xCloud

What is an IIoT Controller in a production environment
Sesam Seminar October 12th ,2017

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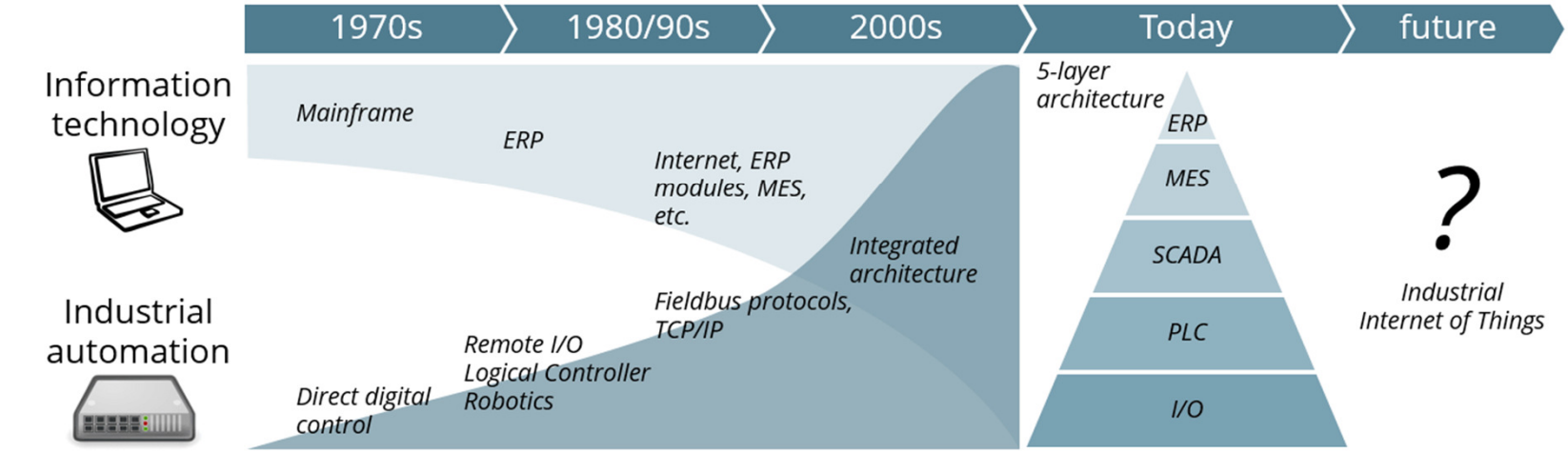
Exor International Sales Manager

IT and Automation : two different worlds now connected

IoT Analytics – *Quantifying the connected world*

Convergence of IT and automation



ERP = Enterprise Resource Planning MES = Manufacturing Execution System SCADA = Supervisory Control and Data Acquisition PLC = Programmable Logic Controller I/O = Input/Output signals Source: IoT Analytics

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IT and Automation : two different needs

This two infrastructures both utilize common networking components, but they are very different when it comes to maintenance, operation, and security management.

The commons principles are confidentiality, integrity, and availability.

- For IT, confidentiality is the highest priority. Next, the integrity of the data is very important and that is followed by network availability (no time sensitive)
- For Automation availability of the datas is the highest priority (time sensitive network and fieldbus realtime). The integrity of them is even important. Then finally confidentiality is not considered a concern for industrial networks.

The contrast in network operations of IT and Automation makes the implementation of security methods very different as well.

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IT and Automation : How to Match them ?

Our vision for such implementation is to use :

Secure Cloud Connection and IIot Controllers

With more than 40 years of expertise in Industrial Automation we try to make simple the configuration and usage of IT technology for the PLC programmers and users

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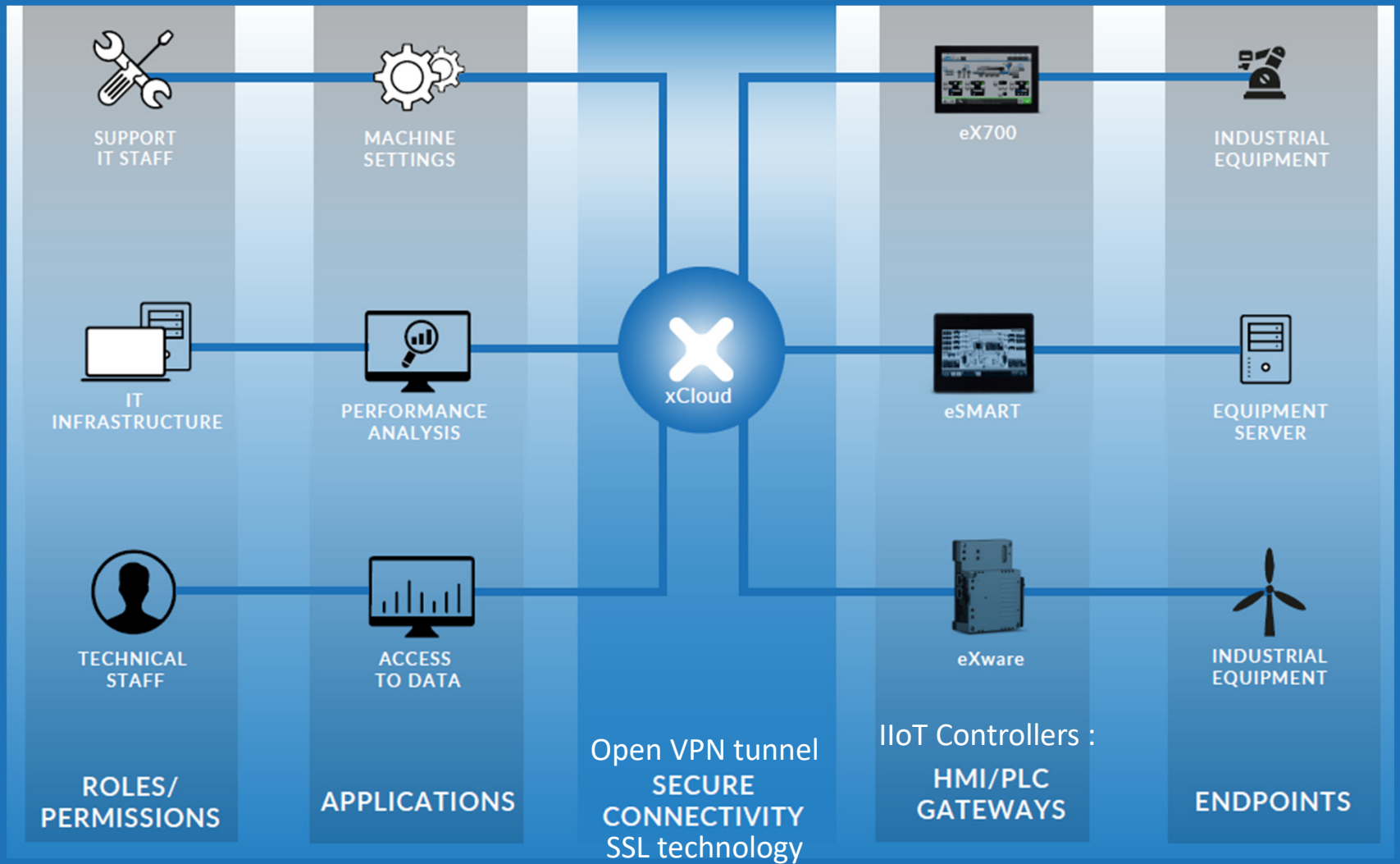
EXOR INFRASTRUCTURE BASED ON IIoT Controllers and CLOUD



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Common topics you need to approach in your Cloud / IIoT Infrastructure

- Security
- Easy configuration
- Easy usage
- Full Connectivity from any device
- Compatibility with all the industrial communication protocols
- Espandibility for the future

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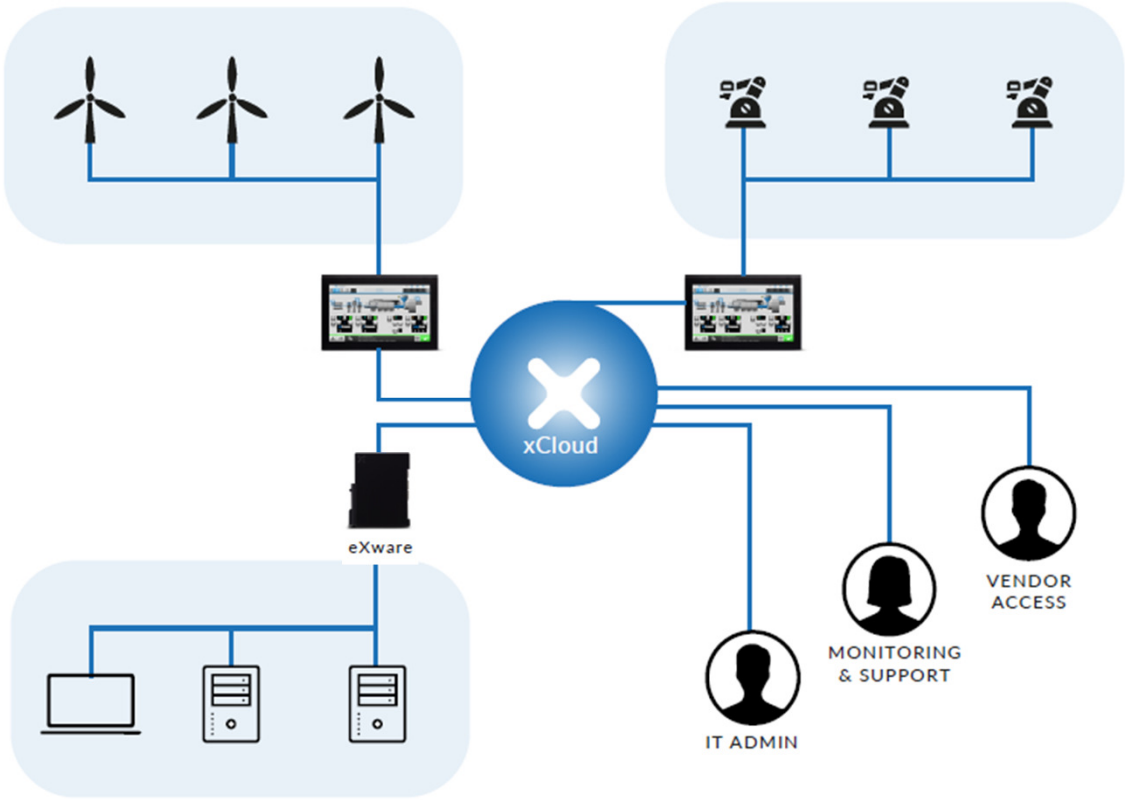
Security : tunnel VPN

A powerful and highly scalable solution that offers advanced **VPN** capabilities with a simple web-based interface allows all your remote devices, networks and users to be able to communicate seamlessly.

