

inetum.
realdolmen
Positive digital flow

SIEMENS

IT

Convergence

OT



MORE THAN
27 000
CONSULTANTS



2019 (Pro Forma)
€ 2.3
BILLION
IN REVENUE



26 COUNTRIES

FRANCE, SPAIN, PORTUGAL, BELGIUM, MEXICO, LUXEMBOURG, POLAND, MOROCCO, ROMANIA, SWITZERLAND, BRAZIL, TUNISIA, COLOMBIA, COTE D'IVOIRE, PERU, USA, ANGOLA, CAMEROON, SINGAPORE, ENGLAND, UAE, RP OF PANAMA, CHILI, COSTA RICA, DOMINICAN REPUBLIC, ARGENTINA

6
ACTIVITIES

- + CONSULTING
- + APPLICATION & INFRASTRUCTURE SERVICES
- + SYSTEM INTEGRATION
(Business Solutions, ERP, CRM, PLM...)
- + OUTSOURCING
- + VALUE ADDED RESELLING
- + SOFTWARE:
 - 4 vertical solutions :
Local government, Insurance, Healthcare social, Retail
 - Transverse Solutions
*Time Management (Chronotime)
DDM (Business Document)*

MORE

- + Proximity-Intimacy-Agility
- + Industrialisation-Automation
- + Innovation-Business



5
VALUES
& PRINCIPLE
OF ACTION

SOLIDARITY

We have a united entrepreneurial spirit.

AMBITION

Our local power fosters our global success.

EXCELLENCE

Our culture of excellence is a product of our daring.

ENGAGEMENT

We grow but stay close to our clients.

INNOVATION

We are constantly co-inventing the technology based business of our customers

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Positive digital flow

6 INNOVATION
CENTERS

PARIS, NANTES, LYON,
GHENT, LISBON, MADRID
Casablanca & Warsaw in 2021

**GROUP
ALLIANCES**

SAP, Microsoft, Oracle,
Salesforce
.....
AWS, IBM, Sage, HRAccess
.....
PTC, Siemens, Dassault

21 SERVICE CENTERS

- APAC (Macau) ■ BRAZIL (São Paulo) ■
- COLOMBIA (Bogota) ■
- FRANCE (Lille, Lyon, Meudon, Nantes, Toulouse) ■
- INDIA (Pune) ■ MOROCCO (Casablanca) ■
- POLAND (Warsaw-Poznan-Lublin) ■
- PORTUGAL (Lisbon-Covilha-Bragança) ■
- ROMANIA (Bucarest-Constanza) ■
- SPAIN (Alicante-Bilbao) ■ TUNISIA (Tunis)

10 GROUP
PRACTICES

- DIGITAL BANKING ■
- DIGITAL INSURANCE ■ DIGITAL RETAIL ■
- DIGITAL UTILITIES ■ E-HEALTHCARE ■
- INDUSTRY 4.0 ■ SMART CITIES ■
- DIGITAL TELECOM ■
- DIGITAL TRANSPORT ■
- SMART DATA & AI ■

7
BUSINESS SECTORS

- FINANCIAL SERVICES
- INDUSTRIES
- PUBLIC-HEALTHCARE
- TELECOM-MEDIA-TECHNOLOGIES
- ENERGY-UTILITIES-CHEMICALS
- RETAIL-CONSUMER GOODS
- TRANSPORTATION-TRAVEL-SERVICES



HANDBALL

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Handball



A positive digital flow: key challenges in industry?

Future Proof ICT

- How to support our business departments in a **cost efficient** and **agile (& secure)** manner?
- How do we ensure **technology adoption** and create a digital mindset?

Employee Experience

- How to realize an ultimate **digital customer experience**?
- How to accomplish a post-COVID **workforce strategy** and engaging employee experience?
- How to close the **digital skills gap** of our workers?



Customer Centricity

- How to get a **360-customer view** and a deep understanding of our customer needs?
- How to realize an ultimate **digital customer experience**?

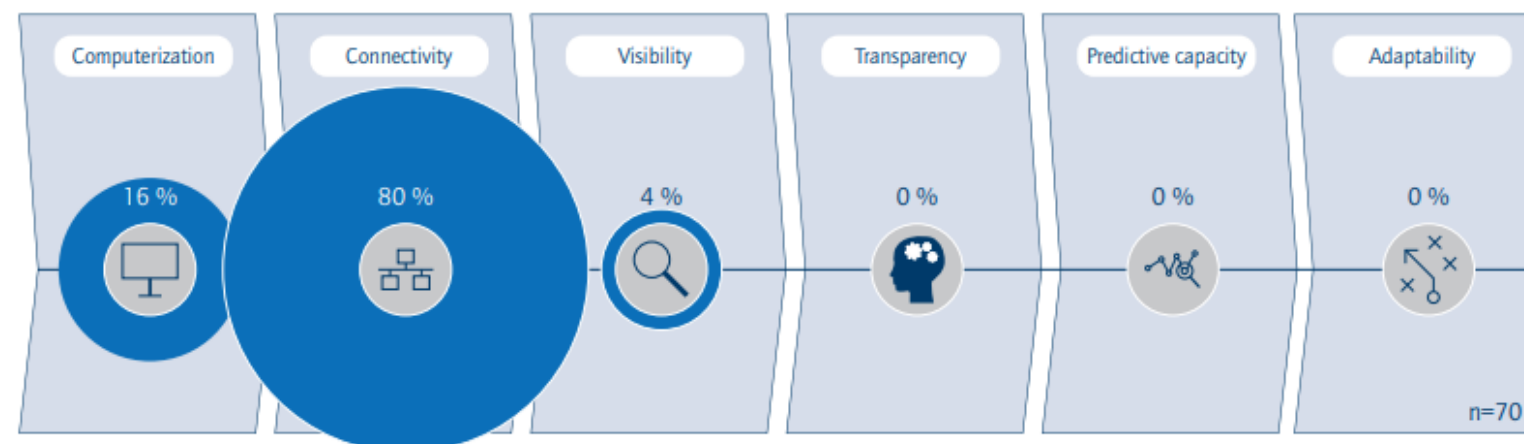
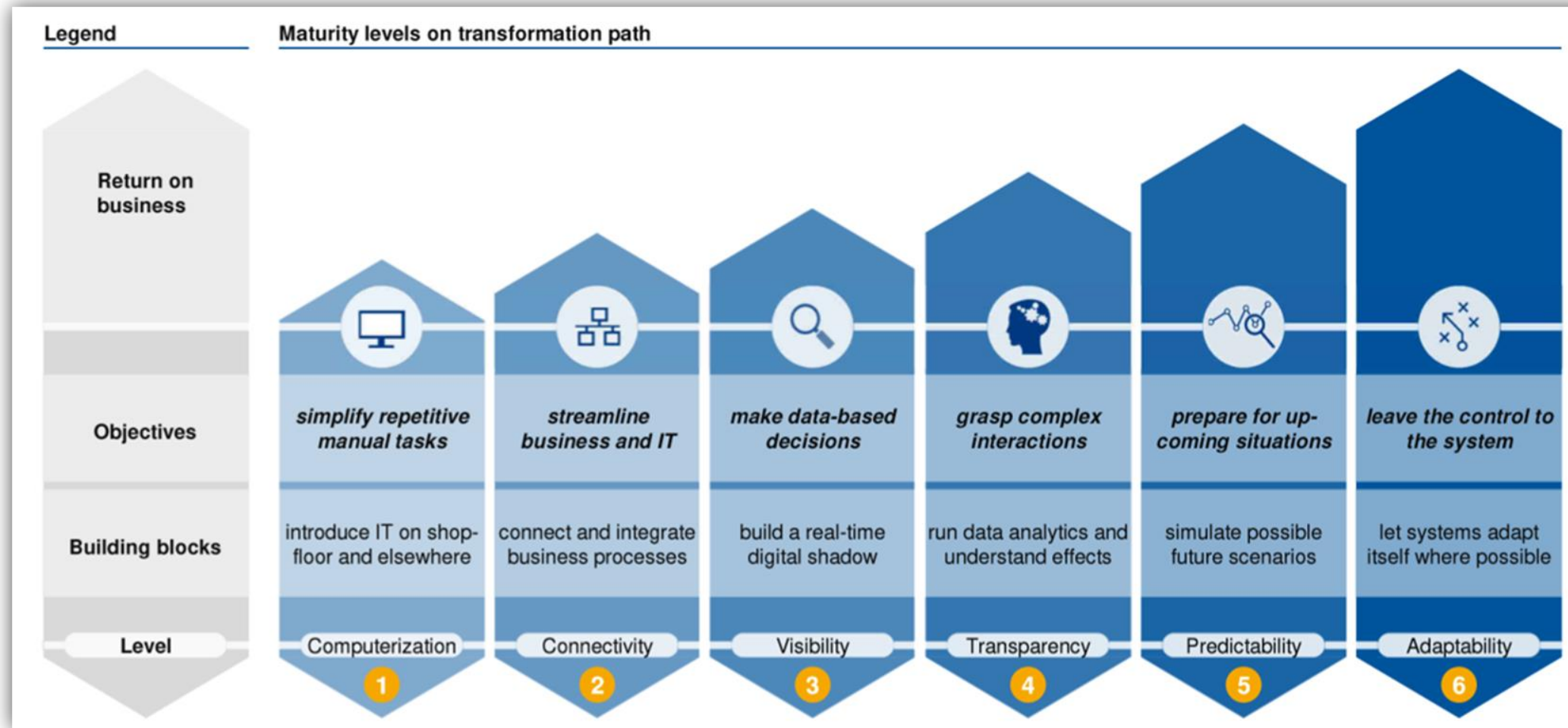
Product & Service Innovation

- How to design new innovative products and services?
- How to develop new disruptive, **data driven business models**?

Manufacturing Excellence

- How to increase **quality and process control**?
- How to increase production **efficiency**: OEE & asset utilization?
- How to minimize **ecological footprint**?
- How to keep up with increasing regulation and **compliance**?

From connected to cognitive manufacturing !



Vulnerability

Cyber Criminals

External Access

Outdated OT Infrastructure

Your Input

Defense in Depth

Network segmentation

Virus Updates / Patches in OT

Firmware Updates

Compatibility IT/OT SW

System Hardening

Version Management

IT Monitoring of OT

Collaboration IT/OT

Knowledge

Agenda

01 Intro IT-OT Convergence

02 Benefits

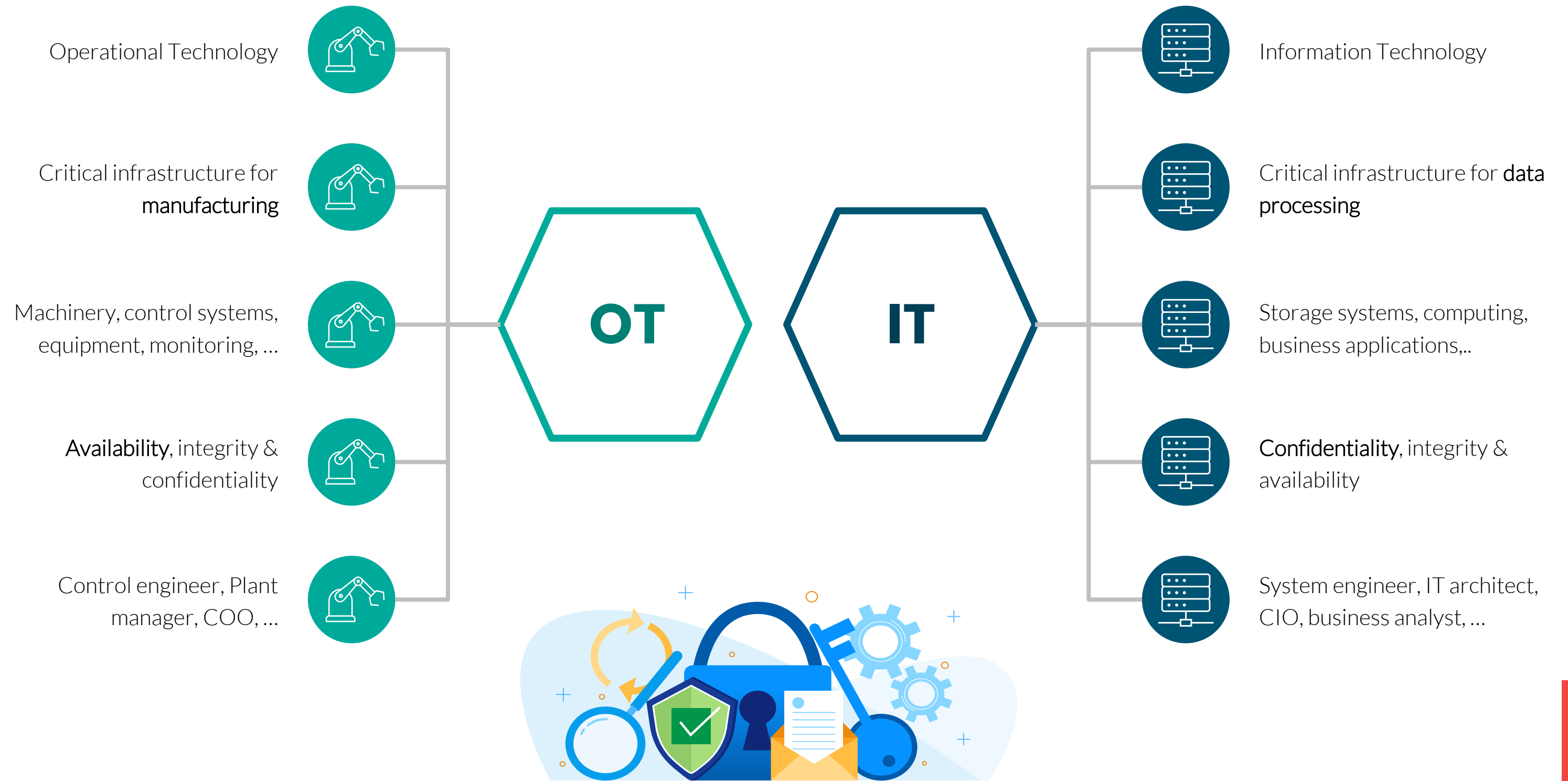
03 Challenges

04 Best practices

05 Getting started

The convergence of OT & IT

Components, functions & expectations



The convergence of OT & IT

Components, functions & expectations

INDUSTRIAL GRADE



EMC Robust
Fast Connect (steel plugs)
Fan-less
...



