

UBIQUITY

SECURE REMOTE ACCESS FOR INDUSTRIAL AUTOMATION DEVICES



11/2024

SUMMARY

UBIQUITY OVERVIEW



RUNTIME FEATURES



ROUTER FEATURES



CONNECTIVITY SERVICES



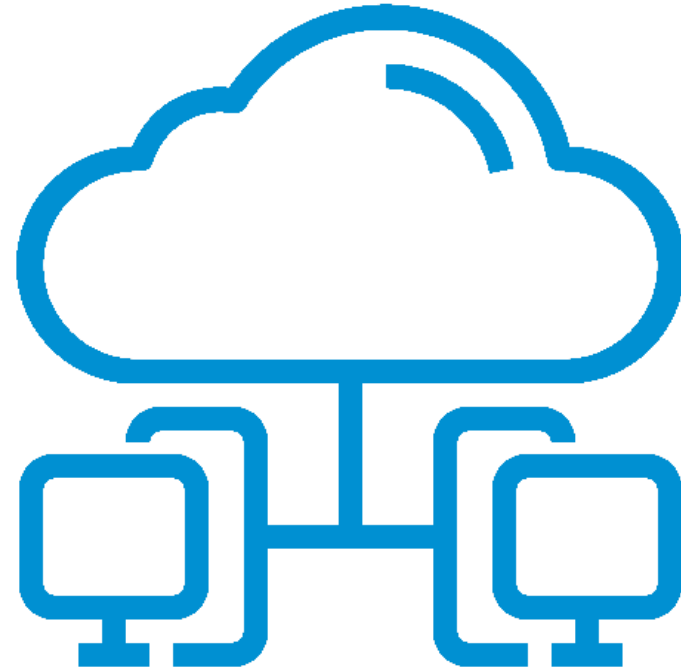
LICENSE MODEL



PRIVATE SERVER

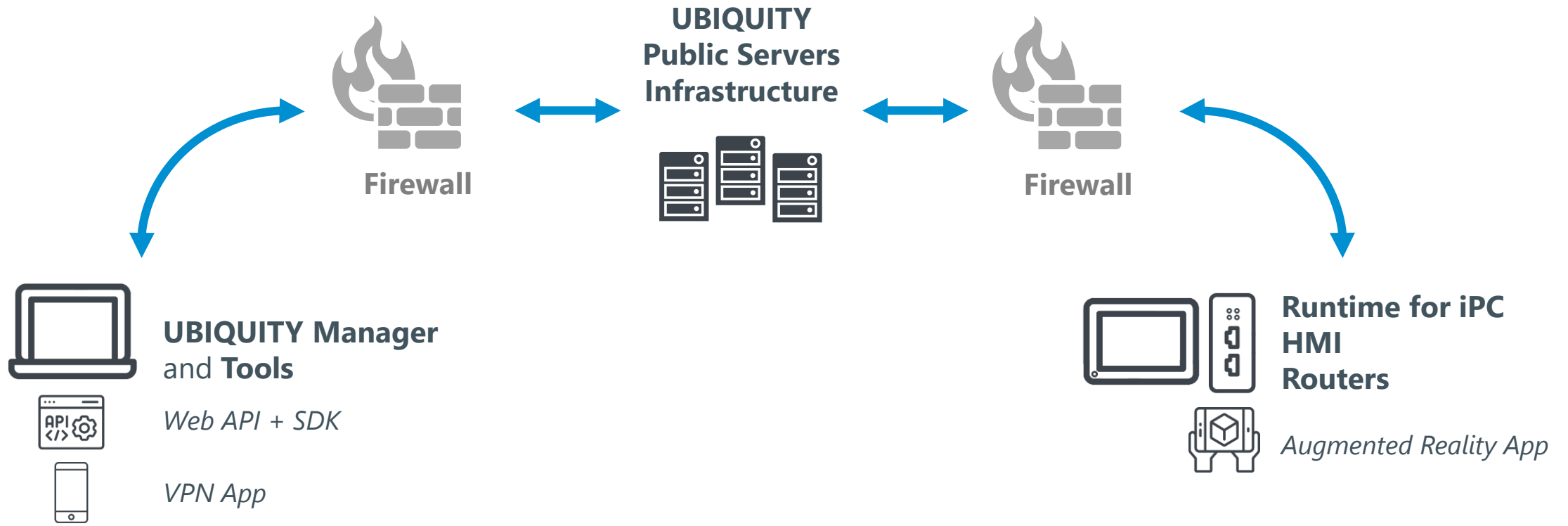


UBIQUITY OVERVIEW



UBIQUITY OVERVIEW

- UBIQUITY Manager and UBIQUITY Manager Tools
- UBIQUITY Public Server Infrastructure
- Runtime, HMI and Routers