Industry standard **encryption technology** ensures your data stays protected in transit for complete IoT security.

Granular **role-based access** permissions allow users to only get to required resources and nothing else



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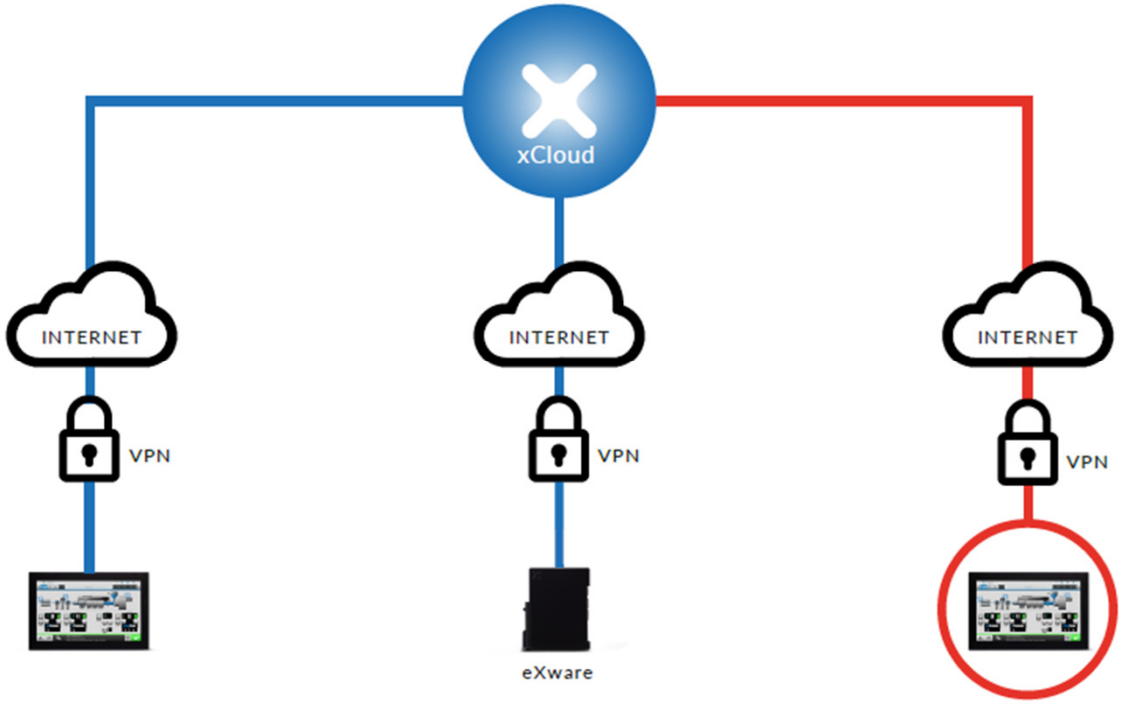
Security : SSL VPN (Open VPN) technology

xCloud uses a SSL VPN technology (OpenVPN) to allow both installation and maintenance to be made remotely and highly securely.



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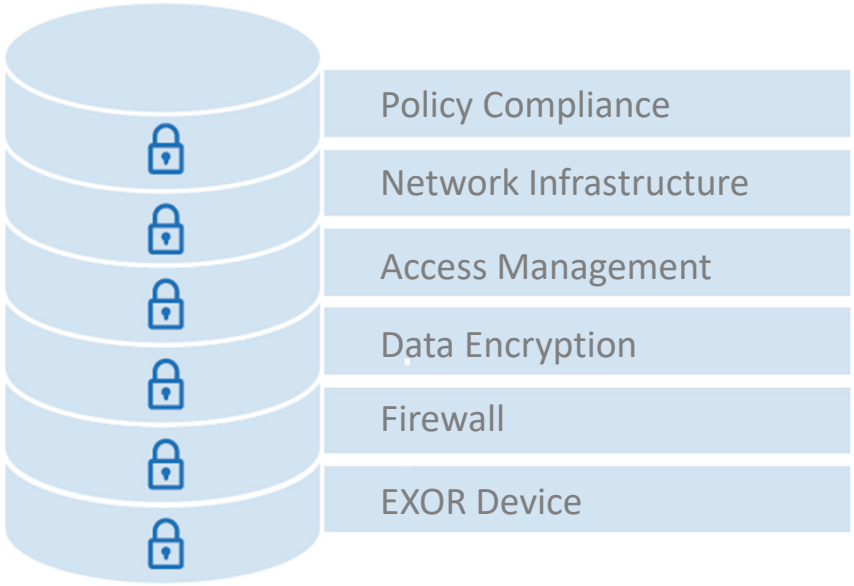
Security : Layed Security

EXOR's approach to security is based on the international guidelines set out in:

- ISO27002
- IEC 62443-2-4
- NIST Cyber security Framework 1.0

Akin to the nascent industry standard EXOR has multiple layers of security that allow as much as possible our clients to be protected but at the same time can actually go about their business. The security has to present and robust but not impede operational needs. This is the delicate balancing point which we work with each of our clients to achieve.



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Security : Firewall

IP, port, and protocol filtering/firewalling available. Restricted access based on user, group, site for all or single devices.

With the combined set up features of Organization and User Management administrators are afforded complete flexibility over filtering and firewall rules. Devices, users, departments, and even individual I/O ports can all be configured.

Firewall settings are 100% configurable to the organization and department needs this ensuring that the company is able to operate effectively. Access to the devices IP address, ports, FTP and HTTP servers can all be configured.

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Security : Traffic Encryption

VPN sessions are end-to-end encrypted using SSL/TLS protocol

Communications between the remote user and the device are fully encrypted using the SSL/TLS protocol, ensuring data authenticity, integrity & confidentiality.

All users and EXOR devices are authenticated using x509 SSL certificates and end-to-end traffic is encrypted using strong symmetric & asymmetric algorithms that are part of the SSL/TLS protocol cipher suite.

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Security : User and access management

Unique user logins, configurable user rights to different devices, two-factor authentication *(roadmap) , connection traceability

There is no limit to the number of users that can be applied to the xCloud account. Unique logins may be created for every user and as such it is easy to alter and revoke access as and when needed.

Administrators have complete control, allowing them to direct access of engineers for re programming or updating of software whereas simple monitoring access for factory floor managers.

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Security : User and access management

In a recent survey commissioned by IBM, they pointed out that over 495 of old employees maintain their access credentials even after leaving the company.

With xCloud this risk is now easily eliminated.

All access, all traffic and all remote access can be documented as a report. This provides the final “manual” check that the right users have access to the right levels.

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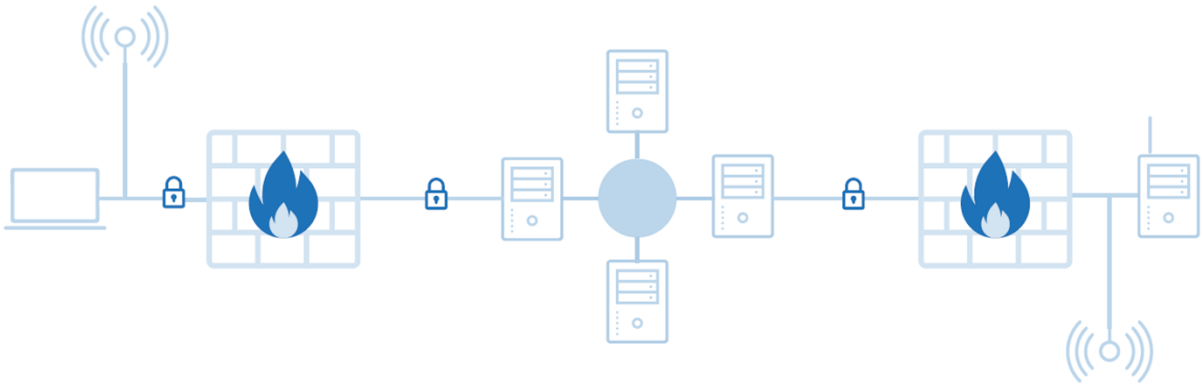
Security :Network Infrastructure

The xCloud layered infrastructure plays an important role in all our remote access solutions. It brings together in a secure data area all network servers, VPN servers and any other service.

EXOR partners with leading global Tier 1, 2 and 3 hosting partners to reduce and define latency. Having a defined latency is one of the critical requisites of Industrial IoT.

xCloud is hosted in SOC1, SOC2/SSAE 16 and ISO 27001:2005 certified data centres



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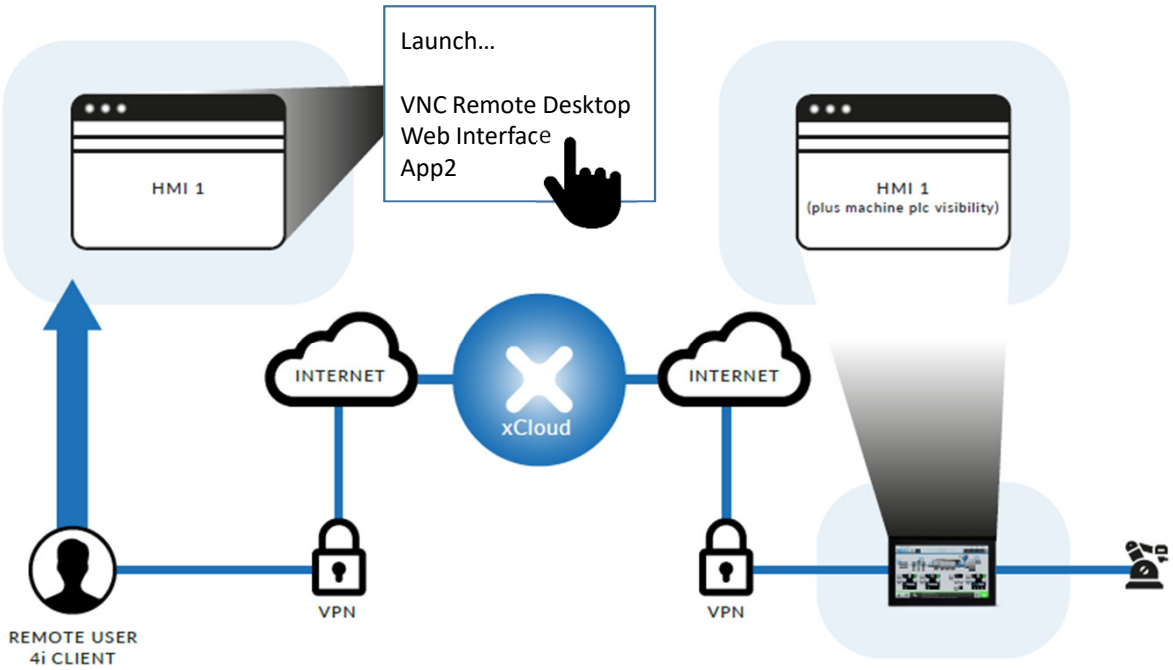
Easy Usage : Applications

In traditional VPN solutions, there is no support for helping users to identify or link their local applications to remote VPN resources which means users have to remember IP addresses or requires the use of complicated DNS systems.

xCloud solves this issue by allowing you to specify “application links” which will launch a local application on a user’s computer and connect it to a remote resource automatically and with just a single click of the mouse.



