UBIQUITY

SECURE REMOTE ACCESS FOR INDUSTRIAL AUTOMATION DEVICES

04/2024

æ **ASEM**

A **ROCKWELL AUTOMATION** COMPANY

SUMMARY

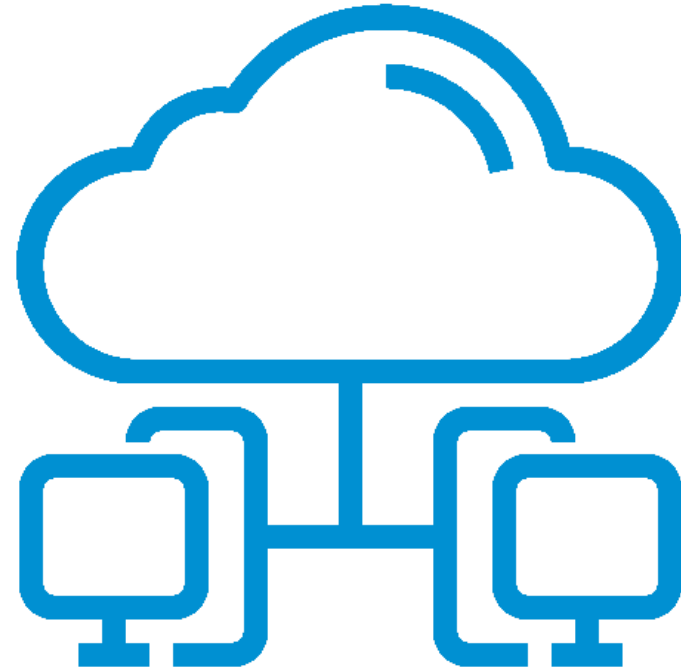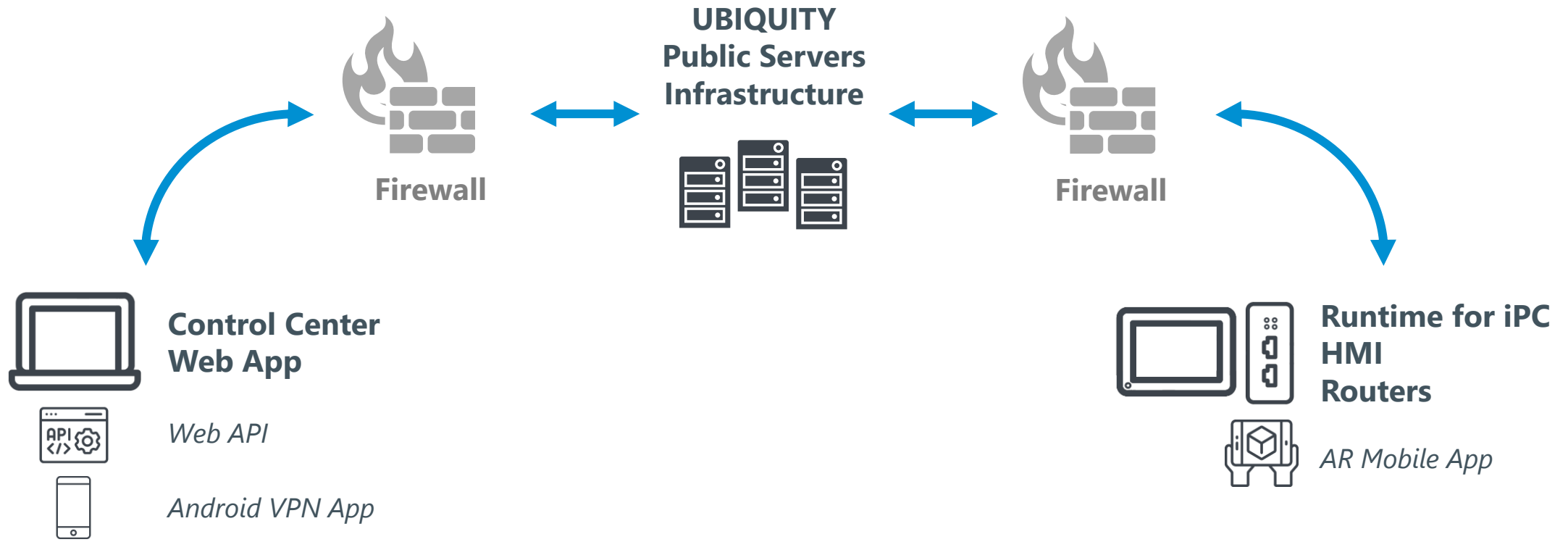|		
UBIQUITY OVERVIEW	RUNTIME FEATURES	ROUTER FEATURES
CONNECTIVITY SERVICES	LICENSE MODEL	PRIVATE SERVER

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UBIQUITY OVERVIEW

UBIQUITY OVERVIEW

- Ubiquity Control Center Web App
- Ubiquity Public Server Infrastructure
- Runtime, HMI and Routers

