Physically Safe Data Hub Connectivity

The Gateway to Heaven?

Andrew Ginter & Evgeni Elzin

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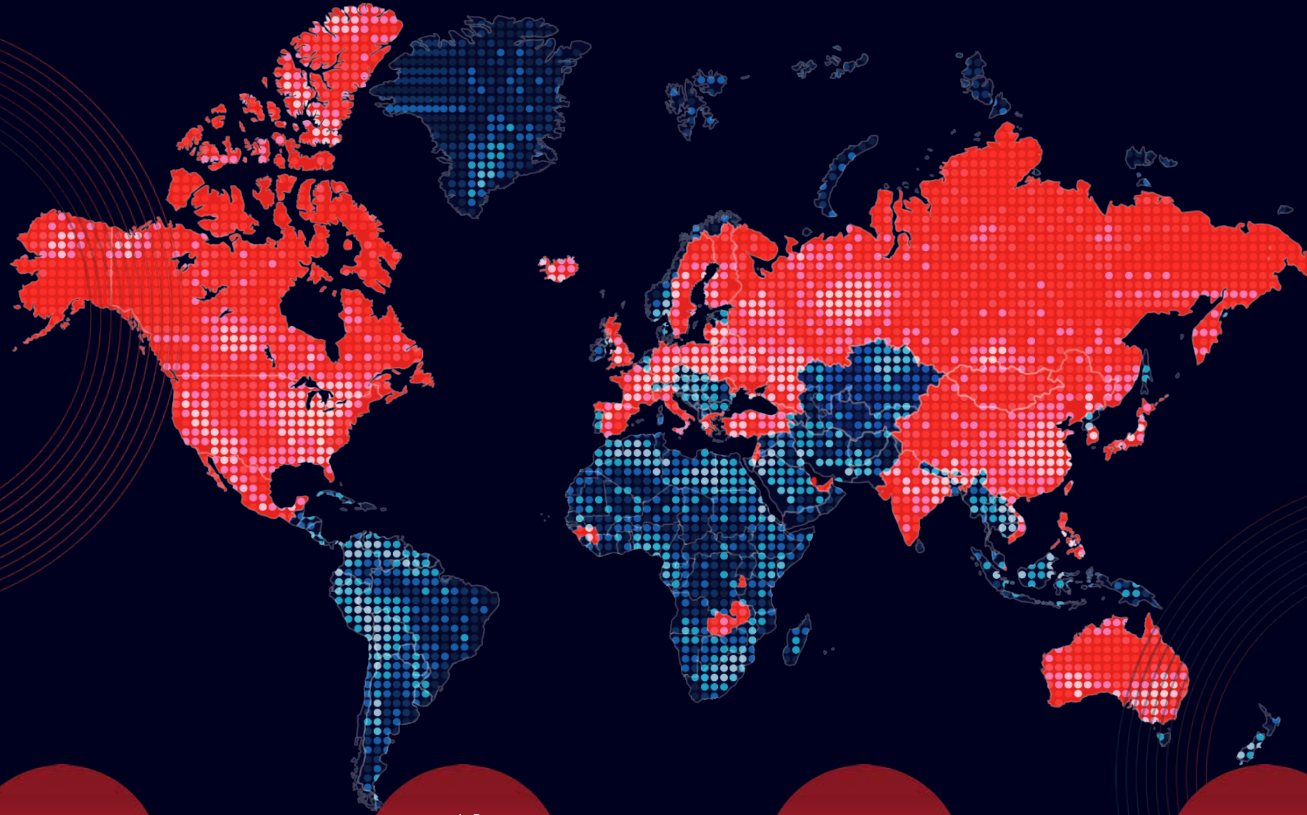# Waterfall – The OT Security Company

