



Quad Plus®



Operation to Enterprise (O2E)

Integrate from the shop floor to the enterprise via secure operational technology. Smart centralization to rollup data for analysis and manage common data without compromising production facility autonomous capability.

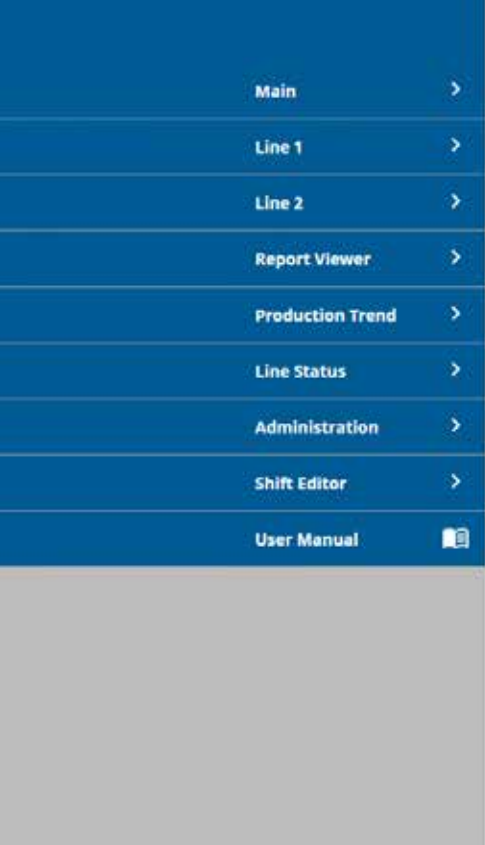
Cybersecurity, Operational Technology Infrastructure, Power of Virtual Architecture, OT Network

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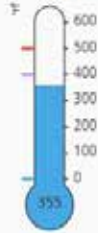


Production Line 1

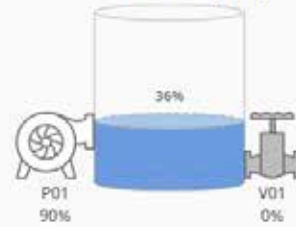
Line Tension



Line Temperature



Coolant Supply



Line Speed: **90**

Production Footage: **2205**



Line Run	P01 Run	V01 Open
Line Stop	P01 Stop	V01 Close

Operation to Enterprise (O2E)

Streamline your business with Enterprise Resource Planning integration to the production floor and back. Centralized management of data, such as products, recipes and scheduling, with real-time synchronization to the manufacturing facilities SCADA. Live tracking of production with automated reporting of production, scrap and consumption, centralized reporting with data rollup.

What is OT?

Though IT and OT have much in common, they are fundamentally different.

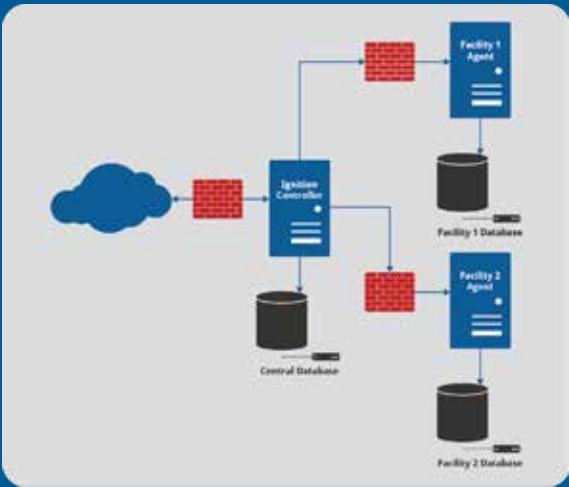
- Information Technology (IT) is the use of computers to create, process, store, retrieve and exchange electronic data and information, which prioritizes confidentiality.
- Operational Technology (OT) is hardware and software to detect or cause change, via the direct monitoring and/or control of industrial equipment, assets, processes and events with a focus on safety.

