

# Waste Water Treatment in Cloud: Case Veolia Krüger A/S

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OPC Day Finland



**SUOMEN AUTOMAATIOSEURA RY**  
FINNISH SOCIETY OF AUTOMATION

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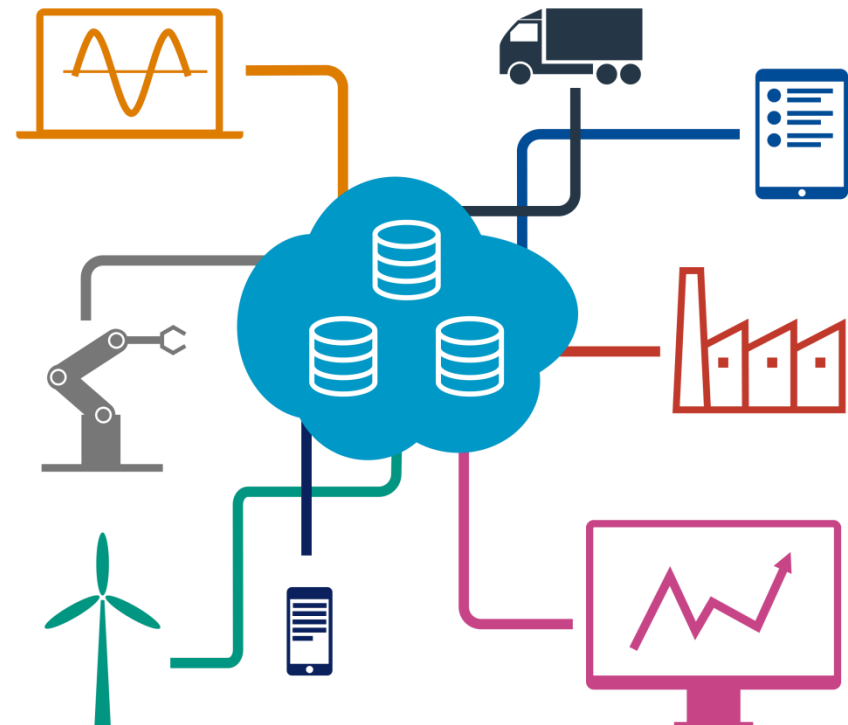
**BECKHOFF**  
Partner



# The Industrial Internet / IoT

Prosys OPC UA software products offer multiplatform capabilities, making them ideal building blocks of any networked system

- OPC UA connectivity
- Sensor data
- Smart devices
- Big data
- Analytics
- Optimization
- Automation



# Prosyst OPC UA Multiplatform Products



## *Developer Tools*



OPC UA  
**Java SDK**

## *Applications*



OPC UA  
**Historian**



OPC UA  
**Modbus Server**

## *Free Tools*



OPC UA  
**Simulation Server**



OPC UA  
**Client**



OPC UA  
**Client for Android**



# Unified Automation Products

## Developer tools

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OPC UA  
C/C++ SDKs



OPC UA  
.NET SDK



OPC UA  
Modeler

## Applications

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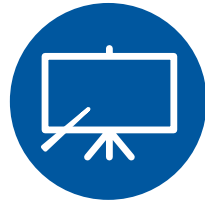
OPC UA  
Gateway



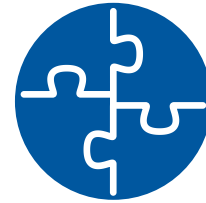
# Professional Services



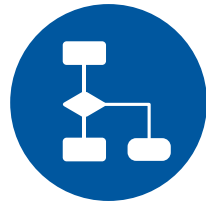
QuickStart



Training & Workshops



System Integration



Design & Development



Product Certification



Consulting



# OPC UA Workshop

- One, two or three days of training
- Covers the basics of OPC UA for experts and software developers



