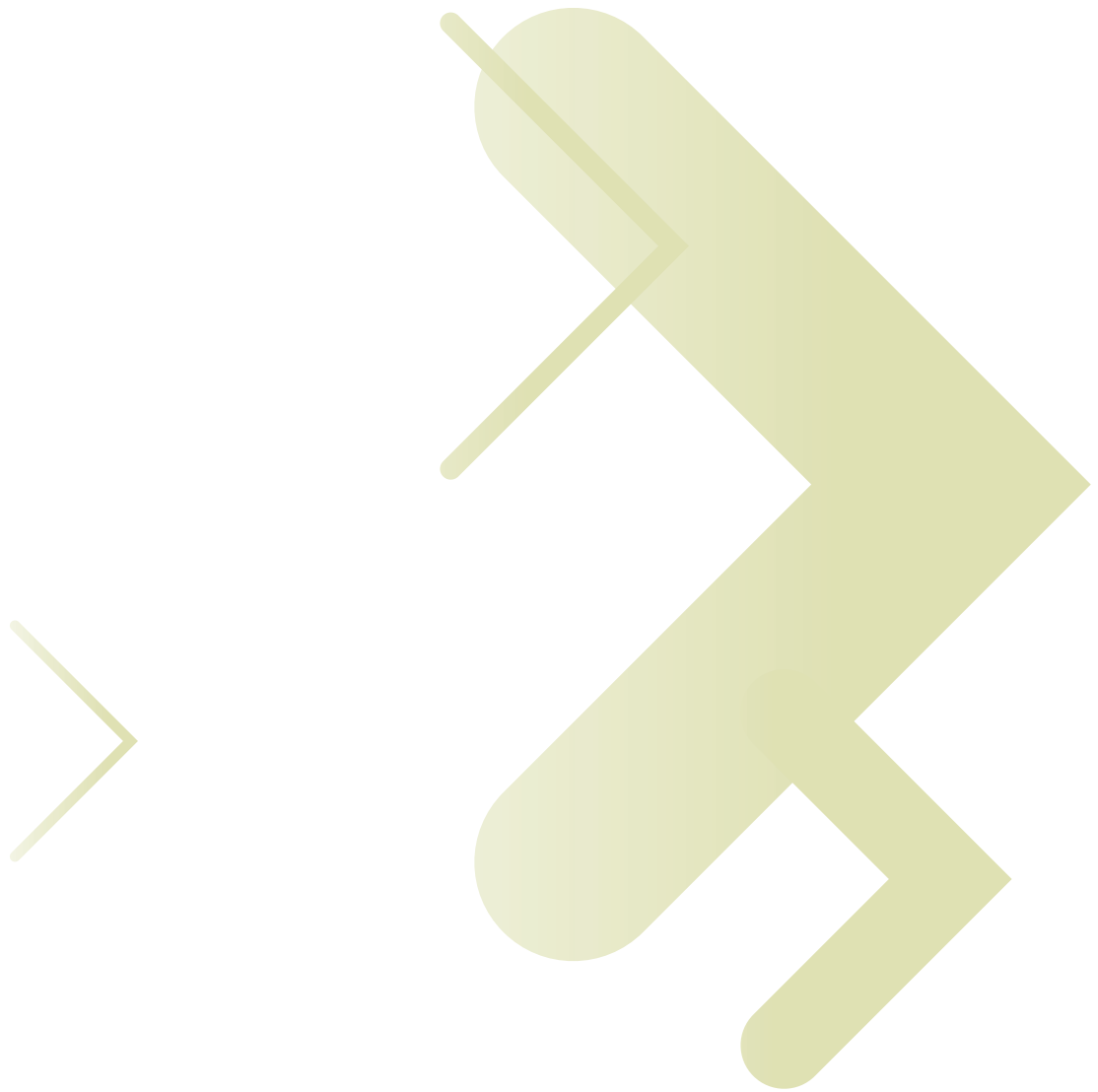




Designing the Optimal WiMAX Network: Motorola's wi4 WiMAX Flexible Access Point Portfolio



An optimal WiMAX network must be able to address specific market requirements, deployment geography, end-user demands, and planned service offerings – both for today as well as for tomorrow.

Introduction

WiMAX is a versatile technology with relevance to all operator segments in all regions of the world whether it be a mature market with demanding utilization needs or an emerging market with challenging price constraints. WiMAX is equally well suited to serve a broad range of application scenarios spanning from fixed, nomadic, mobile, indoor and outdoor communications.

