Agenda

Introductions

What is edge computing ?

How does edge computing work?

5G and Edge computing

Demonstration

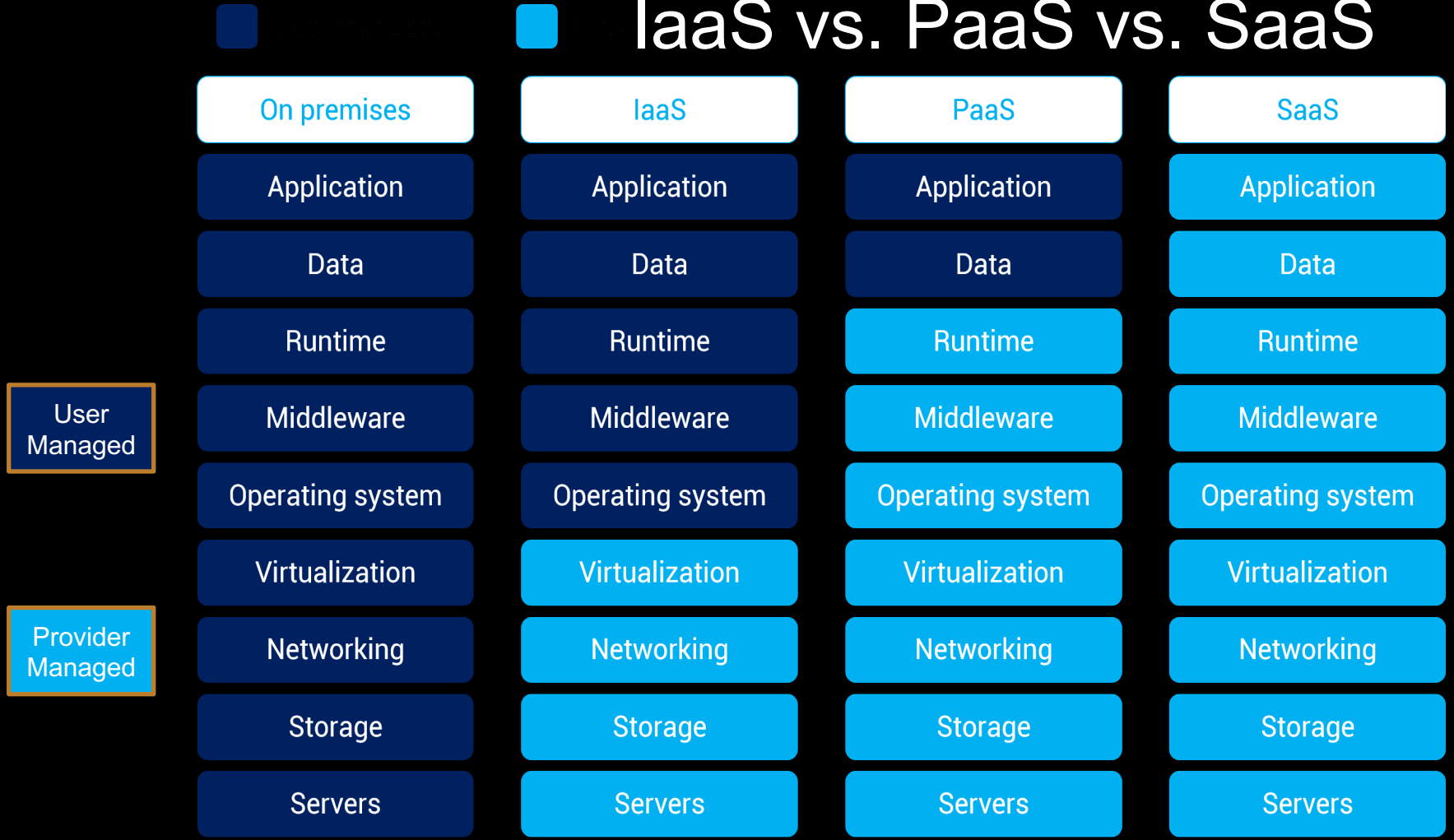
IaaS vs. PaaS vs. SaaS

Infrastructure as a service (IaaS)
A vendor provides clients pay-as-you-go access to storage, networking, servers, and other computing resources in the cloud.

Platform as a service (PaaS)
A service provider offers access to a cloud-based environment in which users can build and deliver applications. The provider supplies underlying infrastructure.

Software as a service (SaaS)
A service provider delivers software and applications through the internet. Users subscribe to the software and access it via the web or vendor APIs.