**PROSYS**  **OPC**  
*Multiplatform OPC and OPC UA solutions*

# OPC UA WORKSHOP

for industry experts  
and software developers

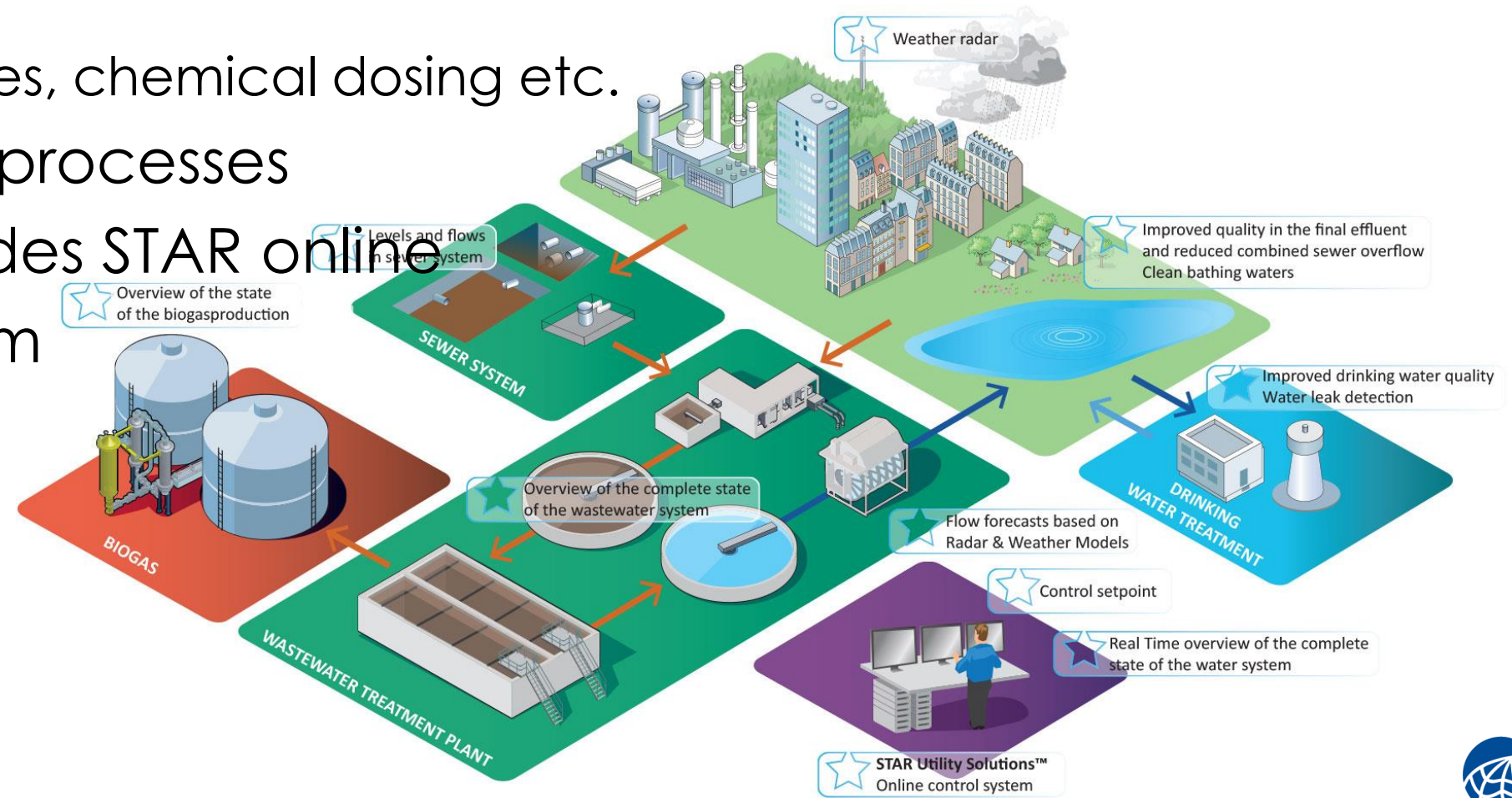
**21.-23.11.2017**  
**ESPOO, FINLAND**

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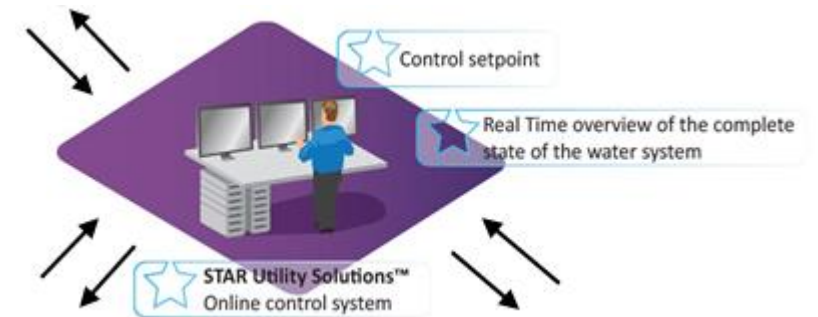
# Waste Water Treatment

- Entire waste water facility needs to be optimized and monitored
  - Pumps, gates, chemical dosing etc.
- Multitude of processes
- Krüger provides STAR online control system