Founded in 2007

Sales & Ops in NA, EU, APAC, ME

Global Installed Base

Israel HQ

All types of critical infrastructure

Global tech & sales partners

Multiple registered US patents

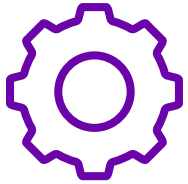FACILITIES

POWER

OIL & GAS

WATER

RAILS

MANUFACTURING

WATERFALL
Stronger Than Firewalls

OCS (AVEVA Data Hub)
Safe For Even The Most Sensitive Sites

WATERFALL®
Stronger Than Firewalls

Challenge

- Reap the benefits of AVEVA Data Hub (OSIsoft Cloud Services (OCS)) without the cyber risks of cloud connectivity, or cyber attacks reaching back into physical operations through firewalls

Solution

- Deploy Waterfall Unidirectional Security Gateways – the hardware is physically one-way – no risk of attacks leaking back into operations

- Deploy the new unidirectional OMF connector enable data flows straight from operations into OCS (AVEVA Data Hub)
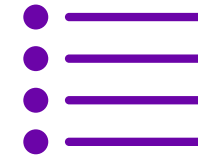
Benefits

- The future is the cloud – reap the benefits of cloud connectivity, without the risks to physical operations of cloud connectivity

- Reliably defeat ransomware and other attacks leaking from IT back into operations as well

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Attacks With Physical Consequences Are Increasing

- 150% increase year over year
- All were targeted, almost all were ransomware
- Connectivity problem – targeted attacks pivot through firewalls from one machine/network to another
- Typical outage affects many plants, for days or longer
- Cloud connections guarantee a pivoting path from the Internet

Ransomware tools & tactics
trail nation-states
by less than a handful of years

Ransomware Incidents With Physical Consequences

Source:ICSStrive.com
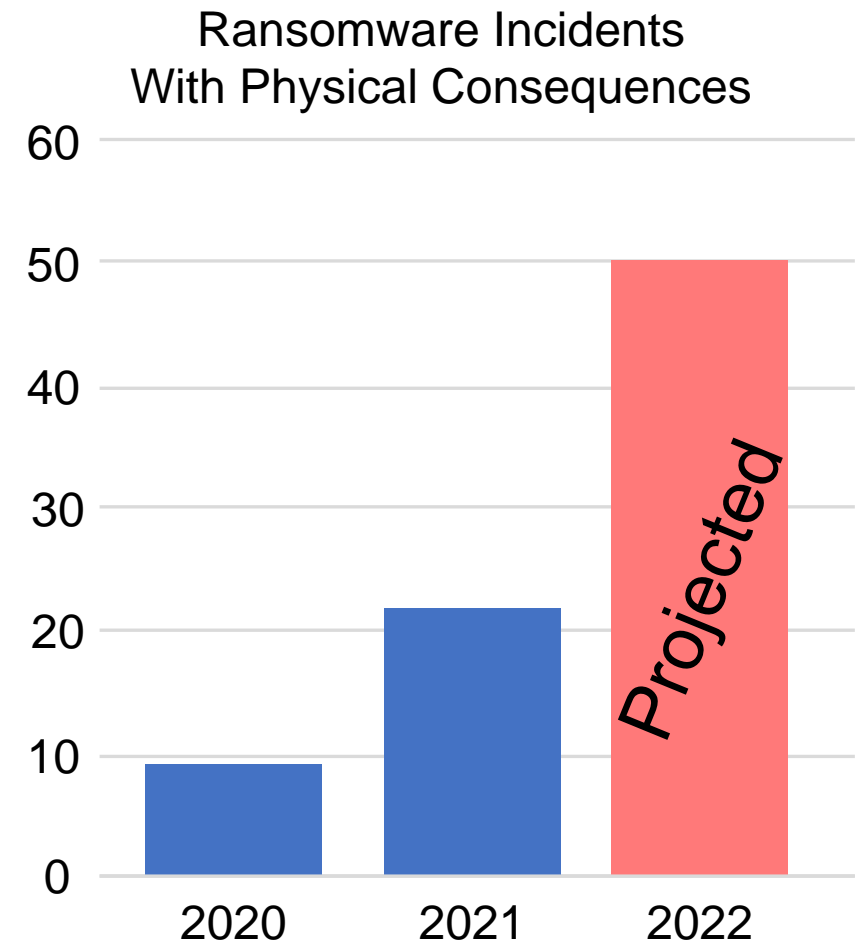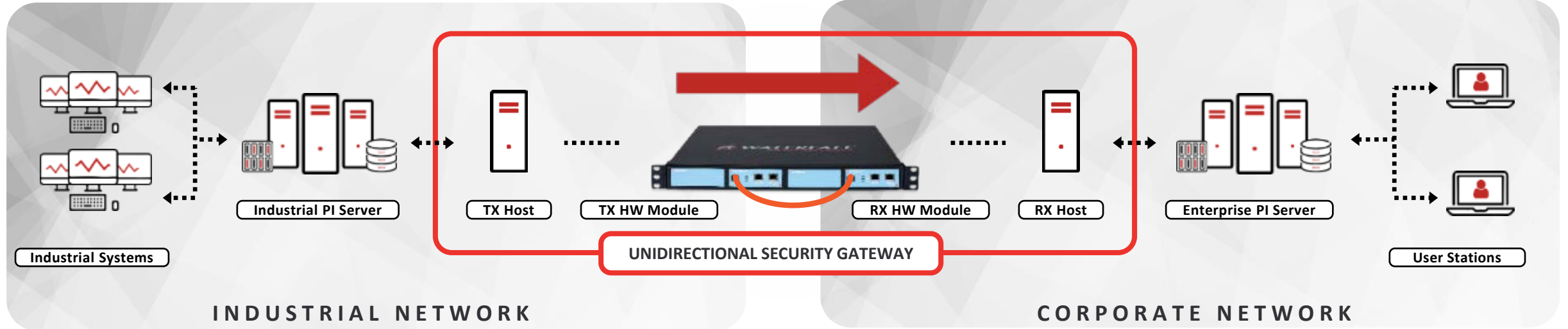
Unidirectional Security Gateways

