

PROFICLOUD računarstvo u oblaku

Vedad Ćosić

PHOENIX CONTACT

INSPIRING INNOVATIONS



Vedad Ćosić

- Inženjer industrijske automatizacije (*Application Engineer*)
- PLC programiranje, razvoj HMI i SCADA aplikacija

Odgovornosti:

- Osposobljavanje kupaca (*Customer Trainings*)
- Upravljanje projektima (*Project Management*)
- Tehnička podrška (*Technical Support*)

Sadržaj

- Računarstvo u oblaku
- Primjena u energetici
- PROFICLOUD V1
 - Time Series Data Service
 - PLCnext Store
 - mGuard Secure Remote Service
 - ImpulseAnalytics Service
 - PROFINET Service
- PROFICLOUD V2

Računarstvo u oblaku

IaaS, PaaS, SaaS i PROFICLOUD

SaaS (Software as a Service)

- Korisnik pristupa aplikacijama pružatelja usluga, dostupnima putem klijentskog sučelja
- Korisnik ne upravlja osnovnom infrastrukturom oblaka (npr. mrežom, računalnim resursima)



PaaS (Platform as a Service)

- Korisničke aplikacije izrađene pomoću programskih jezika, knjižnica...
- Korisnik ne upravlja osnovnom infrastrukturom oblaka (npr. mrežom, računalnim resursima)



IaaS (Infrastructure as a Service)

- Pohrana, mreže, osnovni računalni resursi...
- Korisnik ne upravlja osnovnom infrastrukturom oblaka (npr. mrežom, računalnim resursima)



Računarstvo u oblaku

IaaS, PaaS, SaaS i PROFICLOUD

SaaS
(Software as a Service)

Rješenja u oblaku



PaaS
(Platform as a Service)

PROFICLOUD
(Phoenix Contact IoT platforma)

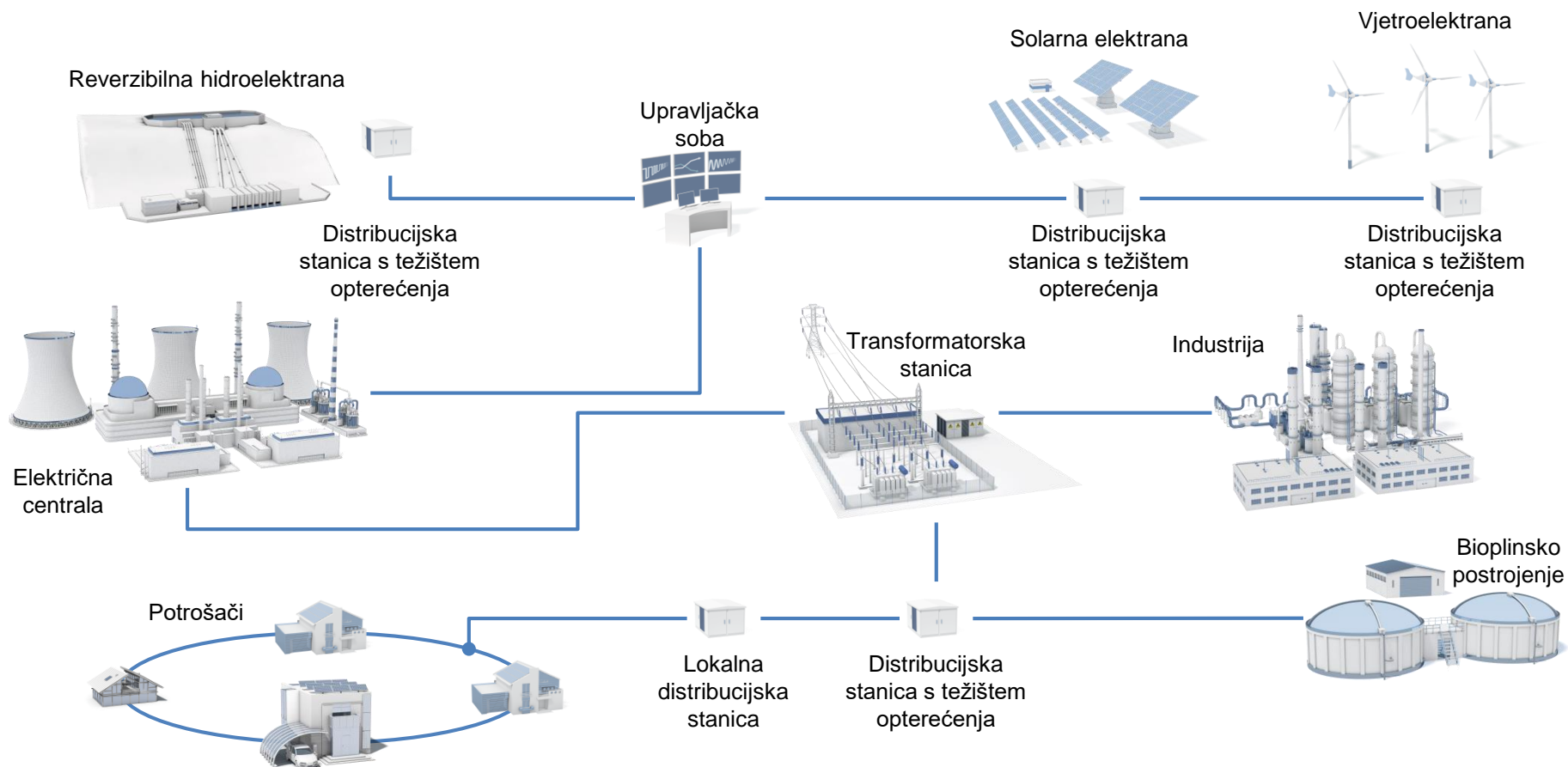


IaaS
(Infrastructure as a Service)

amazon web services
(usluge poslužitelja)



Primjena u energetici

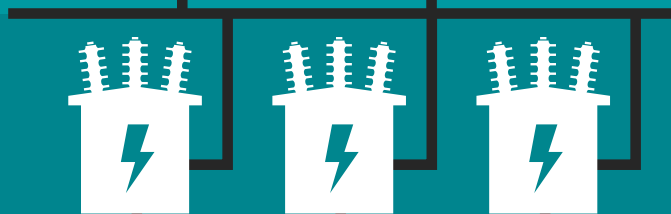


Primjena u energetici

Komunikacija u EES-u



IEC 60870-0-101/-102/-104
DNP3
IEC 60870-6 (ICPP/TASE.2)

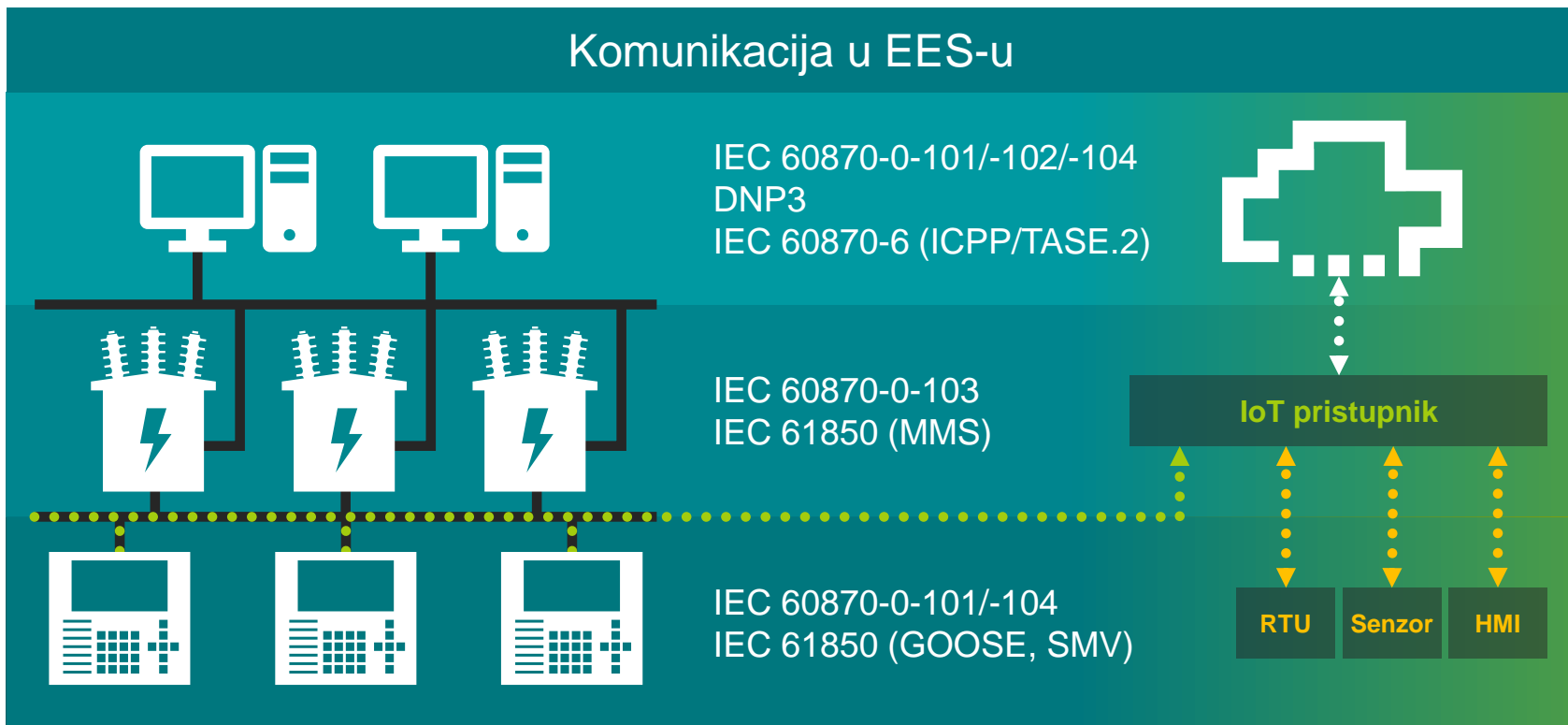


IEC 60870-0-103
IEC 61850 (MMS)