UBIQUITY OVERVIEW: UBIQUITY MANAGER

Ubiquity

ubiquity.asem.it/controlcenter/

Guest

ASEM

A ROCKWELL AUTOMATION COMPANY

UBIQUITY

Luca Begnini

Domain View

Search

Interactive Access (Web Only)

VPN

ASEM Demo: 3

Explorer

Domain view

Devices view

Map view

Audit

Settings

Tools

Log

ASEM Demo

ASEM Verona

Alessio

HMI30 - Alessio

Demo BOX

IT4-Alessandro

Rm21_New

Meeting Room

Demo IIoT Cloud Connector HT700 + Omron Fins Ser&Eth (10.60.0.60)

Ubiquity RK10 + S7-300 MPI/TCP (10.90.0.90)

AUSTRIA

pro-SCADA

intern

HMI30 - Alessio Information

Status

Online

Device IP Addresses

10.8.0.1

172.19.17.40

Public IP Addresses

93.62.67.178

UBIQUITY Runtime Version

13.4.13

Firmware Version

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Update Status

Up-To-Date

Operating System

Windows Embedded Compact 7.0

CPU Architecture

ARM

System Family

Generic device

System Capabilities

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

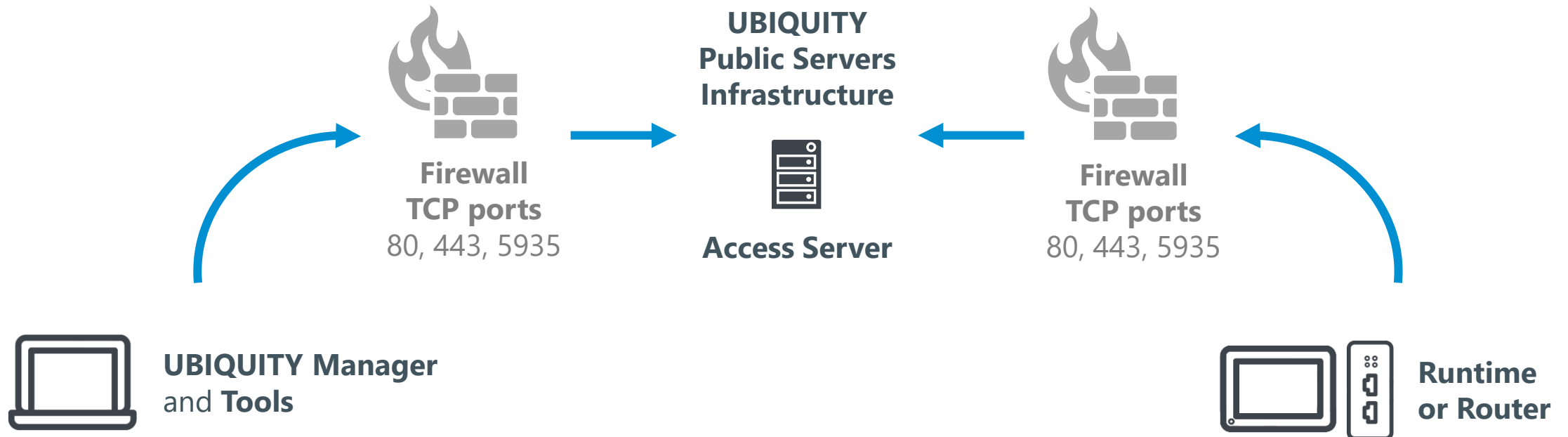
Unlimited Runtimes
and devices manageable

