



B DATA



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# BLOCKCHAIN IOT NETWORK

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# EXECUTIVE SUMMARY

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As IoT devices have become more prolific, so have cyber-attacks that exploit their vulnerabilities. In the last two decades, these attacks have increased both in frequency and magnitude. It is therefore crucial that suitable defensive practices be identified and implemented.

Blockchain technology is the ideal alternative, since it eliminates the usual points of failure of traditional password and user ID driven VPN networks. Blockchain technology provides a decentralized, immutable mechanism for digital identities and sharing encrypted data. It can be integrated with present-day IoT applications to create a safer, more secure BIoT (Blockchain Internet of Things) alternative.

BDATA's BIoT technology provides fast and low latency data streaming from Supermicro-built gateways to BDATA's blockchain enabled secure digital twin platform, where data is secured in the form of hashes and only readable by the peers deployed on the network.

BDATA provides BIoT technology SDK which can be deployed in Supermicro Servers for blockchain enabled secure cloud deployments.



# INTRODUCTION

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Industrial control systems and cloud networks across various sectors have been attacked by hackers several times in the past decades. Historically, cyberattacks were mostly hidden from the public. However, these threats still remain very real.

As enterprises switch to remote-controlled systems, especially in this COVID-19 stricken world, the threat becomes even deadlier.

To combat this, we need disruptive technologies such as blockchain to protect the future of the IoT-based infrastructure.

## CYBER ATTACK ON CRITICAL INFRASTRUCTURES

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A power grid was temporarily disabled two times in the past five years in Ukraine. In 2010, the famous Stuxnet malware damaged one-fifth of the nuclear centrifuges in Iran. In 2009, Chinese hackers conducted a coordinated attack targeting several energy, oil, and petrochemical companies in the U.S.

Researchers from the Finnish IT security company F-Secure made a scary discovery in 2019. According to a report titled ‘Attack Landscape H1 2019,’ it was revealed that the number of attacks increased by three times in just the first half of the year, causing \$600 billion in damages. Highly popular exploits that devastated networks all over the world, such as WannaCry and EternalBlue, still wreak havoc on a multitude of unpatched servers.

With the advent of 5G technology, such instances are only expected to increase. The need for defensive strategies and devices that can counteract these threats is critical.

# BLOCKCHAIN INTERNET OF THINGS

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Industrial control systems and cloud networks across various sectors have been attacked by hackers several times in the past decades. Historically, cyberattacks were mostly hidden from the public. However, these threats still remain very real.

As enterprises switch to remote-controlled systems, especially in this COVID-19 stricken world, the threat becomes even deadlier.

To combat this, we need disruptive technologies such as blockchain to protect the future of IoT-based infrastructure.

Typical IoT network is secured using password driven VPN technology, which is highly vulnerable - hackers can easily scaleup the attack to millions of devices , shutdown entire network, convert data to binary and ask for ransom.

However, in the case of BDATA, a blockchain IOT solution provider based in Canada, every IoT gateway comes with its blockchain driven, cryptographically encoded solution, deployed in the core of the device to ensure that every time device restart it gets auto authenticated by the IoT devices on the network.

BloT users have the odds to turn their data immutable, scalable, and cryptographically secured. Their end-to-end blockchain devices for IoT infrastructure come with SIM support, ensuring secure remote monitoring for enterprise-level use cases. An extensive list of features enables users to utilize the products as IoT devices in private blockchain networks.

By the end of 2026, the global IoT market is expected to reach \$1.1 trillion. The sector will be further boosted with the help of 5G technology, which is predicted to fully cover North America by 2025. Together, they have created a surge of interest in deploying remotely operated IoT systems in diverse sectors such as mining operations, surgeries, pumping systems, autonomous vehicles, etc.

BDATA's gateway products deliver high-quality network solutions for protecting critical infrastructure by leveraging the blockchain technology. Embedded with eSIM and SIM, they provide high speed, low latency, scalable and cryptographically secured networks that protect IoT data communications.



The following are the unique features of BDATA's BloT technology:

- Programming Codes (to connect sensors with PLC/Gateway) stored in binaries forms on the BloT blockchain network.
- Database/Realtime Data is stored in BloT Blockchain Network
- Immutable Real Time Data Streaming
- Immutable Remote Device Management (Bluetooth, HDMI, USB etc.)
- Machine to Machine Cryptographic Bond
- Data Stream from Blockchain Gateway/PLC only readable by the peers deployed on BDATA's Blockchain Peer Network.
- BDATA BloT API can be consumed in any 3rd Party Platform (SAP, Oracle , AWS, Azure etc.)