UBIQUITY Public Servers Infrastructure

Firewall

Firewall

Control Center Web App

Web API

Android VPN App

Runtime for iPC HMI Routers

AR Mobile App

UBIQUITY OVERVIEW: CONTROL CENTER WEB APP

UBIQUITY OVERVIEW: PUBLIC SERVER INFRASTRUCTURE

Redundant

7+ Relay servers located
distributed all over the world

2+ Access servers in Europe

provides Continuity of Service
and High Performances

Scalable

Unlimited Runtimes
and devices manageable

Unlimited Users and Groups

Unlimited traffic
between Control Center
and remote systems

UBIQUITY OVERVIEW: PUBLIC SERVER INFRASTRUCTURE AUTHENTICATION

Control Center, Runtime and Routers authenticates to one of the UBIQUITY Access Server using outgoing connections (SSL/TSL) usually allowed by firewall policies

**UBIQUITY
Public Servers
Infrastructure**

Access Server

**Firewall
TCP ports**
80, 443, 5935

**Firewall
TCP ports**
80, 443, 5935

**Control Center
Web App**
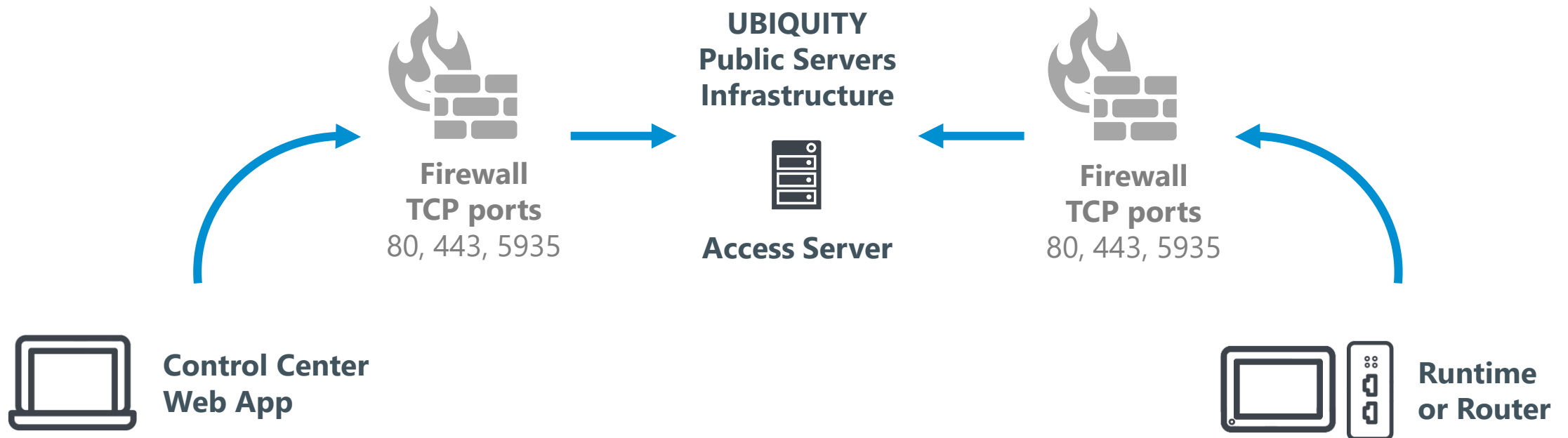
**Runtime
or Router**

UBIQUITY OVERVIEW: PUBLIC SERVER INFRASTRUCTURE CONNECTION

When Control Center wants to connects to a Runtime/Router:

- Endpoints agree on the Relay Server with best round-trip time
- The secure end-to-end connection will be established with the Relay Server
- Relay Server forward encrypted messages without being able to decrypt them