IEC 60870-0-101/-104
IEC 61850 (GOOSE, SMV)

Primjena u energetici



IoT pristupnici



Osnovni RTU

AXC F 1152

2700973

- Cyclone 5 s ARM Cortex-A9 CPU 1 x 800 MHz
- Komunikacijski protokoli: HTTP(S), FTP, SNTP, SNMP, SMTP, SQL, MySQL, DCP, itd.
- Broj upravljačkih zadataka (IEC 61131): 8
- Najmanje vrijeme ciklusa (IEC 61131): 5 ms
- Profinet (kontroler, uređaj) sa 16 AR-ova
- 512 MB RAM
- Utor za SD Flash karticu
- 1 x ETH-MAC sučelje (2 x 10/100 Mbit)
- Sat stvarnog vremena
- Podrška za Inline i Axioline I/O module
- Trusted platform module (TPM) za sigurnost
- Temperaturni raspon: -25 °C...+60 °C



Standardni RTU

AXC F 2152

2700974

- ARM Cortex-A9 CPU 2 x 800 MHz
- Komunikacijski protokoli: HTTP(S), FTP, SNTP, SNMP, SMTP, SQL, MySQL, DCP, itd.
- Broj upr. zadataka (IEC 61131): 16
- Najmanje vrijeme ciklusa (IEC 61131): 1 ms
- Profinet (kontroler, uređaj) sa 64 AR-a
- 512 MB RAM
- Utor za SD Flash karticu
- 1 x ETH-MAC sučelje (2 x 10/100 Mbit)
- Micro-USB tip C
- Sat stvarnog vremena
- Podrška za Inline i Axioline I/O module
- Mogućnost proširenja s lijeve strane
- Trusted platform module (TPM) za sigurnost
- Temperaturni raspon: -25 °C...60 °C



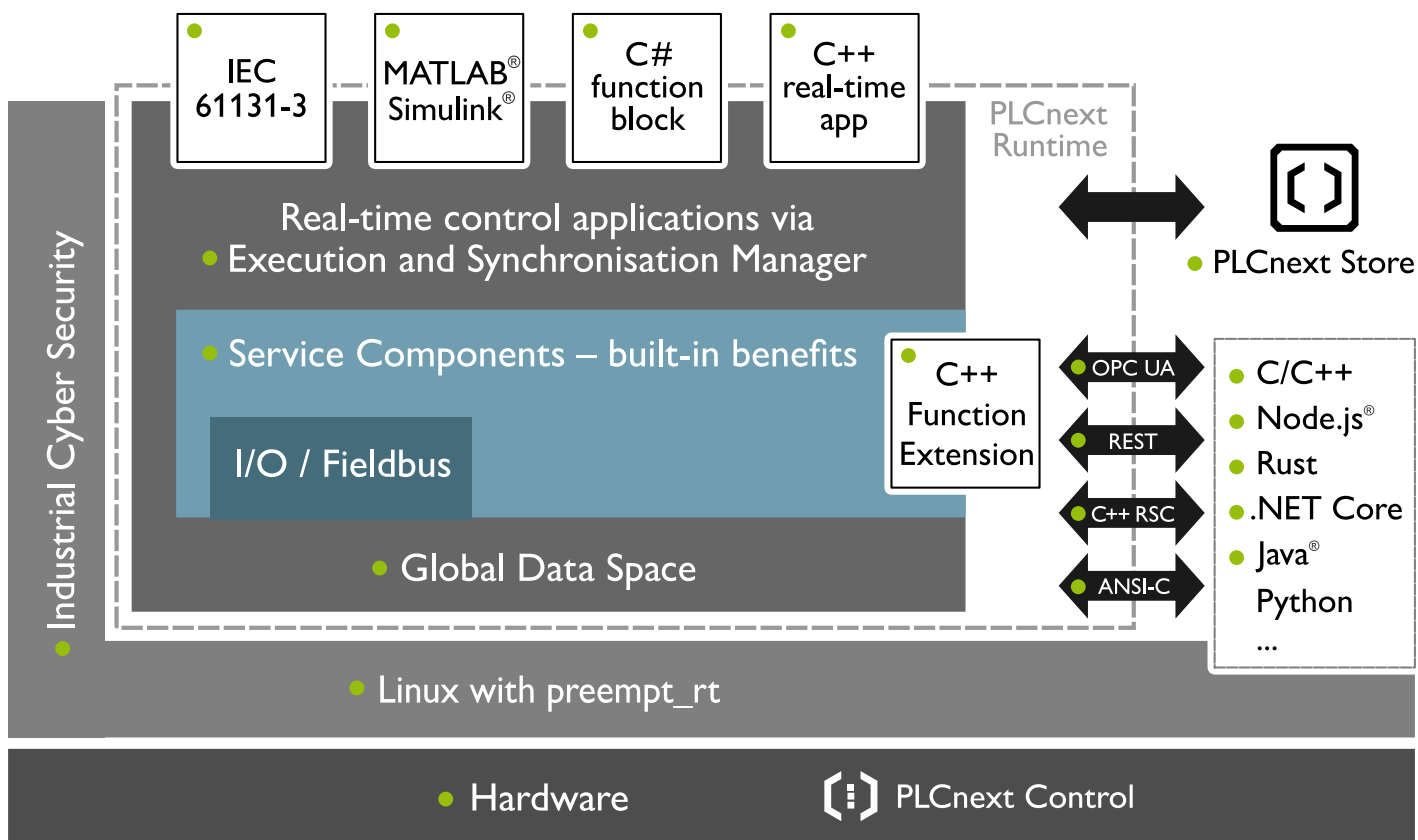
IoT pristupnik

CLOUD IOT GATEWAY

1031235

- Robustno kućište za industrijska okruženja
- Arm® Cortex®-A8 1 x 600 MHz
- Sučelja: RS-232, RS-485, Ethernet (2 x RJ45 (100 Mbps)), USB tip C
- Komunikacijski protokoli: Modbus/RTU, Modbus/TCP, HTTPS
- Siguran prijenos podataka putem TLS (engl. Transport Layer Security) enkripcije
- Sat stvarnog vremena
- Temperaturni raspon: -25 °C...55 °C

PLCnext tehnologija



PLCnext tehnologija



PLCnext tehnologija omogućuje bilo koju željenu kombinaciju neovisno izrađenih programa i kompletnih aplikacija. Korištenje softvera i aplikacija otvorenog koda poboljšava učinkovitost Vaših razvojnih procesa.

