



the **UMA** company



Universal Mobile Access: UMA Expands Beyond Dual-Mode Handsets

With UMA now a formal 3GPP standard, the mobile industry is looking to leverage it to deliver fixed-mobile convergence services well beyond cellular/Wi-Fi handsets, including dual-mode cellular/WiMAX handsets, femtocells, terminal adaptors and softmobiles.

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➔ Introduction

As mobile handset penetration reaches saturation levels in many markets, mobile operators are aggressively seeking new ways to drive top-line revenue growth. One key initiative being pursued to address this challenge is providing UMA-enabled dual-mode (cellular/Wi-Fi) handset services to encourage increased use of mobile voice and data at home and the office (i.e. accelerate fixed-to-mobile substitution).

However, in addition to offering dual-mode handset (DMH) services, mobile operators are now looking to leverage their UMA deployments to deliver a number of additional fixed-mobile convergence services.

Fundamentally, the UMA standard provides a scalable, secure IP interface into the core service network of mobile operators. By deploying a UMA Network Controller (UNC), an operator is able to extend all of its existing and future voice, data and IMS services over any IP-based access network through an open, standards-based interface. This capability can be leveraged well beyond the concept of providing enriched mobile voice and data services to dual-mode cellular/Wi-Fi handsets.

This whitepaper provides an overview of how UMA is being leveraged to support a number of new fixed-mobile convergence services and devices, including UMA-enabled dual-mode cellular/WiMAX handsets, UMA-enabled femtocells, UMA-enabled terminal adaptors and UMA-enabled softmobiles (Figure 1). As the UMA market matures, it appears UMA is rapidly evolving beyond “Unlicensed” Mobile Access to truly becoming “Universal” Mobile Access.

