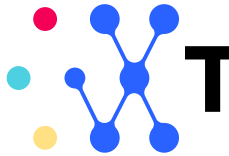


Trueverit. | Microservices 2020

Bologna, September 8-10, 2020

DISMANTLING THE MONOLITH

A TRUE STORY ABOUT MICROSERVICES IN IOT BUSINESS

Bologna, 10 Settembre 2020

Trueverit.

Simone Fardella

Co-Founder & CTO @ Trueverit

- Open hardware lover
- Open source addicted
- Tech Enthusiast

WHO WE ARE

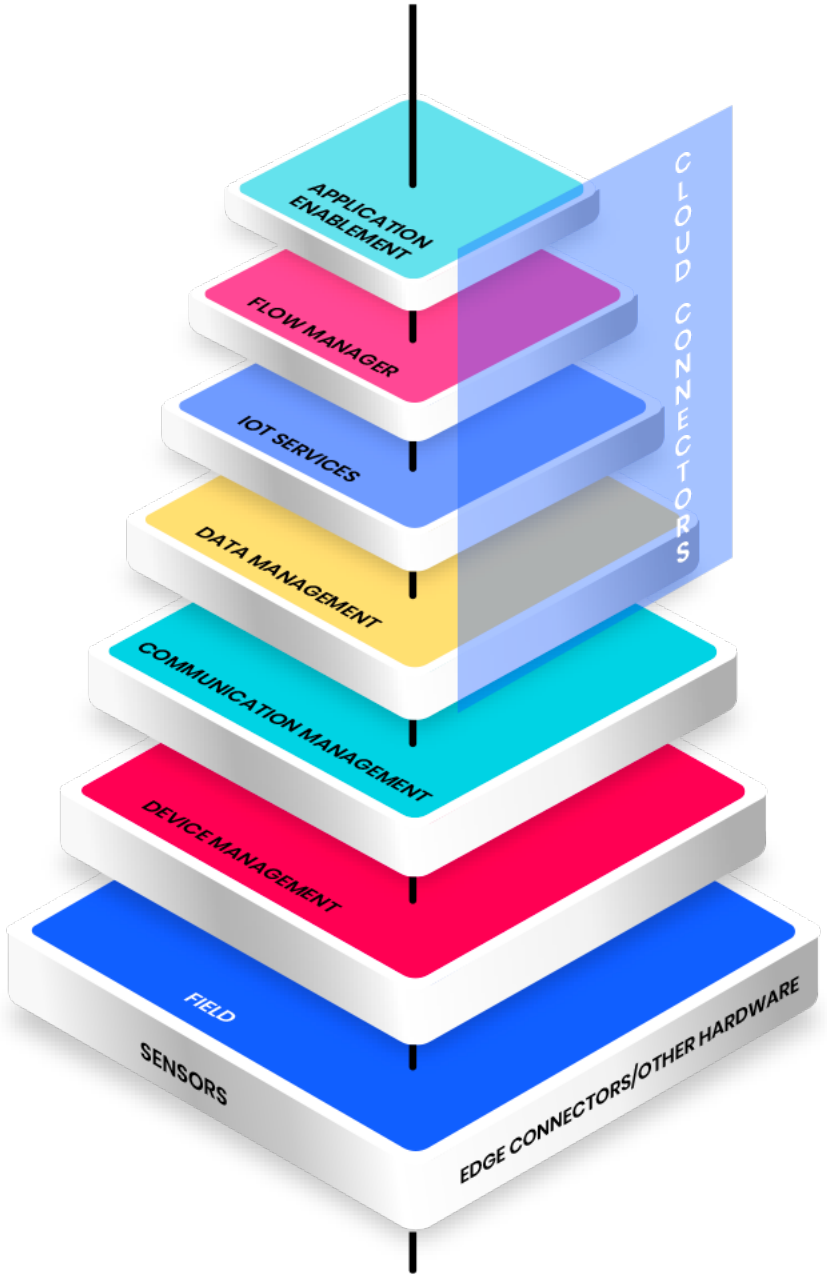
INDUSTRIAL IOT INTEGRATION PLATFORM

Agnostic approach (HW & Infrastructure)

