Bohemia Automation

EVA ICS v4

an extended automation platform designed to revolutionize DCS/SCADA/MES deployment

High Energy
Smart City
Machinery
Defense
Smart Farming
Renewables

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EVA ICS v4 overview

Security:
EDGE deployment enables the creation of a fully isolated cloud on your hardware to host all components for mission-critical systems, allowing you to decide which data to share with third parties. All communications are additionally encrypted with industrial-grade algorithms (FIPS-140 complaint)

Zero vendor lock-in:
Support for multiple fieldbus types facilitates experimentation with new equipment in existing installations, offering you the freedom to select the optimal solution for your requirements.

Real-time control and monitoring:
Each node is equipped to handle millions of objects and events without the hassle of traditional SCADA applications providing real-time equipment control, monitoring, and data collection.

Unlimited Scaling:
Cloud formation can be easily extended with additional nodes, installed on the same or different plants, at any time. For heavy-loaded nodes, can be split into points - clusters of local machines processing different tasks such as fieldbus control, HMI applications, database gateways, and more.

Reliability:
The industrial control system is divided into robust processes, ensuring the stability and robustness of each node and node point streamlining the operator`s routine.
Communication between processes is made super-fast and stable with the use of BUS/RT, a high-speed in-house IPC bus that outpaces all competitors.

Flexible management tools:
Flexible tools created to simplify industrial control system management and automate typical tasks using the powerful EVA-shell console application, managing all resources across all nodes with ease to use the EVA ICS Cloud Manager UI, all from a single desktop dashboard.

Rapid deployment:
Infrastructure-as-Code paradigm provides a streamlined and cost-effective solution.
All configurations can be easily copied, exported, and deployed to new plants reducing integration costs.

Modern HMIs:
HMI web service and EVA JS Framework ensure that all required data is automatically pushed into the web browser, allowing to easily design and apply custom HTML templates and bind controls for a unique and visually appealing interface.
IDC Interactive Dashboard Constructor enabling the rapid creation of intricate HMI applications

Efficient Solution Development
The presence of comprehensive and structured documentation significantly enhances the effectiveness and ease of platform and solution development. This thorough documentation streamlines the development process by providing detailed guidelines, references, and resources. Available SDK: Rust, Python, JS/TS, C++

Complete documentation

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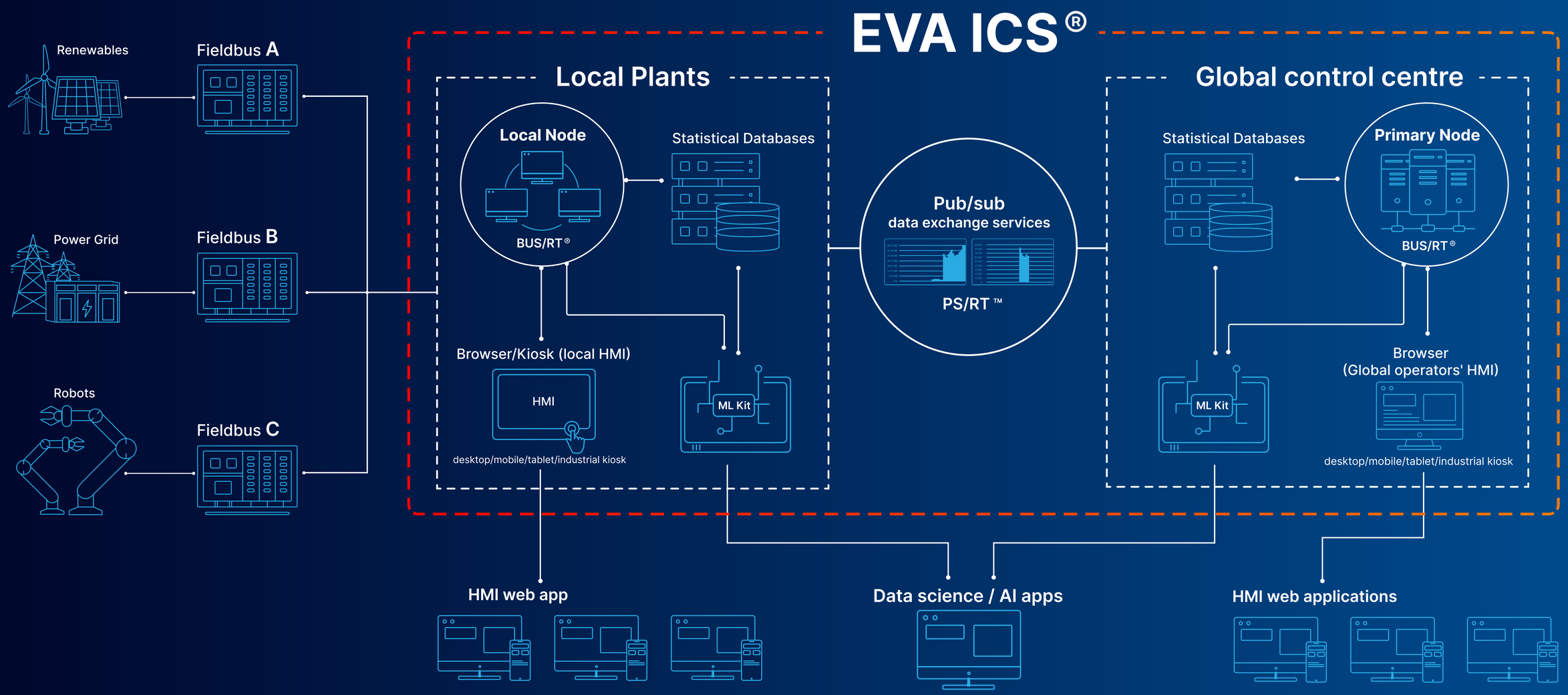
EVA ICS v4 an Extended Automation Platform