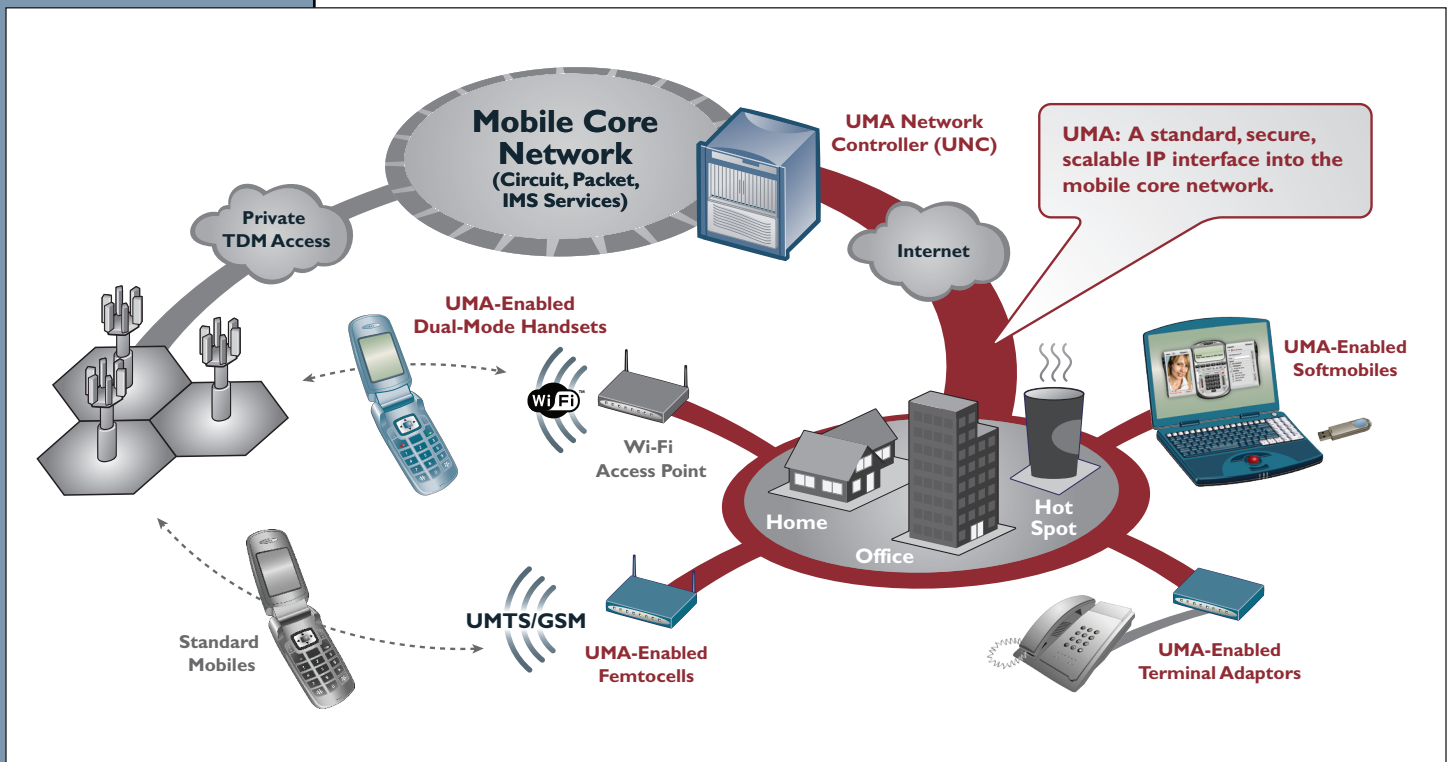


Figure 1. The Expanding UMA Service Opportunity

➔ **UMA-Enabled Dual-Mode Cellular/Wi-Fi Handsets**

Dual-mode cellular/Wi-Fi handset (DMH) services are by far the most well-known application of UMA technology. With UMA-enabled dual-mode handsets, operators can improve the performance and lower the cost of traditional mobile voice and data services for subscribers when in range of a Wi-Fi network. While the basic opportunity for these handsets is well documented, there are a few areas of interest that are not generally known.

3G/UMTS Handset Support:

It is widely known that UMA enables the development of dual-mode 2.5G (GSM/GPRS/EDGE)/Wi-Fi handsets. What is less known is that the existing 3GPP UMA standard also supports the development of tri-mode 2.5G/3G/Wi-Fi handsets and allows for seamless handovers between 3G and Wi-Fi networks. In fact, there are several UMA-enabled tri-mode handset projects in development at this time.

UMA In The Enterprise:

The value UMA-enabled mobile handsets provide to end users and operators extends well beyond the home. For example, the use of a flat rate DMH service plan when in range of public hotspots could be greatly valued by some consumers. For enterprise IT departments, service cost and performance continue to be the primary concerns with employee mobile phone usage. With UMA, operators can now approach enterprises with value propositions that simply and directly address these concerns.

For example, an operator could offer an enterprise's employees a flat rate service plan for mobile usage whenever connected to an enterprise, home office or Wi-Fi hot spot network. If developed correctly, the UMA service offer could enable enterprises to save on overall communications spending while providing additional revenues to the operator.

