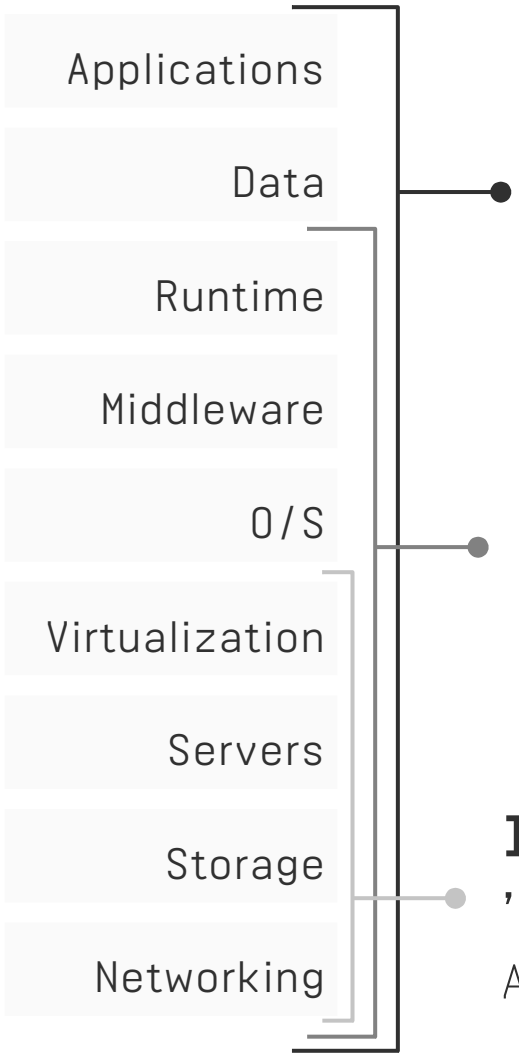
Cloud & container monitoring

04.05.2018, Lars Michelsen
Check_MK Conference #4

CONFERENCE
MUNICH 2018/5/2-4
#4

Some cloud definitions

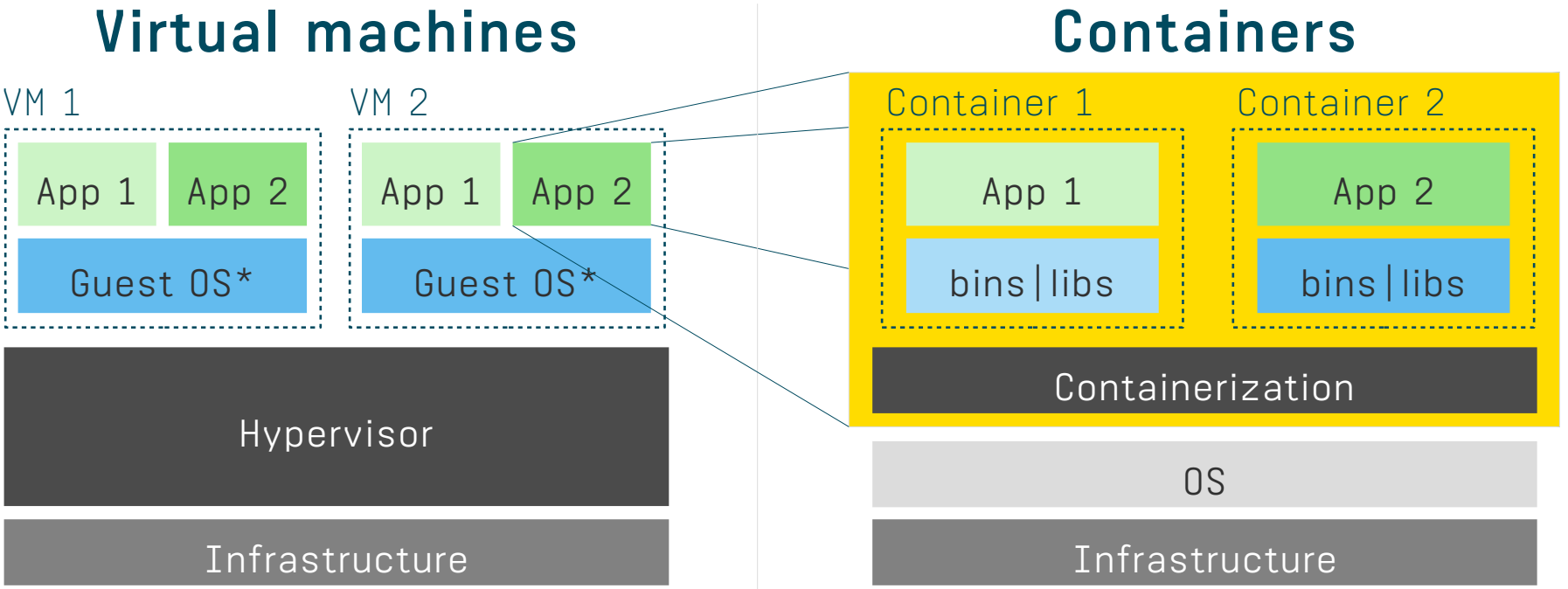


Software-as-a-Service (SaaS)
‘Applications’
Office 365, Salesforce, Netflix

Platform-as-a-Service (PaaS)
‘Runtime environment for applications’
Azure App Services, AWS Elastic Beanstalk

Infrastructure-as-a-Service (IaaS)
’Server in the cloud’
Amazon EC2, Azure VM, Google CE, Amazon S3, Azure Storage

Containers – what is it?



