Cloud Technology in Public Safety

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Doug Gartner

Principal Solutions Architect, AWS

9-1-1

PSAP
Next Generation Core Services
Call Handling/Taking
Computer Aided Dispatch

Network
DirectConnect
5G/LTE
Satellite

Emergency Communications
Notifications
GIS
Recording

Law Enforcement

Mission Critical
Computer aided dispatch (CAD)
Records management
Digital evidence management

Sub-Mission Critical
Document management
ALPR
Specialized ERP

Video Storage
Body worn camera
CCTV/VMS
In-car/On-scene

Courts

Mission Critical
Next Gen Court Case Management
Jury Administration
Probation Case Management
Attorney Case Management

Court Solutions
Online Dispute Resolution
Electronic Communications
Virtual Hearings
Digital Recording & Transcription
eDiscovery
Digital Evidence

Probation/ Parole
Electronic Monitoring
Alternatives to incarceration
Second chance hiring

Corrections

Mission Critical
Offender/Jail Management Systems
Electronic Healthcare Records
Video Management/Access Controls

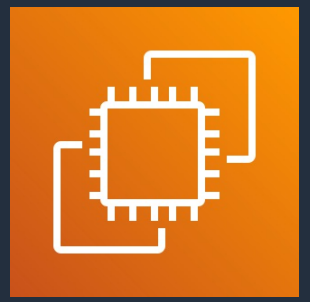
Corrections
Inmate Communications
LMS- Educational Content
Inmate Trust Account/Commissary

Probation/ Parole
Electronic Monitoring
Alternatives to incarceration
Second chance hiring

WHAT IS CLOUD?

On-demand delivery of IT resources through the Internet with pay-as-you go pricing

What is Nitro?



Amazon EC2 Nitro

Launched in November 2017

In development since 2013

Purpose-built hardware and software

Custom hypervisor developed for AWS

Every new instance launch uses Nitro

Nitro System is the foundation of AWS

Nitro Card

Local NVMe storage
Elastic Block Storage
Networking, monitoring, and security

Nitro Security Chip

Integrated into motherboard
Protects hardware resources

Nitro Hypervisor

Lightweight hypervisor
Memory and CPU allocation
Bare metal-like performance

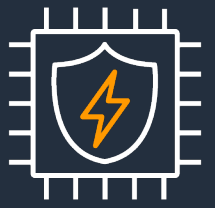
Nitro Enclaves

Isolated environments for highly sensitive data processing
Utilizes EC2's Isolation Technology

Nitro SSD

60% lower I/O latency
Firmware Upgrades w/o Interruption
Encryption at rest

Nitro TPM



TPM 2.0 specification
Cryptographic attestation of instances integrity

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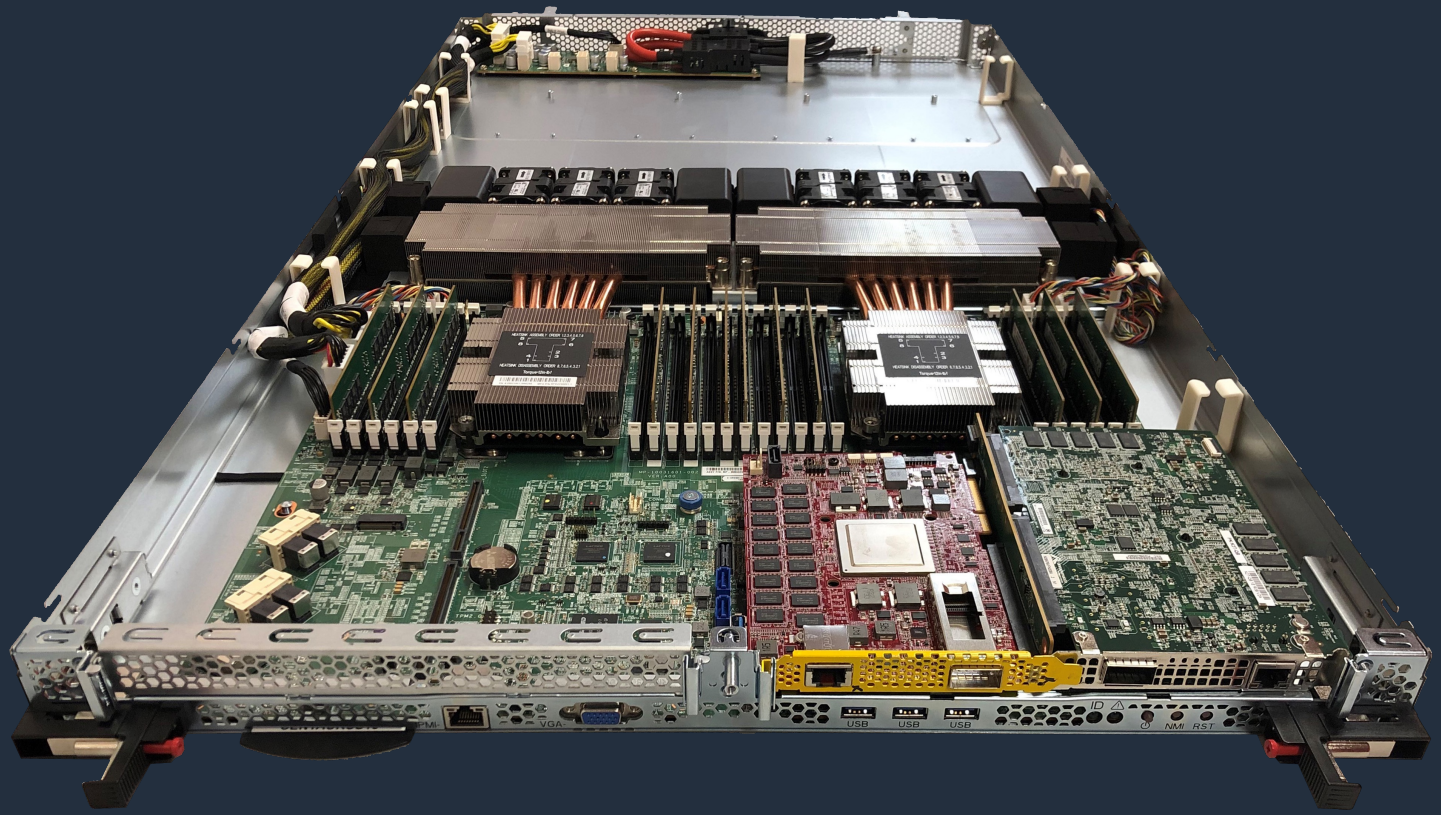
Nitro-Powered EC2 Server