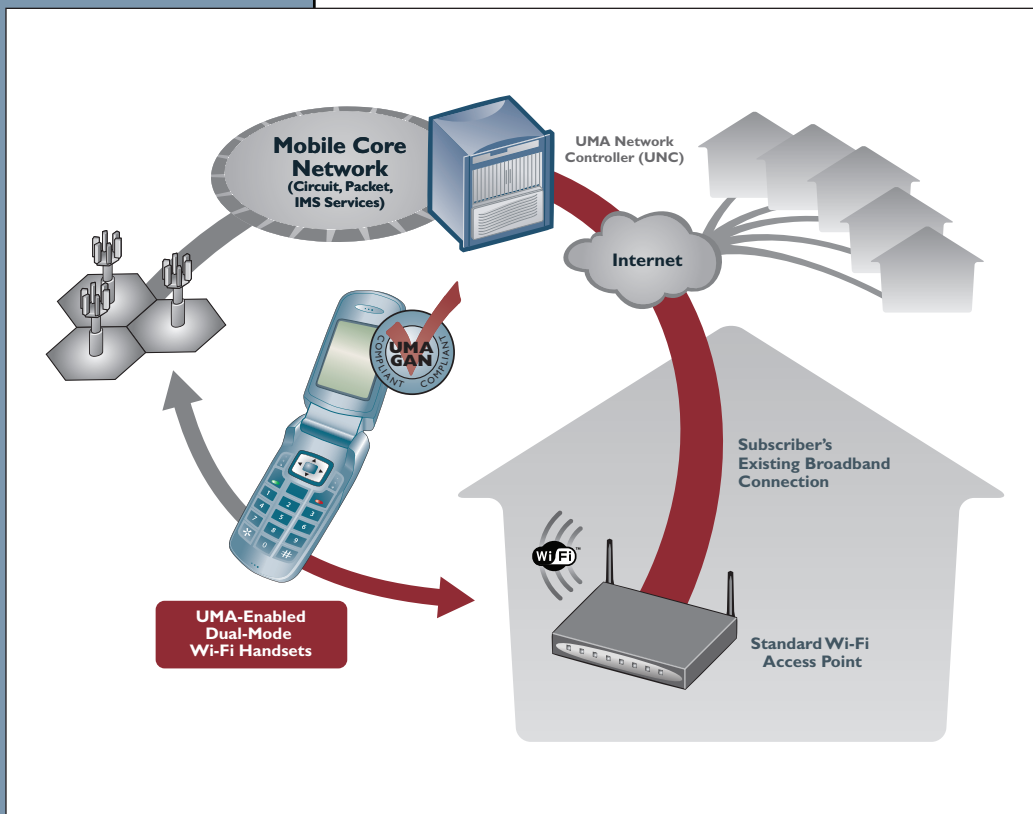


Figure 2. UMA-Enabled Dual-Mode Wi-Fi Handset Services

➔ **UMA-Enabled Dual-Mode Cellular/WiMAX Handsets**

The momentum building behind WiMAX would appear to ensure its success in the market in the coming years. As an IP-based radio technology, WiMAX is moving beyond a simple data-overlay technology for fixed broadband services and is rapidly becoming a viable radio access technology for servicing nomadic and mobile devices.

In fact, several mobile operators are now investigating deployment of WiMAX networks alongside their existing 2G and 3G networks. While the reasons for investigating such hybrid networks vary by operator, they are all now seeking technology that could enable them to provide dual-mode cellular/WiMAX handsets with seamless operation across both access network types.

Fortunately, the 3GPP UMA standard can be directly leveraged to address the dual-mode cellular/WiMAX service opportunity (Figure 3). UMA was designed from the beginning to enable seamless delivery of all mobile services over any type of IP access network technology, including WiMAX.

Operators can leverage UMA to support dual-mode WiMAX handsets as easily as supporting dual-mode Wi-Fi handsets. In fact, it is known that several dual-mode cellular/WiMAX handset projects are underway at this time.