Virtualization runs on a ‘hypervisor’

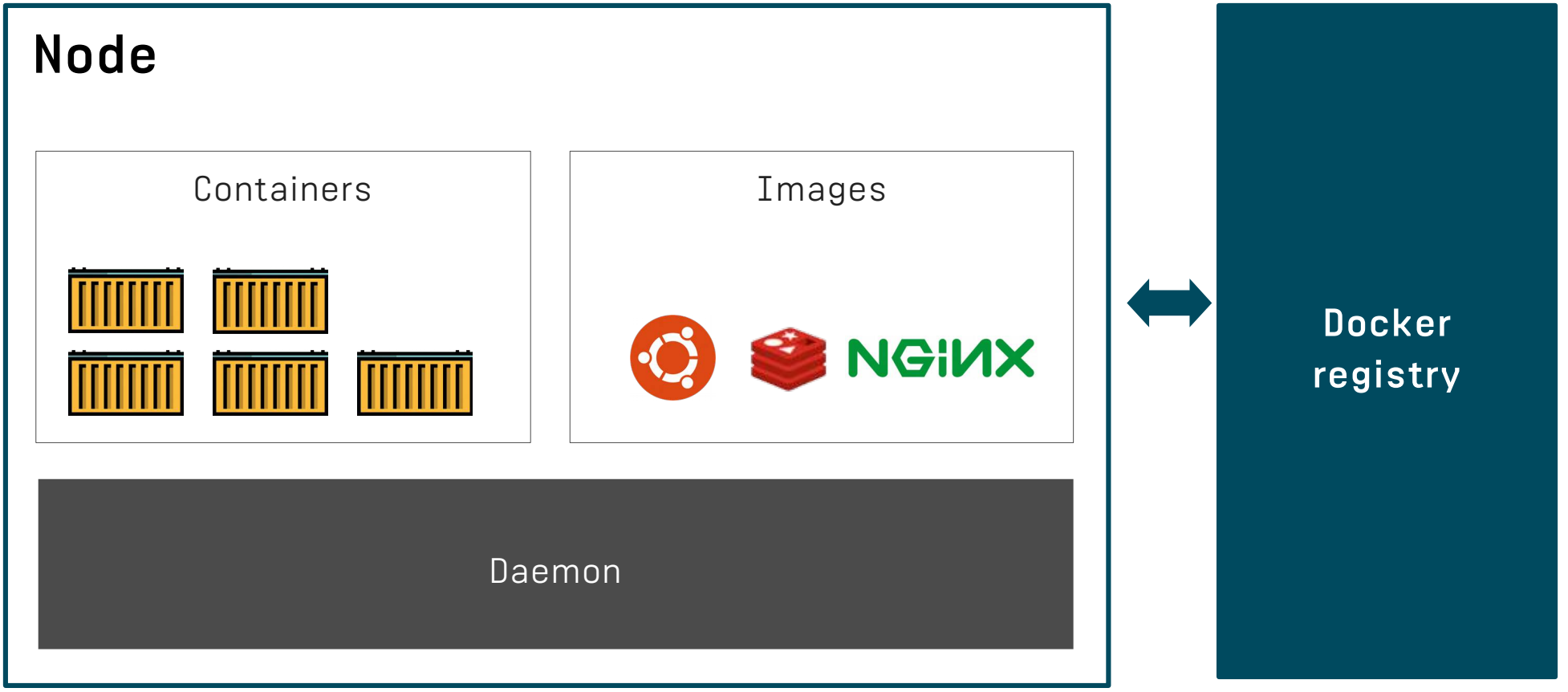
Enables portability, increases utilization of infrastructure – but resource burden

Containers use the nodes OS kernel

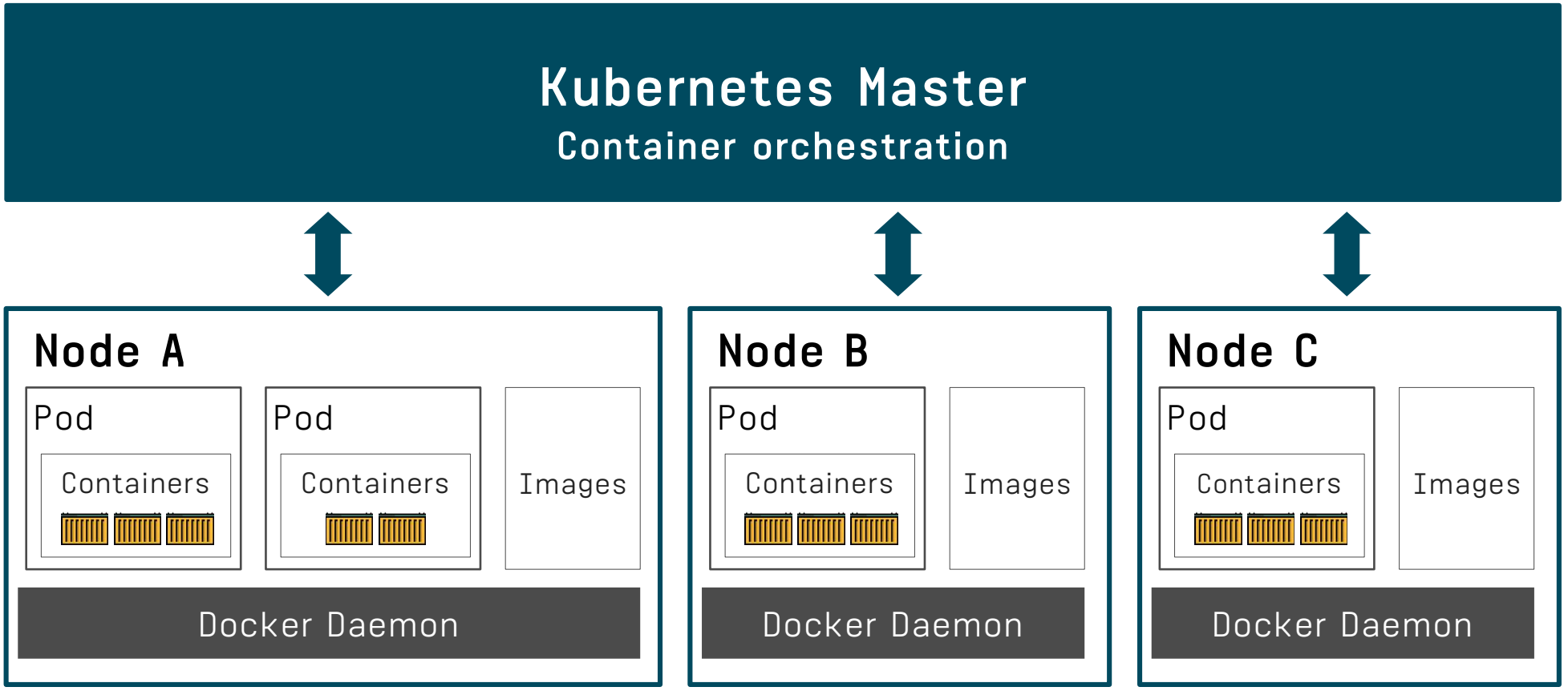
Enables portability at high-infrastructure efficiency