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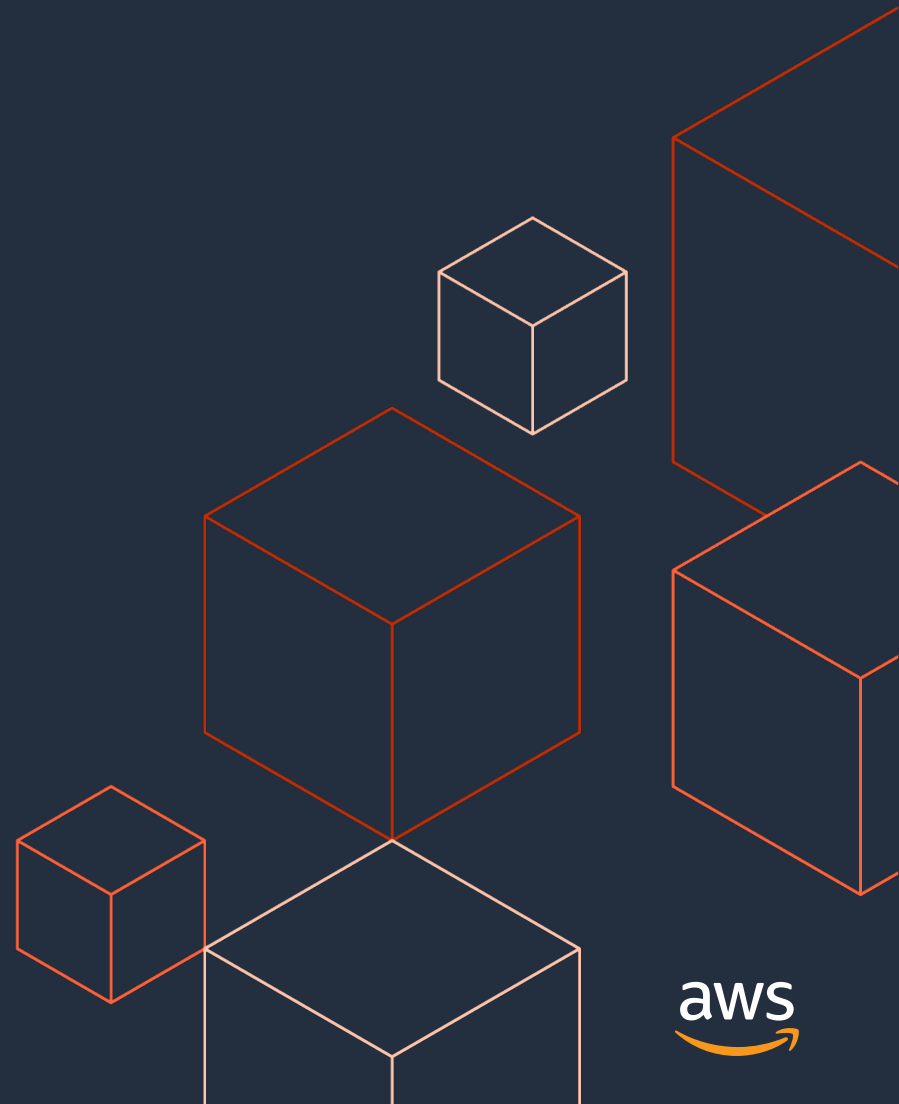
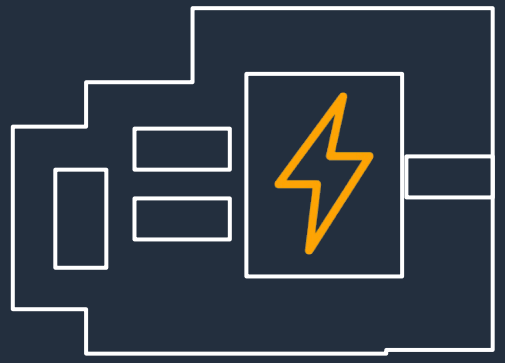
The Nitro Card