IaaS vs. PaaS vs. SaaS

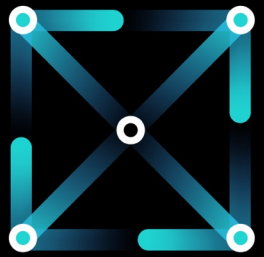


Edge Computing…

places enterprise applications closer to where the data is created, and where actions need to be taken

https://www.ibm.com/thought-leadership/institute-business-value/report/edge-computing

Edge Computing Enables

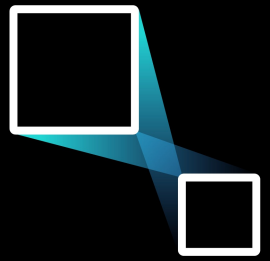


Continuous operations

running critical applications, even when disconnected, reduces disruption and cost

Faster insights and actions

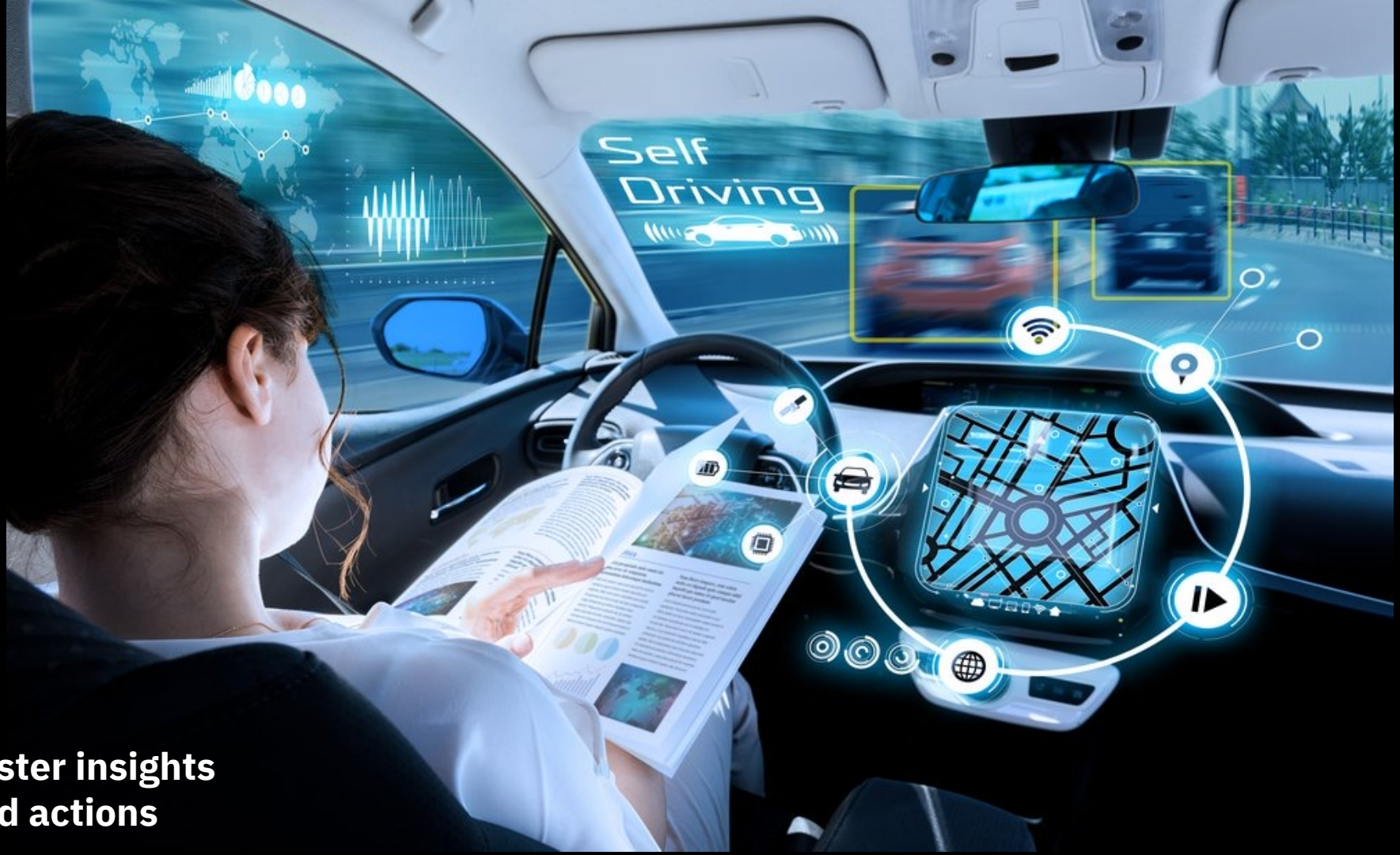
running IT closer to an explosion of data, improves speed-to-action