PROFICLOUD V1

PROFICLOUD



Time Series Data
Service



PLCnext Store



mGuard Secure
Remote Service



ImpulseAnalytics
Service



PROFINET Service

PROFICLOUD V1

PROFICLOUD



Time Series Data
Service



PLCnext Store



mGuard Secure
Remote Service



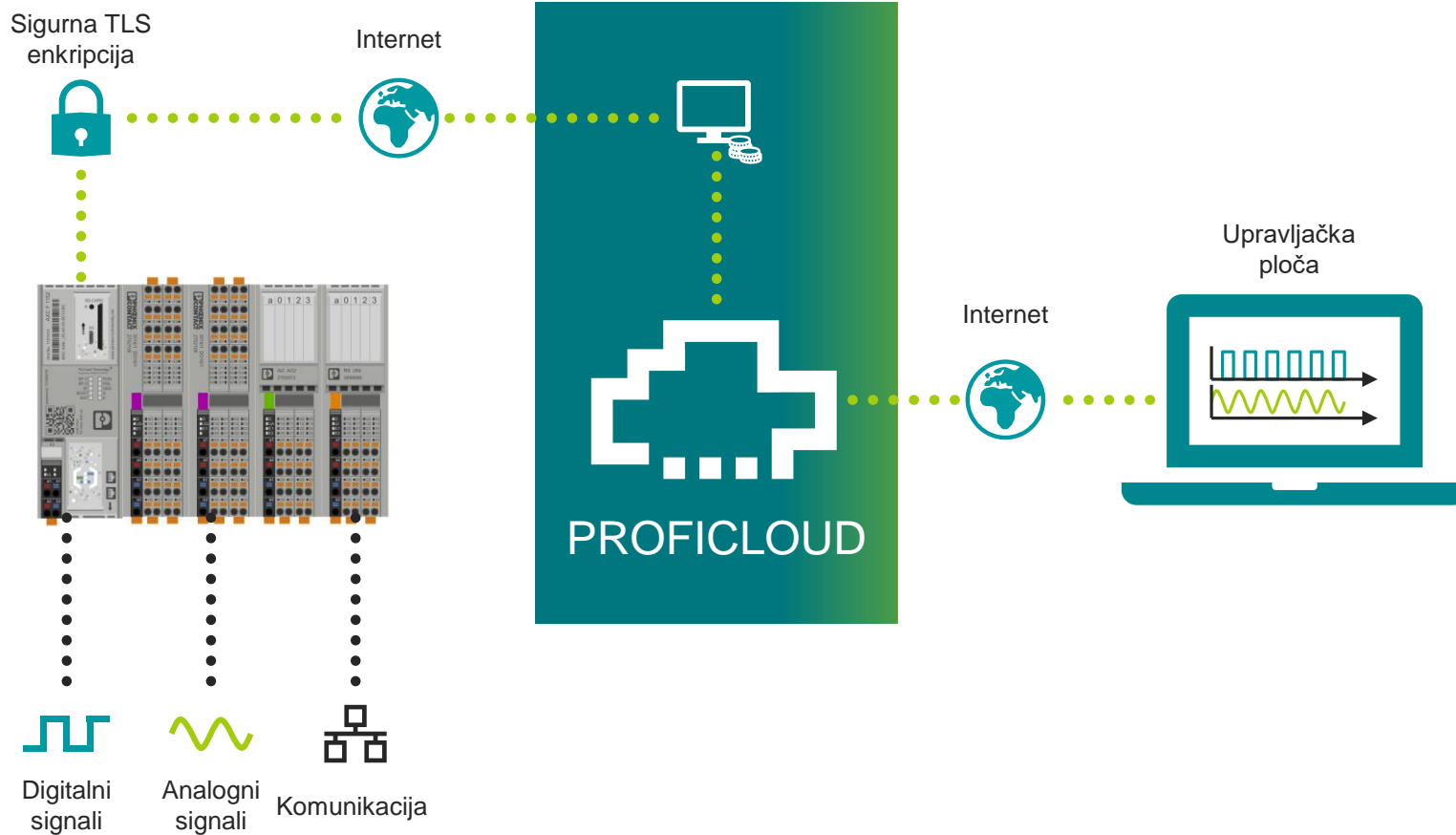
ImpulseAnalytics
Service



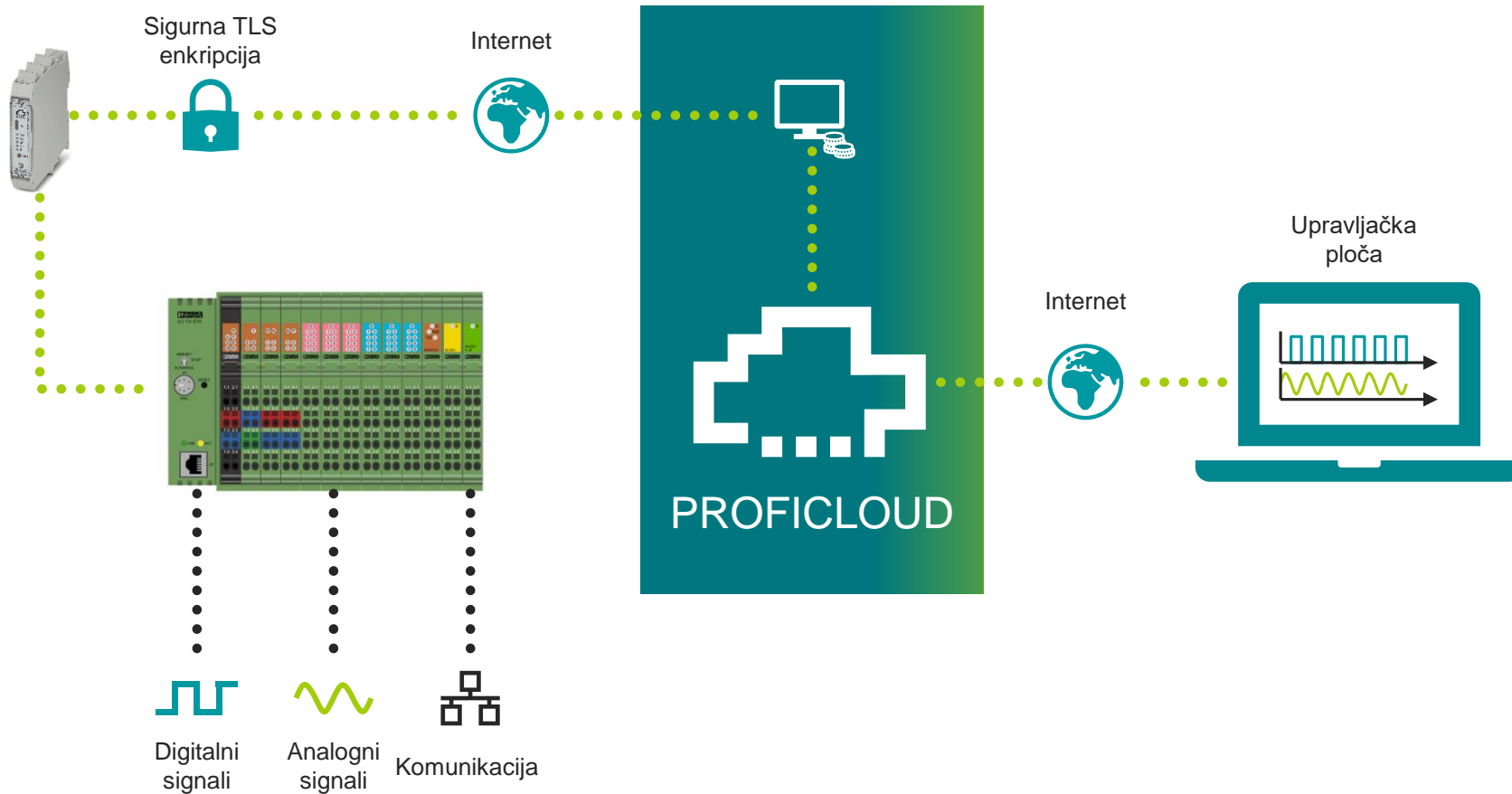
PROFINET Service

- TSD rješenje omogućuje slanje upita, prikaz i razumijevanje mjernih podataka koji su pohranjeni u Vašoj vlastitoj bazi podataka u Proficloudu
- Izrada, pregled i dijeljenje nadzornih ploča (engl. *Dashboards*)

PROFICLOUD V1



PROFICLOUD V1



PROFICLOUD V1



PROFICLOUD V1

PROFICLOUD



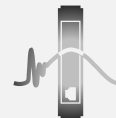
Time Series Data
Service



PLCnext Store



mGuard Secure
Remote Service




ImpulseAnalytics
Service



PROFINET Service

- PLCnext Store nudi softverske aplikacije s kojima možete izravno i jednostavno proširiti funkcije PLCnext kontrolera
- Kao programer softverskih rješenja možete stvoriti i vlastite aplikacije i ponuditi ih u PLCnext Storeu


PLCnext Store



PLCnext Store

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for your PLCnext Control

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Hardware >

<div style="text-align: center;">  <p>AnalogTechnology</p> <p>Phoenix Contact GmbH & Co. KG</p> <p>★★★★★</p> <p>The AnalogTechnology library offers function blocks for acquisition and evaluation of analog signals.</p> <p style="text-align: right; color: teal; font-weight: bold;">Free</p> </div> <div style="text-align: right; margin-top: 10px;"> <p style="background-color: teal; color: white; padding: 5px 10px; border-radius: 5px;">Download</p> <p>Downloads: 612 Library</p> </div>	<div style="text-align: center;">  <p>Modbus_TCP</p> <p>Phoenix Contact GmbH & Co. KG</p> <p>★★★★★</p> <p>For the MB_TCP_Server function block, the registers used for Modbus correspond to the elements of the udTCP_ComData array. Each WORD array element is to be considered as a 16-bit Modbus register. The...</p> <p style="text-align: right; color: teal; font-weight: bold;">Free</p> </div> <div style="text-align: right; margin-top: 10px;"> <p style="background-color: teal; color: white; padding: 5px 10px; border-radius: 5px;">Download</p> <p>Downloads: 576 Library</p> </div>
<div style="text-align: center;">  <p>Modbus_RTU</p> <p>Phoenix Contact GmbH & Co. KG</p> <p>★★★★★</p> </div> <div style="text-align: right; margin-top: 10px;"> <p style="background-color: teal; color: white; padding: 5px 10px; border-radius: 5px;">Download</p> <p>Downloads: 338 Library</p> </div>	<div style="text-align: center;">  <p>PLCnextBase</p> <p>Phoenix Contact GmbH & Co. KG</p> <p>★★★★★</p> </div> <div style="text-align: right; margin-top: 10px;"> <p style="background-color: teal; color: white; padding: 5px 10px; border-radius: 5px;">Download</p> <p>Downloads: 331 Library</p> </div>