Operational Technology



PROFINET
PROFISAFE
PROFIENERGY
MODBUS
...



Machinery, control systems,
equipment, monitoring, ...



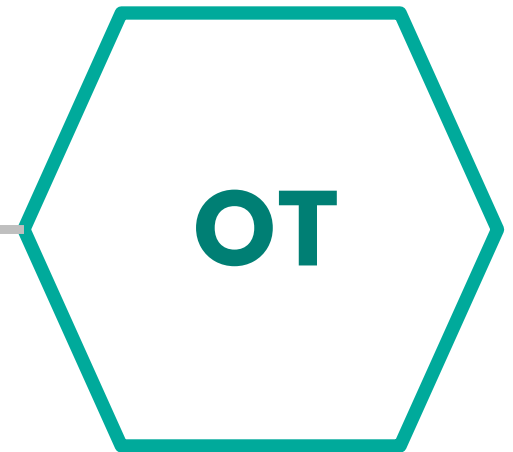
Easy Diagnostics
Easy Configuration
Easy Replacement
...



Availability, integrity &
confidentiality



Control engineer, Plant
manager, COO, ...



Benefits of OT & IT convergence



CONTROL

Enables more direct control and complete monitoring of complex systems

SILO

Less siloed IT & OT departments and more shared expertise

REGULATIONS

Improved compliance with regulatory standards

ASSETS

More efficient asset management across both environments

DATA

Decision making improves due to having access to real life data insight

AVAILABILITY

Improved availability through preventive maintenance and enhanced security

Benefits of OT & IT convergence



CONTROL

Enables more direct control and complete monitoring of complex systems

SILO

Less siloed IT & OT departments and more shared expertise

REGULATIONS

Improved compliance with regulatory standards

ASSETS

More efficient asset management across both environments



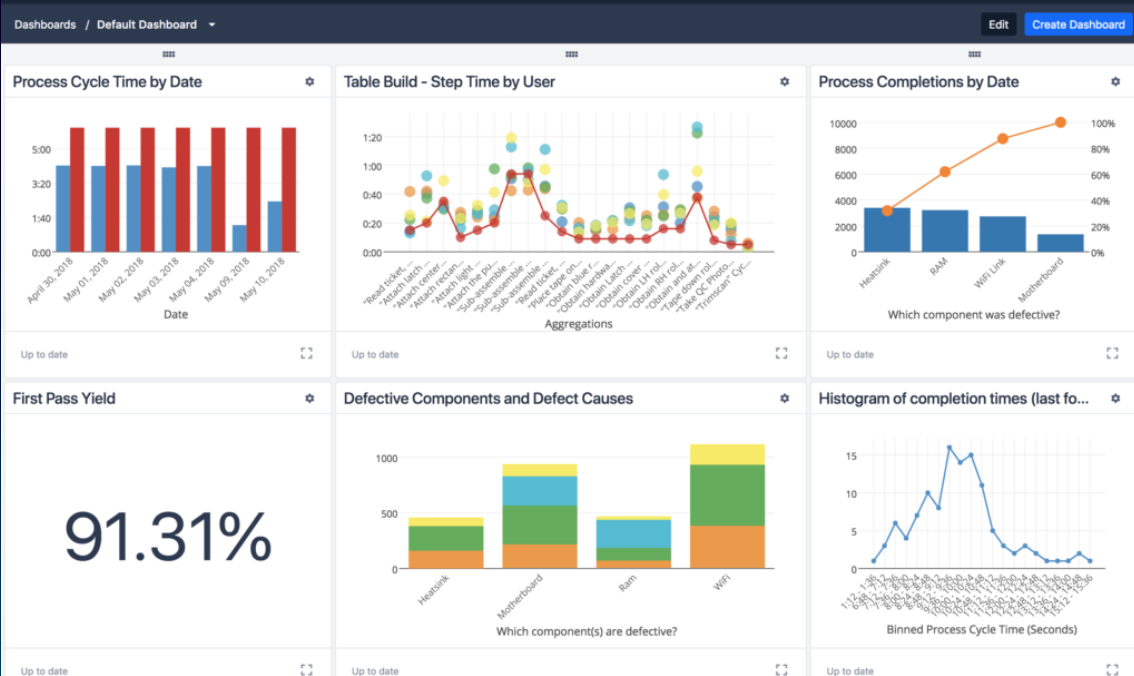




DATA

Decision making improves due to having access to real life data insight

AVAILABILITY

Improved availability through preventive maintenance and enhanced security

Data driven applications will be the main driver for further productivity increases in manufacturing – Use case driven

<p>OEE analysis & improvements</p> 	<p>Predictive Maintenance</p> 	<p>Energy Management</p> 	<p>Application</p> 
<p>Inventory Management</p> 	<p>Service Management</p> 	<p>...</p>	
<p>Complete data management and access (analog-, image-data & further)</p> 	<p>Standardized data integration – of any source</p> 	<p>Standardized system inter-connection to MES/ERP/BI</p> 	

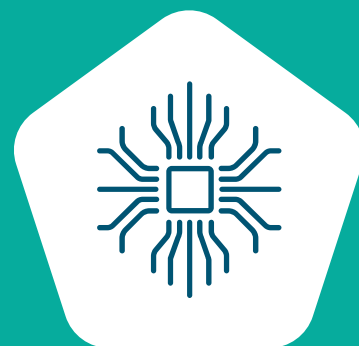




More data



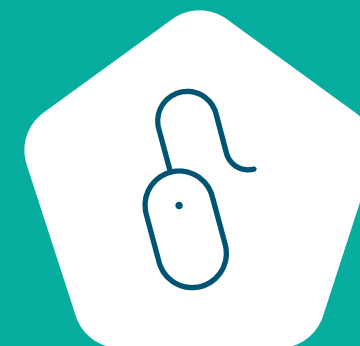
More assets



More connectivity



More security risks



More governance



**IT/OT Cross
Collaboration**

**IT/OT Process
Alignment**

**More attack
surface**

**Less visibility and
asset management**

**More unpatched
devices**

**More lateral
movement**



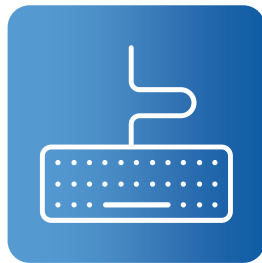
**More security
risks**

Security strategies & best practices



Security Roadmap

Benchmark your security maturity and define needed actions to minimize risks



Asset Management

Know what you have means you know what to protect



Network Segmentation

Avoid lateral movement by dividing the network



Network Access Control

Gain control on which devices can do what on your network



Security Roadmap

Assess current security maturity and describe recommendations to reduce risk



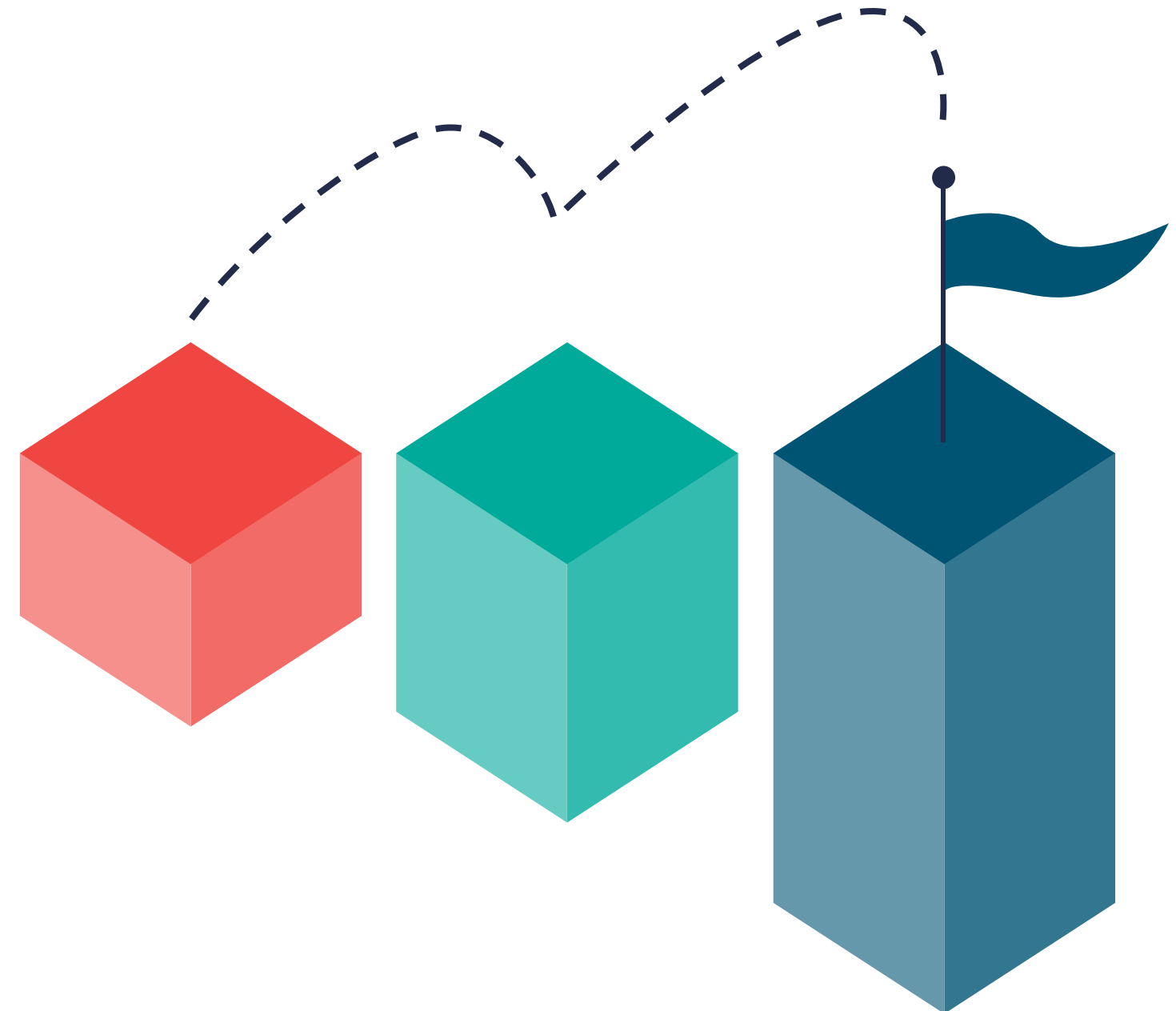
“From here to there”

- Where are you today?
- How do you align with industry standard security frameworks?
- Where do you want to go?
- How will we get there?
- What budget must be foreseen?
- What’s the user impact?