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EVA ICS v4 in-house Core Components

EVA ICS Cloud Manager UI:

The ultimate solution for remote management. This desktop dashboard application provides a user-friendly interface to effortlessly monitor and manage EVA ICS v4 nodes along with all connected nodes. Its interactive cloud dashboard allows you to stay updated on all resources, ensuring confident execution of management operations.

PSRT:

pub/sub protocol certified by IANA as one of the standard protocols. With the ability to handle 100K+ messages on a single node with low latencies, PSRT uses B-tree algorithms to process hundreds of thousands of subscriptions without speed loss. Its data throughput works seamlessly on any type of channel, including low-speed satellites, making it ideal for IIoT setups in remote areas

BUS/RT:

super-fast IPC bus that outperforms all competitors. With a single EVA ICS machine capable of aggregating an unlimited number of objects and processing up to 1,500,000 events per second from local fieldbus, applications, and connected neighbor nodes,
BUS/RT is the perfect solution for high-performance data processing needs.

BUS/RT benchmark

Number of objects	unlimited*	~3.5GB RAM per million of objects
Deployment speed	25.000	objects a second
BUS/RT events with HMI enabled, non-repetitive	~ 600 000**	a second
BUS/RT events with HMI disabled, non-repetitive	~ 1 000 000**	a second
BUS/RT events, repetitive	~ 1 500 000**	a second

Consider a single EVA ICS machine can aggregate a nearly unlimited number of objects and process up to 1 500 000 events a second from the local fieldbus, applications and connected neighbour nodes.

Footnote
* - as EVA ICS core uses b-tree algorithms to manage inventory, number of objects does not affect the system speed
** - events from field bus services or BUS/RT applications

The system, used for the benchmark:
- CPU: AMD 5950X (4 cores consumed by EVA ICS core process)
- Inventory database: external (SQLite)
- Instant save: off
- BUS/RT core process queue size: 256000

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EVA ICS v4 Enterprise

Zero-failure replication:

Zero-failure event replication layer addresses the challenge of uncertain data processing in Pub/Sub-based event exchange between two applications, such as two cloud-SCADA nodes. With this layer, EVA ICS ensures that all telemetry events are exchanged with 100% accuracy between all participants, offering a reliable solution to this critical challenge.

Kiosk Manager Kit:

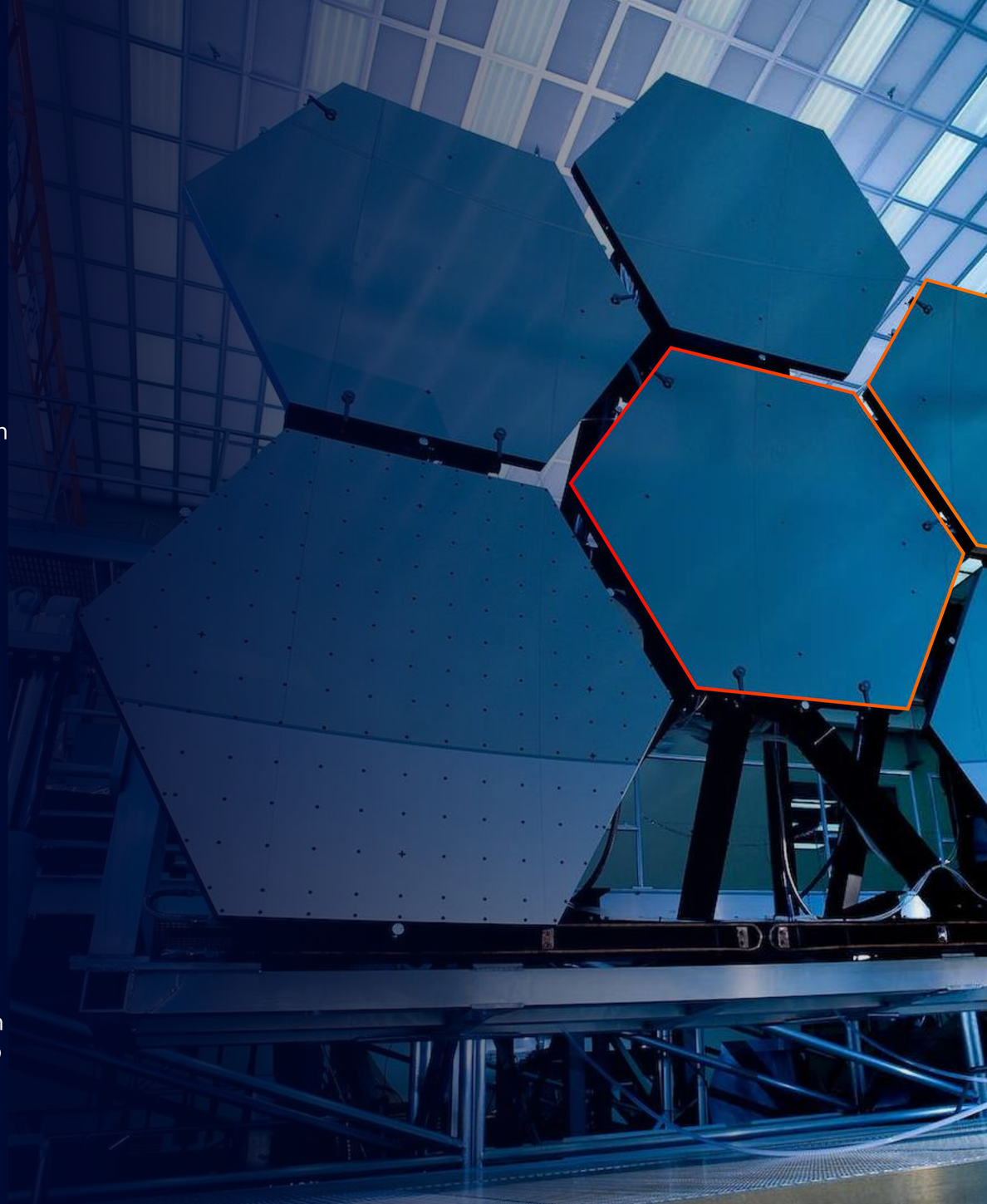
EVA ICS enables touch panel kiosk interfaces to become a new SCADA standard used by end customers, field engineers, and plant operators. Its flexible and secure orchestration can manage hundreds of touch panels, providing additional security opportunities. Touch panels don't need real login credentials as the interface application is automatically authenticated upon connection to the manager service, using a one-time password and specified access control lists.

Machine Learning Kit:

Comprises a collection of data science tools that provide an easy way to retrieve and format necessary data frames from EVA ICS databases. It comes equipped with pre-configured TensorFlow models that are ideal for typical industrial IoT research tasks such as predictive maintenance, accident prevention, and auto-regressive planning.
The kit is also fully compatible with popular data analytics environments like Jupyter Lab, Matlab, and other Python-based tools

EVA JS Framework WASM extensions:

Address the speed limitations of web browsers when handling large amounts of objects and events in Web-HMI applications. With this extension, the object and event processing logic can be offloaded to local, secure browser-built-in web-assembly containers, resulting in an average application speed increase of 20-30 times.



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Key facts for engineers:

EVA ICS v4

is a set of modern in-house IIoT technologies and protocols, developed for heavy industry applications.

is the only cloud-SCADA, fully written in Rust - one of the world-fastest and reliable modern system programming languages.