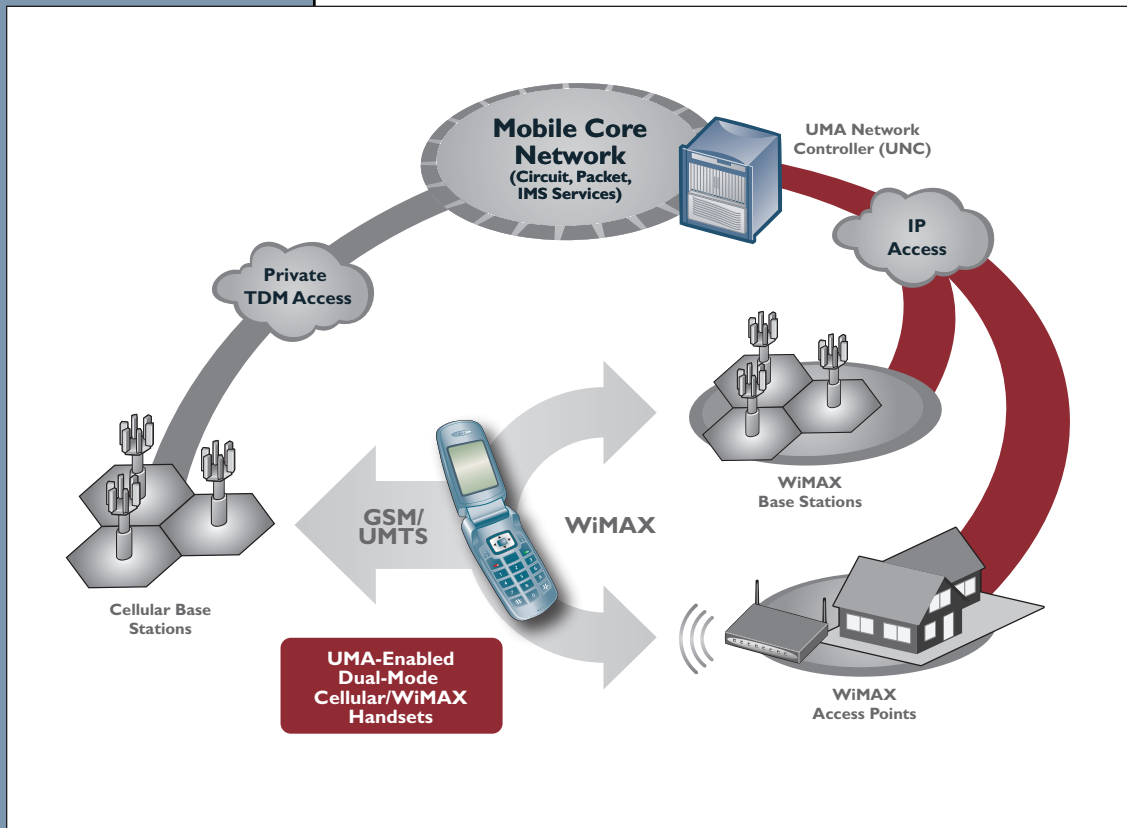


Figure 3. UMA-Enabled Dual-Mode Wi-MAX Handset Services

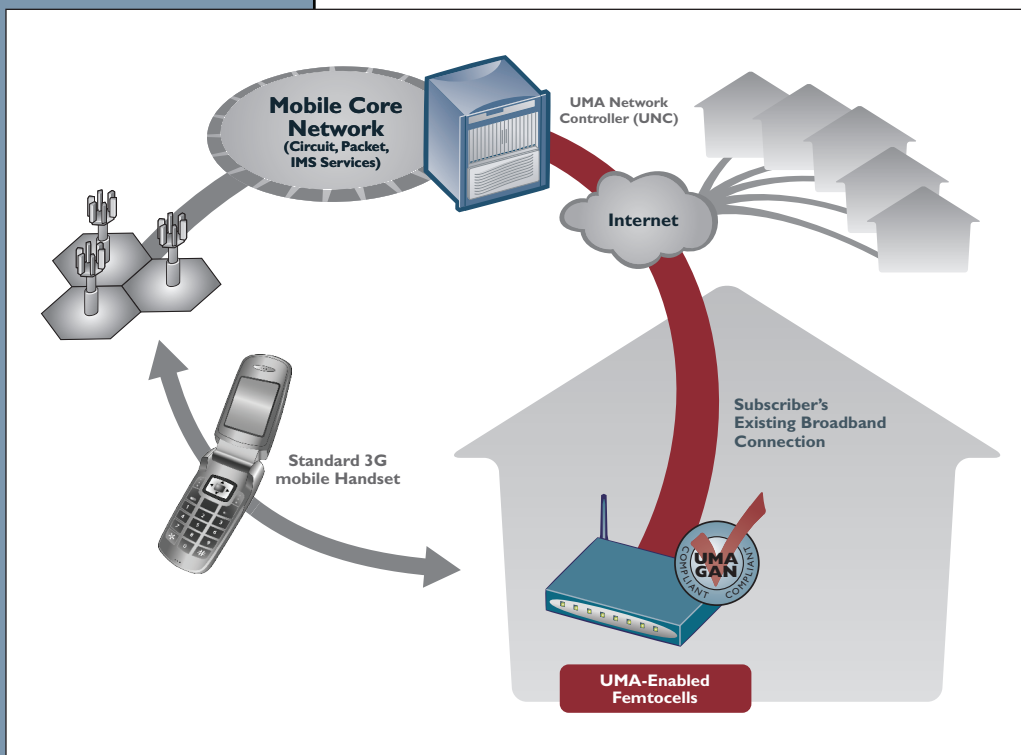
➔ **UMA-Enabled Femtocells**

The wireless industry has been searching for low-cost indoor coverage solutions since the beginning of mobile networks. To date, a small sub-sector of the wireless equipment industry has satisfied the indoor coverage market by offering cost-effective picocell solutions for high-traffic and high-worth locations. Unfortunately, the bulk of the indoor coverage opportunity (i.e. residential environments) has been beyond the addressable market for cost and operational reasons. To be successful, a residential femtocell deployment must meet the following requirements:

- Low-cost femtocell products (under €150)
- A reasonable approach for managing RF interference
- A standard, cost-effective, approach for core network integration

Recent developments in 2G and 3G silicon have once again raised the possibility of offering low-cost femtocells to address the residential indoor licensed coverage opportunity. Technology companies such as picoChip, Radioframe, ipAccess and UbiquiSys are working on femtocell products expected to meet the tough cost target as well as provide reasonable approaches for managing interference with outdoor radio networks. While solutions to the first two requirements are being addressed and availability expected over the next several years, the challenge of identifying a standard, cost-effective approach for integrating femtocells back into the core network has remained.

Fortunately, the 3GPP UMA standard, originally defined to enable millions of dual-mode handsets to access mobile services over the Internet, can be directly leveraged to address the femtocell core network integration challenge (Figure 4). UMA provides a standard, scalable, cost effective IP-based access infrastructure that can be leveraged by femtocells in the same manner as it is currently by dual-mode handsets.