Roadmap outcome

- Identify potential risks
- Insight on level of security maturity
- Prioritized actionable recommendations
- Budget estimation per recommendation



Security Roadmap

Assess current security maturity and describe recommendations to reduce risk

ID	Topic
1	Inventory and control of hardware assets
2	Inventory and control of software assets
3	Data protection
4	Secure configuration of hardware assets and software
5	Account management
6	Access Control Management
7	Continuous Vulnerability Management
8	Audit Log Management
9	Email and web browser protections
10	Malware defenses
11	Data Recovery
12	Network infrastructure management
13	Network monitoring and defense
14	Security awareness and training
15	Service provider management
16	Application software security
17	Incident response management
18	Penetration testing

Actions that form a set of best practices that mitigate the most common attacks against systems and networks

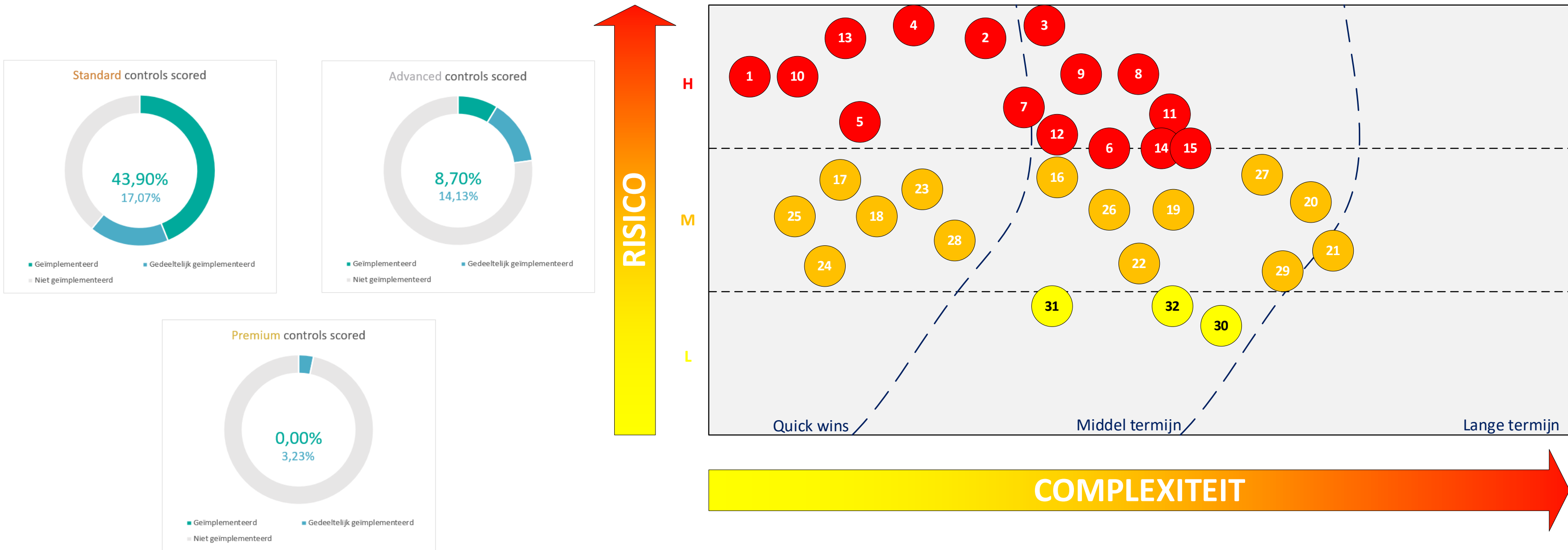
STANDARD

ADVANCED

PREMIUM

Security Roadmap

Assess current security maturity and describe recommendations to reduce risk



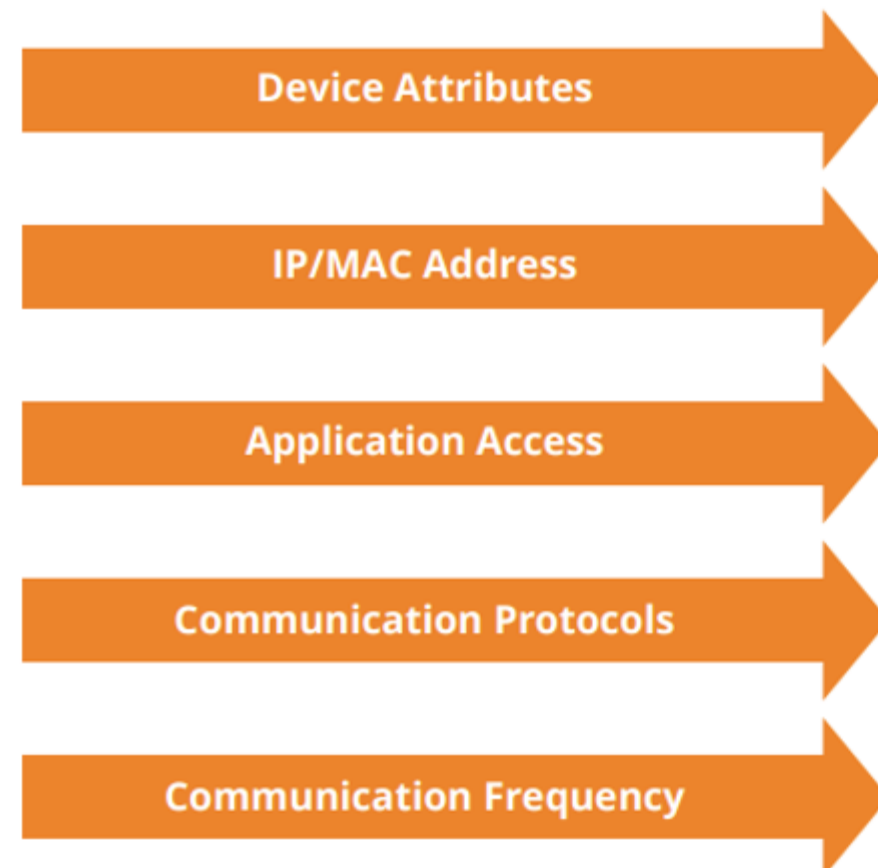
Asset Management

Know what you have, to know what you need to protect

CLEARPASS DEVICE INSIGHT

Device Visibility is key to proper segmentation

DEEP PACKET INSPECTION (DPI)