Although WiMAX addresses a broad range of capabilities, we recognize that designing an optimal WiMAX network requires consideration for the specific market requirements, deployment geography, end-user demands, and planned service offerings – both for today as well as for tomorrow. Additionally, a WiMAX network should be flexible in order to meet an operator's varying needs throughout the operator's service perimeter and the network should be able to evolve over time.

Responding to the need for highly flexible WiMAX solutions that can be configured based on evolving needs and varying market requirements, Motorola delivers the wi4 WiMAX Flexible Access Point Portfolio. In an innovative advance, Motorola's wi4 WiMAX Flexible Access Point Portfolio can be easily configured to support a wide assortment of coverage, capacity, and application scenarios utilizing an array of options including macro, micro, outdoor, indoor, sectorized, omni, tower-top electronics, distributed electronics, MIMO and smart antenna techniques.

With the wi4 WiMAX Flexible Access Point Portfolio, operators can rapidly deploy an optimized network tuned to the varying requirements in their service footprint today and easily grow and scale to meet the growing demands of tomorrow.

The wi4 WiMAX Flexible Access Point Portfolio is comprised of a common WiMAX Base Control Unit paired with any selection from a wide portfolio of Motorola WiMAX RF Modules.

WiMAX Base Control Unit

At the heart of Motorola's wi4 WiMAX infrastructure solution is the WiMAX Base Control Unit (WiMAX BCU). The WiMAX BCU is the core WiMAX engine for the wi4 WiMAX Flexible Access Point System performing all the baseband processing, site synchronization, power distribution, and network interfacing. The flexible design of this infrastructure solution enables the WiMAX BCU to be paired with a wide variety of RF solutions ranging from distributed electronics, tower-top design, MIMO capability, and Adaptive Antenna Arrays.

The WiMAX BCU is a compact, self-contained, and fully weatherized unit that allows for flexible deployment options. The WiMAX BCU with "zero-footprint" design can be mounted to a pole, the exterior of a building, within existing shelters, rack-mounted, or floor-mounted. The flexible deployment options offer considerable ease in network design and the potential for significant savings in cost of ownership.

The WiMAX BCU connects into Motorola's wi4 WiMAX Distributed Network Architecture providing a simple, peer-to-peer network approach that is a flat, all IP-based design. The WiMAX distributed network architecture is supported by Motorola's WiMAX Access Point Control (WiMAX APC) to administer key functions best served by localized management such as security and mobility decisions and a separate bearer control path realized from standard IP routers and switches.



WiMAX RF Modules

The selection of WiMAX RF Modules include self-contained, fully integrated units consisting of all RF processing components including multiple transmit and receive lineups, filters and multiple antenna elements. Additionally, redundant fiber optic interfaces allow for simple connectivity to the WiMAX BCU eliminating the need for heavy RF coaxial cables. For high output power requirements, the wi4 WiMAX Flexible Access Point System can be deployed with distributed RF electronics and collocation of the higher output active components with the WiMAX BCU.

The multiple RF module options including MIMO and beamforming capabilities provide tremendous flexibility for addressing the variety of application requirements in a given deployment as well as providing the confidence for seamlessly growing the network in the future.

System Design Benefits

High Performance

The wi4 WiMAX Flexible Access Point Portfolio is based on the IEEE 802.16e-2005 WiMAX standard, and benefits from such features as the spectrally efficient S-OFDMA interface, low latency performance, and IP based architecture. Enhanced system gain supported by advanced antenna capabilities allow strong indoor penetration as well as support for cellular-like mobility applications. Additionally, QoS capabilities, security features, and redundancy options make the platform a true carrier-class solution.

Fixed & Mobile Application

The wi4 WiMAX Flexible Access Point Portfolio provides Non-Line-of-Sight, fixed and mobile wireless broadband connections to deliver bandwidth intensive, rich media applications across data, voice, and video services.

Ease of Installation & Management

Motorola's design philosophy for the wi4 WiMAX product portfolio focuses on ease of installation, management, and operation. The wi4 WiMAX Flexible Access Point Portfolio features small, "zero-footprint" base sites with an all-outdoors design and flexible mounting options for both the RF Modules and the WiMAX BCU. Simple Operations & Management software allows for remote configuration and system updates.