**UBIQUITY
Public Servers
Infrastructure**

Firewall

Relay Server

Firewall

**Control Center
Web App**
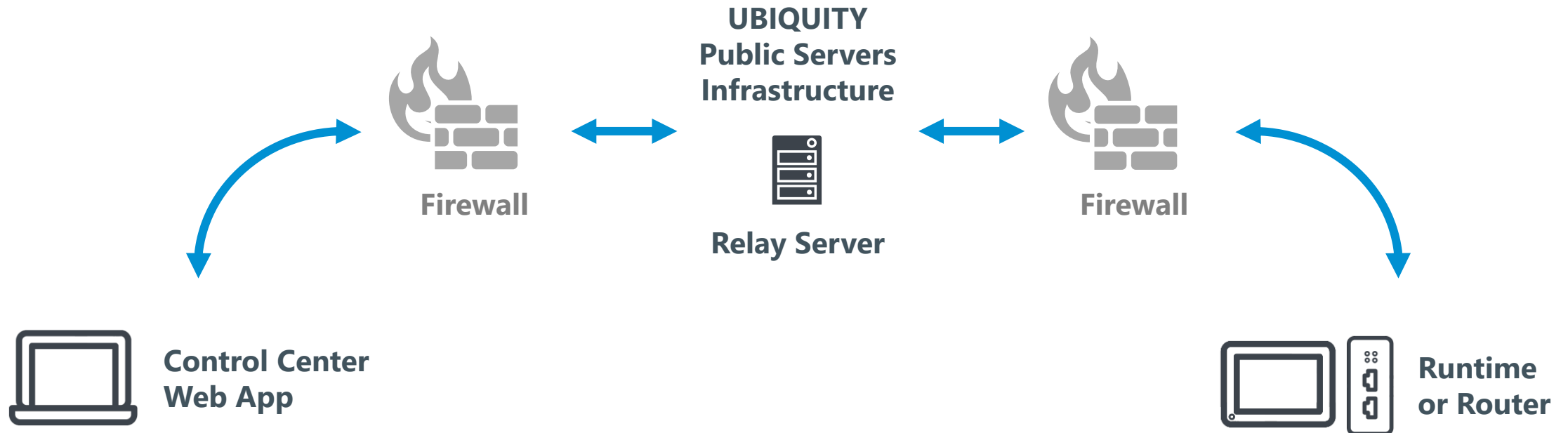
**Runtime
or Router**

UBIQUITY OVERVIEW: RUNTIME FOR IPCS

CROSS-PLATFORM APPLICATION

Installable on third-party iPC

pre-installed on all Asem's iPC

Available from WinCE up to Win10 and Linux Ubuntu22
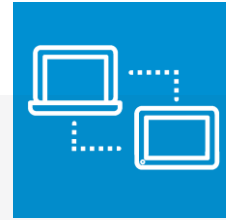
INTERACTIVE ACCESS

allows interactive access to remote systems with audit

VPN ACCESS

Secure access to the device and to the automation subnet

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UBIQUITY OVERVIEW: HMIS

**EMBEDDED
OPERATOR INTERFACE**

Ubiquity Runtime
Embedded

Can provide
physical network separation
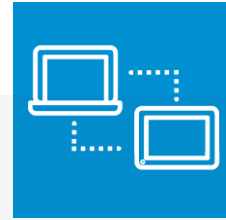
**INTERACTIVE
ACCESS**

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ACCESS**

Secure access
to the device
and to the
automation subnet

UBIQUITY OVERVIEW: ROUTERS
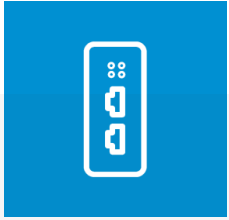
ROUTER APPLIANCE

Ubiquity Runtime embedded

Provide physical network separation
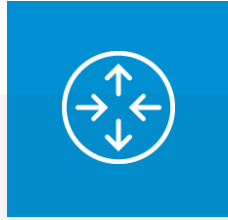
NETWORKING CAPABILITIES

Routing, NAT, Internet Sharing and can provide Wifi/4G connection
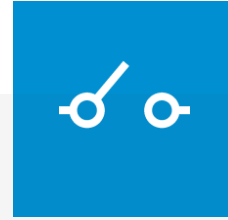
EMBEDDED I/O

Remote access management via digital I/O

VPN ACCESS

Secure access to the device and to the automation subnet

SSL TLS

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RUNTIME FEATURES

RUNTIMES FEATURES: INTERACTIVE ACCESS

REMOTE DESKTOP

VNC-like feature with
remote input lock and multi-monitor support

Allow to chat with remote users
with conversation log *

TASK MANAGER

Allow to check RAM and CPU usage
of process running on the remote system

Process termination

Remote System Reboot

FILE TRANSFER

Allow to transfer files
to/from remote systems

MULTICLIENT SUPPORT

A remote system
manages multiple
concurrent connections
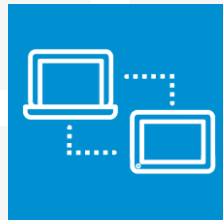
* chat is currently available on Runtime for iPC and on Runtime for HMI25/30/40

RUNTIMES FEATURES: VPN

VPN TO THE DEVICE

Optimized for industrial communications

The VPN Server it's at Runtime level
not on the Server Infrastructure

IP CONFLICT RESOLUTION

Conflicts are solved
by UBIQUITY VPN virtual adapter
with the use of metric

DATA LINK - LAYER 2

No routing rules required

No default gateway required

Service PC gets a real remote subnet IP

Supports broadcast messages

FIREWALL and ROUTING RULES

VPN traffic can be filtered by Firewall rules
with a set of predefined rules ready-to-use

VPN traffic can be routed
by static routing rules

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RUNTIMES FEATURES: ADVANCED

VPN TO THE SUBNET

VPN can be established
with the automation's subnet
to reach PLC, Drives
of the machine/plant

INTERNET SHARING

Provide internet access
to devices of automation's subnet

Filtered by MAC-Address

USB PASS-THROUGH

Allow to access a remote device
connected to the remote system
via USB port

SERIAL PASS-THROUGH

Allow to access a remote device
connected to the remote system
via Serial port

ROUTER FEATURES

UBIQUITY ROUTERS: WHY?