# VALUE PROPOSITION

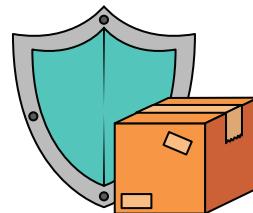
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20-40%  
OPMEX REDUCE



IMMUTABLE  
DATA

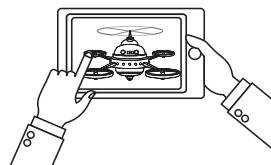


BLOCKCHAIN SECURITY

- BDATA proprietary predictive equipment failure and alerts algorithm helped customers to significantly reduce (20%-40%) operation and maintenance cost.
- BDATA proprietary patent\* blockchain ensures that data remains unaltered and indelible, this allow customer to trust the data and use it for remote operation, example data stream from the sensors/iot gateway/plc/scada to cloud can be trusted for remote and global automation.



USB/BLUETOOTH/PORTS  
REMOTE DEVICE MANAGEMENT



REMOTE OPERATION



5G ENABLE

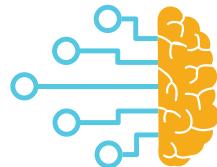
- BDATA has deployed its platform and hardware on 5G network for remote operation, where we remotely control the valve position on a remote site at <10msec data latency using 5G and blockchain.
- BDATA's Digital Twin can allow customers to get the health of remotely deployed gateway devices and control multiple ports to perform security actions, such as enable or disable USB/Bluetooth/Kill an application/ get the status and device info.

\*patent pending

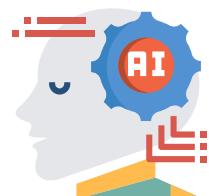
# VALUE PROPOSITION



DIGITAL TWIN

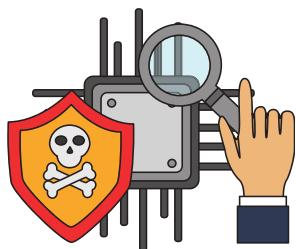


MACHINE LEARNING  
EDGE COMPUTING



ARTIFICIAL INTELLIGENCE  
VISION DETECTION

- BDATA edge device comes with machine learning driven application for predictive failure alerts and analytics.
- CCTV cameras deployed on site can be connected with Digital Twin for Artificial Intelligence driven fire detection, leak detection, human detection and safety helmet detection on site.



DEVICE SECURITY ANALYTICS



DATA/CODE STORED IN  
BINARIES



DATA STREAM  
IN BINARIES

- BDATA Digital Twin provide blockchain enable cyber security analytics with predictive alerts to identify the attacks on the network.
- All the data stored and stream in the form of binaries, that includes the reading from the sensors and even the codes running on the edge device.

# BLOCKCHAIN ENABLED SECURE DIGITAL TWIN WITH 5G CONNECTIVITY

## What is a Digital Twin?

A digital twin is a digital replica of a living or non-living physical entity. It refers to a digital replica of potential and actual physical assets, processes, people, places, systems and devices that can be used for various purposes.

## Challenge

Often due to the demanding production targets, operators are not much keen on reducing operating cost. Their first priority is to keep the operations going and avoid production shutdown. Most of the times, there is no smart tool available which synthesizes all the data generated from equipment and provides analytics and predictive alerts to reduce the operation and maintenance cost.