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PROFICLOUD V1

PROFICLOUD

 <p>Time Series Data Service</p>	 <p>PLCnext Store</p>	 <p>mGuard Secure Remote Service</p>	 <p>ImpulseAnalytics Service</p>	 <p>PROFINET Service</p>
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- mGuard Secure Cloud – internetska metoda visoke sigurnosti za trenutno daljinsko povezivanje s bilo kojim krajnjim elementom unutar klijentove mreže
- Pristup svim relevantnim informacijama: lokacijama, operaterima, ciljanim krajnjim elementima, korisnicima, kao i njihovim pristupnim pravima (standardni web-preglednik)
- Dostupan brzi pregled za sve lokacije koje su trenutno na mreži i koje su spremne za trenutnu daljinsku uslugu

mGuard Secure Remote Service

General	IEC 62443-1-1	IEC 62443-1-2	IEC 62443-1-3	IEC 62443-1-4	Phoenix Contact certifikati	
	Concepts and models	Master glossary of terms and abbreviations	System security conformance metrics	IACS security life-cycle and use-cases		
Policies and procedures	IEC 62443-2-1	IEC 62443-2-2	IEC 62443-2-3	IEC 62443-2-4	IEC 62443-2-5	Uloga: Vlasnik imovine
	Security program requirements for IACS asset owners	IACS protection levels	Patch management in the IACS environment	Security program requirements for IACS service providers	Implementation guidance for IACS	
System	IEC 62443-3-1	IEC 62443-3-2	IEC 62443-3-3			Uloga: Integratori sustava
	Security technologies for IACS	Security risk assessment and system design	System security requirements and security levels			
Component	IEC 62443-4-1	IEC 62443-4-2				Uloga: Proizvođač opreme
	Product security development life-cycle requirements	Technical security requirements for IACS components				
Process requirements		Functional requirements				

mGuard Secure Remote Service

mGuard sigurnosni usmjerivači



PLCnext upravljački uređaji



mGuard Secure Remote Service

DIN šina



PCI(E)



Prijenosni uređaji



Stolina upotreba

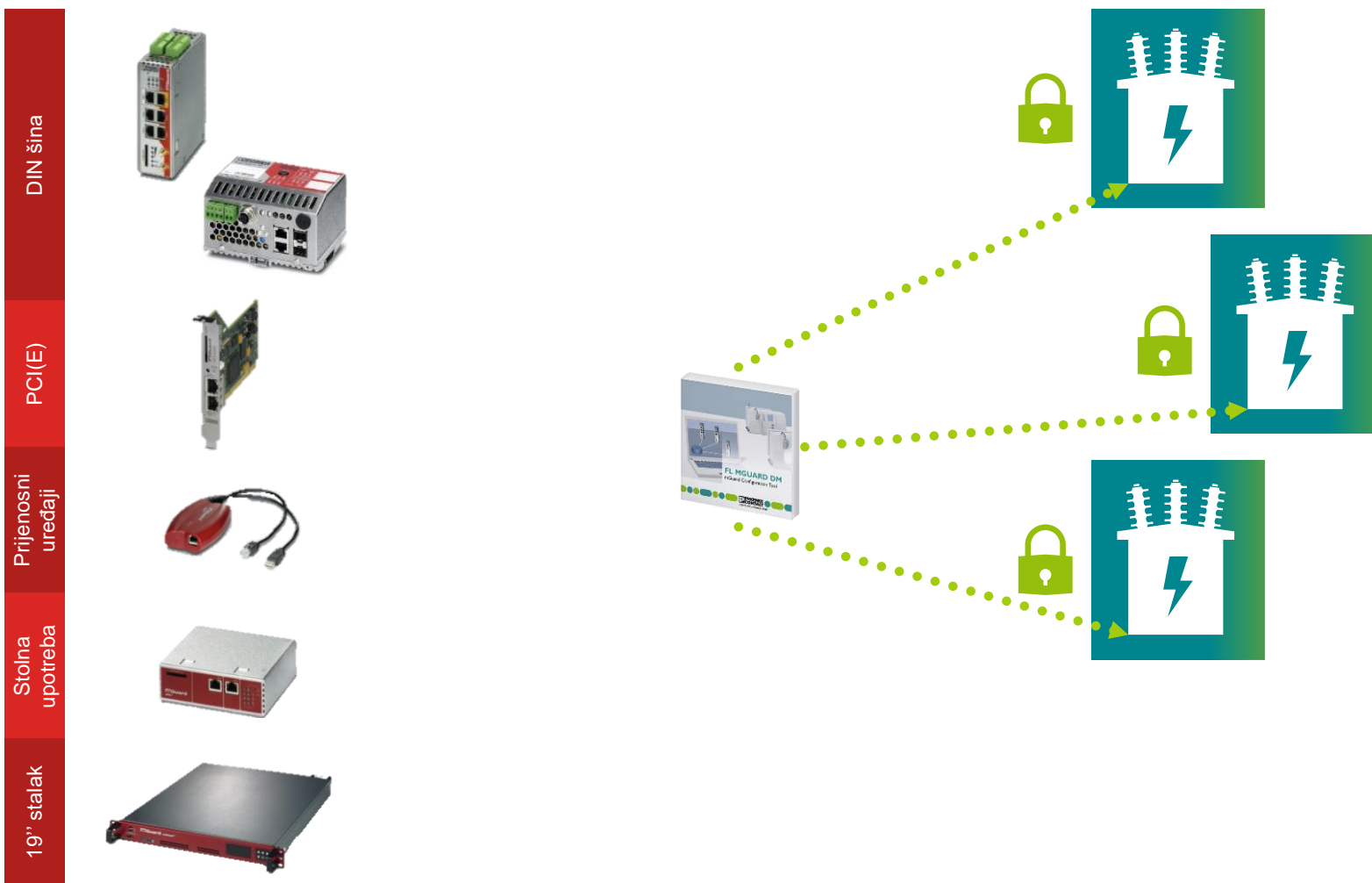


19" stalak

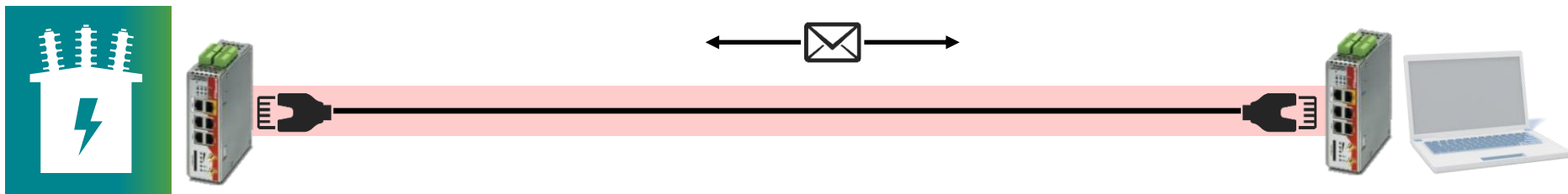


- Smanjenje vjerojatnosti i utjecaja sigurnosnog incidenta
- Podjela mreže, ograničenje neovlaštenog pristupa, enkriptirani prijenos podataka (VPN), demilitarizirano područje (DMZ)
- Neovisnost o operacijskom sustavu (npr. Windows XP)
- Nisu potrebni upravljački program
- Nova i postojeća industrijska računala mogu se jednostavno i ravnomjerno zaštititi
- Prijenosni uređaj za servisne tehničare
- Povezivost preko optičke komunikacije do 80 km
- Provjera preko 1.600 izvještaja o ranjivosti svakog mjeseca
- Brza isporuka sigurnosnih zakrpi tijekom dužeg vremenskog razdoblja
- VPN softver za servisne tehničare