MACHINE LEARNING



Crowdsourcing



Network Segmentation on different levels

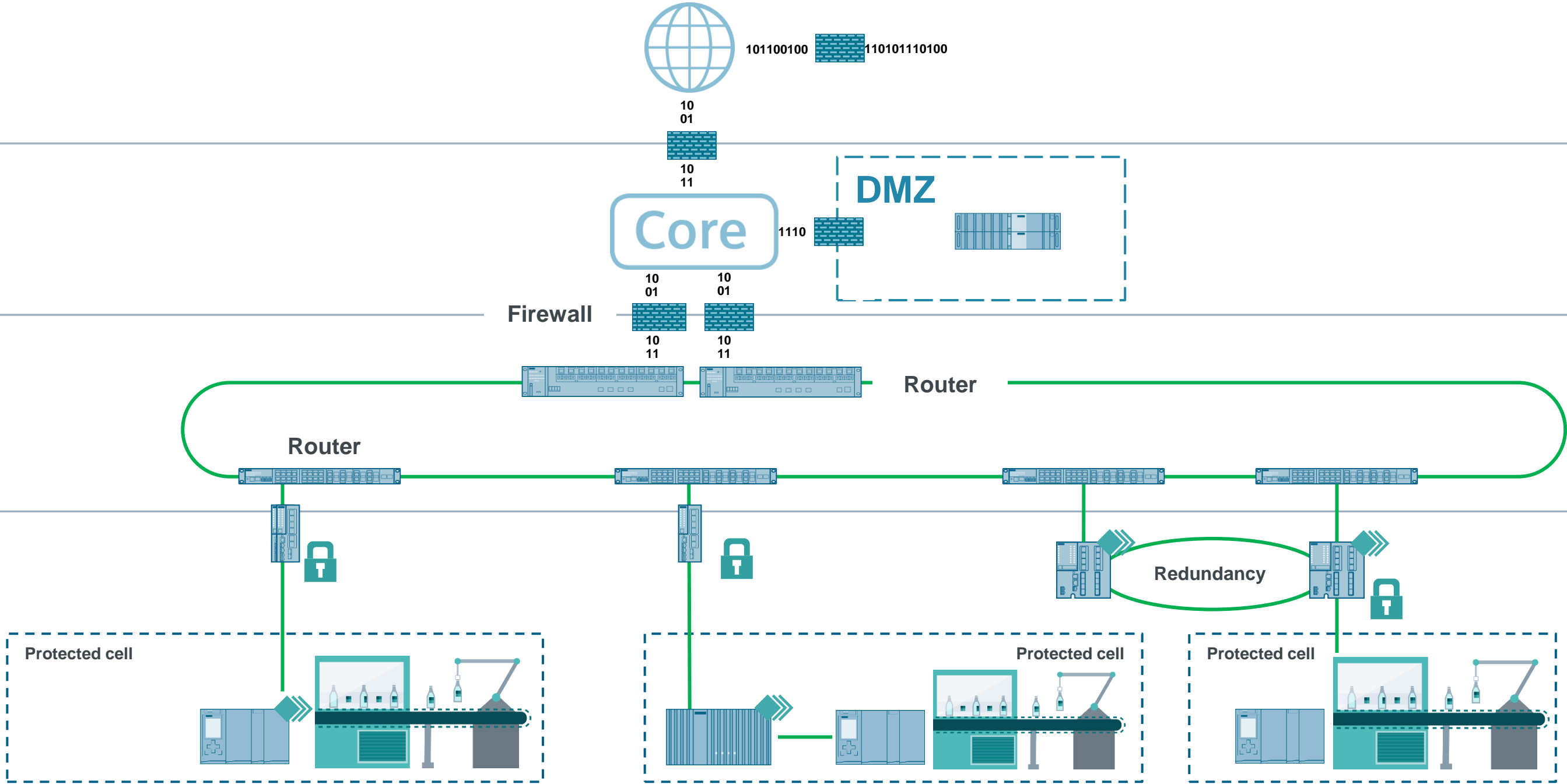
IT

Cloud

Enterprise Network

Production Backbone

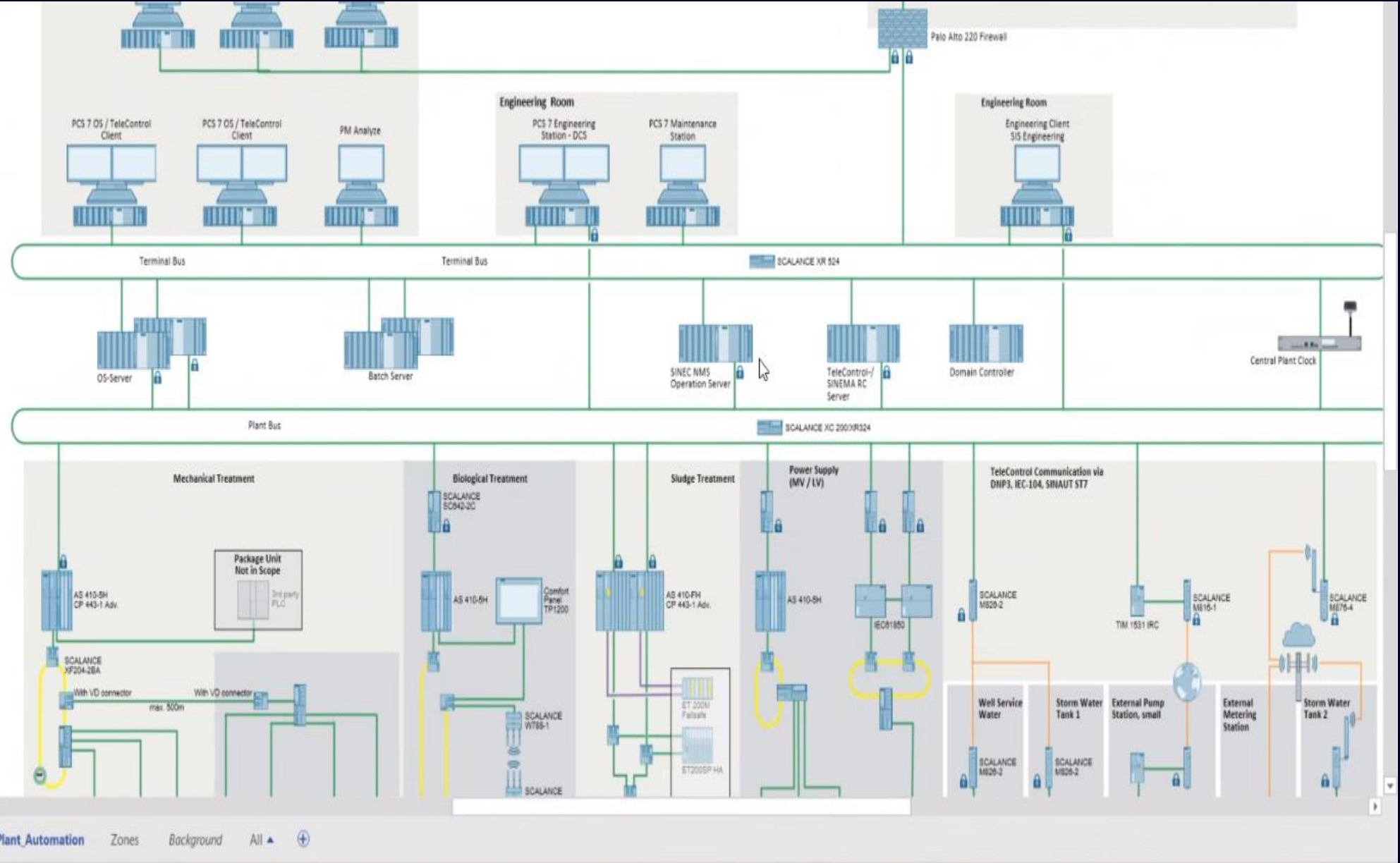
Production Cell



NETWORK SEGMENTATION and CELL PROTECTION PLANTBUS vs TERMINALBUS

SCADA design
vs purdue model

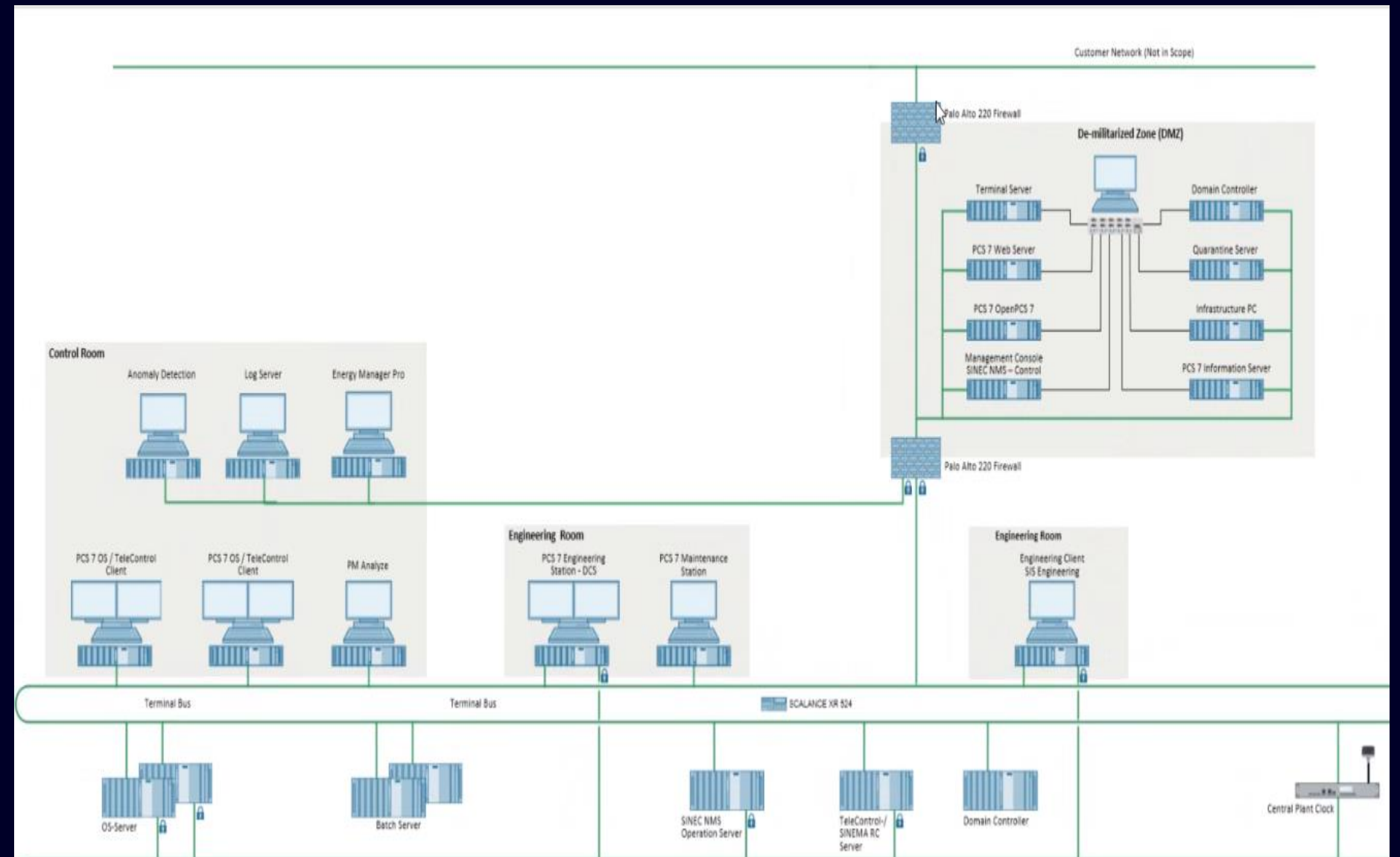
Conflict



INDUSTRIAL DMZ CONCEPT

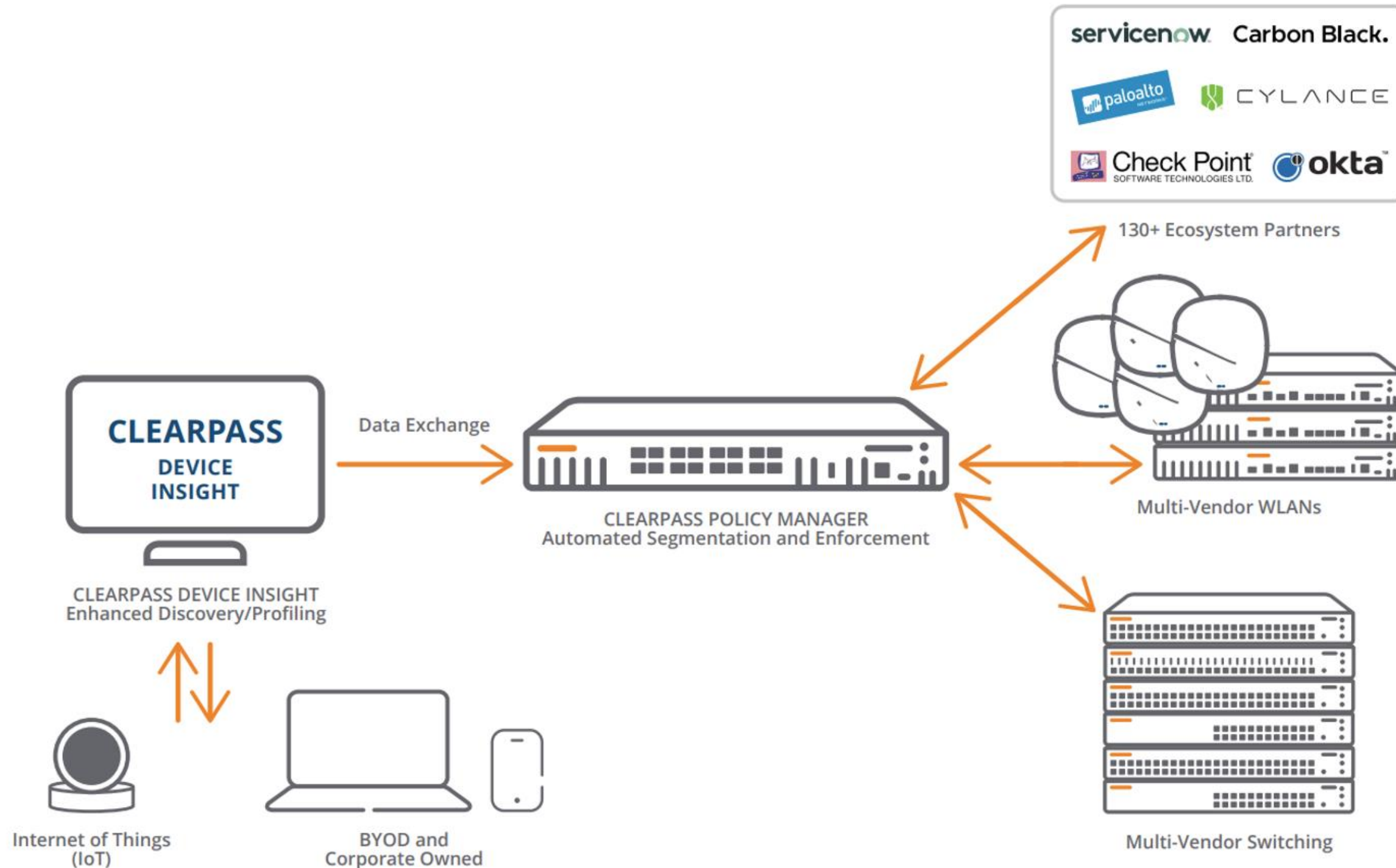
A DMZ dedicated for OT

IDMZ



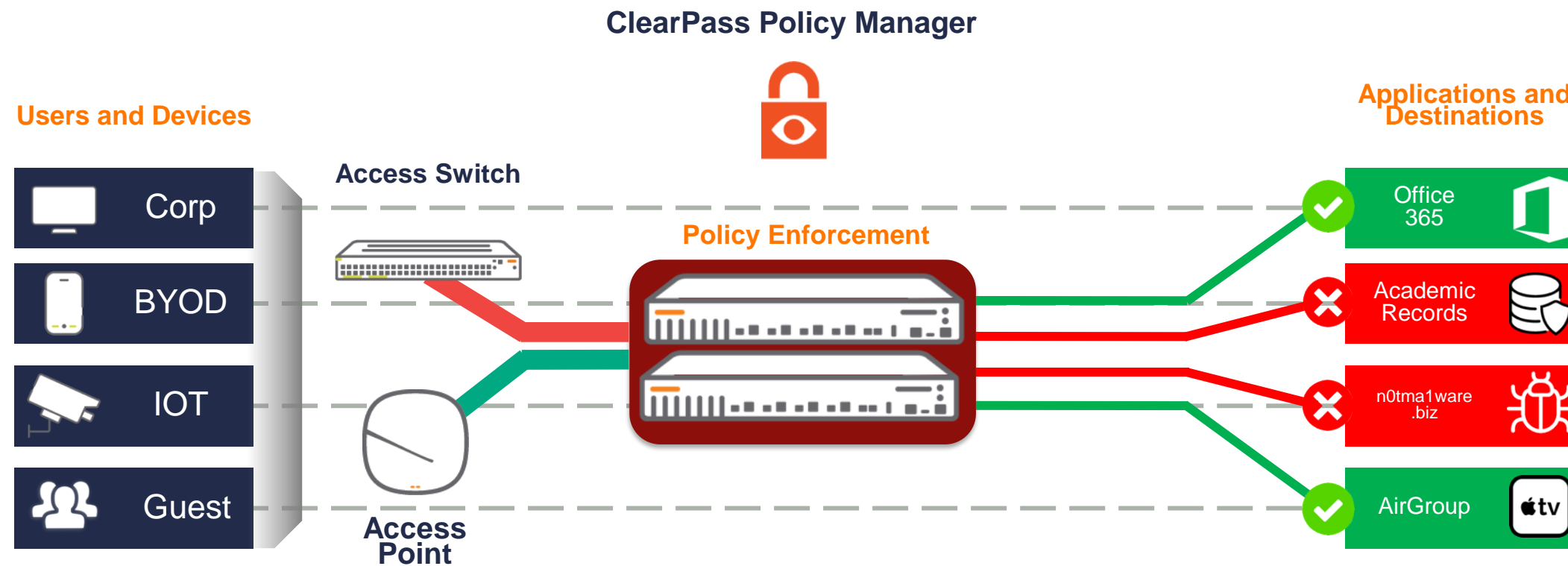
Network Access Control

Gain control on which devices can do what on your network

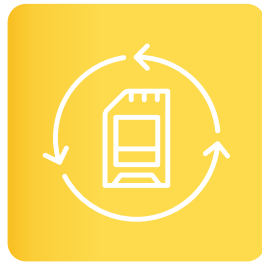


Network Access Control

Gain control on which devices can do what on your network

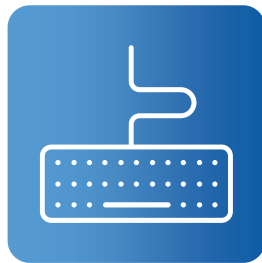


Security strategies & best practices



Monitoring

Get notified when anomalies are detected or if systems are unavailable



Patch Management

Make sure that all devices have the latest security patches installed



Vulnerability Management

Calculate the risks of new vulnerabilities that might affect your assets



Identity Access Management

Gain control on who can do what on your network

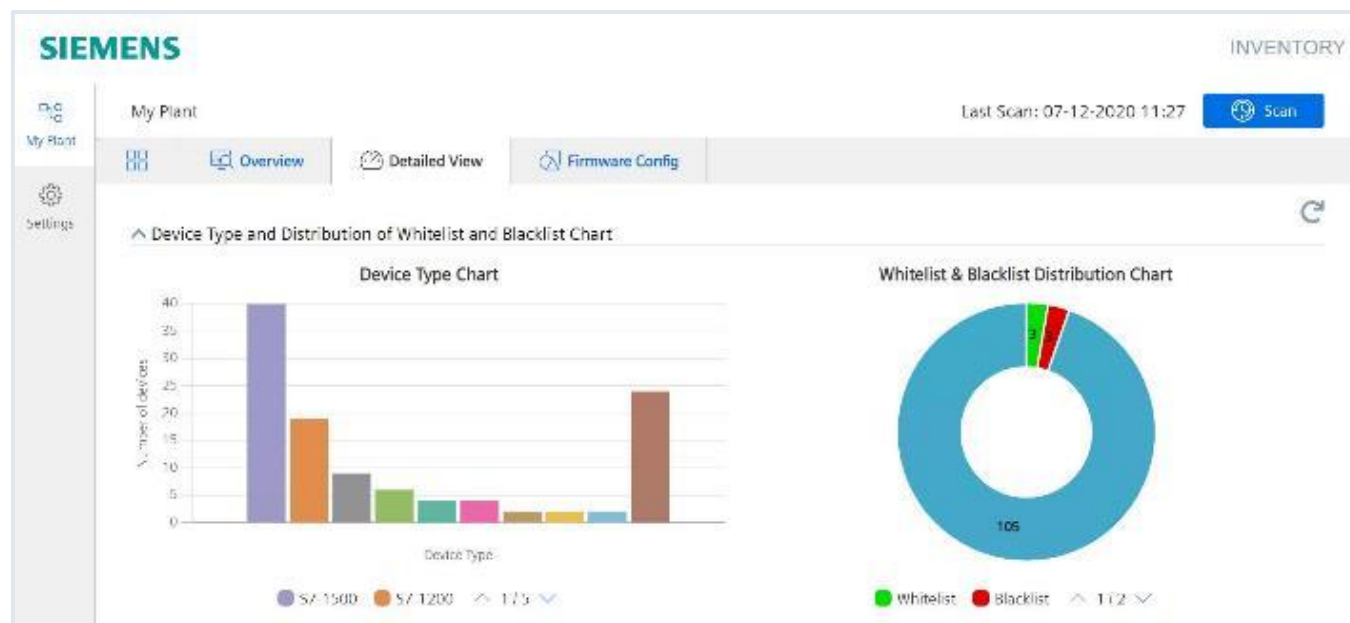


SIEMENS
Ingenuity for life

The screenshot displays the Siemens SINEC NMS (Network Management System) interface. The main window shows a network topology diagram with a central node highlighted. The left sidebar contains a tree view of the network configuration, including overall status, internal devices, and subnets. The right sidebar shows detailed information for a selected device, including its name, article number, firmware version, and IP address. The bottom of the interface features an event log table.

Read	Event status	Device status	Event	Event details	Event class	Time stamp	Protocol	Interface / slc	IP address ex	IP address internal
<input type="checkbox"/>	No	-	Discovery: scan for new devices completed	-	Notification	2020-04-08 11:45:17.342	-	-	-	172.31.254.126
<input type="checkbox"/>	No	-	Discovery: network scan started	C:\Siemens\SINECNMS_1	Notification	2020-04-08 11:45:00.931	-	-	-	172.31.254.126