Cybersecurity

Cyber-attack frequency has been increasing at an exponential rate. Prior to Industry 4.0, OT was seldom a target, but times have changed. Ransomware no longer targets only to compromise IT systems, but to stop production. OT has become a very appealing target. OT enjoyed a long period of physical isolation, which required little or no security, which has left it vulnerable. OT Cybersecurity, like IT, is composed of layers to reduce the likelihood of a break and breach and minimize the severity. The last line of defense is backup and recovery.

No.	Time	Source	Destination	Protocol	Length	Info
13	0.030675	192.168.1.105	192.22.168.19	CIP I/O	82	Connection: ID=0x00AA0BA3, SEQ=0004704371
14	0.030679	192.168.1.105	192.22.168.19	CIP I/O	82	Connection: ID=0x00470621, SEQ=0002001872
15	0.030681	192.168.1.105	192.22.168.19	CIP I/O	82	Connection: ID=0x009310A2, SEQ=0004704373
16	0.032064	192.168.1.105	192.22.168.19	CIP I/O	66	Connection: ID=0xE4971C29, SEQ=0055849902
17	0.032720	192.168.1.105	192.22.168.19	CIP I/O	70	Connection: ID=0x00931225, SEQ=0001542411

< Frame 17: 70 bytes on wire (560 bits), 70 bytes captured (560 bits) on interface \Device\NPF_{FDBE9CAB-4C08-4084-9AC2-B0509ACC34A9}, id 0
 > Ethernet II, Src: Rockwell_22:c5:a1 (00:00:cd:55:b3:4f), Dst: IPv4cast_10:61:b3 (01:00:23:4d:40:61)
 > Internet Protocol Version 4, Src: 192.168.1.105, Dst: 192.22.168.19
 > User Datagram Protocol, Src Port: 3389, Dst Port: 3389
 > EtherNet/IP (Industrial Protocol)
 > Common Industrial Protocol, I/O

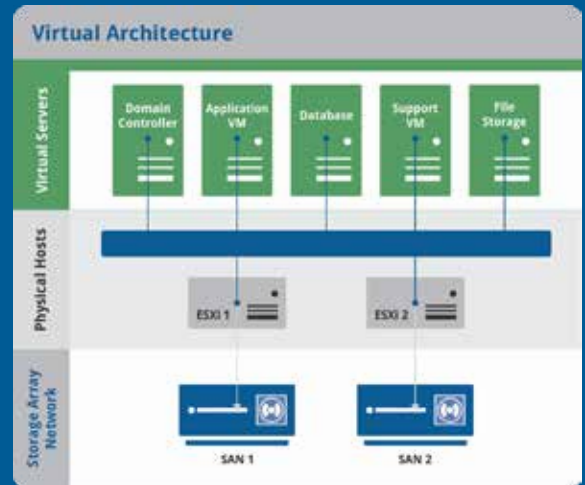


OT Infrastructure

OT Infrastructure has many characteristics of an IT infrastructure and should embrace the same approach to cybersecurity. The largest difference is the impact of system failure, being OT failures result in downtime and can affect the safe operation of equipment. Virtual Architecture and proper OT networking provide increased reliability and security.

