SNIA STORAGE SECURITY SUMMIT

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# How to Protect the Integrity of Electronic Components and Storage Devices from Supply Chain Attacks

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**Trusted Computing Group (TCG)**

A SNIA Event

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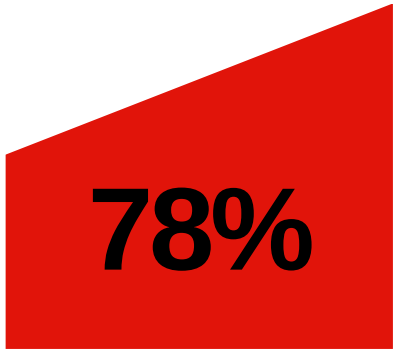
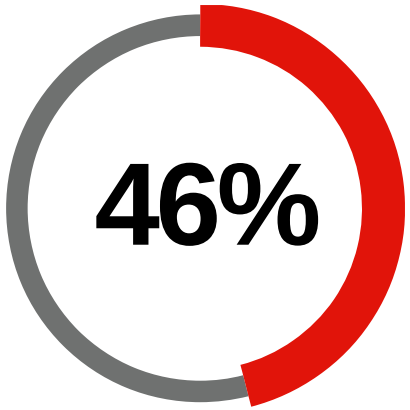
# Strategic Planning Assumptions

«Most organizations' security processes consider only the visible state of computing devices. The ***provenance*** and ***integrity*** of a delivered device and its ***components*** are typically accepted without validating through technology that there have been no unexpected modifications.»

«***Provenance*** is the comprehensive history of a device throughout the entire life cycle from creation to ownership, including changes made within the device or its components.»




year-over-year increase in supply chain attacks

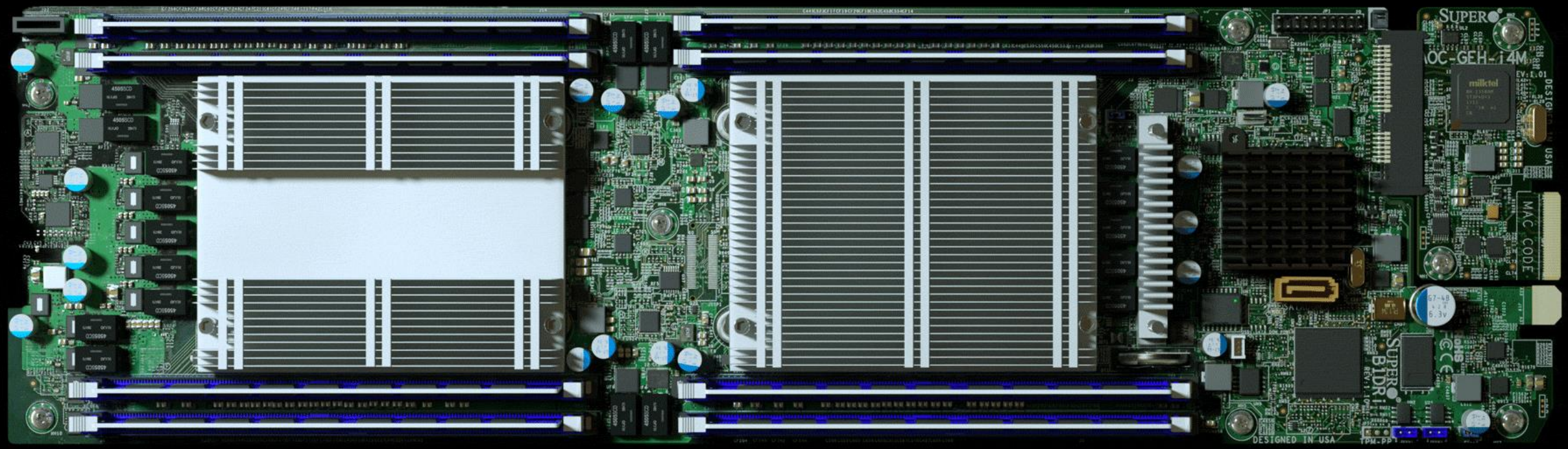



of global businesses have encountered at least one supply chain scare since shifting to a remote working model in the first quarter of 2022