For more information on this topic, please refer to "The Case for UMA-Enabled Femtocells" whitepaper available on the Kineto Wireless web site, www.kineto.com.

Figure 4. UMA-Enabled Femtocell Services

➔ **UMA-Enabled Terminal Adaptors**

The market for Fixed VoIP services has increased dramatically over the last 12 months. As of December 2006, Vonage Holdings alone had more than 2 million subscribers paying between \$15 and \$25 per month for a telephone service delivered over existing broadband access connections.

Now, with UMA-enabled terminal adaptors, mobile operators can also participate in this large and growing service opportunity. A UMA-based fixed line VoIP service is the ideal approach for mobile operators looking to increase fixed-to-mobile substitution by directly capturing in-home fixed minutes of use.

UMA-based terminal adaptors enable mobile operators to leverage their existing mobile core networks to deliver a standard analog telephone service over any broadband access network connection (a.k.a. Fixed VoIP) (Figure 5). As far as subscribers are concerned, the service behaves as a standard analog fixed telephone line. The service is delivered in a manner similar to other fixed-line VoIP services, where a simple device (in this case the UMA-enabled terminal adaptor) is connected to the subscriber's existing broadband service.

The UMA-enabled terminal adaptor, which represents itself to the core mobile network as another mobile terminal (including SIM credentials), then converts standard mobile service into a standard fixed analog telephone service. To deliver the service, the terminal adaptor provides one or more standard analog telephone ports.