mGuard Secure Remote Service



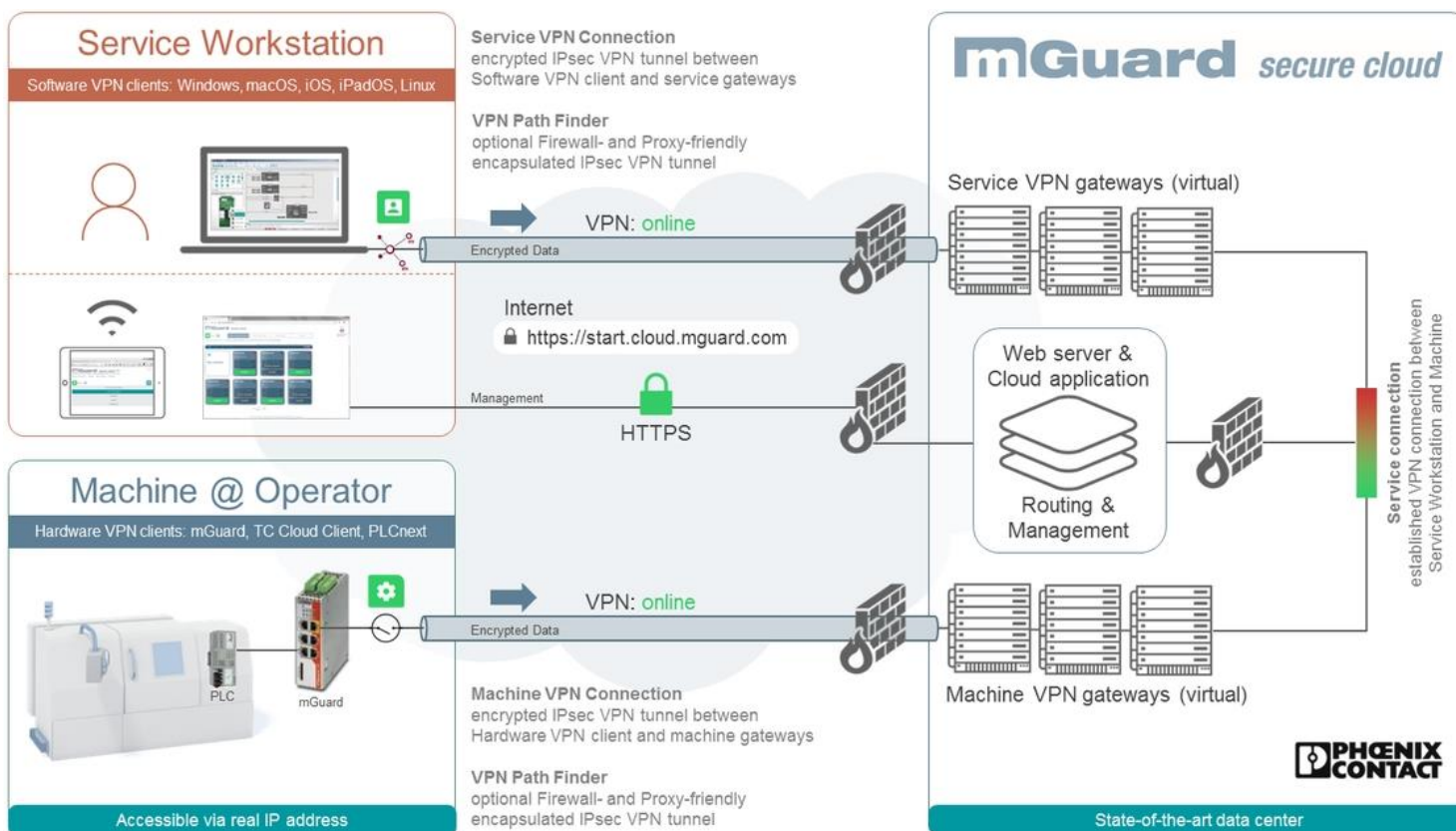
mGuard Secure Remote Service



mGuard Secure Remote Service



mGuard Secure Remote Service



PROFICLOUD V1

PROFICLOUD



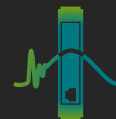
Time Series Data
Service



PLCnext Store



mGuard Secure
Remote Service



ImpulseAnalytics
Service



PROFINET Service

- ImpulseCheck – kontinuirani nadzor aktivnih vodiča spojenih na prenaponsku zaštitu
- Detekcija prenaponskih struja i visokofrekventnih naponskih impulsa, te analiza s obzirom na amplitudu, naboj i specifičnu energiju
- Slanje detektiranih vrijednosti na Proficloud, te njihova interpretacija i evaluacija pomoću pohranjenih modela prenaponskih uređaja
- Izravni podaci o stvarnom opterećenju sustava i trenutnom stanju utičnih modula

PROFICLOUD V1

PROFICLOUD



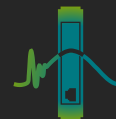
Time Series Data
Service



PLCnext Store



mGuard Secure
Remote Service



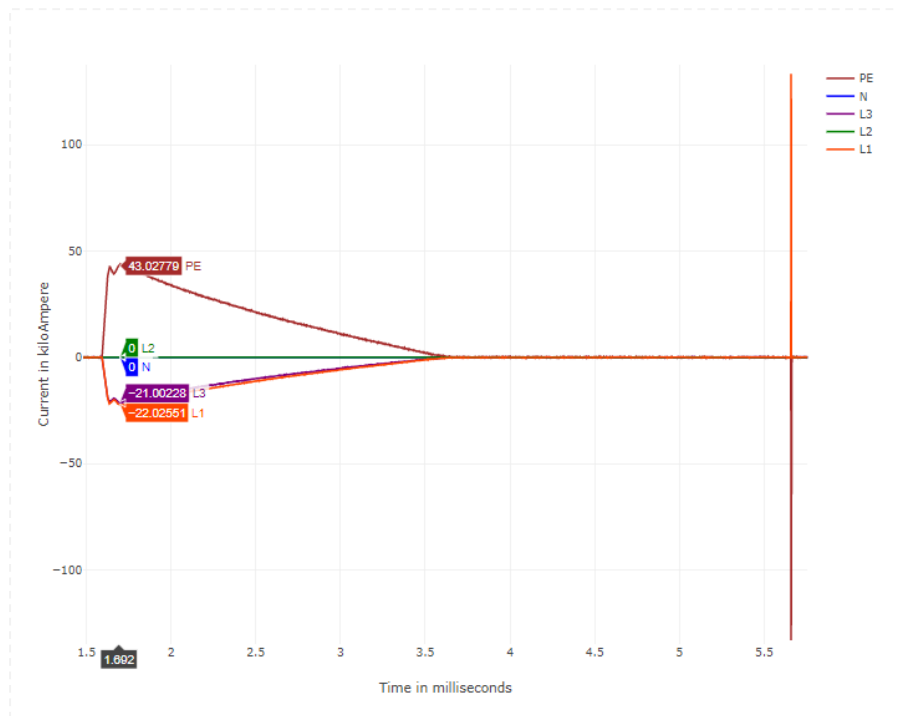
ImpulseAnalytics
Service



PROFINET Service

- Standardni web preglednik
- Različiti rezultati, kao što je bilo kakva promjena u statusu utičnog modula, također se prijavljuju putem "push" poruke
- Omogućuje djelovanje prije greške