Unidirectional Security Gateways are a combination of hardware and software
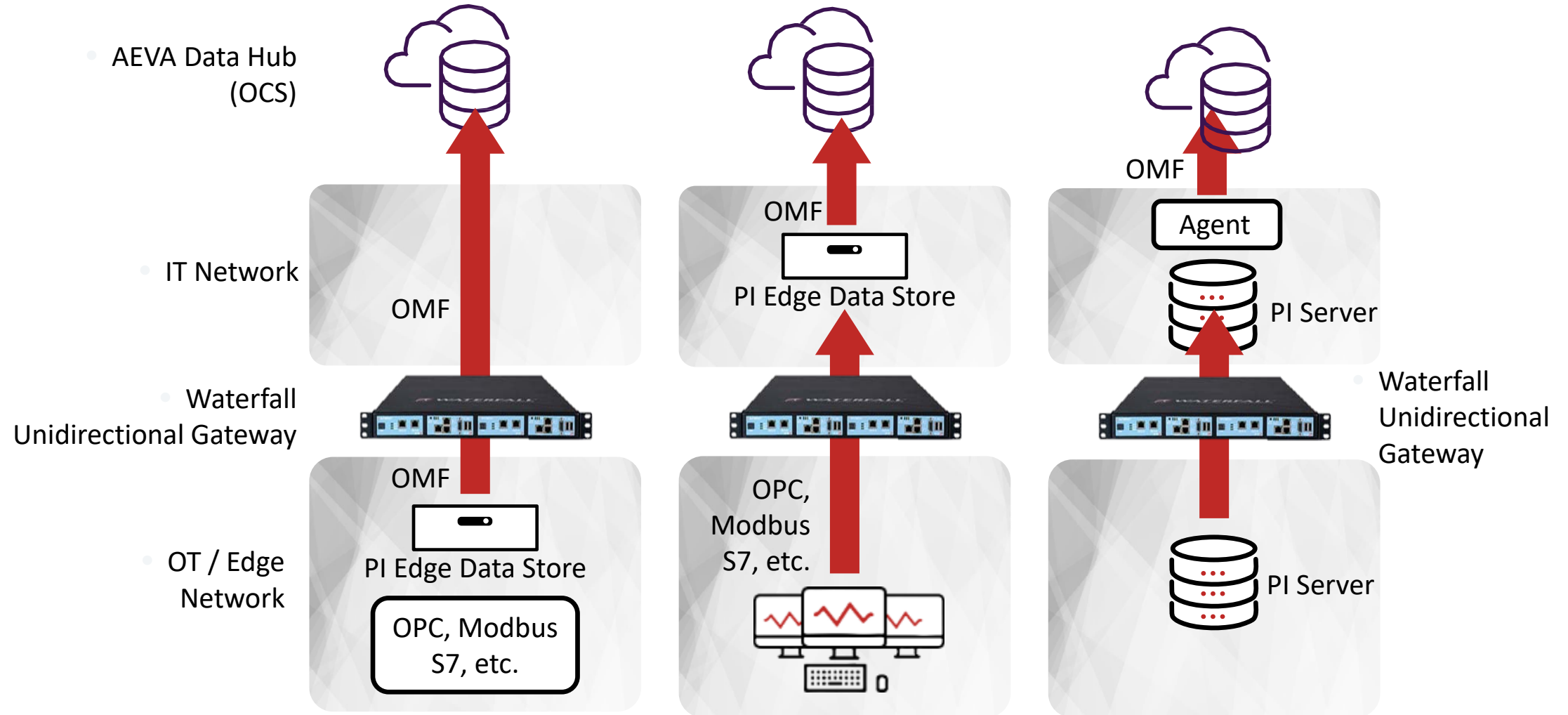
- The hardware sends information in only one direction
- The software makes copies of servers & devices from the industrial network to the enterprise network
- No attack, no matter how sophisticated, can propagate back into the industrial network through the gateway