Unlimited Users and Groups

Unlimited traffic
between UBIQUITY Manager
and remote systems

UBIQUITY OVERVIEW: PUBLIC SERVER INFRASTRUCTURE AUTHENTICATION

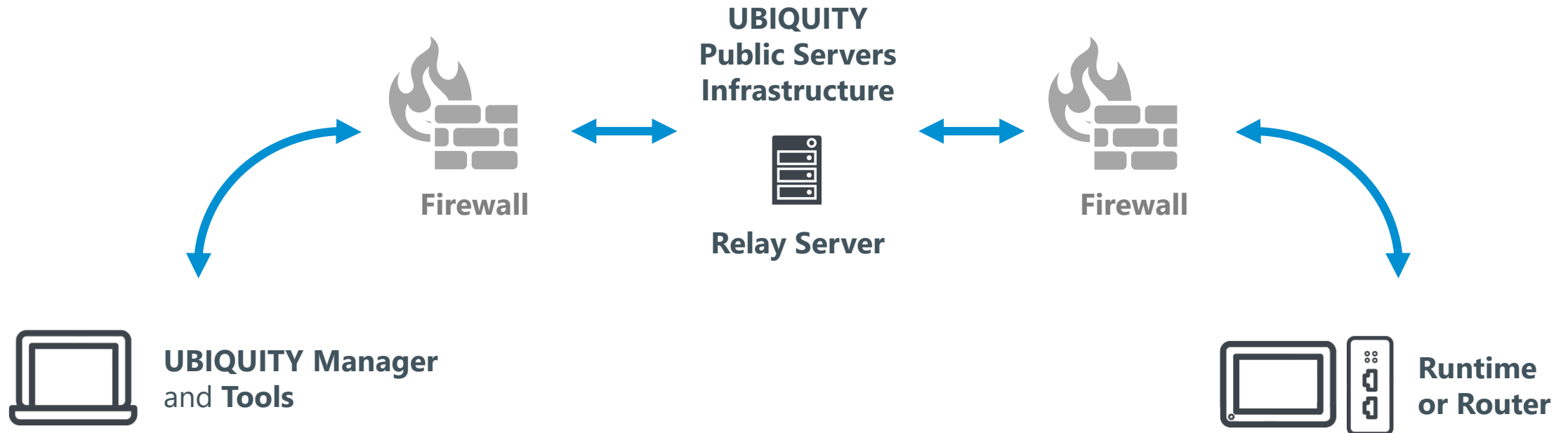
UBIQUITY Manager Tools, Runtime and Routers authenticates to one of the UBIQUITY Access Server using outgoing connections (SSL/TSL) usually allowed by firewall policies



UBIQUITY OVERVIEW: PUBLIC SERVER INFRASTRUCTURE CONNECTION

When UBIQUITY Manager wants to connect 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 OVERVIEW: RUNTIME FOR IPCS

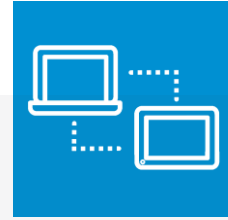


CROSS-PLATFORM APPLICATION

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

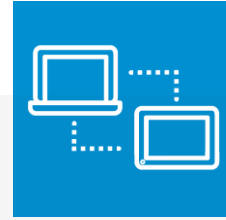
UBIQUITY OVERVIEW: HMIS



EMBEDDED OPERATOR INTERFACE

Ubiquity Runtime
Embedded

Can provide
physical network separation



INTERACTIVE ACCESS

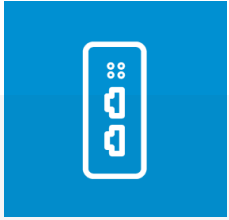
allows
interactive access
to remote systems
with audit



VPN ACCESS

Secure access
to the device
and to the
automation subnet

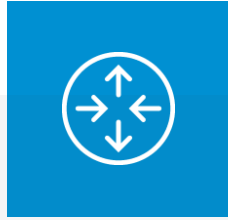
UBIQUITY OVERVIEW: ROUTERS



ROUTER APPLIANCE

Ubiquiti 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

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

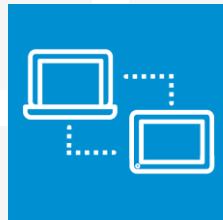
Process termination
Remote System Reboot

FILE TRANSFER

Allow to transfer files
to/from remote systems

MULTICLIENT SUPPORT

A remote system
manages multiple
concurrent connections



* chat is currently available only on Runtime for Windows and on ASEM 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