Nitro Card



- System control
  - Provides passive API endpoint
  - Coordinates all other Nitro Cards
  - Coordinates with Nitro Hypervisor
  - Coordinates with Nitro Security Chip
- Exposes services to instances as virtual devices over PCIe

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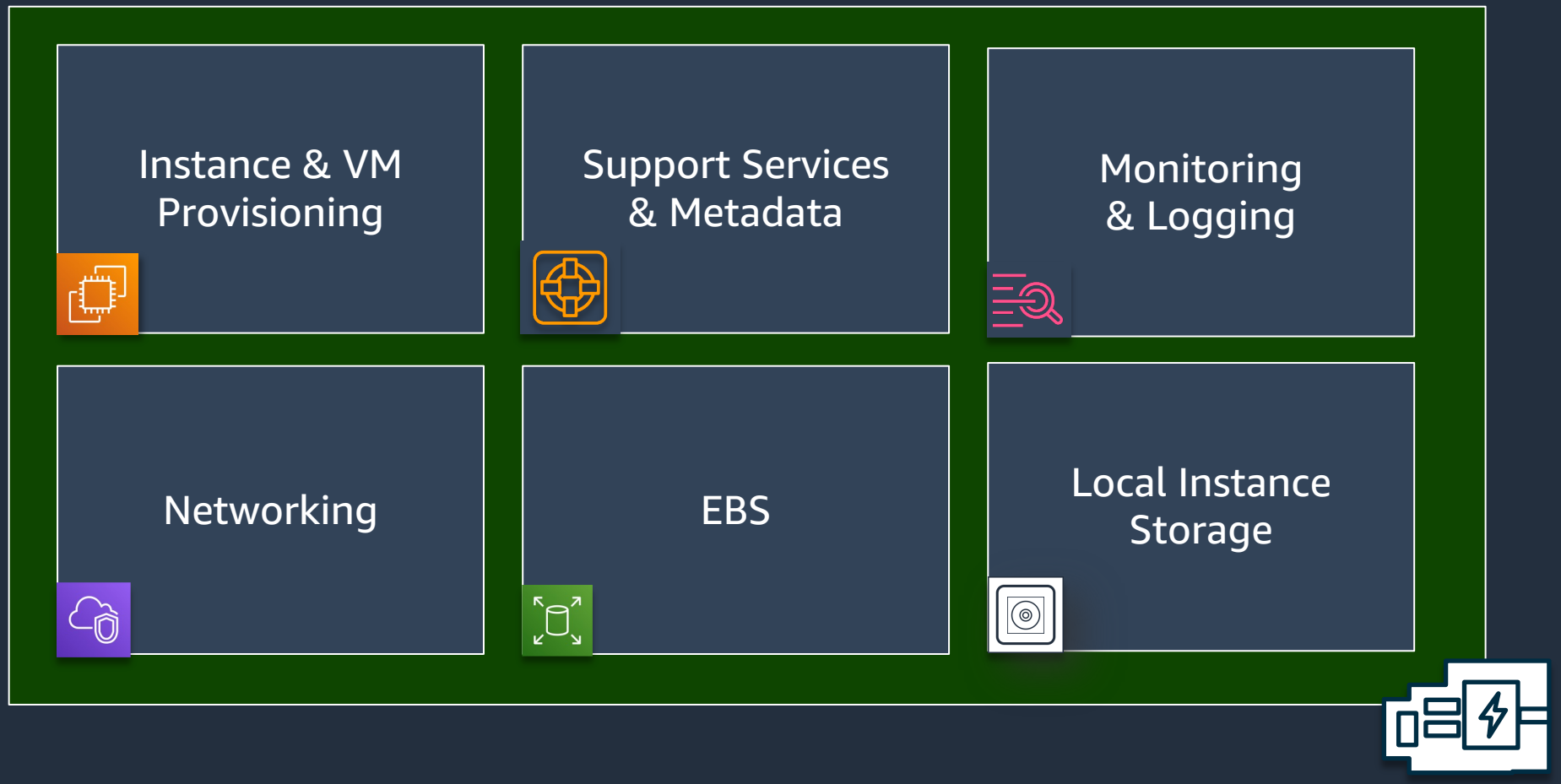
Functions of the Nitro Card