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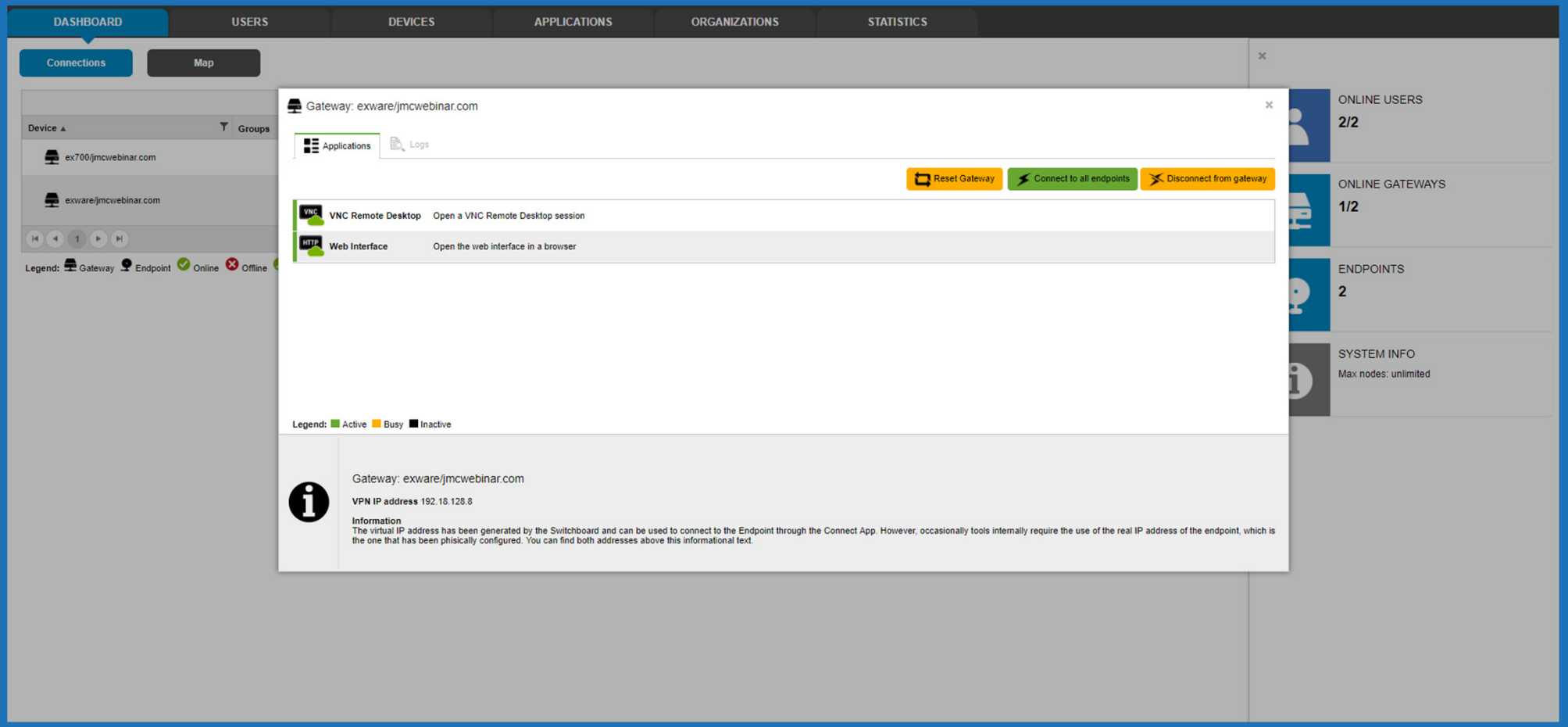
Applications



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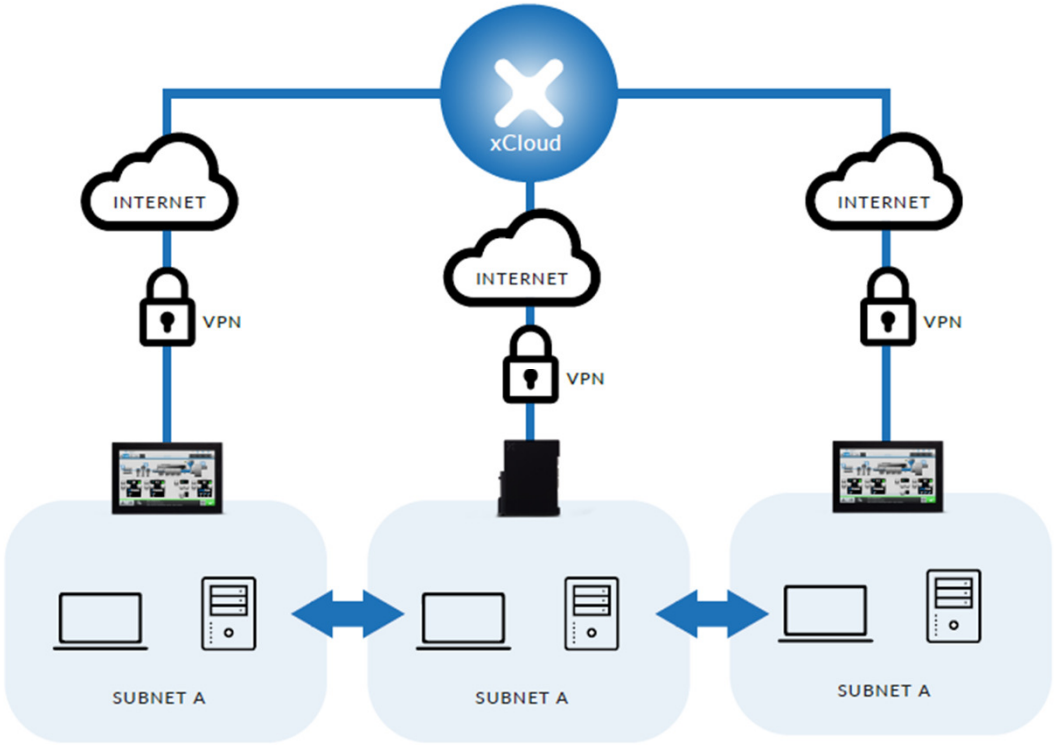
Easy Usage : subnet mapping

One of the most common challenges industrial networks are faced with is the problem whereby multiple locations have the same subnet, making it impossible to implement a central VPN management tool without significant intervention.

xCloud is the only solution on the market that can seamlessly resolve this routing nightmare, allowing your deployment to go smoothly.



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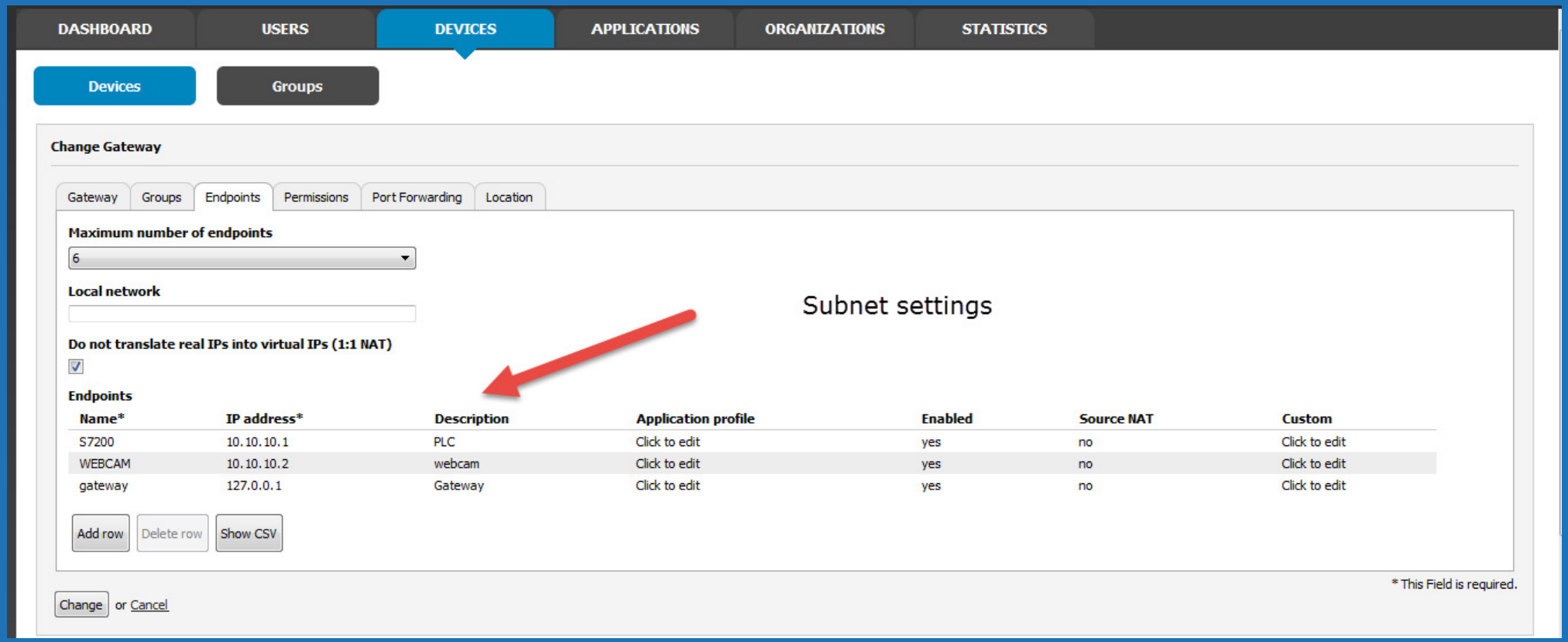
Subnet Mapping