* incl. Binaries and libraries

What is docker on my host?



From one to many, many containers



Implications for monitoring

1	**Cloud-APIs (for PaaS / SaaS)**	→ Plugins
2	**Containers as additional layer**	→ Plugins
3	**Fast changing environments**	→ Dynamic configuration
4	**Single metrics become less relevant**	→ Aggregated metrics

0) Intro

1) Cloud monitoring

2) Container monitoring

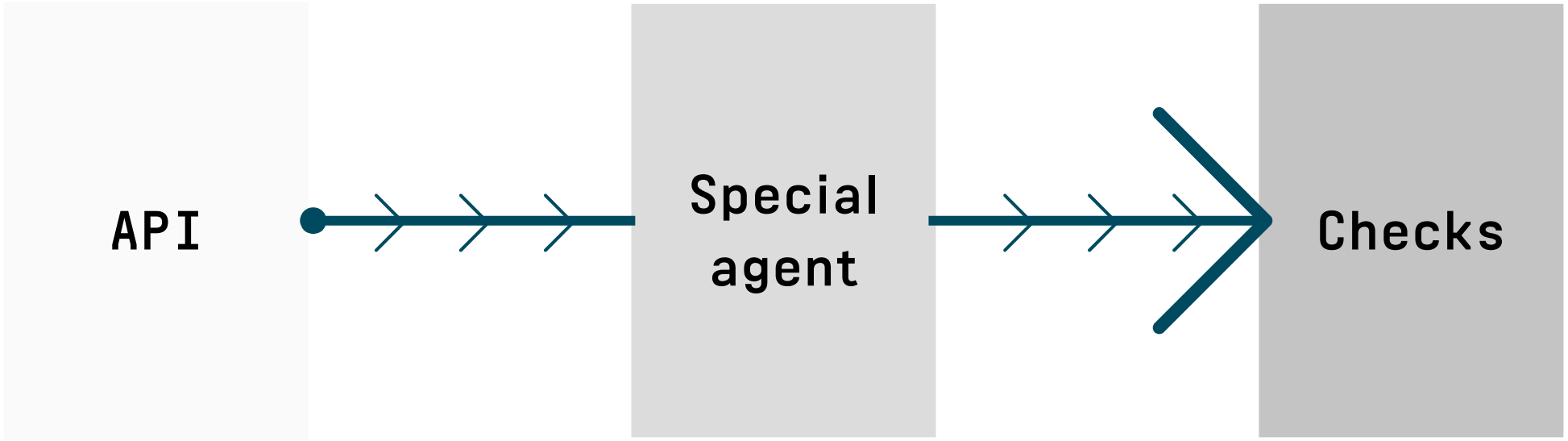
3) Dealing with dynamics

4) Metrics

IaaS is standard business

	Public Cloud	Private Cloud
SaaS	Planned via APIs	Planned via APIs
PaaS	Planned via APIs	Planned via APIs
IaaS	 Check_MK Agent	 Check_MK Agent

Monitoring PaaS & SaaS via APIs



We build what is needed

Special-Agent and **Checks**

- Working on Azure (e.g. SQL database)
- Involved in several migrations (e.g. multi region Azure)
- What do you need? AWS, Azure services, OpenStack, ...?

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Basics are already possible

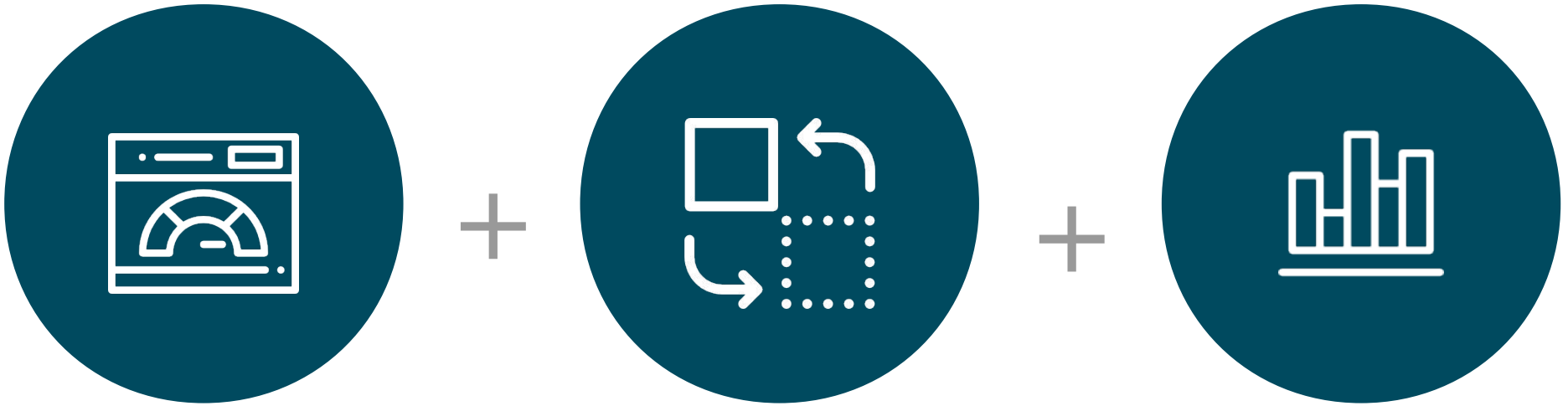
Existing options...