# Waste Water Treatment Simplified

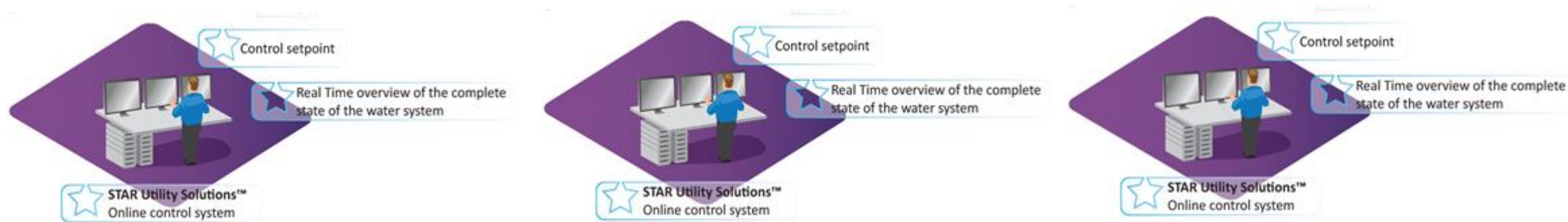
- From the data point of view
  - Get measurements from the processes for analysis
  - Set control values back to the processes
  - 5 ... 1000 variables, control cycles around 30 s
- Just move the data around?
  - Measurements to analysis?
  - Control values to processes?





# Waste Water Treatment Deployed

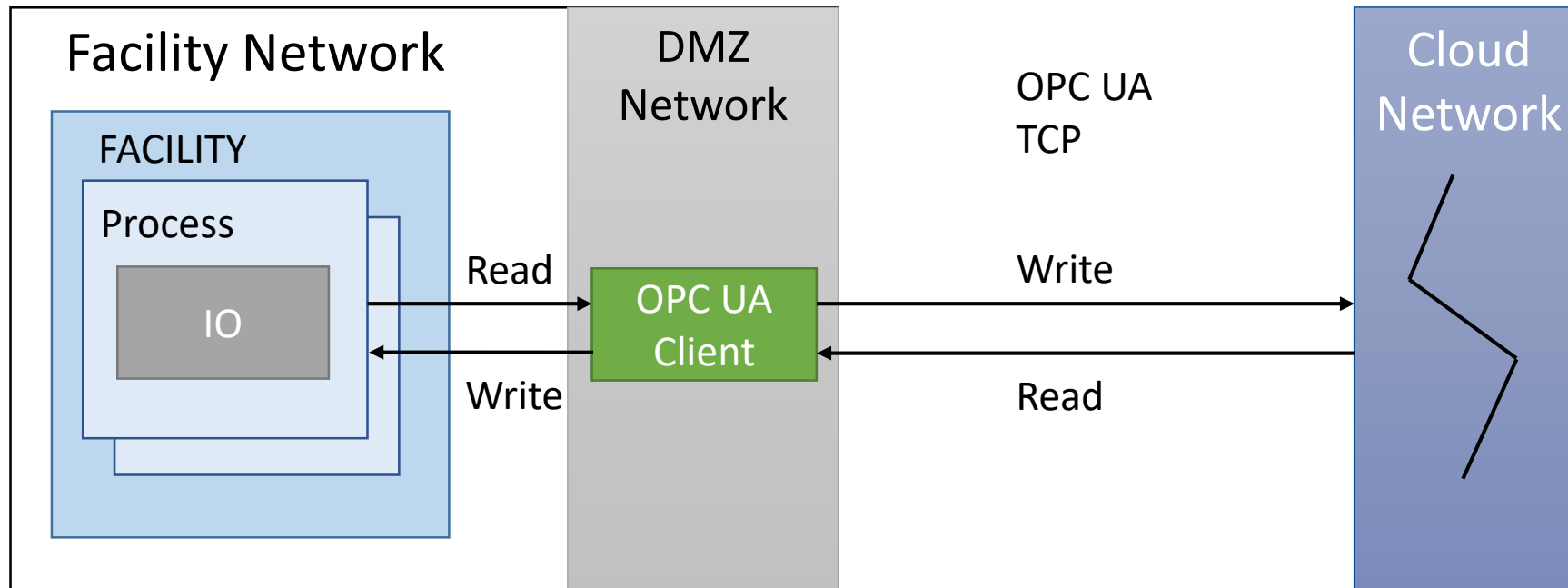
- Starting situation:
  - 100+ facility installations
  - Each facility deployed with full analysis and control
  - Each facility has its own maintaining and troubleshooting work
- Is there an easier and more cost efficient way?