<input type="checkbox"/>	No	Resolving	IO device: PROFINET standard diagnostics: OK	-	Info	2020-04-08 11:40:00.114	Profinet	S2	-	192.168.81.34
<input type="checkbox"/>	No	-	Neither a current connection nor a reference connection to the man Operation: DESKTOP-QRFFIBD	-	Info	2020-04-08 11:39:48.478	-	-	-	-

OT aware network monitoring & management



Available features

- Works for Siemens and 3rd party devices
- Available information for all devices (also with Device Scanner Service)
 - MAC Address, IP Address, Subnet mask
 - Order number (for PROFINET devices)
 - FW-Version (for PROFINET devices)
 - Hardware version (for PROFINET devices)
 - Software version (for PROFINET devices)
 - Serial number (for PROFINET devices)
 - CPU status (for PROFINET devices)
 - Station name (for PROFINET devices)
- Firmware check (Blacklist/Whitelist) to detect outdated firmware
- MQTT interface to share inventory information with e.g. SAP ERP system
- Based on PROFINET mechanism and standard protocols (TCP, RPC and SNMP)
- Plug and play configuration

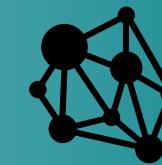
Early detection of threats with Industrial Anomaly Detection



Industrial Anomaly Detection

- Transparency on the shopfloor
- Detecting non-standard behavior

Main value drivers



Transparency over data exchange within industrial networks



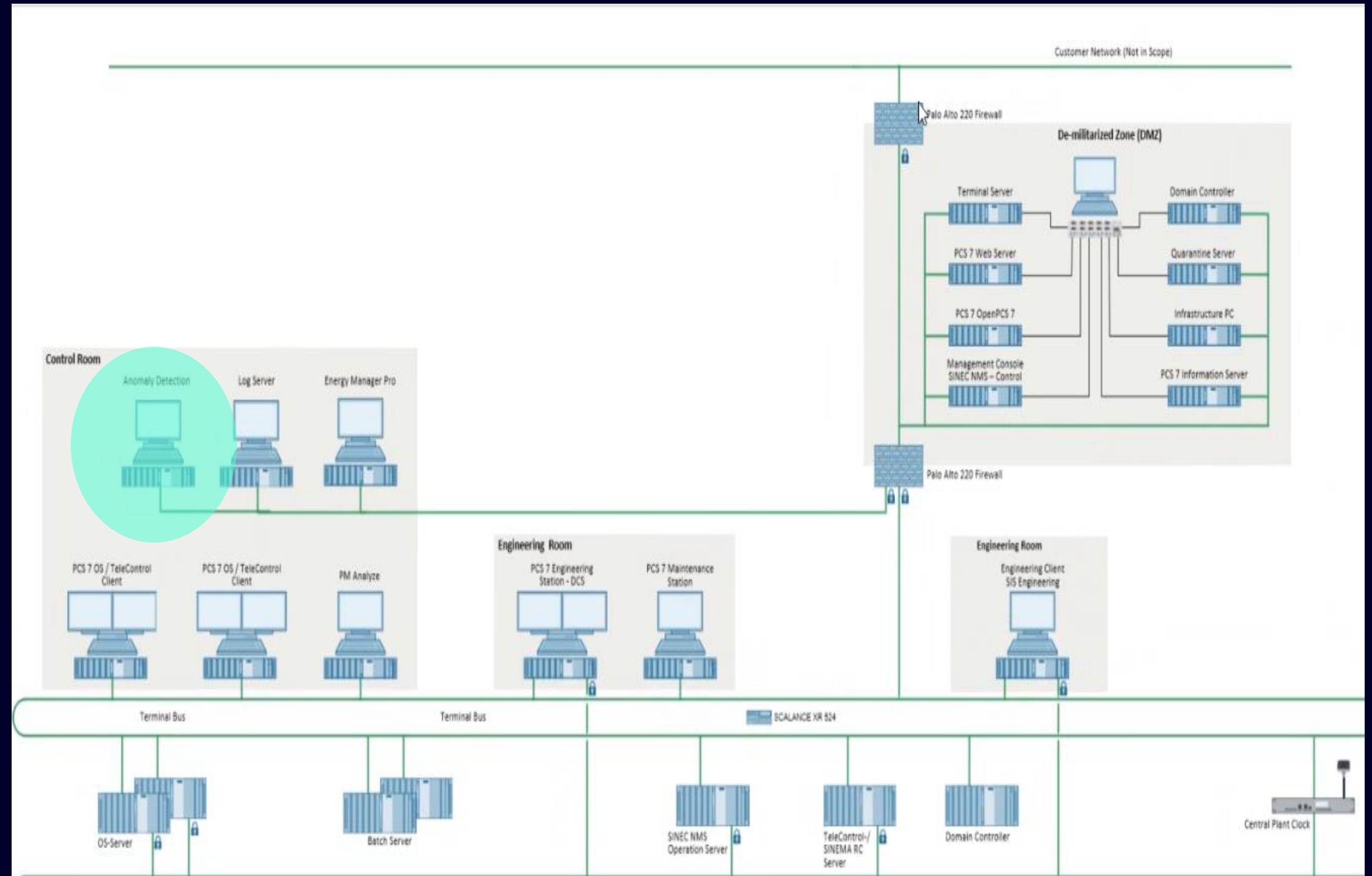
Early detection of anomalies and threats



Transparency over assets and vulnerabilities

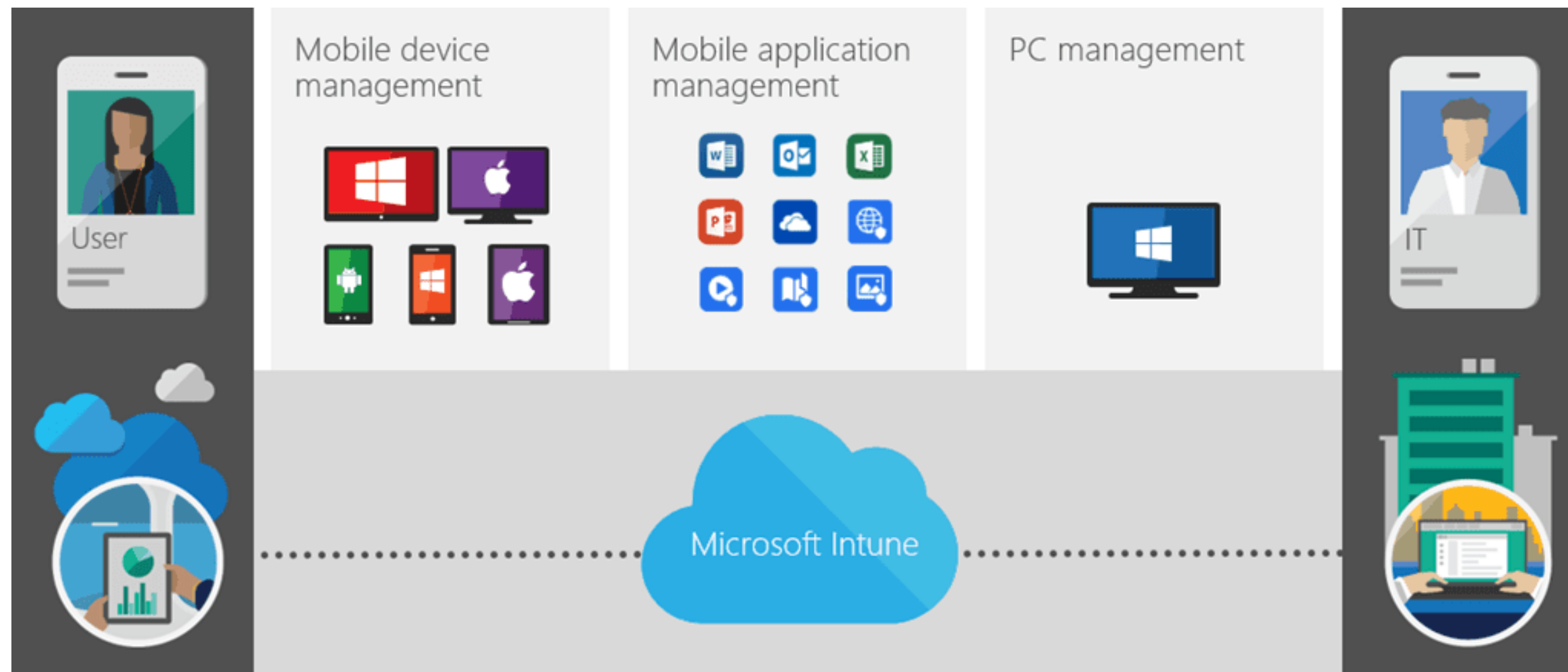
INDUSTRIAL DMZ CONCEPT

Industrial ANOMALY Detection



Patch management

Make sure that all devices have the latest security patches installed



Managing Vulnerabilities & Critical Updates Patch Management !



Patch Management

- Security patches and critical updates in Microsoft products for **SIMATIC PCS 7/WIN CC** to simplify the patch process on the plant.

How does it work?

- **Step 1:** tested and verified for compatibility
- **Step 2:** The **central WSUS** – sends the information automatically to the **local WSUS** server.
- **Step 3:** The customer receives a notification and can download the approved patches directly from Microsoft.