- Checks (Docker on Check_MK Exchange)
- Process checks and other resources of docker nodes
- Agent in docker container

… but

- Need to care about configuration

… but currently developing much broader feature set



Container specific metrics

Dynamic configuration

Aggregated metrics

Container monitoring future

Phase I	Phase II	Phase III
Native container support	Container orchestration	Mgmt. for container & container orchestration
docker	kubernetes	RANCHER
✓	1.6	1.6

Docker native
Check- & Inventory Plug-Ins

Phase I | Phase II | Phase III

Node checks: System status, #images, #containers, disk usage

Node inventory: Version, labels, networks

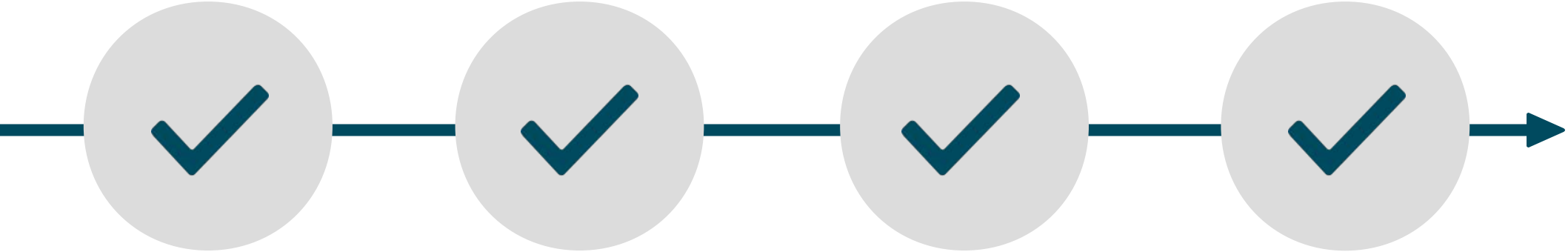
Container checks: CPU, memory, disk IO, traffic, uptime, health

Container inventory: Node running on, labels, networks

Image inventory: Time created, labels, size, #containers (state)