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 System Manager

Remote firmware upgrade



PROTECTION

Protection against
unauthorized domain change

SECURITY INCREASE

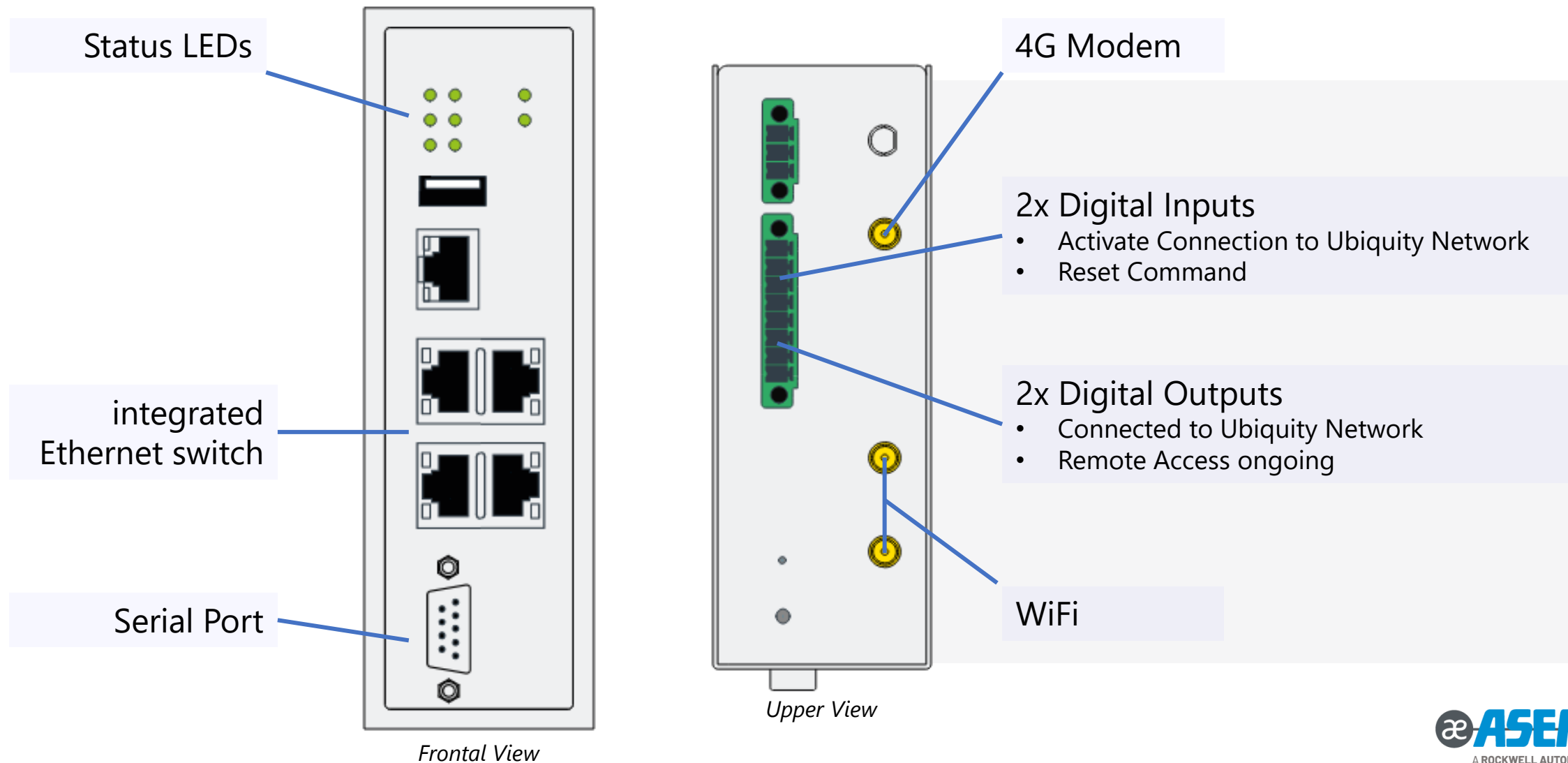
Embedded I/O allows
to physically accept and check
the Remote Connection