- if a **physical network separation** between the automation subnet and customer/internet subnet is required

- if a wired connection is not available, so a **Cellular or Wi-Fi connection** is needed

- if the **Runtime cannot be installed**, like operator panels with proprietary OS or managed by others

UBIQUITY ROUTERS: KEY FEATURES

NETWORKING CAPABILITIES

VPN and Advanced features
provided by the UBIQUITY Runtime
+
Routing and NAT

EASE OF MANAGEMENT

Configuration via USB Memory
or via Control Center

Remote firmware upgrade

PROTECTION

Protection against
unauthorized domain change

SECURITY INCREASE

Embedded I/O allows
to physically accept and check
the Remote Connection

UBIQUITY ROUTERS

Features	RK20	RK21	RK22
USB 2.0	1	1	1
WAN Gigabit	1	1	1
LAN Gigabit	1	1	4
Serial port (multi-standard isolated)	✓	✓	✓
WiFi	✗	✓	✓
4G Modem	✗	✓	✓

UBIQUITY ROUTERS: DETAILED VIEW OF RK22

Status LEDs

integrated
Ethernet switch

Serial Port

Frontal View

4G Modem

2x Digital Inputs
- Activate Connection to Ubiquity Network
- Reset Command

2x Digital Outputs
- Connected to Ubiquity Network
- Remote Access ongoing

WiFi

Upper View
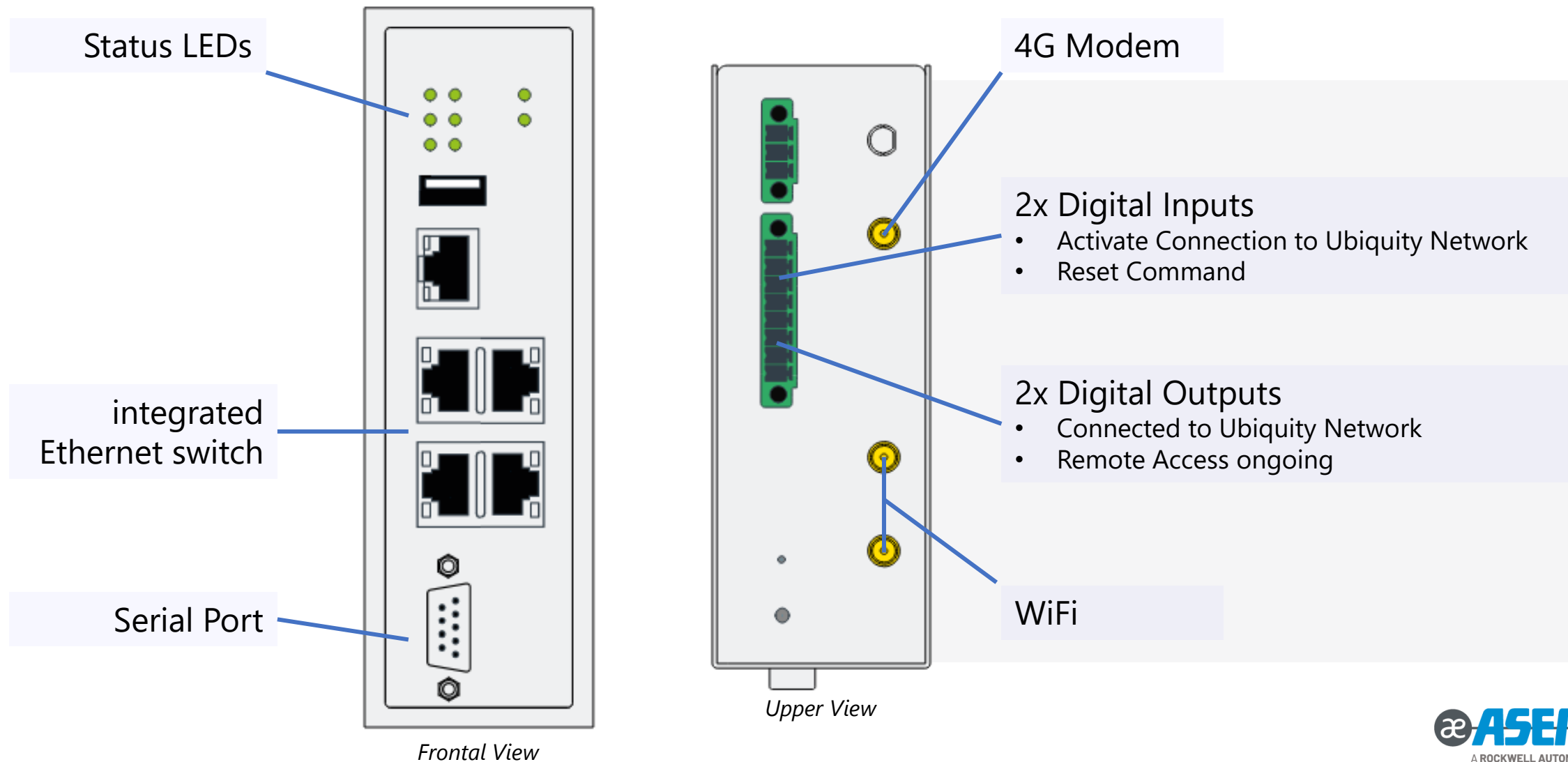
UBIQUITY ROUTERS: WIFI MODE

WiFi as
Adapter Mode

Modem/Router
for Internet Access

WiFi as
Access Point

Modem/Router
for Internet Access

Laptop, Tablet, Smartphone
can connect to the
automation subnet
and if needed
access internet
via Internet Sharing

