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Revolutionizing IoT: Hubble Network's Bluetooth Satellite connectivity Breakthrough



Vishwakarma Institute of Technology, Pune - Welcome to the May 2024 edition of the IT-BULLETIN on IOT Technologies! In this monthly publication, we're excited to bring you the most recent developments in Bluetooth technology, such as the groundbreaking achievement of Hubble Network's historic connection to a satellite via Bluetooth.

Introduction

In a significant advancement for global connectivity, **Hubble Network**, a startup which started its operations in 2021 has achieved a groundbreaking feat: establishing the first-ever long-distance Bluetooth connection to a satellite in orbit. This accomplishment, spanning an impressive 600 kilometers, signifies a potential paradigm shift in how low-power devices can communicate across vast distances.

To fully appreciate the significance of Hubble Network's recent accomplishment, it's helpful to first understand the established limitations of Bluetooth technology, traditionally used for short-range communication.

Limitations of Bluetooth

- **Short-Range Communication:** Bluetooth is a wireless technology designed for short-range data exchange between electronic devices.
- **Radio Wave Reliance:** It utilizes radio waves in the 2.4 GHz Industrial, Scientific, and Medical (ISM) band to transmit and receive data.
- **Limited Range:** These radio waves weaken over distance, typically limiting Bluetooth range to around 10-100 meters.
- **Line of Sight Matters:** Obstacles like walls and buildings can further weaken the signal, requiring a relatively clear line of sight for optimal performance.
- **Power Efficiency Focus:** Bluetooth prioritizes low power consumption for battery life, which limits the signal strength it can transmit.



Hubble Network's Achievement

·**Empowering Low-Power Devices:** Imagine environmental sensors deployed in remote areas for monitoring weather patterns or tracking wildlife activity. These battery-powered devices can now leverage Hubble Network's innovation to connect directly with a satellite network, eliminating the need for complex and expensive infrastructure in geographically dispersed locations.

·**Bridging the Connectivity Divide:** Many regions across the globe currently lack access to reliable and affordable internet infrastructure. Hubble Network's technology offers the potential to bridge this disparity by enabling low-power devices to seamlessly connect to a global network via satellites. This paves the way for groundbreaking applications in diverse fields such as:

- **Smart Agriculture:** Real-time monitoring of soil moisture content in remote fields can empower farmers to optimize irrigation practices and resource utilization.
- **Environmental Monitoring:** Long-range Bluetooth can facilitate the connection of air quality sensors in densely populated urban centers or track wildlife migration patterns across vast stretches of land.
- **Asset Tracking:** Imagine the ability to seamlessly track the location of shipping containers across the globe, significantly enhancing logistics and supply chain management processes.
- **A More Connected Future:** Hubble Network's achievement opens doors to a future where low-power devices within the IoT ecosystem can communicate and share data over vast distances. This fosters a more interconnected environment, enabling advancements in remote monitoring, data collection, and automation across diverse industries .

Career Paths

Technical Careers:

- IoT Software Engineer:** These developers design, build, and test software applications for IoT devices and platforms. They may specialize in areas like embedded systems programming, cloud integration, or data analytics.
- IoT Security Engineer:** With the vast amount of data collected by IoT devices, security is paramount. These engineers ensure the security of data transmission, device access, and network infrastructure.
- IoT Hardware Engineer:** Designing and developing the physical components of IoT devices falls under the domain of hardware engineers. They work on aspects like sensors, microcontrollers, and low-power circuits.
- Data Scientist/Analyst:** The data collected by IoT devices holds immense value. Data scientists and analysts are responsible for extracting insights, identifying trends, and developing machine learning models to unlock the potential of this data.

Non-Technical Careers:

- IoT Product Manager:** These individuals manage the entire lifecycle of an IoT product, from ideation to market launch. They oversee product development, marketing strategies, and user experience.
- IoT Solutions Architect:** These architects design and implement comprehensive IoT solutions for specific needs. They understand the technical aspects of IoT devices, platforms, and integration with existing infrastructure.
- IoT Business Analyst:** Understanding the business value of IoT is crucial. Business analysts identify potential applications of IoT within an organization, assess market opportunities, and develop ROI (Return on Investment) models.
- IoT Security Consultant:** With the growing security concerns surrounding IoT, consultants advise businesses on implementing robust security measures for their IoT deployments.

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