More info: [FAQ here](#)

Main value drivers



Save time and cost due to reduction of manual work on-site



Minimize risk of human error



Enhanced plant availability

Update your systems with SIMATIC Automation Tool



Available Features

- Works separately from TIA portal
- Firmware, application and PLC code update for S7-1200 and S7-1500
- Show network information (IP, MAC, Subnet mask, Gateway, Network Interface, Device Type, Device status, firmware, current application ID)
- User management from Edge platform is applied to update restriction/approval
- Remote Updates via SIMATIC Automation Tool with 2 separated network interfaces for secure update mechanism

Tested/Guaranteed SW Compatibility

Software combinations need vendor support

		STEP 7 Professional (TIA Portal)		
		V17.0	V16.0	V15.1
Microsoft Windows 7	Ultimate (64-Bit) SP1		√	√
	Professional (64-Bit) SP1		√	√
	Enterprise (64-Bit) SP1		√	√
Microsoft Windows 10	Pro Version 20H2 (64-Bit)	√	√ ²¹⁾	√ ²²⁾
	Pro Version 2004 (64-Bit)	√	√ ²³⁾	√ ²²⁾
	Pro Version 1909 (64-Bit)	√	√ ²³⁾	√ ²²⁾
	Pro Version 1903 (64-Bit)		√	√ ²²⁾
	Pro Version 1809 (64-Bit)		√	√
	Pro Version 1803 (64-Bit)			√
	Pro Version 1709 (64-Bit)			√
	Enterprise Version 20H2 (64-Bit)	√	√ ²¹⁾	√ ²²⁾
	Enterprise Version 2004 (64-Bit)	√	√ ²³⁾	√ ²²⁾
	Enterprise Version 1909 (64-Bit)	√	√ ²³⁾	√ ²²⁾
	Enterprise Version 1903 (64-Bit)		√	√ ²²⁾
	Enterprise Version 1809 (64-Bit)		√	√
	Enterprise Version 1803 (64-Bit)			√
	Enterprise Version 1709 (64-Bit)			√
	Enterprise LTSC 2019 Version 1809 (64-Bit)	√	√	√
	Enterprise LTSC 2016 Version 1607 (64-Bit)	√	√	√
	Enterprise LTSC 2015 Version 1507 (64-Bit)		√	√

More info: [FAQ here](#)

Vulnerability Management

Calculate the risks of new vulnerabilities that might affect your assets

Nessus
Scans Settings 🔔 👤

FOLDERS

- 📁 My Scans
- 📁 All Scans
- 🗑️ Trash

RESOURCES

- 🛡️ Policies
- 🔧 Plugin Rules
- 📄 Customized Reports
- 🔄 Scanners

Live Results Scan
Configure Audit Trail Launch Export

← Back to My Scans

Hosts 1
Vulnerabilities 45
History 1

Filter 45 Vulnerabilities


<input type="checkbox"/>	Sev	Name	Family	Count		
<input type="checkbox"/>	CRITICAL	LIVE Mozilla Foundation Unsupported Application ...	MacOS X Local Security Checks	1	🔄	✎
<input type="checkbox"/>	HIGH	LIVE Mozilla Firefox < 59 Multiple Vulnerabilities (m...	MacOS X Local Security Checks	1	🔄	✎
<input type="checkbox"/>	HIGH	LIVE Mozilla Firefox < 59.0.1 Multiple Code Executi...	MacOS X Local Security Checks	1	🔄	✎
<input type="checkbox"/>	HIGH	LIVE Mozilla Firefox < 59.0.2 Denial of Service Vuln...	MacOS X Local Security Checks	1	🔄	✎
<input type="checkbox"/>	HIGH	LIVE Mozilla Firefox < 60 Multiple Critical Vulnerabili...	MacOS X Local Security Checks	1	🔄	✎
<input type="checkbox"/>	HIGH	LIVE Mozilla Firefox < 61 Multiple Critical Vulnerabili...	MacOS X Local Security Checks	1	🔄	✎
<input type="checkbox"/>	HIGH	LIVE Mozilla Firefox < 62 Multiple Critical Vulnerabili...	MacOS X Local Security Checks	1	🔄	✎
<input type="checkbox"/>	MEDIUM	SSL Certificate Cannot Be Trusted	General	1	🔄	✎
<input type="checkbox"/>	INFO	Netstat Portscanner (SSH)	Port scanners	16	🔄	✎
<input type="checkbox"/>	INFO	Service Detection	Service detection	4	🔄	✎
<input type="checkbox"/>	INFO	HTTP Server Type and Version	Web Servers	2	🔄	✎
<input type="checkbox"/>	INFO	Additional DNS Hostnames	General	1	🔄	✎

Notice: This scan has been updated with **Live Results**. [Launch](#) a new scan to confirm these findings or [remove](#) them.

Scan Details

Name: Live Results Scan
 Status: Completed
 Policy: Advanced Scan
 Scanner: Local Scanner
 Modified: Today at 6:03 PM (Live Results)

Vulnerabilities



- Critical
- High
- Medium
- Low
- Info

INDUSTRIAL VULNERABILITY MNGT



Industrial Vulnerability Manager

- Tailored for OT
- Industrial Communication Aware

How does it work?

- Step 1: Definition of components to be monitored
- Step 2: Monitoring regarding published vulnerabilities
- Step 3: Automatic generation of digital “Security Bulletins”



Main value drivers



Instant transparency on vulnerabilities and patches



Proactive management of cyber risks

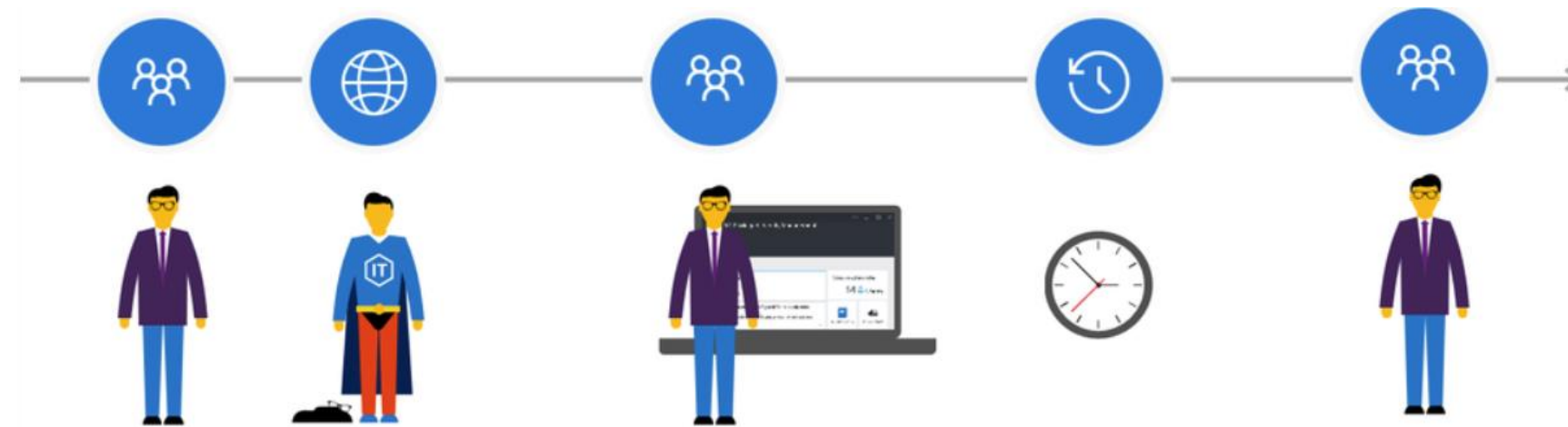


Avoid downtime and save costs

Identity Access Control (remote)

How to secure remote access

Self-Service Privileged Identity Management (SSPIM)



Management dashboard

A management dashboard to determine which users can have which privileges for a certain duration



Web application

A web application, hosted in the cloud, that enables users to request escalation of their privileges



On-premises agent

On-prem agents that follow up on escalation requests

SINEMA Remote Connect use case UMC/ AD use case with server in the factory

Task

- Secure remote maintenance for series machines and larger systems using central user and permission management

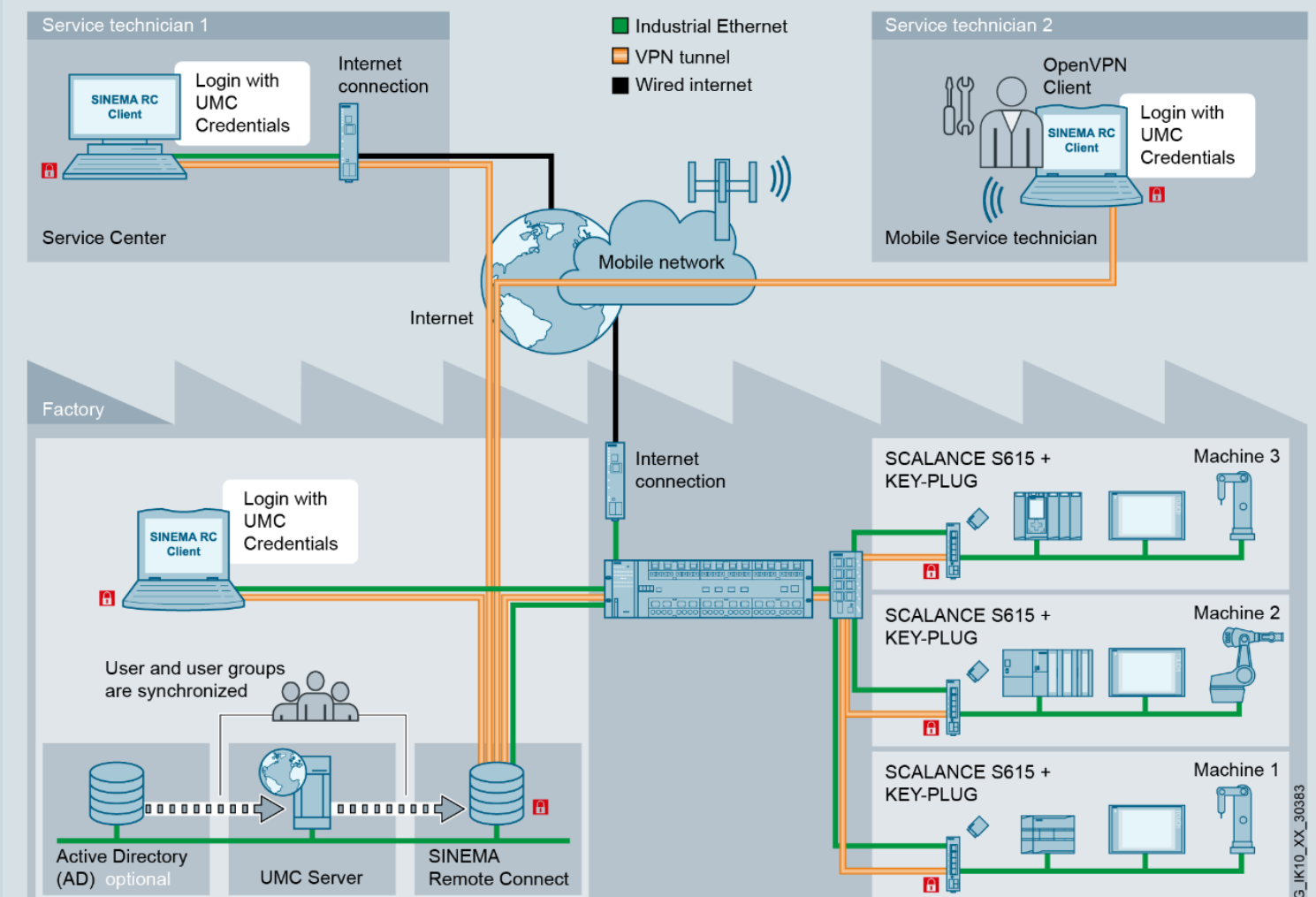
Solution

- Uniform login with Active Directory user data on SINEMA RC server and SINEMA RC client
- Optional connection to Active Directory

Benefits

- Central user and rights management
- Cooperation via UMC server with other systems

Configuration example SINEMA Remote Connect: Remote service for special machine construction with central authentication