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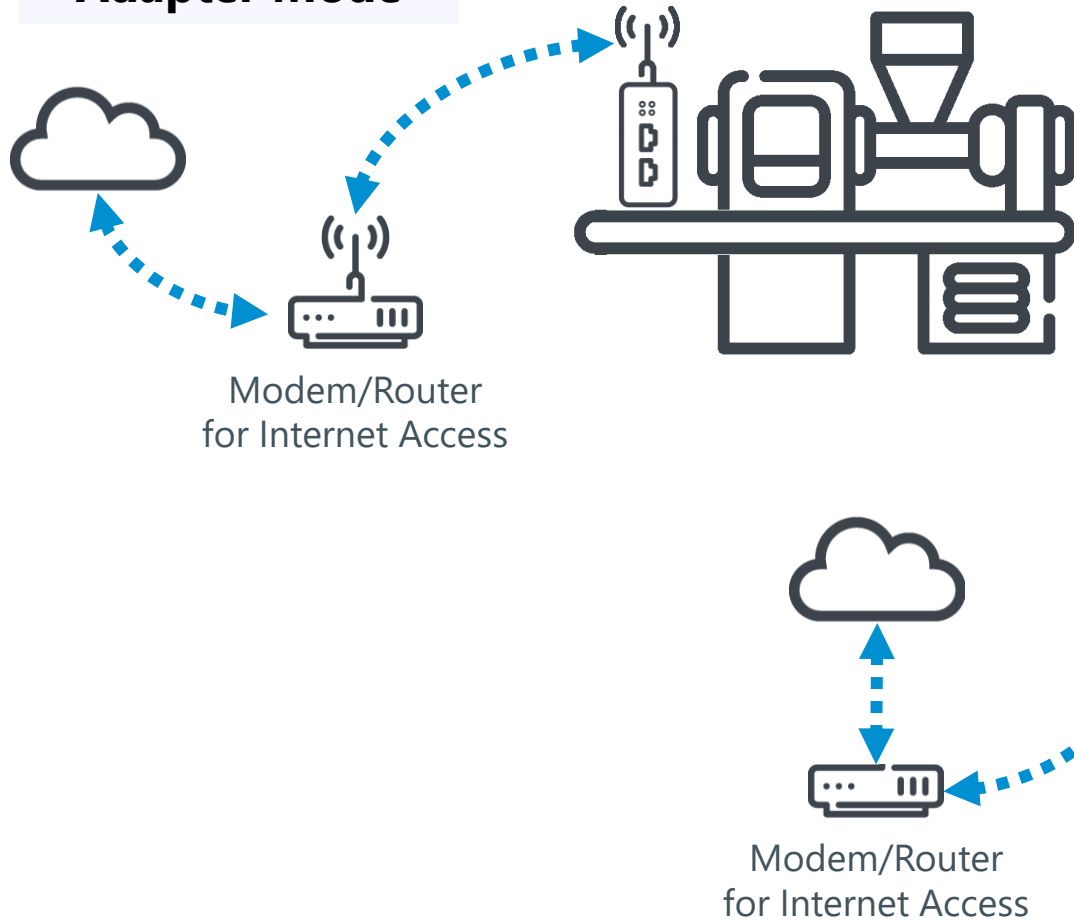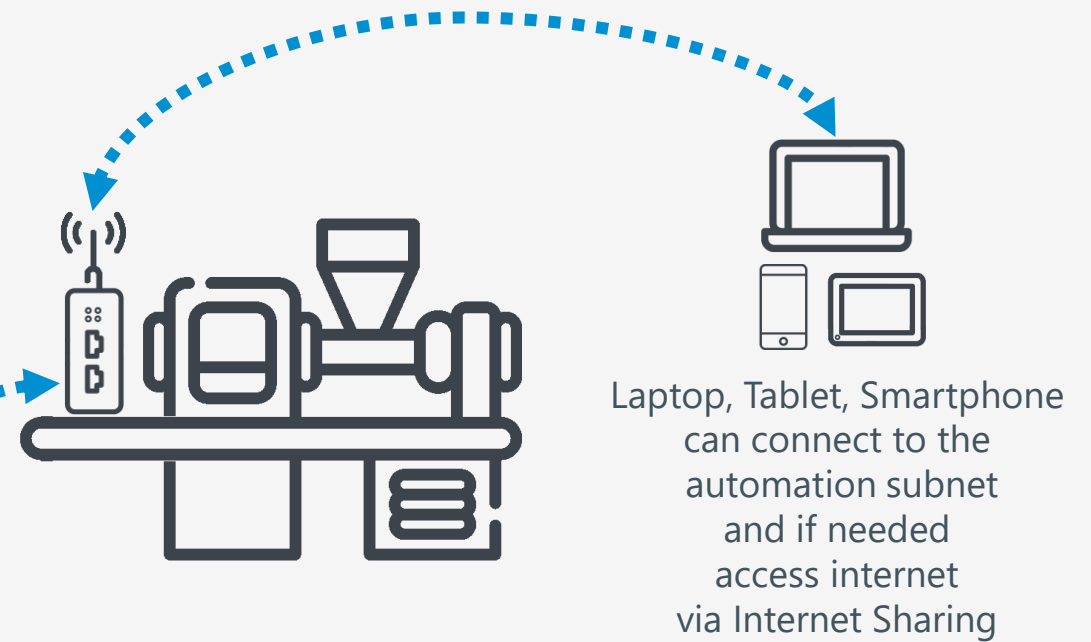
CONNECTIVITY SERVICES