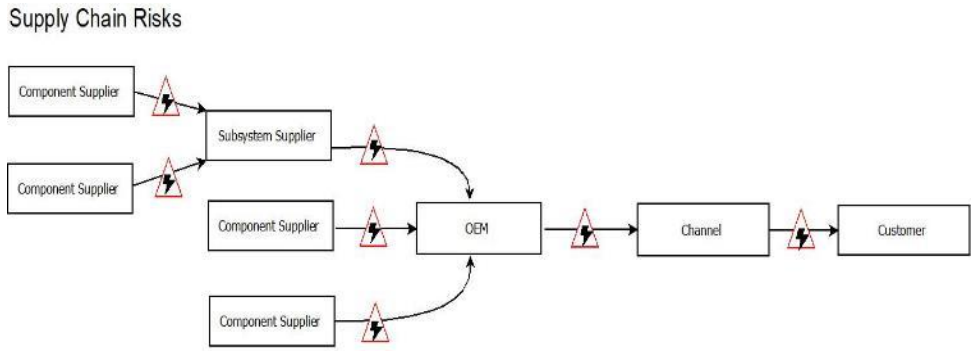
- By 2025, 60% of organizations building or procuring critical infrastructure components (SW&HW) will mandate and standardize Supply Chain Trust principles into their engineering practice, up from less than 20% in 2022
  (Gartner, Feb 2022 G00761079)

# The importance of a securing hardware in transit




https://youtu.be/C7H3V7tkxeA



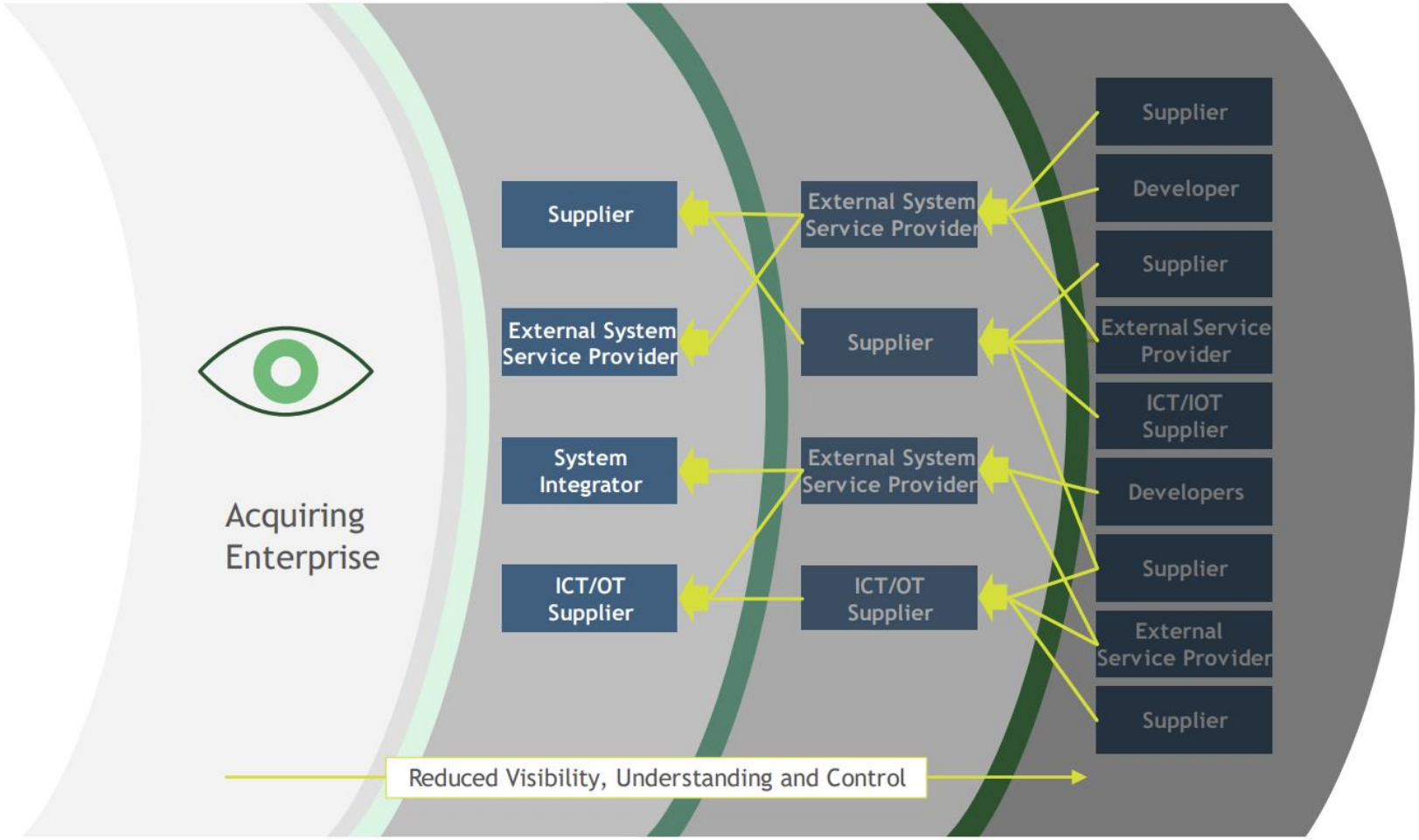
# Important Regulatory and Standards work:

- NIST SP800-161r1 (Cybersecurity Supply Chain Risk Management Practices for Systems and Organizations)
- NIST SP1800-34 (Validating the Integrity of Computing Devices: Preliminary Draft)
- NIST SP800-193 (Platform Firmware Resiliency Guidelines)
- SBOM (Executive Order on Improving the Nation’s Cybersecurity)
- TCG FIM (TCG PC Client Platform Firmware Integrity Measurement)
- TCG RIM (TCG Reference Integrity Manifest (RIM) Information Model)
- EU RED (COMMISSION DELEGATED REGULATION (EU) 2022/30)

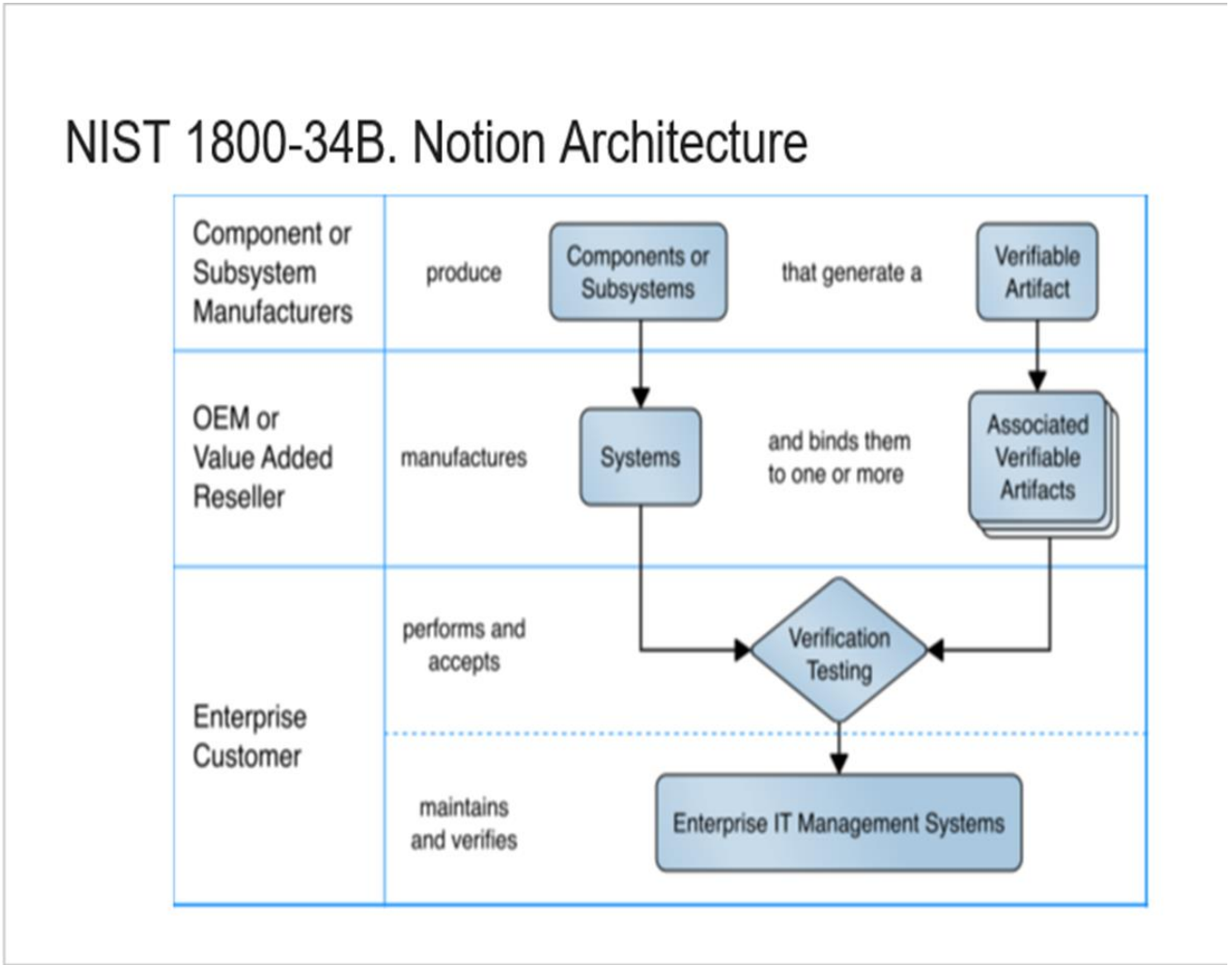
# An Enterprise's Visibility, Understanding, and Control of its Supply Chain