Better data control and costs

minimizes data transport to central hubs, reduces vulnerabilities & costs

Continuous operations



Faster insights and actions

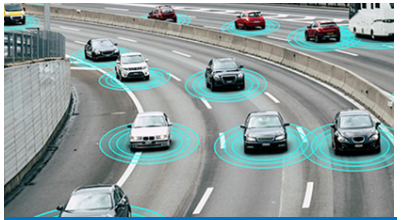
Better data control and costs

5G & Edge will reshape industry

Financial

Comply with data regulations and improve client experience

Vehicles



Improve driver experience and reduce cost of operations

Kiosks

Improve client experience, lower cost of operations and higher security

Healthcare

Improve patient experience and improve data privacy and security

Manufacturing

Reduce downtime, improve throughput, quality and worker safety

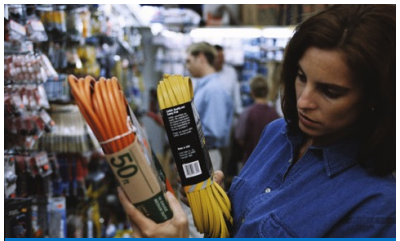
Distribution

Improve resiliency and agility and enable evolution to autonomous operations

Insurance

Improve client experience and safety, and protect privacy

Retail



Improve client experience and reduce operational and inventory costs

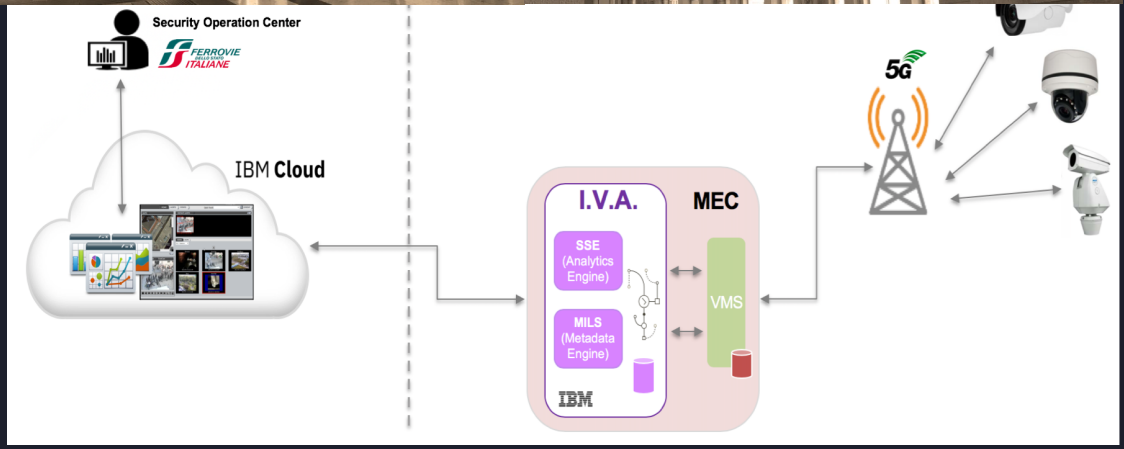
Urban and commuters safety in train stations

The solution enablse the adoption of smart video-surveillance systems, which not only record, but also automatically detect and signal suspicious or anomalous behaviours, the prevention of public spaces is more effective. Large turnout places, like stations, could have a reduced probability of terrorist attacks, harassment and vandalism, allowing a more accurate post-event analysis, too.

Source *[Accessed 2020-09-22]:* https://www.vodafone5g.it/use-cases-internal.php?id=44&icmp=dkt_hp_sliderUseCases_id44

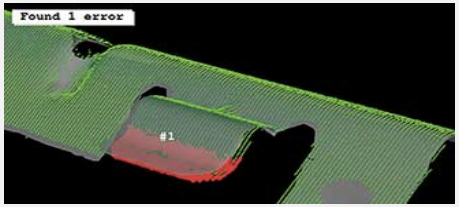
Milan UC13: Rail Station Security

Implement an innovative protection system to be used in critical and complex structures (Milan central station) through video analysis and data processing in real time about specific situations like abandoned object, person laying to the ground, abnormal flows of people



The three use cases analyzed for 5G edge computing in **Manufacturing and Remote Operations**