Open Protocol

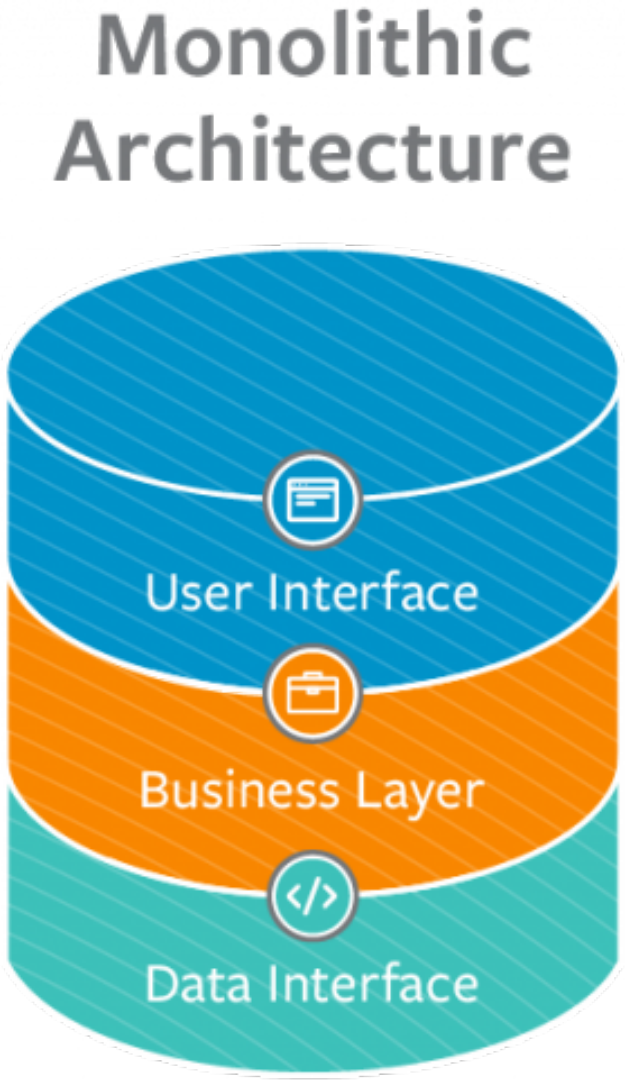
API based

Full stack *VS* Single Layer



2014

STARTING POSITION

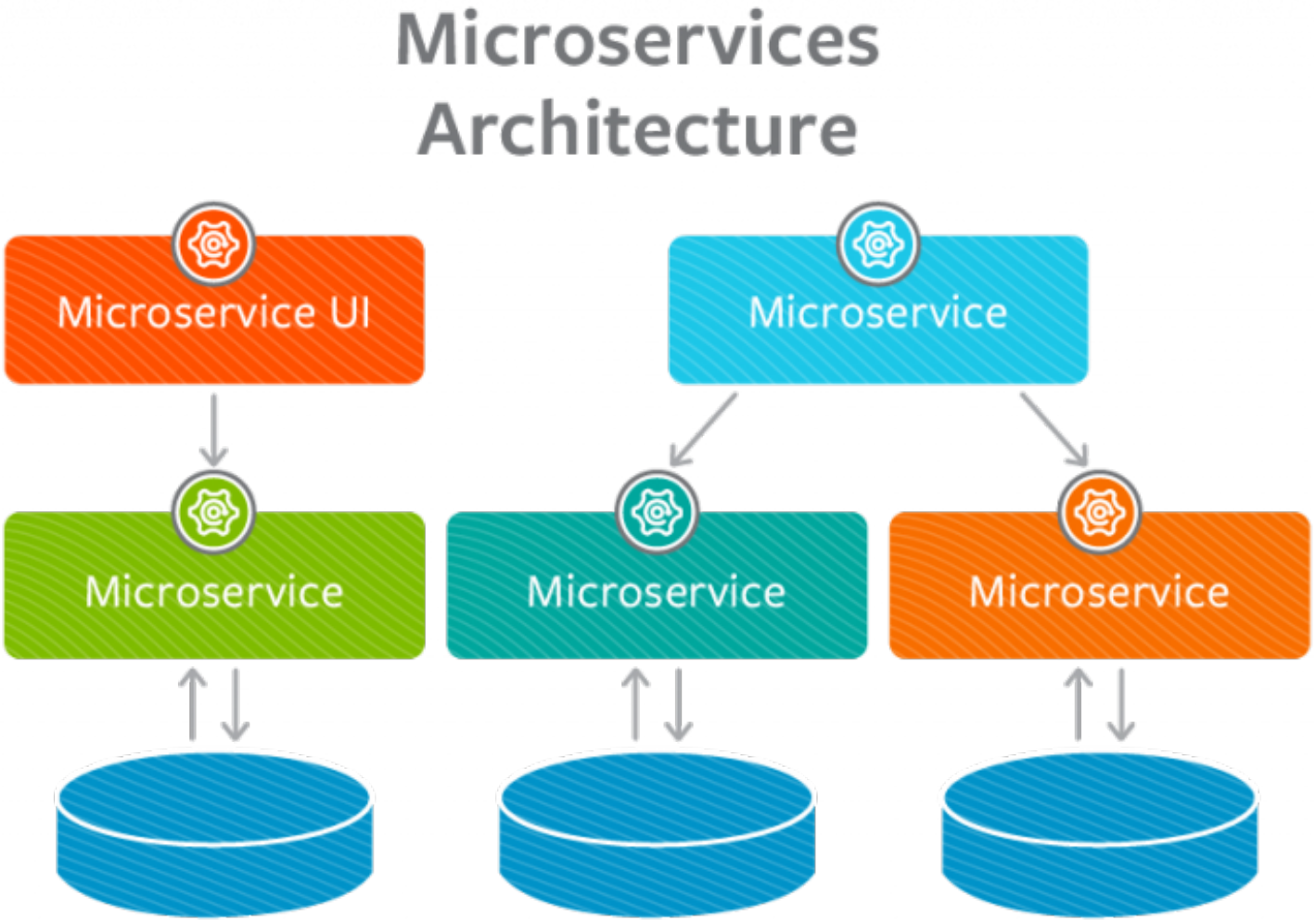


WEAKNESSES

- Single frontend and backend for each customer
- Services load balance difficult to implement
- HA was a distant dream
- Whole instances compromised with each update/refactoring
- Versioning was managed R/W mount

