# DECODING IoT

WITH BLE, BLE MESH & CLOUD

THE VVDN WAY

With the booming demand for technologies dealing with connected devices, there is a need for connecting smart devices with the cloud. Inspite of the rapid growth in IoT adoption, there are considerable issues that arise when it comes to implementation of a full IoT Solution. A lot of challenges need to be addressed especially with respect to Customizability, Scalability, Connectivity and Compatibility. This is greatly determined by the device application and type of transmission media.

BLE

An Evolved Technology for Communication
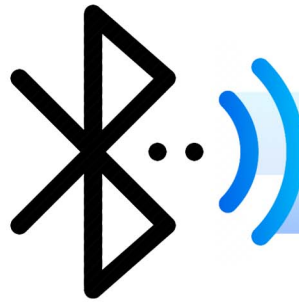
Bluetooth Low Energy (BLE)

or formally known as Bluetooth Smart, is one such impactful evolved technology. BLE provides low cost and reduced power consumption with a similar communication range as that of BT and is well suited across a lot of IoT applications. BLE has interestingly become a defacto choice for some of the applications such as:

Asset Tracking

Popular for this category the BLE beacon "listens" for the unique IDs of BLE tags attached to objects. Since these devices can be equipped with multiple sensors including light, sound, movement and temperature—the use cases are many, from tracking of wheelchairs and cylinders in hospitals to monitor the movement, speed and vibration of an airport baggage conveyor etc.

Indoor Positioning

BLE infrastructure has revolutionized indoor positioning. Whether it is finding accurate position of a smartphone or doing turn-by-turn indoor navigation or marking the important venues and indicating recommending routes in multistory stores, malls, BLE technology provides the location details with greater accuracy. This has enabled organizations to deliver location-triggered content, location-based advertising and much more.

Wearables

The low power consumption of BLE makes it ideal for wearable such as Smart Fitness Trackers, Pedometers and body sensors. It helps to reduce battery size, which in turn reduces device cost, size, and weight.

Smart Home Appliances

Appliances such as Smart Locks, Smart Plugs, Smart Washing Machines etc. all use BLE Technology.

BLE MESH

A silent entrant in the Connectivity Space

BLE Mesh is another technology that has inroads into the IoT application space. From the technology perspective it is the adaptation from BLE but offers an upgrade in core specification, compatibility and interoperability. With BLE Mesh, all devices can communicate and connect to each other, rather than connecting to a central system. This enables an endless number of connections, making a large-scale device network needed for various IoT Applications such as:

Smart Home Automation

Another significant application where BLE Mesh is an ideal fit owing to its low power and low latency pedigree of BLE. This mesh solution can be integrated with other control systems in the smart home or hotels making it smart and intelligent. BLE mesh is the only wireless solution capable of delivering secure and reliable full-building coverage that meets the strict requirements of different industrial and commercial environments.

Smart City

BLE Mesh with its low power and security feature enables gateways in a smart city applications work with the combined power of BLE with virtually infinite range with its mesh capability.

Cloud

The NECESSITY of the AGE

IoT application has no meaning if the data collected from BLE based sensors/devices is not sent to the cloud. BLE devices will either need a mobile platform (such as a smartphone) or a gateway to do a fast communication of data from the device to the cloud on demand or automatically. The significant benefits for storing sensing data on the cloud is to utilize it intelligently for multipurpose applications such as monitoring purpose in healthcare domain, targeted re-marketing in shopping malls etc.

Inspite of rise and popularity of above mentioned various IoT applications, industries today witness a huge market gaps in designing and rapid prototyping end-to-end IoT Solutions. There is no one single cloud platform that can cater to the needs for every use case or application. Every use case comes with some customizations. Considerable issues arise when it comes to the implementation of an IoT Solution due to following:

Need for Multiple Expert Stakeholders

Any IoT Application is a complex amalgamation of heterogeneous components such as the sensors, communication, cloud and app development. Hence OEMs often face the challenge to work with multiple vendors to implement an end-to-end IoT Solution.

Lack of Technology Expertise

There is a need for specialists in each field given above to provide a seamless integration across various components including hardware, firmware, cloud and app. With evolving architectures, protocols, it is obvious that for a seamless user experience, specialists are required who understands the complete system holistically and is able to potentially integrate all the components.

Security

Security is deemed as the biggest challenge for any IoT implementation. Gaining the confidence of customers, by ensuring and promising them about their data security comes with a lot of responsibility. Poorly secured IoT devices and applications are at the potential risk for cyberattacks, thereby compromising the safety of individual users. OEMs today need partners who can help them secure all the vulnerable entry points from device to communication, from cloud to application.

Scalability

The need of the hour today is to rethink the IoT with a scalable approach for connecting everything. Today Cloud is just not used as a medium for a device to connect with the application but billions of the devices connected will be monitoring the environment, most sensors and actuators will not just communicate but also act upon the information. Hence there is a need for a cloud platform architecture to evolve by rethinking the approaches to IoT applications.

Decoding IoT

Connectivity with BLE and Cloud – the VVDN Way

VVDN today is the enabler for the organizations who are looking for IoT adoption with end-to-end implementation. With expertise across the complete IoT spectrum, VVDN Cloud team offers service benefits to customers with multifold benefits including:

Develop Custom IoT Cloud Solutions

for the specific use case and application. The cloud team is not only proficient in the latest cloud technologies and architectures, but stays ahead by having a deep knowledge on all the communication technologies including BLE, BLE Mesh. Team can rapidly build and demonstrate custom IoT Cloud.

Reusable IoT Cloud Components

VVDN Cloud Team has developed various reusable components including

- Customized library for Data encryption and secure Communication
- Customized Classic Bluetooth and Bluetooth Low Energy Wrappers for all platforms.

These components act as an accelerator and speed up the development process.

Partnership with IoT Cloud Platform Providers

VVDN has partnership with partners like AWS, Microsoft Azure, Google Cloud. VVDN choses the right platform as per the use case and requirement and preference of the customer.

One Stop Solution Provider

VVDN has a unique offering for the organizations in terms of providing IoT Engineering Services, IoT Cloud and Application Development Services as well as Manufacturing Services. VVDN Technologies ensures all the customers needs are addressed under one roof.

VVDN Feature

Focus for an IoT Cloud

1. Provide **Microservices** based Cloud architecture

2. Provide **Platform Agnostic** Services

3. High **Scalability** and Availability

4. **Easy onboarding** and Device Configuration

5. End to end **Cloud Security** using encryptions

6. Add intelligence by adding **Analytics**

7. Reports Generations

8. OTA Firmware Upgrade

Cloud Migration Services

Cloud Architecture Development

Cloud Application Development

VVDN Service Offerings for end-to-end IoT Application Development

Cloud Operations & NOC Services

Mobile Application Development

About VVDN

VVDN is a leading Product Engineering, Cloud and Manufacturing Company that is uniquely positioned to deliver versatile, innovative, world-class quality products
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