UBIQUITY ROUTERS



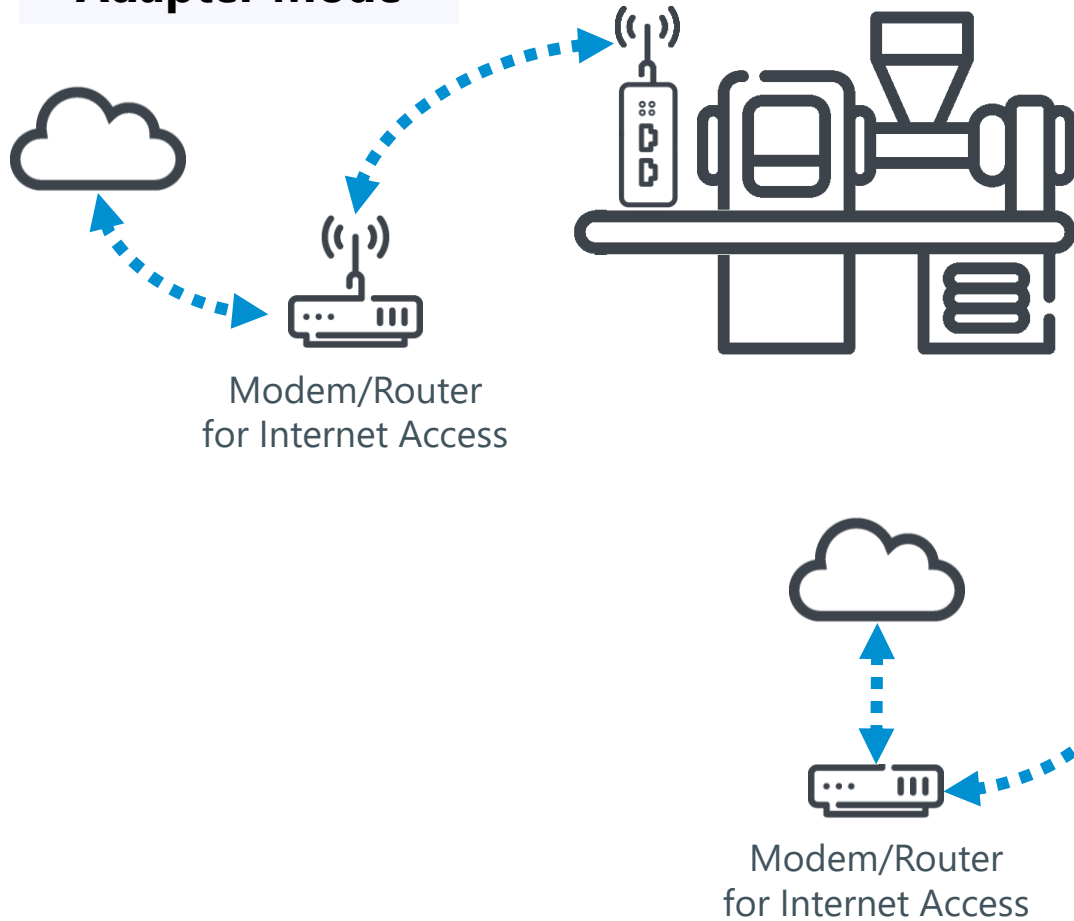
Features	RK20	RK21	RK22
USB 2.0	1	1	1
WAN Gigabit	1	1	1
LAN Gigabit	1	1	4
Serial port (multi-standard isolated)	✓	✓	✓
WiFi	X	✓	✓
4G Modem	X	✓	✓