CONNECTIVITY SERVICES

NEW with 13.5

BEST ROUTE FOR REMOTE ACCESS

Automatic selection of the best route
through one of the Relay Servers

LOCAL CONNECTION

Interactive Access
to devices on the local network [1]

CONNECTION AUTHORIZATION

Operator/Technician
can authorize
the remote connection

EASY MANAGEMENT

Runtime/Firmware updates
for remote devices

Updates can be scheduled

[1] works without Internet Access and without domain concurrent connection license
it's supported by the Windows Runtimes, OptixPanel HMIs and RK2x Routers (devices may require firmware update)

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CONNECTIVITY SERVICES

USER & GROUPS

User profiling and
Permissions control

SUB DOMAINS

Creation and management
of Domain's subfolders
that act as sub-domains

AUDIT

Audit of connections
and administration activities

GEOLOCATION

View of remote devices
on geographical map
based on public IP address

CONNECTIVITY SERVICES

NEW with 13.3

APPS

Augmented Reality App
for video streaming with VoIP

Mobile VPN App
for Android devices

SINGLE SIGN-ON

Single Sign-On
interfacing with 3rd party
OpenID identity providers [1]

ASSISTANCE REQUEST

Operator/Technician
can send assistance request

Notifications are visible on the Control
Center and/or via e-mail

3rd PARTY INTEGRATION

Integration
on 3rd party application
through Web API [2]

[1] requires first a feasibility assessment and then the domain configuration made by ASEM technicians
[2] web API substitutes the SDK discontinued on 1 Nov 2019

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LICENSE MODEL

LICENSING MODEL

Connectivity services

Based on the
Number of concurrent remote connections
with devices

Runtimes

Available for
iPCs, HMIs and Routers

Perpetual License
Basic and **Pro**

CONNECTIVITY SERVICES: CONCURRENT CONNECTIONS

Company
Locations

Concurrent
remote connections

Customers
Plants
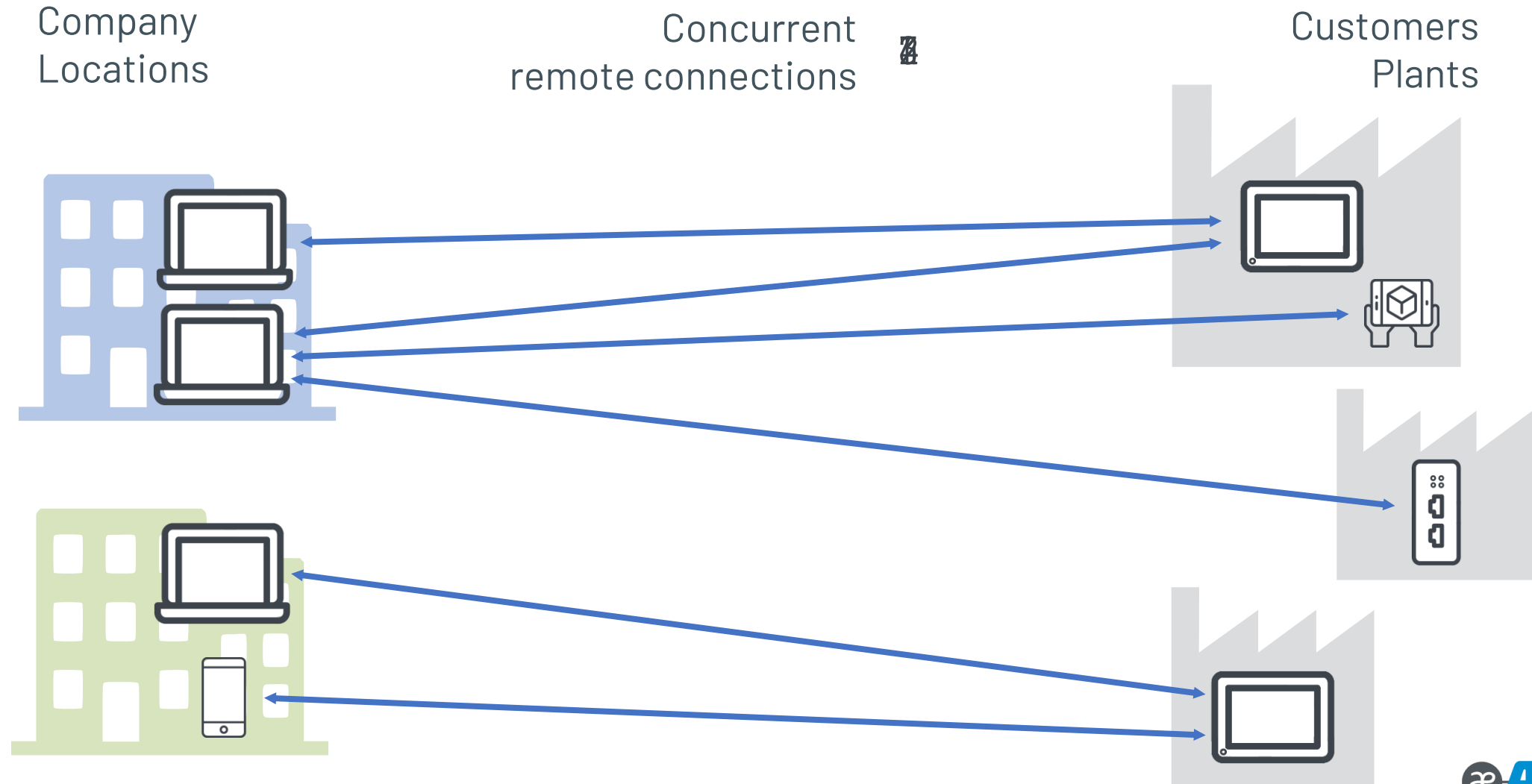
CONNECTIVITY SERVICES: DETAILS