Agent with batteries included

Phase I | Phase II | Phase III



ps check
is aware of namespaces

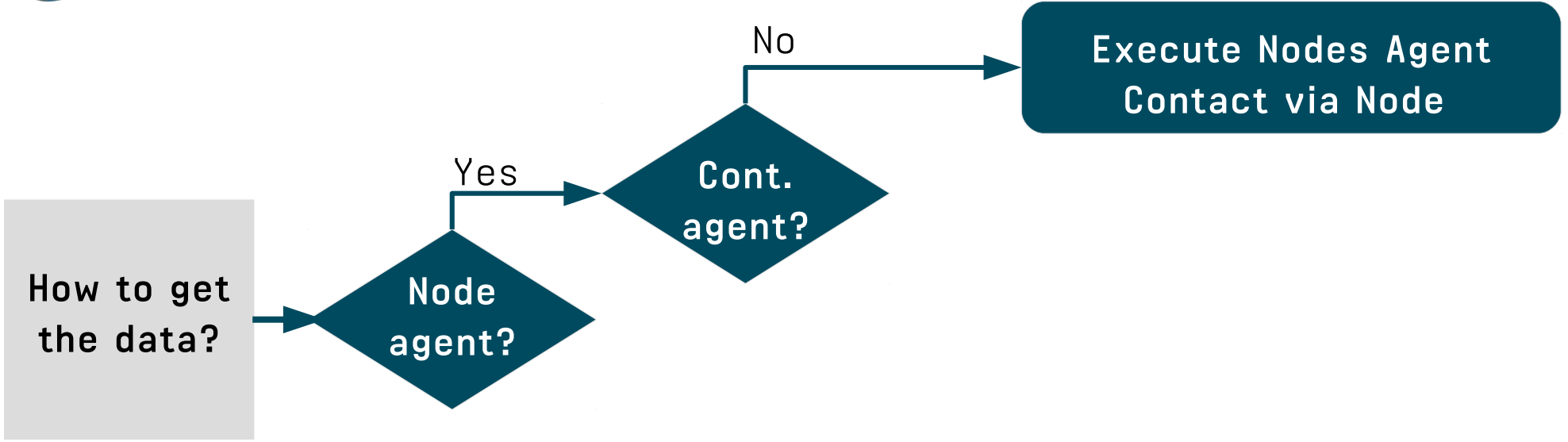
veth interfaces
are totally ignored

container mounts
are totally ignored

docker ext.
included in agent

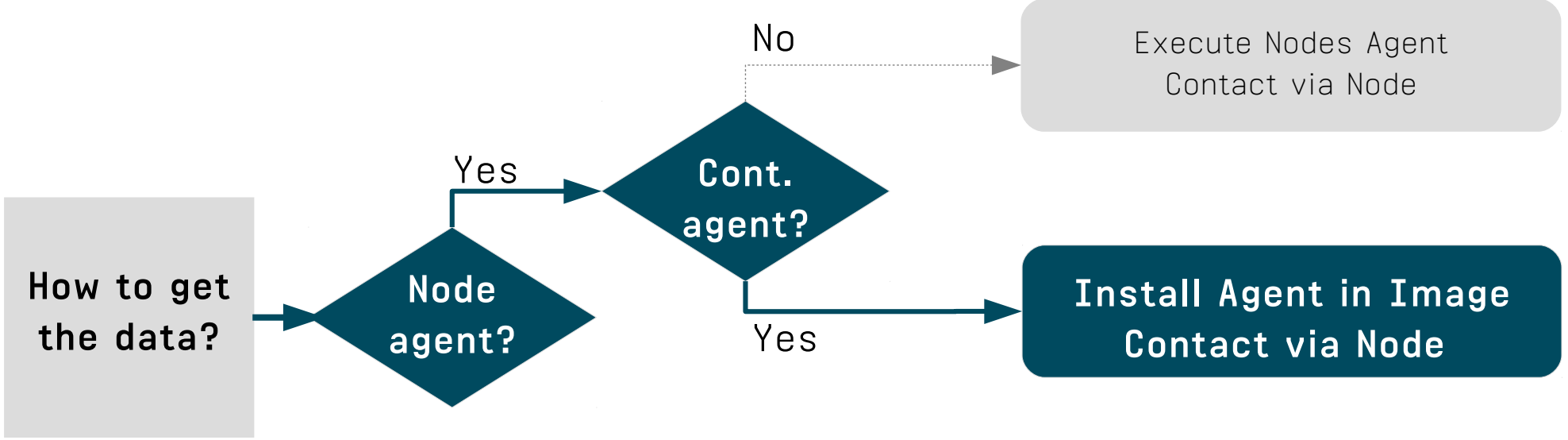
How Check_MK gets docker data

Phase I | Phase II | Phase III

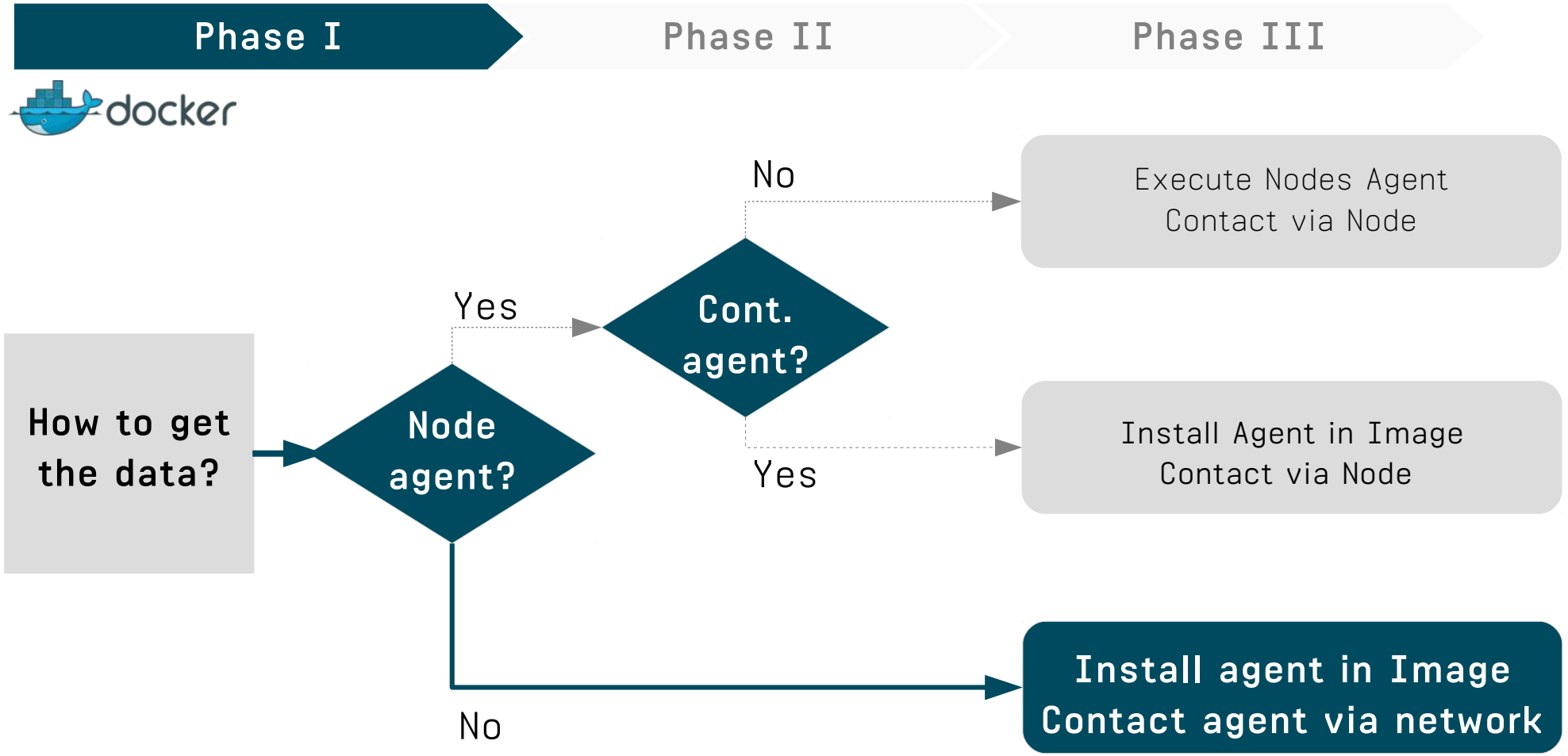


How Check_MK gets docker data

Phase I | Phase II | Phase III



How Check_MK gets docker data



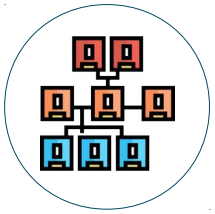
Short demo!