Flexible & Scalable Deployments

Capacity and coverage requirements will factor into network dimensioning to determine the initial scale of a network deployment. With the wi4 WiMAX Distributed Network Architecture, operators can rapidly deploy their networks today and easily scale to meet the growing demands of tomorrow. As coverage or capacity needs grow, additional base sites can be readily deployed and seamlessly "dropped" into the distributed IP architecture.

Reduced CAPEX

The wi4 WiMAX Flexible Access Point Portfolio benefits from an integrated design that reduces real estate requirements and allows for simple connections between components. Flexible hardware and software programmable radios provide the benefit of no-touch software updates. Integrated RF antenna design eliminates the need for costly and heavy coaxial cables between antennas and baseband modules and avoids power losses associated with heavy RF coaxial cables.

Reduced OPEX

The wi4 WiMAX Flexible Access Point Portfolio has been designed as IP end-to-end. The network architecture eliminates high-cost centralized boxes, simplifies management, and reduces core transport costs. Connectivity to standard IP equipment allows operators to realize significant cost advantages. The wi4 WiMAX Flexible Access Point Portfolio deployment approach can benefit from collocation with existing cell sites as well as reusing existing shelters with the small WiMAX BCU form factor allowing both rack mountable as well as floor mountable options.

Conclusion

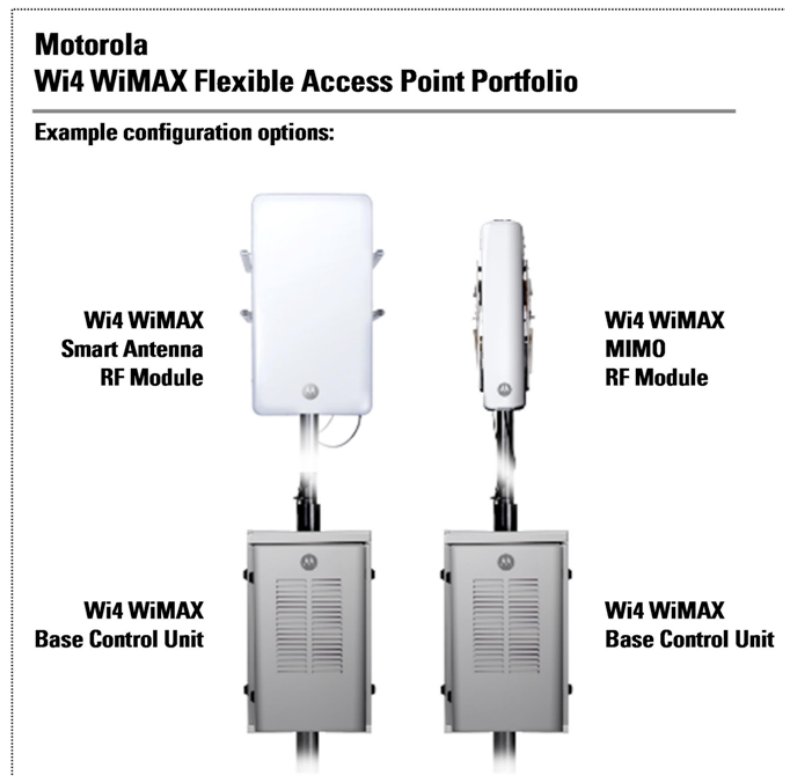
With Motorola's wi4 WiMAX Flexible Access Point Portfolio paired with a distributed network architecture, operators are able to address fixed and full mobility applications, have the assurances of service quality and security, as well as benefit from substantially reduced CAPEX and OPEX models. Throughput and latency-stringent applications such as VoIP, streaming video, and gaming will have enhanced performance in the flat, all-IP network.

With Motorola's Flexible Access Point Portfolio paired with the wi4 WiMAX Distributed Network Architecture, operators are able to address full mobility applications, have the assurances of service quality and security, as well as benefit from substantially reduced CAPEX and OPEX models

Motorola's wi4 WiMAX Flexible Access Point System delivers on the promise of personal broadband and rich service delivery. Paired with a converged IP core and communicating with feature-rich, multimodal devices Motorola can offer:

- one network
- one service delivery platform
- one bill
- one seamless experience that is transparent to the end-user.

Service Providers in all regions and segments will have the ability to differentiate their service and recognize revenue growth opportunities through Motorola's high-performing and cost-effective wi4 WiMAX network. Whether end-users in these markets are demanding access to increasingly rich, interactive and personalized content anytime and anywhere, or simply basic voice connections and the ability to access and share information with their communities and the world – with Motorola's wi4 WiMAX systems these experiences are now well within reach.





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