2017

INTERMEDIATE STAGE

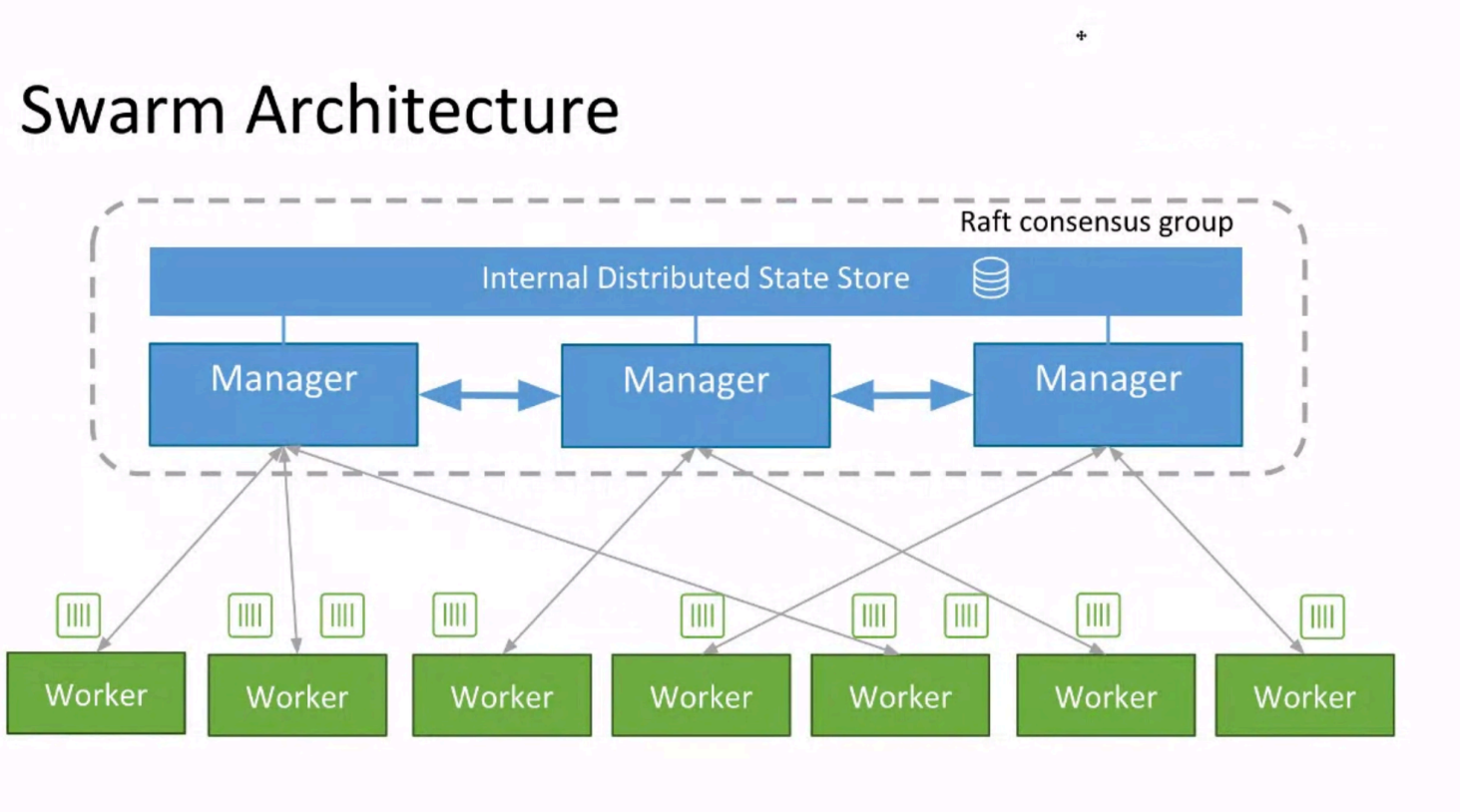


WEAKNESSES

- Difficult to scale a single microservice
- Not so easy to deploy and mainain in production
- Volumes? Data persistency represents problem
- How we can scale FE/DB?
- Versioning?
- Security between containers?
- Docker compose for ever?

2020

FINAL ARCHITECTURE – PRODUCTION GRADE



ADVANTAGES

- Quite well scalable
- Workload can be distributed between hosts and nodes
- Native TLS Encryption between Manager and Workers
- Every service represent a microservice: 18 microservices in production
- Versioning based on image hash
- Quite simple to deploy and manage