The Nitro Card(s)

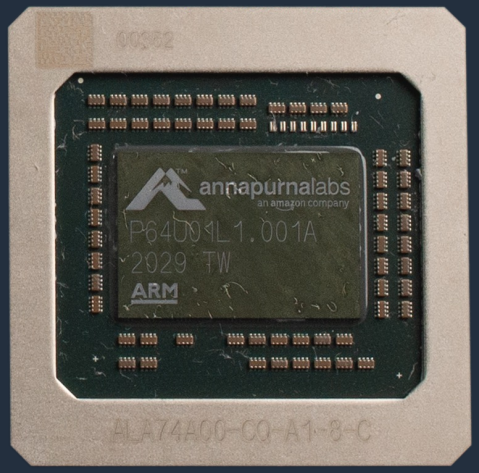
Nitro iteration & scope expansion

- Management, monitoring, instance storage, etc
- Performance improvements over the years (v1 to v5)
- More hardware accelerated functions over time

NITRO 1

NITRO 2

NITRO 3



NITRO 4

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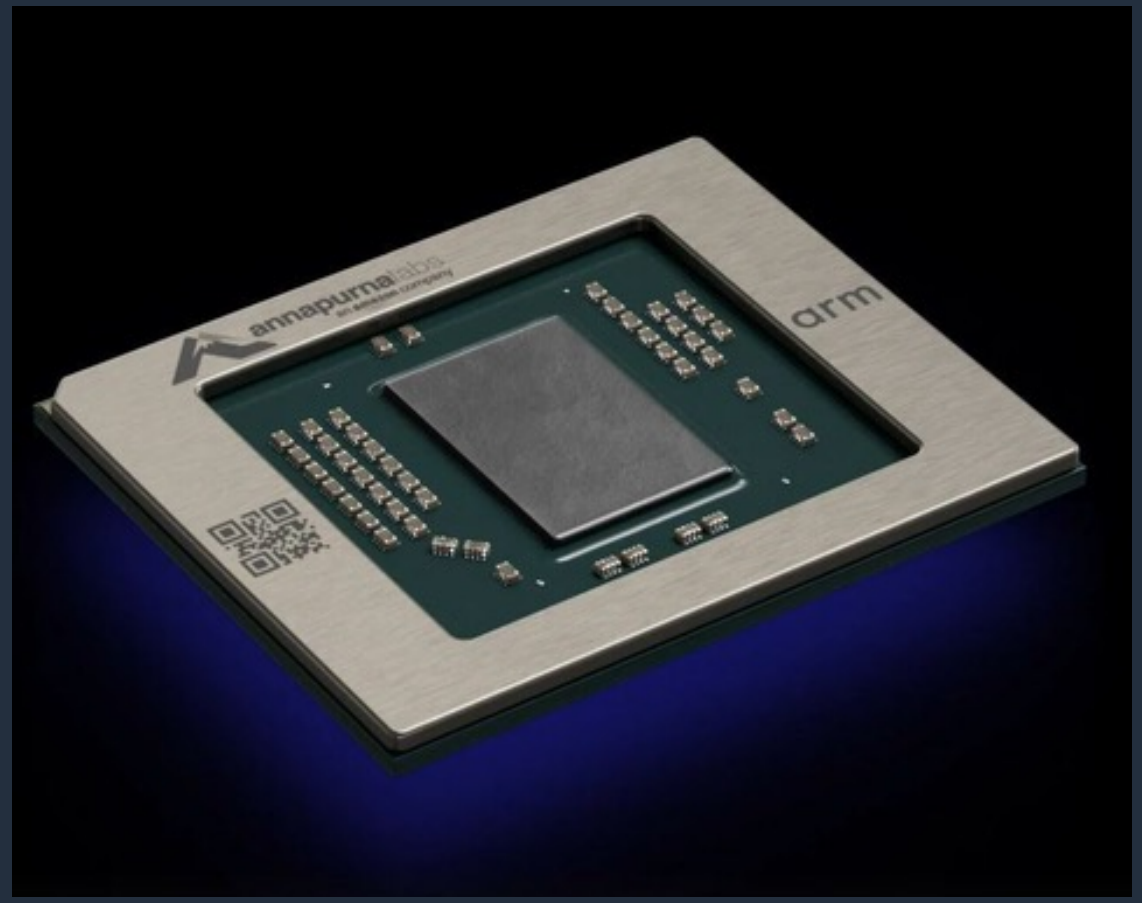
Nitro V5