ImpulseAnalytics Service



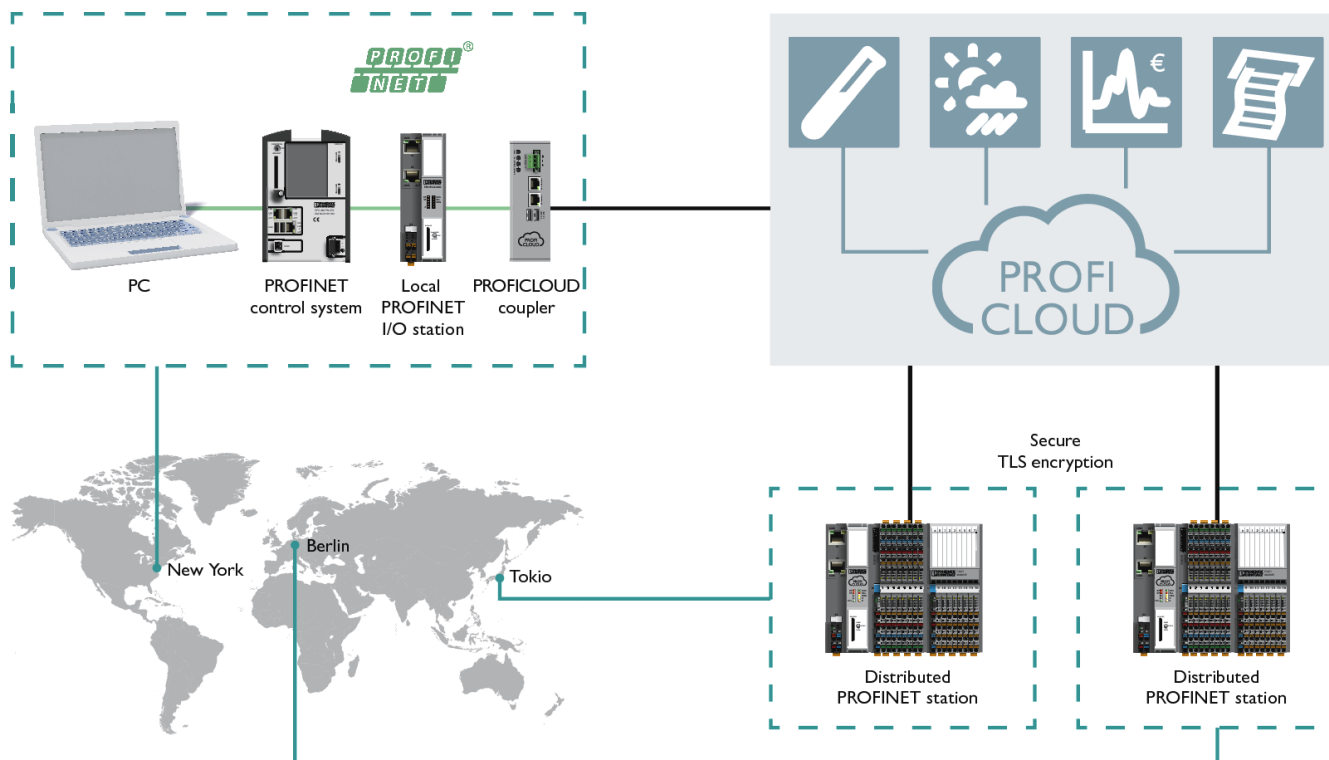
PROFICLOUD V1

PROFICLOUD

 <p>Time Series Data Service</p>	 <p>PLCnext Store</p>	 <p>mGuard Secure Remote Service</p>	 <p>ImpulseAnalytics Service</p>	 <p>PROFINET Service</p>
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- Zahvaljujući PROFINET rješenjima u oblaku, moguće je dodavanje usluga u oblaku postojećoj PROFINET mreži
- Povezivanje s udaljenim aplikacijama ili pri korištenju usluga poput nadzora, izvještavanja, izračunavanja ili predviđanja

PROFINET Service



PROFICLOUD V1

PROFICLOUD



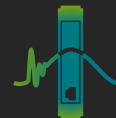
Time Series Data
Service



PLCnext Store



mGuard Secure
Remote Service

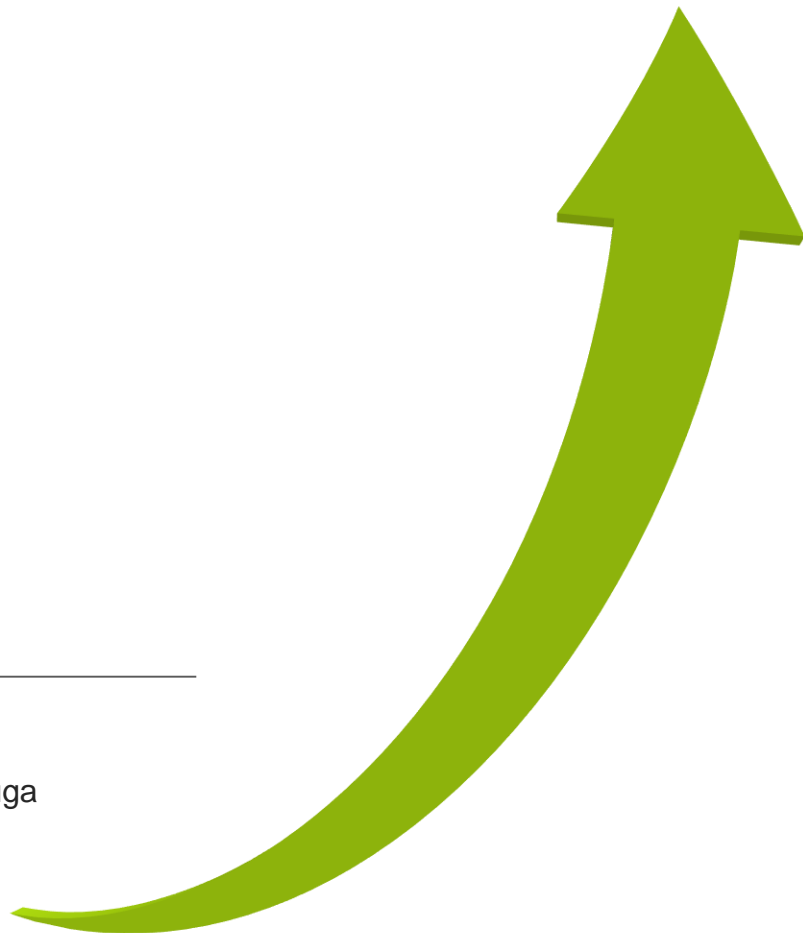


ImpulseAnalytics
Service



PROFINET Service

PROFICLOUD V2



Phoenix Contact IoT

Proficloud temeljen na fleksibilnoj arhitekturi mikrousluga

PROFICLOUD V2

Arhitektura mikrousluga

SaaS
(Software as a Service)

Rješenja u oblaku

- Usluga upravljanja uređajima
- Usluga pametnih uređaja
- Usluga pametnih rješenja

PaaS
(Platform as a Service)

PROFICLOUD
(Phoenix Contact IoT platforma)



kubernetes + Docker (platforma spremnika)

IaaS
(Infrastructure as a Service)

amazon web services
(usluge poslužitelja)



kubernetes



PROFICLOUD V2



Povezivanje pametnih uređaja

Jednostavno povezivanje s Proficloudom ili bilo kojim oblakom



Phoenix Contact IoT

Proficloud temeljen na fleksibilnoj arhitekturi mikrousluga

PROFICLOUD V2



Blokovski modularni I/O sustav



Mjerenje energije



Napajanja s najvećom funkcionalnosti



Visoko kompaktni relejni moduli



Industrijski Ethernet i kibernetička sigurnost



Pretvarači signala



PLCnext upravljački uređaji



Pomoćni sustav za prenaponske zaštite



DC UPS s IQ tehnologijom



Hibridni pokretači i upravljači motora



Daljinsko upravljanje i državanje



Izolacijska pojačala s funkcionalnom zaštitom i zaštitom od eksplozije

Automatizacija

Nadzor

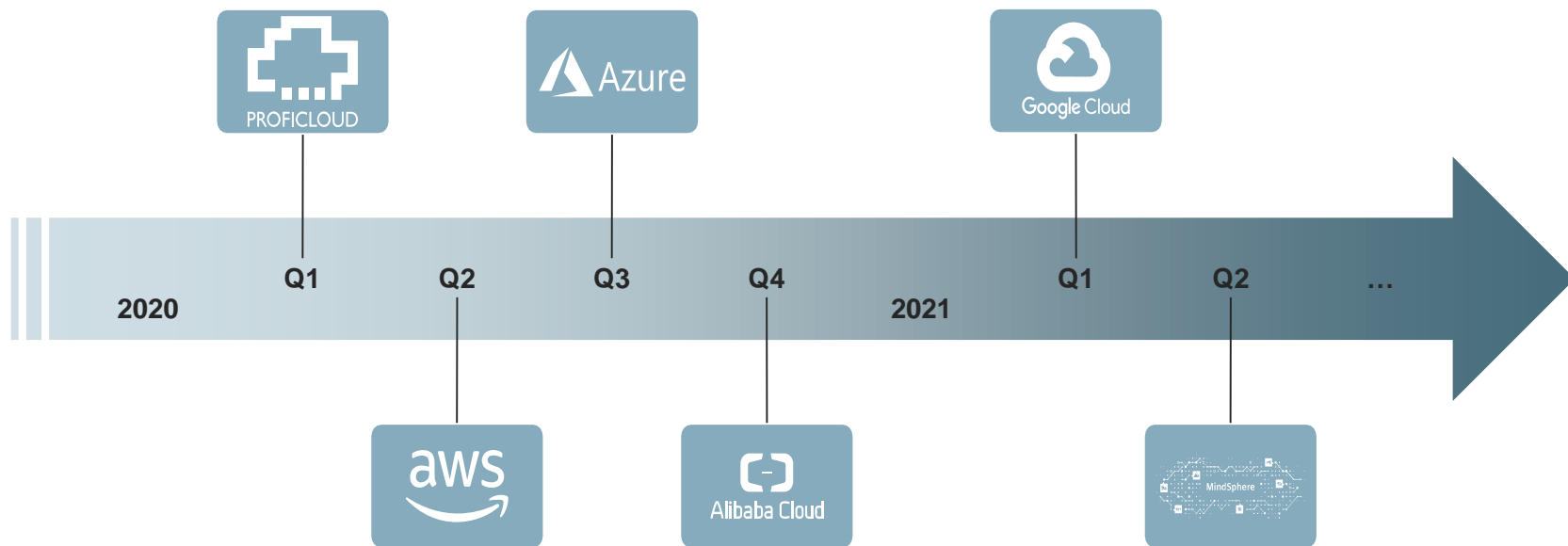
Napajanje i zaštita

Uklapanje

Komunikacija

Odvajanje

PROFICLOUD V2



PROFICLOUD V2



Pametne usluge u Proficloudu

Pohrana i vizualizacija podataka o uređajima i razvoj različitih algoritama za predviđanje, optimizaciju, upravljanje i sl.