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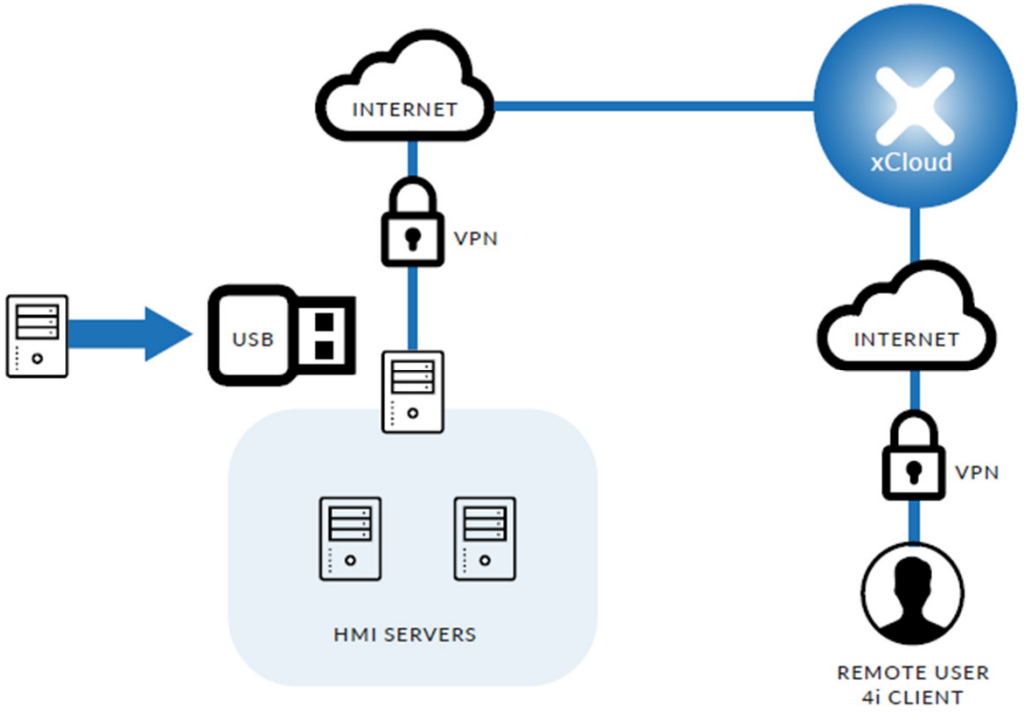
Easy Configuration : USB Provisioning

With distributed networks that span large territories, it's common for the IT staff to experience a lot of traveling to deploy network equipment. This takes a lot of time, not to mention incredible cost.

With the USB Provisioning tool, devices can be easily pre-configured on a USB stick and shipped out to their location for a simple, secure installation.



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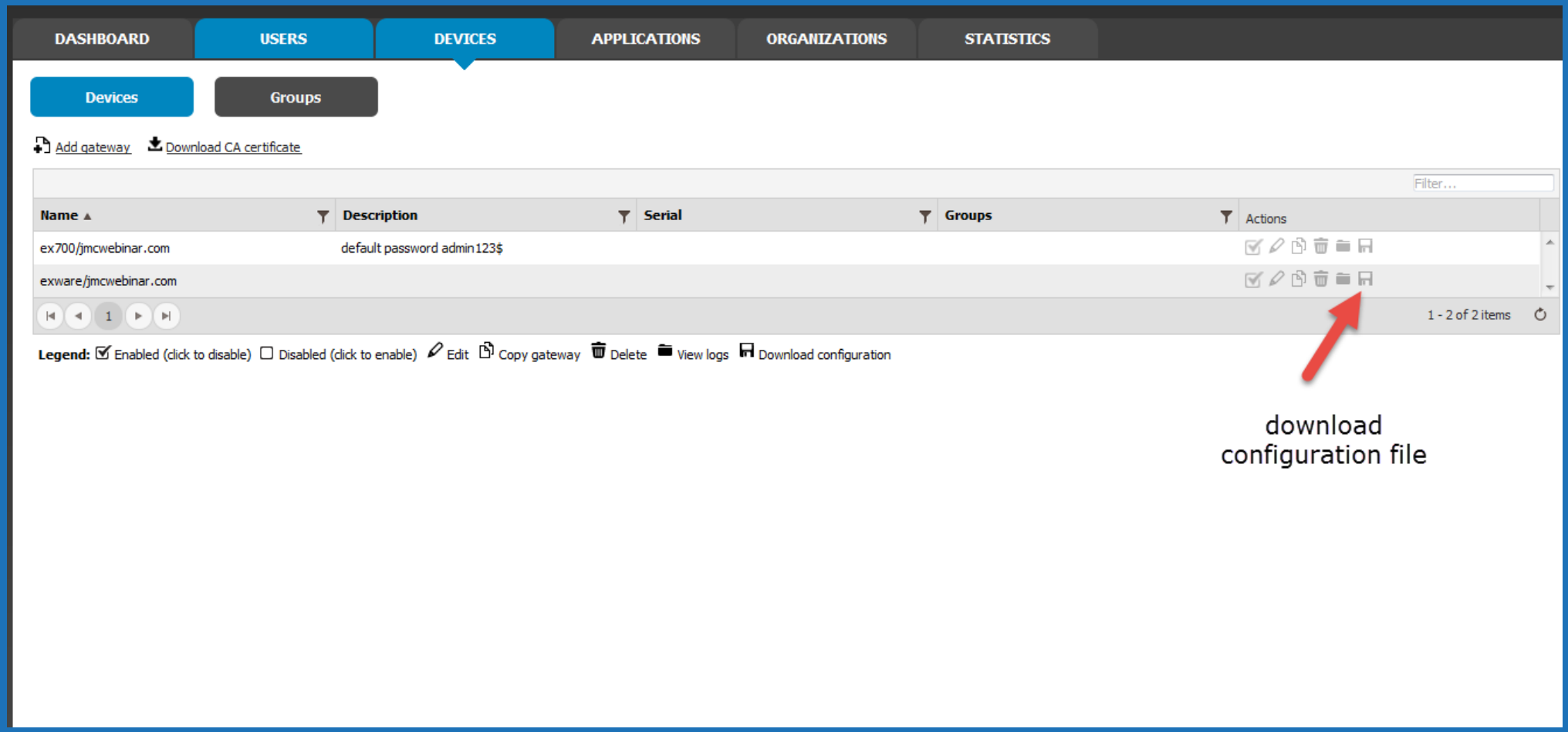
USB Provisioning



download
configuration file

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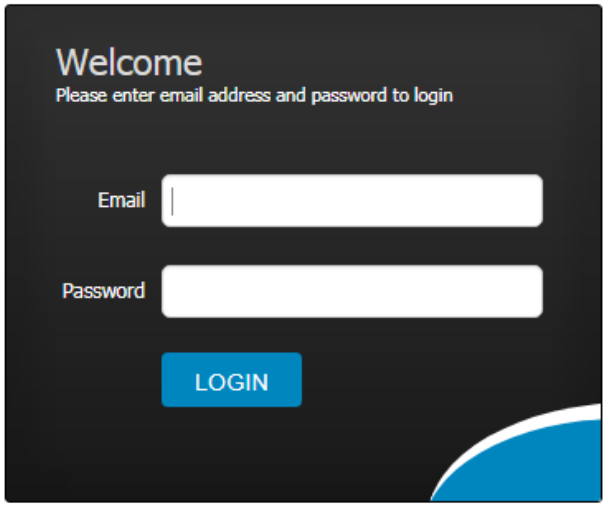
Full Connectivity from any device : Web access using standard browser

xCloud uses web proxy technology to allow usage of standard browser to connect to portal with security HTPPS protocol

It is possible to access to local display of device using VNC client integrated into portal

It is possible to access to web server of device using standard browser



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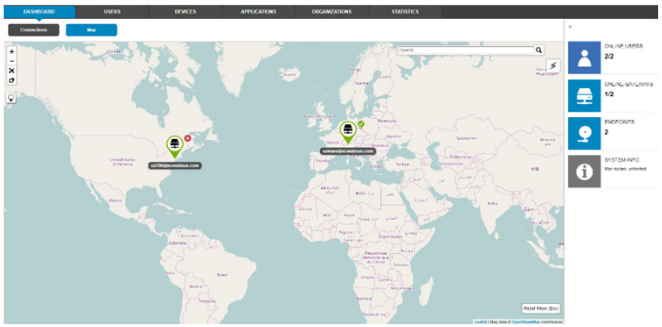
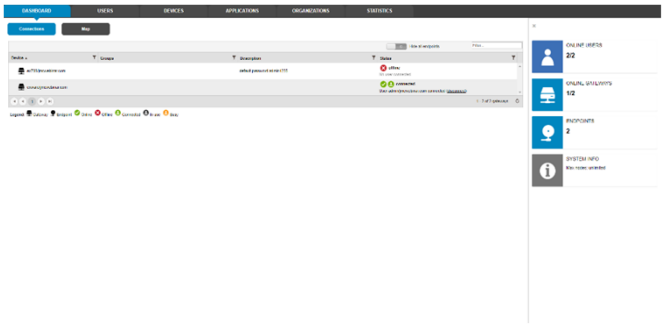
Live Map Dashboard

Shows location and status information of all devices in the field

Real time data of of which devices are online, offline and who is accesing each device