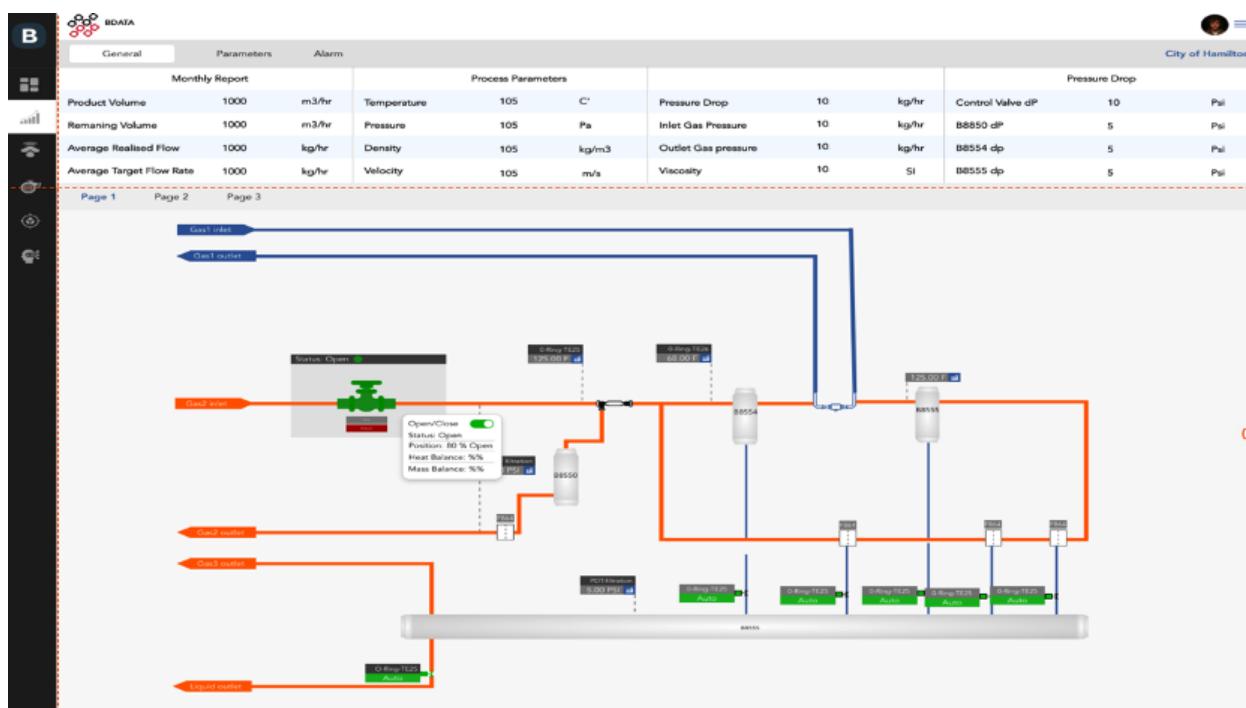
## Solution

BDATA's digital twin provides remote monitoring / secure low latency operation and diagnostic of process equipment to ensure that the operation is managed properly.

BDATA predictive model allows customers to have 48 hours advance notification before equipment fails, which provides operators enough time to adjust process the parameters and avoid equipment failure.

## Global Remote Automation

BDATA's two way (edge to cloud and cloud to edge) low latency data streaming with a high speed internet connectivity will enable companies to do global automation, that means load balance on a gas / oil pipeline, water pumping stations, power grid, remote mining operations, defense, drones, remote surgeries and many other use cases where data latency and secure connectivity is essential for remote global automation.



BDATA's has a team of data scientists, who are registered professional engineers with prior experience and knowledge in process simulation, manufacturing & process plants operations and maintenance.

BDATA provides detail insights to customers on monthly basis along with corrective approach to reduce guaranteed 20–40% operation and maintenance cost depends on the existing condition of equipment.

Significant reduction in OPMEX (Operation & Maintenance Expenses) allow companies to focus on quality and sales of their product.

# BLOCKCHAIN ENABLED IOT GATEWAY DEVICES

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The E100-9AP-IA and E100-9W-H with embedded BDATA blockchain technology are the first two Supermicro systems to provide secure BioT gateways for smartfactories and buildings. They are perfected for machine and industrial automation in the cases of process analytics, predictive equipment failure, artificial intelligence and deep learning driven edge computing applications. The device supports AWS, AZURE, IBM, Oracle and other major cloud networks.



E100-9W-H



E100-9AP-1A

# BLOCKCHAIN ENABLED PROGRAMMABLE LOGIC CONTROL (PLC)

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An edge programmable industrial controller, opto 22 groov EPIC is much more than a PLC or a PAC. It offers a reliable real-time industrial controller and a processor to collect, process, display, and exchange data.

We have enabled groov EPIC to provide secure immutable data streaming using BiOT technology. BDATA's blockchain enabled secure connectivity ensures that all the data is being transferred in the form of hashes and only readable by the peers deployed on the BDATA's blockchain network.

This enables customers to have secure remote monitoring and secure remote operation by combining BiOT technology with 5G to ensure <1sec data latency.



# CONCLUSION

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IoT infrastructure represents an extension of modern industrial systems. As innovative new technologies appear, enterprises and manufacturing consumers switch more and more to digital frameworks that require remote operation. Since cyberattacks represent a real-world threat to various industries, such as energy markets, it is necessary to protect the flow of data.

By leveraging blockchain technology, industry systems can ensure a heightened state of security and stability with the help of cryptographically encrypted networks. Solutions such as the blockchain-based gateway devices from BDATA guarantee the safety and utility of IoT networks. With the new line of BIOT (Blockchain Internet of Things) products, both major industries and retail consumers can integrate these solutions for numerous use cases that require remote operation. These include industrial automation, smart factories, and edge computing.

With the help of the BDATA, a Canada-based IoT solutions provider, the world can finally have access to scalable, decentralized, and secure infrastructure. With a product line that already counts three gateway devices, BDATA plans to take the world by storm.



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