**NIST SP800-161r1**



# NIST SP1800-34



# SP800-193 defines Storage as critical boot device

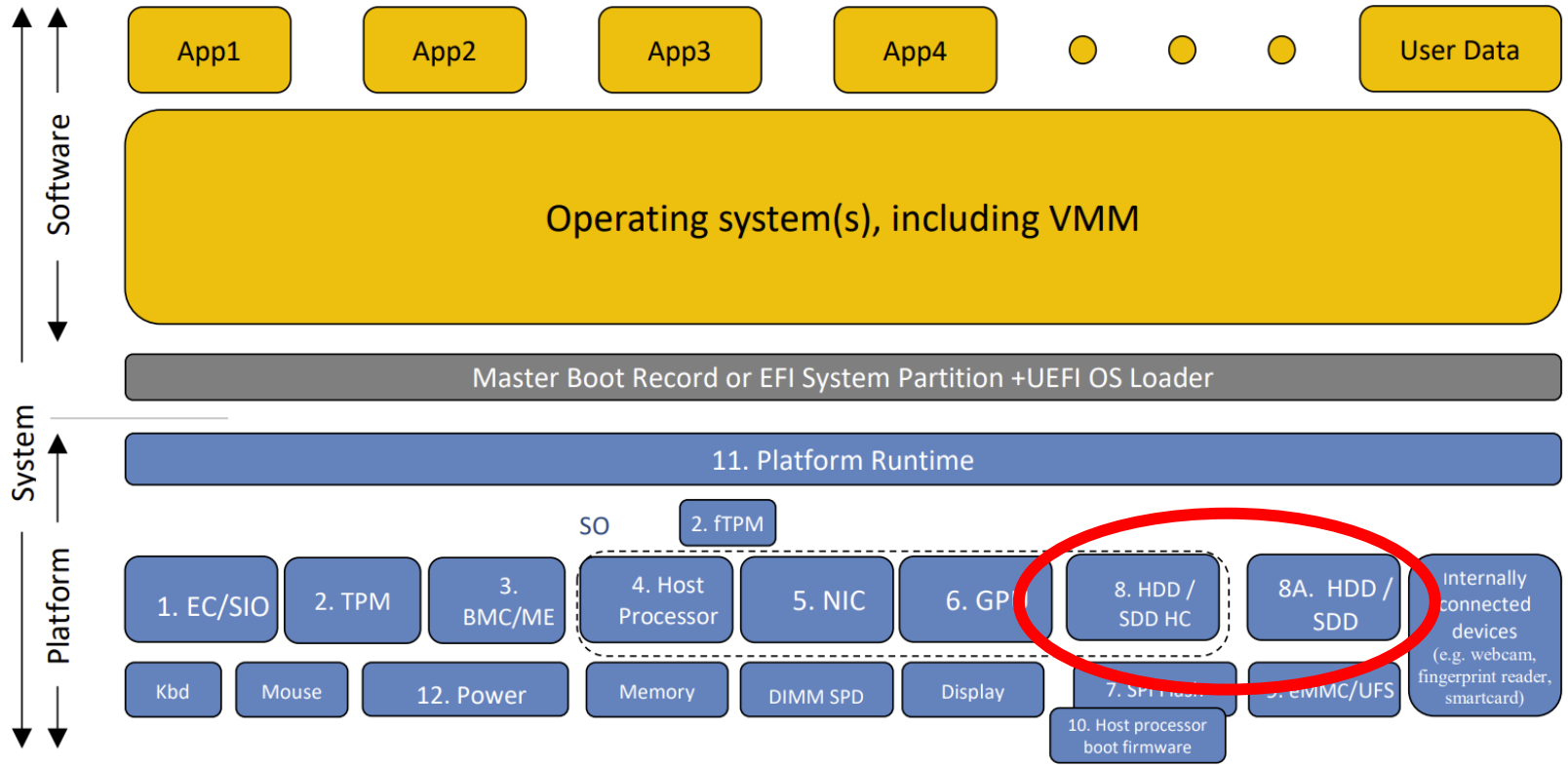



**Figure 1: High-Level System Architecture**

# Firmware