# Waste Water Treatment in Cloud

1/3

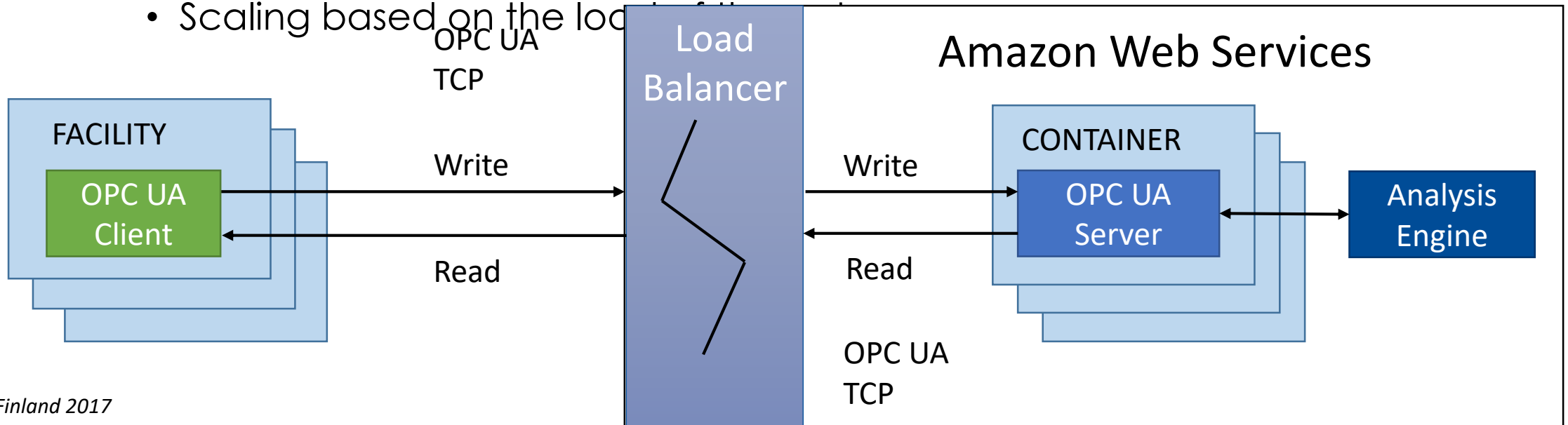
- Local OPC UA Client in the facility
  - Write measurements to the cloud
  - Read control set points from the cloud
  - Write control set points back to processes
- Access only through Demilitarized Zone Network