UBIQUITY ROUTERS: DETAILED VIEW OF RK22

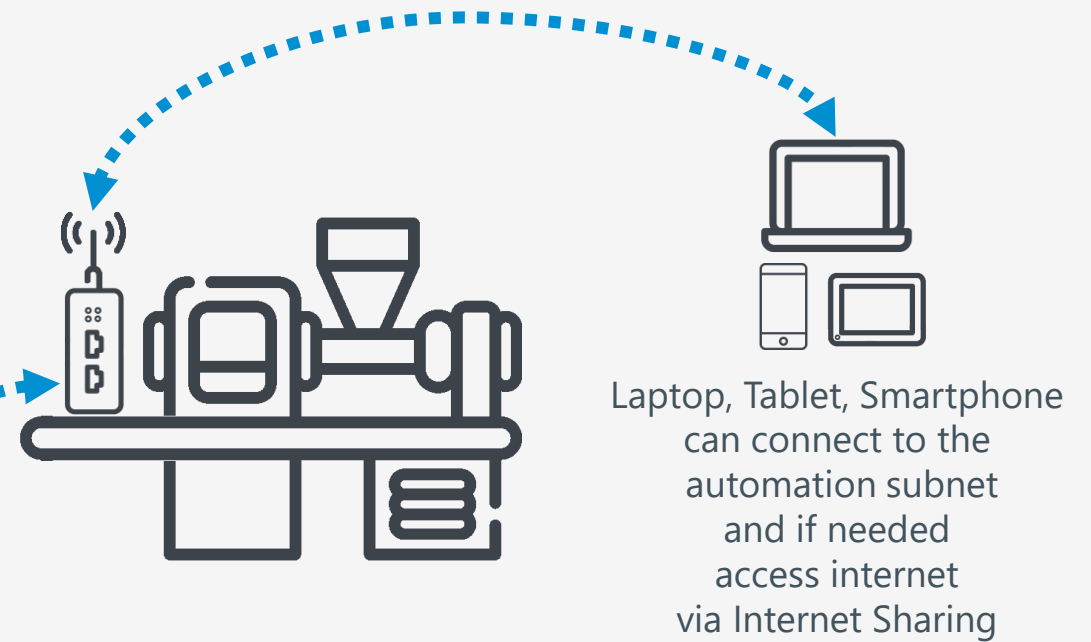


UBIQUITY ROUTERS: WIFI MODE

WiFi as Adapter Mode



WiFi as Access Point



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

OVER-THE-AIR UPDATES

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)

CONNECTIVITY SERVICES

NEW
with 14

DOMAIN MANAGEMENT

User profiling and
Permissions control

Subfolders act as sub-domains

DEVICE MANAGEMENT

Sub-devices definition
with actions/services

Invite user to a device

AUDIT

Audit of connections
and administration activities

GEOLOCATION

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



CONNECTIVITY SERVICES

APPS

Augmented Reality App
for video streaming with VoIP

VPN App

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 in UBIQUITY
Manager and/or via e-mail

3rd PARTY INTEGRATION

Integration
on 3rd party application
through Web API ⁽²⁾

⁽¹⁾ requires a domain with Unlimited Concurrent Connections license and a feasibility assessment by ASEM R&D

⁽²⁾ the web API is used for domain management, SDK allow to open VPN tunnel and File Transfer