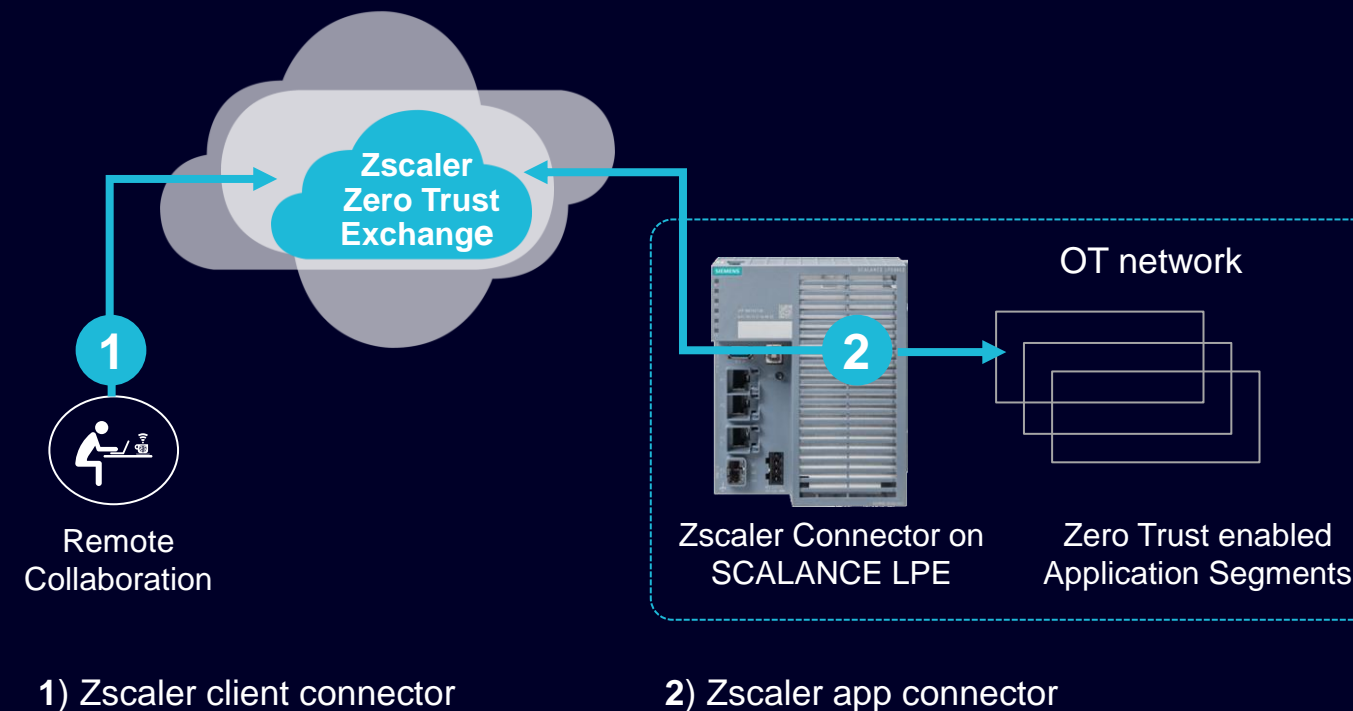
Zscaler Connector running on Siemens SCALANCE LPE

Driving the technological OT/IT convergence



Scale up Zscaler as proven Zero Trust IT-Technology to:

- Enable SCALANCE products to support Zscaler technology out of the box
- Leverage the approach of Siemens and Zscaler to empower existing automation networks

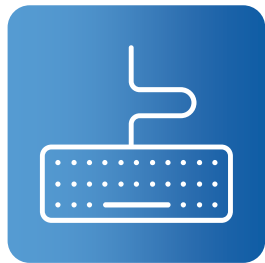


Security strategies & best practices



Systems hardening

Deploy best-practice security configurations to your assets



Backup Management

Ensure proper backups are being taken of all data containing systems



Response Plans

Make sure response plans are in place to quickly react in case of an incident



Standardization

Simplify Vertical Digitalization by bottom-up standardization



Systems hardening

Deploy best-practice security configurations to your assets

1.1.1.1 Ensure mounting of cramfs filesystems is disabled (Automated)

Profile Applicability:

- Level 1 - Server
- Level 1 - Workstation

Description:

The `cramfs` filesystem type is a compressed read-only Linux filesystem embedded in small footprint systems. A `cramfs` image can be used without having to first decompress the image.

Rationale:

Removing support for unneeded filesystem types reduces the local attack surface of the server. If this filesystem type is not needed, disable it.

Audit:

Run the following commands and verify the output is as indicated:

```
# modprobe -n -v cramfs | grep -E '(cramfs|install)'
install /bin/true
# lsmod | grep cramfs
<No output>
```

Remediation:

Edit or create a file in the `/etc/modprobe.d/` directory ending in `.conf`

Example: `vim /etc/modprobe.d/cramfs.conf`

and add the following line:

```
install cramfs /bin/true
```

Run the following command to unload the `cramfs` module:

```
# rmmod cramfs
```



Implementation on the hyper-convergent IT platform Industrial Automation DataCenter

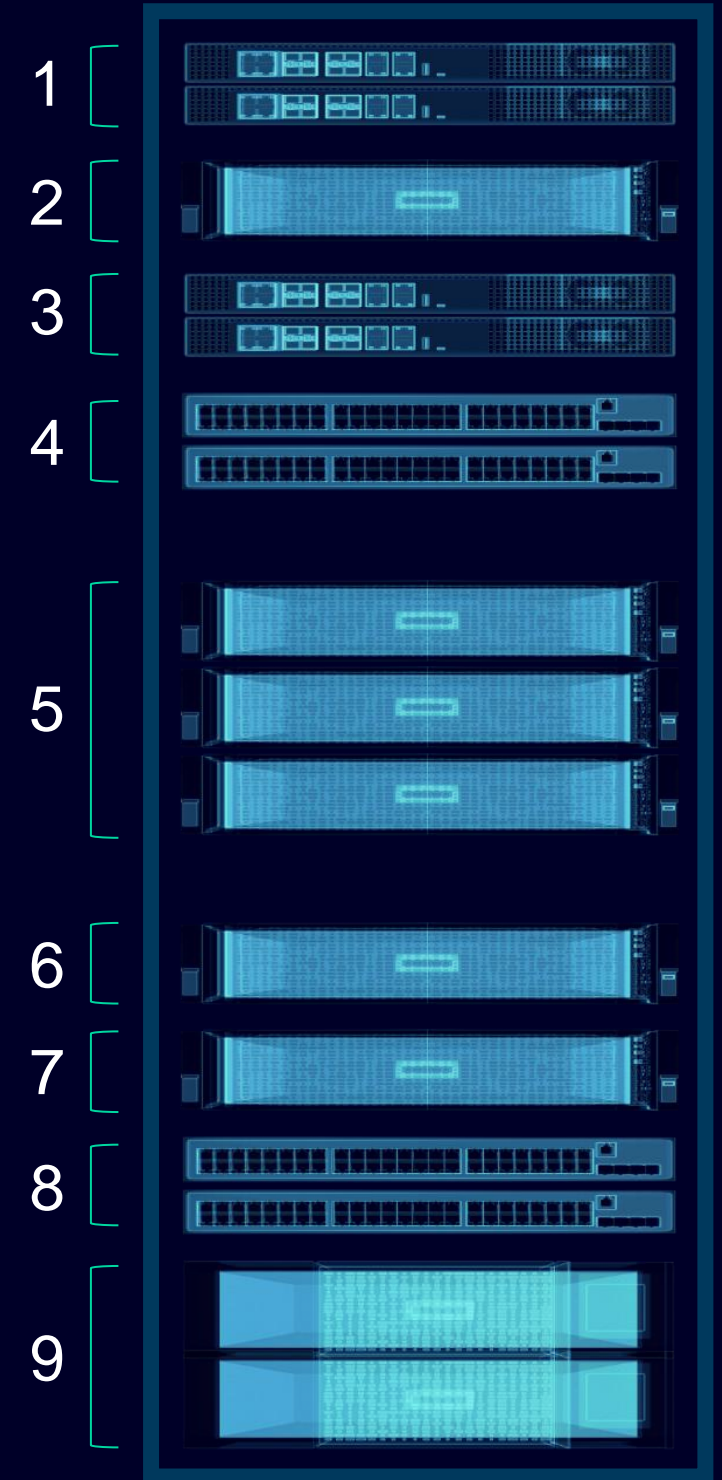


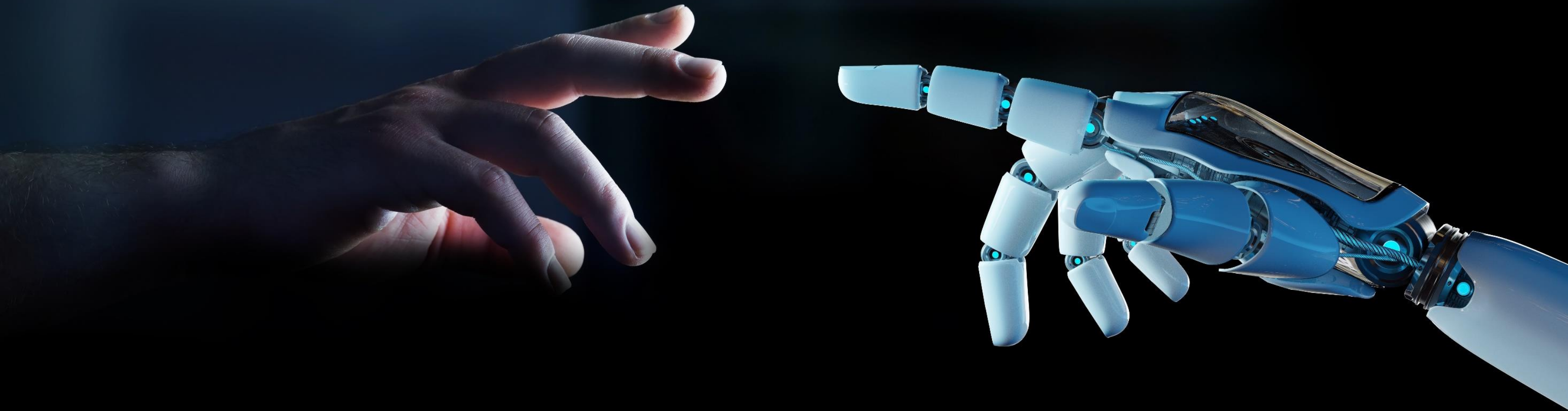
Pre-configured and pre-tested HW/SW components

1. Front Firewall
2. Industrial DMZ
3. Back Firewall
4. IT Networking
5. Computing
6. Backup & Disaster Recovery
7. Process Historian
8. OT Networking
9. Uninterruptable Power Supply