- 2x More Transistors
- 50% Faster DRAM Speed
- 2x More PCIe Bandwidth



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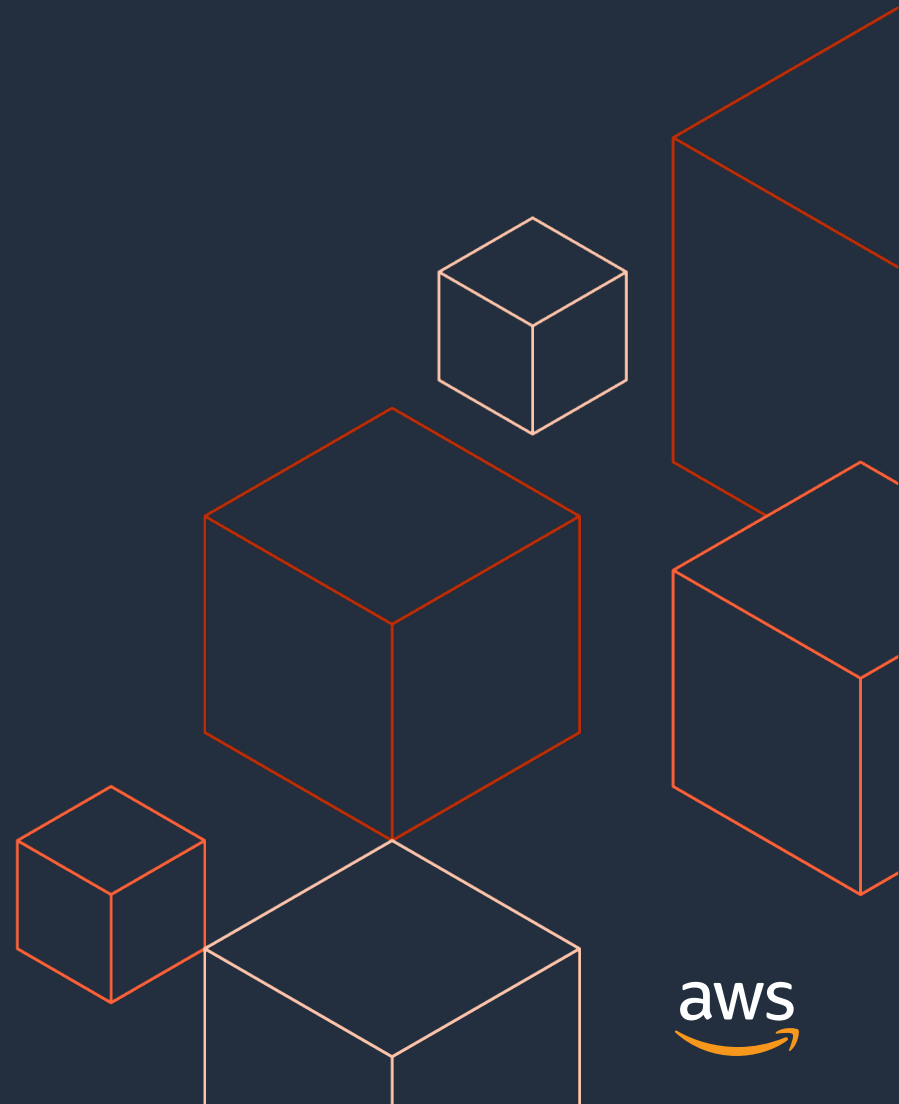
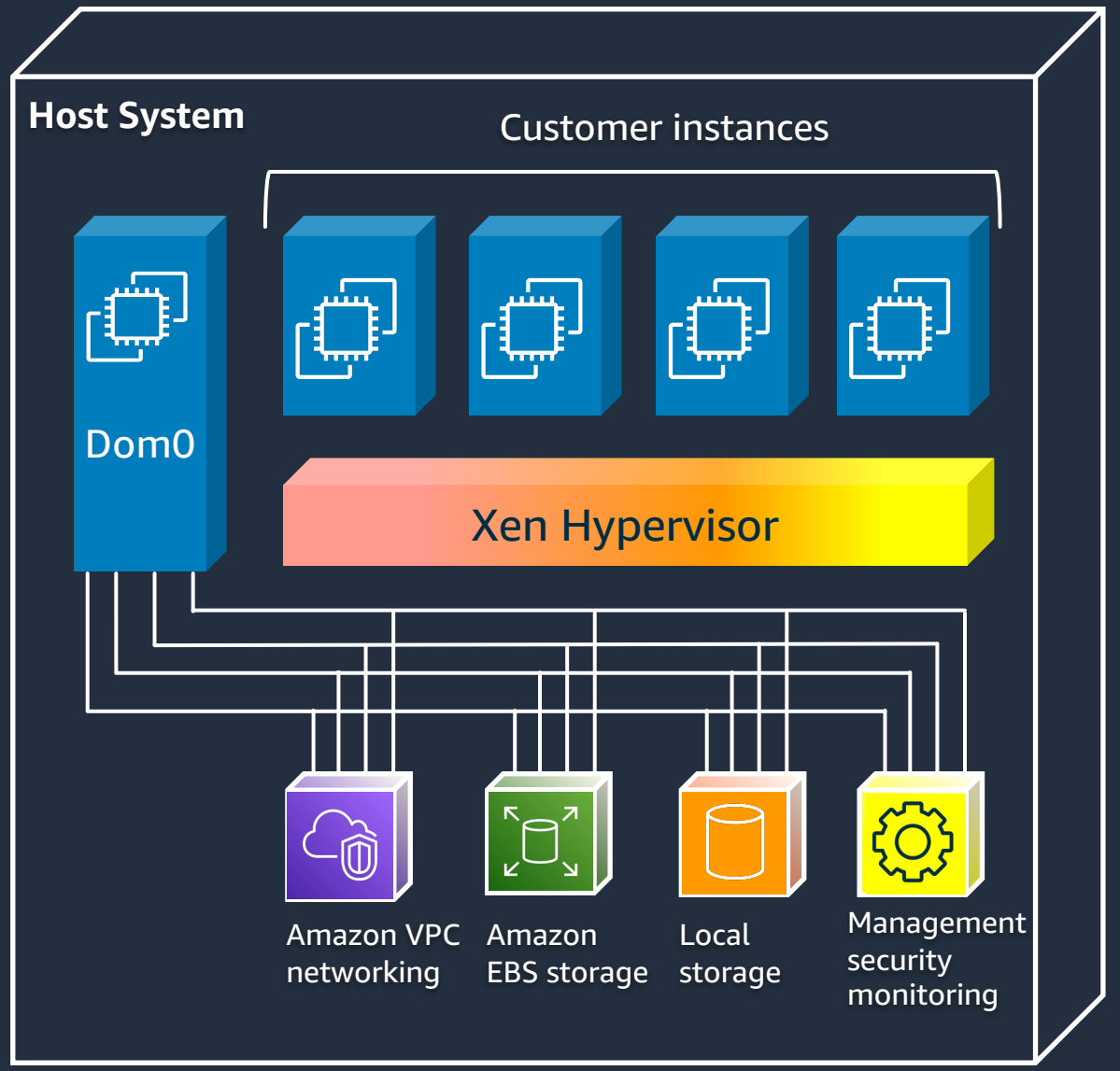
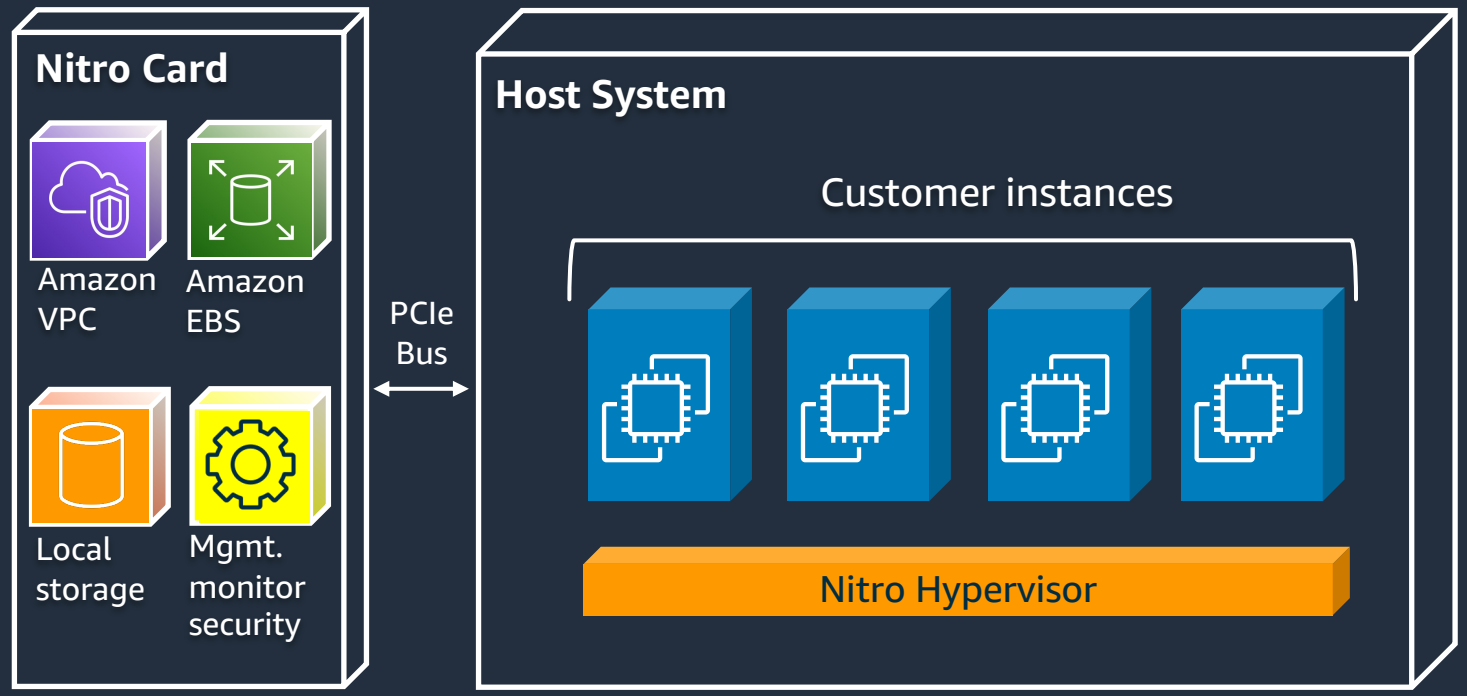
Nitro Hypervisor