# Waste Water Treatment in Cloud

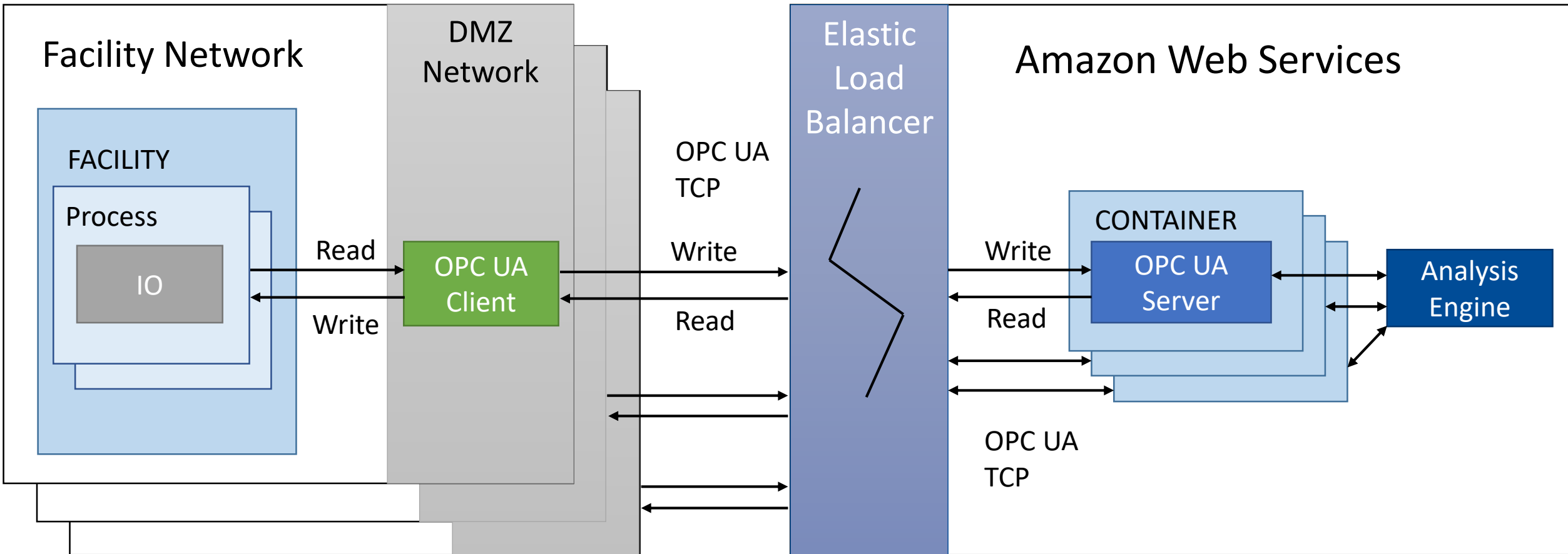
2/3

- Cloud OPC UA Server
  - Relay measurements to the analysis engine
  - Publish analysis results in the OPC UA Address Space
  - OPC UA Servers behind Amazon Web Services Elastic Load Balancer
    - Automated scaling of OPC UA Docker server containers
    - Scaling based on the load



# Waste Water Treatment in Cloud

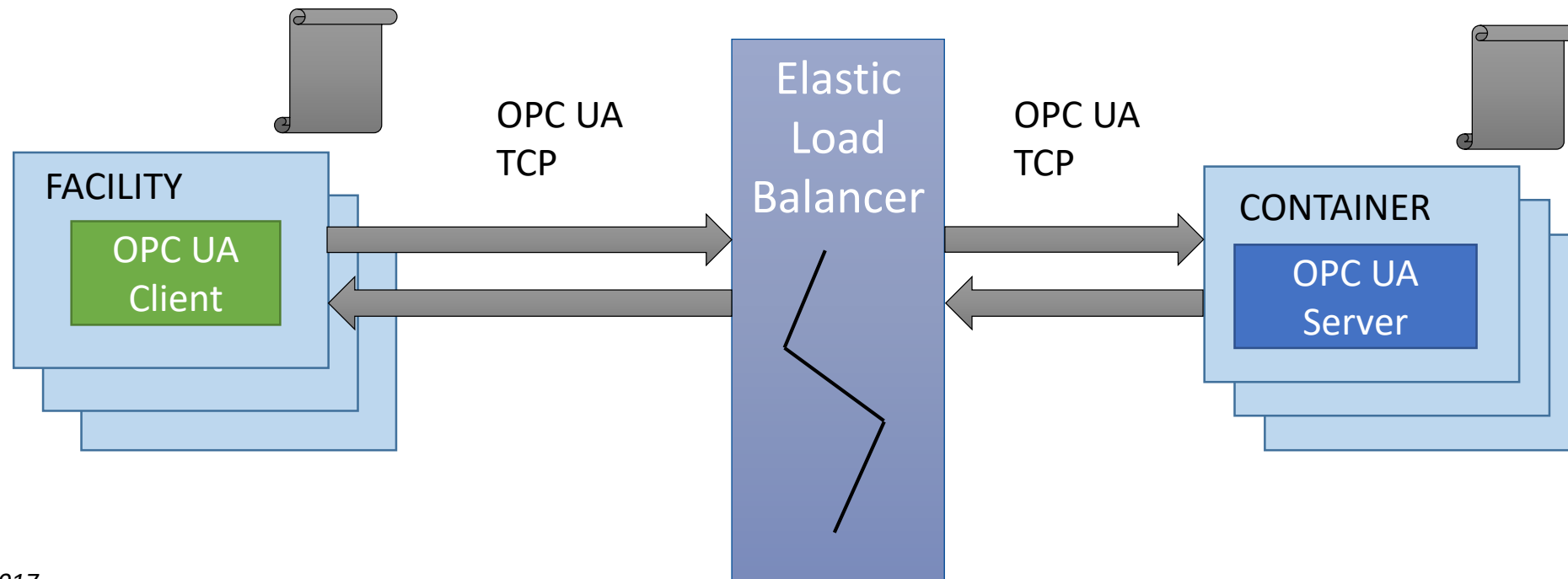
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# Security in OPC UA

1/2

1. All applications (OPC UA servers and clients) are authenticated with X.509 public key certificates
2. All traffic is secured with OPC UA built-in encryption



# Security in OPC UA

2/2

- Certificates ensure that only trusted applications can access the critical data in the OPC UA servers
- Certificates are generated and handled by Krüger A/S
- Certificates are managed within an internal web dashboard developed by Prosys OPC for Krüger A/S
  - Easy security and access control through modern web interface



# Conclusions

- Before:
  - Full deployments per facility
  - Maintenance and troubleshooting work for each facility
- After:
  - 24/7 online system hosted in the Amazon cloud
  - Connections are secured by certificates and encrypted
  - Automated scaling
    - Costs are directly proportional to the number of customers
  - Simplified maintenance of a large number of customer facilities



# Questions?