inetum.
realdolmen
Positive digital flow

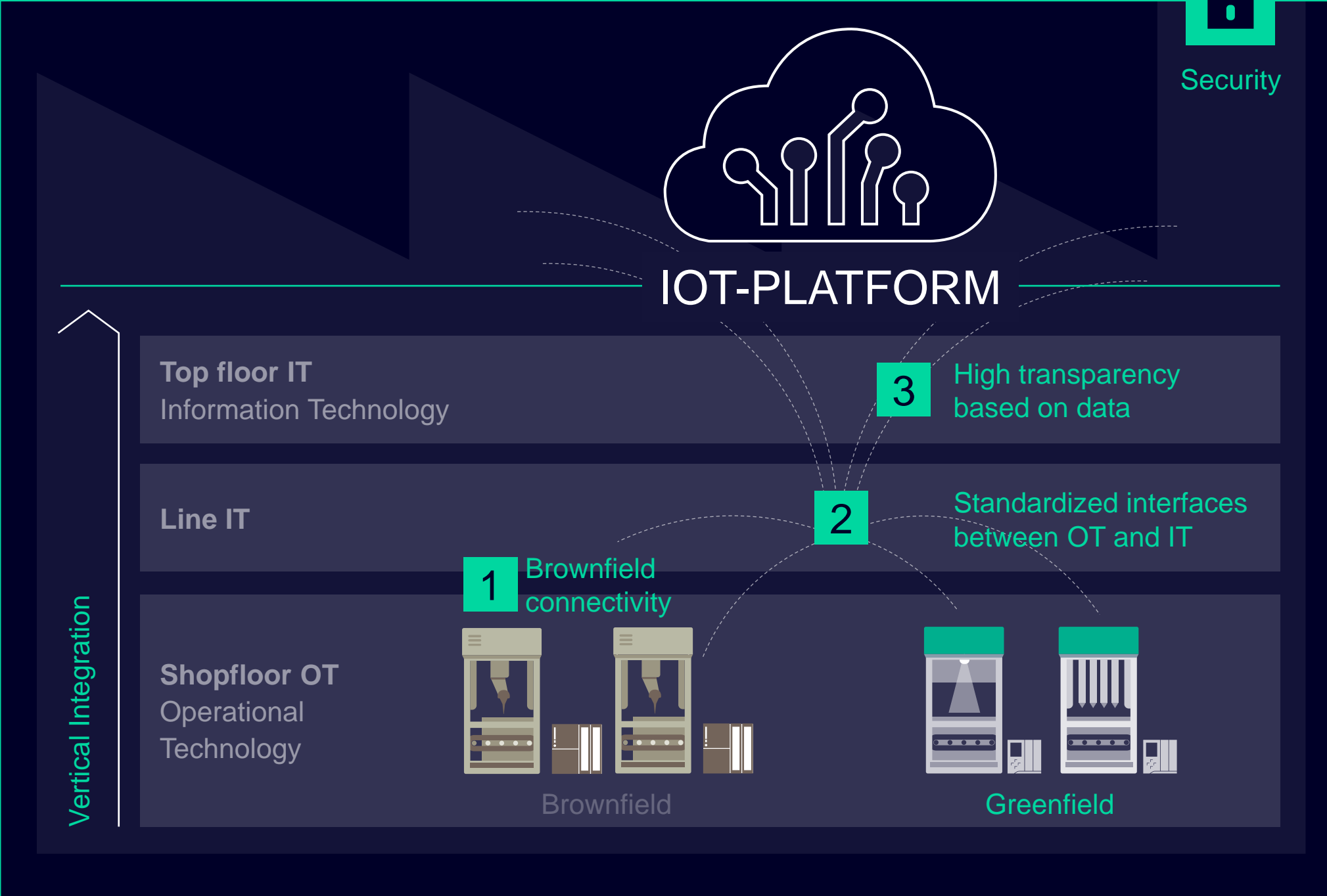
+ **SIEMENS**



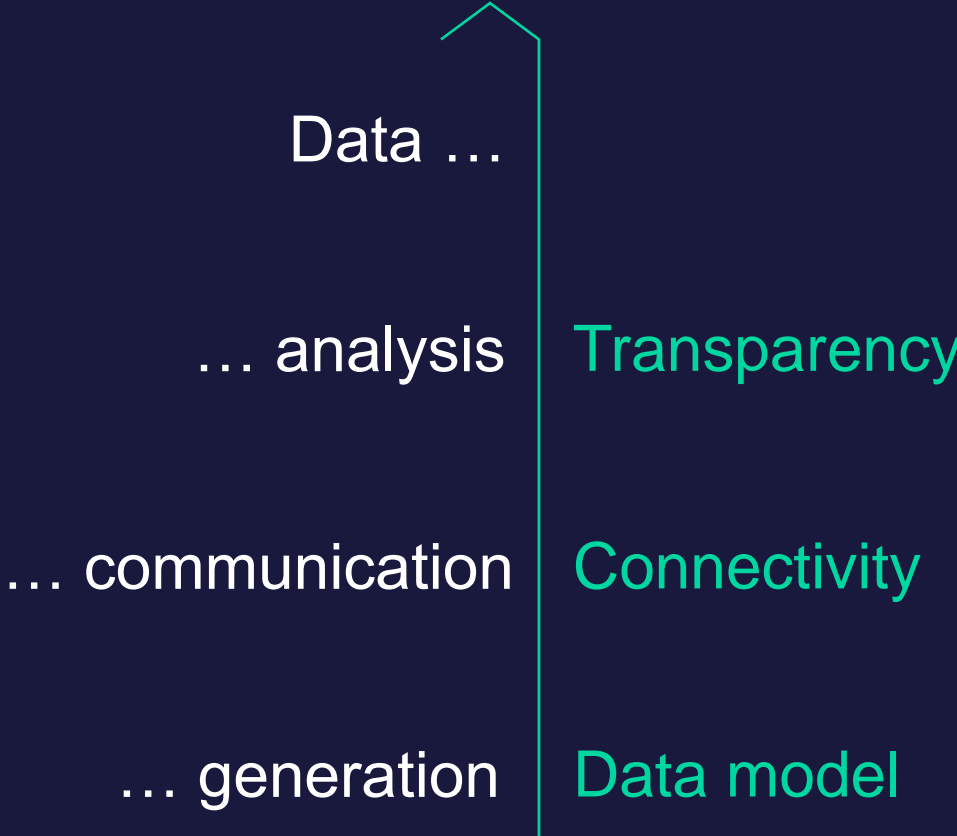


Simplify your Digitalization use-case
by starting with the **right foundations**

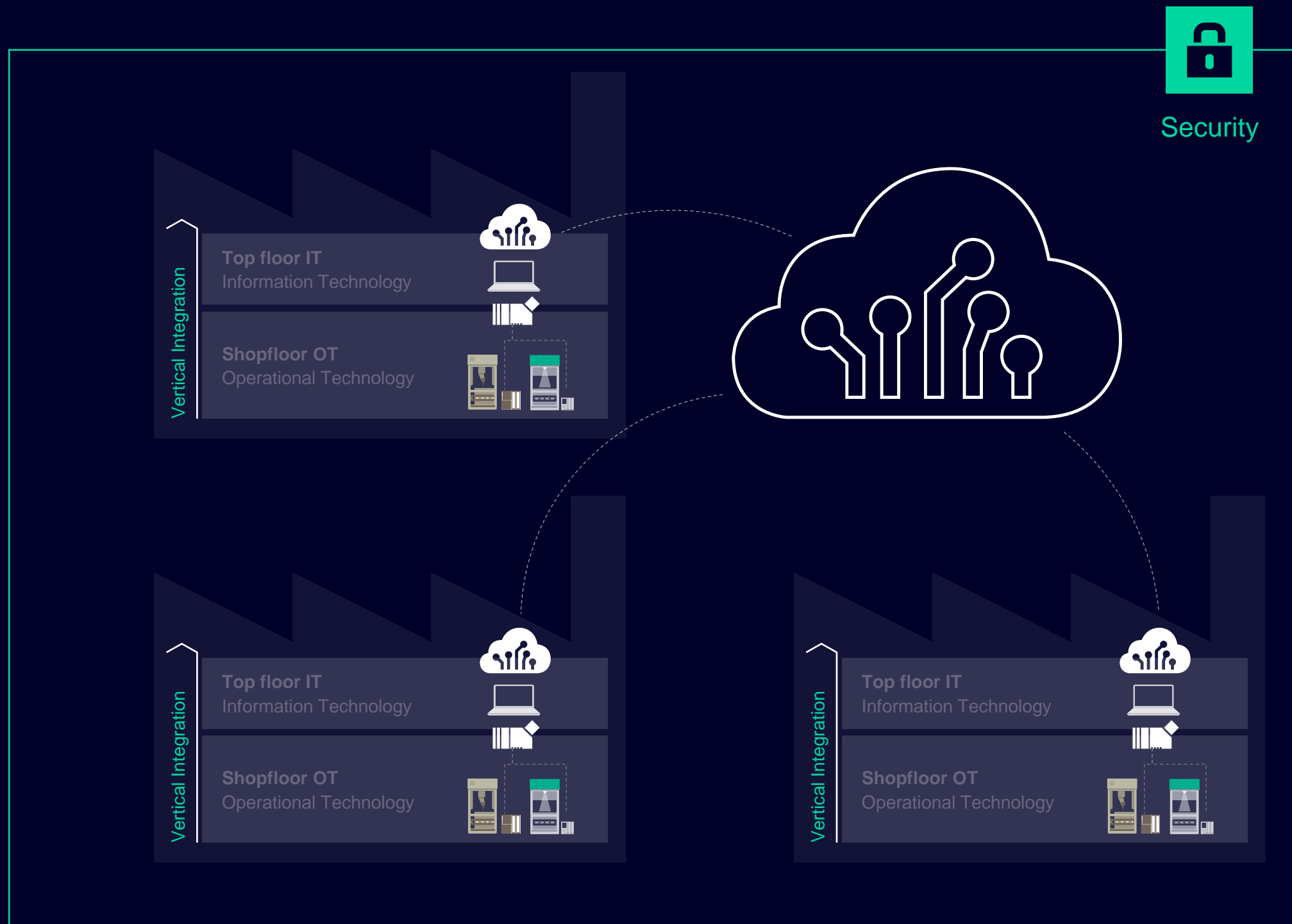
Standardization is “THE” starting point of your Vertical Digitalization foundations



Increase efficiency and gain new business models based on data from all areas.



Set the base for further open ecosystems



Build a digital enterprise for more flexibility and optimization.

More transparency about global production facilities increases efficiency.

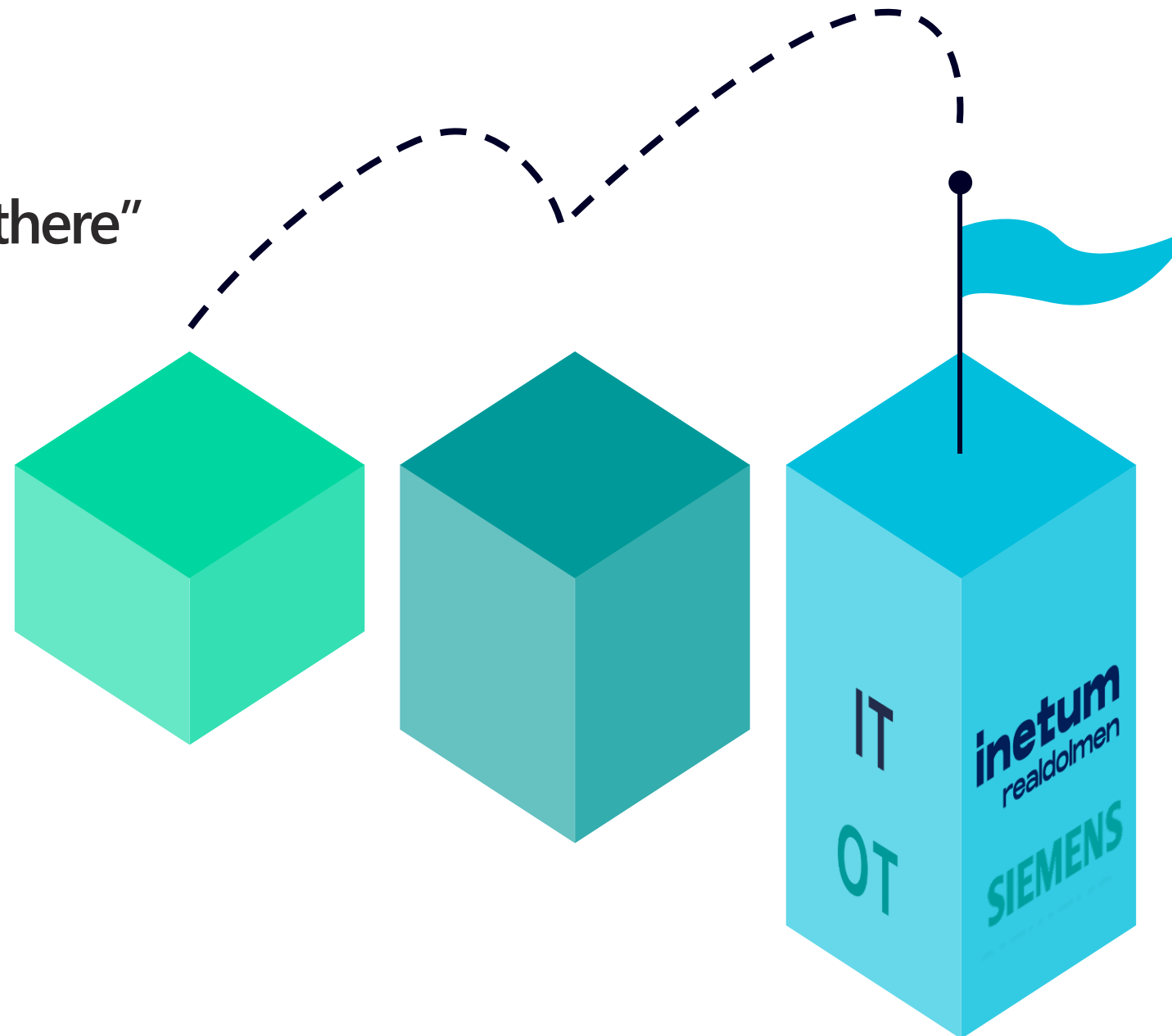
The standardized OT-IT concept must be integrated into every factory.

How to get started?

Security Maturity Roadmap



"From here to there"



Roadmap outcome

Call to action

Who ?

SPOC: Single Point Of Contact: Frederik De Naeyer

GSM: 0496/23.53.05

Email: frederik.denaeyer@inetum-realdolmen.world

What ?

Peilen >

- **Behoeftte ? SID, Availability, Security,...**

Ondersteunen >

- **Expertise OT_IT**

How ?

Afsluiten >

- **Step1: Intake-meeting onsite**
- **Step2: Quick scan, passive / Active scanning,...**

Doel >

- **Begeleidingstraject opstarten met oog op performante, stabiele, en cyber-secure omgeving**



Combining the Best of OT and IT

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and get the most out of
your factory

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