Great UI aggregating large number of devices into one numbered icon





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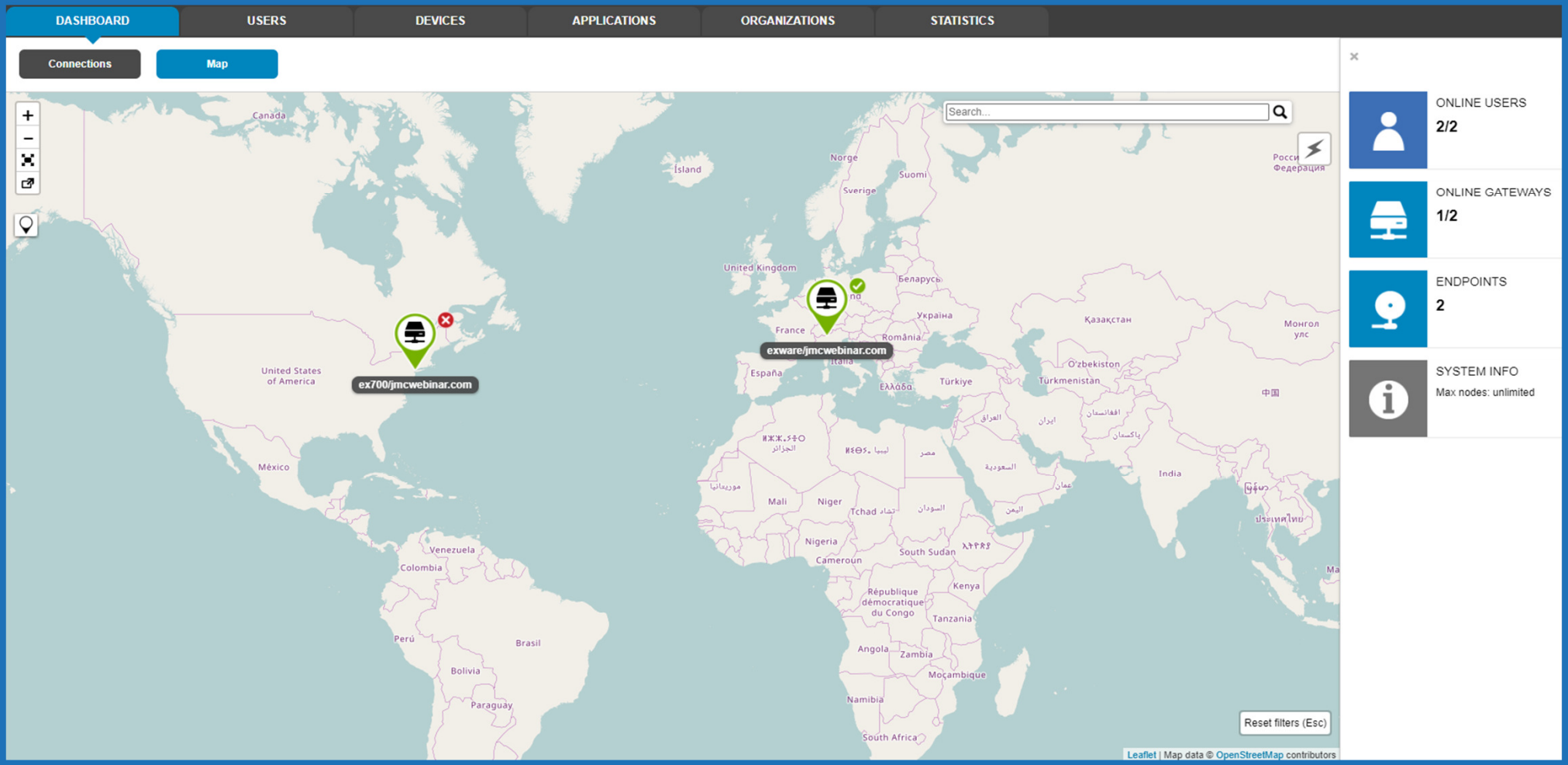
Dashboard with Map visualization



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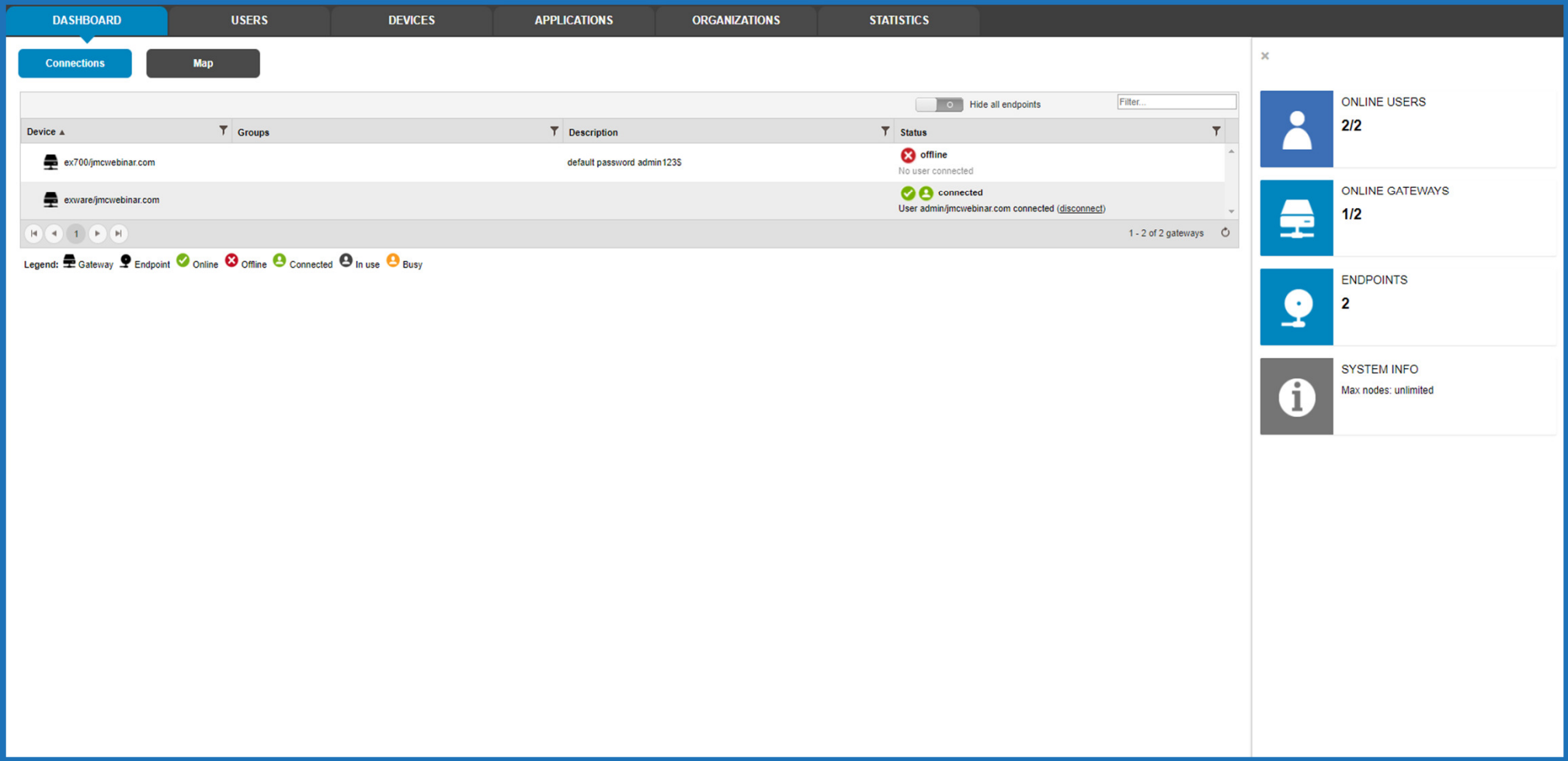
Dashboard with list visualization



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Espandibility for the future : Multiple Organizations

An organization, also called Domain, is a collection of users and devices, possibly arranged in groups. Every node in one organization is completely separated from, and invisible to, other organizations. Therefore, no user or device can belong to two or more domains. Organizations can be arranged in a hierarchy, with one root organization and one or more children or descendants.

Within a domain, the default policy is that users can see all other users and all the devices in sub-domains that are lower in the hierarchy.

Benefits :

- The creation and management of multiple small companies on a same xCloud installation.
- Break up a large enterprise into smaller departments, that shall remain separate and host all of them on a single xCloud installation.

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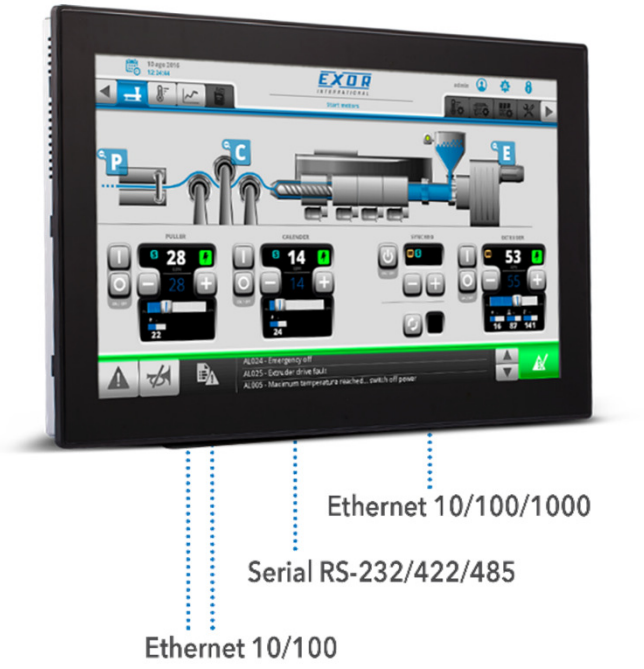
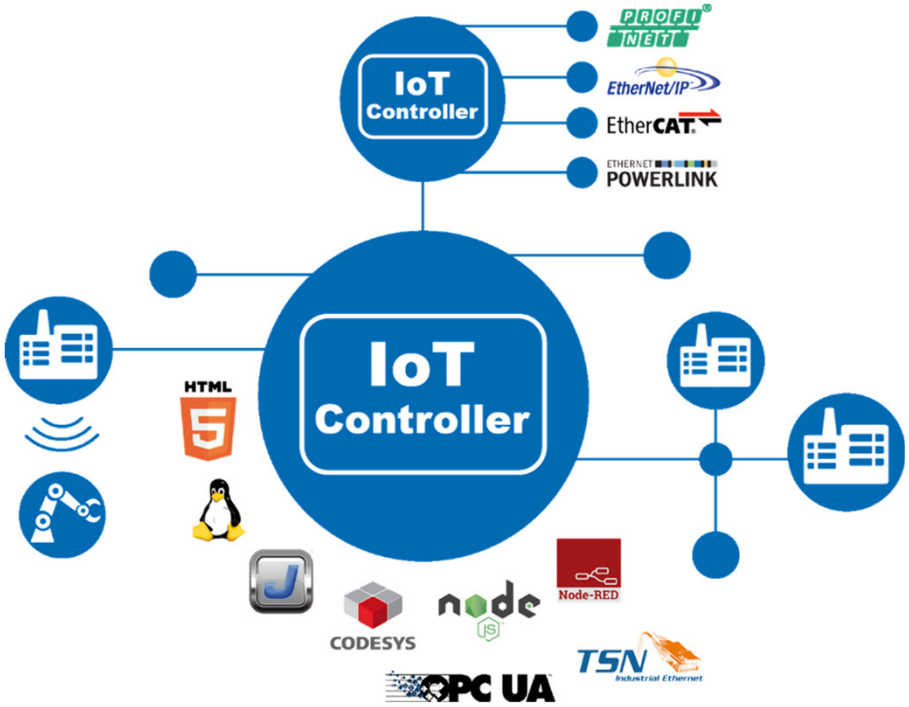
Compatibility in Automation : IIoT Controllers (exor ex700 Family)





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Compatibility in Automation : IIoT Controllers (exor ex700 Family)

GATEWAY

3 Ethernet networks
OPC UA Server and Client , MQTT protocol and NODE RED ,
Multiple field bus protocols (more than 100 , possibility to manage 4 of them at the same time (gateway). Can connect to a public cloud service like Azure, AWS at the same time as being inside xCloud

HMI

HMI designer platform (Jmobile) with high-resolution displays , multitouch operation , vectorial Graphics SVG , HTML5 based .

