

# Extending the Cloud to the Edge



Cloud computing has revolutionized the way applications and services can be developed, deployed, and scaled. Now Max2 is bringing the power of the cloud to the network edge.



Current Solution



Max2 Solution

Max2's Revolutionary Edge Application Platform is a complete end-to-end hardware and software solution that extends retailers' data center or cloud services to the edge with a unique software architecture that enables retailers to run their applications dynamically and most efficiently at the edge in retail locations, in the private data center or the Cloud, or both, based on a number of business rules such as reducing latency, application privacy, minimizing communications with cloud resources, providing for backhaul resilience, and ensuring business continuity through running mission critical applications at the edge with cloud back-up services. This highly secure, easy-to-deploy, self-healing platform brings together distributed computing, state-of-the-art communications combined with container-based virtualization, with portable Docker containers, ensuring isolation between apps and constrained access to the OS kernel, providing for highly balanced computing, storage and network capabilities that are optimized for running of edge applications, creating a hyperconverged edge. And it's technology that gives you a highly scalable competitive edge with price-performance.

Veeahub Platform facilitates and simplifies the roll-out of IoT for a wide range of Smart Retail applications such as connectivity, communications, security, scalability, automation, intelligence, and enhanced in-store operations including omnichannel sales, CRM, Converged Supply Chain Management and Marketing (CSM) and many others. Max2 platform gives customers a competitive edge in things that matter: performance, security, resilience and cost.

Breakthrough Vmesh™ Technology is like no other mesh network, in that it facilitates communication between each Veeahub node with a hybrid of commonly used wireless protocols, providing for a unified wireless/wired mesh, with open IoT framework, while also distributing computing power and capacity across the coverage area along the edge. Vmesh extends the coverage beyond other typical mesh networks and optionally offers a turn-key 3G or 4G connectivity solution.

Veeahub platform offers an incredible business opportunity to retailers for improving omnichannel operations by enabling and empowering a connected and collaborative mobile salesforce while providing real-time service status that modernizes retail business operations with transaction tracking across systems and subsystems along with context-aware services. Moreover, given the explosion of massive amounts of real-world data produced by IoT devices, running machine learning applications on Veeahub nodes closer to where data is collected, permits use of significantly more and higher quality data for delivery of relevant Artificial Intelligence ("AI") to the edge applications. Realizing an optimal solution for blockchain applications with selective endorsements is yet another unique aspect of Veeahub's distributed architecture. In addition, high-speed instantaneous delivery of cached content from Veeahub nodes with a CSM and local management of beacons are key differentiator of Veeahub platform for proximal marketing applications. Peripheral management and communications application to more readily become PCI-compliant for POS and payment terminals. PA system application with speaker addressing. Private edge messaging with video conferencing is among many more applications that can be customized for retailer's specific operational requirements.

## At-a-Glance

- **Distributed Intelligence**  
Improves user experience, reduces costs and enhances security
- **Authentication and Secure Communications**  
Joins the network with e2e security from end point to the cloud
- **Homogenous Software Architecture**  
Eases application deployment, migration and management
- **Vmesh Connectivity Between Edge Servers and the Cloud**  
Extends coverage and reachability beyond existing footprints
- **Centralised and Local Management**  
Easy, secure deployment, operational handling and analytics
- **Open Development Architecture**  
Allows third party developers to create applications
- **Edge Application Store**  
Facilitates distribution of applications for Veeahub

# Ultimate Solution for Smart Retail



## Management & Authentication Services (MAS)

- Remote management of multiple Veeahub Edge Servers over multiple mesh clusters from central cloud server
- Local management of Veeahub nodes through smartphone or tablet
- Simple commissioning - no truck roll
- App selection and download per Edge Server through Veeahub App Store

## App Management

- Veeahub App Store for download of containerized apps
- Edge Server containerization ensures isolation between apps
- Open software development platform with SDK for third party developers to distribute apps through Veeahub App Store

## Mesh Functionality

- m-DNS based Service Discovery that extends to global discovery
- Consensus based protocol for efficient configuration across mesh
- Network layer routing, transport agnostic, and self organizing
- Estimated Transmit Time routing metric ensures efficient routing in multi-MCS 802.11 network

## Security

### Link-Layer

- IKEv2 / IPsec between Edge Server acting as border router for mesh and cloud server
- WPA2-PSK / CCMP between Edge Servers in the mesh

### End-to-End

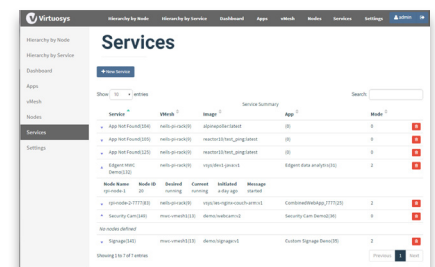
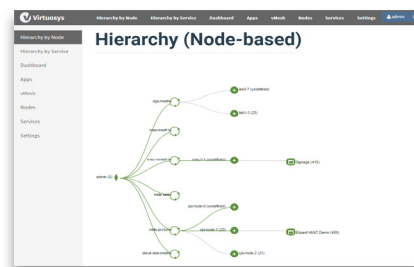
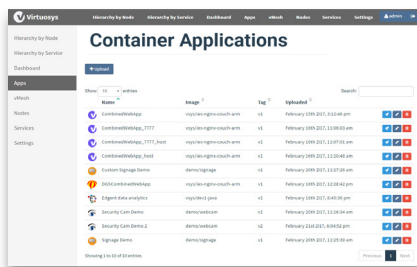
- TLSv1.2 using cipher suites employing Ephemeral Elliptic Curve Diffie-Hellman key exchange

### General Security and Authentication

- Secure boot employing a Trusted Platform Module
- AES based encryption / SHA based integrity
- Central EAP-TLS authentication of Edge Servers
- X.509 certificates
- Private network for access to MAS
- RADIUS based AAA functionality

## Network Layer Connectivity

- Both IPv6 and IPv4 connectivity is provided to external devices
- IPv4 NAT and firewall functionality
- IPv6 private network for management services



# Veeahub R4 Specifications

## Max2 Veeahub Edge Server R4

### Dimensions

- 115mm x 115 mm x 35 mm
- 4.5" x 4.5" x 1.3"



### About Max2 Inc.

Max2, based in New York City, is a platform company with a suite of innovative products and services for Smart Retail industry. Max2's solutions include payment services, intelligent wireless edge servers with software applications, as well as Point of Sale (POS) systems, 3G/4G MVNO cellular services with CloudSIM, and mobile applications for both businesses and the consumer. Headquartered in New York City with several offices in the US, Europe and Asia, Max2 is run by an experienced and tenured management team including former board members and senior executives from leading technology, payments and telecom companies.

### CPU

- ARM A53 Quad-core - 1.5 GHz
- System Memory – 2 - 4 GB DDR4 SDRAM
- Storage - 32GB eMMC Flash

### Wireless Connectivity

- Wi-Fi - Dual-band 802.11ac 4x4 MU-MIMO (Vmesh)
- Wi-Fi - Dual-band 802.11ac 2x2 MIMO (AP)
- Bluetooth - V4.2 compliant (optional upgrade to V5.0)
- 802.15.4\* - Zigbee (PRO, RF4CE, IP), Zwave, Thread / 6LoWPAN, WirelessHART, ISA100.11a

### Backhaul

- Ethernet – 1 Gbps
- Wi-Fi – Dual-band 802.11ac 2v2 MIMO
- Cellular – 3G or LTE (optional backhaul with CloudSIM and data subscription services in over 100 countries)