Software Bill of materials

https://blogs.gnome.org/hughsie/2022/03/10/firmware-software-bill-of-materials/

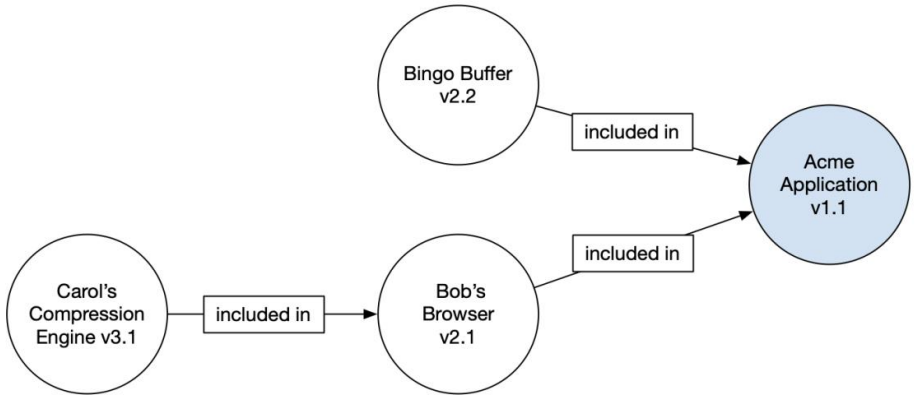
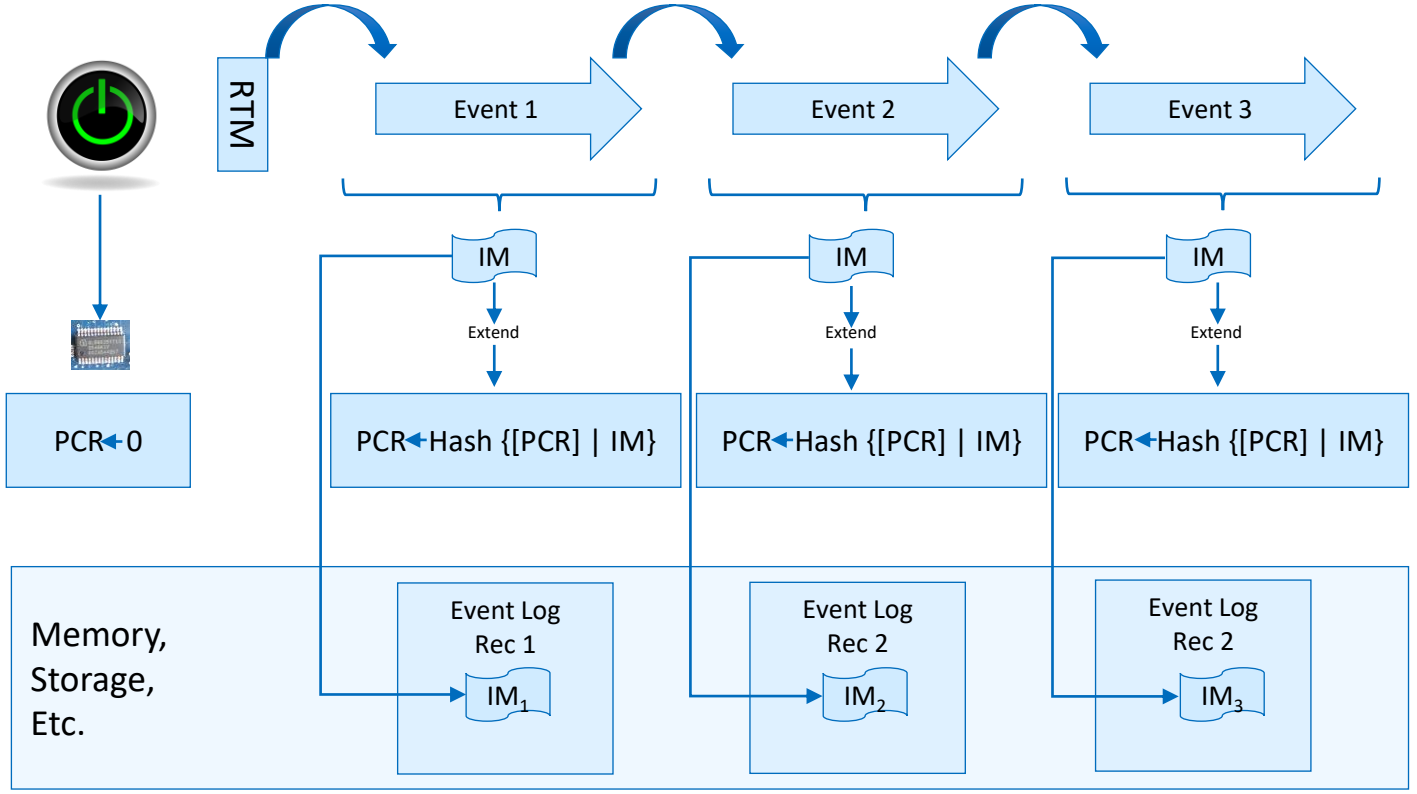