LICENSE MODEL



LICENSING MODEL



Connectivity services

Based on the
**Number of concurrent
remote connections**
with devices

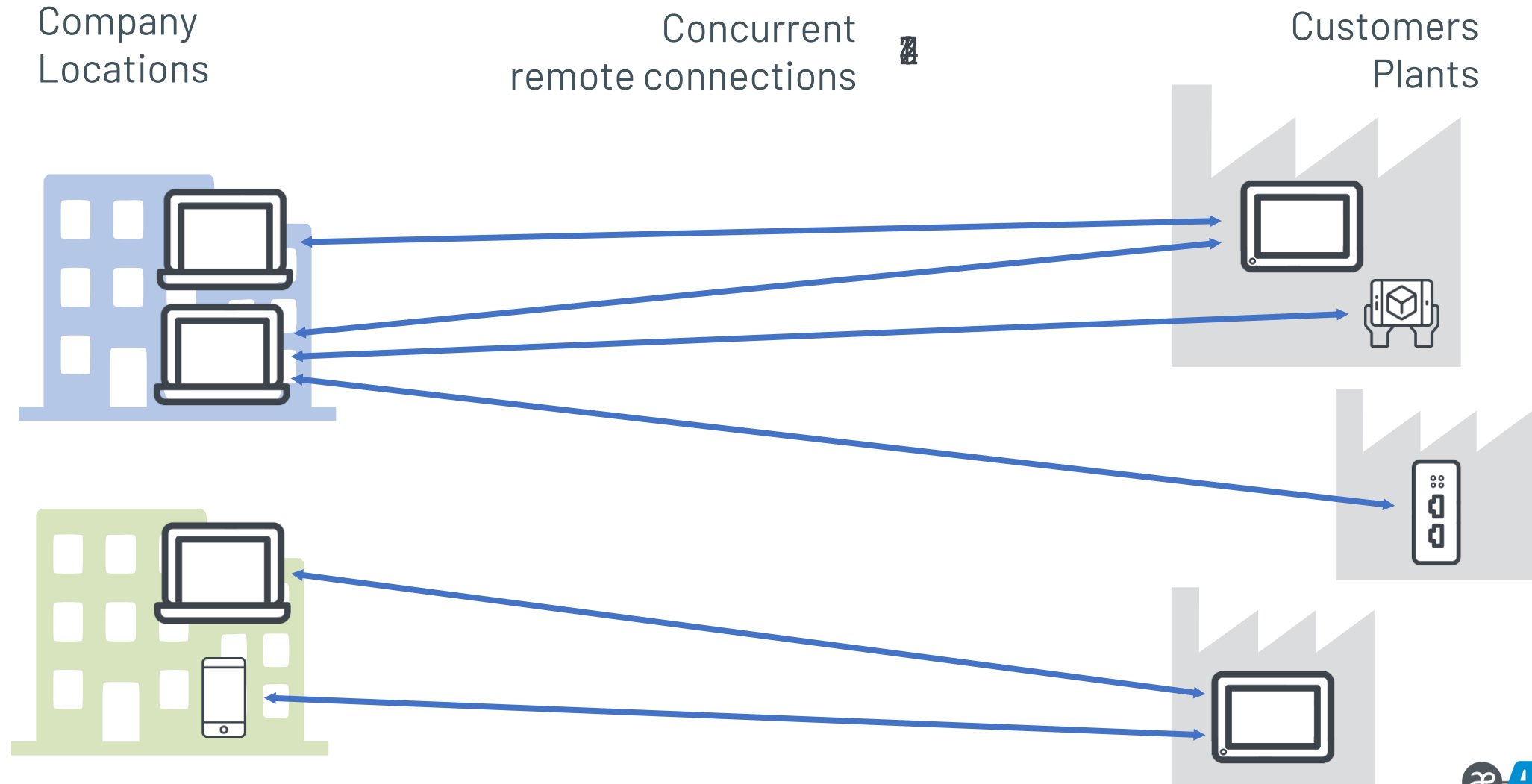


Runtimes

Available for
iPCs, HMIs and Routers

Perpetual License
Basic and **Pro**

CONNECTIVITY SERVICES: CONCURRENT CONNECTIONS



CONNECTIVITY SERVICES: DETAILS

UBIQUITY Connectivity Services

- Annual fee
- License based on an Activation Key to use on the Domain through UBIQUITY Manager
- 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
<ul style="list-style-type: none">▪ 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 UBIQUITY Manager Tools with separate VPNs for each client▪ Local Connection to use Interactive tools and VPN without internet access	✓	✓
<ul style="list-style-type: none">▪ 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 Windows and on ASEM HMI25/30/40

RUNTIMES LICENSES FOR ROUTERS

UBIQUITY Runtime for Router ⁽¹⁾	PRO ROUTER
<ul style="list-style-type: none">▪ Interactive tools: File transfer, Task manager▪ VPN to the device with integrated Firewall and Routing Rules▪ Support for multiple connections from different UBIQUITY Manager Tools with separate VPNs for each client▪ Local Connection to use Interactive tools and VPN without internet access	✓
<ul style="list-style-type: none">▪ 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	✓
<ul style="list-style-type: none">▪ Programming NAT rules between Ethernet interfaces▪ Programming static Routing rules between Ethernet interfaces	✓

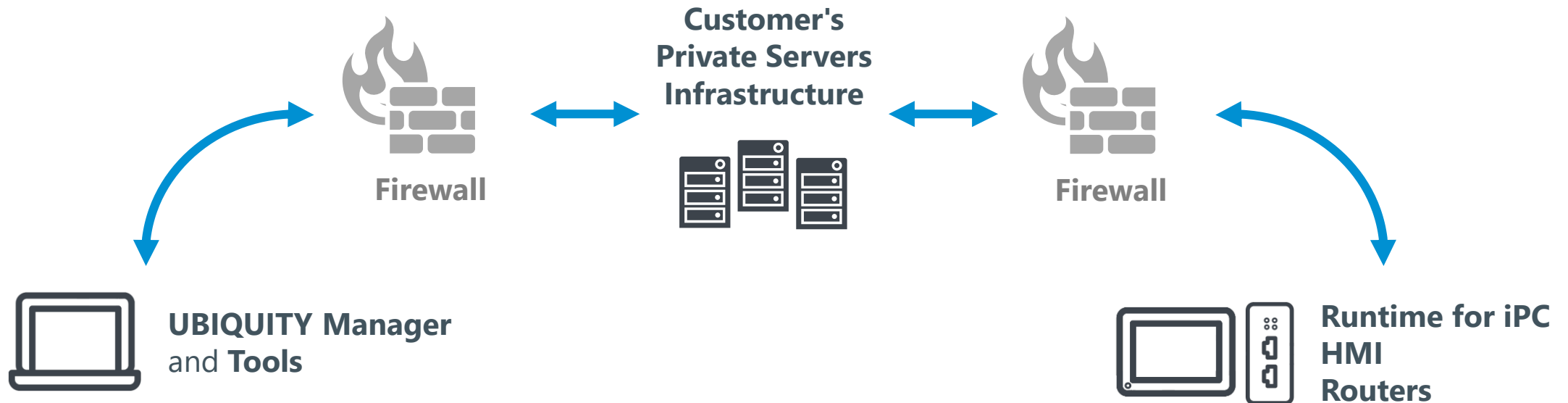
⁽¹⁾ any UBIQUITY Router includes the Ubiquity Pro Router license