Povezivanje pametnih uređaja

Jednostavno povezivanje s Proficloudom ili bilo kojim oblakom



Phoenix Contact IoT

Proficloud temeljen na fleksibilnoj arhitekturi mikrousluga

PROFICLOUD V2

PROFICLOUD



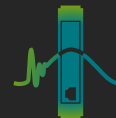
Time Series Data
Service



PLCnext Store



mGuard Secure
Remote Service



ImpulseAnalytics
Service



PROFINET Service

PROFICLOUD V2

PROFICLOUD

Device Management Service



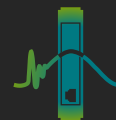
Time Series Data
Service



PLCnext Store



mGuard Secure
Remote Service




ImpulseAnalytics
Service



PROFINET Service

PROFICLOUD V2

PROFICLOUD

 Device Management Service

Smart Device Services



PROFICLOUD V2

Intelligent Energy Management REST API



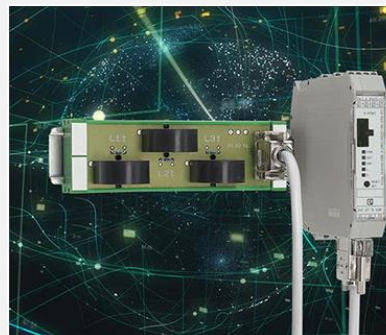
- IoT EMpro uređaji
- EMpro REST API
- Nadogradnja funkcionalnosti putem ažuriranja firmvera
- Sigurnost ("samo za čitanje" (engl. *read-only*) koncept)
- Usporedno korištenje komunikacijskih protokola poput Modbus/TCP-a

Intelligent Energy Management ONLINE



- IoT EMpro uređaji
- Pristup podacima mjerenja i uređaja s bilo kojeg mjesta
- Nadzor energije putem usluge upravljanja energijom i usluga upravljanja uređajima (npr. stanje zdravlja brojila energije)
- Jednostavno web sučelje

Electronic machine manager



- Electronic Machine Manager
- Analiza zdravlja stroja i pomoć za optimizaciju ciklusa održavanja
- Temelj za koncepte daljinskog održavanja
- Pristup podacima u stvarnom vremenu i obogaćivanje podacima u oblaku


Smart Power Supplies



- Inteligentni sustav upravljanja baterijom (BMS)
- Stanje sustava i mogućnost lokalnog ili daljinskog komuniciranja za produljeno upravljanje opterećenjem
- Stanje napunjenosti (SOC), stanje zdravlja (SOH), radni vijek baterije (kontrolirano isključivanje aplikacije) i planiranje održavanja

PROFICLOUD V2

PROFICLOUD

 Device Management Service

Smart Device Services



Smart Solution Services

PROFICLOUD V2



Proficloud: Professional Cloud Solutions


Use the many advantages of the Proficloud, whether for your automation solutions or to monitor your machinery. Get an individual notification or simply check the health status of your Phoenix Contact hardware.

[SIGN UP](#)

Welcome
back!

[LOGIN](#)

PROFICLOUD V2


PROFICLOUD

Device Management Service

Device Overview 🔍


- Device Management Service
- Time Series Data Service
- mGuard Secure Remote Service
- ImpulseAnalytics Service
- PROFINET Service
- Settings

ADD DEVICE

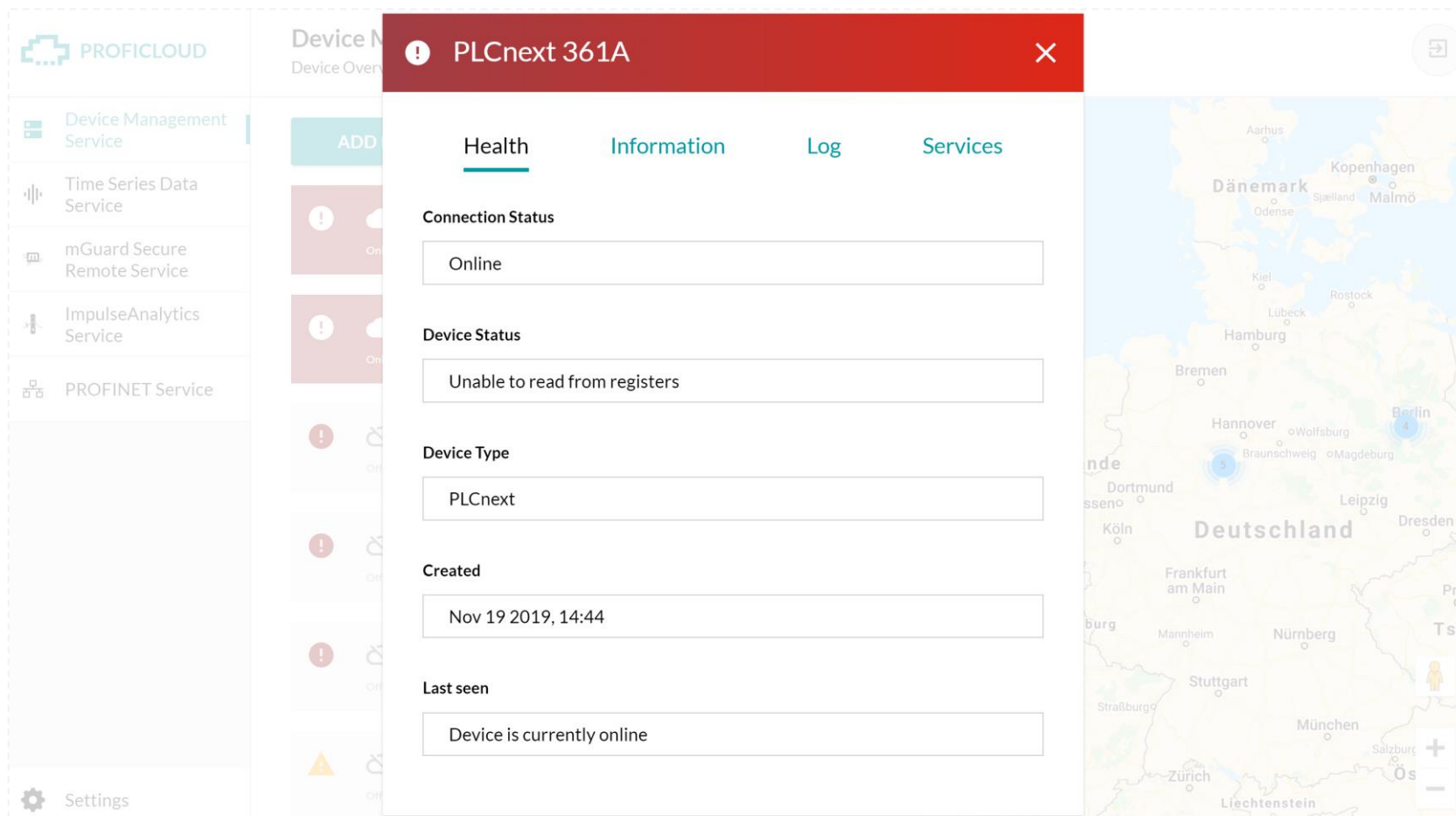
🔍

↓ STATUS ^

!	☁️	PLCnext 361A	PLCnext	📍
Online		F5FA43F1-9DA6-4504-A9ED-901508472B0C		
⚠️	☁️	PLCnext 362A	PLCnext	📍
Online		8AC7CB54-BFF2-4BF4-ABEB-E79C45E7077C		
!	🌐	Speed Sensor Windpark 001	Speed Sensor	📍
Offline		9623C26B-7A8C-4B16-B4B6-12B6EE4ED4DB		
!	🌐	Humidity Sensor Bad Pyrmont	Humidity Sensor	📍
Offline		505F2506-F972-4E5E-9739-8216C2EE76BD		
!	🌐	Proficloud Booth	AXCF2152	📍
Offline		7468b922-b8ab-442f-9434-1505a805838a		
⚠️	🌐	Temperature Sensor 002	Temperature Sensor	📍
Offline		2D0DC816-187E-4657-9099-3C5582A452F7		