1 Product Quality - Production Optimization



Edge devices process quality feed in real time to determine quality and enable instant, self-governing adjustments.
5G enables 1) connection of 10x more devices/sensors to network edge, 2) video/acoustic data to be transmitted from distant cameras..; 3) optimization across multiple floors & sites…

2 Asset Health – Predictive Maintenance

Edge servers analyze data of all machines to predict maintenance issues and trigger actions. **5G** enables 1) performant wireless connection of machines to network edge, 2) very low latency for remote machine control and maintenance execution, 3) real-time integration with factory technicians for human actions with AR/VR;

3 Enhanced worker safety

Edge devices in factories alert when crossing safety thresholds; **5G** network edge enables real-time analysis of data-feed from distant / mobile devices and trigger alerts.

Demonstration

“Managing hundreds of remote devices is **overwhelming**, and I do not have enough resources to update software applications in a safe manner .”

Elsa, Global Security Company CEO

Goals

- Run and update AI-based surveillance applications, **even when disconnected** to reduce service disruption and revenue loss
- Run vision recognition software closer to where data is captured to **improve speed to action** and grow business opportunities
- Minimize network data transport to central hubs to **reduce exposure and transfer costs** and follow data residency and privacy regulations

Nodes | Services | Patterns | Policies

Find nodes

Add node +

Refresh Last updated: 9 minutes ago

Nodes

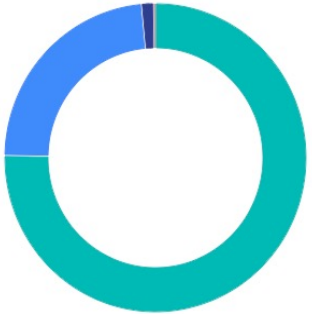
Total edge nodes	Edge devices	Edge clusters
939	919	20

Deployments

Nodes running a policy	Nodes running a pattern	Nodes with agent errors
924	3	0

Node states

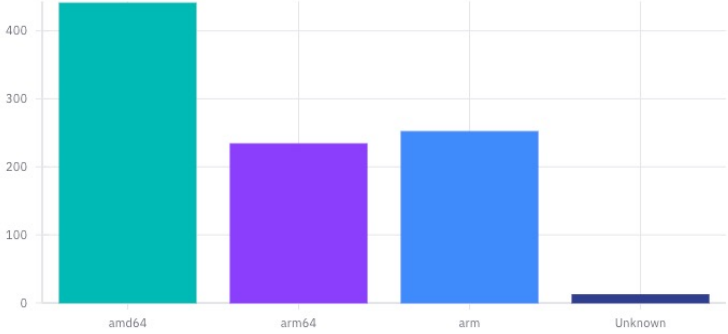
Breakdown of nodes by their state



Active with services | Active without services | Unregistered | Inactive | Has error