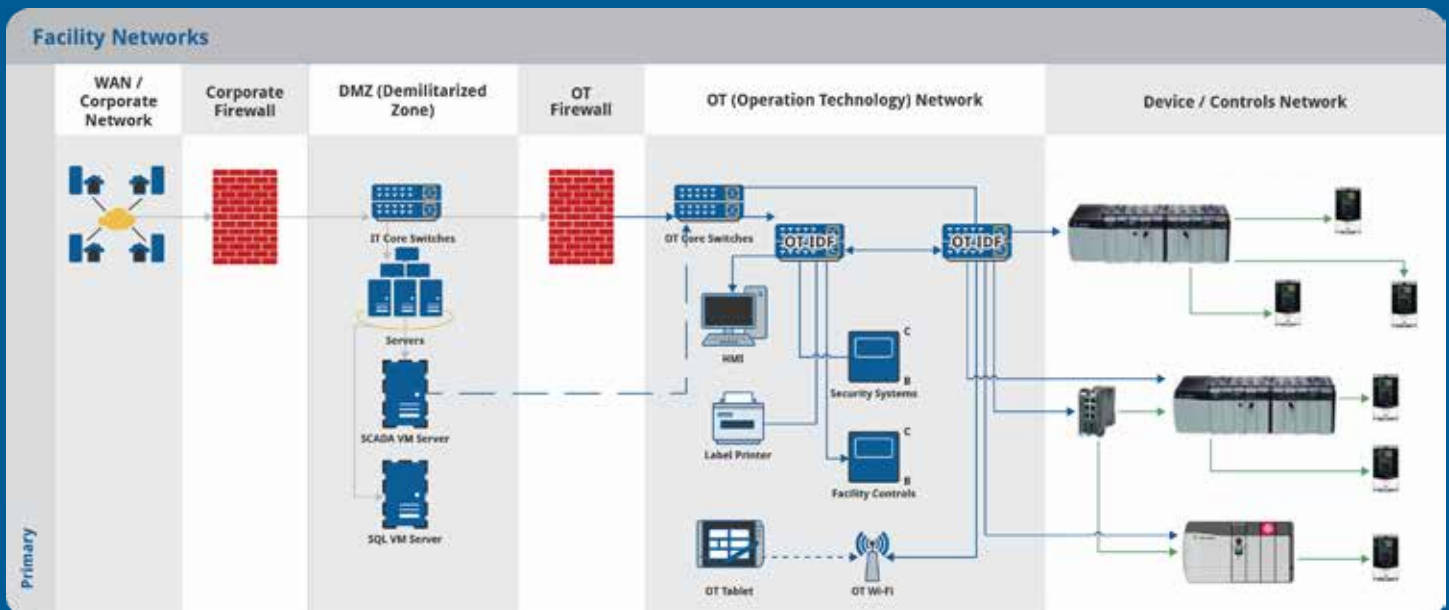
Power of Virtual Architecture

The initial startup cost of a virtual environment can be a deterrent, until the full benefits are understood. Proper virtual environments are highly resilient with multiple redundancies to maximize up time. Scalability enables the system to grow with far less cost and complexity, when compared to physical servers. Backup and recovery of virtual servers not only enhances cybersecurity, but maximizes uptime due to the speed and simplicity. Physical servers are expensive and bulky, which leads to the installation of multiple systems on a single server resulting in reduced security for all systems and a much larger impact. The ability to create as many virtual servers as needed enables a server per system with security locked down, exposing only what each system requires.



OT Network

When Industry 4.0 forced the integration of controls and IT systems, people simply did what had always done and connected controls systems directly to the IT network. As controls systems became dependent on the network, outages began resulting in downtime, scrap and losing control of the equipment. Sharing a common network results in congestion and increased exposure. The approach is the same as cybersecurity, being layers and segmentation.





Quad Plus®

What We Do:

- ✓ Systems Integration (ERP's, CMMS, Recipe)
- ✓ Replace existing systems (integrate functionality into Enterprise Level SCADA)
 - Smart Centralization
- ✓ Install/Replace Secure OT Network (Interfacing large machines and 2-way Data Management)
- ✓ Install/Replace hardware with Virtual Architecture
- ✓ Data Collection, Reporting and trending.
- ✓ HMI
- ✓ Cybersecurity and network consulting.
- ✓ Database tuning
- ✓ Implement Backup and Recovery

O2E Managed Services:

- ✓ Cybersecurity
 - ✓ Backup and Disaster Recovery
 - ✓ Firewall and End Point
 - ✓ Resource Monitoring
 - ✓ Asset Management
- See our O2E MSP Brochure for details.



Existing/New Projects which can be enhanced:

- ✓ SCADA/HMI Projects
- ✓ Multiple plant projects
- ✓ Large Scale Controls Projects

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