UBIQUITY Connectivity Services

- Annual fee
- License based on an Activation Key to use on the Domain through Control Center Web App
- Available sizes of concurrent remote connections
    - 1 remote connection
    - 2 concurrent remote connections
    - 5 concurrent remote connections
    - 10 concurrent remote connections
    - Unlimited concurrent remote connections [1]

[1] includes also the *"Basic concurrent access"* feature: any Runtime without a license, will be recognized as with the Basic license

RUNTIMES LICENSES FOR IPC AND HMI

UBIQUITY Runtime for iPC [1] and HMI [2]	BASIC	PRO
▪ Interactive tools: Remote Desktop, Chat [3], File transfer, Task manager ▪ VPN to the device with integrated Firewall and Routing Rules ▪ Support for multiple connections from different Control Center Web App with separate VPNs for each client ▪ Local Connection to use Interactive tools and VPN without internet access	✓	✓
▪ VPN to the automation subnet with integrated Firewall and Routing Rules ▪ Serial and USB passthrough ▪ Internet connection sharing (ICS) with devices on the automation subnet	-	✓

[1] any ASEM iPC, includes Ubiquity Runtime Basic license
[2] any ASEM HMI, includes Ubiquity Runtime Basic or Pro license depending on the model
[3] available on Runtime for iPC and on Runtime for HMI based on WinCE

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RUNTIMES LICENSES FOR ROUTERS

UBIQUITY Runtime for Router [1]	PRO ROUTER
▪ Interactive tools: File transfer, Task manager ▪ VPN to the device with integrated Firewall and Routing Rules ▪ Support for multiple connections from different Control Center Web App with separate VPNs for each client ▪ Local Connection to use Interactive tools and VPN without internet access	✓
▪ VPN to the automation subnet with integrated Firewall and Routing Rules ▪ Serial and USB passthrough ▪ Internet connection sharing (ICS) with devices on the automation subnet	✓
▪ Programming NAT rules between Ethernet interfaces ▪ Programming static Routing rules between Ethernet interfaces	✓

[1] any UBIQUITY Router includes the Ubiquity Pro Router license

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PRIVATE SERVER

PRIVATE SERVER: OVERVIEW

- Ubiquity Control Center Web App
- Ubiquity Private Server Infrastructure
- Runtime, HMI and Routers