PRIVATE SERVER



PRIVATE SERVER: OVERVIEW

- UBIQUITY Manager and UBIQUITY Manager Tools
- Ubiquity Private Server Infrastructure
- Runtime, HMI and 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



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.



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

PUBLIC VS PRIVATE SERVER

CONNECTIVITY SERVICES	PUBLIC	PRIVATE
▪ USER, GROUPS and SUB DOMAINS: User profiling and Permissions control	✓	
▪ AUDIT: Audit of connections and administration activities	✓	
▪ ASSISTANCE REQUEST and CONNECTION AUTHORIZATION: User can request assistance from the remote device and User can authorize the remote connection	✓	
▪ LOCAL CONNECTION: Interactive Access to devices on the local network	✓	
▪ SUB-DEVICES: Define devices in the automation subnetwork with easy access to their services	✓	
▪ INVITE USER TO DEVICE: Invite a user to access to a device with temporary permissions	✓	
▪ APPS: Augmented Reality App and VPN App (Android and iOS)	✓	
▪ BEST ROUTE : Automatic selection of the best route through one of the Relay Servers	✓	✓ ⁽¹⁾
▪ OVER-THE-AIR UPDATES: Runtime/Firmware updates for remote devices	✓	-
▪ MAP/GEOLOCATION: View of remote devices on geographical map based on public IP address	✓	✓ ⁽²⁾
▪ SINGLE SIGN-ON: Single Sign-On interfacing with 3rd party OpenID identity providers	✓ ⁽³⁾	✓
▪ 3rd PARTY INTEGRATION: Integration on 3rd party application through Web API and Tools SDK	✓	
▪ BASIC CONCURRENT ACCESS: any Runtime will be recognized as with the Basic license	✓ ⁽³⁾	✓

⁽¹⁾ require at least one Secondary Server license

⁽²⁾ require to purchase an IP Geolocation service from a 3rd party provider

⁽³⁾ available only with license "Unlimited concurrent remote connections"

UBIQUITY

VS

FT REMOTE ACCESS

Part of FT HUB

Integration with FT Optix

Integration with FT Design Studio

Web Client

Runtime
for Windows10
and Linux Ubuntu22

Trial Period

License based on
Concurrent Connection

Unlimited License

Wired/Wireless Routers

Local Connection

Geolocation

Remote Device Update

Device/Router Setup via USB ⁽²⁾

OpenID Connect provider (AD integration)

Runtime for WCE, Win7

Augmented Reality App (includes VoIP)

VPN App

Private Server ⁽²⁾

Web API ⁽²⁾

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

UBIQUITY
VS
UBIQUITY X

UBIQUITY VS UBIQUITY X

Domain features ⁽¹⁾	UBIQUITY	UBIQUITY X
<ul style="list-style-type: none"> • Best route selection • Geolocation • Remote Connection authorization • Remote Runtime/Firmware updates with scheduling • Users, Groups and permission management • Audit of Connections and Operations • WebAPI and SDK for 3rd party integration 	Y	Y
<ul style="list-style-type: none"> • Sub-devices, • Invite user to a device, • Assistance request, • Single Sign-On with 3rd party OpenID identity providers ⁽²⁾ • Augmented Reality App and VPN App for Android and iOS 	-	Y

⁽¹⁾ Features related to Runtimes and/or Embedded Devices remain available on both Ubiquity and Ubiquity X domains

⁽²⁾ Require license "Unlimited concurrent remote connections"

THANK YOU