PLC

CODESYS V3 with Ethernet distributed I/O stacks. High processing performance
(modbus RTU,TCP – Profinet – Ethercat – Ethernet IP – CAN –Powerlink)

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Compatibility in Automation : IIoT Controllers (exor ex700 Family)

	eX705	eX707	eX710	eX715	eX721
Size	5“ wide	7” wide	10,1“ wide	15,6“ wide	21,5“ wide
Resolution	800x480 pixel (WVGA)	800x480 pixel (WVGA)	1280x800 pixel (WXGA)	1366x768 pixel (WVXGA)	1920x1080 (Full HD)
Colors	64K	16M	16M	16M	16M
Touchscreen	PCAP	PCAP	PCAP	PCAP	PCAP
Multitouch	Yes	Yes	Yes	Yes	Yes
Front	Glass	Glass	Glass	Glass	Glass
Processor	ARM Cortex-A8 Single Core 1 GHz	ARM Cortex-A9 Dual Core 1 GHz	ARM Cortex-A9 Dual Core 1 GHz	ARM Cortex-A9 Quad Core 1 GHz	ARM Cortex-A9 Quad Core 1 GHz
RAM	512 MB	1 GB	1 GB	2 GB	2 GB
Flash	4 GB	4 GB	4 GB	8 GB	8 GB
OS	Linux RT	Linux RT	Linux RT	Linux RT	Linux RT
Ethernet	2 Ethernet ports 10/100	1 Ethernet port 10/100/1000 2 Ethernet ports 10/100	1 Ethernet port 10/100/1000 2 Ethernet ports 10/100	1 Ethernet port 10/100/1000 2 Ethernet ports 10/100	1 Ethernet port 10/100/1000 2 Ethernet ports 10/100
USB	1 USB Host port	2 USB Host ports	2 USB Host ports	2 USB Host ports	2 USB Host ports
SD	SD Card Slot	SD Card Slot	SD Card Slot	SD Card Slot	SD Card Slot
Serial	1	1	1	1	1
Operating temperature	-20°C +60°C	-20°C +60°C	-20°C +60°C	-20°C +60°C	-20°C +60°C

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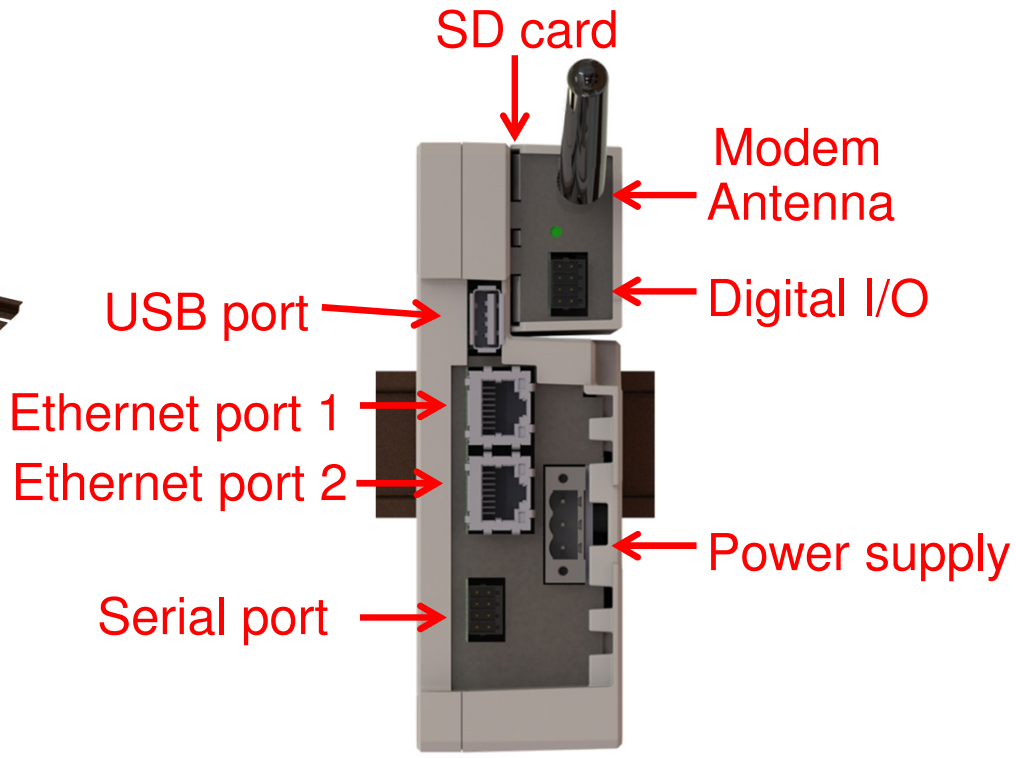
Compatibility in Automation : IIoT Controllers (exor ex700 ware)



Feature	Description
CPU	ARM Cortex-A8
RAM	512MB DDR3
Storage	Flash Disk 4GB eMMC
Network	2 x 10/100 Ethernet ports
USB Port	1 Host 2.0
SD Card Slot	MicroSD
Modem	2G/3G/4G
Digital Input	1 x VPN abilitazione 1 x VPN reset
Digital Output	1 x VPN stato abilitazione 1 x VPN stato attivazione
Operating Temperature	-20 C° , + 60C°
OS	Linux 4.x
VPN	OpenVPN
Security	SSL/TSL

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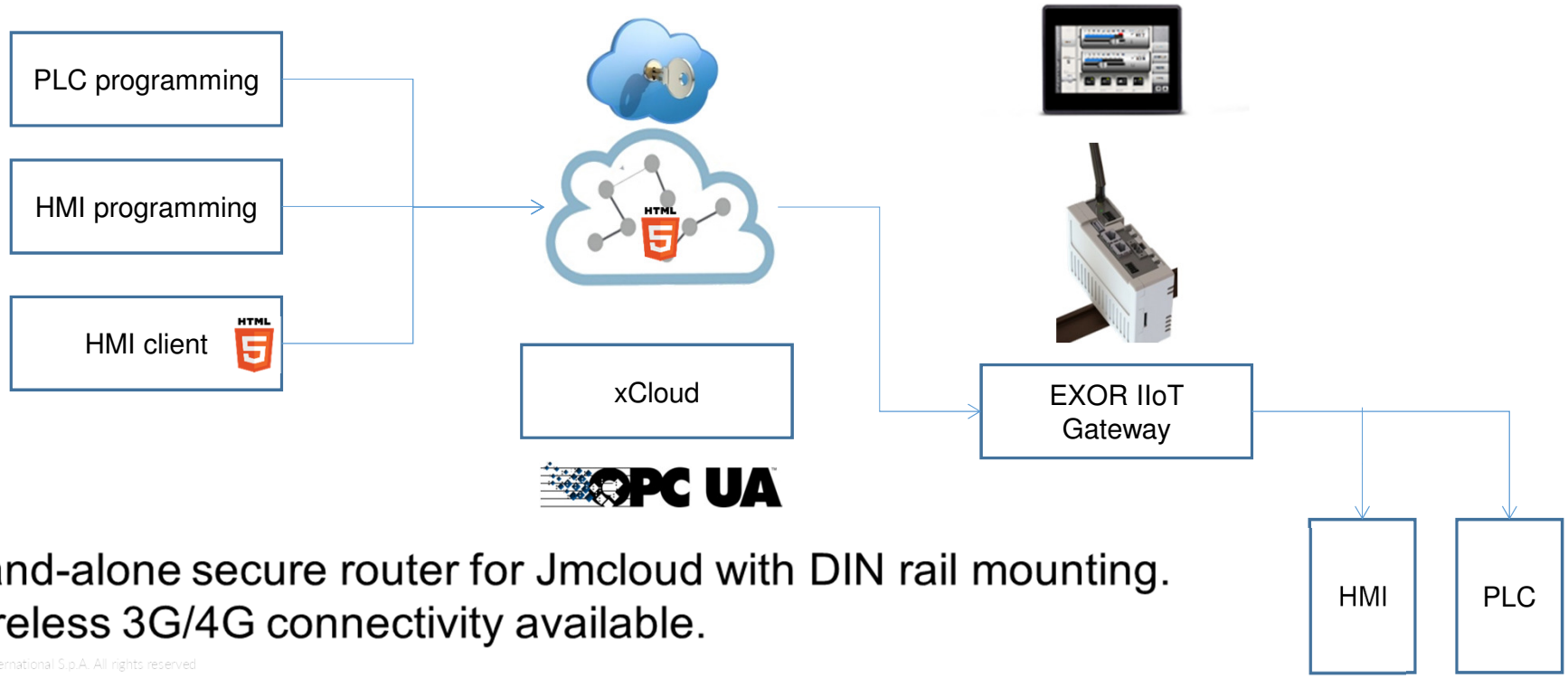
Compatibility in Automation : IIoT Controllers application cases



Stand-alone secure router for Jmcloud with DIN rail mounting.
Wireless 3G/4G connectivity available.

