native software stacks, including Kubernetes® and Prometheus™. CNCF provides a neutral home for collaboration, bringing together the industry's top developers, end users and vendors, including the world's largest public cloud providers.

Cloud native computing uses an open source software stack to orchestrate containerized services on any public, private or hybrid cloud. CNCF is part of The Linux Foundation, a nonprofit organization. For more

Panoptica:
Cisco's Secure Application Cloud

Panoptica
Cisco's Secure Application Cloud

- A SaaS solution providing cloud native security
- Seamless deployment with cloud accounts
- Serverless functions security risks:
  - Vulnerable code (SBOM)
  - Code integrity degradation
  - Exposed Secrets
  - Overly permissive permissions
  - Public exposure
  - Data Exphiltration options

Demo

Avoiding the “Garbage in garbage out” effect
- Thousands of functions
- Multi cloud accounts
- Abuse of user credentials
- Clones of credentials

Guidelines
- Code should never leave its original site
- Scheduled and auto event driven analysis
- Enforcement
- Multi accounts (Root account, Terraform provider)

Conclusion

- Serverless applications has a different security posture
- It requires dedicated security tools that addresses their ephemeral nature
- Cisco's Panoptica is a cloud native serverless security solution that addresses these security needs

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