Figure 1: Conceptual SBOM graph

| Component Name | Supplier | Version | Author | Hash | UID | Relationship |
|---|---|---|---|---|---|---|
| Application | Acme | 1.1 | Acme | 0x123 | 234 | Primary |
| \|--- Browser | Bob | 2.1 | Bob | 0x223 | 334 | Included in |
| \|--- Compression Engine | Carol | 3.1 | Acme | 0x323 | 434 | Included in |
| \|--- Buffer | Bingo | 2.2 | Acme | 0x423 | 534 | Included in |

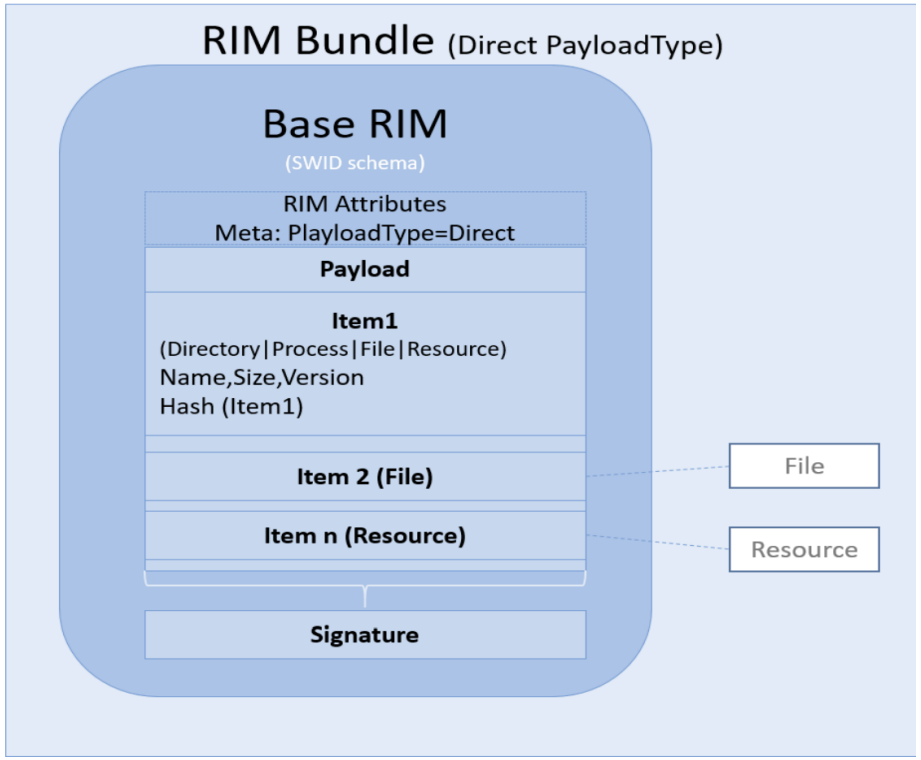
# TCG Firmware Integrity Measurement



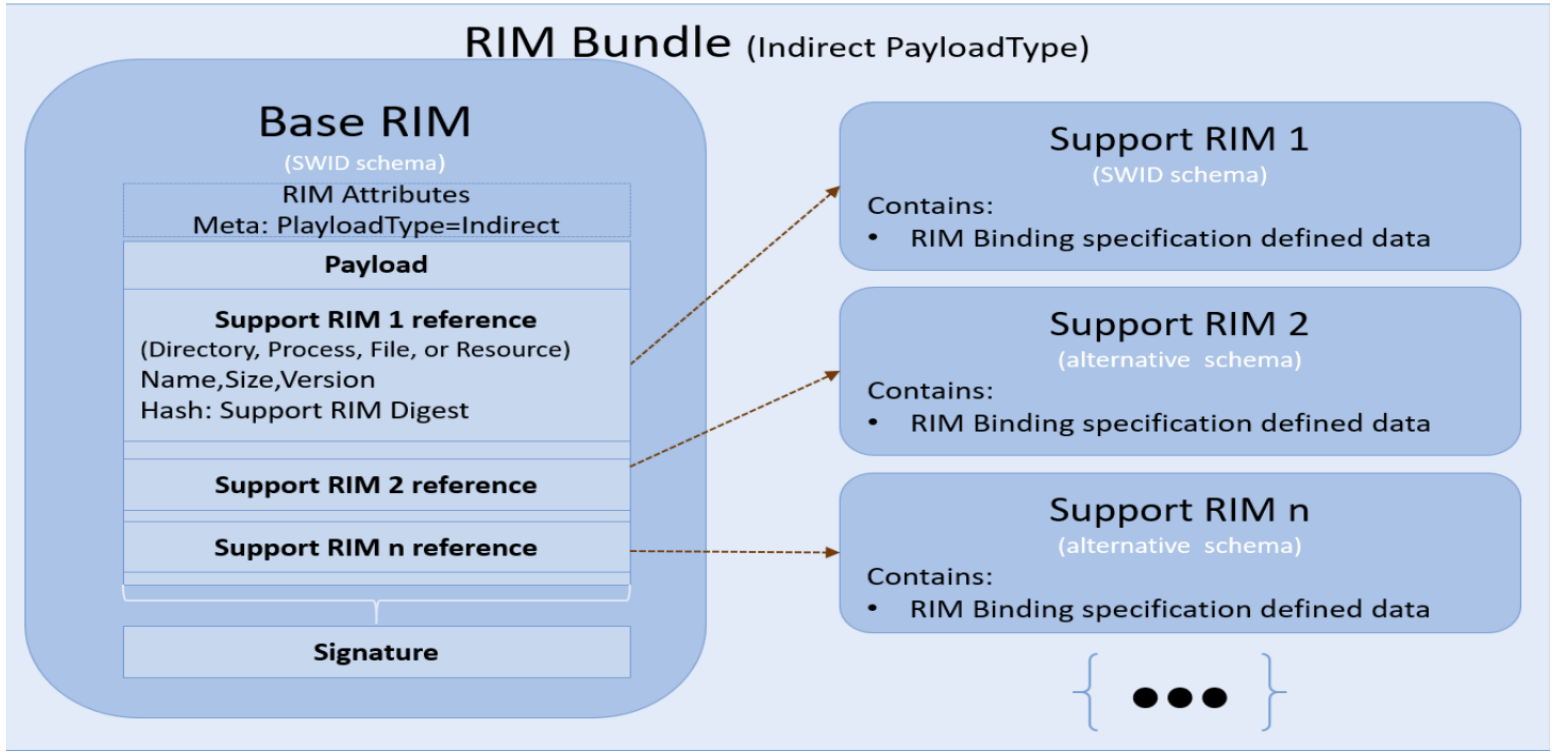

 