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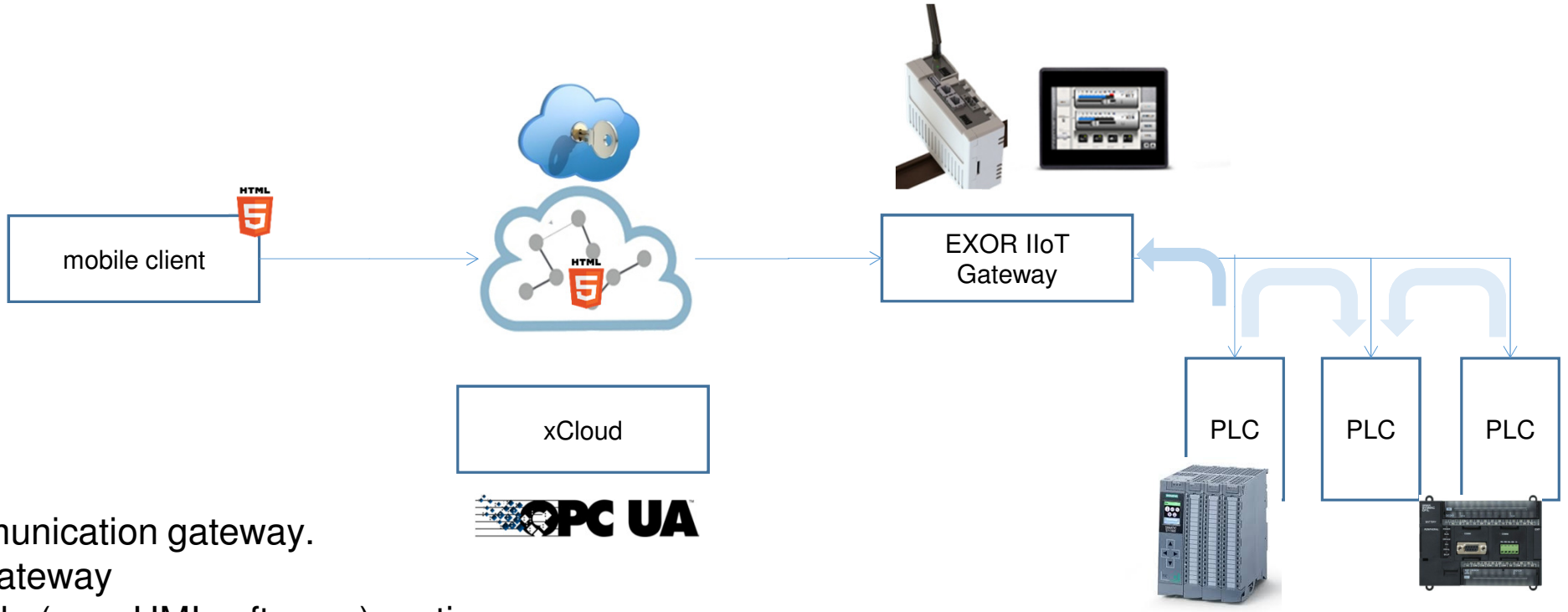
Compatibility in Automation : IIoT Controllers application cases



Communication gateway.
IIoT gateway
Jmobile (exor HMI software) runtime

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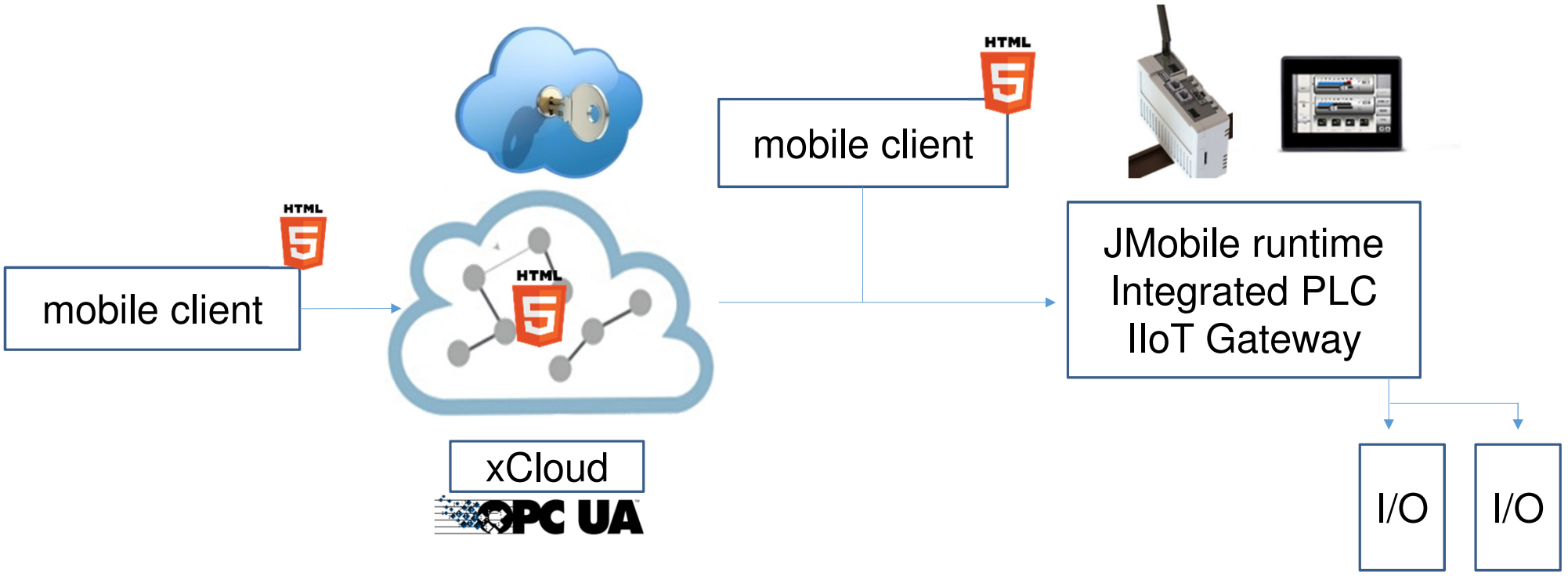
Compatibility in Automation : IIoT Controllers application cases



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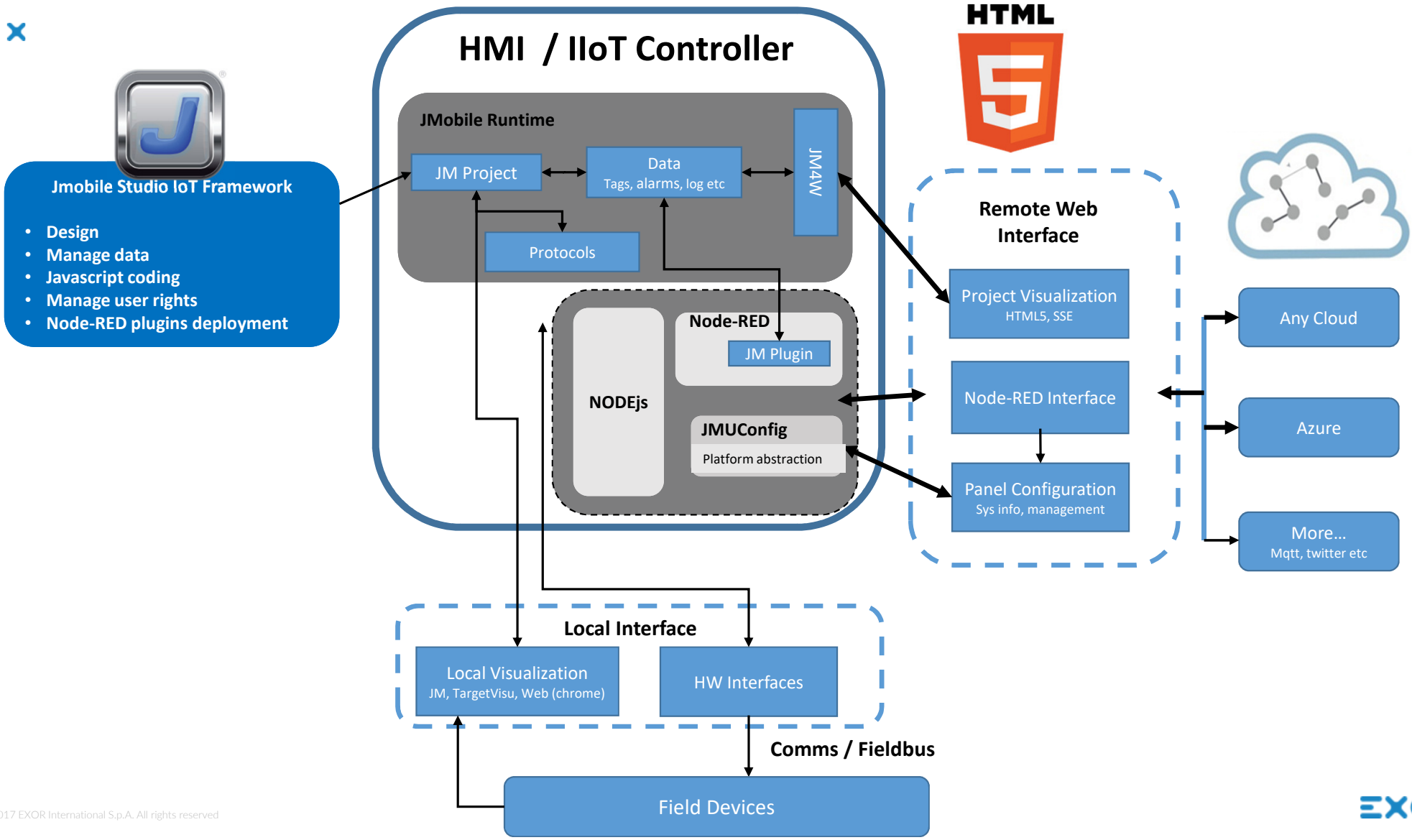