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Standards and Best Practices Agree

- ANSSI – Safety-critical *must* use unidirectional gateways connecting to less-critical networks, reliability-critical *should* use them

- CENELEC – TS50701 – Unidirectional gateways are only connection permitted between networks at very different criticality levels

- IEC 62443 – Unidirectional gateways are recommended for connections to even the most consequential network zones

- UK DoT – Unidirectional gateways are strongly recommended for any connection to signaling systems

- Israel – Unidirectional gateways are required for critical infrastructures

Safe Cloud Connectivity – Options

AEVA Data Hub (OCS)

IT Network

Waterfall Unidirectional Gateway

OT / Edge Network

OMF

OMF

PI Edge Data Store

OPC, Modbus S7, etc.

OMF

PI Edge Data Store

OPC, Modbus S7, etc.

OMF

Agent

PI Server

Waterfall Unidirectional Gateway

PI Server

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Demo

INDUSTRIAL NETWORK — Industrial PI Server — UNIDIRECTIONAL SECURITY GATEWAY — CORPORATE NETWORK — Enterprise PI Server — INTERNET — AVEVA Data Hub (OCS)

Waterfall® RX Configuration | Waterfall Console | OSIsoft Cloud Services

Not secure | https://127.0.0.1:9000/console

Update

WATERFALL
Stronger Than Firewalls

License Agreement   Support   Logout

Channels | Servers | Services | License | Help

Id	Name	Type	Agent	Transfer Progress	Transfer Completed	Active Transfer	Transfer Total Size	Alerts	Restart
1	Heartbeat 1	Heartbeat	wfstrmrx	80%	32 sec		40 sec	0	↻
2	PI AF 1	PI AF	wfstrmrx	0%	0 bytes		0 bytes	38543	↻
3	PI Point 1	PI Point	wfstrmrx	0%	0 points		42 points	0	↻