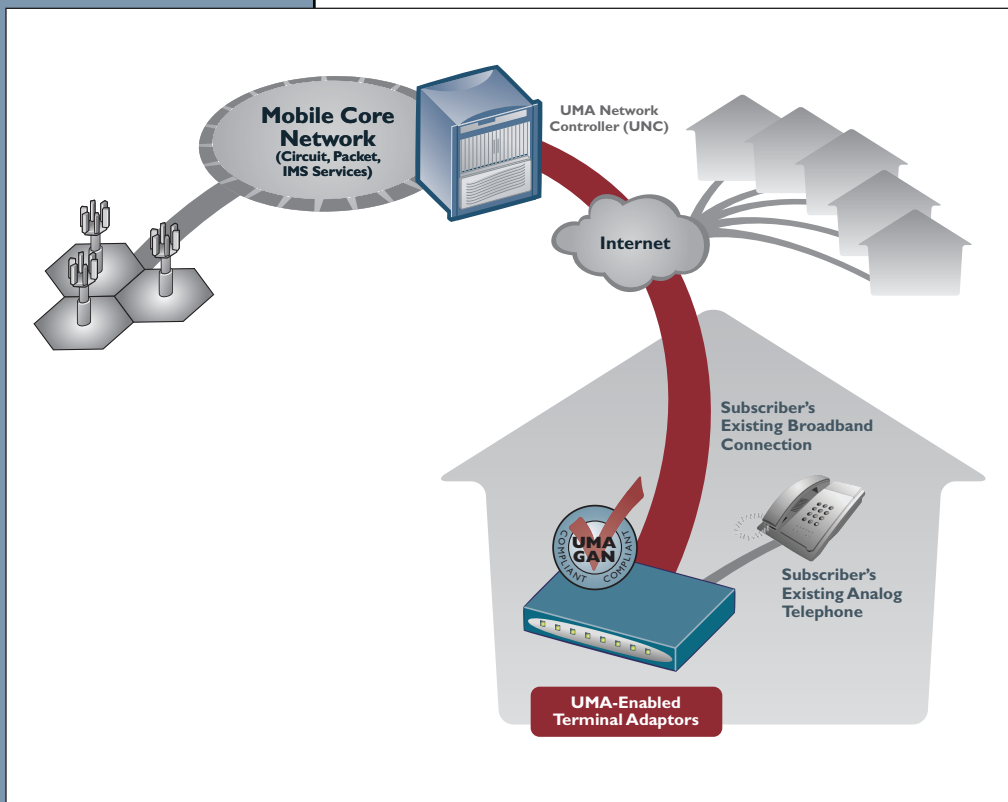


Figure 5. UMA-Enabled Terminal Adaptor Services

➔ **UMA-Enabled Softmobiles**

Connecting laptops to broadband access at hotels and Wi-Fi hot spots has become a standard part of everyday life, particularly for international business travelers. In addition, many travelers are beginning to utilize laptops and broadband connections for the purpose of voice communications. Rather than using mobile phones to make calls and pay significant roaming fees, they are turning to PC-based softphones and VoIP services when making international calls. This represents a significant threat and opportunity for mobile operators.

By implementing UMA technology, mobile operators will be able to leverage their existing UNC deployments to provide UMA-enabled softmobile services. Imagine a service where subscribers traveling abroad could make inexpensive calls from their laptop whenever connected to a hotel broadband connection or public hotspot, while under the auspices of the home mobile service provider.

To use a UMA-enabled softmobile service, a subscriber would simply place a USB memory stick with an embedded SIM into a USB port on their laptop. The UMA-enabled softmobile client would automatically launch and connect over IP to the home mobile service provider (Figure 6). From that point on, the subscriber would be able to make and receive mobile calls as if he or she was in their home calling area. The service would function in a similar manner to SoftPhone clients provided by VoIP providers such as Vonage.



Figure 6. UMA-Enabled softmobile Services

→ Summary

By providing a well-defined interface for extending mobile voice, data and IMS services over IP access networks, the 3GPP UMA standard opens tremendous new service opportunities for mobile operators. By deploying a Kineto UMA core network solution, operators will soon have the ability to deliver a number of compelling fixed-mobile substitution services based on UMA-enabled dual-mode Wi-Fi handsets, dual-mode WiMAX handsets, femtocells, terminal adaptors and even softmobiles.