Phase I | Phase II | Phase III

Monitoring of container orchestration tool Kubernetes

Phase I | **Phase II** | Phase III

kubernetes



Pod deployments: Current vs. available Pods

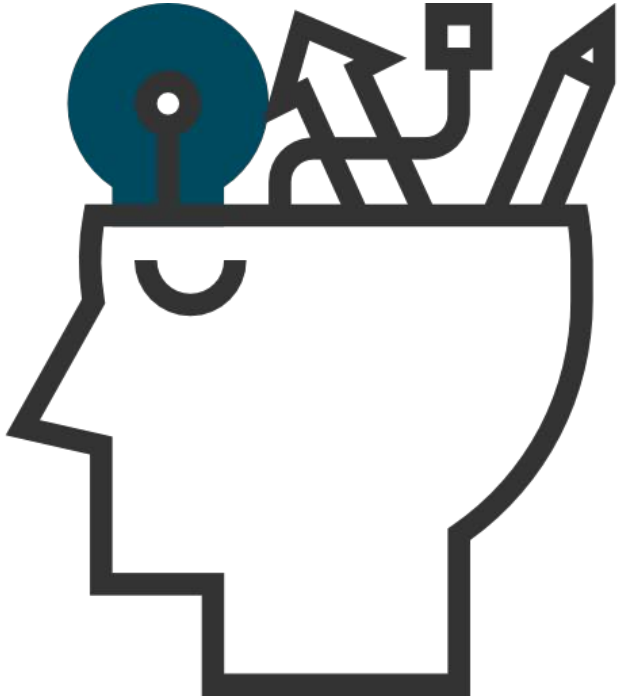
Running pods: Per node, per replica set

Node: Resource request vs. limits

Monitoring of management tools for container orchestration

Phase I | Phase II | **Phase III**

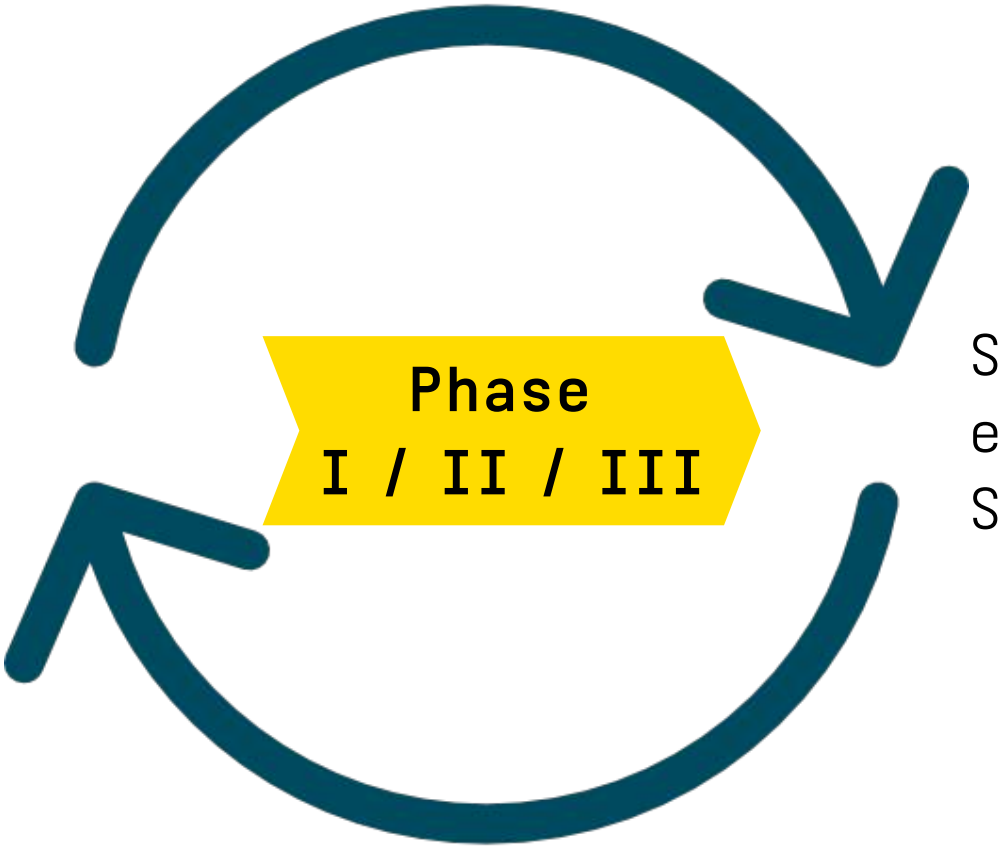
RANCHER



Only idea stage yet –
your feedback is welcome

… and then …

Continuously improve Phase I-III



More plugins

Support tools, e.g. Docker Swarm

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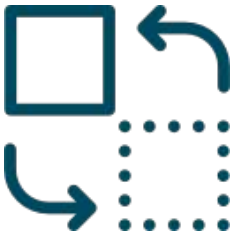
Requires highly dynamic configuration

Why?

