• AMMP

Svet Bajlekov AMMP Technologies GrafanaCon LA, Feb 2019 An open technology stack for smart energy and industrial IoT with Grafana

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Traditional SCADA models have been built for an off-line era

- When these systems were built, everything was essentially airgapped – by necessity
- Security, extensibility, and repeatability have not been leading design considerations
- IoT exploits are proliferating; industrial IoT is clearly an increasingly ripe target





2017 Industrial Internet of Things Security Survey



The Industrial Internet of Things ultimately delivers value to organizations, and that's why we're seeing an increase in deployments. Security can't be an industry of 'no' in the face of innovation, and businesses can't be effective without addressing risks.

While IIoT may bring new challenges and risks, the fundamentals of security still apply. Organizations don't need to find new security controls, rather they need to figure out how to apply security best practices in new environments.

-**Tim Erlin** Director, Security and IT Risk Strategist, Tripwire

tripwire.com | The State of Security: Stories, trends, insights at tripwire.com/blog

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Let's explore what a secure, open, and extensible IIoT stack might look like





Time for SCADA to embrace the Internet in all its glory?

- Industrial systems increasingly online (whether intentionally or not)
- More threat/attack vectors. Fewer and fewer systems can be considered truly isolated from the Internet, and from external access
- At the same time, across the board devices have higher processing power, and greater available comms bandwidth
- Instead of fighting off the Internet, maybe industry could embrace it and its best practices?

Reference architecture for open industrial IoT





Reference architecture for open industrial IoT





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REQUIRED INTEROPERABILITY FOUNDATION

REPLACEABLE REFERENCE SERVICES

Platform Architecture

"NORTHBOUND" INFRASTRUCTURE AND APPLICATIONS

LOOSELY-CO	UPLED MICROSERVICES FRAMEWORK CHOICE OF CONTAINER DEPLOYMENT REMOTE/L	OCAL GUI
REVERSE PROXY	APPLICATION/EXPORT SERVICES CLIENT REGISTRATION DISTRIBUTION ADDITIONAL SERVICES	ADDITIC SERVI
Y ITY SERVICES	SUPPORTING SERVICES ALERTS & LOGGING RULES ENGINE SCHEDULING ALERTS & NOTIFICATIONS LOGGING	ONAL MAN CES
SECURIT	ALL MICROSERVICES INTERCOMMUNICATE VIA APIS CORE DATA COMMAND METADATA REGISTRY & CONFIG	AGEMENT MGMT SERVICE A
SECRET STORE	DEVICE SERVICES (ANY COMBINATION OF STANDARD OR PROPRIETARY PROTOCOLS VIA SDK) REST OPC-UA MODBUS BACNET ULE BLE MQTT ENOCEAN VIRTUAL ADD'L DEVICE SERVICES	GENT

"SOUTHBOUND" DEVICES, SENSORS AND ACTUATORS

Why this is a good thing

- Security of communications protocols have been proven over decade; designed with a "this is out in the open" mindset
- Mature open-source projects have a high level of auditing for security vulnerabilities
- Extremely easy and cost-effective to set up and configure
- Interfaces are well-documented and designed with flexibility and robustness in mind
- Grafana's customizability and extensibility are perfect examples of this



Where to from here?

- Industry has been slow to adopt some of these:
 - Open source (or really, anything that's not Windows-based or PLC-related)
 - Cloud (i.e. IT infrastructure that's not on-promises)
 - Serverless

...but it's catching up. The drivers of these shifts are fundamental – and financial benefits certainly play a role

- On the tech stack side some gaps still exist around configuration and control
 - How do we standardize on the logic/bes practices in a way that meets a broad range of use cases (e.g. logic in cloud vs local)
 - Grafana UI plugins for native two-way control, rather than just data visualization

AMMP integrates with all major vendors and relevant technologies, allowing an exceptional level of unification of data and streamlining of operations





Mini-grids are the building blocks of tomorrow's clean decentralized energy infrastructure

AMMP makes these new energy systems truly smart

Join us on our mission to power up tomorrow



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