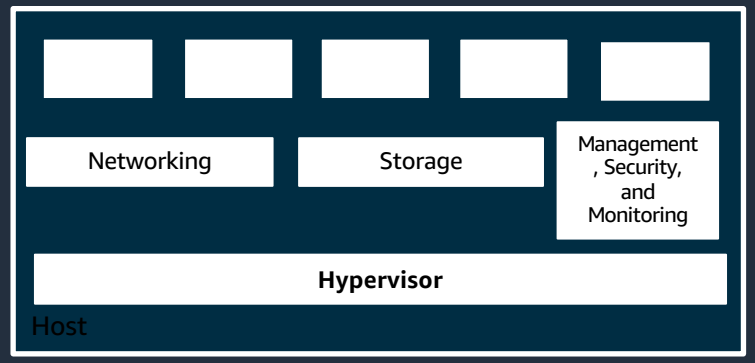
Before Nitro . . .



With Nitro



Reinventing virtualization for the cloud

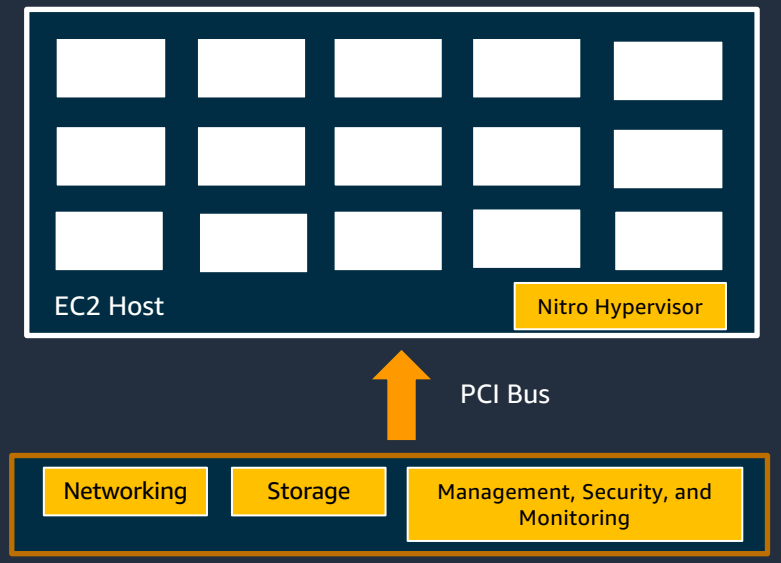


Classical virtualization

Allows operator access to host hardware

Networking, storage, and monitoring are all running on the same hardware that runs customers' VMs.

Reduced performance and resources available for VMs



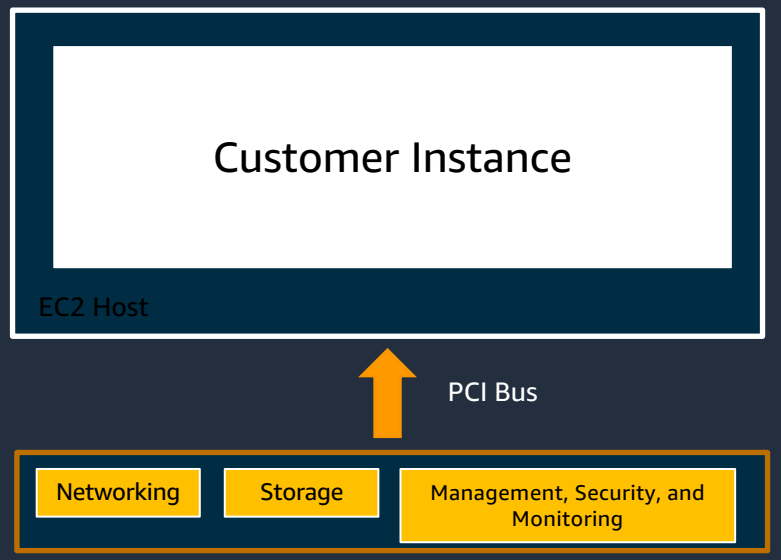
EC2 virtual machines

Trusted computing base significantly reduced.