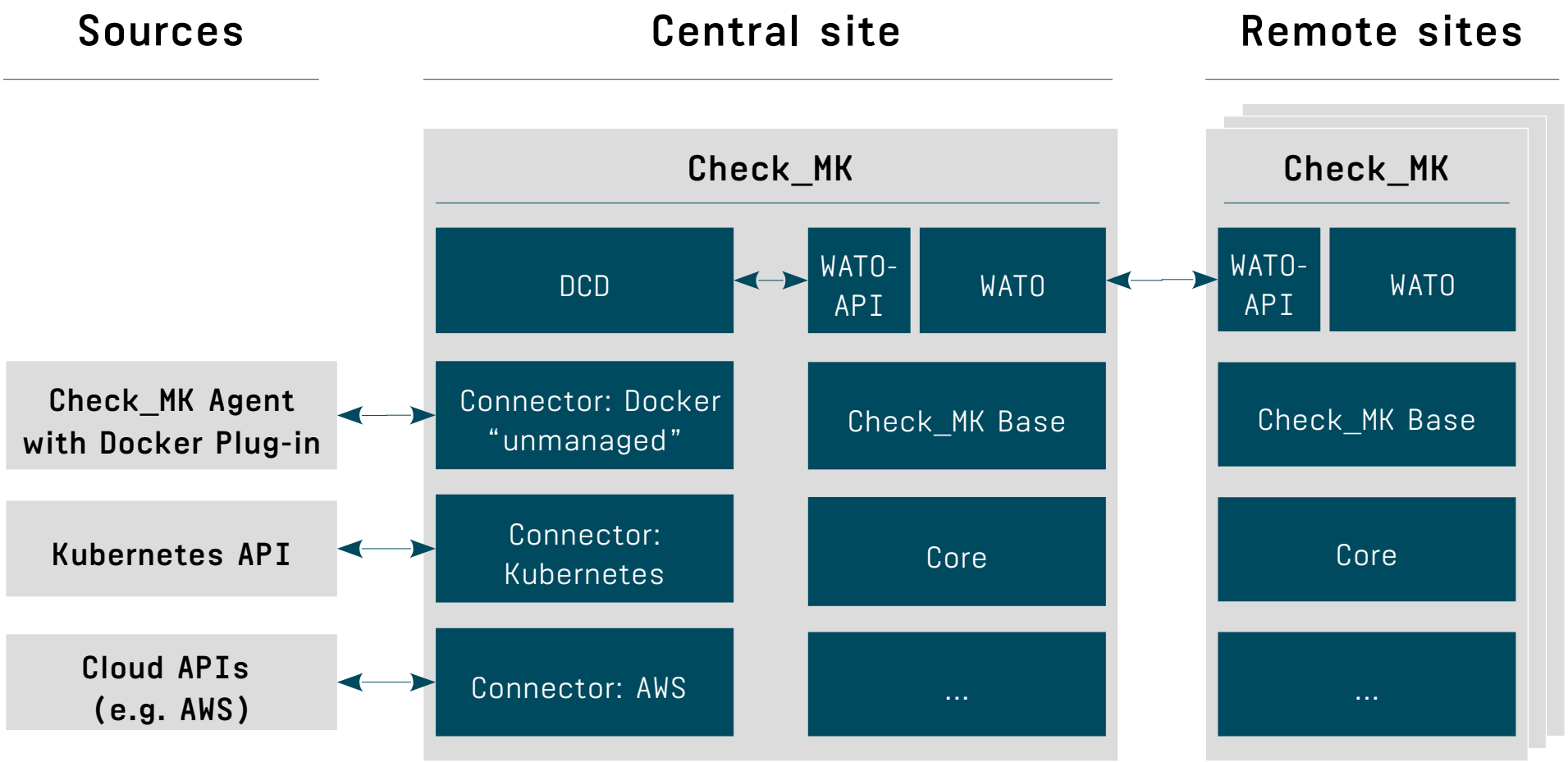


- Volatile environment
- Monitoring configuration thus needs to adapt very dynamically

Dynamic configuration (DCD)

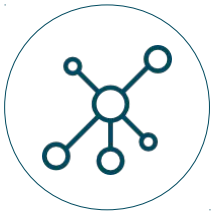
- Focus on containers
- Nodes & Kubernetes later
- Enterprise Edition only