PROFICLOUD V2

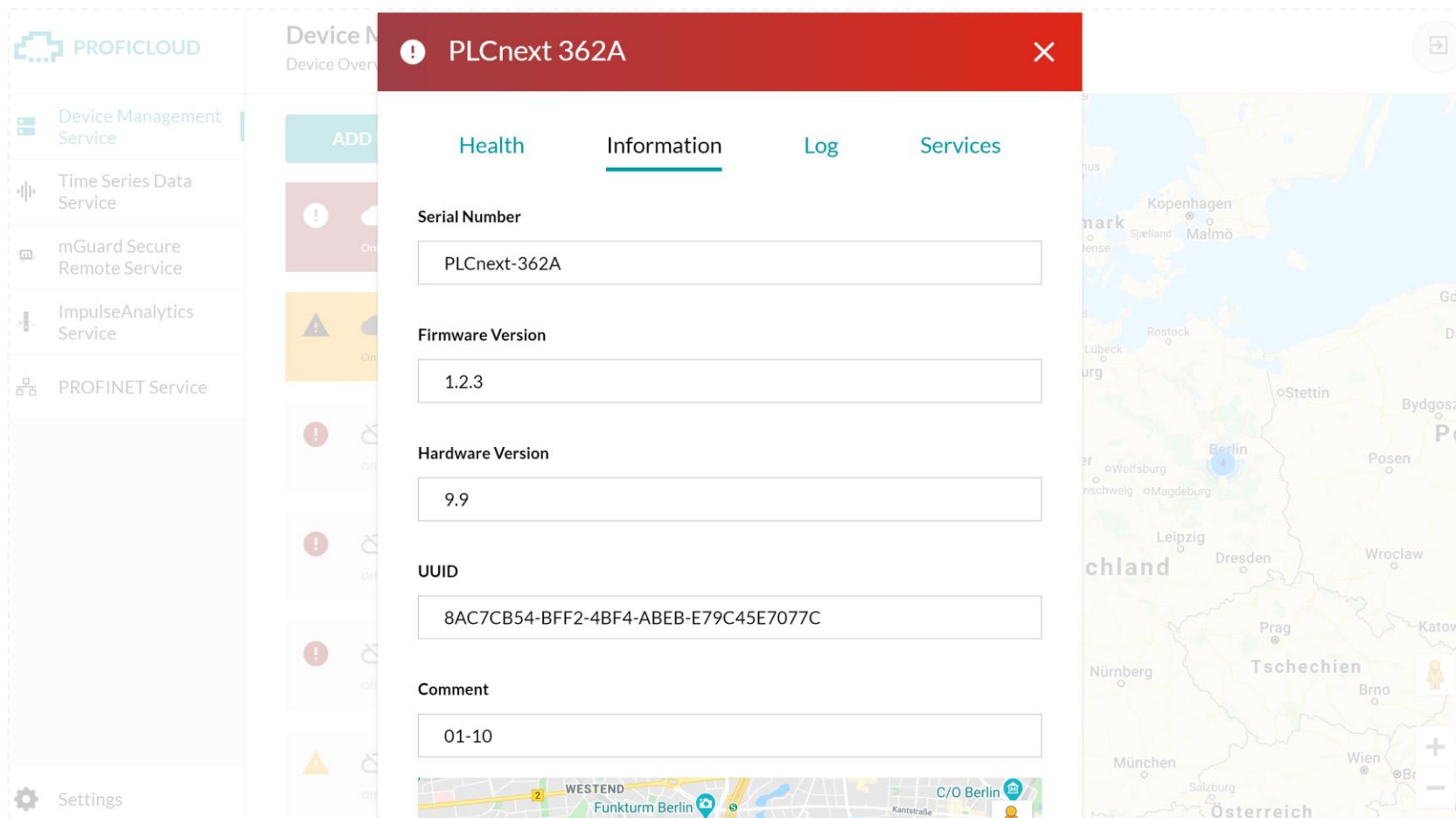


The screenshot displays the PROFICLOUD V2 interface. On the left is a sidebar with navigation options: Device Management Service, Time Series Data Service, mGuard Secure Remote Service, ImpulseAnalytics Service, PROFINET Service, and Settings. The main area shows a 'Device Overview' section with a list of devices. A modal window is open for 'PLCnext 361A', featuring a red header with a close button. The modal has four tabs: Health (selected), Information, Log, and Services. The 'Health' tab displays the following information:

- Connection Status:** Online
- Device Status:** Unable to read from registers
- Device Type:** PLCnext
- Created:** Nov 19 2019, 14:44
- Last seen:** Device is currently online

To the right of the modal is a map of Europe, with a blue circle indicating the device's location in Germany.

PROFICLOUD V2

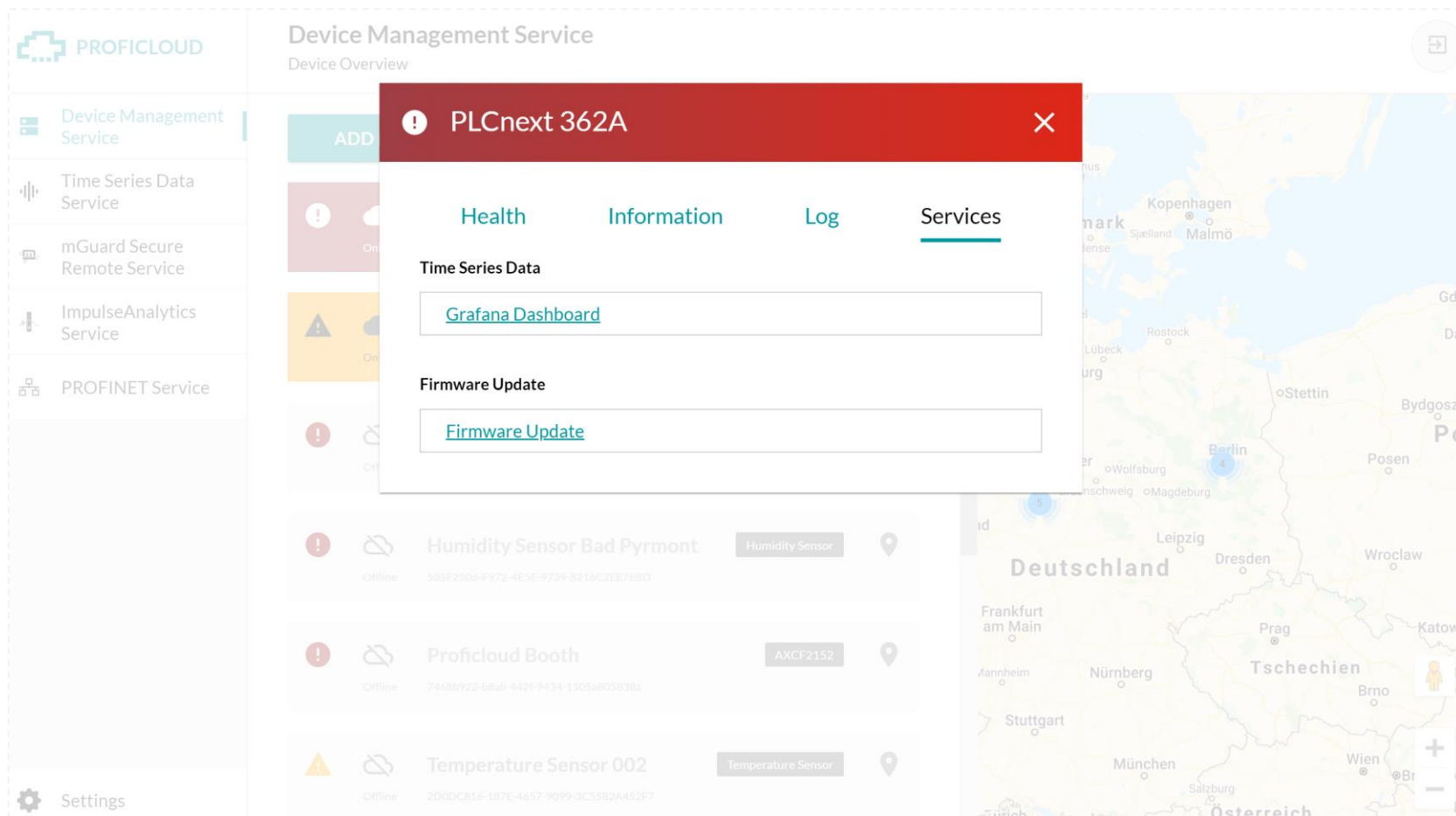


The screenshot displays the PROFICLOUD V2 interface. On the left is a sidebar with navigation options: Device Management Service, Time Series Data Service, mGuard Secure Remote Service, ImpulseAnalytics Service, PROFINET Service, and Settings. The main content area shows a device overview for 'Device M' with a list of devices. A modal window is open for 'PLCnext 362A', displaying the following information:

- Serial Number:** PLCnext-362A
- Firmware Version:** 1.2.3
- Hardware Version:** 9.9
- UUID:** 8AC7CB54-BFF2-4BF4-ABEB-E79C45E7077C
- Comment:** 01-10

The modal window also features tabs for Health, Information (selected), Log, and Services. A map of Europe is visible in the background of the modal window, with Berlin highlighted.

PROFICLOUD V2



The screenshot displays the PROFICLOUD V2 Device Management Service interface. On the left is a navigation sidebar with the following items: Device Management Service, Time Series Data Service, mGuard Secure Remote Service, ImpulseAnalytics Service, and PROFINET Service. The main content area is titled "Device Management Service" and "Device Overview". A red notification banner at the top reads "PLCnext 362A". Below it, a modal window is open for the "PLCnext 362A" device, showing tabs for "Health", "Information", "Log", and "Services". The "Services" tab is active, displaying two sections: "Time Series Data" with a link to "Grafana Dashboard" and "Firmware Update" with a link to "Firmware Update". In the background, a map of Germany and surrounding regions is visible. At the bottom of the main area, a list of devices is shown, including "Humidity Sensor Bad Pyrmont", "Proficloud Booth", and "Temperature Sensor 002". A "Settings" icon is located at the bottom left of the interface.

 **PHOENIX
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Hvala!



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