All networking, storage, and monitoring runs on a separate, isolated, and secured hardware.

Prohibits all administrative access, including those of Amazon employees.

Only a thin hypervisor on the host.



EC2 bare metal instances

All benefits of Nitro with the hypervisor removed.

Customers can deploy applications that use physical hardware resources directly on AWS infrastructure.

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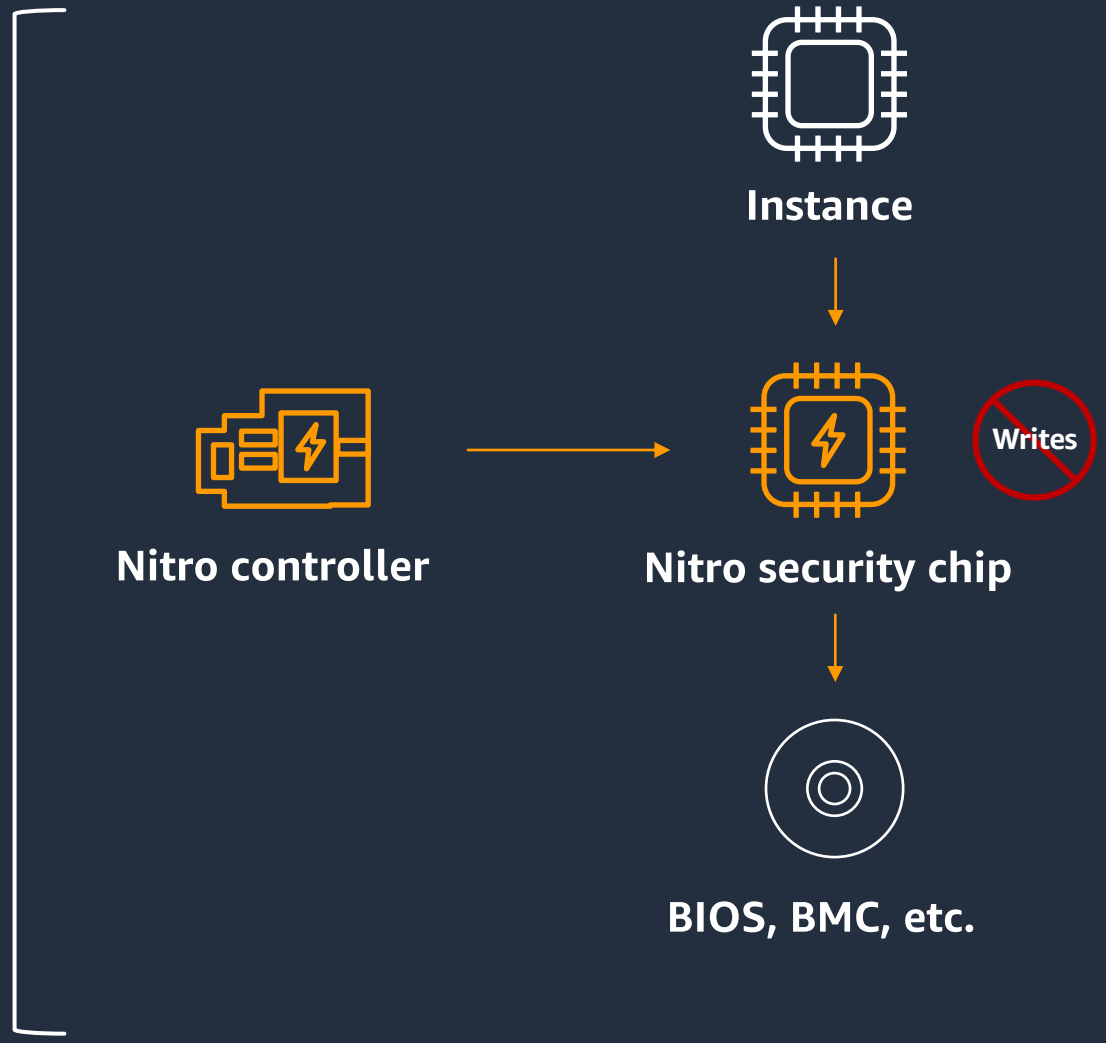
Nitro Security Chip

Integrated into motherboard

Traps I/O to nonvolatile storage

Hardware root of trust



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The AWS Nitro System enables ...

SECURITY

Enhanced security that continuously monitors, protects, and verifies the instance hardware and firmware

PERFORMANCE

Better performance across CPU, networking, and storage

INNOVATION

Building blocks can be assembled in many different ways, giving us the flexibility to design and rapidly deliver EC2 instances

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Thank you!