Firewall

Customer's Private Servers Infrastructure

Firewall

Control Center Web App

Runtime for iPC HMI Routers
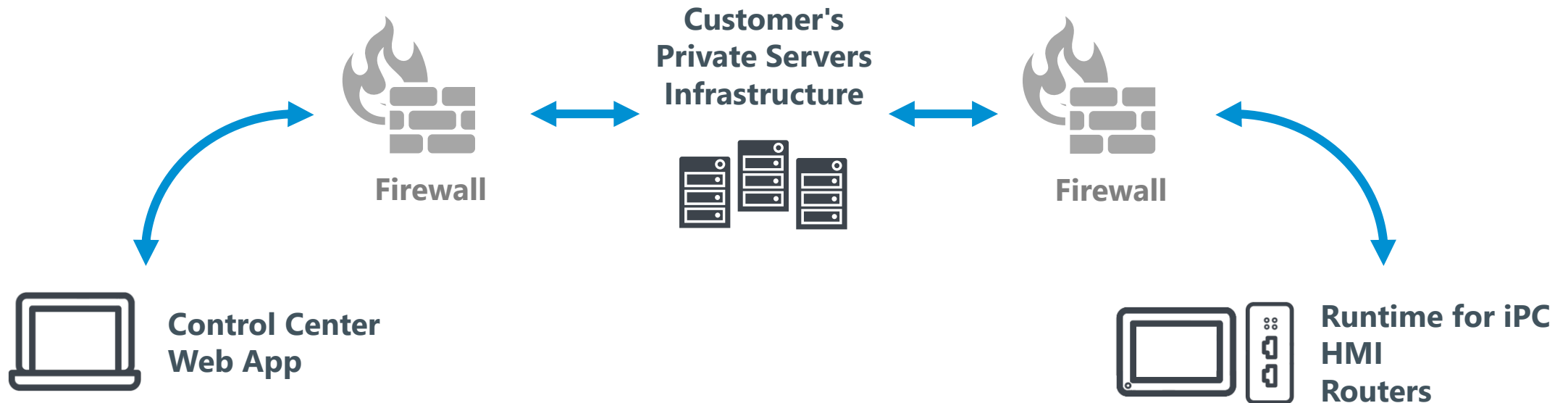
PRIVATE SERVER: WHY?

FULL CONTROL

The IT department
can have full control
over the whole
servers infrastructure

Ubiquity servers can be installed
on physical or virtual machine
hosted on premises or on a private cloud

EXTRA SECURITY

Gather an extra degree of security
thanks to the separation
from the Public Infrastructure

Any possible data breach,
server maintenance,
connectivity downtime
on the public infrastructure
does not effect the private

PRIVATE SERVER: LICENSE MODEL

1 PRIMARY SERVER

Acts as Access Server
and Relay Server
with
Unlimited concurrent connections

Includes the first year
of Maintenance and Technical Support
Following years require annual payment.

2 SECONDARY SERVER

Acts only as a Relay Server

Can be used for redundancy,
decrease latency,
traffic balancing.

It's optional and require the presence
of the Primary Server but can be installed
in a distinct geographic location

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PUBLIC VS PRIVATE SERVER

CONNECTIVITY SERVICES	PUBLIC	PRIVATE
▪ **USER & GROUPS:** User profiling and Permissions control		✓
▪ **SUB DOMAINS**: Creation and management of subfolders that act as sub-domains		✓
▪ **AUDIT**: Audit of connections and administration activities		✓
▪ **BEST ROUTE :** Automatic selection of the best route through one of the Relay Servers	✓	✓ (1)
▪ **CONNECTION AUTHORIZATION:** User can authorize the remote connection		✓
▪ **ASSISTANCE REQUEST**: User can request assistance and notifications are visible on the Control Center and/or via e-mail		✓
▪ **LOCAL CONNECTION**: Interactive Access to devices on the local network		✓
▪ **EASY MANAGEMENT**: Runtime/Firmware updates for remote devices	✓	-
▪ **GEOLOCATION**: View of remote devices on geographical map based on public IP address		✓
▪ **APPS**: Augmented Reality App and Mobile VPN App for Android devices		✓
▪ **SINGLE SIGN-ON**: Single Sign-On interfacing with 3rd party OpenID identity providers		✓
▪ **3rd PARTY INTEGRATION**: Integration on 3rd party application through Web API	✓	-
▪ **BASIC CONCURRENT ACCESS:** any Runtime will be recognized as with the Basic license	✓ (2)	✓

(1) require at least one Secondary Server license
(2) available with license "Unlimited concurrent remote connections"

UBIQUITY
VS
FT REMOTE ACCESS

FT Remote Access

UBIQUITY

Part of FT HUB

Integration with FT Optix

Web Client

Runtime
for Windows10
and Linux Ubuntu22

Trial Period

License based on
Concurrent Connection

Unlimited License

Wired Routers

Local Connection

Geolocation

Remote Device Update

Control Center – Desktop version [1]

Device/Router Setup via USB [2]

OpenID Connect provider (AD integration)

Runtime for WCE, Win7

App: Ubiquity AR + VoIP

App: Ubiquity VPN (Android only)

Private Server [2]

Web API [2]

Wireless/LTE Router [2]

(1) in the near future will be discontinued

(2) in the near future will be available also in FT Remote Access

UBIQUITY
VS
UBIQUITY X

UBIQUITY VS UBIQUITY X

Domain features *	UBIQUITY	UBIQUITY X
• Best route selection • Geolocation • Remote Connection authorization • Remote Runtime/Firmware updates with scheduling • Users, Groups and permission management • Audit of Connections and Operations	Y	Y
• Augmented Reality App, • Android VPN App, • Assistance request, • WebAPI for 3rd party integration, • Single Sign-On with 3rd party OpenID identity providers	–	Y

* Features related to Runtimes and/or Devices remain available on both Ubiquity and Ubiquity X domains

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THANK YOU