Dynamic Configuration Daemon (DCD) architecture



Also useful beyond containers

Virtual machines: Ask vCenter for VMs



Network scan: Ask the network for hosts

LDAP: Ask for users or hosts

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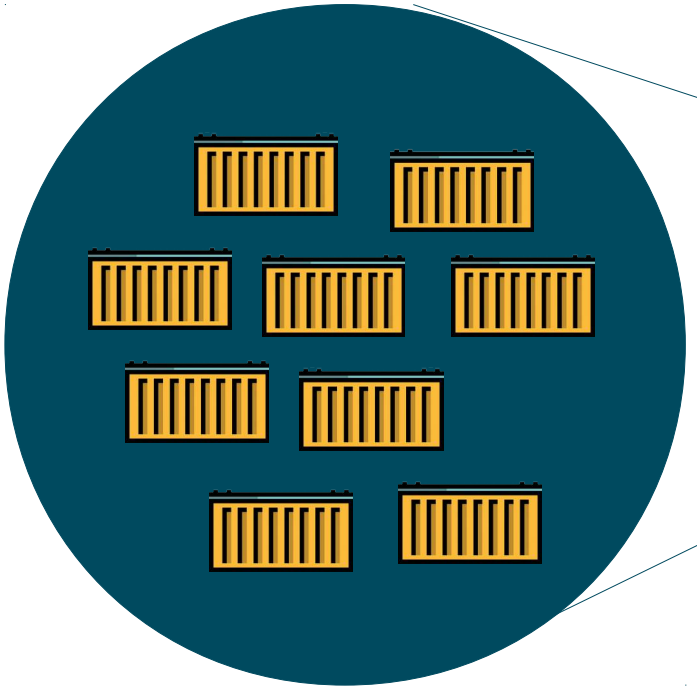
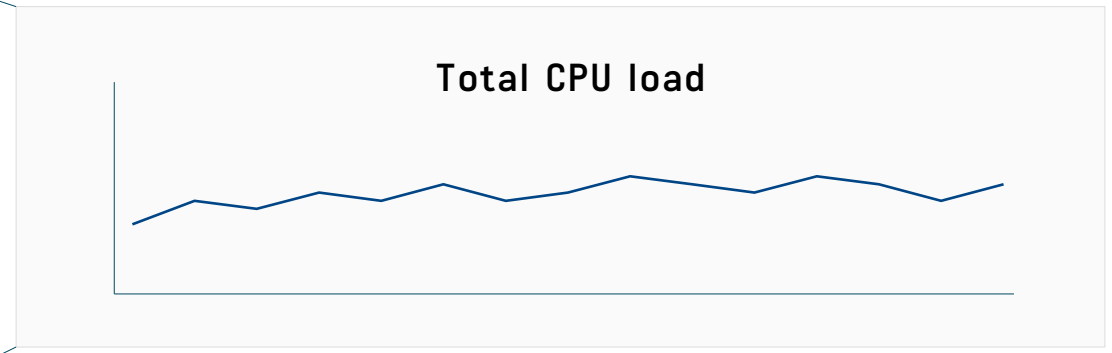
Static containers: Standard metrics

Dynamic containers: Which metrics are relevant?



Dynamic pool of containers

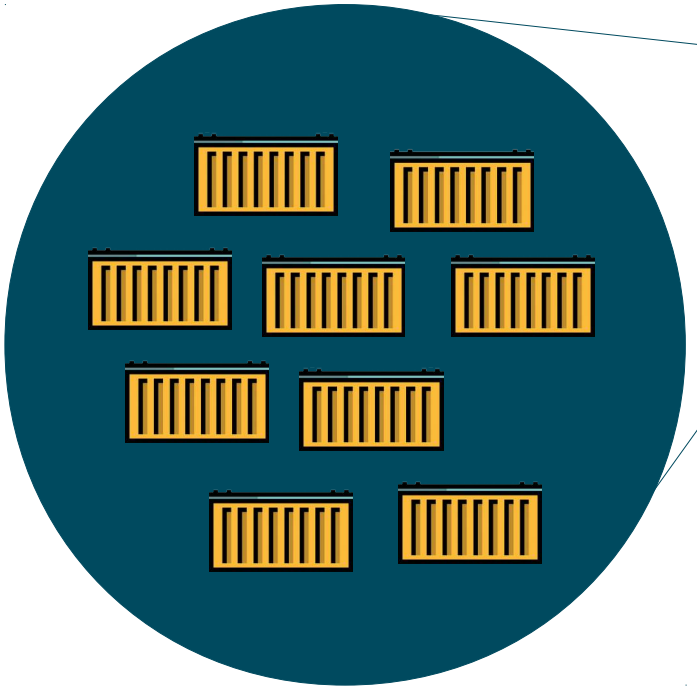


Aggregated metrics

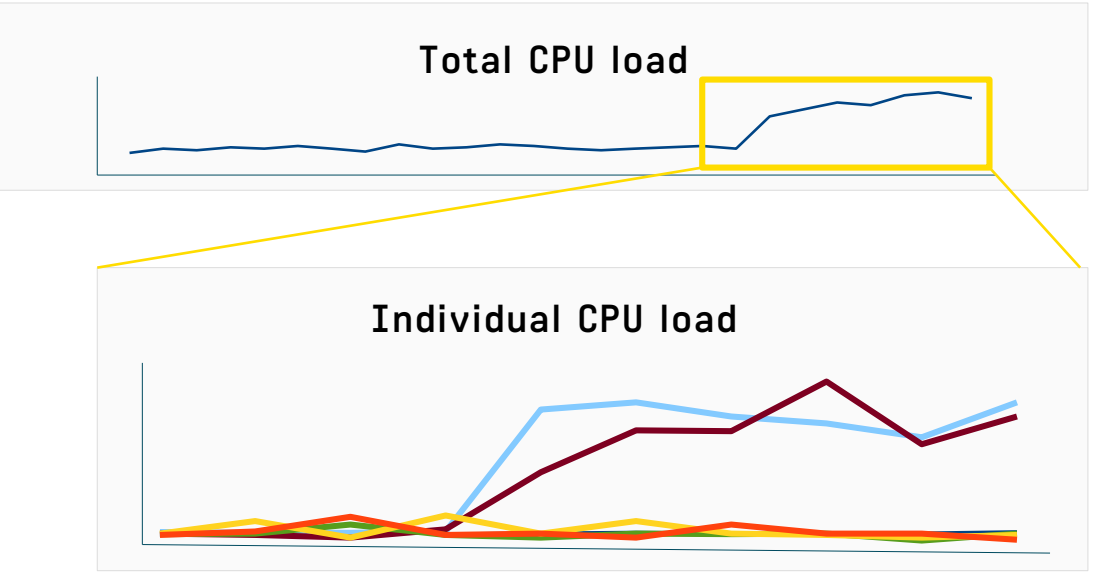
Averages or total values over all containers

Understand performance & trends

Dynamic containers: Which metrics are relevant?



Dynamic pool of containers



Individual metrics

Value per container

Understand faults

What we will do with these metrics

Aggregated metrics

- Collect with regular monitoring
- Independent of individual hosts
- Not limited to containers
- Make configurable via GUI

Container metrics

- Volatility per container
- Defines resolution
- Defines lifetime of metrics

Getting ready for a new world.

Join us!

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