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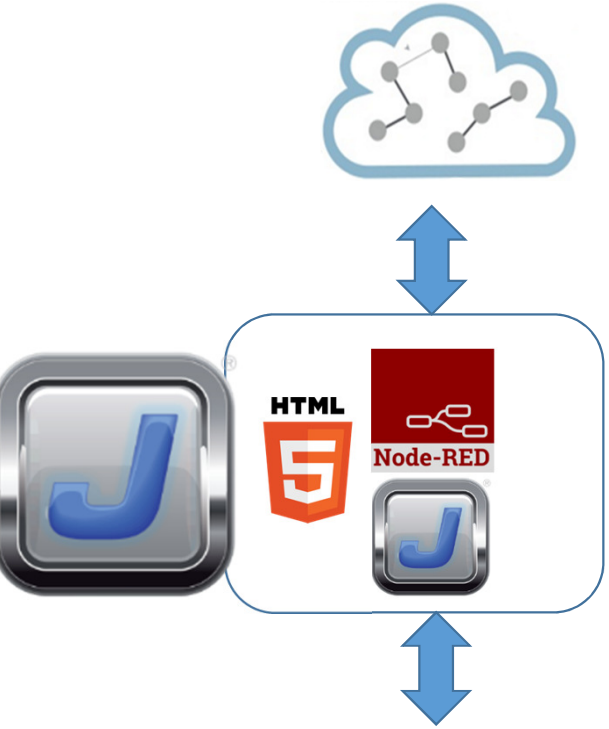
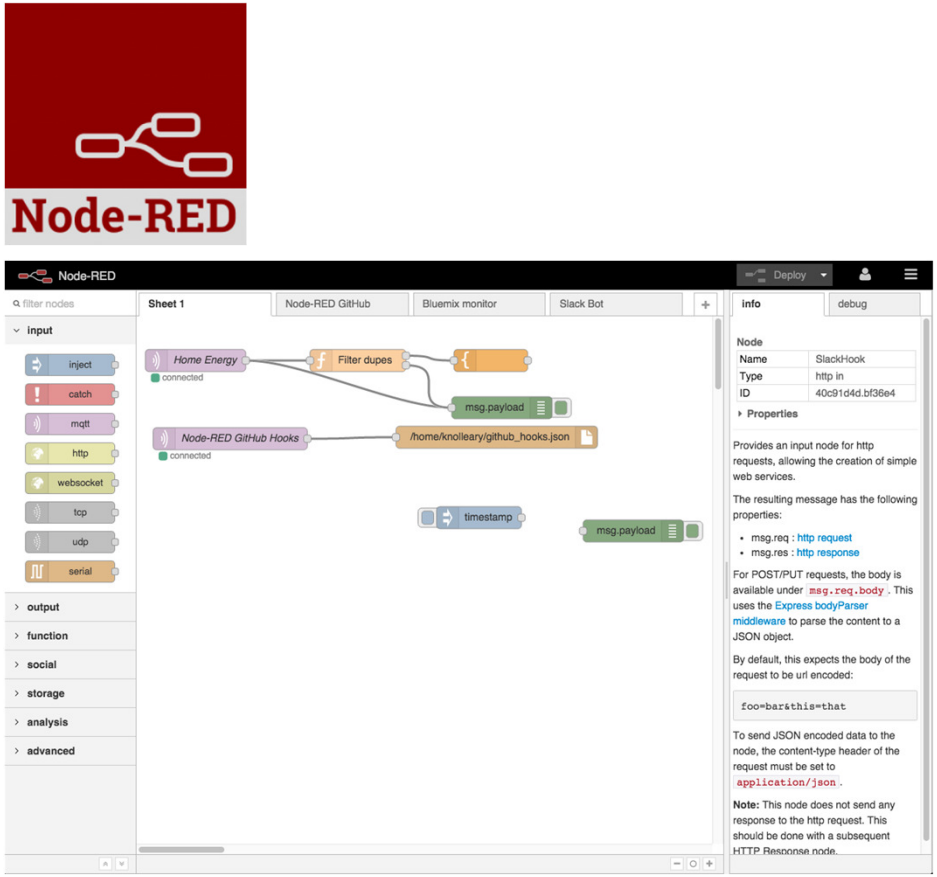
Jmobile: Cloud edge programming



Cloud Interfaces

Industry 4.0 components need to assure Connecting Industrial Assets with the Enterprise

Automation Interfaces



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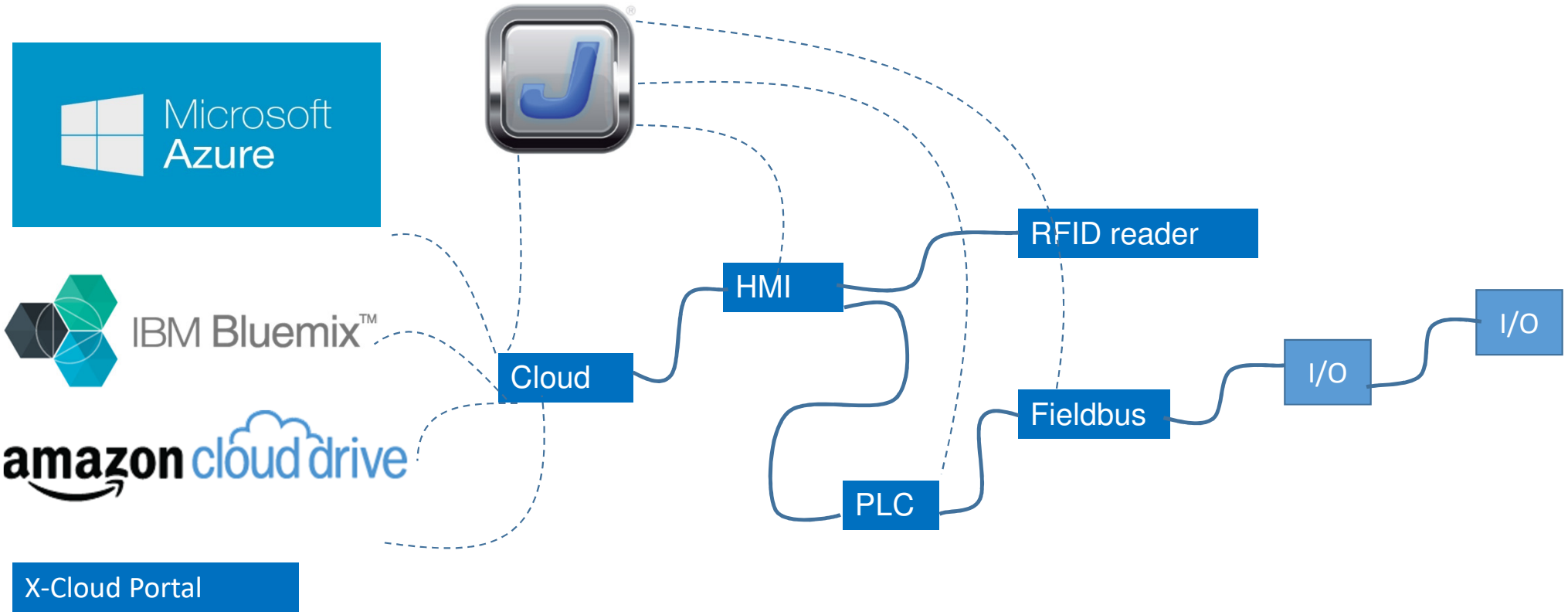
Jmobile: AnyCloud



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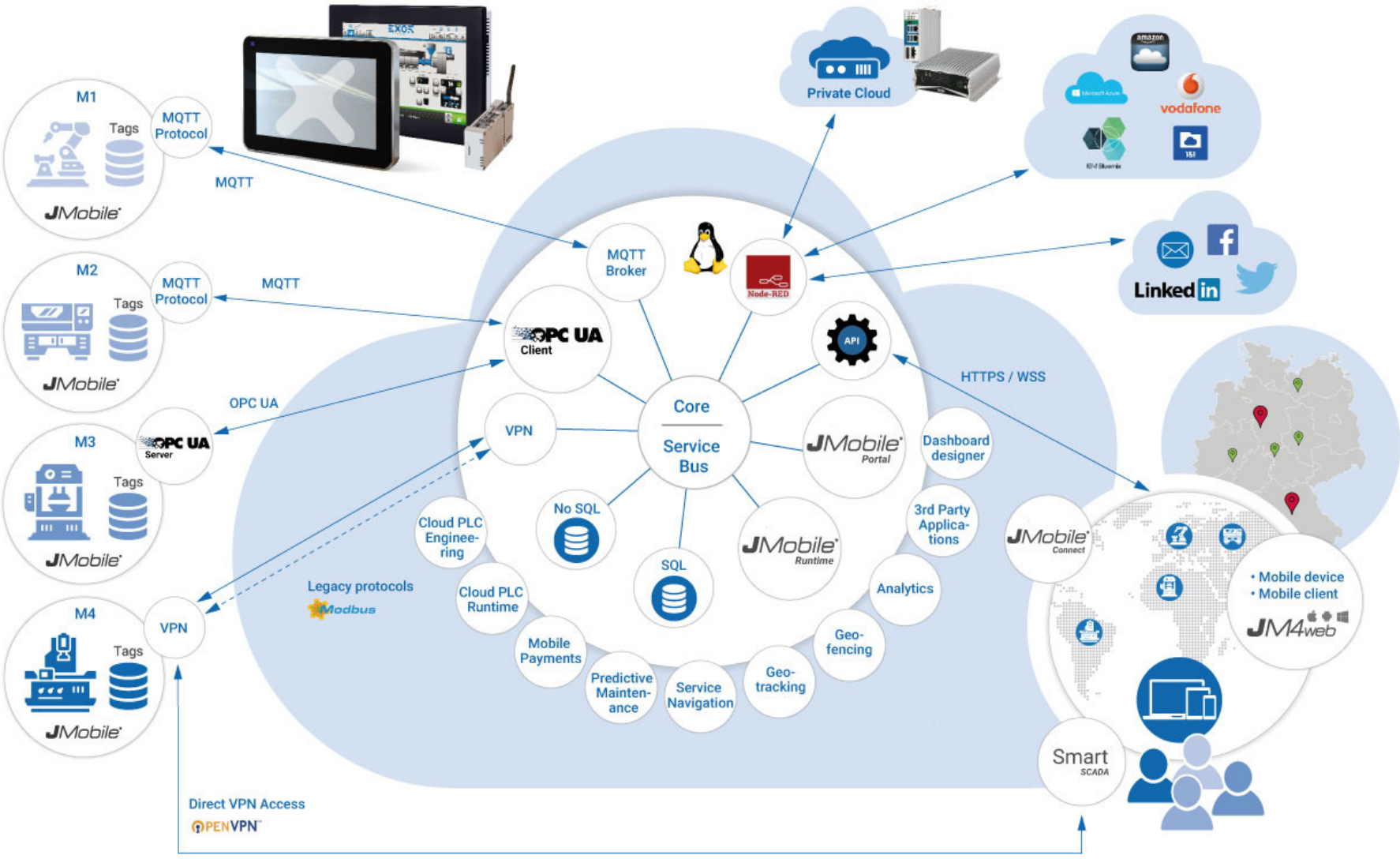

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And have a nice IIoT ;-)

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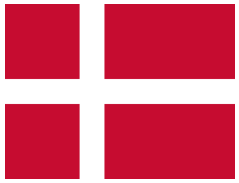

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