FINAL ARCHITECTURE – PRODUCTION GRADE PT II

Container Registry

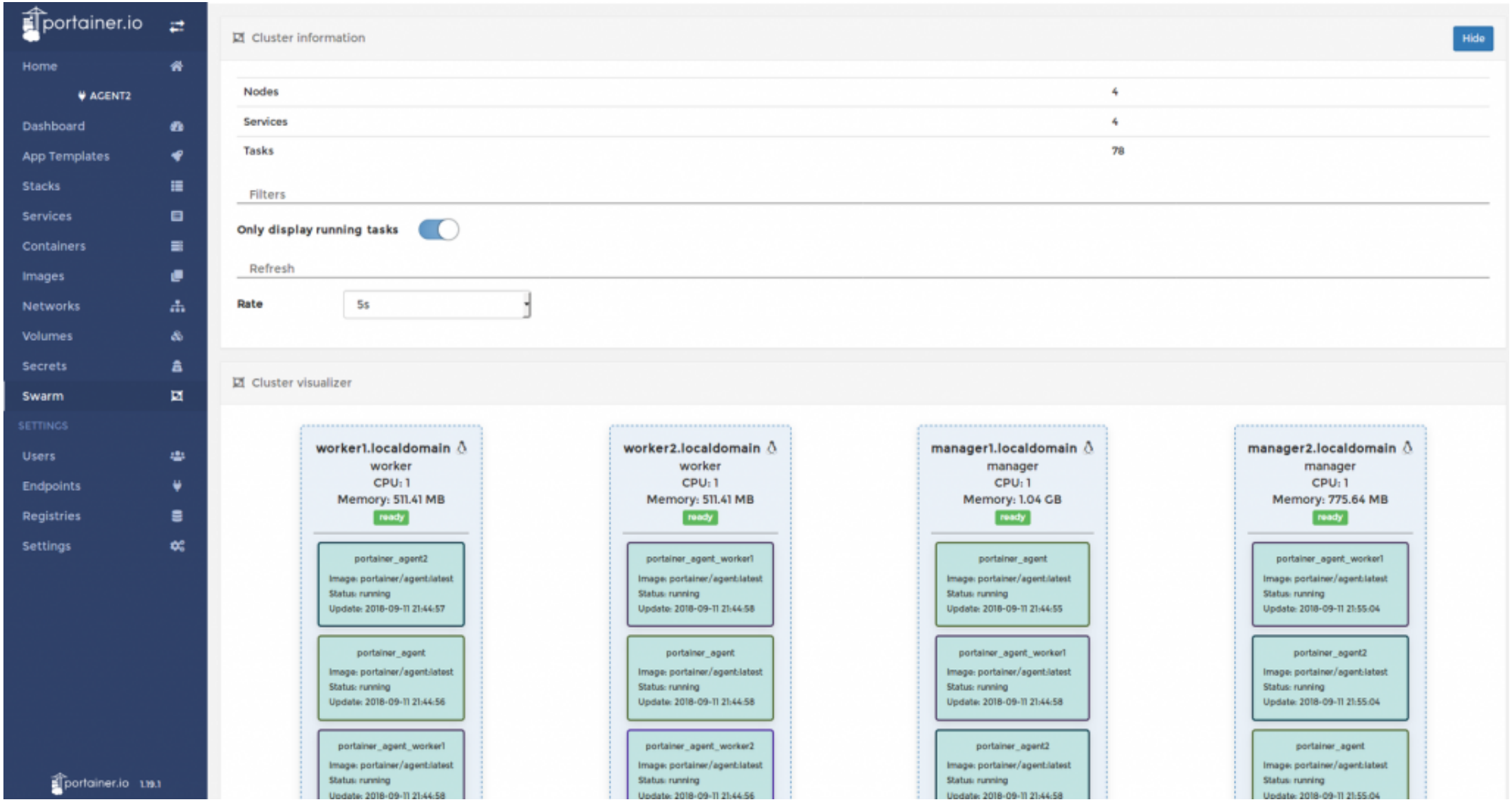
With the Docker Container Registry integrated into GitLab, every p

- simone.fardella/trueverit_cloud/cloud
- simone.fardella/trueverit_cloud/edge
- simone.fardella/trueverit_cloud/trueverit_iot_flow
- simone.fardella/trueverit_cloud/business_analytics
- simone.fardella/trueverit_cloud/backup-engine
- simone.fardella/trueverit_cloud/cloud_wsgi
- simone.fardella/trueverit_cloud/edge_wsgi
- simone.fardella/trueverit_cloud/trueverit_nginx_cloud
- simone.fardella/trueverit_cloud/trueverit_nginx_edge

simone.fardella/trueverit_cloud/cloud tags

Tag	Image ID	Compressed Size	Last Updated
024d5365	f024cd6a9	197.34 MiB	1 day ago
48da7a3e	7f601df8a	197.33 MiB	2 days ago
5365a9d2	649959ed6	197.33 MiB	2 days ago
5d515f77	cac78672d	197.33 MiB	1 day ago
c8930a99	91280b78c	197.33 MiB	3 days ago
latest	5c993e086	128.86 MiB	2 weeks ago

FINAL ARCHITECTURE – PRODUCTION GRADE PT III



USE CASE – TRUEVERIT INTO A MILITARY IT ENVIRONMENT

THE CHALLENGE

- Deploy Trueverit in a high security military environment
- Create a cluster of resources based on microservices
- Manage in simple and time effective solution updates and hotfix
- Obtain and mantain flexibility and high performance data collecting services maintaining security levels
- Deliver a system that can scale geographically

THE RESULTS

- Created single VM's on Vmware hosts, vm were inspected and validated by IT Security dept. -> Installed Docker Hypervisor -> deployed Stack Trueverit
- Cluster Swarm based
- Updates and versioning image based
- Each Docker swarm node communicates using TLS Encryptions
- Scalability guaranteed with simple network segment

KEY TAKEAWAY

DIFFICULTIES

- Many microservices
- Security e Vulnerability
- Cluster Management
- Image Dimensions

BEST PRACTICE

- Deploy compose or swarm stack
- Base images slim, few users privileged and expose limited to services
- Use of orchestration tools like (K8S, Portainer, etc...)
- Minimal dependencies, only what is needed!

Thanks.

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