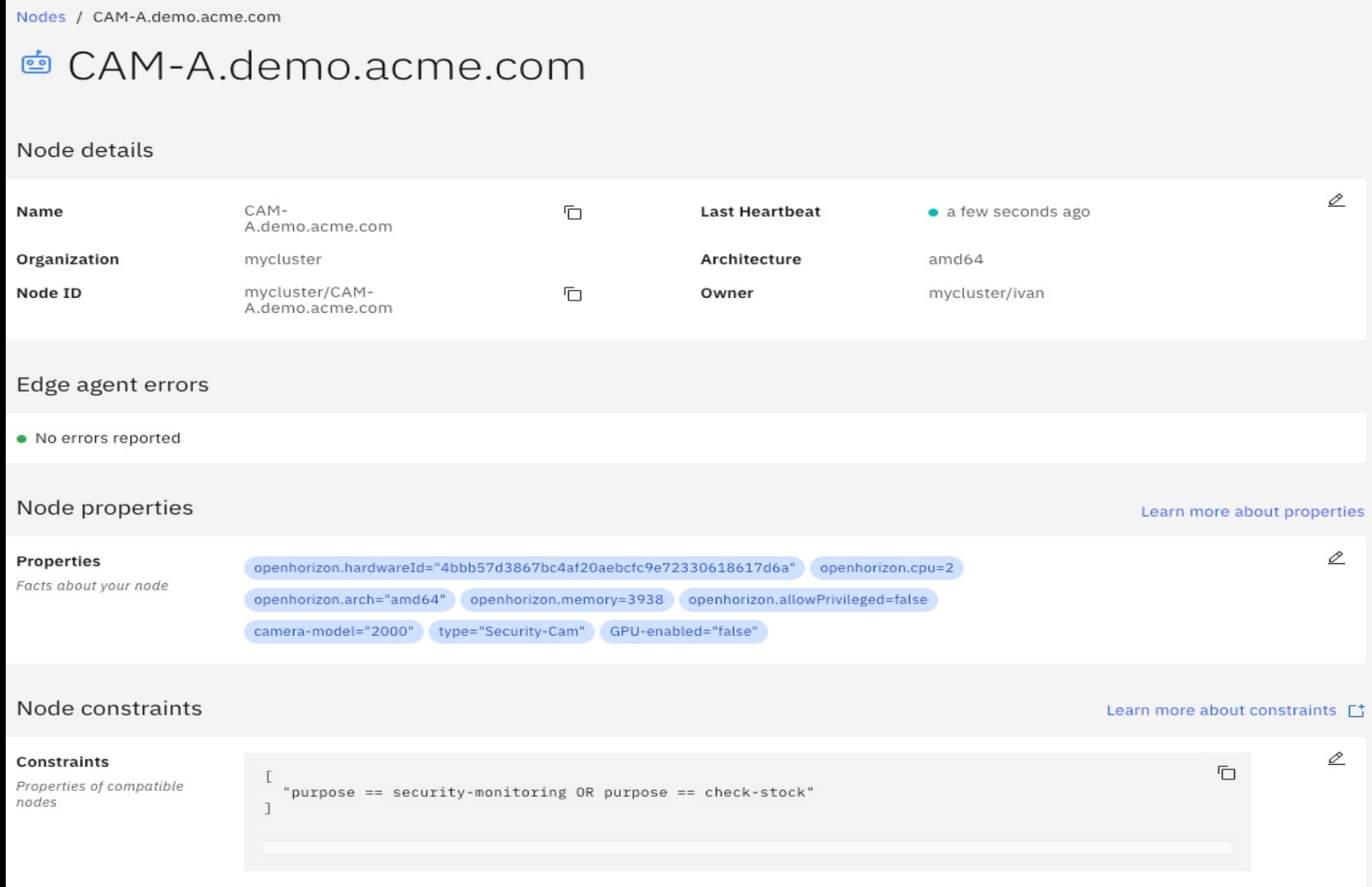
Node architectures

Breakdown of all node architectures



amd64 | arm64 | arm | Unknown

Demo


Nodes / CAM-A.demo.acme.com
CAM-A.demo.acme.com
Node details
Name
CAM-A.demo.acme.com
Organization
mycluster
Node ID
mycluster/CAM-A.demo.acme.com
Last Heartbeat
a few seconds ago
Architecture
amd64
Owner
mycluster/ivan
Edge agent errors
No errors reported
Node properties
Learn more about properties
Properties
Facts about your node
openhorizon.hardwareId="4bbb57d3867bc4af20aebcfc9e72330618617d6a"
openhorizon.cpu=2
openhorizon.arch="amd64"
openhorizon.memory=3938
openhorizon.allowPrivileged=false
camera-model="2000"
type="Security-Cam"
GPU-enabled="false"
Node constraints
Learn more about constraints
Constraints
Properties of compatible nodes
[
"purpose == security-monitoring OR purpose == check-stock"
]

Questions & Answers

Resources

IBM Edge Application Manager
https://www.ibm.com/cloud/edge-computing

Models Deployed at the Edge
https://www.ibm.com/cloud/blog/models-deployed-at-the-edge

Analytics at the Edge
https://www.ibm.com/cloud/blog/analytics-at-the-edge


Thank You
Suksama
Maake
Asante
Shukria
Dhanyavadagalu
Vinaka
Kiitos
Manana
Dankon
Suksama
Dank Je
Maururu
Biyan
நன்றி
Dziekuje
Chokrane
Arigato
Grazie
Juspaxar
Gracias
Najis Tuke
Matur Nuwun
감사합니다
धन्यवाद
cảm ơn bạn
Grazas
Ua Tsaug Rau Koj
Nirringrazzjak
Děkuji
Obrigado
ありがとう
Rahmat
谢
Hvala
Danke
Merci
Go Raibh Maith Agat
Eskerrik Asko
谢
ขอขอบคุณคุณ
Salamat
Tingki
Gratias Tibi
Terima Kasih
Diolch i Chi
Taiku
Paldies
Khap Khun Kop
Tack
Di Ou Mèsi
Bedankt
Dakujem
köszönöm
Danke
Спасибо
Danke
Хвала