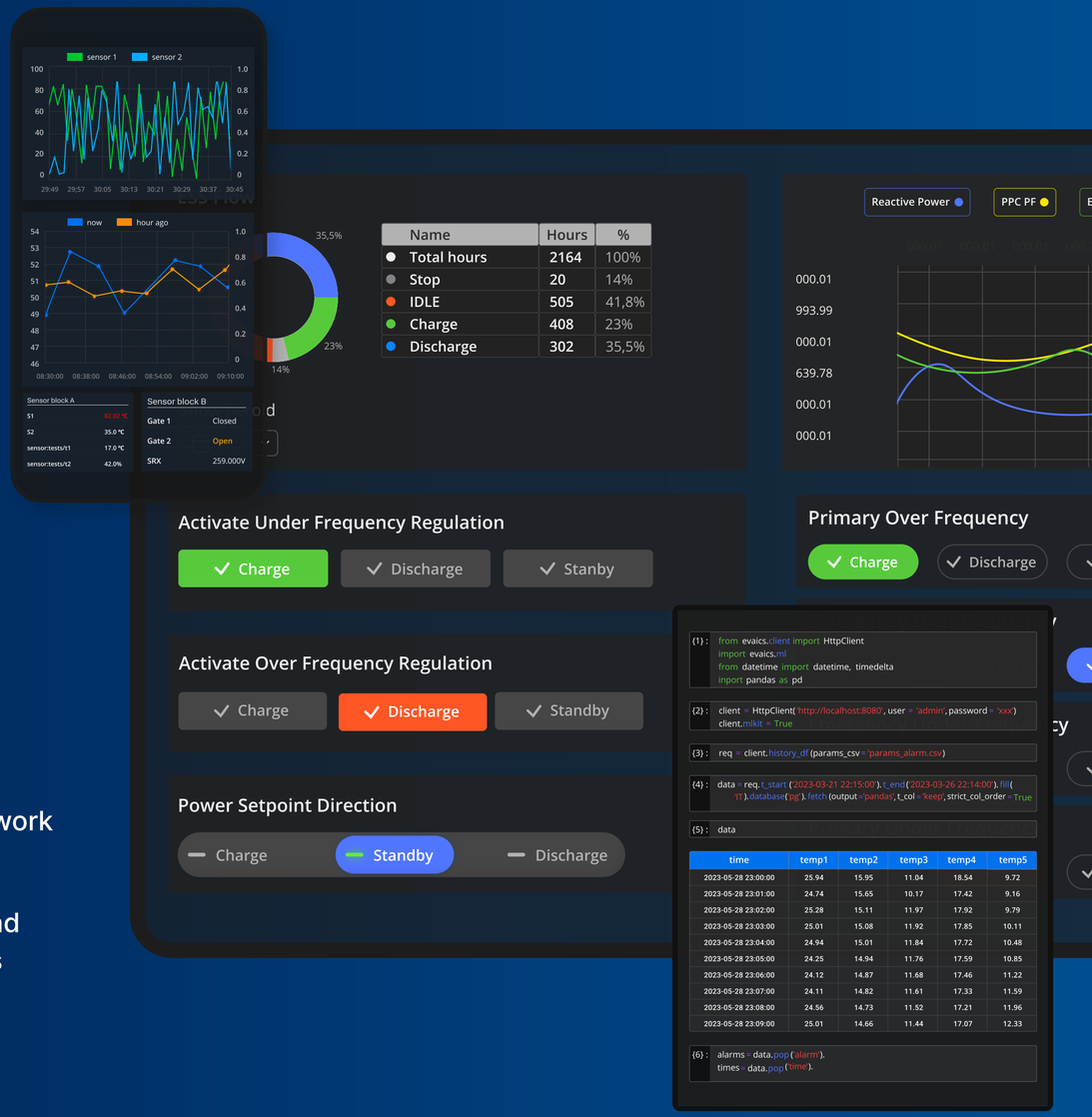
is the only cloud-SCADA, which completely supports Infrastructure-as-Code (IAC) DevOps technology.

has been extensively used and tested for years in various Industrial IoT sectors, demonstrating its exceptional quality in production.

builds are created with two dedicated build-servers, which nearly eliminates any bit-flipping in binaries

Fieldbuses out-of-the-box: Modbus, 1-Wire, Ethernet/IP, TwinCAT/ADS PSRT is the in-house wide-area network pub/sub protocol, developed especially for industrial applications and fully optimized for EVA ICS.

BUS/RT is the in-house IPC bus, developed especially for modern low-latency heavy-loaded applications and combines the best sides of IPC approach, starting from Erlang/OTP and ending with modern IPC techniques



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Since 2012, Bohemia Automation (formerly the automation department of Altertech group) has been a pioneering company in the development of new IIoT technologies and cloud-SCADA products.