Waterfall® TX Configuration | Waterfall Console | PI Vision - Tray Detail

Not secure | https://127.0.0.1:9000/console

Update

Apps   PI Vision   Reading list

WATERFALL
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Channels | Servers | Services | License | Help

Id	Name	Type	Agent	Transfer Progress	Transfer Completed	Active Transfer	Transfer Total Size	Alerts	Restart
1	Heartbeat 1	Heartbeat	wfstrmtx	66%	20 sec		30 sec	0	↻
2	PI AF 1	PI AF	wfstrmtx	0%	0 bytes		0 bytes	2	↻
3	PI Point 1	PI Point	wfstrmtx	0%	0 points		42 points	0	↻

Channel details

PI Point 1
PI Point

Link
Bytes :	150936855
Packets :	1014820
Queue Status :	0
Alerts :	0

Errors
Network Errors :	0

PI Point Details
PI Server :	127.0.0.1

Messages | Alerts

Date & Time	Message Code	Message

Hardware-Enforced Safety for AVEVA Data Hub (OCS) Connectivity

Edge → Plant → Cloud

Remote assets → Edge Data Store (EDS) → PI Server → Asset operators, Site engineers

Unidirectional Security Gateway — OSIsoft Cloud Services → Tools and application, Operations analysts, Data scientist, Industrial service providers
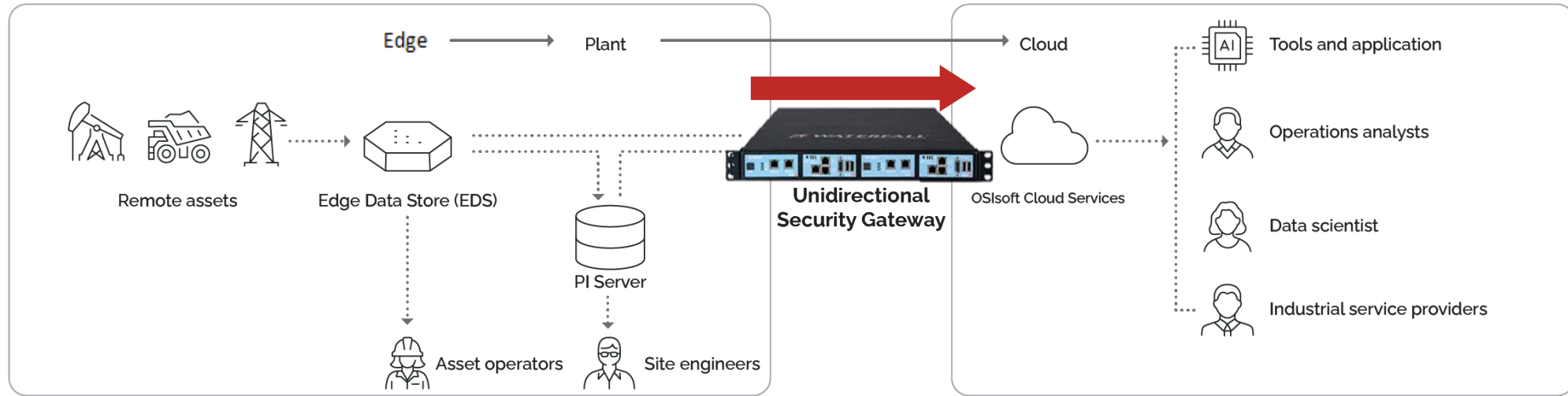
ICS / OT perimeter security:
100% protection from internet-based attacks

SAFE access to your data... Anytime, anywhere

Waterfall Unidirectional Security Gateways:

| Keeps your OT network safe and secure | Prevents remote attacks from the Internet and the cloud | Seamless AVEVA Data Hub (OCS) integration | Enables big data and cross-site applications | Real-time | Risk compliance for operations | Value chain optimization |

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Learn more at www.aveva.com

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