# TCG Reference Integrity Manifest

## Direct

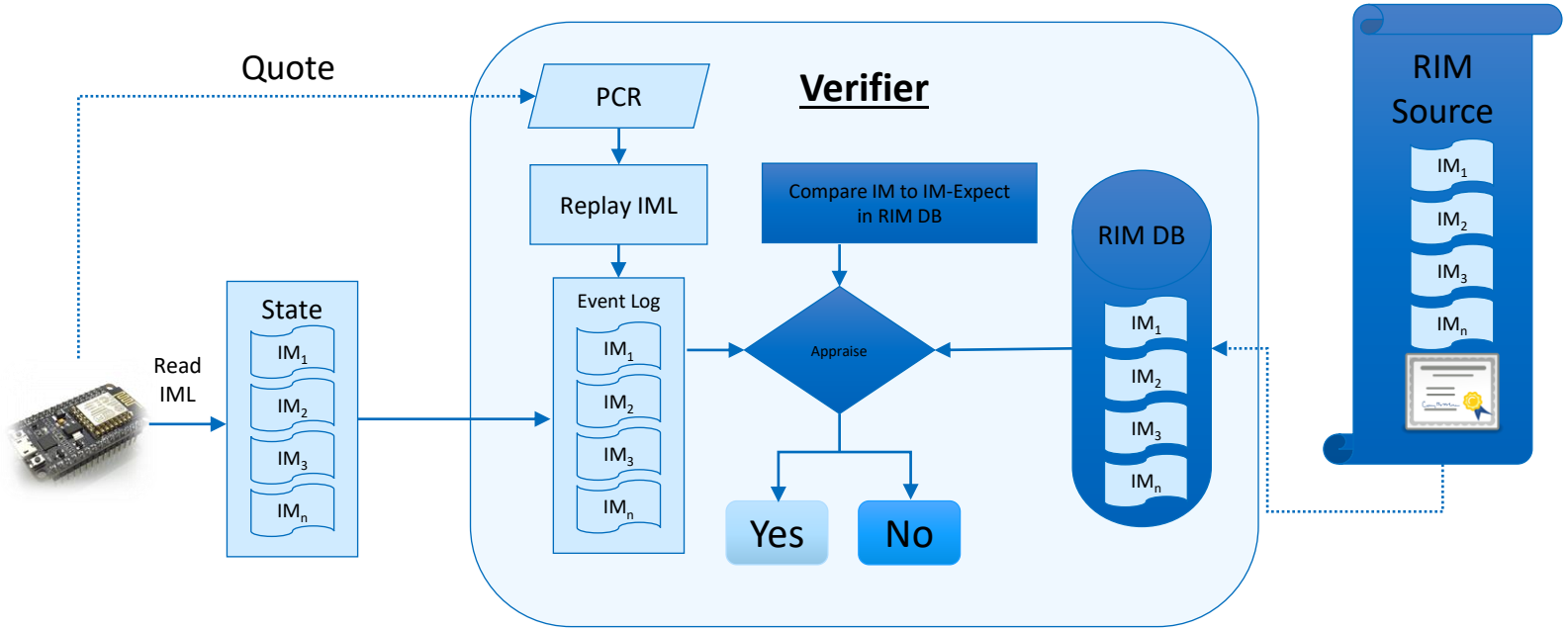



## Indirect



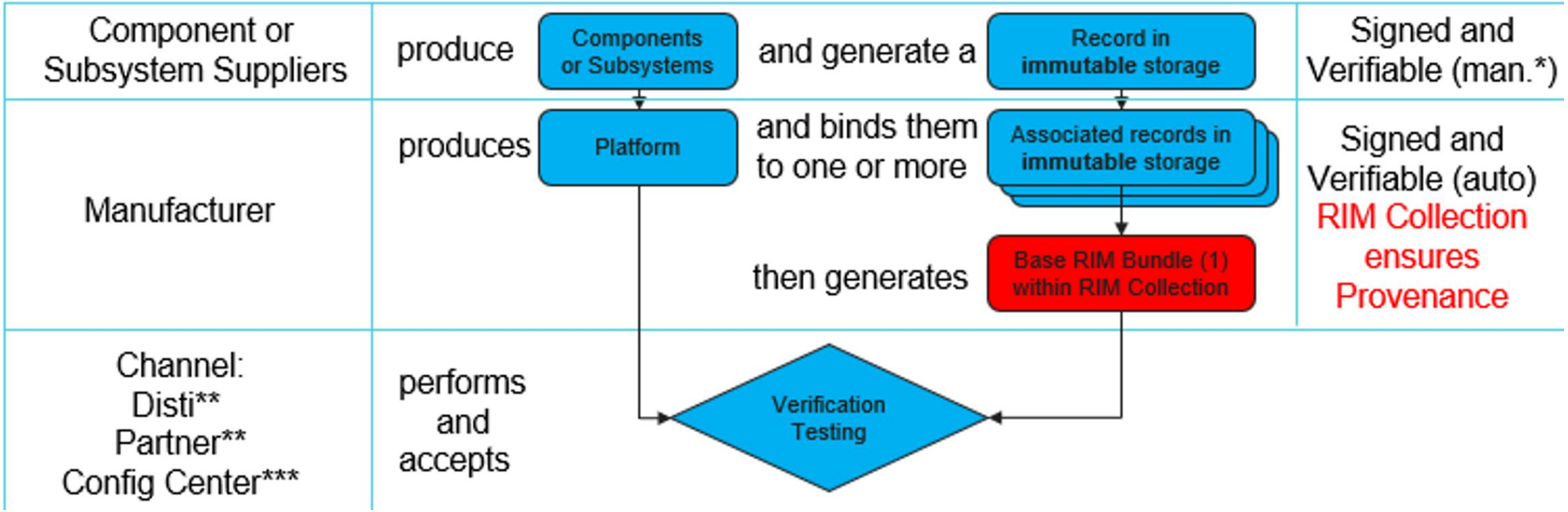

 

# How it all fits together



# Summary

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